SECOND QUARTER 2018 GROUNDWATER ASSESSMENT MONITORING REPORT
JUNE 2018 MONITORING EVENT

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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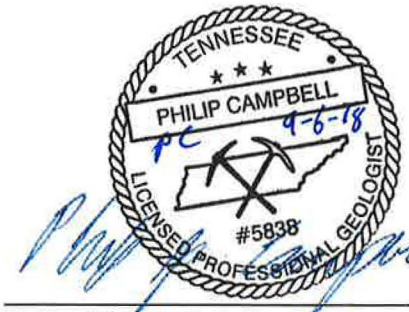

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EXECUTIVE SUMMARY

This report documents the second quarter 2018 assessment-monitoring event, which was performed at the former Environmental Waste Solutions, LLC (EWS) Camden Class II Landfill on June 19, 2018.

The former EWS Camden Class II Landfill is located in Benton County at 200 Omar Circle, Camden, Tennessee (latitude 36°03'16" N/longitude -88°05'16" W), and was formerly registered with the Tennessee Division of Solid Waste Management (DSWM) with permit number IDL 03-0212. The IDL 03-0212 permit was terminated in July 2017.

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

Quarterly assessment monitoring activities have been performed since the November 2015 monitoring event in general accordance with the site's Groundwater Quality Assessment Plan (GWQAP) dated March 14, 2016. During the second quarter 2017 assessment-monitoring event, total cadmium was detected above the maximum contaminant level (MCL) at MW-3, which was the first MCL exceedance for total cadmium concentrations at any well location on site. As a result, enhancements have been made to the sampling and analytical program for the site. Additional quarterly sampling activities have been added to the sampling and analytical program for the site, which includes the addition of stream and sediment sampling in nearby Charlie Creek and Cane Creek and quarterly leachate sampling. In addition, the annual storm water sample collected for Sector L National Pollutant Discharge Elimination System (NPDES) compliance now includes the analysis of total cadmium.

The Second Quarter 2018 sampling event at the facility included the following sampling activities:

Groundwater samples were collected by CEC on June 19, 2018 from MW-1, MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3. Leachate samples were collected by Civil & Environmental Consultants, Inc. (CEC) on June 19, 2018 from the "Aluminum Processing Waste Cell (APWC)" and "Industrial Waste Cell (IWC)" locations. On June 27, 2018, surface water and sediment samples were collected from Cane Creek and Charlie Creek by CEC. The stream (surface water

and sediment) sample locations included Charlie Creek Upstream (US), Charlie Creek Midstream (MS), Cane Creek US, Cane Creek MS, and Cane Creek Downstream (DS-1).

Pace Analytical (Pace), formerly ESC Lab Sciences, was the laboratory sub-contracted to perform the chemical analyses. Laboratory reports for the leachate analysis were prepared by Pace and reported to CEC on June 29, 2018. Laboratory reports from the groundwater analysis were prepared by Pace and reported to CEC on July 5, 2018. Laboratory reports from the surface water and sediment analysis were prepared by Pace and reported to CEC on July 7, 2018.

The reported concentrations of chemicals detected in the groundwater monitoring wells and temporary monitoring wells were reviewed and compared against their respective U.S. EPA Maximum Contaminant Levels (MCLs) and U.S. National Secondary Drinking Water Standards (2DWS). Stream (surface water) samples were reviewed and compared to the upstream sampling results and the General Water Quality Criteria established in TDEC Rule Chapter 0400-40.03 of the Rules of the Tennessee Department of Environment and Conservation. 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 the sample size is very limited at this time. The results of the analyses are summarized in the following paragraphs.

Total mercury was detected above the MCL (0.002 mg/l) at up-gradient MW-1 during the June 9, 2018 monitoring event (total mercury at MW-1=0.00319 mg/l) and was the only mercury detection above the MCL. The presence of mercury in the local groundwater near up-gradient monitoring well MW-1 may be attributable to naturally occurring deposits in the soil overburden since there is no immediate development up-gradient of MW-1. Total cadmium was detected above the MCL (0.005 mg/L) at MW-3 during the June 9, 2018 monitoring event (total cadmium at MW-3 = 0.0312 mg/l) and was the only cadmium detection above the MCL at any of the groundwater monitoring locations. The statistical trend analysis for total cadmium at MW-3 does confirm an increasing trend having statistical significance. The reported total cadmium concentration during this event was higher than the previous March 22, 2018 monitoring event where total cadmium at MW-3 = 0.00671 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).

Although there have been elevated concentrations of total cadmium in MW-3, the extent of cadmium in the groundwater at the site appears to be limited to the area around MW-3 as there have been no detections of cadmium above the Practical Quantitative Limit (PQL) of 0.001 mg/l, 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.

Total cadmium was not detected above the laboratory PQL in the surface water and sediment samples collected from nearby Charlie Creek and Cane Creek during the June 19, 2018 monitoring event.

In addition, five SSIs were identified over background during this event. Those SSIs include aluminum (TMW-2), barium (MW-3, TMW-2), chloride (MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3), fluoride (MW-3), and sulfate (MW-3). The barium, chloride, fluoride and sulfate detections observed in the site monitoring wells were all below their associated MCLs or 2DWS. However, the aluminum detection observed in TMW-2 was above the 2DWS.

Glossary of Terms

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

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

1.0 INTRODUCTION

1.1 SITE LOCATION

The former 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 with construction activities currently underway). 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 because 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 were in response to elevated chloride concentrations at MW-3, which were first detected during the November 2015 sampling event. In addition to providing potentiometric information for the site, these temporary wells yield groundwater samples for water-quality analyses.

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

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

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

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

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

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

Top of casing elevation has been determined by a licensed land surveyor and is referenced to the current Tennessee State 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 monitoring wells MW-2, MW-3, MW-4, and MW-5 and temporary monitoring wells TMW-1, TMW-2, and TMW-3, which are all down-gradient of the waste cells.

2.4 POTENTIOMETRIC GRADIENT

The potentiometric surface of the unconfined aquifer occurring beneath the former EWS Class II landfill occurs at approximately twenty-two (22) feet below the top of casing at the up-gradient monitor well MW-1 to approximately ten (11) feet below the top of casing at monitor well MW-4. The potentiometric gradient calculated from groundwater elevation data collected on June 19, 2018 is approximately 1.28%.

The potentiometric gradient is calculated according to the following formula:

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

$$\frac{(394.73') - (370.22')}{1{,}910'} * 100 = 1.28\%$$

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

2.5 HYDRAULIC CONDUCTIVITY

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

3.0 GROUNDWATER SAMPLING PROCEDURES

3.1 INSTRUMENTATION

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

3.2 GROUNDWATER PURGING AND COLLECTION OF FIELD PARAMETER VALUES

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

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

The start time of purging, the parameter measurements at intervals during purging, estimated pumped volumes, depths to water for low-flow sampling, and any notes of unusual conditions were recorded during purging activities. Field parameter measurements (temperature, pH, conductivity, DO, ORP, and turbidity) were collected periodically until proper field stabilization goals had been met, which are defined by the USEPA SESD as: "for at least three consecutive measurements, the pH remains constant within 0.1 Standard Unit (SU), conductivity varies no more than 5 percent, and the turbidity has either stabilized or is below 10 Nephelometric Turbidity Units (NTUs)". Other parameters such as DO were also measured as a purge-adequacy parameter. Normal goals for DO are 0.2 mg/L or 10% saturation, whichever is greater. Temperature and ORP

were measured during purging to obtain measurements of record for these parameters for each sampling event.

During the June 19, 2018 monitoring event, a peristaltic pump was utilized during purging activities in the temporary monitoring wells (TMW-1, TMW-2, and TMW-3). According to the USEPA SESD groundwater sampling procedures, peristaltic pumps can be utilized as an alternative and acceptable method for low-flow or multiple volume purging and sampling activities. During the previous March 21, 2018 monitoring event, dedicated bladder pumps were utilized during initial purging activities in the temporary monitoring wells (TMW-1, TMW-2, and TMW-3) and the turbidity values remained above 1,000 NTU, which was well above the acceptable 10 NTU requirement. Since an acceptable turbidity value could not be obtained from each of the temporary wells during the previous monitoring event, the dedicated bladder pumps were removed from each of the temporary wells, and purging activities continued on March 21, 2018 utilizing a peristaltic pump at each of the temporary monitoring well locations. When the peristaltic pump was utilized, a more acceptable turbidity value was obtained from each of the temporary monitoring wells (TMW-1, TMW-2, and TMW-3). Therefore, a peristaltic pump was utilized at each of the temporary monitoring wells during this June 19, 2018 monitoring event to obtain more representative groundwater samples for analysis.

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

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

3. A minimum of three well volumes were purged.

Field chemistry parameters were collected periodically at the temporary wells until field parameter measurements had stabilized, and at least three well volumes were removed from each temporary monitoring well. The purge water from down-gradient monitoring wells MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3 were containerized and discarded into the on-site leachate collection system storage tank.

Field parameter values for each well are presented in Table 1 – Field Parameters and Potentiometric Data in Appendix A. A detailed account of each purge and sample procedure conducted at each monitoring well is presented in Appendix D – CEC 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 the laboratory supplied sample vessels in the following order: Appendix I organics – three (3) forty (40) mL amber glass containers preserved with hydrochloric acid (HCl); Appendix I organics EDB and DBCP– three (3) forty (40) mL clear glass containers preserved with sodium thiosulfate ($Na_2S_2O_3$); total metals (Appendix I metals, Al, Ca, Fe, K, Mg, Mn, Na, and Boron) – one (1) five-hundred (500) ml HDPE container preserved with nitric acid (HNO_3); 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_2SO_4). In addition to total metals analysis, dissolved metals samples 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_3. As soon as samples were collected in their respective containers, samples were preserved accordingly and placed on ice in a sample cooler.

As described in the previous section, a peristaltic pump was used to purge temporary monitoring wells TMW-1, TMW-2, and TMW-3. Samples for organic analysis cannot be exposed to the flexible peristaltic pump-head tubing, due to the risk of contaminant sorption and/or the risk of the dissolution of organic compounds to the sample. Therefore, the sample containers for the more turbidity-sensitive analysis were filled first (metals), and samples for organic analysis were collected using a clean Teflon® bailer at each temporary monitoring well.

3.4 STREAM (SURFACE WATER AND SEDIMENT) SAMPLE COLLECTION AND PRESERVATION

The stream surface water sampling activities were completed in accordance with the USEPA SESD sampling procedure -SESDPROC-201-R4 titled "Surface Water Sampling". The stream sediment sampling activities were completed in 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 upstream, and ending with the furthest designated upstream sampling location. 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
- Cane Creek DS-1: Stream location at landfill property boundary, before Camden WWTP.

The laboratory results for all stream (surface water and sediment) sample locations are summarized in Table 2b – Stream and Sediment Analytical Data in Appendix A. The stream (surface water and sediment) sample locations are shown on Figure 3 - "Groundwater and Stream Sample Locations" located in Appendix A.

3.4.1 Stream Sampling

The surface water samples were collected prior to the collection of the sediment samples at approximately the same dedicated sampling locations in the stream. CEC sampling personnel faced upstream and collected the sample without disturbing the bottom sediments. The surface water samples were collected directly 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_3); 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. The CEC sampler added the laboratory-supplied preservative to the appropriate sample vessels directly after sample collection.

3.4.2 Sediment Sampling

The sediment 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 collected sample 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. All sediment samples collected from the stream were analyzed for the same list of parameters as the surface water samples, with the exception of total hardness and dissolved metals.

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

3.5 LEACHATE SAMPLING PROCEDURES

Leachate samples were collected by CEC on June 19, 2018, from the "Aluminum Processing Waste Cell (APWC)" and "Industrial Waste Cell (IWC)" 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 before the leachate entered the IWC leachate collection tank. Laboratory reports from the leachate analysis were prepared by Pace and reported to CEC on June 29, 2018. The approximate APWC and IWC leachate sample locations are shown on Figure 2 - Potentiometric Surface Map located in Appendix A.

3.6 QUALITY ASSURANCE AND QUALITY CONTROL

3.6.1 Field Quality Assurance and Quality Control

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

A field blank and a duplicate sample were collected during this groundwater monitoring event. CEC collected a field blank next to monitoring well TMW-3 and a duplicate sample was collected from MW-4. The field blank was collected by pouring deionized water into a set of sample bottles provided by the laboratory, thereby allowing any airborne contaminants a chance to enter the field blank sample. The duplicate sample was collected by taking separate samples from within MW-4 at the same time. In addition, a laboratory supplied trip blank for VOC analysis was prepared and placed in a cooler, which was present during groundwater sampling activities. Upon the collection of the final groundwater sample, the trip blank was placed in a sample cooler and delivered to Pace for VOC analysis. No VOCs were detected above the laboratory PQL in the trip blank sample.

Pace reported the groundwater laboratory analytical results to CEC on July 5, 2018. 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-4 were similar to the original MW-4 sample results.

3.6.2 Laboratory Quality Assurance and Quality Control

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

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

The internal laboratory IQA and IQC results are included in the laboratory analytical reports located in Appendix C - Laboratory Analytical Reports & Field Information Logs.

3.7 SAMPLE CHAIN-OF-CUSTODY

A sample Chain-of-Custody (COC) traveled with the sample kit from Pace to the former EWS Class II Landfill site and back to Pace for the June 2018 sampling event. The CEC SOP 07-01-01 for maintaining sample Chain of Custody may is presented in Appendix D – CEC Standard Operating Procedures.

4.0 LABORATORY ANALYTICAL PROCEDURES

4.1 ANALYTICAL METHODS

All laboratory analyses for the second quarter 2018 groundwater assessment-monitoring event were completed by Pace Analytical. The analytical methods chosen for these monitoring events were in full compliance with the procedures required by the DSWM and the USEPA's publication SW-846, entitled Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (3rd Edition).

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

Method 6010b	Inductively Coupled Plasma (ICP) – Atomic Emission Spectrometry
Method 7470A	Mercury in Liquid Waste – Manual Cold Vapor Technique
Method 9056A	Determination of Inorganic Anions by Ion Chromatography (Bromide, Chloride, Fluoride)

4.2 LABORATORY ANALYTICAL RESULTS

Second quarter groundwater samples were collected by CEC on June 19, 2018. Pace performed the groundwater analysis and reported the results on July 5, 2018. Second quarter leachate samples were collected by CEC on June 19, 2018 from the "Aluminum Processing Waste Cell (APWC)" and "Industrial Waste Cell (IWC)" leachate sample locations. Pace performed the leachate analysis and reported the results on June 29, 2018. Second quarter stream (surface water and sediment) samples were collected from the Cane Creek and Charlie Creek by CEC on June 27, 2018, and Pace reported the results on July 7, 2018.

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 Data in Appendix A. Constituent values from all inorganic laboratory analyses for stream and sediment samples are presented in Table 2b – Stream and Sediment Analytical Data in Appendix A. Copies of the laboratory reports are located in Appendix C – Laboratory Analytical Reports.

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

Total Cadmium was detected above the MCL (0.005 mg/L) at MW-3 during the June 19, 2018 monitoring event (total cadmium at MW-3 = 0.0312 mg/l), which was higher in concentration than the previous March 22, 2018 monitoring event (total cadmium at MW-3 = 0.00671 mg/l) and December 14, 2017 monitoring event (total cadmium at MW-3=0.00659 mg/L). The turbidity results for MW-3 on June 18, 2018 (4.92 NTUs) was within the recommended goal of 10 NTUs. The turbidity results for MW-3 on March 22, 2018 (24.3 NTUs), December 14, 2017 (23 NTUs), and September 28, 2017 (18.9 NTUs) at the time of sample collection were slightly above the recommended goal of 10 NTUs. The sampling results from the June 18, 2018 event and the previous three sampling events (March 22, 2018, December 14, 2017 and September 28, 2017) revealed that the dissolved cadmium results in the field-filtered samples collected at MW-3 were above the MCL and similar to the total cadmium results. Total 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. 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). 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.

Total cadmium was not detected above the laboratory PQL in the surface water and sediment samples collected from nearby Charlie Creek and Cane Creek during this June 27, 2018 event.

Total Cobalt was detected in up-gradient well MW-1 (0.0206 mg/L) and down-gradient wells MW-5 (0.00233 mg/l), and TMW-2 (0.00385 mg/l) during this June 2018 event. Cobalt does not have an MCL; however, TDEC-DSWM uses the EPA regional screening level (RSL) of 0.006 mg/L as the groundwater protection standard for this constituent. The reported detections at MW-

1, MW-5, and TMW-2 were above the RSL during this June 2018 event. Cobalt has historically been detected at concentrations that exceed the RSL at MW-1 prior to the disposal of waste in the landfill, and total Cobalt was detected in MW-1 at a similar concentrations during the previous March 2018 event (total cobalt at MW-1= 0.0425 mg/l) and December 2017 event (total cobalt at MW-1=0.0411 mg/L). The presence of cobalt in the local groundwater is considered to be naturally occurring, originating from deposits in the soil overburden, since there is no immediate development up-gradient of MW-1.

Total Mercury was detected above the MCL (0.002 mg/l) in up-gradient well MW-1 (total mercury=0.00319 mg/l) during this June 2018 event, which is the first time the total mercury concentration has exceeded the MCL at MW-1. Total mercury has previously been detected above the laboratory PQL (0.0002 mg/l) at up-gradient well MW-1 at concentrations ranging from 0.00024 mg/l (February 2011) to 0.000858 mg/l (May 2016). Although total mercury has been previously detected at up-gradient MW-1 above the PQL, total mercury has not been detected above the laboratory PQL in any of the down-gradient monitoring wells since monitoring began at the site in 2008. The presence of mercury in the local groundwater near up-gradient monitoring well MW-1 may be attributable to naturally occurring deposits in the soil overburden since there is no immediate development up-gradient of MW-1. The observed concentrations of mercury at MW-1 will continue to be monitored closely and carefully in future monitoring events.

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

Laboratory analytical results for the groundwater samples collected in June of 2018 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 include iron and manganese in up-gradient well MW-1, aluminum in down-gradient wells TMW-1, TMW-2, and TMW-3, iron in down-gradient wells MW-5, TMW-1, TMW-2, and TMW-3, and manganese in down-gradient wells MW-3, MW-5, and TMW-2. Chloride and sulfate were below the 2DWS during this event. The observed concentrations at monitoring wells at the site for the constituents given below are discussed relative to the 2DWS.

Total Aluminum concentrations observed in TMW-1 (1.35 mg/L), TMW-2 (11.0 mg/L), and TMW-3 (0.696 mg/L) during the June 2018 sampling event were above the 2DWS (0.2 mg/L). During the previous March 2018 sampling event, the aluminum concentrations at MW-3 (0.846 mg/L), MW-5 (0.432 mg/L), TMW-1 (0.442 mg/L), TMW-2 (1.28 mg/L), and TMW-3 (0.236 mg/L) were also above the 2DWS (0.2 mg/L). Aluminum was not detected above the PQL (0.001 mg/L) at MW-3 and MW-5 during this June 2018 event.

Sampling data suggests that total aluminum concentrations are sensitive to turbidity values, given that the dissolved aluminum concentrations at TMW-1 and TMW-3 were less than the laboratory PQL (<0.1 mg/L). The total aluminum detection at TMW-2 was also likely affected by the turbidity at the time of sampling (turbidity at TMW-2=128 NTU), and is supported by the fact that the dissolved aluminum at TMW-2 (dissolved aluminum=2.63 mg/l) was significantly lower in

concentration than the total aluminum concentration. Each dissolved metals sample was field-filtered using a 0.45 micron filter before sample collection, and the turbidity in the field-filtered samples at TMW-1 (2.62 NTU) and TMW-3 (1.25 NTU) were below the recommended 10 NTUs. It should also be noted that although each sample was field-filtered using a 0.45-micron filter before sample collection, the turbidity at TMW-2 (106 NTU) remained elevated after field filtering, indicating that very small (<0.45 micron) colloidal clay particles were able to pass through the filter and remain in the water column.

The **Chloride** concentration reported at MW-3 was 99.0 mg/L during this June 2018 event, which was slightly higher in concentration than the previous March 2018 event (65.2 mg/L). However, this concentration was below the 2DWS for chloride concentrations (250 mg/l) and was less than the concentrations reported during the previous sampling events in December 14, 2017 (104 mg/L), September 2017 (112 mg/l), June 2017 (163 mg/l), 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.

Total Iron was detected above the 2DWS (0.3 mg/L) in up-gradient well MW-1 (6.39 mg/L), and down-gradient wells MW-5 (0.307 mg/L), TMW-1 (2.04 mg/L), TMW-2 (15.1 mg/L), and TMW-3 (2.09 mg/L) during the June 2018 monitoring event. The reported total iron concentrations at MW-1, MW-5, TMW-1, TMW-2, and TMW-3 were less than the highest concentrations observed prior to placement of waste and do not exhibit a trend via time-series graphs. The presence of iron in the local groundwater is considered to be naturally occurring, originating from deposits in the soil overburden, and iron has consistently been detected above the 2DWS in MW-1.

Total Manganese has been consistently detected at concentrations above the 2DWS (0.05 mg/L) in up-gradient well MW-1. Manganese detections were observed above the 2DWS (0.05 mg/L) in up-gradient MW-1 (0.431 mg/L) and down-gradient site monitoring wells MW-3 (0.401 mg/L), MW-5 (0.0953 mg/L), and TMW-2 (0.170 mg/L) during this June 2018 sampling event. The presence of total manganese in the local groundwater is considered to be naturally occurring, originating from deposits in the soil overburden.

The **Sulfate** concentration reported at MW-3 during this sampling event was 30.1 mg/L. This concentration was below the 2DWS for sulfate (250 mg/L) and less than the concentrations reported during the previous December 2017 (46.2 mg/L), September 2017 (46.2 mg/L), and June 2017 (93.7 mg/) monitoring events. For further comparisons, the detected sulfate concentration 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. Sulfate was not detected above the PQL in any of the other monitoring wells across the site.

4.3 SURFACE WATER AND SEDIMENT ANALYTICAL RESULTS

Total cadmium was not detected above the laboratory PQL in the surface water or sediment samples collected from nearby Charlie Creek and Cane Creek during the June 2018 event. In addition, total mercury was not detected above the laboratory PQL in the surface water samples collected from nearby Charlie Creek and Cane Creek during this event. No other parameters were detected at levels above regulatory limits in the surface water samples.

4.4 QUALITY CONTROL QUALIFIER CODES

The EPA Contract Laboratory Program states that sample and result qualifiers should be utilized as part of a total quality-control process. Pace complies with this directive and reports all qualifiers along with explanations of QC qualifier codes. A total of seven QC qualifier codes (B, J2, J3, J4, T8, P1, and Q) were indicated during the laboratory analysis of groundwater samples collected in June 2018. Five QC qualifier codes (B, J4, T8, P1, and Q) were indicated during the laboratory analysis of groundwater samples. Three QC qualifier codes (J2, J3, and J4) were indicated during the laboratory analysis of leachate samples. Two QC qualifier code (B and P1) were indicated during the laboratory analysis of stream and sediment samples.

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, MW-5, TMW-1, TMW-2, and TMW-3.

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

After the non-representative background sample data was removed, 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 PQL. Data determined to be normally distributed were evaluated using parametric prediction limit (PPL) analysis. Data that were not normally distributed were evaluated using non-parametric statistical methods. Inter-well and intra-well PPL analysis and non-parametric statistical methods were appropriately utilized to determine statistically significant trends in data.

Inter-well analyses compared the concentrations observed at the down-gradient monitoring locations (MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3) to the concentrations observed at the up-gradient monitoring location (MW-1) during this monitoring event. 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.

Arsenic and cobalt data at up-gradient well MW-1 were normally distributed and were evaluated using PPL intra-well analysis. Chloride data from all up-gradient and down-gradient monitoring wells was normally distributed when the data was log-transformed and non-detects were replaced by half of the corresponding PQL. Therefore, the chloride data at MW-3, MW-4, and MW-5 was evaluated using PPL inter-well analysis.

Barium, nickel, and mercury data at MW-1 were not normally distributed and were evaluated using intra-well non-parametric statistical methods. Aluminum, barium, total cadmium, cobalt, fluoride, nickel, zinc, and sulfate data at all up-gradient and down-gradient monitoring wells were not normally distributed and were evaluated using non-parametric statistical methods.

The percentage of inter-well non-detects for each parameter determined the primary statistical method utilized. If the percentage of non-detects in the samples was less than 50%, Shewart-CUSUM control charts were utilized. If more than 50% non-detects existed for the given parameter, non-parametric inter-well prediction limit analyses were 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 were conducted for most of the data from up-gradient well MW-1 compared to down-gradient monitoring wells (MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3). Additional statistical procedures performed included Mann-Kendall trend analyses and the non-parametric Wilcoxon Rank Sum group comparisons (with non-detects set to the highest reporting limit for the given constituent 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 are given in Appendix B – Statistical Evaluations and Time Series Plots.

5.2 STATISTICAL RESULTS

One statistically significant increase (SSI) in the reported mercury concentrations was identified in up-gradient well MW-1 using intra-well non-parametric prediction limit analysis.

SSIs over background identified for the current monitoring event include total barium at MW-3 and TMW-2, total cadmium at MW-3, chloride at MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3, fluoride at MW-3, sulfate at MW-3, and zinc at MW-3. Trend analyses revealed a statistically significant upward trend in total barium, total cadmium, chloride, fluoride, sulfate, and zinc concentrations reported at MW-3; and a statistically significant upward trend in chloride concentrations reported at MW-5 and TMW-1.

Trend analyses revealed a statistically significant downward trend in nickel concentrations reported at MW-3. Also, trend analysis revealed a downward trend in total barium concentrations at MW-4, and no distinct statistically significant trend in chloride detections at MW-4, TMW-2, and TMW-3.

The total barium concentration at MW-3 was 0.135 mg/L during this sampling event, and was slightly higher than the previous March 2018 sample event (0.102 mg/L). However, the reported barium concentration at MW-3 remains less than the seven consecutive sample results collected at MW-3 from November 21, 2014 to November 10, 2016. Total barium also remains below the MCL for the primary drinking water standard for barium (2 mg/L).

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, Wilcoxon 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 group tests have low Power (< 0.8). As a result, obtaining more groundwater samples from MW-3 for total cadmium, as well as the other measured constituents, should improve the validity of the use of the Wilcoxon group test and its ability to detect differences in the group medians.

The chloride concentration observed at MW-3 (99 mg/L), MW-4 (6.71 mg/L), MW-5 (62.2 mg/L), TMW-1 (11.7 mg/L), TMW-2 (16.8 mg/L), and TMW-3 (53.2 mg/L) produced an SSI over background during this event. The chloride detections at MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3 are consistent with previous data and are below the 2DWS for chloride concentrations (250 mg/L). When considering all chloride data to date from MW-4, TMW-2, and TMW-3, the data did not show an upward or downward trend in chloride concentrations using the Mann-Kendall trend analysis at the 95% confidence level. However, the chloride concentrations observed at MW-3, MW-5, and TMW-1 indicated an upward trend in chloride concentrations using the Mann-Kendall trend analyses at the 95% confidence level.

Similar to the total cadmium and zinc trend analysis, the statistical trend analysis for total fluoride at MW-3 during this June 2018 event (Fluoride=0.248 mg/L) confirmed an increasing trend having statistical significance. However, this reported fluoride concentration was less than the previous March 2018 monitoring event (Fluoride=0.274 mg/L).

An SSI in reported sulfate concentrations at MW-3 was identified during this sampling event. In addition, when considering all data accumulated from MW-3 since May 19, 2009, a statistically upward trend in sulfate concentrations at MW-3 was indicated using the Mann-Kendall trend analysis at the 95% confidence level. The sulfate concentration reported at MW-3 during this sampling event was 30.1mg/L, which is below the 2DWS for sulfate concentrations (250 mg/L).

The statistical trend analysis for total zinc at MW-3 during this March 2018 event (total zinc at MW-3= 0.0109 mg/l) confirmed an increasing trend having statistical significance. Total zinc was first detected above the laboratory PQL (<0.025 mg/L) at MW-3 during the June 2017 groundwater event (total zinc=0.0769 mg/l) and was also detected during the September 2017 event (total zinc= 0.0439 mg/l) December 2017 event (total zinc = 0.159 mg/L), and March 2018 event (total zinc = 0.0499 mg/l). Before June 2017, zinc had remained below the current laboratory PQL of 0.025 mg/l since July of 2010. Although zinc levels are above the PQL, the levels are still well below the secondary drinking water standard of 5 mg/L.

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

6.0 CONCLUSIONS

The results of the second quarter assessment-monitoring event of 2018 are summarized as follows:

- The mercury concentration at up-gradient monitoring well MW-1 exceeded the MCL. Total mercury has not been detected in any of the down-gradient monitoring wells since monitoring began at the site in 2008. The presence of mercury in the local groundwater near up-gradient monitoring well MW-1 may be attributable to naturally occurring deposits in the soil overburden since there is no immediate development up-gradient of MW-1. The observed concentrations of mercury at MW-1 will continue to be monitored closely and carefully in future monitoring events.
- The total and dissolved cadmium concentrations at MW-3 during this event were above the MCL. Also, the statistical trend analysis for total cadmium at MW-3 does confirm an increasing trend having statistical significance when analyzing the data using the Mann-Kendall trend analysis method. Based on current data, the impacted area appears to be limited to the MW-3 location, since there have been no detections from groundwater samples obtained from temporary monitoring wells TMW-2 and TMW-3 that are immediately down-gradient of MW-3. The increased concentration of cadmium present in MW-3 for the second quarter monitoring event is believed to be caused by on-going closure activities in and around the storm water pond located immediately adjacent to MW-3. It is expected that as closure activities are completed, the concentration of cadmium detected in MW-3 will decrease. In the future, cadmium levels will be closely monitored at this well. However, the detections of total cadmium and dissolved cadmium at MW-3 remain at levels above the MCL, and the accompanying statistically significant trend analysis for cadmium in MW-3 remains an area of concern.
- Total cadmium was not detected above the laboratory PQL in any of the surface water and sediment samples collected from nearby Charlie Creek and Cane Creek during this event.
- The statistical trend analysis for total zinc data at MW-3 confirms an increasing trend having statistical significance and identifies an SSI based on non-parametric prediction limits. Zinc was first detected above the laboratory PQL at MW-3 during the June 2017 groundwater event. Before June 2017, zinc had remained below the current laboratory PQL of 0.025 mg/l since July of 2010. Although zinc levels have been above the laboratory PQL since June 2017, the total zinc concentrations have remained well below the 2DWS of 5 mg/L.
- An SSI was identified for the reported chloride concentration at MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3 during this event. Additionally, the chloride concentrations at MW-3, MW-5, and TMW-1 exhibited a statistically significant increasing trend per the Mann-Kendall non-parametric trend procedure. The chloride concentrations at MW-3 have remained below the 250 mg/L 2DWS since the monitoring event in November 2015 (458 mg/L) and the supplemental re-sampling

event (360 mg/L) in December 2015. The chloride detections at MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3 are consistent with previous data and are below the 2DWS for chloride concentrations (250 mg/L). When considering all chloride data to date from MW-4, TMW-2, and TMW-3, the data did not show an upward or downward trend in chloride concentrations using the Mann-Kendall trend analysis at the 95% confidence level. However, the chloride concentrations observed at MW-3, MW-5, and TMW-1 indicated an upward trend in chloride concentrations using the Mann-Kendall trend analyses at the 95% confidence level. The chloride concentrations at MW-4, MW-5, TMW-1, TMW-2, and TMW-3 are still well below the 250 mg/L 2DWS. Although the chloride concentrations at MW-1 and MW-5 appear to have an increasing trend, there is still a limited amount of data that has been collected (eight total events at MW-5 and TMW-1) since MW-5 and TMW-1 were installed in April 2016.

- A SSI was identified for the reported sulfate concentration at MW-3 during this event. In addition, the sulfate concentration at MW-3 exhibited a statistically significant increasing trend. The sulfate concentration reported at MW-3 was below the 250 mg/L 2DWS for sulfate concentrations and was less than the concentration reported during the previous fourth quarter 2017 sampling event. Sulfate has not consistently been detected above the PQL (5 mg/l) at any of the other permanent monitoring wells or temporary monitoring wells.
- Time series graphs prepared for MW-3 indicate a recent decreasing trend since the June 2017 quarterly event for chloride, total calcium, total magnesium, total potassium, total sodium, and sulfate.
- No VOCs were detected above their respective laboratory PQL during the monitoring event.
- No constituents were detected above regulatory limits at any of the stream (surface water and sediment) samples. Sediment samples do not have an MCL and surface water is compared to general water quality criteria.

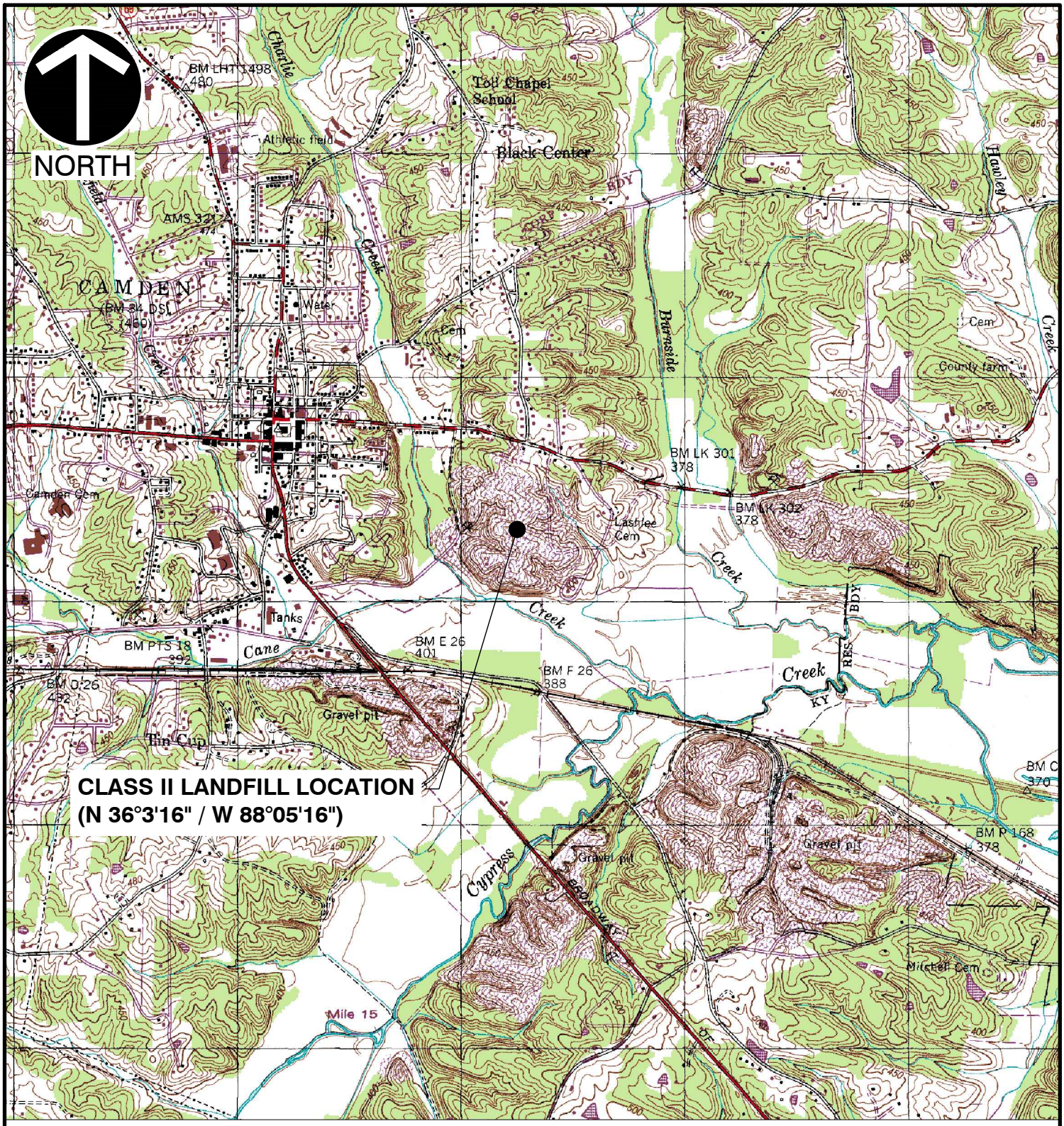
The third quarter 2018 assessment monitoring event is tentatively scheduled for September 2018 and will consist of collecting groundwater samples from up-gradient well MW-1 and down-gradient wells MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3. Also, surface water and sediment samples will be collected from selected locations along Charlie Creek and Cane Creek. Leachate samples will be collected from the APWC and IWC.

7.0 RECOMMENDATIONS

The following recommendations are presented 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. Although dedicated bladder pumps have been installed within temporary monitoring wells TMW-1, TMW-2, and TMW-3 for low-flow sampling purposes, it appears that an alternative purging and sampling procedure may be more suitable for obtaining representative groundwater samples. During this event, a peristaltic pump was used to obtain more representative groundwater samples with lower turbidity values in each temporary monitoring well. Therefore, it is recommended that TMW-1, TMW-2, and TMW-3 be purged and sampled by utilizing a peristaltic pump as described in Section 3.2 and 3.3 for future sampling events.
2. It is recommended that all permanent monitoring wells on the site continue to be monitored quarterly. In addition, quarterly groundwater samples will continue to be collected from temporary monitoring wells down-gradient from MW-3. In addition, 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 (Pace) continue to analyze for total and dissolved metal constituents, using methods that will produce the lowest reporting limit. In addition to providing 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, if there is a future need for groundwater modeling.
4. It is recommended that sample data will continue to be removed from the background data set for statistical evaluations if elevated turbidity values >150 NTU were observed during sample collection.

APPENDIX A
MAPS & TABLES



REFERENCE

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

SCALE IN FEET

0 2000' 4000'

* HAND SIGNATURE ON FILE

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FORMER EWS SITE
CLASS II CAMDEN LANDFILL
CAMDEN, TENNESSEE

SITE LOCATION MAP

DRAWN BY:	KLU	CHECKED BY:	PC	APPROVED BY:	KBW*	FIGURE NO.:	1
DATE:	JULY 2018	DWG SCALE:	1"=2000'	PROJECT NO:	181-364		

P:\2018\181-364\-CADD\Dwg\181-364_ SITE LOCATION MAP.dwg[LAYOUT1] LS:(7/13/2018 - csliger) - LP: 8/29/2018 12:31 PM

NORTH

LEGEND

- MW1 394.73 — GROUND WATER MONITORING WELL GROUND WATER ELEVATION (FMSL)
- TMW-1 373.94 — 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.

$$i = \frac{394.73' \text{ (MW–1)} - 370.22' \text{ (MW–4)}}{1{,}910'} = 0.0128 \text{ ft/ft}$$

GROUNDWATER CONDITIONS

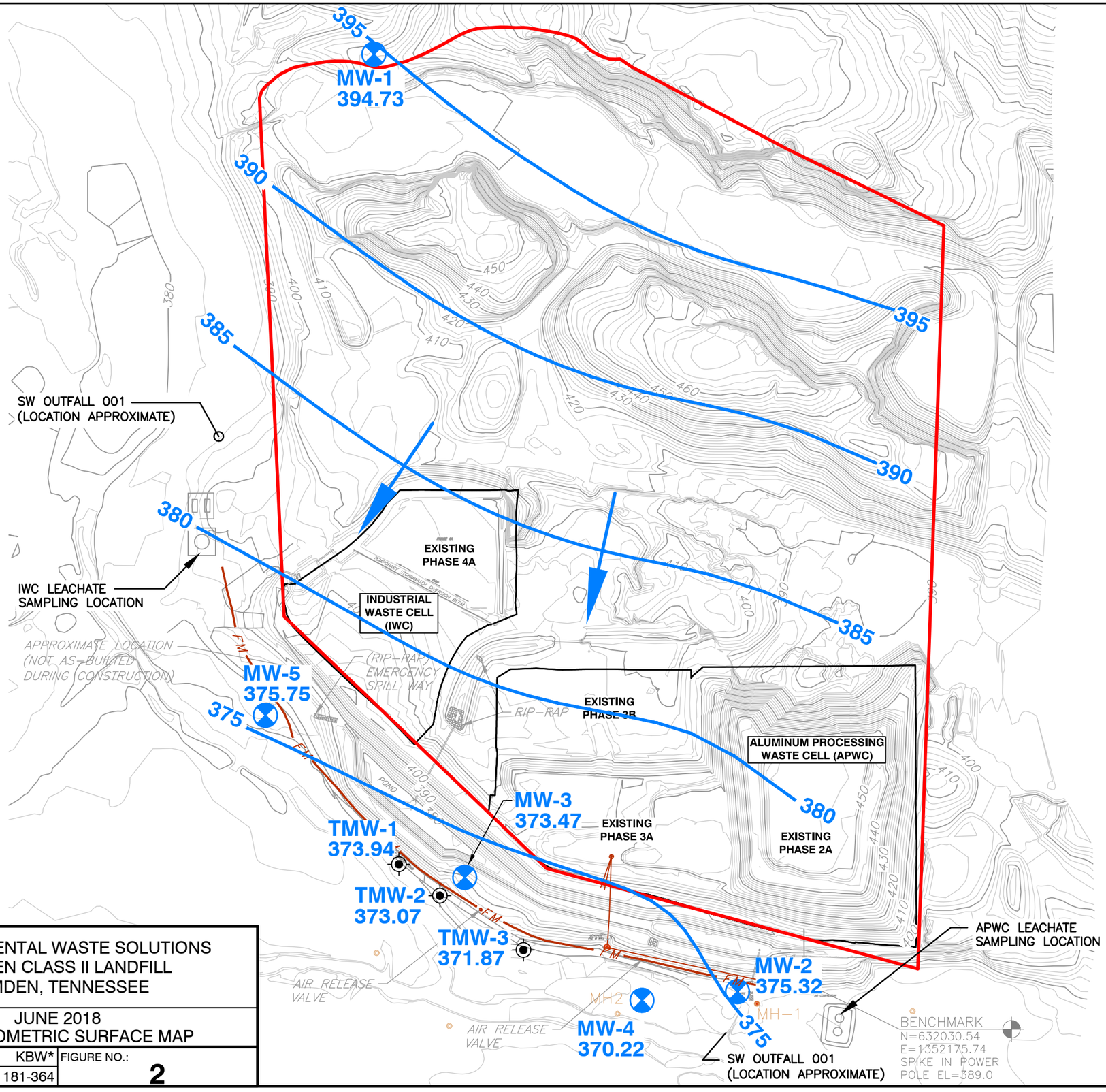
THE WATER LEVELS PRESENTED HEREIN ARE APPLICABLE TO THE LOCATION AND TIME OF MEASUREMENT. WATER LEVELS MAY FLUCTUATE THROUGH TIME.

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

SCALE IN FEET

0 200 400

*HAND SIGNATURE ON FILE



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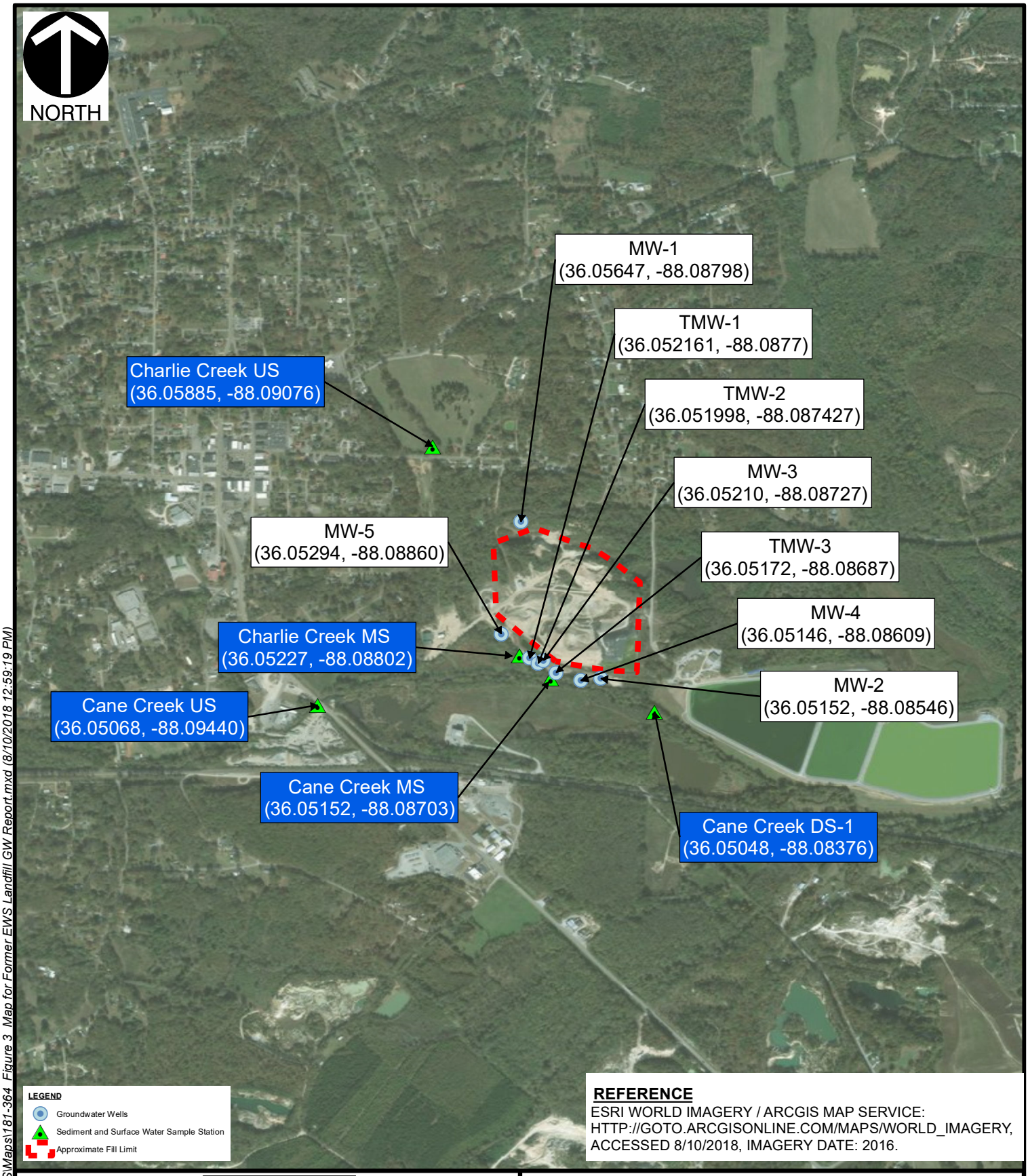
ENVIRONMENTAL WASTE SOLUTIONS
CAMDEN CLASS II LANDFILL
CAMDEN, TENNESSEE

JUNE 2018
POTENTIOMETRIC SURFACE MAP

DRAWN BY:	CDS	CHECKED BY:	PC	APPROVED BY:	KBW*	FIGURE NO.: 2
DATE:	JULY 2018	DWG SCALE:	1"=200'	PROJECT NO:	181-364	

P:\2018\181-364\-CADD\DWG\181-364_ GROUNDWATER MAP JUNE 2018.DWG\FIG 2 (2)\LLS:(PCAMPBELL - 8/3/2018) - LP: 8/29/2018_12:28:33_PM



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:	KBW* * Hand signature on file	FIGURE NO:	3
DATE:	AUGUST 2018	SCALE:	1 " = 1,500 '	PROJECT NO:	181-364		

\\SVR-NASH\ P:\2018\181-364\-GIS\Maps\181-364 Figure 3 Map for Former EWS Landfill GW Report.mxd (8/10/2018 12:59:19 PM)

Table 1

Former Environmental Waste Solutions Camden Class II Landfill

Field Parameters and Potentiometric Data - June 2018

Monitoring Well/ Sample Location	Date	Sample Time	Top of Casing Elevation[1] (Feet MSL)	Bottom of Well Elevation (Feet)	Well Diameter (Feet)	Well Volume Gallons	Depth to Water (Feet)[2]	Potentiometric Surface (Feet MSL)	Temperature (˚C)	Conductivity (micromhos/cm)	pH (SU)	Dissolved Oxygen (mg/l)	Oxidation Reduction Potential (Millivolts)	Turbidity (NTU)
MW-1	6/19/2018	12:35	416.47	385.97	0.17	1.5	21.74	394.73	18.2	59.4	5.56	4.05	140.7	8.31
MW-2*	6/19/2018	15:51	380.35	367.70	0.17	1.3	5.03	375.32	24.8	293.9	6.11	1.19	207.8	14.2
MW-3	6/19/2018	15:20	392.90	365.10	0.17	1.4	19.43	373.47	19.8	420.3	5.85	1.12	201.3	4.92
MW-4	6/19/2018	13:55	381.47	358.37	0.17	2.0	11.25	370.22	15.8	56.9	5.95	8.11	264.0	0.41
MW-5	6/19/2018	12:50	385.25	351.40	0.17	4.1	9.50	375.75	17.4	235.9	5.35	0.68	242.9	12.5
TMW-1	6/19/2018	12:30	381.19	348.99	0.085	1.1	7.25	373.94	18.7	81.6	5.10	5.86	103.0	12.0
TMW-2	6/19/2018	14:15	384.27	356.77	0.085	0.7	11.20	373.07	21.3	81.2	5.33	5.80	120.8	128
TMW-3	6/19/2018	16:50	381.37	353.37	0.085	0.8	9.50	371.87	19.7	212.6	4.99	1.70	154.4	58.4
Charlie Creek US	6/27/2018	13:30	NA	NA	NA	NA	NA	NA	25.3	131.3	6.77	8.15	102.0	2.37
Cane Creek US	6/27/2018	12:45	NA	NA	NA	NA	NA	NA	25.7	182.2	6.84	7.43	108.3	14.6
Charlie Creek MS	6/27/2018	12:00	NA	NA	NA	NA	NA	NA	24.6	149.4	6.45	7.43	113.2	6.38
Cane Creek MS	6/27/2018	11:15	NA	NA	NA	NA	NA	NA	8.6	180.6	6.79	6.11	96.2	14.5
Cane Creek DS-1	6/27/2018	10:25	NA	NA	NA	NA	NA	NA	24.4	199.4	6.76	5.29	91.4	12.6
Leachate (IWC-L)	6/19/2018	15:00	NA	NA	NA	NA	NA	NA	27.0	122,724	3.60	2.95	300.4	38.2
Leachate (APWC-L)	6/19/2018	15:25	NA	NA	NA	NA	NA	NA	15.6	463,570	9.02	0.88	123	20.6

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

[2] Depth to water measurements collected by Civil & Environmental Consultants, Inc. on June 19, 2018.

* - 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)
Groundwater and Leachate Analytical Data - June 2018

		MW-1		MW-3		MW-4		Duplicate (MW-4)		MW-5		TMW-1		TMW-2		TMW-3		Field Blank		Leachate IWC-L		Leachate-APWC-L	
		6/19/2018		6/19/2018		6/19/2018		6/19/2018		6/19/2018		6/19/2018		6/19/2018		6/19/2018		6/19/2018		6/19/2018		6/19/2018	
Parameter	**MCL/GWPS (mg/l)**	**Value (mg/l)**		**Value (mg/l)**		**Value (mg/l)**		**Value (mg/l)**		**Value (mg/l)**		**Value (mg/l)**		**Value (mg/l)**		**Value (mg/l)**		**Value (mg/l)**		**Value (mg/l)**		**Value (mg/l)**	
Hardness	-	<30		**110**		<30		<30	P1	**82.8**		**34.3**	**B**	**37.1**	**B**	**78.7**		<30		**27100**		**735**	
Alkalinity	-	**24.1**		<20		<20		<20		<20		<20		<20		<20		<20		<20		**14,000**	
Ammonia Nitrogen	-	<0.1		**0.142**		<0.1		<0.1		<0.1		<0.1		<0.1		<0.1		<0.1		**893**		**6,450**	
COD	-	<10		<10		<10		<10		<10		<10		<10		<10		<10		**2,610**		**8,780**	
Boron	-	<0.2		<0.2		<0.2		<0.2		<0.2		<0.2		<0.2		<0.2		<0.2		<2.0		<4.0	
Bromide	-	<1		<1		<1		<1		<1		<1		<1		<1		<1		**42.9**		**149**	
Chloride	250 [2]	**2.24**		**99.0**		**6.71**		**7.14**		**62.2**		**11.7**		**16.8**		**53.2**		<1		**48,300**		**150,000**	
Fluoride	2 [2]	<0.1		**0.248**		<0.1		<0.1		<0.1		<0.1		<0.1		<0.1		<0.1		<0.1		<0.1	
Nitrate	10	<0.1		**1.06**		**0.495**		**0.622**	**T8**	**1.25**		**1.46**		**0.689**		**3.98**		<0.1	Q	<0.1		**40.8**	
Sulfate	250 [2]	<5		**30.1**		<5		<5		<5		<5		<5		<5		<5		**1,910**		**1,240**	
Aluminum	0.2 [2]	<0.1		<0.1		<0.1		<0.1		**0.18**		**1.35**		**11.0**		**0.696**		<0.1		**319**		<9.0	
Aluminum, Dissolved	0.2 [2]	<0.1		<0.1		<0.1		<0.1		<0.1		<0.1		**2.63**		<0.1		<0.1		**311**		<10.0	
Antimony	0.006	<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.2		<0.18	
Arsenic	0.01	**0.0063**		<0.002		<0.002		<0.002		<0.002		**0.00217**		**0.00680**		**0.00232**		<0.002		**0.455**		<0.18	
Arsenic, Dissolved	0.01	**0.0078**		<0.002		<0.002		<0.002		<0.002		<0.002		**0.00289**		<0.002		<0.002		**0.457**		<0.2	
Barium	-	**0.0163**		**0.135**		**0.00646**		**0.0078**		**0.032**		**0.0233**		**0.096**		**0.0414**		<0.005		**2.06**		**1.6**	
Barium, Dissolved	-	**0.0175**		**0.136**		**0.00788**		**0.00735**		**0.0331**		**0.00817**		**0.0491**		**0.038**		<0.005		**2.16**		**1.54**	
Beryllium	0.004	<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.2		<0.18	
Beryllium, Dissolved	0.004	<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.2		<0.2	
Total Cadmium	0.005	<0.001		**0.0312**		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		**110**		**0.216**	
Cadmium, Dissolved	0.005	<0.001		**0.0292**		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		**115**		**0.206**	
Calcium	-	**3.31**		**22.7**		**4.4**		**4.45**		**14.1**		**8.65**		**7.72**		**18.4**		<1		**7,640**		**320**	
Calcium, Dissolved	-	**3.47**		**24**		**4.77**		**4.69**		**14.9**		**8.87**		**7.74**		**19.3**		<1		**7,960**		**289**	
Chromium	0.1	<0.002		<0.002		<0.002		<0.002		**0.00436**		**0.00429**		**0.0179**		**0.00208**		<0.002		<0.2		<0.18	
Chromium, Dissolved	0.1	<0.002		**0.00235**	**B**	**0.00258**	**B**	**0.00227**	**B**	**0.00303**	**B**	**0.00233**	**B**	**0.00703**	**B**	**0.00217**	**B**	<0.002		<0.2		<0.2	
Cobalt	0.006 [3]	**0.0206**		<0.002		<0.002		<0.002		**0.00233**		<0.002		**0.00385**		<0.002		<0.002		**1.05**		<0.18	
Cobalt, Dissolved	0.006 [3]	**0.0222**		<0.002		<0.002		<0.002		**0.00246**		<0.002		<0.002		<0.002		<0.002		**1.13**		<0.2	
Copper	1.3	<0.005		<0.005		<0.005		<0.005		<0.005		**0.00584**		**0.00867**		<0.005		<0.005		**18.7**		**25.8**	
Copper, Dissolved	1.3	<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		**0.00636**	**B**	**17.7**		**23.2**	
Iron	0.3 [2]	**6.39**		<0.1		<0.1		<0.1		**0.307**		**2.04**		**15.1**		**2.09**		<0.1		**944**		<9.0	
Iron, Dissolved	0.3 [2]	**6.47**		<0.1		<0.1		<0.1		<0.1		<0.1		**4.13**		<0.1		<0.1		**970**		<10.0	
Lead	0.015	<0.002		<0.002		<0.002		<0.002		<0.002		**0.00438**		**0.00839**		<0.002		<0.002		**0.439**		<0.18	
Lead, Dissolved	0.015	<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		**0.00274**		<0.002		<0.002		**0.462**		<0.2	
Magnesium	-	**2.06**		**9.92**		**2.72**		**2.70**		**9.78**		**2.48**		**3.70**		**6.08**		<1		**1,290**		<90	
Magnesium, Dissolved	-	**2.12**		**10.3**		**2.82**		**2.84**		**10.2**		**2.43**		**2.98**		**6.25**		<1		**1,380**		<100	
Manganese	0.05 [2]	**0.431**		**0.401**		**0.0300**		**0.0264**		**0.0953**		**0.0303**		**0.1700**		**0.0284**		<0.005		**205**		<0.45	
Manganese, Dissolved	0.05 [2]	**0.440**		**0.366**		**0.0220**		**0.0246**		**0.0844**		<0.005		**0.0517**		**0.0127**		<0.005		**213**		<0.5	
Nickel	0.10 [1]	**0.00637**		**0.00376**		<0.002		<0.002		**0.00772**		0.00209		**0.0073**		<0.002		<0.002		**1.29**		**0.265**	
Nickel, Dissolved	0.10 [1]	**0.00635**		**0.00404**		<0.002		<0.002		**0.00772**		<0.002		**0.00268**		<0.002		<0.002		**1.29**		**0.248**	
Potassium	-	**1.13**		**18.3**		<1		<1		**1.24**		**1.13**		**1.75**		**1.63**		<1		**7,470**		**46,500**	
Potassium, Dissolved	-	**1.11**		**19.2**		**1.41**		<1		**1.27**		<1		**1.04**		**1.56**		<1		**7,750**		**45,500**	
Selenium	0.05	<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		**0.355**		<0.18	
Selenium, Dissolved	0.05	<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		**0.681**		<0.2	
Silver	0.10 [2]	<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.2		<0.18	
Sodium	-	**2.88**		**35.3**		**3.77**		**3.68**		**16.7**		**3.30**		**3.58**		**10.5**		<1		**14,300**		**74,600**	
Sodium, Dissolved	-	**3.04**	**B**	**34.9**		**3.63**		**3.45**		**16.6**		**2.91**	**B**	**3.09**	**B**	**10.0**		<1		**15,100**		**73,000**	
Thallium	0.002	<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.2		<0.18	
Vanadium	-	<0.005		<0.005		<0.005		<0.005		<0.005		**0.00615**		**0.0274**		<0.005		<0.005		<0.5		<0.45	
Vanadium, Dissolved	-	<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		**0.00729**		<0.005		<0.005		<0.5		<0.5	
Zinc	5 [2]	<0.025		**0.109**		<0.025		<0.025		<0.025		<0.025		**0.0254**		<0.025		<0.025		**1,300**		**14.1**	
Zinc, Dissolved	5 [2]	<0.025		**0.107**		<0.025		<0.025		<0.025		<0.025		<0.025		<0.025		<0.025		**1,370**		**13.8**	
Mercury	0.002	**0.00319**		<0.0002		<0.0002		<0.0002		<0.0002		<0.0002		<0.0002		<0.0002		<0.0002		**0.000496**		<0.002	
Mercury, Dissolved	0.002	**0.000223**		<0.0002		<0.0002		<0.0002		<0.0002		<0.0002		<0.0002		<0.0002		<0.0002		**0.000495**		<0.002	

Notes:

MCL: Maximum Contaminant Level Enforceable National Primary Drinking Water Standards

GWPS: Groundwater Protection Standard

[1] - MCL value obtained from TN Division of Water Supply rule 1200-5-.06(1)(b)11

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

[3] - GWPS value is referenced from EPA Regional Screening Level for Cobalt

NA-Not Analyzed by the Laboratory.

Bold text indicates laboratory analytical detections above the practical quantitation level

Dark gray shaded text indicates detection above respective MCL/GWPS

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

B-The same analyte is found in the associated blank.

T8-Sample(s) received past/too close to holding time expiration.

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

Q-Samples was prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values.

Table 2b
Former EWS Camden Class II Landfill IDL 03-0212 (Terminated)
Stream and Sediment Analytical Data - June 2018

	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	
	6/27/2018		6/27/2018		6/27/2018		6/27/2018		6/27/2018		6/27/2018		6/27/2018		6/27/2018		6/27/2018		6/27/2018	
Parameter	**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	**47.9**		**59.8**		**72.9**		**68.2**		**73.9**		NA		NA		NA		NA		NA	
Boron	<0.2		<0.2		<0.2		<0.2		<0.2		<10		<10		<10		<10		<10	
Bromide	<1		<1		<1		<1		<1		<10		<10		<10		<10		<10	
Chloride	**8.12**		**10.2**		**8.06**		**10.6**		**14.1**		<10		**17.3**		<10		**43.0**		**39.2**	
Fluoride	<0.1	P1	<0.1		**0.161**		**0.101**		**0.143**		<1		<1		<1		<1		<1	
Aluminum	<0.1		**0.124**	**B**	**0.275**		**0.195**		**0.137**		**579**		**991**		**1,120**		**540**		**1,010**	
Aluminum (Dissolved-LF)	<0.1		<0.1		<0.1		<0.1		<0.1		NA		NA		NA		NA		NA	
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	**0.0270**		**0.0347**		**0.0242**		**0.0286**		**0.0318**		**30.1**		**17.4**		**8.8**		**6.6**		**14.1**	
Barium (Dissolved-LF)	**0.0275**		**0.0338**		**0.024**		**0.0246**		**0.0274**		NA		NA		NA		NA		NA	
Beryllium	<0.002		<0.002		<0.002		<0.002		<0.002		<0.2		<0.2		<0.2		<0.2		<0.2	
Total 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		NA		NA		NA		NA		NA	
Calcium	**13.1**		**15.6**		**19.9**		**18.4**		**19.8**		<100		**268**		**785**		**107**		**213**	
Calcium (Dissolved-LF)	**13**		**15.7**		**20.1**		**18.5**		**19.4**		NA		NA		NA		NA		NA	
Chromium	<0.002		<0.002		<0.002		<0.002		<0.002		**1.82**		**4.96**		**4.59**		**2.37**		**5.53**	
Cobalt	<0.002		<0.002		<0.002		<0.002		<0.002		**1.19**		**1.54**		<1		<1		**1.65**	
Cobalt (Dissolved-LF)	<0.002		<0.002		<0.002		<0.002		<0.002		NA		NA		NA		NA		NA	
Copper	<0.05		<0.005		<0.005		<0.005		<0.005		<2		<2		<2		<2		<2	
Copper, (Dissolved-LF)	<0.005		<0.005		<0.005		<0.005		<0.005		NA		NA		NA		NA		NA	
Iron	**0.333**		**0.424**		**0.863**		**0.794**		**0.843**		**2,270**		**3,490**		**3,510**		**1,580**		**4,460**	
Iron (Dissolved-LF)	**0.131**		**0.229**		**0.169**		<0.1		<0.1		NA		NA		NA		NA		NA	
Lead	<0.002		<0.002		<0.002		<0.002		<0.002		**1.45**		**2.05**		**4.21**		**1.86**		**3.9**	
Magnesium	**2.39**		**2.95**		**3.79**		**3.72**		**4.18**		<100		<100		**230**		<100		<100	
Magnesium (Dissolved-LF)	**2.31**		**2.85**		**3.62**		**3.61**		**4.01**		NA		NA		NA		NA		NA	
Manganese	**0.113**		**0.232**		**0.136**		**0.177**		**0.202**		**68.4**		**149**		**129**		**126**		**213**	
Manganese (Dissolved-LF)	**0.012**		**0.0951**		**0.0239**		<0.005		<0.005		NA		NA		NA		NA		NA	
Nickel	<0.002		<0.002		<0.002		<0.002		<0.002		<2		<2		<2		<2		<2	
Nickel, (Dissolved-LF)	<0.002		**0.00786**		<0.002		<0.002		<0.002		NA		NA		NA		NA		NA	
Potassium	**1.41**		**2.48**		**3.64**		**4.06**		**3.97**		<100		**133**		**247**		<100		**105**	
Potassium (Dissolved-LF)	**1.99**		**2.16**		**3.87**		**4.84**		**3.65**		NA		NA		NA		NA		NA	
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	**6.22**		**6.71**		**7.02**		**7.77**		**9.02**		<100		<100		<100		<100		<100	
Sodium (Dissolved-LF)	**6.22**		**6.45**		**6.81**		**7.43**		**8.64**		NA		NA		NA		NA		NA	
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		**4.35**		**6.8**		**5.69**		**2.85**		**8.05**	
Zinc	<0.025		<0.025		<0.025		<0.025		<0.025		**6.69**		**15.1**		**15.1**		**6.99**		**18.1**	
Mercury	<0.0002		<0.0002		<0.0002		<0.0002		<0.0002		**0.0445**	**B**	**0.047**	**B**	**0.0454**	**B**	<0.02		**0.0316**	**B**

Notes:
Bold text indicates laboratory analytical detections above the laboratory practical quantitation level (PQL)
NA: Not Analyzed
(Dissolved-LF): Dissolved metals samples were filtered in the laboratory. Samples were placed into unpreserved sample containers in the field.
B-The same analyte is found in the associated blank
P1-RPD value not applicable for sample concentrations less than 5 times the reporting limit.

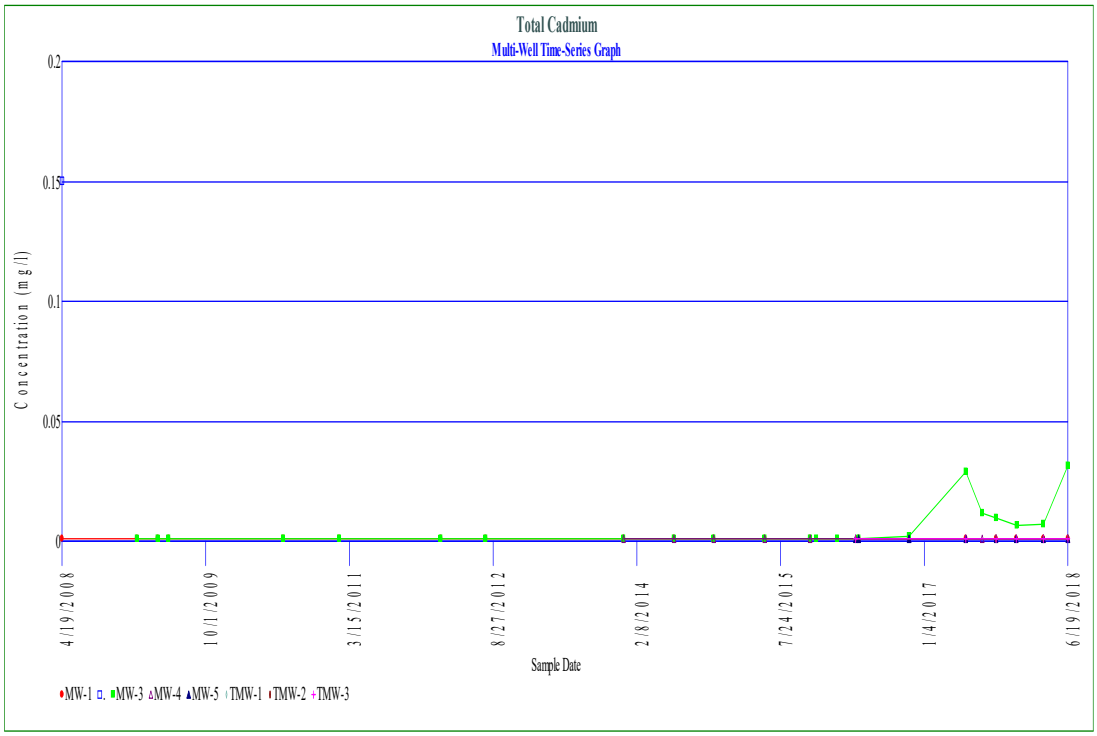
Table 3
Intra-Well and Inter-Well Statistical Summary
Environmental Waste Solutions Camden Class II Landfill IDL 03-0212 (Terminated)
Inorganic Analytical Data - June 2018

Intra-Well Statistical Summary (Upgradient Background Well MW-1)								
Constituent	Well	% Non Detects	Normality	Intra-well NPPL	Intra-well PPL	Shewhart-Cusum	Wilcoxon Rank Sum	SSI
Arsenic	MW-1	0.00	parametric	--	Pass	--	--	No
Barium	MW-1	0.00	non-parametric	Pass	--	Pass	--	No
Chloride	MW-1	0.00	log-normal	--	Pass	--	--	No
Cobalt	MW-1	0.00	parametric	--	Pass	--	--	No
Nickel	MW-1	52.38	non-parametric	Pass	--	Pass	--	No
Mercury	MW-1	42.86	non-parametric	**Fail**	--	**Fail**	N/A*	**Yes**

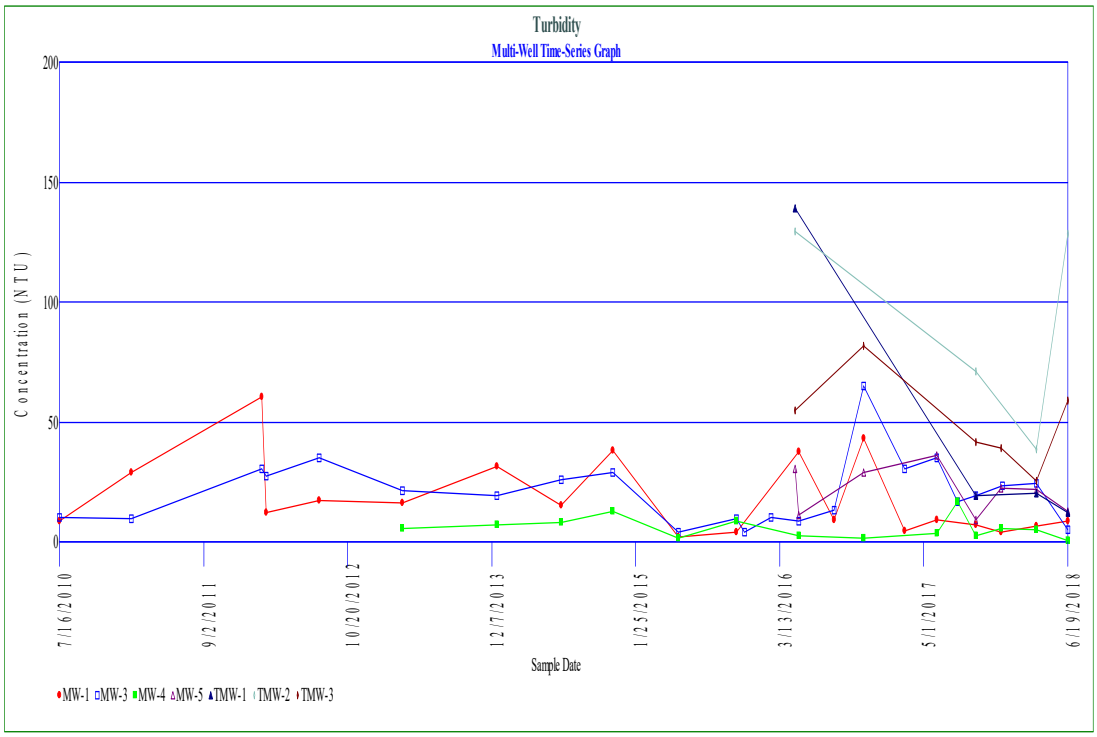
Inter-Well Statistical Summary (Downgradient Compliance Wells)									
Constituent	Well	Total % Non Detects	Normality	Inter-well NPPL	Inter-well PPL	Shewhart-Cusum	Wilcoxon Rank Sum	SSI	Mann-Kendall Trend Analysis
Aluminum	MW-5	38.46	non-parametric	--	--	Pass	--	No	No Trend
	TMW-1		non-parametric	--	--	Pass	--	No	No Trend
	TMW-2		non-parametric	--	--	**Fail**	**Fail**	**Yes**	No Trend
	TMW-3		non-parametric	--	--	Pass	--	No	No Trend
Arsenic	TMW-1	66.23	non-parametric	Pass	--	--	--	No	No Trend
	TMW-2		non-parametric	Pass	--	--	--	No	No Trend
	TMW-3		non-parametric	Pass	--	--	--	No	No Trend
Barium	MW-3	0	non-parametric	--	--	**Fail**	**Fail**	**Yes**	**Upward Trend**
	MW-4		non-parametric	--	--	Pass	--	No	**Downward Trend**
	MW-5		non-parametric	--	--	Pass	--	No	No Trend
	TMW-1		non-parametric	--	--	Pass	--	No	No Trend
	TMW-2		non-parametric	--	--	**Fail**	**Fail**	**Yes**	No Trend
	TMW-3		non-parametric	--	--	Pass	--	No	No Trend
Total Cadmium	MW-3	90.91	non-parametric	**Fail**	--	**Fail**	**Fail**	**Yes**	**Upward Trend**
Chloride	MW-3	0	log-normal	--	**Fail**	--	--	**Yes**	**Upward Trend**
	MW-4		log-normal	--	**Fail**	--	--	**Yes**	No Trend
	MW-5		log-normal	--	**Fail**	--	--	**Yes**	**Upward Trend**
	TMW-1		log-normal	--	**Fail**	--	--	**Yes**	**Upward Trend**
	TMW-2		log-normal	--	**Fail**	--	--	**Yes**	No Trend
	TMW-3		log-normal	--	**Fail**	--	--	**Yes**	No Trend
Cobalt	MW-5	57.69	non-parametric	Pass	--	--	--	No	No Trend
	TMW-2		non-parametric	Pass	--	--	--	No	No Trend
Copper	TMW-1	83.12	non-parametric	Pass	--	--	--	No	No Trend
	TMW-2		non-parametric	Pass	--	--	--	No	No Trend
Fluoride	MW-3	85.71	non-parametric	**Fail**	--	**Fail**	**Fail**	**Yes**	**Upward Trend**
Lead	TMW-1	87.18	non-parametric	Pass	--	--	--	No	No Trend
	TMW-2		non-parametric	Pass	--	--	--	No	No Trend
Nickel	MW-3	64.56	non-parametric	Pass	--	--	--	No	**Downward Trend**
	MW-5		non-parametric	Pass	--	--	--	No	No Trend
	TMW-2		non-parametric	Pass	--	--	--	No	No Trend
Zinc	MW-3	58.23	non-parametric	**Fail**	--	**Fail**	N/A*	**Yes**	**Upward Trend**
	TMW-2		non-parametric	Pass	--	--	--	No	No Trend
Sulfate	MW-3	61.25	non-parametric	**Fail**	--	**Fail**	**Fail**	**Yes**	**Upward Trend**

Notes:
* N/A due to low Power of Wilcoxin-Rank Sum non-parametric inter-well statistical procedure.
** Only three usable background sampling events, not enough points to determine a statistical trend.

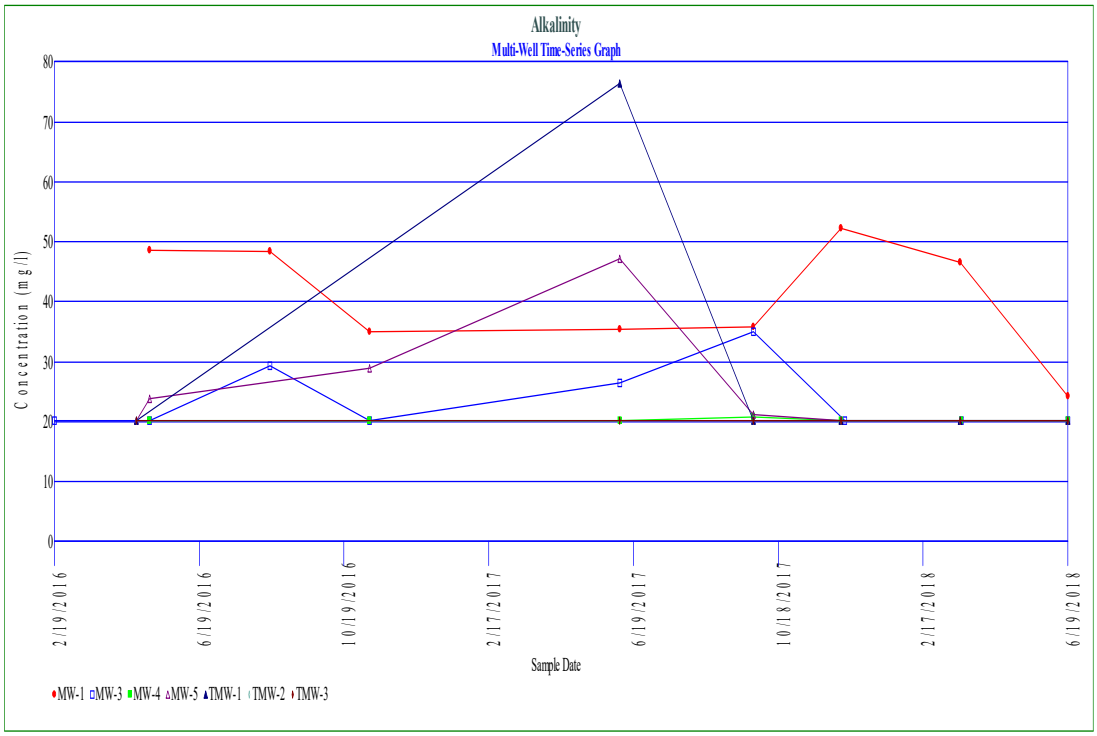
APPENDIX B
STATISTICAL EVALUATIONS & TIME SERIES PLOTS

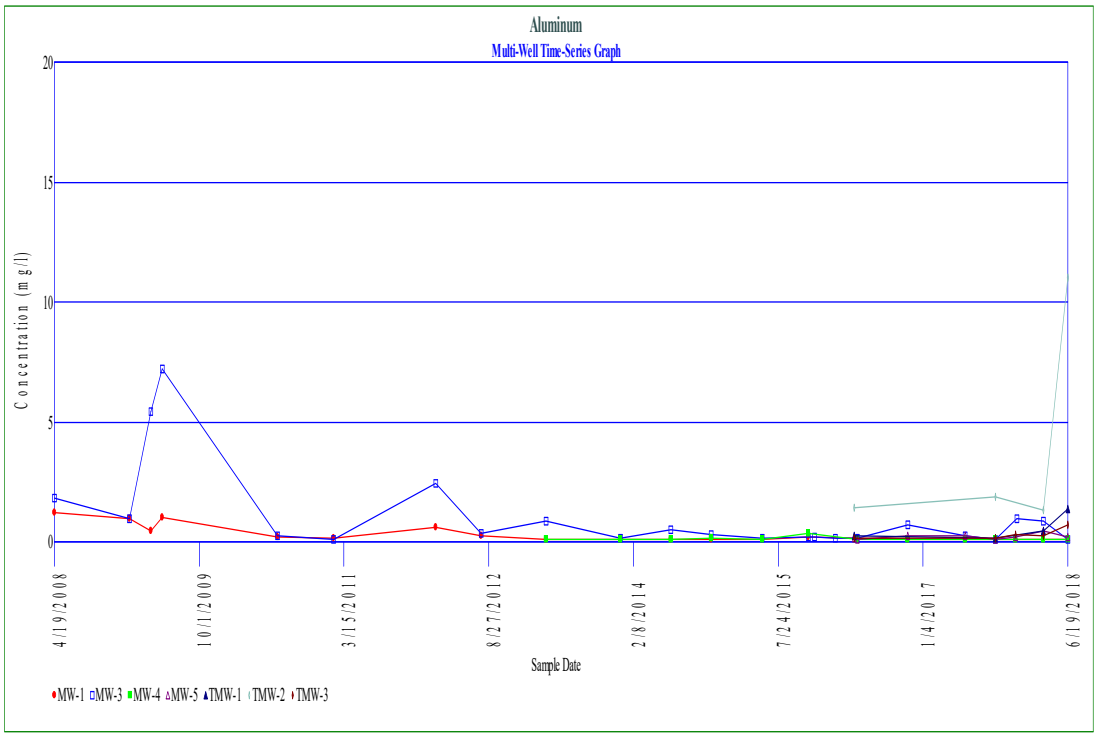

Total Cadmium
Multi-Well Time-Series Graph
0.2
0.15
0.1
0.05
0
Concentration (mg/l)
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

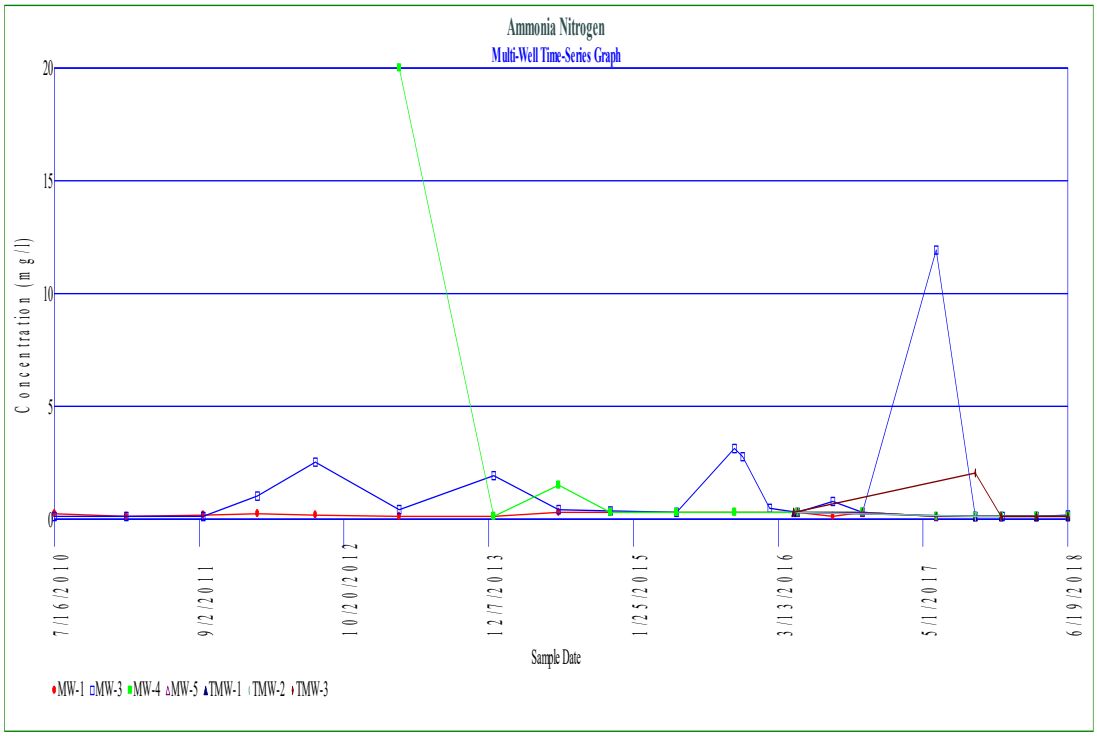
Page 1

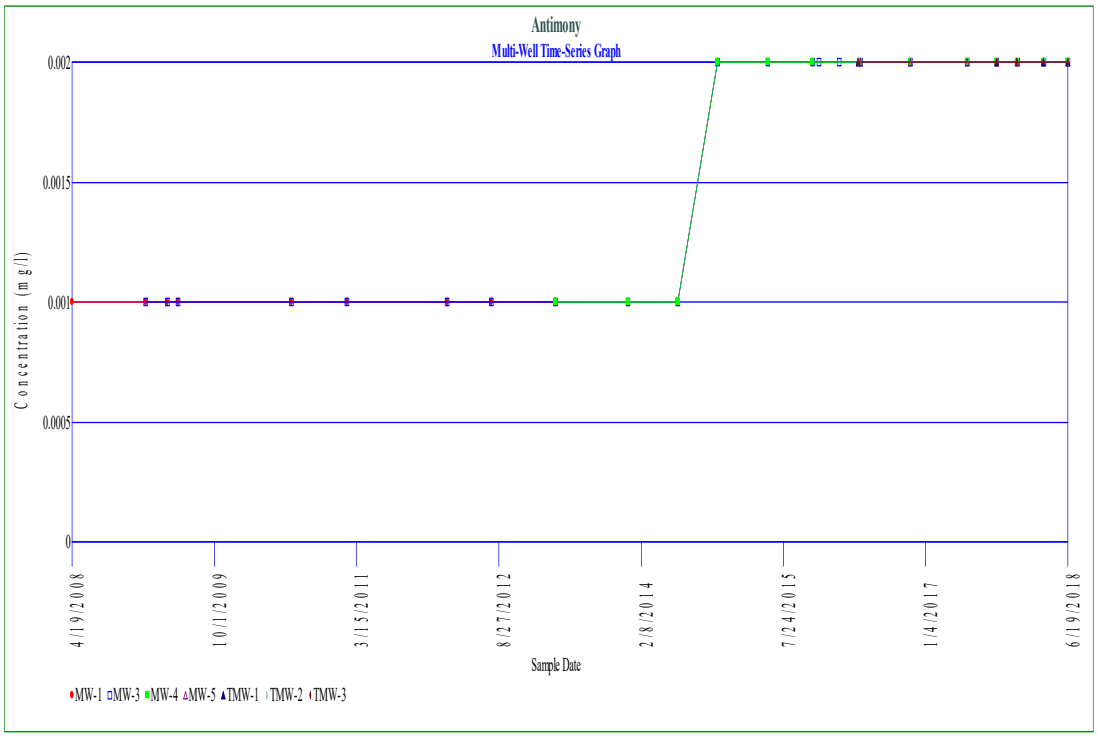

Turbidity
Multi-Well Time-Series Graph
200
150
100
50
0
Concentration (NTU)
7/16/2010
9/2/2011
10/20/2012
12/7/2013
1/25/2015
3/13/2016
5/1/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

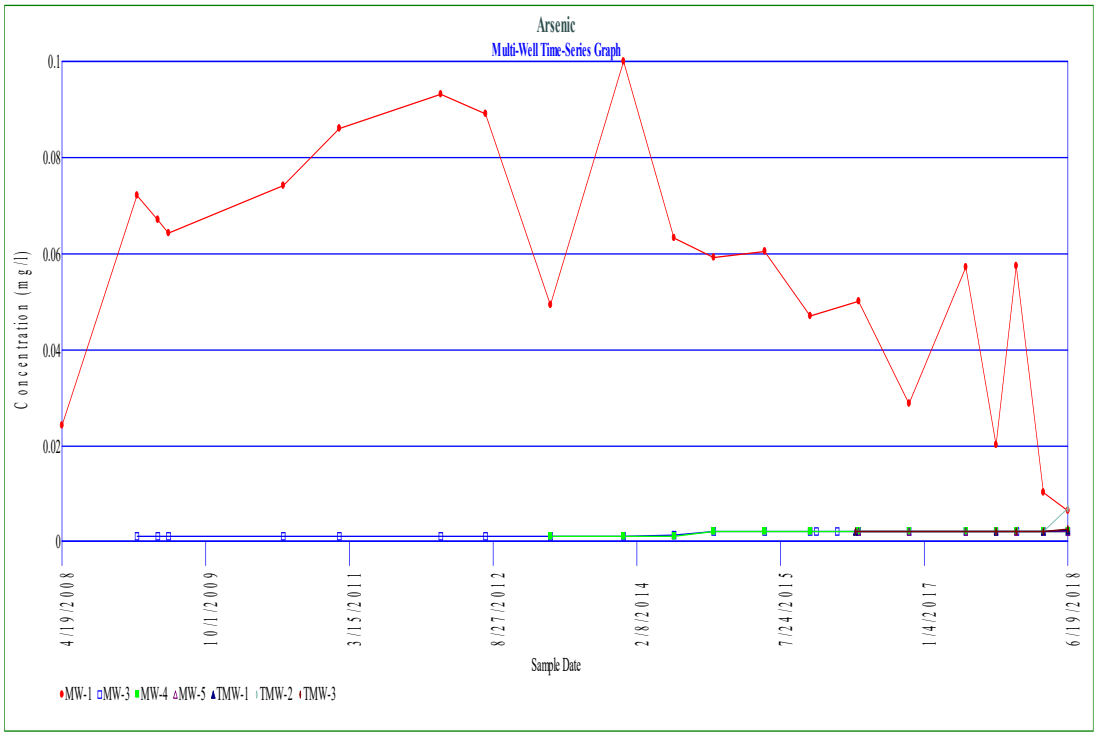
Page 2

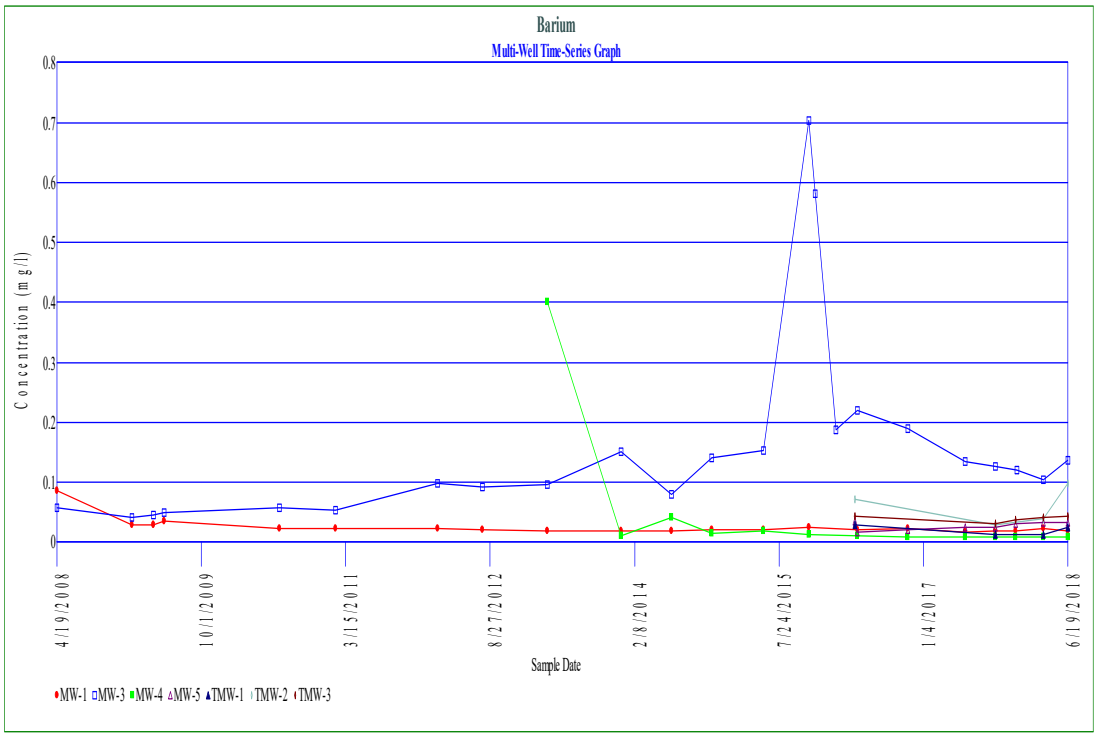

Alkalinity
Multi-Well Time-Series Graph
Concentration (mg/l)
80
70
60
50
40
30
20
10
0
2/19/2016
6/19/2016
10/19/2016
2/17/2017
6/19/2017
10/18/2017
2/17/2018
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

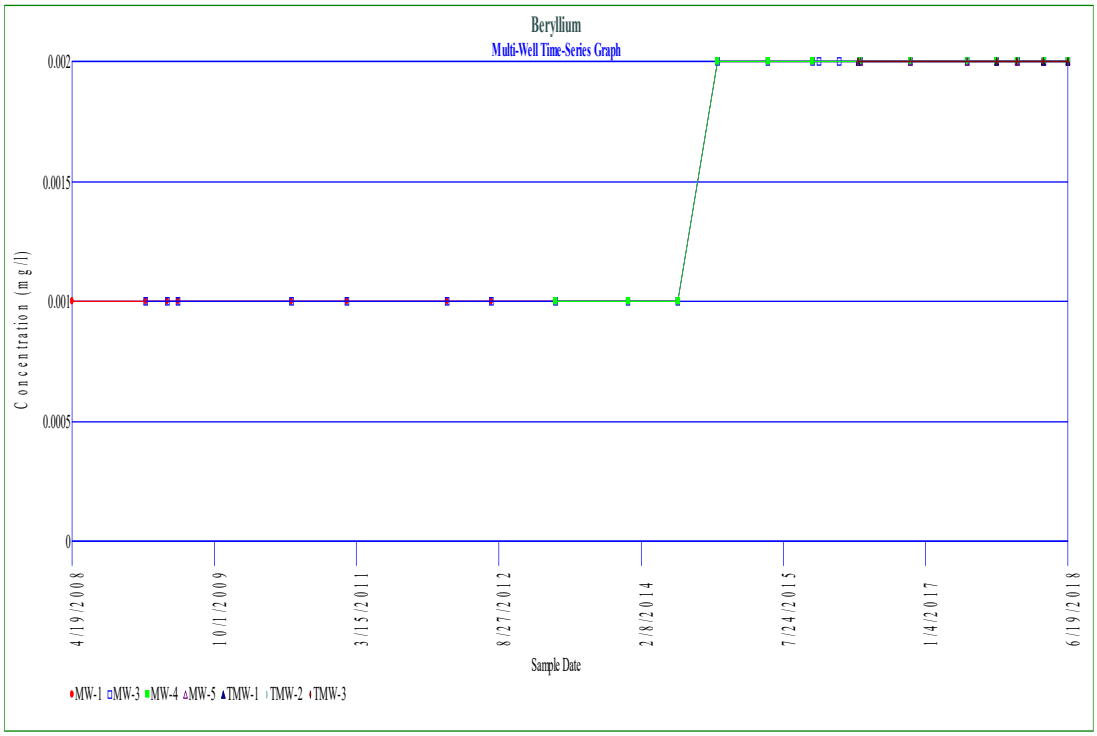

Aluminum
Multi-Well Time-Series Graph
Concentration (mg/l)
20
15
10
5
0
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

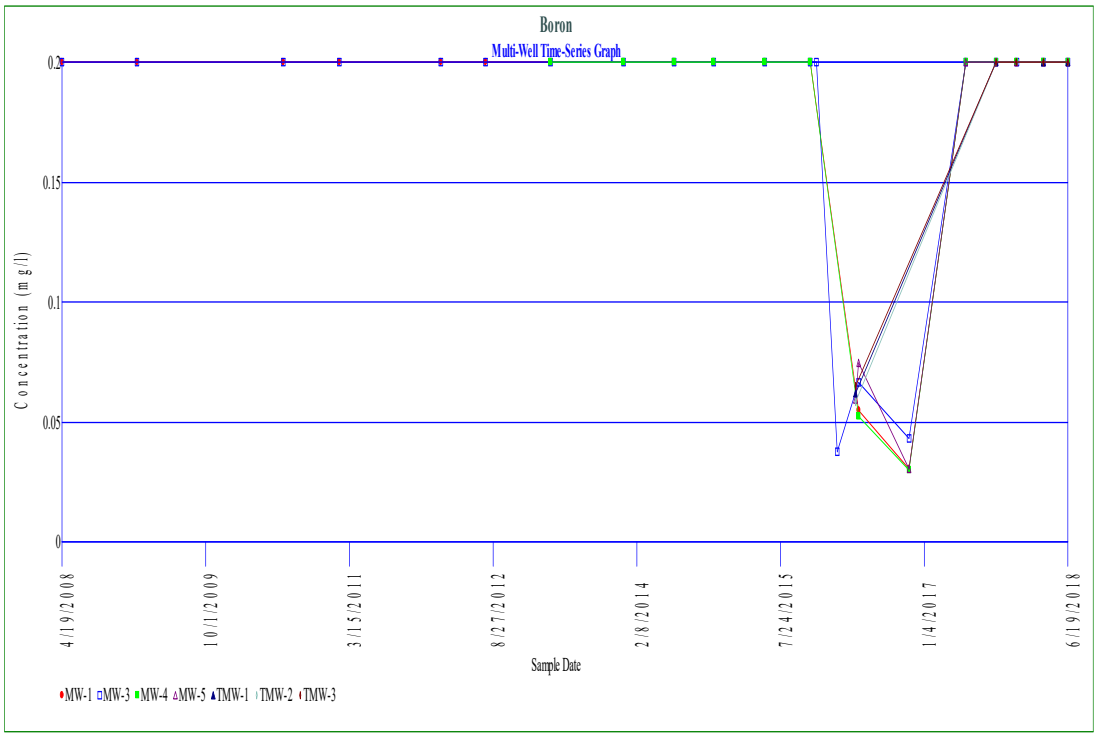

Ammonia Nitrogen
Multi-Well Time-Series Graph
Concentration (mg/l)
20
15
10
5
0
7/16/2010
9/2/2011
10/20/2012
12/7/2013
1/25/2015
3/13/2016
5/1/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

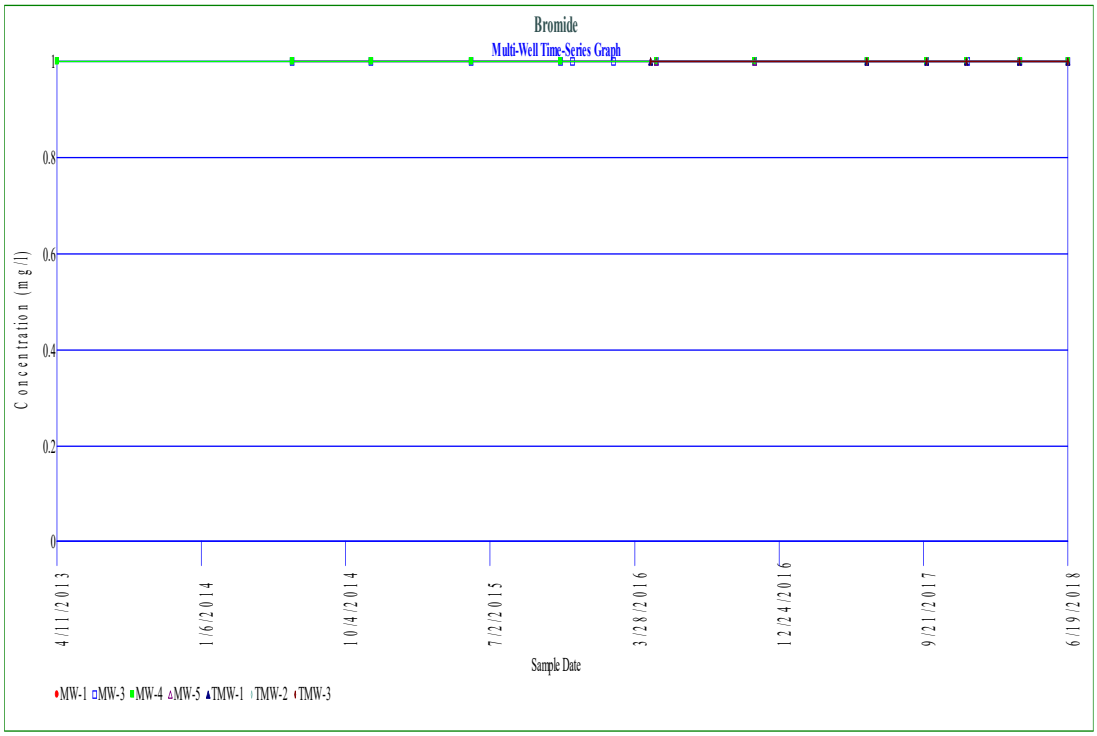

Antimony
Multi-Well Time-Series Graph
Concentration (mg/l)
0.002
0.0015
0.001
0.0005
0
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

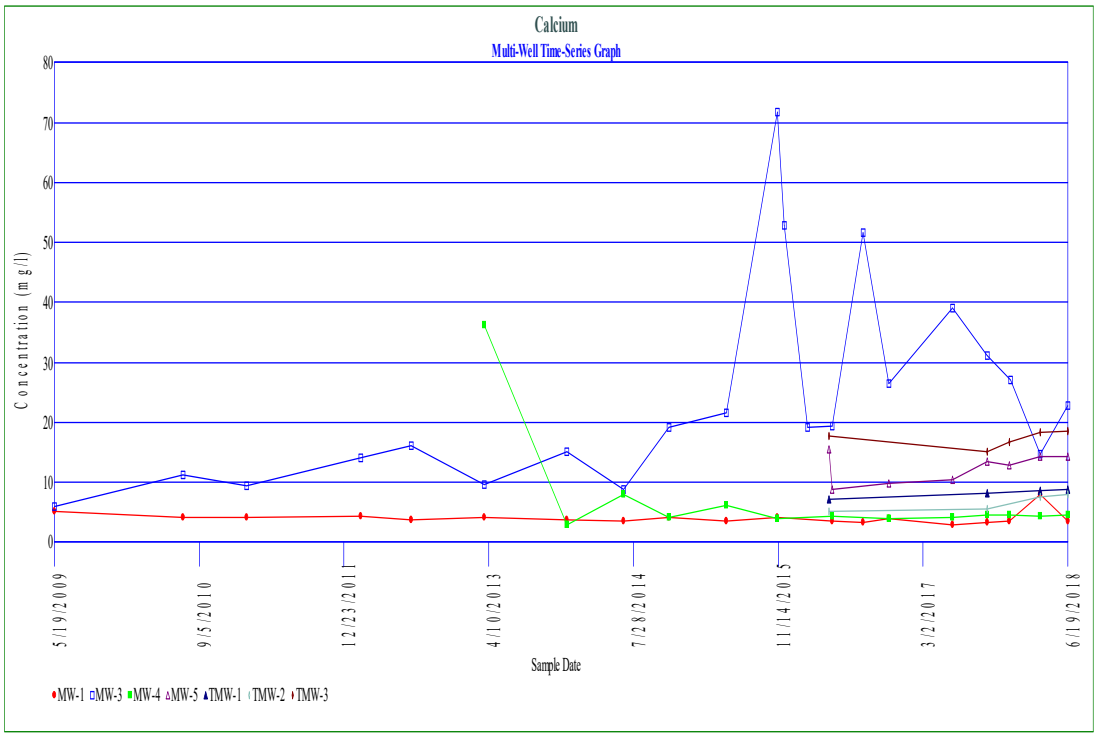

Arsenic
Multi-Well Time-Series Graph
0.1
0.08
0.06
0.04
0.02
0
Concentration (mg/l)
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

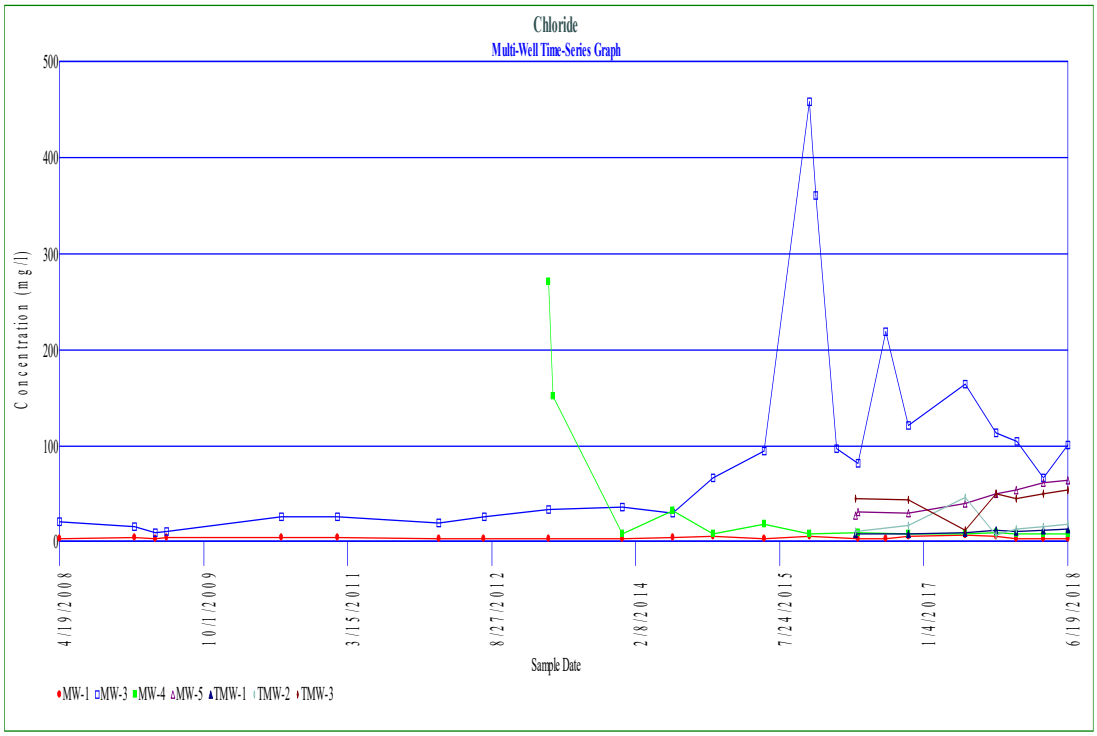

Barium
Multi-Well Time-Series Graph
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Concentration (mg/l)
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

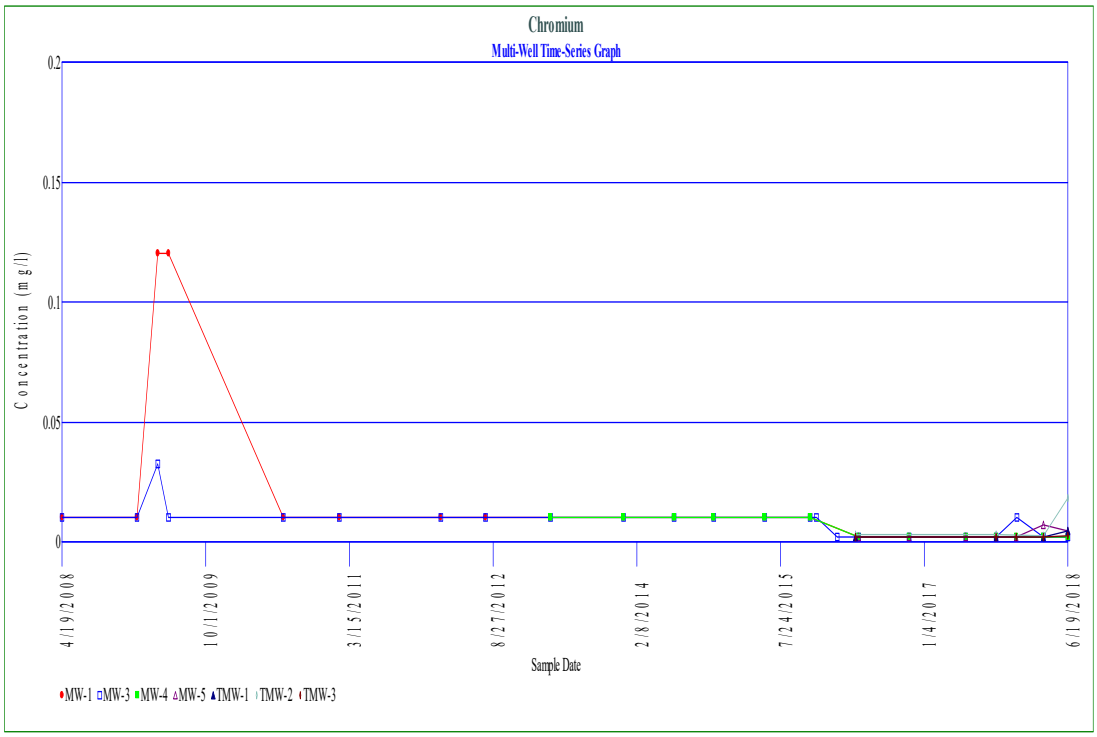

Beryllium
Multi-Well Time-Series Graph
0.002
0.0015
0.001
0.0005
0
Concentration (mg/l)
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

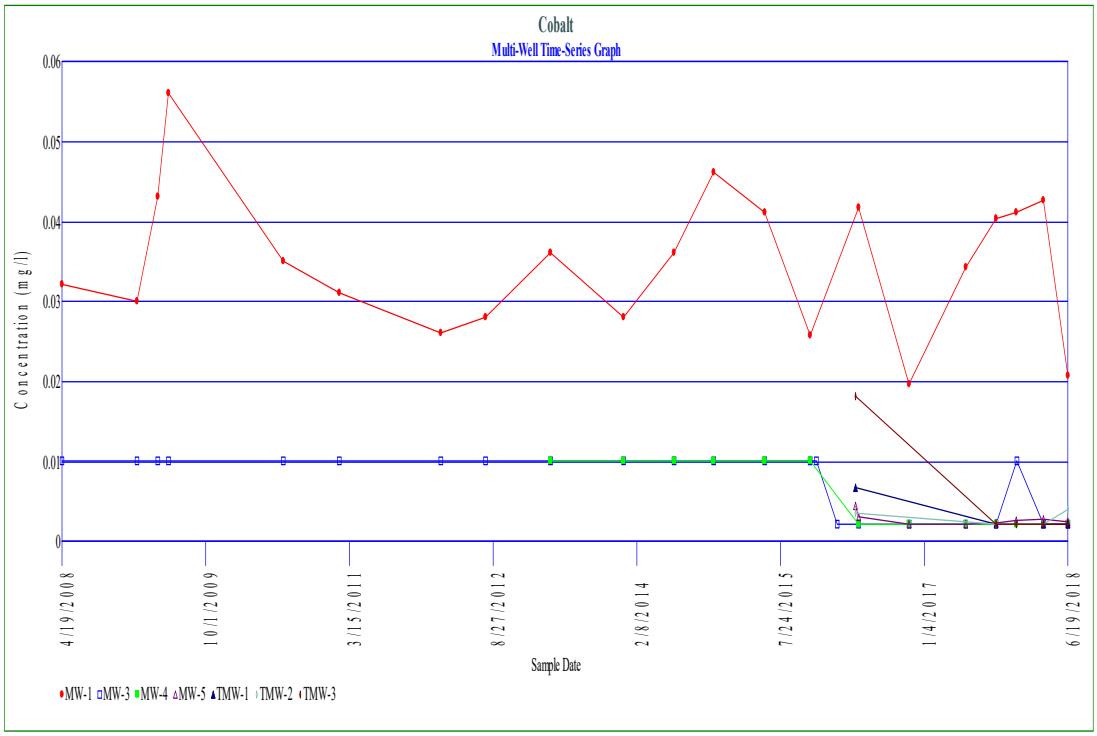

Boron
Multi-Well Time-Series Graph
0.2
0.15
0.1
0.05
0
Concentration (mg/l)
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

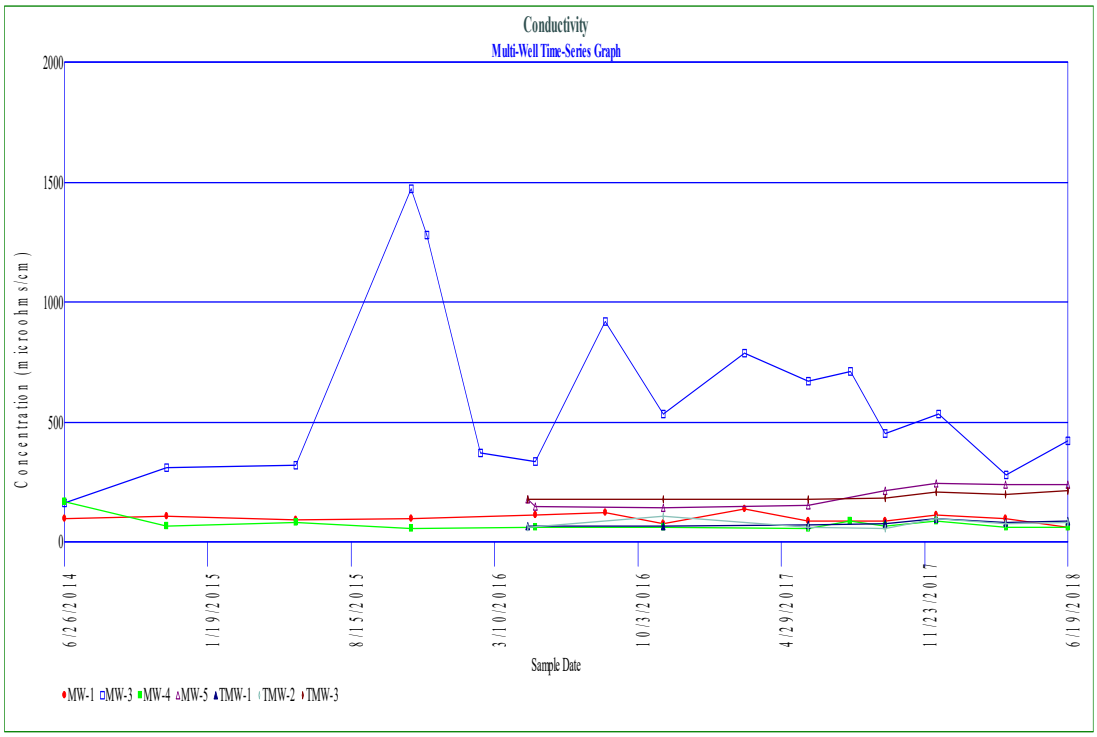

Bromide
Multi-Well Time-Series Graph
Concentration (mg/l)
1
0.8
0.6
0.4
0.2
0
4/11/2013
1/6/2014
10/4/2014
7/2/2015
3/28/2016
12/24/2016
9/21/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

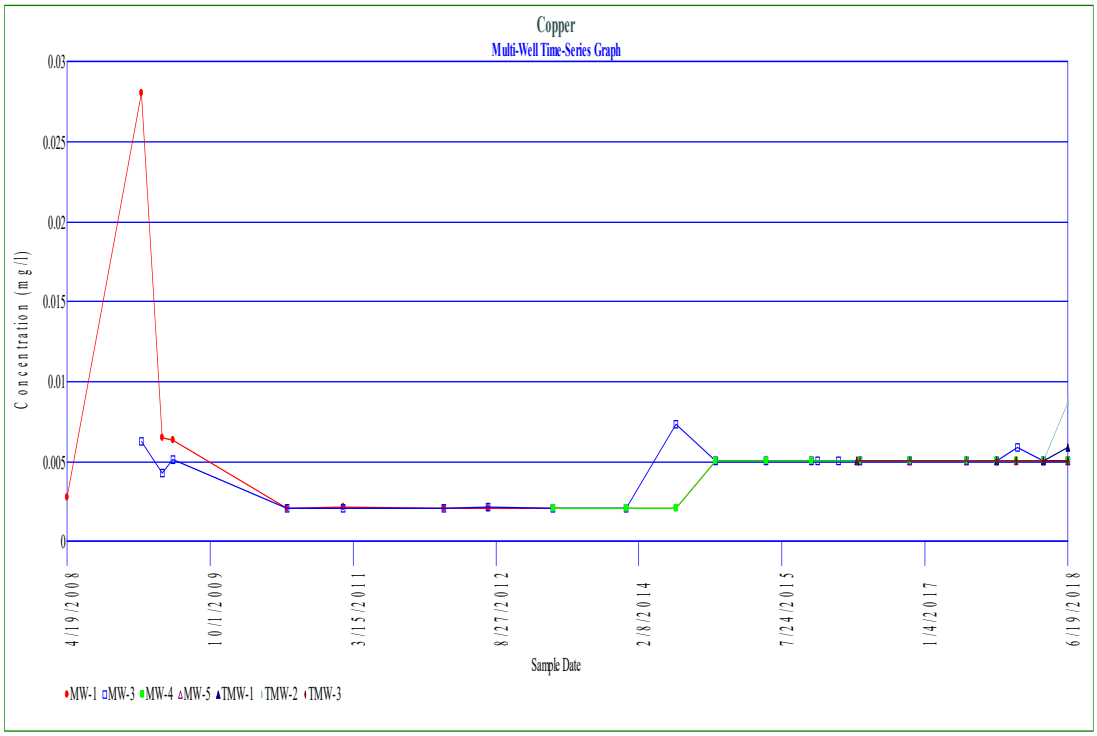

Calcium
Multi-Well Time-Series Graph
Concentration (mg/l)
80
70
60
50
40
30
20
10
0
5/19/2009
9/5/2010
12/23/2011
4/10/2013
7/28/2014
11/14/2015
3/2/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

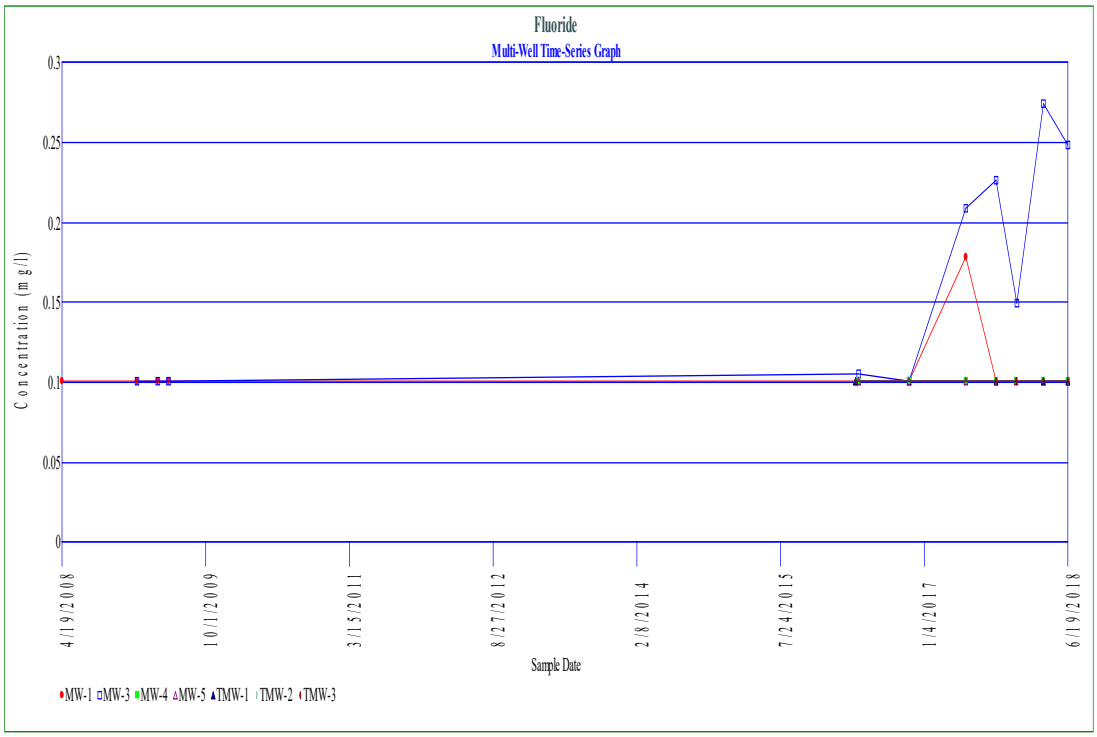

Chloride
Multi-Well Time-Series Graph
500
400
300
200
100
0
Concentration (mg/l)
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

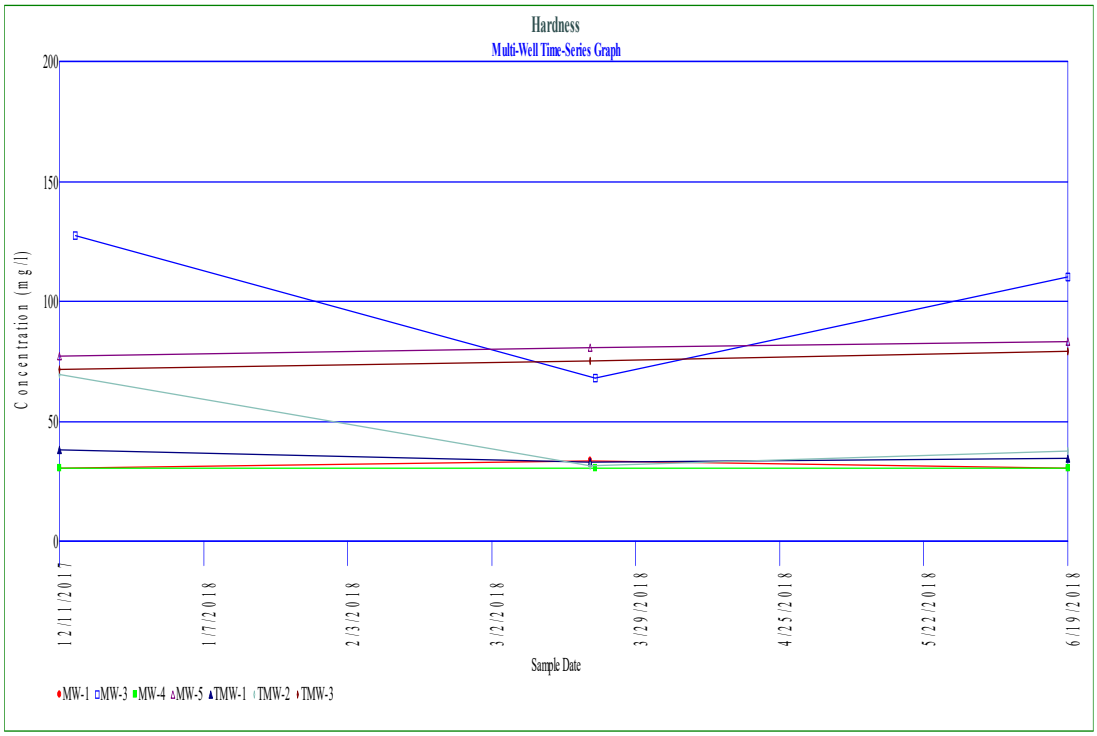

Chromium
Multi-Well Time-Series Graph
0.2
0.15
0.1
0.05
0
Concentration (mg/l)
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

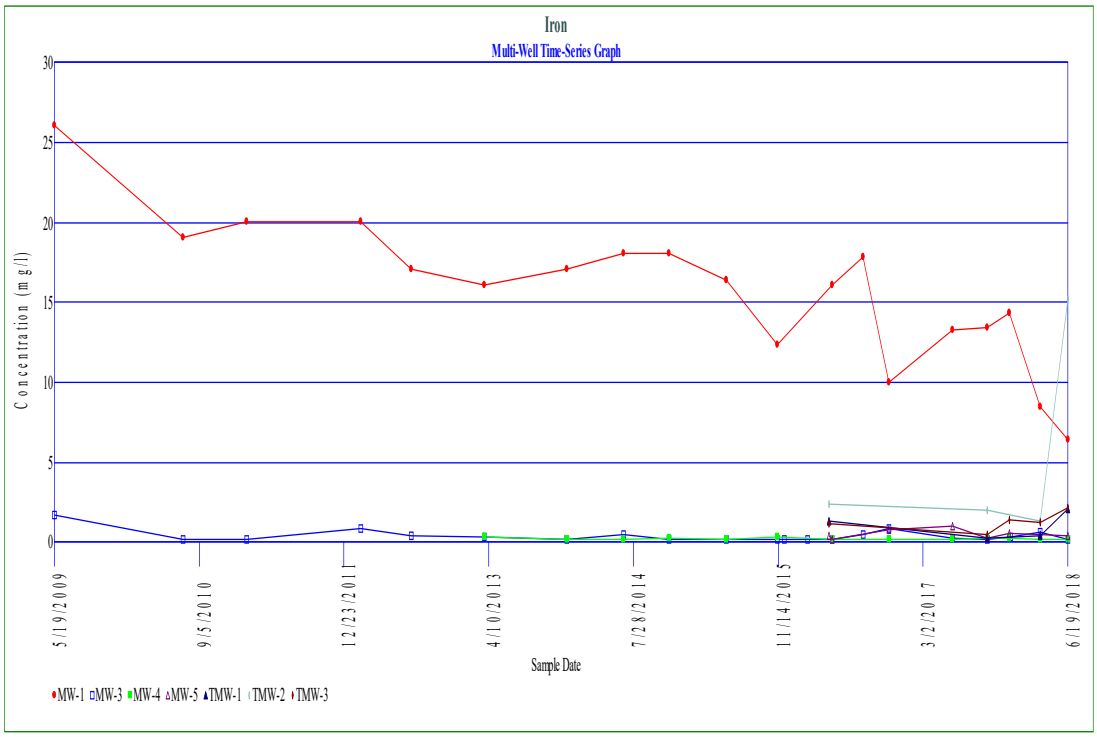

Cobalt
Multi-Well Time-Series Graph
0.06
0.05
0.04
0.03
0.02
0.01
0
Concentration (mg/l)
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

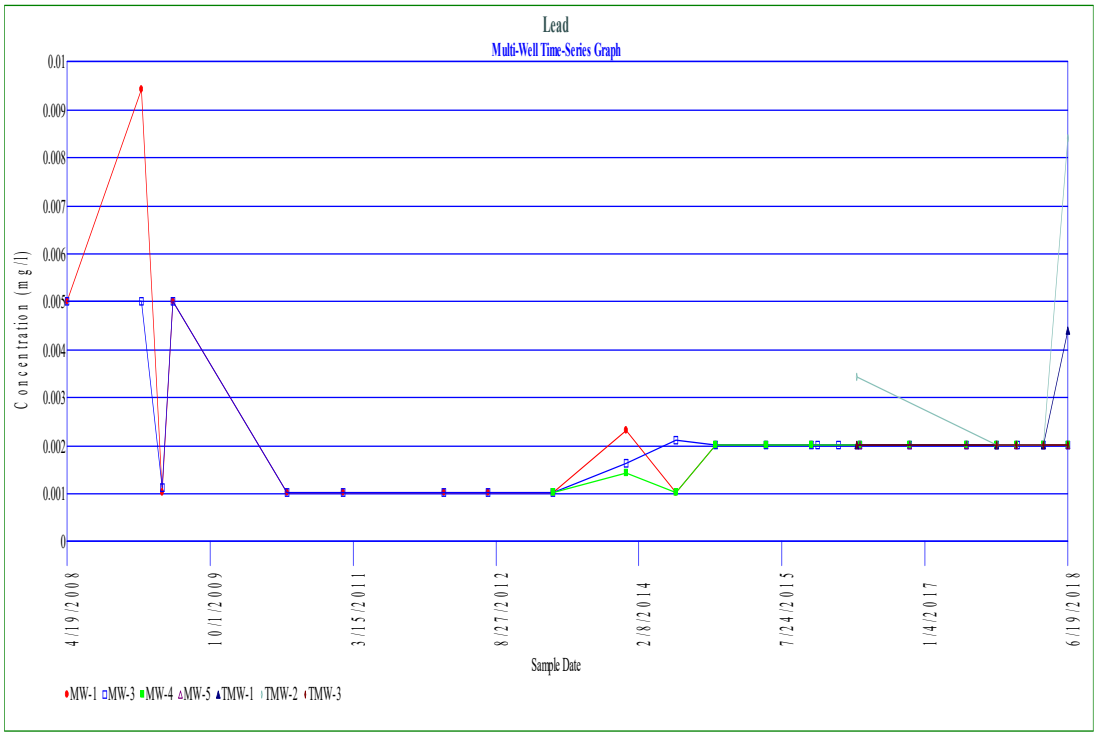

Conductivity
Multi-Well Time-Series Graph
2000
1500
1000
500
0
Concentration (microohms/cm)
6/26/2014
1/19/2015
8/15/2015
3/10/2016
10/3/2016
4/29/2017
11/23/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

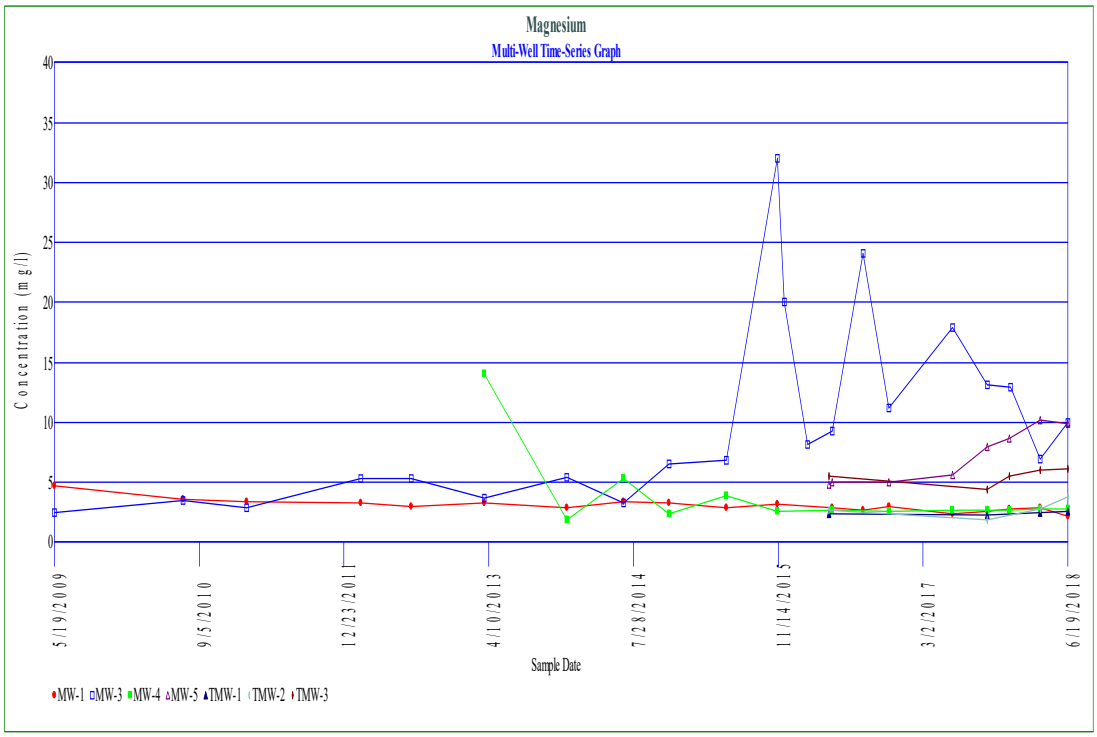

Copper
Multi-Well Time-Series Graph
0.03
0.025
0.02
0.015
0.01
0.005
0
Concentration (mg/l)
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

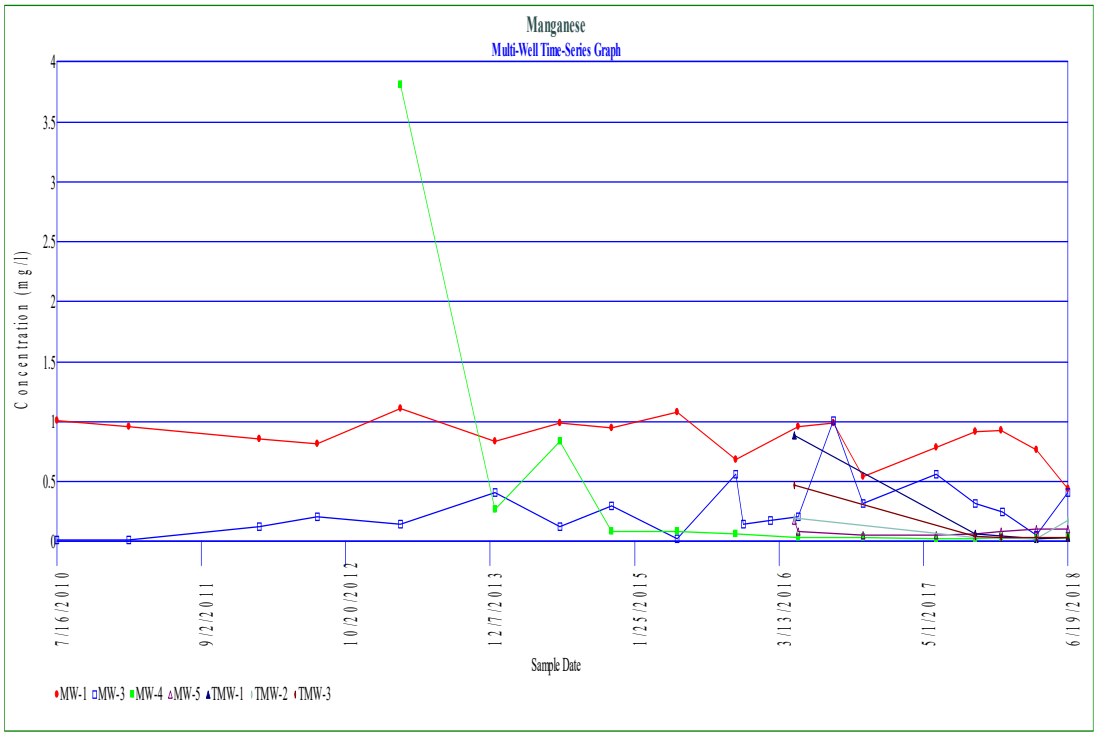

Fluoride
Multi-Well Time-Series Graph
0.3
0.25
0.2
0.15
0.1
0.05
0
Concentration (mg/l)
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

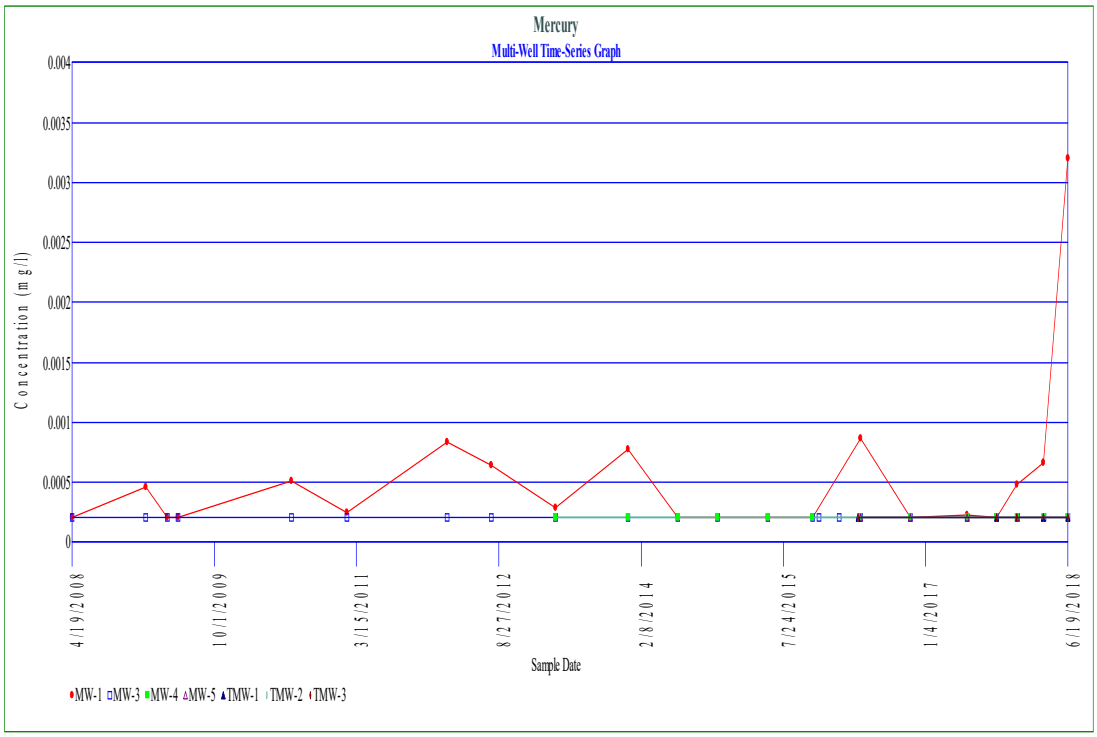

Hardness
Multi-Well Time-Series Graph
200
150
100
50
0
Concentration (mg/l)
12/11/2017
1/7/2018
2/3/2018
3/2/2018
3/29/2018
4/25/2018
5/22/2018
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

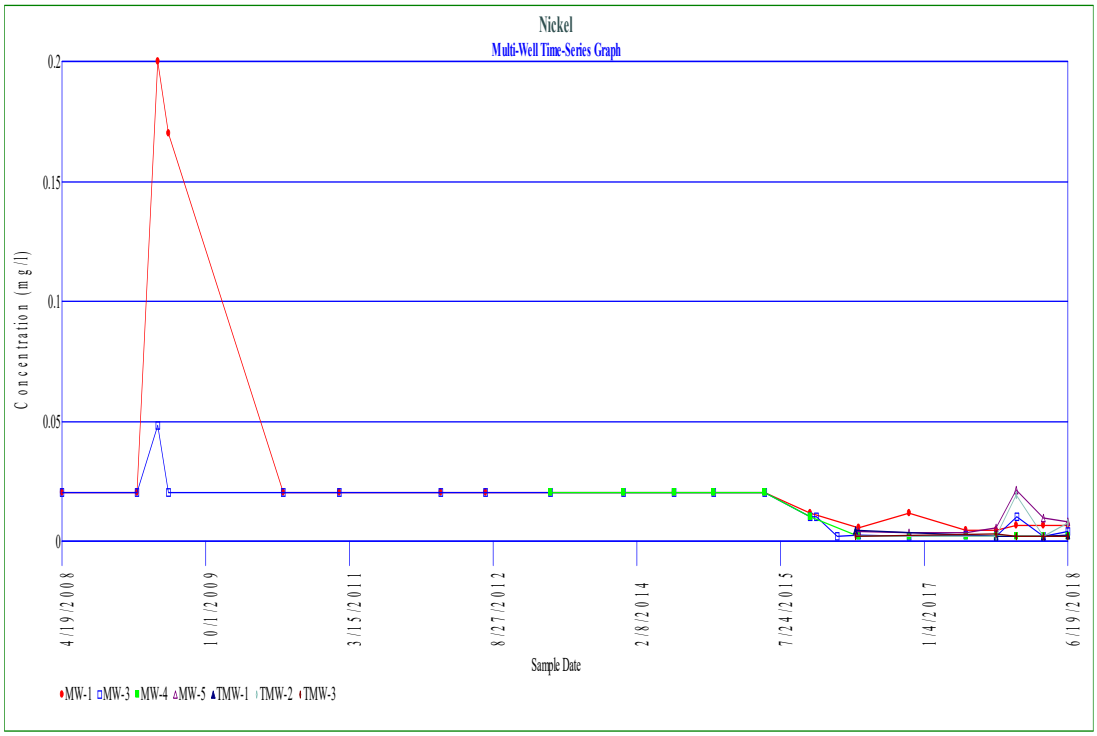

Iron
Multi-Well Time-Series Graph
30
25
20
15
10
5
0
Concentration (mg/l)
5/19/2009
9/5/2010
12/23/2011
4/10/2013
7/28/2014
11/14/2015
3/2/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

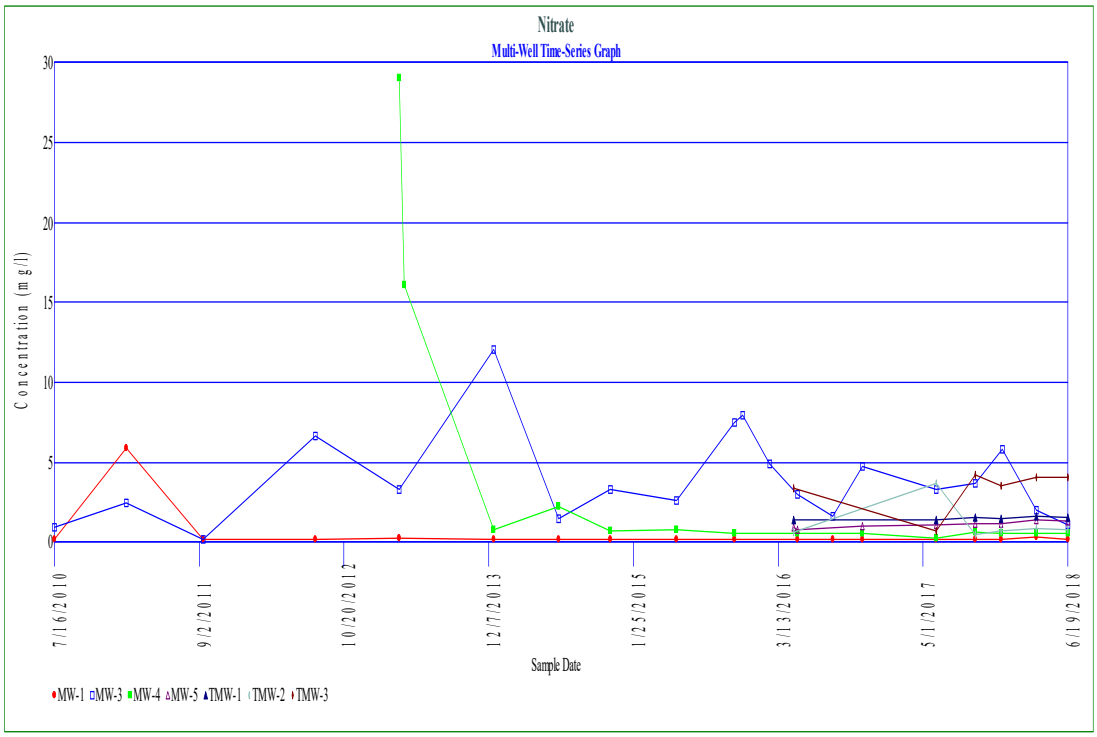

Lead
Multi-Well Time-Series Graph
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
Concentration (mg/l)
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3


Magnesium
Multi-Well Time-Series Graph
40
35
30
25
20
15
10
5
0
Concentration (mg/l)
5/19/2009
9/5/2010
12/23/2011
4/10/2013
7/28/2014
11/14/2015
3/2/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

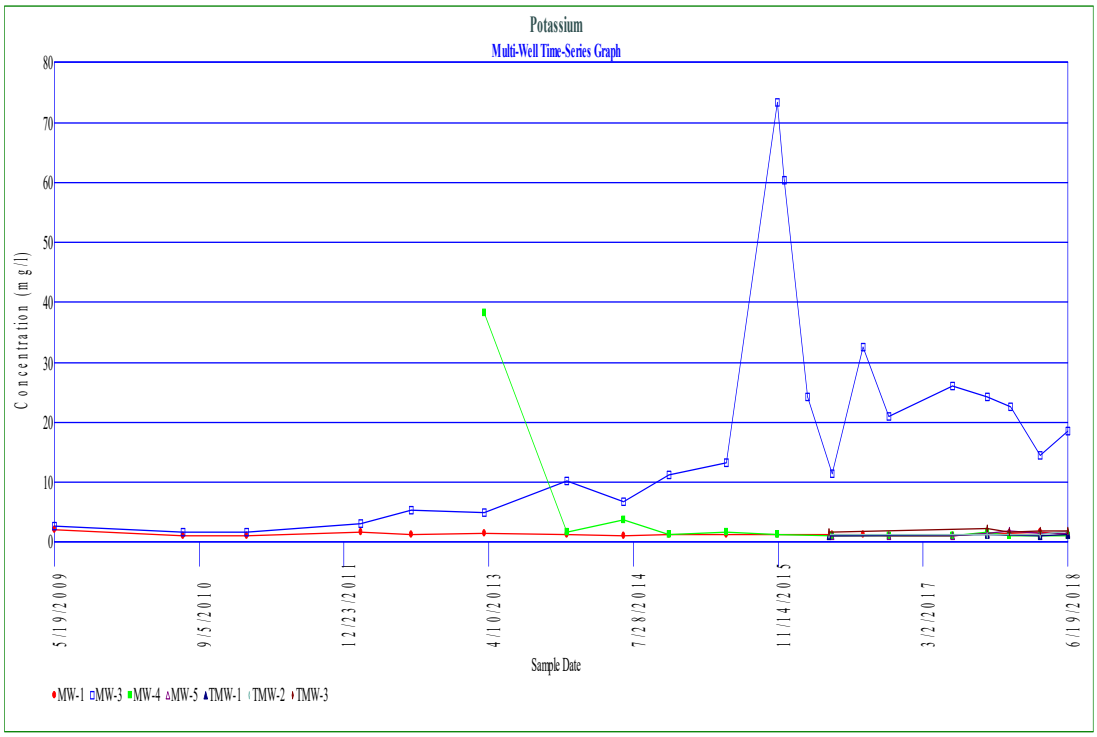

Manganese
Multi-Well Time-Series Graph
Concentration (mg/l)
4
3.5
3
2.5
2
1.5
1
0.5
0
7/16/2010
9/2/2011
10/20/2012
12/7/2013
1/25/2015
3/13/2016
5/1/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

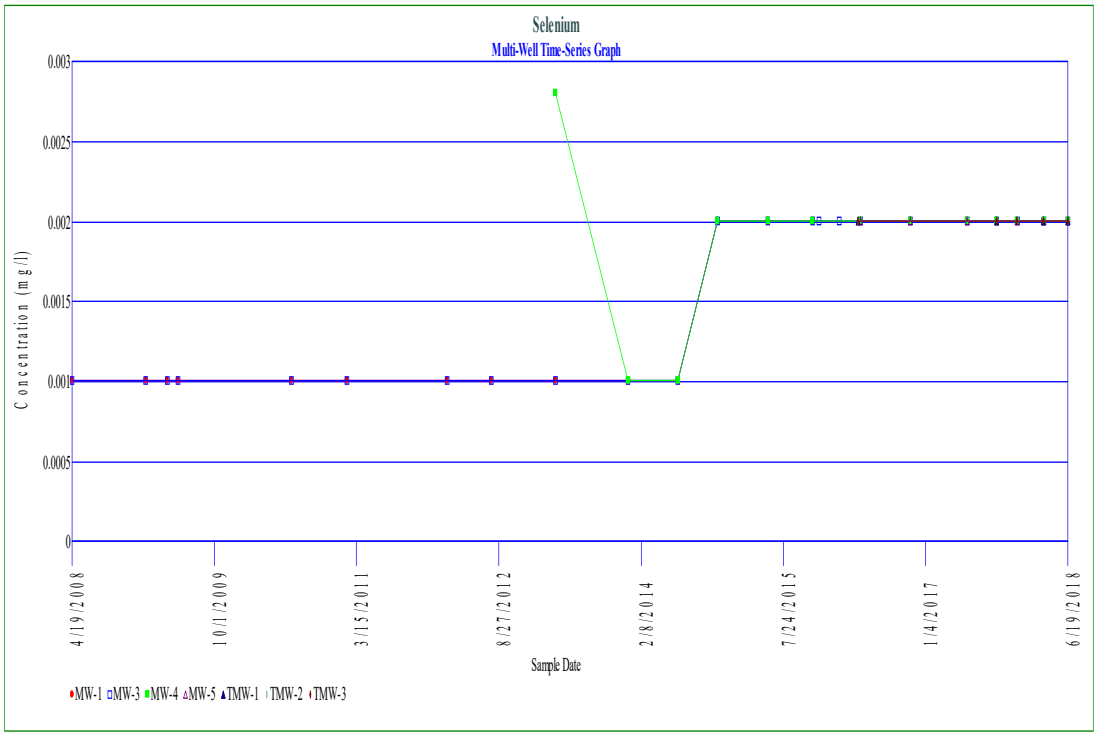

Mercury
Multi-Well Time-Series Graph
Concentration (mg/l)
0.004
0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

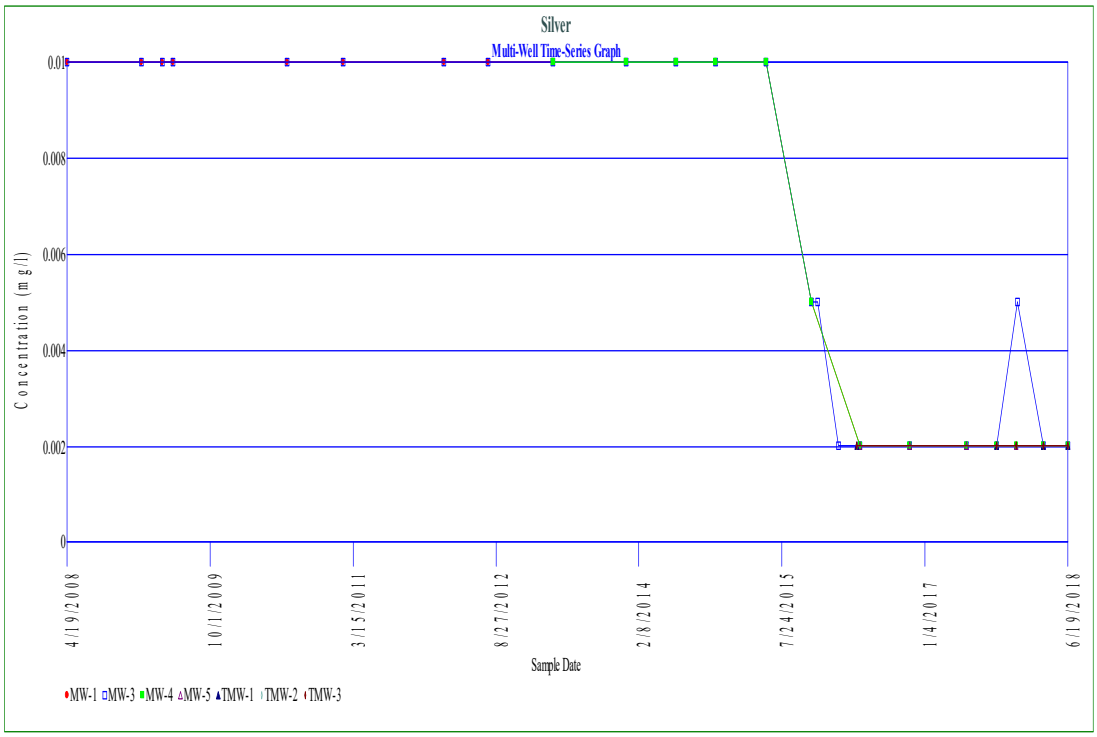

Nickel
Multi-Well Time-Series Graph
0.2
0.15
0.1
0.05
0
Concentration (mg/l)
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

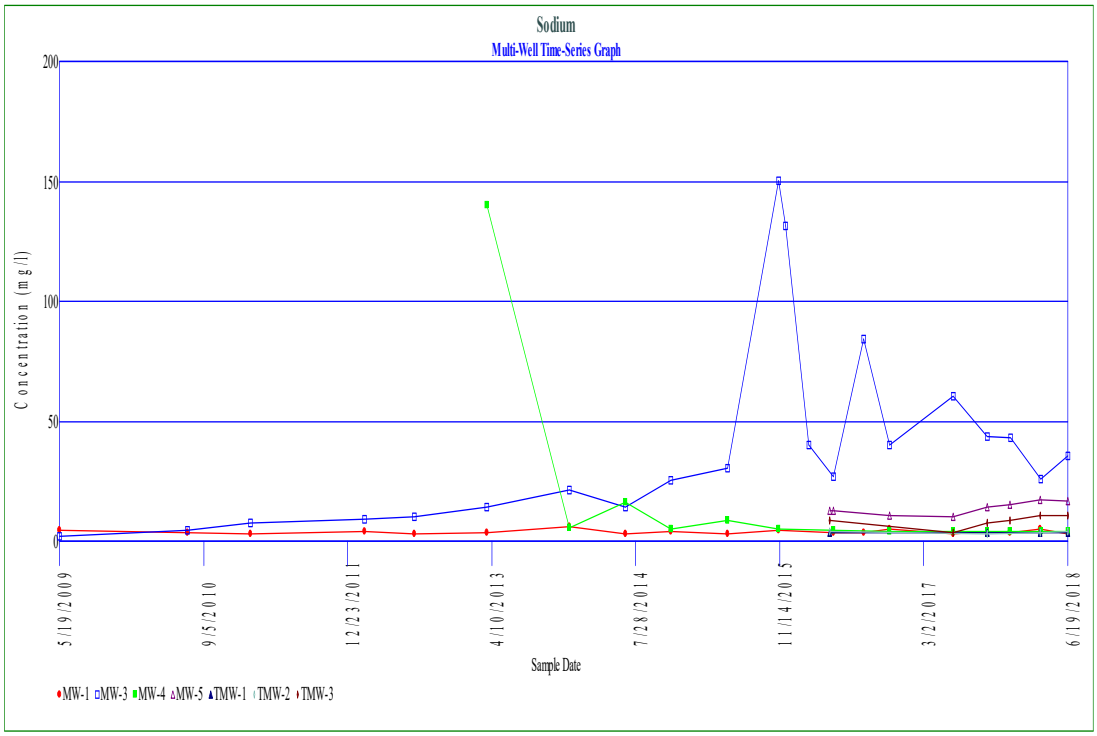

Nitrate
Multi-Well Time-Series Graph
30
25
20
15
10
5
0
Concentration (mg/l)
7/16/2010
9/2/2011
10/20/2012
12/7/2013
1/25/2015
3/13/2016
5/1/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

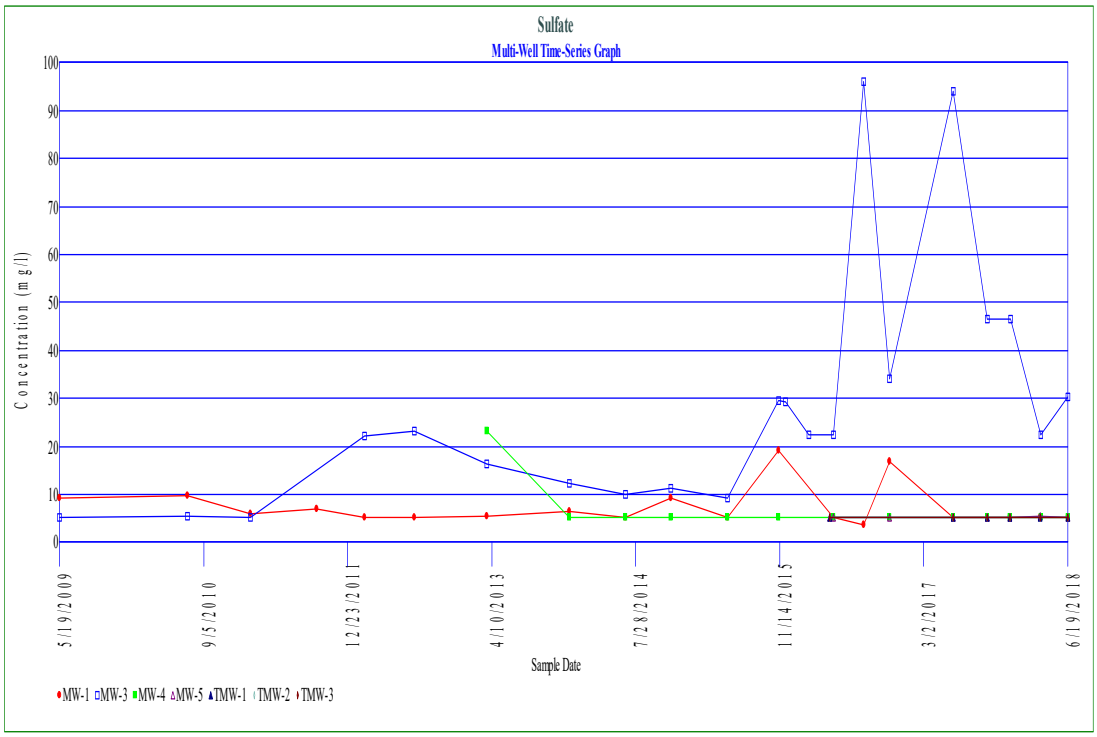

pH
Multi-Well Time-Series Graph
Concentration (SU)
7
6
5
4
3
2
1
0
6/26/2014
1/19/2015
8/15/2015
3/10/2016
10/3/2016
4/29/2017
11/23/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

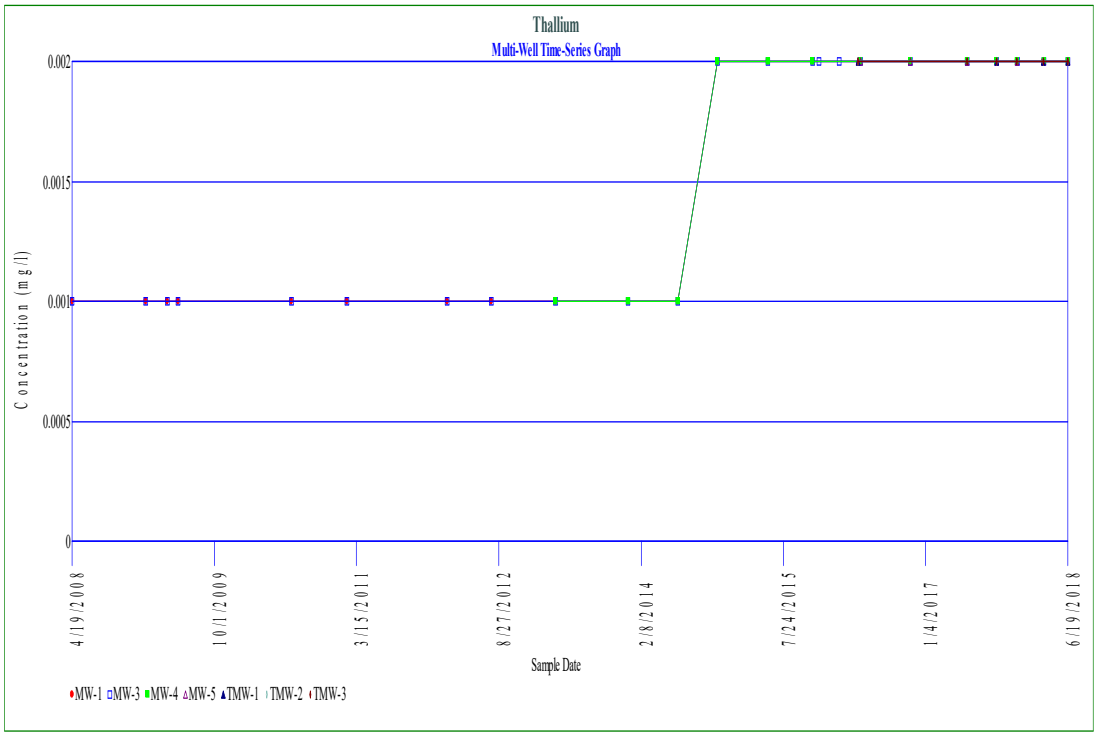

Potassium
Multi-Well Time-Series Graph
Concentration (mg/l)
80
70
60
50
40
30
20
10
0
5/19/2009
9/5/2010
12/23/2011
4/10/2013
7/28/2014
11/14/2015
3/2/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

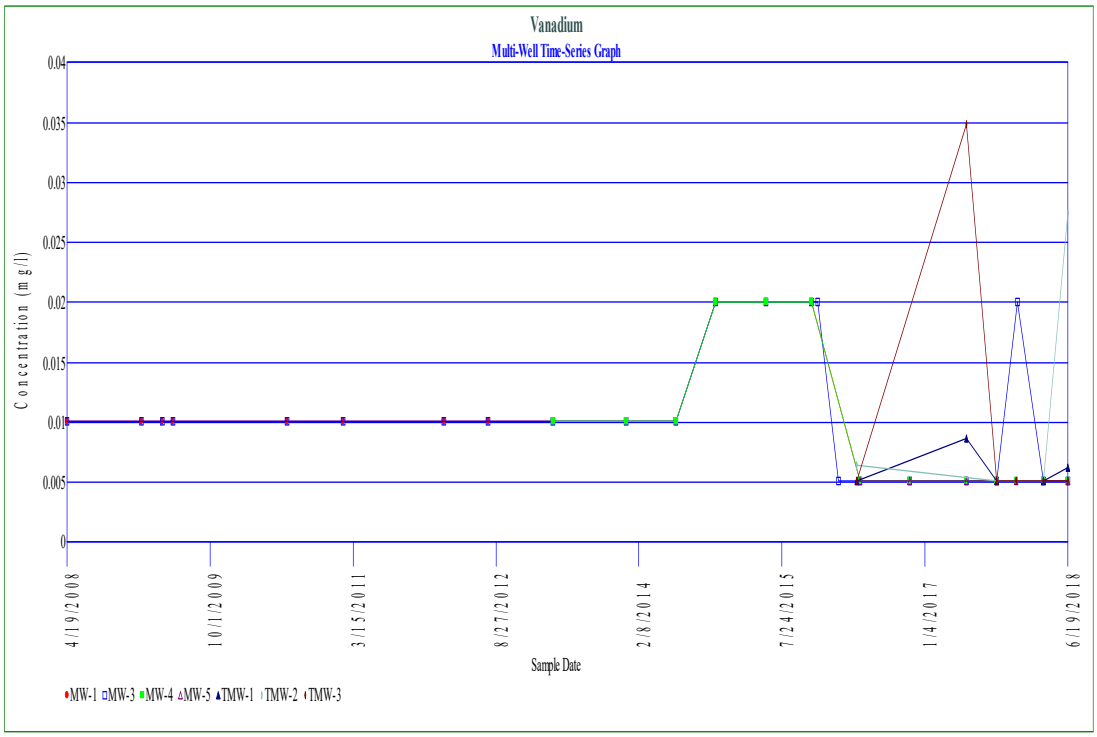

Selenium
Multi-Well Time-Series Graph
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
Concentration (mg/l)
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

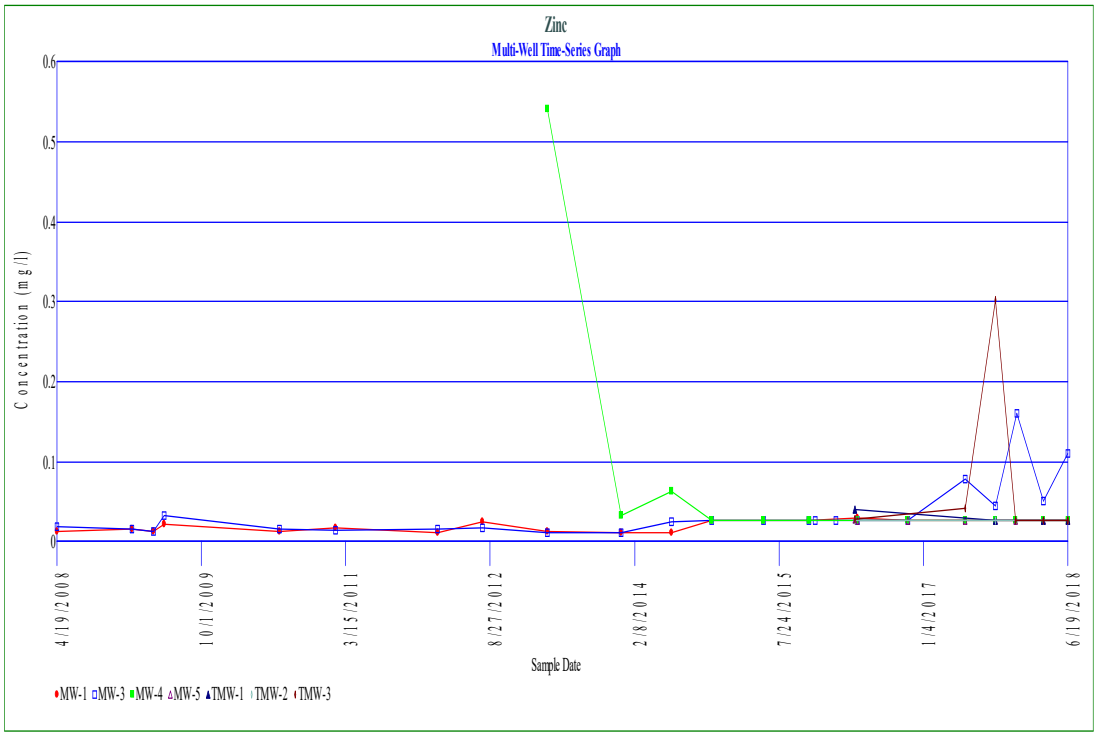

Silver
Multi-Well Time-Series Graph
0.01
0.008
0.006
0.004
0.002
0
Concentration (mg/l)
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3


Sodium
Multi-Well Time-Series Graph
200
150
100
50
0
Concentration (mg/l)
5/19/2009
9/5/2010
12/23/2011
4/10/2013
7/28/2014
11/14/2015
3/2/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3


Sulfate
Multi-Well Time-Series Graph
100
90
80
70
60
50
40
30
20
10
0
Concentration (mg/l)
5/19/2009
9/5/2010
12/23/2011
4/10/2013
7/28/2014
11/14/2015
3/2/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3


Thallium
Multi-Well Time-Series Graph
0.002
0.0015
0.001
0.0005
0
Concentration (mg/l)
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3


Vanadium
Multi-Well Time-Series Graph
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Concentration (mg/l)
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3


Zinc
Multi-Well Time-Series Graph
0.6
0.5
0.4
0.3
0.2
0.1
0
Concentration (mg/l)
4/19/2008
10/1/2009
3/15/2011
8/27/2012
2/8/2014
7/24/2015
1/4/2017
6/19/2018
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

Shapiro-Wilks Test of Normality

Parameter: Arsenic
Location: MW-1
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 10 for 21 measurements

Sum of b values = 0.115739
Sample Standard Deviation = 0.0264215
W Statistic = 0.959427

5% Critical value of 0.908 is less than 0.959427
Data is normally distributed at 95% level of significance

1% Critical value of 0.873 is less than 0.959427
Data is normally distributed 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 = 10 for 21 measurements

Sum of b values = 0.0450978
Sample Standard Deviation = 0.0144949
W Statistic = 0.484008

5% Critical value of 0.908 exceeds 0.484008
Evidence of non-normality at 95% level of significance

1% Critical value of 0.873 exceeds 0.484008
Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Chloride
Location: MW-1
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 11 for 22 measurements

Sum of b values = 4.43911
Sample Standard Deviation = 1.04911
W Statistic = 0.852569

5% Critical value of 0.911 exceeds 0.852569
Evidence of non-normality at 95% level of significance

1% Critical value of 0.878 exceeds 0.852569
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 = 10 for 21 measurements

Sum of b values = 0.039366
Sample Standard Deviation = 0.00891911
W Statistic = 0.974023

5% Critical value of 0.908 is less than 0.974023
Data is normally distributed at 95% level of significance

1% Critical value of 0.873 is less than 0.974023
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 = 10 for 21 measurements

Sum of b values = 0.156257
Sample Standard Deviation = 0.0519095
W Statistic = 0.453061

5% Critical value of 0.908 exceeds 0.453061
Evidence of non-normality at 95% level of significance

1% Critical value of 0.873 exceeds 0.453061
Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Mercury
Location: MW-1
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 10 for 21 measurements

Sum of b values = 0.00208896
Sample Standard Deviation = 0.000655167
W Statistic = 0.508308

5% Critical value of 0.908 exceeds 0.508308
Evidence of non-normality at 95% level of significance

1% Critical value of 0.873 exceeds 0.508308
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 = 10 for 21 measurements

Sum of b values = 1.39129
Sample Standard Deviation = 0.366639
W Statistic = 0.719995

5% Critical value of 0.908 exceeds 0.719995
Evidence of non-normality at 95% level of significance

1% Critical value of 0.873 exceeds 0.719995
Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Chloride
Location: MW-1
Normality Test of Parameter Concentrations
Natural Logarithm Transformation
Non-Detects Replaced with 1/2 DL
K = 11 for 22 measurements

Sum of b values = 1.49696
Sample Standard Deviation = 0.33777
W Statistic = 0.935315

5% Critical value of 0.911 is less than 0.935315
Data is normally distributed at 95% level of significance

1% Critical value of 0.878 is less than 0.935315
Data is normally distributed 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 = 10 for 21 measurements

Sum of b values = 3.41036
Sample Standard Deviation = 0.979219
W Statistic = 0.60647

5% Critical value of 0.908 exceeds 0.60647
Evidence of non-normality at 95% level of significance

1% Critical value of 0.873 exceeds 0.60647
Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Mercury
Location: MW-1
Normality Test of Parameter Concentrations
Natural Logarithm Transformation
Non-Detects Replaced with 1/2 DL
K = 10 for 21 measurements

Sum of b values = 4.2396
Sample Standard Deviation = 1.02893
W Statistic = 0.848891

5% Critical value of 0.908 exceeds 0.848891
Evidence of non-normality at 95% level of significance

1% Critical value of 0.873 exceeds 0.848891
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
	2/17/2012	0.093
	7/31/2012	0.089
	3/27/2013	0.049
	12/23/2013	0.1
	6/26/2014	0.063
	11/21/2014	0.059
	5/28/2015	0.0604
	11/11/2015	0.0469
	5/9/2016	0.05
	11/10/2016	0.0286
	6/8/2017	0.0571
	9/28/2017	0.0199
	12/11/2017	0.0573
	3/21/2018	0.0101

From 20 baseline samples
Baseline mean = 0.058515
Baseline std Dev = 0.0244576

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 = 20 (background observations) - 1
t(0.95, 20) = 1.72913

Date	Samples	Mean	Interval	Significant
6/19/2018	1	0.0063	[0, 0.10185]	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
	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
	9/28/2017	0.0403
	12/11/2017	0.0411
	3/21/2018	0.0425

From 20 baseline samples
Baseline mean = 0.035655
Baseline std Dev = 0.00850743

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 = 20 (background observations) - 1
t(0.95, 20) = 1.72913

Date	Samples	Mean	Interval	Significant
6/19/2018	1	0.0206	[0, 0.0507287	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-1
Parameter: Chloride
Natural Logarithm Transformation
Non-Detects Replaced with 1/2 DL

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

Baseline Samples	Date	Result
	4/19/2008	0.693147
	1/21/2009	1.06471
	4/9/2009	0.641854
	5/19/2009	1.02962
	7/16/2010	1.02962
	2/8/2011	0.955511
	2/17/2012	0.741937
	7/31/2012	0.788457
	3/27/2013	0.587787
	12/23/2013	0.405465
	6/26/2014	1.06471
	11/21/2014	1.36098
	5/28/2015	0.698135
	11/11/2015	1.37877
	5/9/2016	0.751416
	8/18/2016	0.875469
	11/10/2016	1.52388
	6/8/2017	1.73695
	9/28/2017	1.41342
	12/11/2017	0.837248
	3/21/2018	0.741937

From 21 baseline samples
Baseline mean = 0.967668
Baseline std Dev = 0.344316

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 = 21 (background observations) - 1
t(0.95, 21) = 1.72472

Date	Samples	Mean	Interval	Significant
6/19/2018	1	0.806476	[0, 1.57549]	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for MW-1
Parameter: Barium
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 20
Maximum Baseline Concentration = 0.084
Confidence Level = 95.2%
False Positive Rate = 4.8%

Baseline Measurements	Date	Value
	4/19/2008	0.084
	1/21/2009	0.028
	4/9/2009	0.028
	5/19/2009	0.033
	7/16/2010	0.021
	2/8/2011	0.021
	2/17/2012	0.022
	7/31/2012	0.019
	3/27/2013	0.018
	12/23/2013	0.017
	6/26/2014	0.018
	11/21/2014	0.02
	5/28/2015	0.0188
	11/11/2015	0.0237
	5/9/2016	0.02
	11/10/2016	0.0207
	6/8/2017	0.0146
	9/28/2017	0.0175
	12/11/2017	0.0166
	3/21/2018	0.0212

Date	Count	Mean	Significant
6/19/2018	1	0.0163	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for MW-1
Parameter: Mercury
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 45%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 20
Maximum Baseline Concentration = 0.000858
Confidence Level = 95.2%
False Positive Rate = 4.8%

Baseline Measurements	Date	Value
	4/19/2008	ND<0.0002
	1/21/2009	0.00045
	4/9/2009	ND<0.0002
	5/19/2009	ND<0.0002
	7/16/2010	0.0005
	2/8/2011	0.00024
	2/17/2012	0.00083
	7/31/2012	0.00063
	3/27/2013	0.00028
	12/23/2013	0.00077
	6/26/2014	ND<0.0002
	11/21/2014	ND<0.0002
	5/28/2015	ND<0.0002
	11/11/2015	ND<0.0002
	5/9/2016	0.000858
	11/10/2016	ND<0.0002
	6/8/2017	0.000222
	9/28/2017	ND<0.0002
	12/11/2017	0.000473
	3/21/2018	0.000651

Date	Count	Mean	Significant
6/19/2018	1	0.00319	TRUE

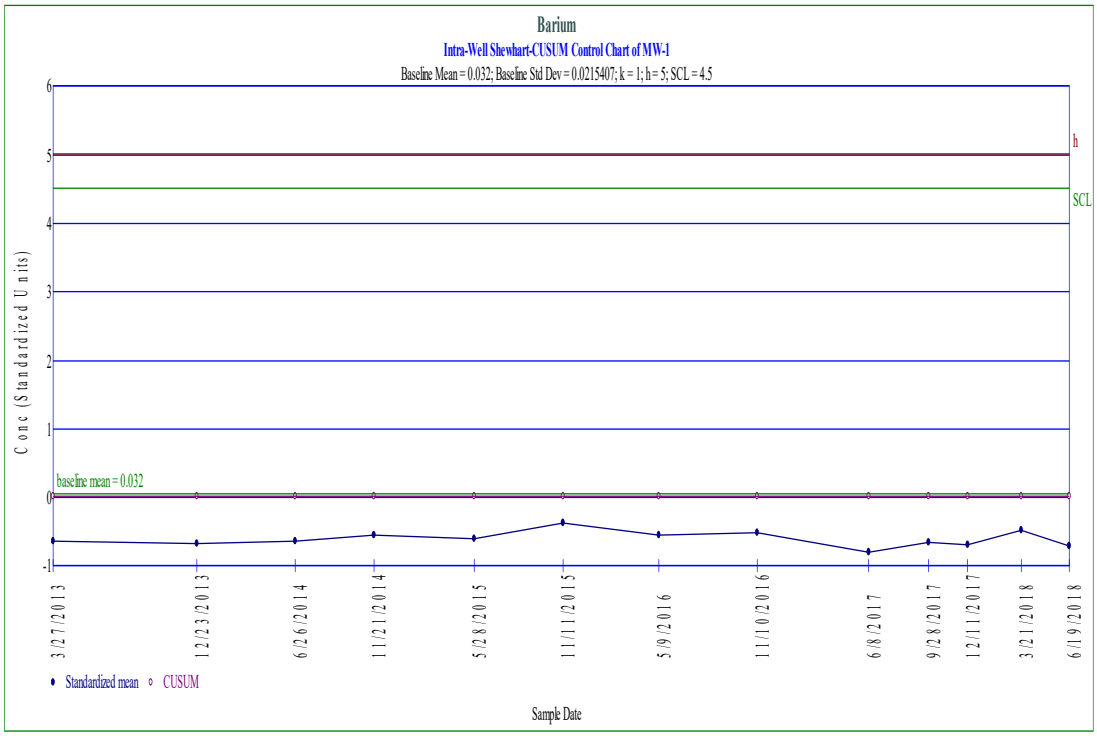
Non-Parametric Prediction Interval

Intra-Well Comparison for MW-1
Parameter: Nickel
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 55%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 20
Maximum Baseline Concentration = 0.2
Confidence Level = 95.2%
False Positive Rate = 4.8%

Baseline Measurements	Date	Value
	4/19/2008	ND<0.02
	1/21/2009	ND<0.02
	4/9/2009	0.2
	5/19/2009	0.17
	7/16/2010	ND<0.02
	2/8/2011	ND<0.02
	2/17/2012	ND<0.02
	7/31/2012	ND<0.02
	3/27/2013	ND<0.02
	12/23/2013	ND<0.02
	6/26/2014	ND<0.02
	11/21/2014	ND<0.02
	5/28/2015	ND<0.02
	11/11/2015	0.0112
	5/9/2016	0.00512
	11/10/2016	0.0112
	6/8/2017	0.00418
	9/28/2017	0.00445
	12/11/2017	0.00652
	3/21/2018	0.00658

Date	Count	Mean	Significant
6/19/2018	1	0.00637	FALSE


Barium
Intra-Well Shewhart-CUSUM Control Chart of MW-1
Baseline Mean = 0.032; Baseline Std Dev = 0.0215407; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
h
SCL
baseline mean = 0.032
3/27/2013
12/23/2013
6/26/2014
11/21/2014
5/28/2015
11/11/2015
5/9/2016
11/10/2016
6/8/2017
9/28/2017
12/11/2017
3/21/2018
6/19/2018
Standardized mean
CUSUM
Sample Date

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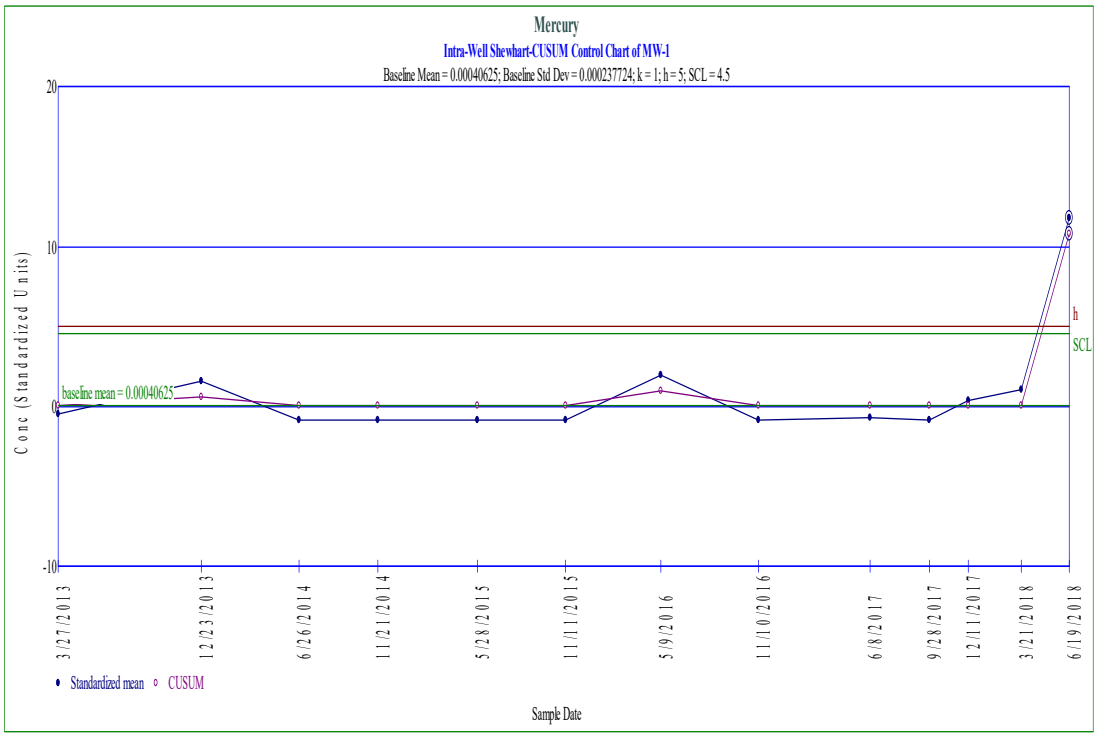
Mercury
Intra-Well Shewhart-CUSUM Control Chart of MW-1
Baseline Mean = 0.00040625; Baseline Std Dev = 0.000237724; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
h
SCL
baseline mean = 0.00040625
3/27/2013
12/23/2013
6/26/2014
11/21/2014
5/28/2015
11/11/2015
5/9/2016
11/10/2016
6/8/2017
9/28/2017
12/11/2017
3/21/2018
6/19/2018
Standardized mean
CUSUM
Sample Date

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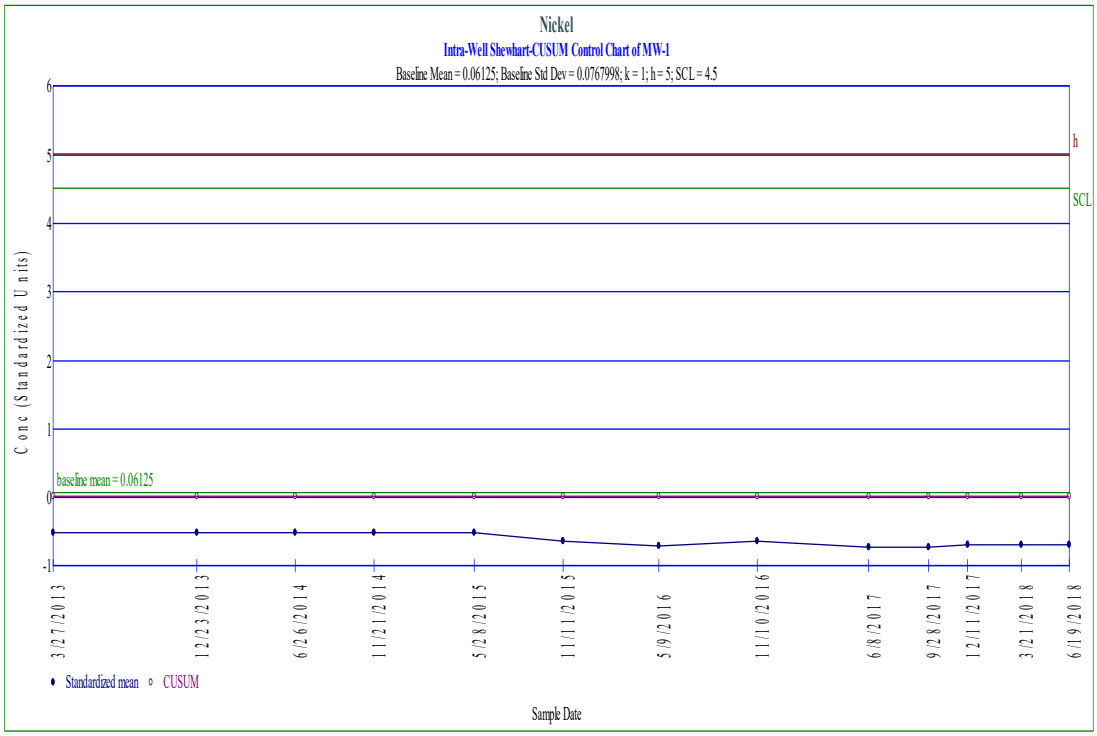

Nickel
Intra-Well Shewhart-CUSUM Control Chart of MW-1
Baseline Mean = 0.06125; Baseline Std Dev = 0.0767998; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
6
5
4
3
2
1
0
-1
h
SCL
baseline mean = 0.06125
3/27/2013
12/23/2013
6/26/2014
11/21/2014
5/28/2015
11/11/2015
5/9/2016
11/10/2016
6/8/2017
9/28/2017
12/11/2017
3/21/2018
6/19/2018
Standardized mean
CUSUM
Sample Date

Wilcoxon Non-Parametric Analysis (Intra-Well)

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

Total non detects is 9
Non detect rank is 5

Wilcoxon Ranks

Group	Date	Conc.	Rank
Baseline Values	4/19/2008	ND<0.0002	5
	1/21/2009	0.00045	13
	4/9/2009	ND<0.0002	5
	5/19/2009	ND<0.0002	5
Comparison Values	7/16/2010	0.0005	15
	2/8/2011	0.00024	11
	2/17/2012	0.00083	19
	7/31/2012	0.00063	16
	3/27/2013	0.00028	12
	12/23/2013	0.00077	18
	6/26/2014	ND<0.0002	5
	11/21/2014	ND<0.0002	5
	5/28/2015	ND<0.0002	5
	11/11/2015	ND<0.0002	5
	5/9/2016	0.000858	20
	11/10/2016	ND<0.0002	5
	6/8/2017	0.000222	10
	9/28/2017	ND<0.0002	5
	12/11/2017	0.000473	14
	3/21/2018	0.000651	17
	6/19/2018	0.00319	21

The Wilcoxon Statistic is 50
The Expected value is is 34
The Standard Deviation is 11.1654
The Z Score is 1.38821
The Standard Deviation adjusted for ties is 10.7216
The Z Score adjusted for ties is 1.44568

1.38821 < 2.326 indicating no statistical significance at 1% level
1.44568 < 2.326 indicating no statistical significance at 1% level when adjusted for ties

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 = 78

Data Set Standard Deviation = 1.59107
Numerator = 4961.97
Denominator = 13896
W Statistic = 0.357078 = 4961.97 / 13896

5% Critical value of 0.97 exceeds 0.357078
Evidence of non-normality at 95% level of significance

1% Critical value of 0.957 exceeds 0.357078
Evidence of non-normality at 99% level of significance

Shapiro-Francia Test of Normality

Parameter: Arsenic
All Locations
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
Total Number of Measurements = 77

Data Set Standard Deviation = 0.0278154
Numerator = 2.49443
Denominator = 4.1341
W Statistic = 0.603381 = 2.49443 / 4.1341

5% Critical value of 0.969 exceeds 0.603381
Evidence of non-normality at 95% level of significance

1% Critical value of 0.957 exceeds 0.603381
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 = 78

Data Set Standard Deviation = 0.112777
Numerator = 34.5087
Denominator = 69.8156
W Statistic = 0.494283 = 34.5087 / 69.8156

5% Critical value of 0.97 exceeds 0.494283
Evidence of non-normality at 95% level of significance

1% Critical value of 0.957 exceeds 0.494283
Evidence of non-normality at 99% level of significance

Shapiro-Francia Test of Normality

Parameter: Total Cadmium
All Locations
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
Total Number of Measurements = 77

Data Set Standard Deviation = 0.0048815
Numerator = 0.029508
Denominator = 0.127326
W Statistic = 0.231752 = 0.029508 / 0.127326

5% Critical value of 0.969 exceeds 0.231752
Evidence of non-normality at 95% level of significance

1% Critical value of 0.957 exceeds 0.231752
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 = 89

Data Set Standard Deviation = 73.6385
Numerator = 2.08432e+007
Denominator = 3.90627e+007
W Statistic = 0.533583 = 2.08432e+007 / 3.90627e+007

5% Critical value of 0.972 exceeds 0.533583
Evidence of non-normality at 95% level of significance

1% Critical value of 0.961 exceeds 0.533583
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 = 78

Data Set Standard Deviation = 0.0143107
Numerator = 0.879949
Denominator = 1.12417
W Statistic = 0.782753 = 0.879949 / 1.12417

5% Critical value of 0.97 exceeds 0.782753
Evidence of non-normality at 95% level of significance

1% Critical value of 0.957 exceeds 0.782753
Evidence of non-normality at 99% level of significance

Shapiro-Francia Test of Normality

Parameter: Copper
All Locations
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
Total Number of Measurements = 77

Data Set Standard Deviation = 0.00303395
Numerator = 0.0188666
Denominator = 0.0491846
W Statistic = 0.383587 = 0.0188666 / 0.0491846

5% Critical value of 0.969 exceeds 0.383587
Evidence of non-normality at 95% level of significance

1% Critical value of 0.957 exceeds 0.383587
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 = 24 for 49 measurements

Sum of b values = 0.178045
Sample Standard Deviation = 0.0404583
W Statistic = 0.403464

5% Critical value of 0.947 exceeds 0.403464
Evidence of non-normality at 95% level of significance

1% Critical value of 0.929 exceeds 0.403464
Evidence of non-normality at 99% level of significance

Shapiro-Francia Test of Normality

Parameter: Lead
All Locations
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
Total Number of Measurements = 78

Data Set Standard Deviation = 0.0014412
Numerator = 0.00622847
Denominator = 0.0114016
W Statistic = 0.546281 = 0.00622847 / 0.0114016

5% Critical value of 0.97 exceeds 0.546281
Evidence of non-normality at 95% level of significance

1% Critical value of 0.957 exceeds 0.546281
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 = 79

Data Set Standard Deviation = 0.0290378
Numerator = 1.65245
Denominator = 4.73491
W Statistic = 0.348994 = 1.65245 / 4.73491

5% Critical value of 0.97 exceeds 0.348994
Evidence of non-normality at 95% level of significance

1% Critical value of 0.957 exceeds 0.348994
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 = 79

Data Set Standard Deviation = 0.0682397
Numerator = 6.91898
Denominator = 26.1492
W Statistic = 0.264596 = 6.91898 / 26.1492

5% Critical value of 0.97 exceeds 0.264596
Evidence of non-normality at 95% level of significance

1% Critical value of 0.957 exceeds 0.264596
Evidence of non-normality at 99% level of significance

Shapiro-Francia Test of Normality

Parameter: Sulfate
All Locations
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
Total Number of Measurements = 80

Data Set Standard Deviation = 16.2721
Numerator = 704863
Denominator = 1.52909e+006
W Statistic = 0.46097 = 704863 / 1.52909e+006

5% Critical value of 0.97 exceeds 0.46097
Evidence of non-normality at 95% level of significance

1% Critical value of 0.958 exceeds 0.46097
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 = 78

Data Set Standard Deviation = 1.38452
Numerator = 9324.79
Denominator = 10522.3
W Statistic = 0.886194 = 9324.79 / 10522.3

5% Critical value of 0.97 exceeds 0.886194
Evidence of non-normality at 95% level of significance

1% Critical value of 0.957 exceeds 0.886194
Evidence of non-normality at 99% level of significance

Shapiro-Francia Test of Normality

Parameter: Arsenic
All Locations
Normality Test of Parameter Concentrations
Natural Logarithm Transformation
Non-Detects Replaced with 1/2 DL
Total Number of Measurements = 77

Data Set Standard Deviation = 1.83087
Numerator = 12916.3
Denominator = 17911.3
W Statistic = 0.721128 = 12916.3 / 17911.3

5% Critical value of 0.969 exceeds 0.721128
Evidence of non-normality at 95% level of significance

1% Critical value of 0.957 exceeds 0.721128
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 = 78

Data Set Standard Deviation = 1.05377
Numerator = 5837.64
Denominator = 6095.39
W Statistic = 0.957714 = 5837.64 / 6095.39

5% Critical value of 0.97 exceeds 0.957714
Evidence of non-normality at 95% level of significance

1% Critical value of 0.957 is less than 0.957714
Data is normally distributed at 99% level of significance

Shapiro-Francia Test of Normality

Parameter: Total Cadmium
All Locations
Normality Test of Parameter Concentrations
Natural Logarithm Transformation
Non-Detects Replaced with 1/2 DL
Total Number of Measurements = 77

Data Set Standard Deviation = 0.89701
Numerator = 1362.76
Denominator = 4299.38
W Statistic = 0.316966 = 1362.76 / 4299.38

5% Critical value of 0.969 exceeds 0.316966
Evidence of non-normality at 95% level of significance

1% Critical value of 0.957 exceeds 0.316966
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 = 89

Data Set Standard Deviation = 1.42347
Numerator = 14237.7
Denominator = 14596.6
W Statistic = 0.975413 = 14237.7 / 14596.6

5% Critical value of 0.972 is less than 0.975413
Data is normally distributed at 95% level of significance

1% Critical value of 0.961 is less than 0.975413
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 = 78

Data Set Standard Deviation = 1.36643
Numerator = 9021.72
Denominator = 10249.2
W Statistic = 0.880238 = 9021.72 / 10249.2

5% Critical value of 0.97 exceeds 0.880238
Evidence of non-normality at 95% level of significance

1% Critical value of 0.957 exceeds 0.880238
Evidence of non-normality at 99% level of significance

Shapiro-Francia Test of Normality

Parameter: Copper
All Locations
Normality Test of Parameter Concentrations
Natural Logarithm Transformation
Non-Detects Replaced with 1/2 DL
Total Number of Measurements = 77

Data Set Standard Deviation = 0.573962
Numerator = 1293.67
Denominator = 1760.27
W Statistic = 0.734927 = 1293.67 / 1760.27

5% Critical value of 0.969 exceeds 0.734927
Evidence of non-normality at 95% level of significance

1% Critical value of 0.957 exceeds 0.734927
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 = 24 for 49 measurements

Sum of b values = 2.22403
Sample Standard Deviation = 0.486069
W Statistic = 0.436159

5% Critical value of 0.947 exceeds 0.436159
Evidence of non-normality at 95% level of significance

1% Critical value of 0.929 exceeds 0.436159
Evidence of non-normality at 99% level of significance

Shapiro-Francia Test of Normality

Parameter: Lead
All Locations
Normality Test of Parameter Concentrations
Natural Logarithm Transformation
Non-Detects Replaced with 1/2 DL
Total Number of Measurements = 78

Data Set Standard Deviation = 0.568969
Numerator = 1277.7
Denominator = 1777.02
W Statistic = 0.719014 = 1277.7 / 1777.02

5% Critical value of 0.97 exceeds 0.719014
Evidence of non-normality at 95% level of significance

1% Critical value of 0.957 exceeds 0.719014
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 = 79

Data Set Standard Deviation = 1.1531
Numerator = 6409.22
Denominator = 7466.48
W Statistic = 0.8584 = 6409.22 / 7466.48

5% Critical value of 0.97 exceeds 0.8584
Evidence of non-normality at 95% level of significance

1% Critical value of 0.957 exceeds 0.8584
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 = 79

Data Set Standard Deviation = 0.8037
Numerator = 2559.98
Denominator = 3627.21
W Statistic = 0.705771 = 2559.98 / 3627.21

5% Critical value of 0.97 exceeds 0.705771
Evidence of non-normality at 95% level of significance

1% Critical value of 0.957 exceeds 0.705771
Evidence of non-normality at 99% level of significance

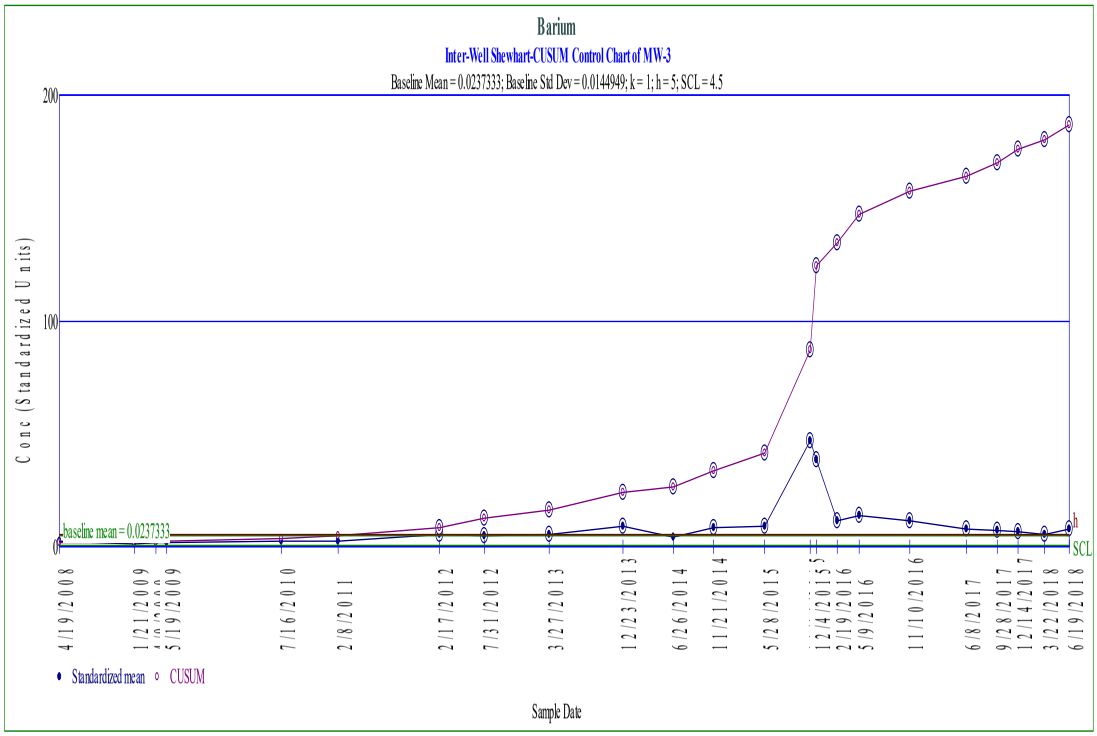
Shapiro-Francia Test of Normality

Parameter: Sulfate
All Locations
Normality Test of Parameter Concentrations
Natural Logarithm Transformation
Non-Detects Replaced with 1/2 DL
Total Number of Measurements = 80

Data Set Standard Deviation = 1.04003
Numerator = 4510.34
Denominator = 6246.57
W Statistic = 0.722051 = 4510.34 / 6246.57

5% Critical value of 0.97 exceeds 0.722051
Evidence of non-normality at 95% level of significance

1% Critical value of 0.958 exceeds 0.722051
Evidence of non-normality at 99% level of significance


Barium
Inter-Well Shewhart-CUSUM Control Chart of MW-3
Baseline Mean = 0.0237333; Baseline Std Dev = 0.0144949; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
200
100
0
baseline mean = 0.0237333
h
SCL
4/19/2008
1/21/2009
5/19/2009
7/16/2010
2/8/2011
2/17/2012
7/31/2012
3/27/2013
12/23/2013
6/26/2014
11/21/2014
5/28/2015
12/4/2015
2/19/2016
5/9/2016
11/10/2016
6/8/2017
9/28/2017
12/14/2017
3/22/2018
6/19/2018
Standardized mean
CUSUM
Sample Date

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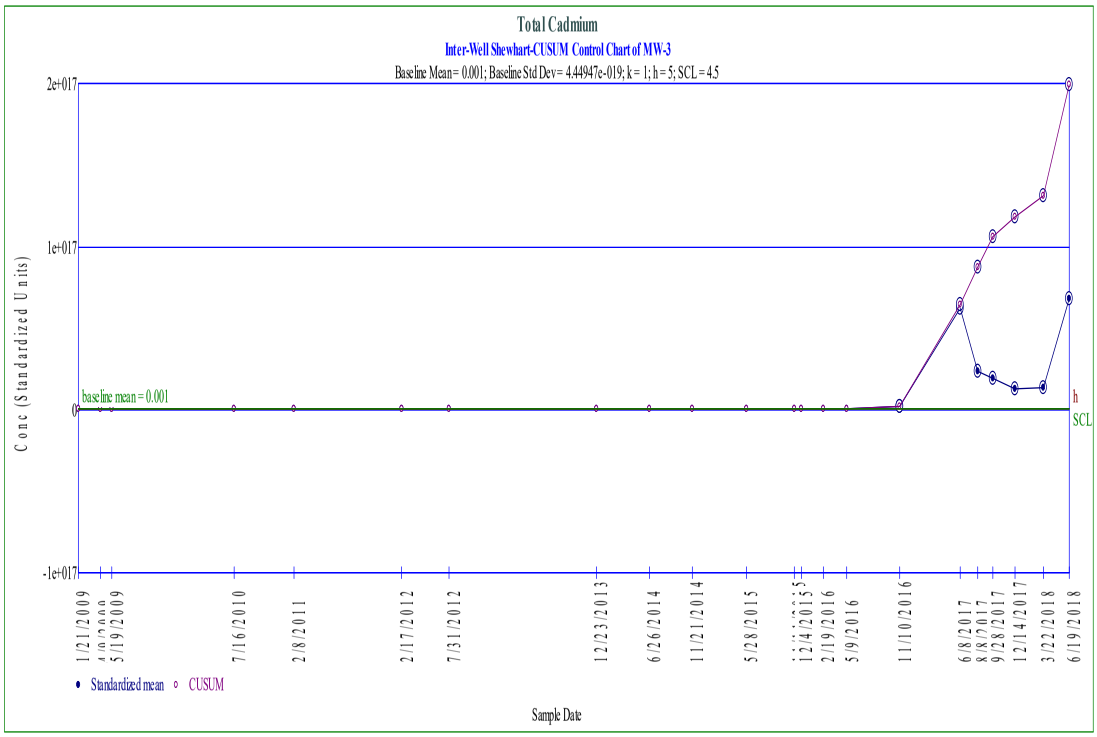
Total Cadmium
Inter-Well Shewhart-CUSUM Control Chart of MW-3
Baseline Mean = 0.001; Baseline Std Dev = 4.44947e-019; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
2e+017
1e+017
0
-1e+017
baseline mean = 0.001
h
SCL
1/21/2009
5/19/2009
7/16/2010
2/8/2011
2/17/2012
7/31/2012
12/23/2013
6/26/2014
11/21/2014
5/28/2015
12/4/2015
2/19/2016
5/9/2016
11/10/2016
6/8/2017
8/8/2017
9/28/2017
12/14/2017
3/22/2018
6/19/2018
Standardized mean
CUSUM
Sample Date

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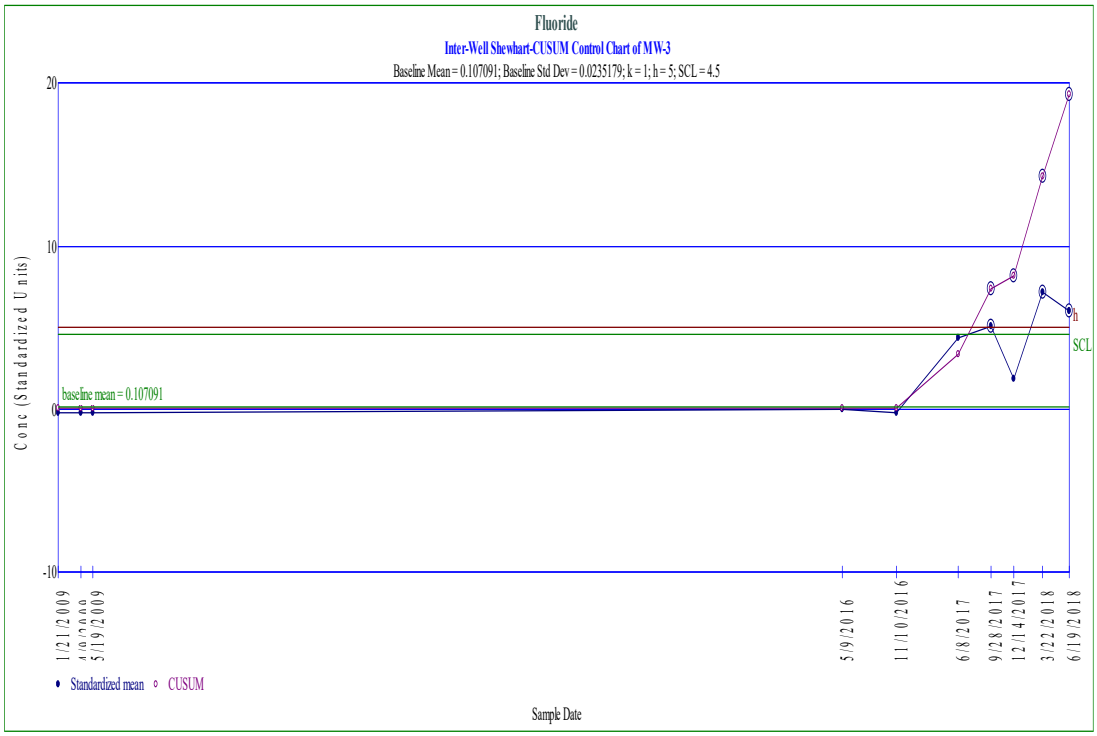
Fluoride
Inter-Well Shewhart-CUSUM Control Chart of MW-3
Baseline Mean = 0.107091; Baseline Std Dev = 0.0235179; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
20
10
0
-10
baseline mean = 0.107091
h
SCL
1/21/2009
5/19/2009
5/9/2016
11/10/2016
6/8/2017
9/28/2017
12/14/2017
3/22/2018
6/19/2018
Standardized mean
CUSUM
Sample Date

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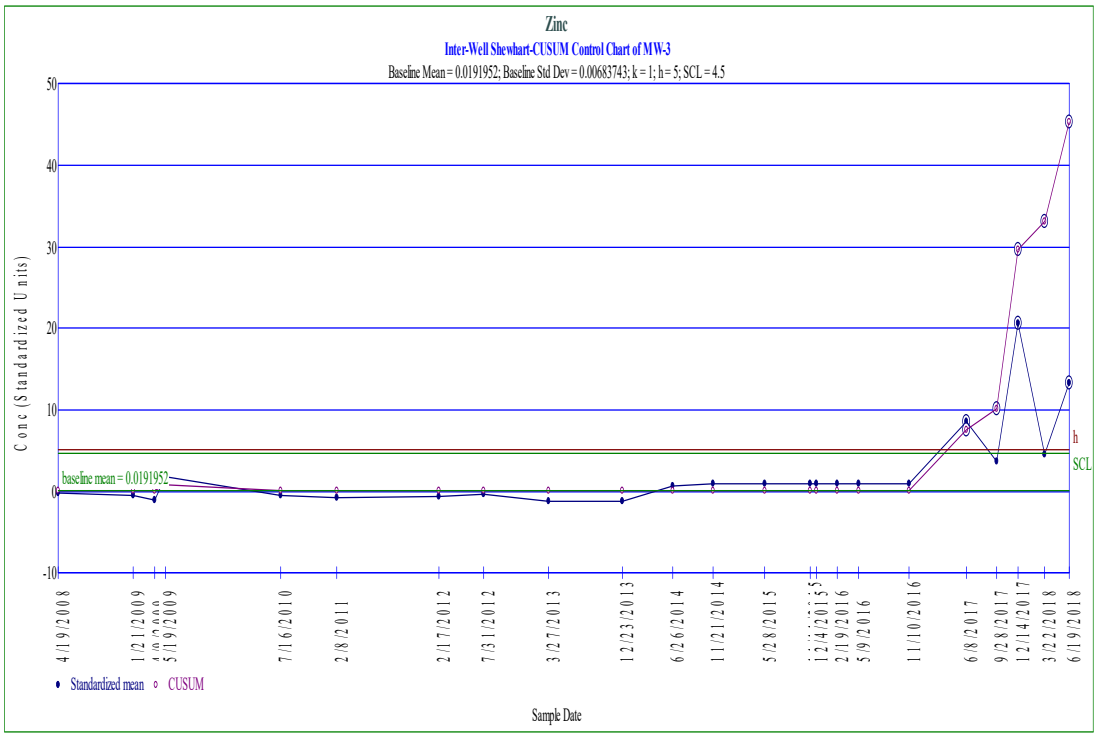
Zinc
Inter-Well Shewhart-CUSUM Control Chart of MW-3
Baseline Mean = 0.0191952; Baseline Std Dev = 0.00683743; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
50
40
30
20
10
0
-10
baseline mean = 0.0191952
h
SCL
4/19/2008
1/21/2009
5/19/2009
7/16/2010
2/8/2011
2/17/2012
7/31/2012
3/27/2013
12/23/2013
6/26/2014
11/21/2014
5/28/2015
2/19/2016
5/9/2016
11/10/2016
6/8/2017
9/28/2017
12/14/2017
3/22/2018
6/19/2018
Standardized mean
CUSUM
Sample Date

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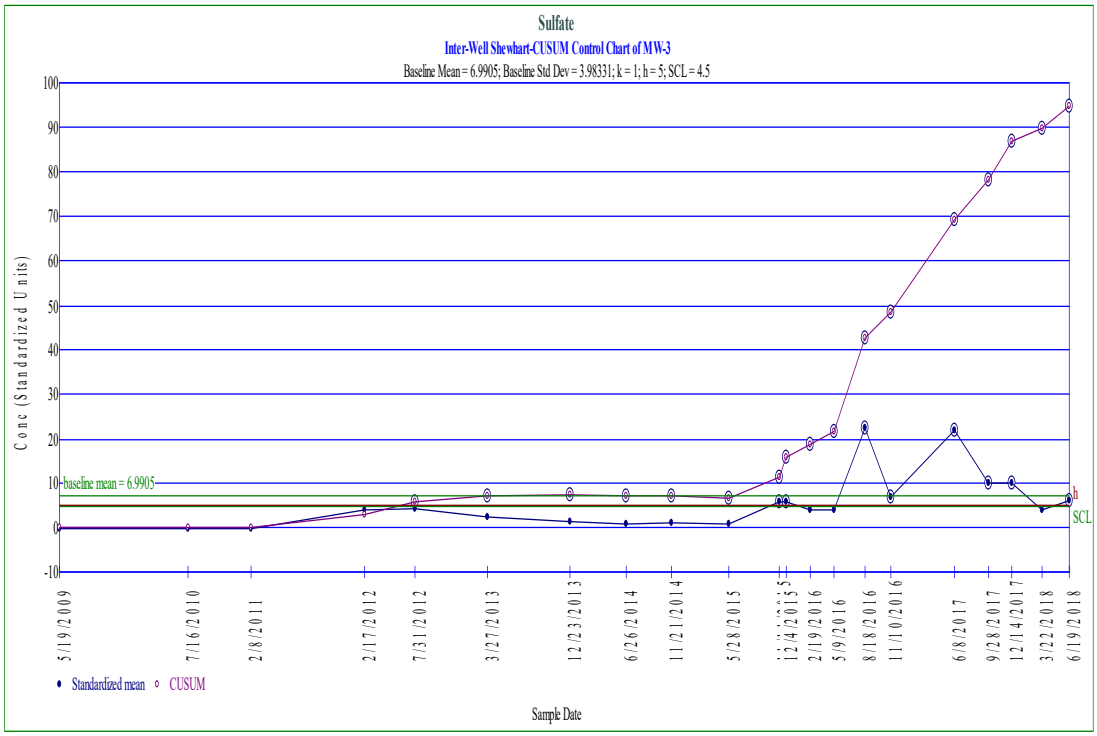
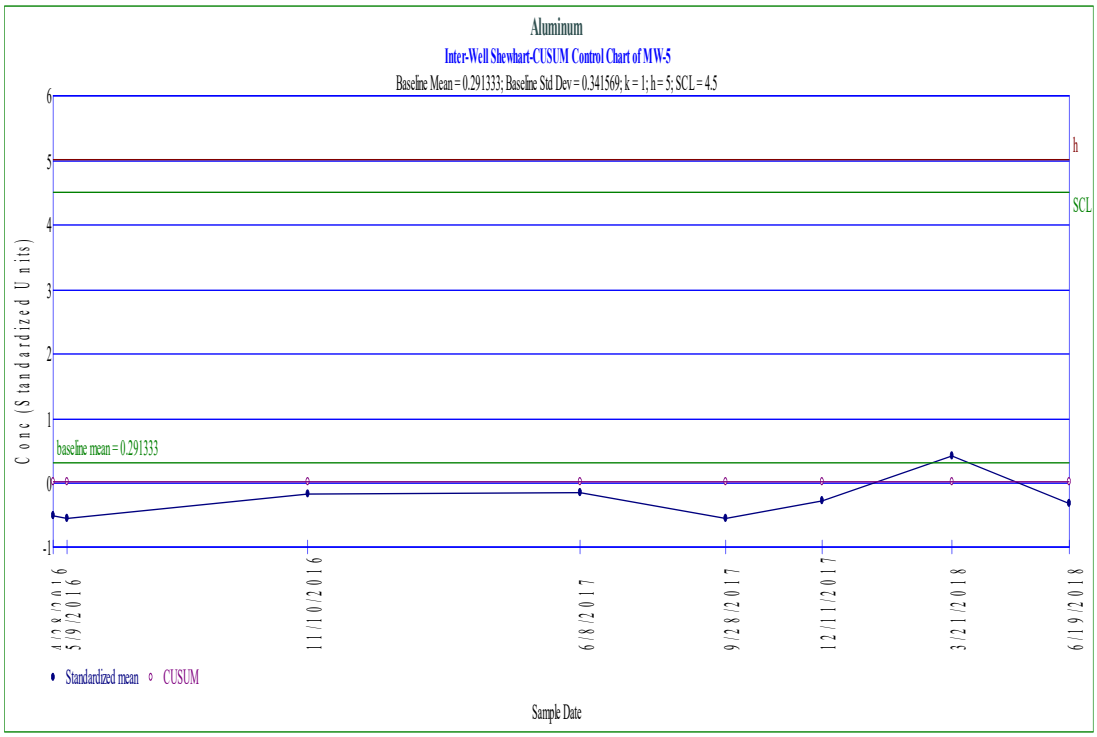
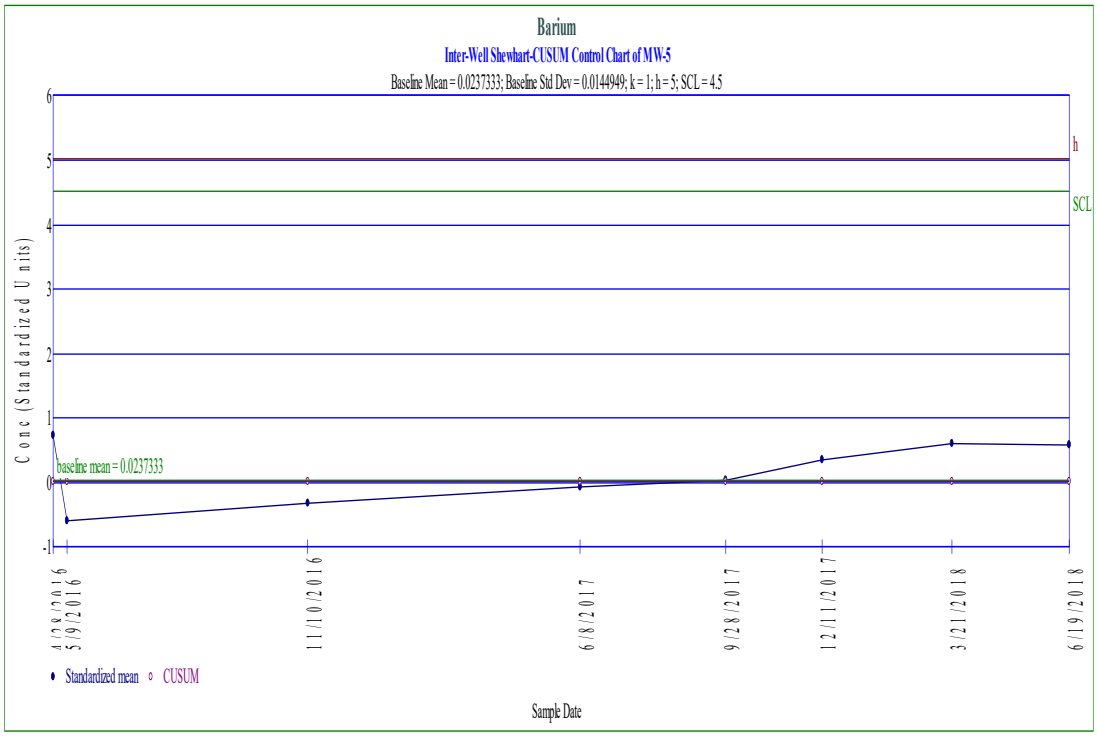
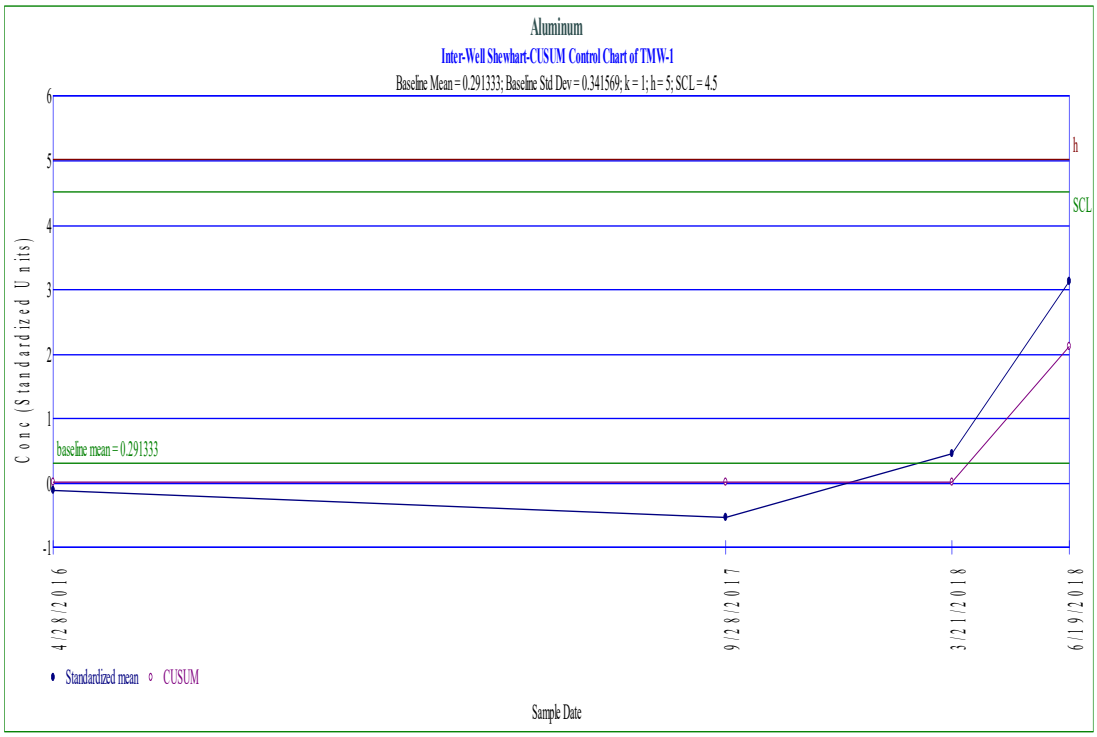
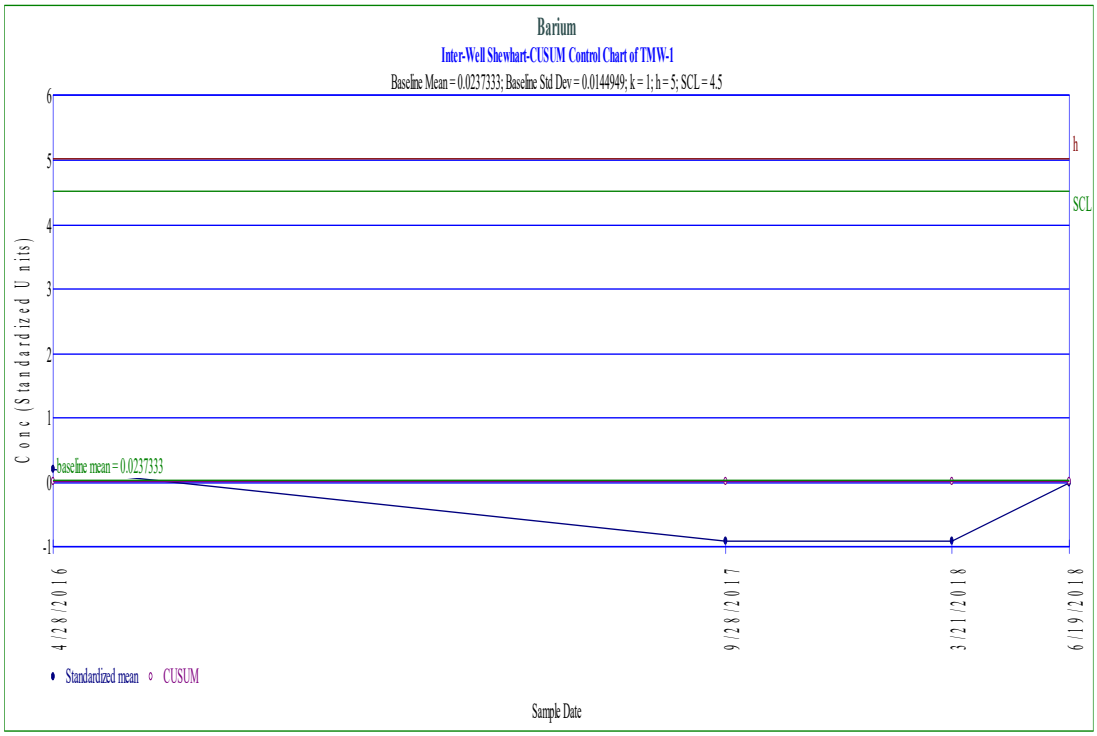
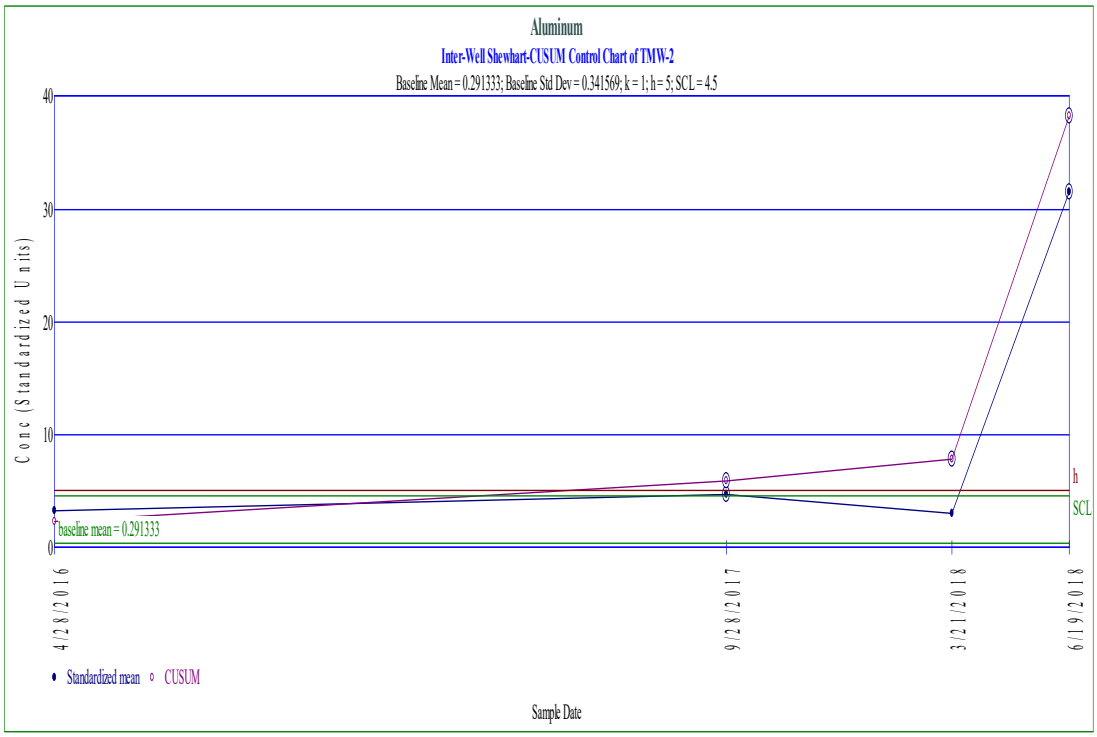

Sulfate
Inter-Well Shewhart-CUSUM Control Chart of MW-3
Baseline Mean = 6.9905; Baseline Std Dev = 3.98331; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
baseline mean = 6.9905
h
SCL
Standardized mean
CUSUM
Sample Date

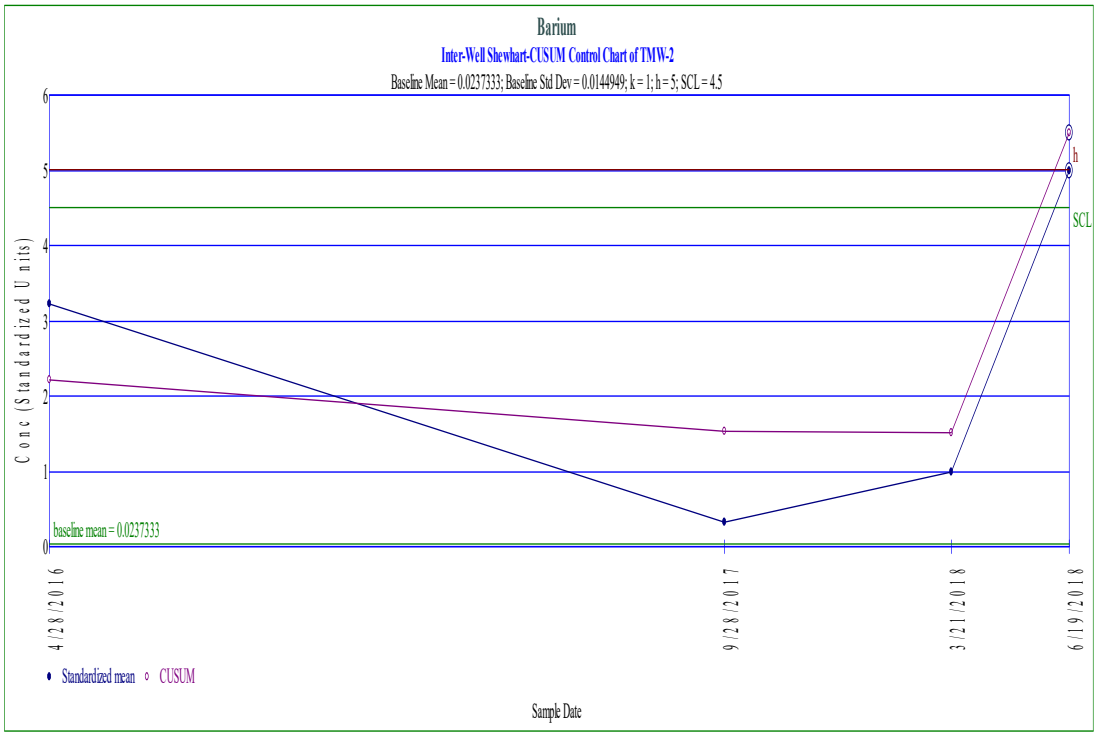

Aluminum
Inter-Well Shewhart-CUSUM Control Chart of MW-5
Baseline Mean = 0.291333; Baseline Std Dev = 0.341569; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
baseline mean = 0.291333
h
SCL
Standardized mean
CUSUM
Sample Date

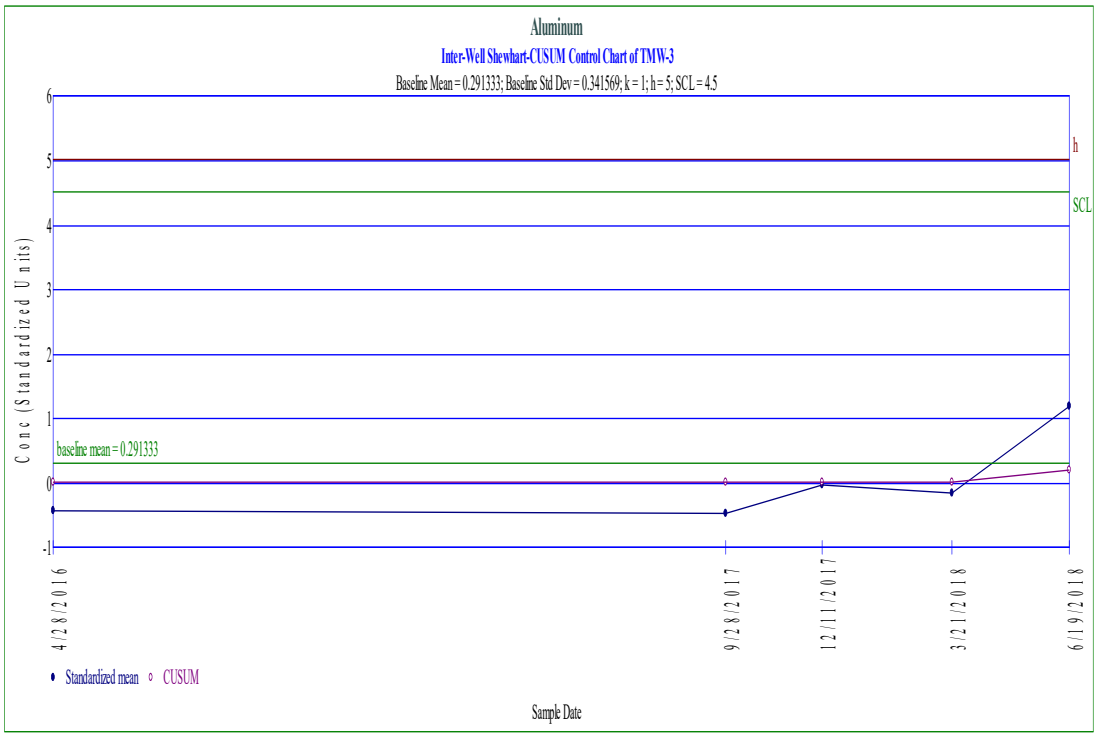

Barium
Inter-Well Shewhart-CUSUM Control Chart of MW-5
Baseline Mean = 0.0237333; Baseline Std Dev = 0.0144949; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
h
SCL
baseline mean = 0.0237333
4/28/2016
5/9/2016
11/10/2016
6/8/2017
9/28/2017
12/11/2017
3/21/2018
6/19/2018
Standardized mean
CUSUM
Sample Date

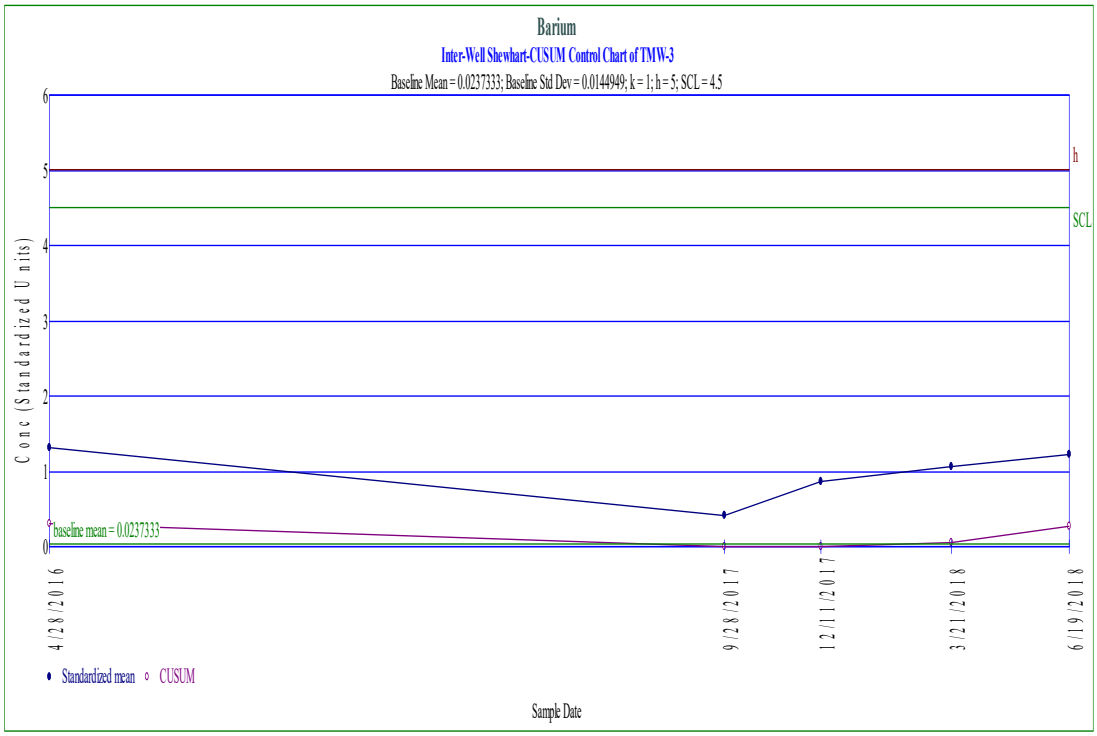

Aluminum
Inter-Well Shewhart-CUSUM Control Chart of TMW-1
Baseline Mean = 0.291333; Baseline Std Dev = 0.341569; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
h
SCL
baseline mean = 0.291333
4/28/2016
9/28/2017
3/21/2018
6/19/2018
Standardized mean
CUSUM
Sample Date


Barium
Inter-Well Shewhart-CUSUM Control Chart of TMW-1
Baseline Mean = 0.0237333; Baseline Std Dev = 0.0144949; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
6
5
4
3
2
1
0
-1
h
SCL
baseline mean = 0.0237333
4/28/2016
9/28/2017
3/21/2018
6/19/2018
Standardized mean
CUSUM
Sample Date


Aluminum
Inter-Well Shewhart-CUSUM Control Chart of TMW-2
Baseline Mean = 0.291333; Baseline Std Dev = 0.341569; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
40
30
20
10
0
h
SCL
baseline mean = 0.291333
4/28/2016
9/28/2017
3/21/2018
6/19/2018
Standardized mean
CUSUM
Sample Date


Barium
Inter-Well Shewhart-CUSUM Control Chart of TMW-2
Baseline Mean = 0.0237333; Baseline Std Dev = 0.0144949; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
h
SCL
baseline mean = 0.0237333
4/28/2016
9/28/2017
3/21/2018
6/19/2018
Standardized mean
CUSUM
Sample Date


Aluminum
Inter-Well Shewhart-CUSUM Control Chart of TMW-3
Baseline Mean = 0.291333; Baseline Std Dev = 0.341569; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
h
SCL
baseline mean = 0.291333
4/28/2016
9/28/2017
12/11/2017
3/21/2018
6/19/2018
Standardized mean
CUSUM
Sample Date


Barium
Inter-Well Shewhart-CUSUM Control Chart of TMW-3
Baseline Mean = 0.0237333; Baseline Std Dev = 0.0144949; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
6
5
4
3
2
1
0
h
SCL
baseline mean = 0.0237333
4/28/2016
9/28/2017
12/11/2017
3/21/2018
6/19/2018
Standardized mean
CUSUM
Sample Date

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Arsenic

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 66.2338%
Number of comparisons = 6
Future Samples (k) = 6
Recent Dates = 1
Background Measurements (n) = 21
Maximum Background Value = 0.1
Confidence Level = 77.8%
False Positive Rate = 22.2%

Location	Date	Count	Mean	Significant
MW-3	6/19/2018	1	0.002	FALSE
MW-4	6/19/2018	1	0.002	FALSE
MW-5	6/19/2018	1	0.002	FALSE
TMW-1	6/19/2018	1	0.00217	FALSE
TMW-2	6/19/2018	1	0.0068	FALSE
TMW-3	6/19/2018	1	0.00232	FALSE

Non-Parametric Prediction Interval

Inter-Well Comparison
Parameter: Total Cadmium
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 90.9091%
Number of comparisons = 6
Future Samples (k) = 6
Recent Dates = 1
Background Measurements (n) = 20
Maximum Background Value = 0.001
Confidence Level = 76.9%
False Positive Rate = 23.1%

Location	Date	Count	Mean	Significant
MW-3	**6/19/2018**	**1**	**0.0312**	**TRUE**
MW-4	6/19/2018	1	0.001	FALSE
MW-5	6/19/2018	1	0.001	FALSE
TMW-1	6/19/2018	1	0.001	FALSE
TMW-2	6/19/2018	1	0.001	FALSE
TMW-3	6/19/2018	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 = 57.6923%
Number of comparisons = 6
Future Samples (k) = 6
Recent Dates = 1
Background Measurements (n) = 21
Maximum Background Value = 0.056
Confidence Level = 77.8%
False Positive Rate = 22.2%

Location	Date	Count	Mean	Significant
MW-3	6/19/2018	1	0.002	FALSE
MW-4	6/19/2018	1	0.002	FALSE
MW-5	6/19/2018	1	0.00233	FALSE
TMW-1	6/19/2018	1	0.002	FALSE
TMW-2	6/19/2018	1	0.00385	FALSE
TMW-3	6/19/2018	1	0.002	FALSE

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Copper

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 83.1169%
Number of comparisons = 6
Future Samples (k) = 6
Recent Dates = 1
Background Measurements (n) = 21
Maximum Background Value = 0.028
Confidence Level = 77.8%
False Positive Rate = 22.2%

Location	Date	Count	Mean	Significant
MW-3	6/19/2018	1	0.005	FALSE
MW-4	6/19/2018	1	0.005	FALSE
MW-5	6/19/2018	1	0.005	FALSE
TMW-1	6/19/2018	1	0.00584	FALSE
TMW-2	6/19/2018	1	0.00867	FALSE
TMW-3	6/19/2018	1	0.005	FALSE

Non-Parametric Prediction Interval

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

Total Percent Non-Detects = 85.7143%
Number of comparisons = 6
Future Samples (k) = 6
Recent Dates = 1
Background Measurements (n) = 11
Maximum Background Value = 0.178
Confidence Level = 64.7%
False Positive Rate = 35.3%

Location	Date	Count	Mean	Significant
MW-3	**6/19/2018**	**1**	**0.248**	**TRUE**
MW-4	6/19/2018	1	0.1	FALSE
MW-5	6/19/2018	1	0.1	FALSE
TMW-1	6/19/2018	1	0.1	FALSE
TMW-2	6/19/2018	1	0.1	FALSE
TMW-3	6/19/2018	1	0.1	FALSE

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Lead

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 87.1795%
Number of comparisons = 6
Future Samples (k) = 6
Recent Dates = 1
Background Measurements (n) = 21
Maximum Background Value = 0.0094
Confidence Level = 77.8%
False Positive Rate = 22.2%

Location	Date	Count	Mean	Significant
MW-3	6/19/2018	1	0.002	FALSE
MW-4	6/19/2018	1	0.002	FALSE
MW-5	6/19/2018	1	0.002	FALSE
TMW-1	6/19/2018	1	0.00438	FALSE
TMW-2	6/19/2018	1	0.00839	FALSE
TMW-3	6/19/2018	1	0.002	FALSE

Non-Parametric Prediction Interval

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

Total Percent Non-Detects = 64.557%
Number of comparisons = 6
Future Samples (k) = 6
Recent Dates = 1
Background Measurements (n) = 21
Maximum Background Value = 0.2
Confidence Level = 77.8%
False Positive Rate = 22.2%

Location	Date	Count	Mean	Significant
MW-3	6/19/2018	1	0.00376	FALSE
MW-4	6/19/2018	1	0.002	FALSE
MW-5	6/19/2018	1	0.00772	FALSE
TMW-1	6/19/2018	1	0.00209	FALSE
TMW-2	6/19/2018	1	0.0073	FALSE
TMW-3	6/19/2018	1	0.002	FALSE

Non-Parametric Prediction Interval

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

Total Percent Non-Detects = 58.2278%
Number of comparisons = 6
Future Samples (k) = 6
Recent Dates = 1
Background Measurements (n) = 21
Maximum Background Value = 0.0281
Confidence Level = 77.8%
False Positive Rate = 22.2%

Location	Date	Count	Mean	Significant
MW-3	**6/19/2018**	**1**	**0.109**	**TRUE**
MW-4	6/19/2018	1	0.025	FALSE
MW-5	6/19/2018	1	0.025	FALSE
TMW-1	6/19/2018	1	0.025	FALSE
TMW-2	6/19/2018	1	0.0254	FALSE
TMW-3	6/19/2018	1	0.025	FALSE

Non-Parametric Prediction Interval

Inter-Well Comparison
Parameter: Sulfate
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 61.25%
Number of comparisons = 6
Future Samples (k) = 6
Recent Dates = 1
Background Measurements (n) = 20
Maximum Background Value = 18.8
Confidence Level = 76.9%
False Positive Rate = 23.1%

Location	Date	Count	Mean	Significant
MW-3	**6/19/2018**	**1**	**30.1**	**TRUE**
MW-4	6/19/2018	1	5	FALSE
MW-5	6/19/2018	1	5	FALSE
TMW-1	6/19/2018	1	5	FALSE
TMW-2	6/19/2018	1	5	FALSE
TMW-3	6/19/2018	1	5	FALSE

Parametric Prediction Interval Analysis

Inter-Well Comparison
Parameter: Chloride
Natural Logarithm Transformation
Non-Detects Replaced with 1/2 DL

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 22
Background Mean = 0.960341
Background Std Dev = 0.33777

Number of comparisons = 6
Future Samples (k) = 6
Actual confidence level is 1.0 - (0.05/6) = 99.1667 %
t is Percentile of Student's T-Test (0.95/6) = 0.991667
Degrees of Freedom = 22 (background observations) - 1
t(0.991667, 22) = 2.62222

Well MW-3

Date	Samples	Mean	Interval	Significant
6/19/2018	1	4.59512	[0, 1.86595]	TRUE

Well MW-4

Date	Samples	Mean	Interval	Significant
6/19/2018	1	1.9036	[0, 1.86595]	TRUE

Well MW-5

Date	Samples	Mean	Interval	Significant
6/19/2018	1	4.13035	[0, 1.86595]	TRUE

Well TMW-1

Date	Samples	Mean	Interval	Significant
6/19/2018	1	2.45959	[0, 1.86595]	TRUE

Well TMW-2

Date	Samples	Mean	Interval	Significant
6/19/2018	1	2.82138	[0, 1.86595]	TRUE

Well TMW-3

Date	Samples	Mean	Interval	Significant
6/19/2018	1	3.97406	[0, 1.86595]	TRUE

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 16.5

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	4/19/2008	0.084	28
	1/21/2009	0.028	18
	4/9/2009	0.028	19
	5/19/2009	0.033	20
	7/16/2010	0.021	13
	2/8/2011	0.021	14
	2/17/2012	0.022	16
	7/31/2012	0.019	9
	3/27/2013	0.018	6
	12/23/2013	0.017	4
	6/26/2014	0.018	7
	11/21/2014	0.02	10
	5/28/2015	0.0188	8
	11/11/2015	0.0237	17
	5/9/2016	0.02	11
	11/10/2016	0.0207	12
	6/8/2017	0.0146	1
	9/28/2017	0.0175	5
	12/11/2017	0.0166	3
	3/21/2018	0.0212	15
	6/19/2018	0.0163	2
MW-3	4/19/2008	0.056	26
	1/21/2009	0.039	21
	4/9/2009	0.043	22
	5/19/2009	0.047	23
	7/16/2010	0.055	25
	2/8/2011	0.052	24
	2/17/2012	0.097	31
	7/31/2012	0.091	29
	3/27/2013	0.094	30

12/23/2013	0.15	38
6/26/2014	0.079	27
11/21/2014	0.14	37
5/28/2015	0.152	39
11/11/2015	0.701	44
12/4/2015	0.579	43
2/19/2016	0.186	40
5/9/2016	0.218	42
11/10/2016	0.188	41
6/8/2017	0.134	35
9/28/2017	0.125	34
12/14/2017	0.119	33
3/22/2018	0.102	32
6/19/2018	0.135	36

The Wilcoxon Statistic is 476
The Expected value is is 241.5
The Standard Deviation is 42.5588
The Z Score is 5.49828
The Standard Deviation adjusted for ties is 42.5588
The Z Score adjusted for ties is 5.49828
5.49828 > 2.326 indicating statistical significance at 1% level
5.49828 > 2.326 indicating statistical significance at 1% level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

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

Total non detects is 35
Non detect rank is 18

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	4/19/2008	ND<0.001	18
	1/21/2009	ND<0.001	18
	4/9/2009	ND<0.001	18
	5/19/2009	ND<0.001	18
	7/16/2010	ND<0.001	18
	2/8/2011	ND<0.001	18
	2/17/2012	ND<0.001	18
	7/31/2012	ND<0.001	18
	12/23/2013	ND<0.001	18
	6/26/2014	ND<0.001	18
	11/21/2014	ND<0.001	18
	5/28/2015	ND<0.001	18
	11/11/2015	ND<0.001	18
	5/9/2016	ND<0.001	18
	11/10/2016	ND<0.001	18
	6/8/2017	ND<0.001	18
	9/28/2017	ND<0.001	18
	12/11/2017	ND<0.001	18
	3/21/2018	ND<0.001	18
	6/19/2018	ND<0.001	18
MW-3	1/21/2009	ND<0.001	18
	4/9/2009	ND<0.001	18
	5/19/2009	ND<0.001	18
	7/16/2010	ND<0.001	18
	2/8/2011	ND<0.001	18
	2/17/2012	ND<0.001	18
	7/31/2012	ND<0.001	18
	12/23/2013	ND<0.001	18
	6/26/2014	ND<0.001	18
	11/21/2014	ND<0.001	18

5/28/2015	ND<0.001	18
11/11/2015	ND<0.001	18
12/4/2015	ND<0.001	18
2/19/2016	ND<0.001	18
5/9/2016	ND<0.001	18
11/10/2016	0.00177	36
6/8/2017	0.0286	41
8/8/2017	0.0113	40
9/28/2017	0.00926	39
12/14/2017	0.00659	37
3/22/2018	0.00671	38
6/19/2018	0.0312	42

The Wilcoxon Statistic is 290
The Expected value is is 220
The Standard Deviation is 39.7073
The Z Score is 1.75031
The Standard Deviation adjusted for ties is 25.7773
The Z Score adjusted for ties is 2.69617
1.75031 < 2.326 indicating no statistical significance at 1% level
2.69617 > 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 14
Non detect rank is 7.5

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	4/19/2008	ND<0.1	7.5
	1/21/2009	ND<0.1	7.5
	4/9/2009	ND<0.1	7.5
	5/19/2009	ND<0.1	7.5
	5/9/2016	ND<0.1	7.5
	11/10/2016	ND<0.1	7.5
	6/8/2017	0.178	17
	9/28/2017	ND<0.1	7.5
	12/11/2017	ND<0.1	7.5
	3/21/2018	ND<0.1	7.5
	6/19/2018	ND<0.1	7.5
MW-3	1/21/2009	ND<0.1	7.5
	4/9/2009	ND<0.1	7.5
	5/19/2009	ND<0.1	7.5
	5/9/2016	0.105	15
	11/10/2016	ND<0.1	7.5
	6/8/2017	0.208	18
	9/28/2017	0.226	19
	12/14/2017	0.149	16
	3/22/2018	0.274	21
	6/19/2018	0.248	20

The Wilcoxon Statistic is 84
The Expected value is is 55
The Standard Deviation is 14.2009
The Z Score is 2.00691
The Standard Deviation adjusted for ties is 11.9199
The Z Score adjusted for ties is 2.39097
2.00691 < 2.326 indicating no statistical significance at 1% level

2.39097 > 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 37
Non detect rank is 19

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	4/19/2008	ND<0.011	19
	1/21/2009	ND<0.015	19
	4/9/2009	ND<0.011	19
	5/19/2009	ND<0.021	19
	7/16/2010	ND<0.011	19
	2/8/2011	ND<0.016	19
	2/17/2012	ND<0.01	19
	7/31/2012	ND<0.023	19
	3/27/2013	ND<0.012	19
	12/23/2013	ND<0.01	19
	6/26/2014	ND<0.01	19
	11/21/2014	ND<0.025	19
	5/28/2015	ND<0.025	19
	11/11/2015	ND<0.025	19
	5/9/2016	0.0281	38
	11/10/2016	ND<0.025	19
	6/8/2017	ND<0.025	19
	9/28/2017	ND<0.025	19
	12/11/2017	ND<0.025	19
	3/21/2018	ND<0.025	19
	6/19/2018	ND<0.025	19
MW-3	4/19/2008	ND<0.017	19
	1/21/2009	ND<0.015	19
	4/9/2009	ND<0.011	19
	5/19/2009	0.031	39
	7/16/2010	ND<0.015	19
	2/8/2011	ND<0.013	19
	2/17/2012	ND<0.014	19
	7/31/2012	ND<0.016	19
	3/27/2013	ND<0.01	19

12/23/2013	ND<0.01	19
6/26/2014	ND<0.023	19
11/21/2014	ND<0.025	19
5/28/2015	ND<0.025	19
11/11/2015	ND<0.025	19
12/4/2015	ND<0.025	19
2/19/2016	ND<0.025	19
5/9/2016	ND<0.025	19
11/10/2016	ND<0.025	19
6/8/2017	0.0769	42
9/28/2017	0.0439	40
12/14/2017	0.159	44
3/22/2018	0.0499	41
6/19/2018	0.109	43

The Wilcoxon Statistic is 296
The Expected value is is 241.5
The Standard Deviation is 42.5588
The Z Score is 1.26883
The Standard Deviation adjusted for ties is 27.1009
The Z Score adjusted for ties is 1.99256
1.26883 < 2.326 indicating no statistical significance at 1% level
1.99256 < 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 12
Non detect rank is 6.5

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	5/19/2009	8.9	19
	7/16/2010	9.4	22
	2/8/2011	5.8	16
	9/14/2011	6.6	18
	2/17/2012	ND<5	6.5
	7/31/2012	ND<5	6.5
	3/27/2013	5.1	14
	12/23/2013	6.1	17
	6/26/2014	ND<5	6.5
	11/21/2014	9.1	21
	5/28/2015	ND<5	6.5
	11/11/2015	18.8	28
	5/9/2016	ND<5	6.5
	8/18/2016	3.51	13
	11/10/2016	16.5	27
	6/8/2017	ND<5	6.5
	9/28/2017	ND<5	6.5
	12/11/2017	ND<5	6.5
	3/21/2018	ND<5	6.5
	6/19/2018	ND<5	6.5
MW-3	5/19/2009	ND<5	6.5
	7/16/2010	5.1	15
	2/8/2011	ND<5	6.5
	2/17/2012	22	29
	7/31/2012	23	33
	3/27/2013	16	26
	12/23/2013	12	25
	6/26/2014	9.7	23
	11/21/2014	11	24
	5/28/2015	9.09	20

11/11/2015	29.3	35
12/4/2015	29.1	34
2/19/2016	22.2	30
5/9/2016	22.3	31
8/18/2016	95.7	41
11/10/2016	34	37
6/8/2017	93.7	40
9/28/2017	46.2	38
12/14/2017	46.2	39
3/22/2018	22.3	32
6/19/2018	30.1	36

The Wilcoxon Statistic is 370
The Expected value is is 210
The Standard Deviation is 38.3406
The Z Score is 4.16008
The Standard Deviation adjusted for ties is 37.86
The Z Score adjusted for ties is 4.21289
4.16008 > 2.326 indicating statistical significance at 1% level
4.21289 > 2.326 indicating statistical significance at 1% level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

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

Total non detects is 0
Non detect rank is 6.5

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	4/19/2008	0.084	24
	1/21/2009	0.028	18
	4/9/2009	0.028	19
	5/19/2009	0.033	21
	7/16/2010	0.021	13
	2/8/2011	0.021	14
	2/17/2012	0.022	16
	7/31/2012	0.019	9
	3/27/2013	0.018	6
	12/23/2013	0.017	4
	6/26/2014	0.018	7
	11/21/2014	0.02	10
	5/28/2015	0.0188	8
	11/11/2015	0.0237	17
	5/9/2016	0.02	11
	11/10/2016	0.0207	12
	6/8/2017	0.0146	1
	9/28/2017	0.0175	5
	12/11/2017	0.0166	3
	3/21/2018	0.0212	15
	6/19/2018	0.0163	2
TMW-2	4/28/2016	0.0703	23
	9/28/2017	0.0282	20
	3/21/2018	0.038	22
	6/19/2018	0.096	25

The Wilcoxon Statistic is 80
The Expected value is is 42
The Standard Deviation is 13.4907

The Z Score is 2.77968
The Standard Deviation adjusted for ties is 13.4907
The Z Score adjusted for ties is 2.77968
2.77968 > 2.326 indicating statistical significance at 1% level
2.77968 > 2.326 indicating statistical significance at 1% level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

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

Total non detects is 14
Non detect rank is 7.5

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	4/19/2008	1.2	21
	1/21/2009	0.94	19
	4/9/2009	0.44	17
	5/19/2009	1	20
	7/16/2010	0.2	15
	2/8/2011	ND<0.12	7.5
	2/17/2012	0.57	18
	7/31/2012	0.24	16
	3/27/2013	ND<0.1	7.5
	12/23/2013	ND<0.1	7.5
	6/26/2014	ND<0.1	7.5
	11/21/2014	ND<0.1	7.5
	5/28/2015	ND<0.1	7.5
	11/11/2015	ND<0.2	7.5
	5/9/2016	ND<0.108	7.5
	11/10/2016	ND<0.1	7.5
	6/8/2017	ND<0.1	7.5
	9/28/2017	ND<0.1	7.5
	12/11/2017	ND<0.1	7.5
	3/21/2018	ND<0.1	7.5
	6/19/2018	ND<0.1	7.5
TMW-2	4/28/2016	1.39	23
	9/28/2017	1.87	24
	3/21/2018	1.28	22
	6/19/2018	11	25

The Wilcoxon Statistic is 84
The Expected value is is 42
The Standard Deviation is 13.4907

The Z Score is 3.07618
The Standard Deviation adjusted for ties is 12.2536
The Z Score adjusted for ties is 3.38677
3.07618 > 2.326 indicating statistical significance at 1% level
3.38677 > 2.326 indicating statistical significance at 1% level when adjusted for ties

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 17 - 10 = 7
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |7| is 0.473
0.473 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 5 - 1 = 4
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |4| is 0.334
0.334 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 4 - 2 = 2
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |2| is 0.75
0.75 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 8 - 2 = 6
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |6| is 0.234
0.234 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 3 - 0 = 3
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |3| is 0.542
0.542 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 3 - 0 = 3
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |3| is 0.542
0.542 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 4 - 0 = 4
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |4| is 0.484
0.484 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 186 - 67 = 119

Tied Group	Value	Members

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
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
12/14/2017	1
3/22/2018	1
6/19/2018	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0

F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1433.67
Z-Score = 3.11643
Comparison Level at 95% confidence level = 1.65463 (upward trend)
3.11643 > 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 = 10 - 68 = -58

Tied Group	Value	Members

Time Period	Observations
3/27/2013	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
12/11/2017	1
3/22/2018	1
6/19/2018	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 4836
b = 15444
c = 312
Group Variance = 268.667
Z-Score = -3.47751
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-3.47751 < -1.65463 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 = 20 - 8 = 12
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |12| is 0.178
0.178 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 3 - 3 = 0
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |0| is 1.25
1.25 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 4 - 2 = 2
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |2| is 0.75
0.75 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 6 - 4 = 2
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |2| is 0.816
0.816 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 117 - 9 = 108

Tied Group	Value	Members
1	0.001	15

Time Period	Observations
1/21/2009	1
4/9/2009	1
5/19/2009	1
7/16/2010	1
2/8/2011	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
12/14/2017	1
3/22/2018	1
6/19/2018	1

There are 0 time periods with multiple data

A = 7350
B = 0
C = 2730
D = 0
E = 210

F = 0
a = 22638
b = 83160
c = 924
Group Variance = 849.333
Z-Score = 3.67151
Comparison Level at 95% confidence level = 1.65463 (upward trend)
3.67151 > 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 = 220 - 53 = 167

Tied Group	Value	Members
1	25	3

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
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
12/14/2017	1
3/22/2018	1
6/19/2018	1

There are 0 time periods with multiple data

A = 66
B = 0
C = 6

D = 0
E = 6
F = 0
a = 29256
b = 109296
c = 1104
Group Variance = 1621.67
Z-Score = 4.12218
Comparison Level at 95% confidence level = 1.65463 (upward trend)
4.12218 > 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 = 30 - 61 = -31

Tied Group	Value	Members

Time Period	Observations
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
12/11/2017	1
3/22/2018	1
6/19/2018	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 6006
b = 19656
c = 364
Group Variance = 333.667
Z-Score = -1.64235
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-1.64235| <= 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 = 27 - 1 = 26
Comparing at 95% confidence level (upward trend)
Probability of obtaining S >= 26 is 0.00019
S > 0 and 0.00019 < 0.05 indicating an upward trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 20 - 1 = 19
Comparing at 95% confidence level (upward trend)
Probability of obtaining S >= 19 is 0.0014
S > 0 and 0.0014 < 0.05 indicating an upward trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 13 - 8 = 5
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |5| is 0.562
0.562 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 16 - 5 = 11
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |11| is 0.136
0.136 >= 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 = 12 - 16 = -4
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-4| is 0.72
0.72 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 3 - 2 = 1
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |1| is 1
1 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 3 - 0 = 3
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |3| is 0.542
0.542 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 3 - 0 = 3
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |3| is 0.542
0.542 >= 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 = 35 - 4 = 31
Comparing at 95% confidence level (upward trend)
Probability of obtaining S >= 31 is 0.0023
S > 0 and 0.0023 < 0.05 indicating an upward trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 3 - 0 = 3
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |3| is 0.542
0.542 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 3 - 2 = 1
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |1| is 1
1 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 17 - 161 = -144

Tied Group	Value	Members
1	0.02	12
2	0.01	3
3	0.002	4

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
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
12/14/2017	1
3/22/2018	1
6/19/2018	1

There are 0 time periods with multiple data

A = 4050
B = 0

C = 1350
D = 0
E = 150
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1208.67
Z-Score = -4.11323
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-4.11323 < -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 = 20 - 8 = 12
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |12| is 0.178
0.178 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 5 - 2 = 3
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |3| is 0.65
0.65 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 187 - 43 = 144

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
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
12/14/2017	1
3/22/2018	1
6/19/2018	1

There are 0 time periods with multiple data

A = 834
B = 0

C = 210
D = 0
E = 46
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1387.33
Z-Score = 3.83924
Comparison Level at 95% confidence level = 1.65463 (upward trend)
3.83924 > 1.65463 indicating an upward trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 3 - 2 = 1
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |1| is 1
1 >= 0.025 indicating no evidence of a trend

Mann-Kendall Trend Analysis

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

95% Confidence Level

S Statistic = 161 - 46 = 115

Tied Group	Value	Members
1	5	2
2	22.3	2
3	46.2	2

Time Period	Observations
5/19/2009	1
7/16/2010	1
2/8/2011	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
12/14/2017	1
3/22/2018	1
6/19/2018	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0

E = 6
F = 0
a = 19740
b = 71820
c = 840
Group Variance = 1093.67
Z-Score = 3.44717
Comparison Level at 95% confidence level = 1.65463 (upward trend)
3.44717 > 1.65463 indicating an upward trend

APPENDIX C
LABORATORY ANALYTICAL REPORTS & FIELD INFORMATION LOGS

ANALYTICAL REPORT

July 05, 2018

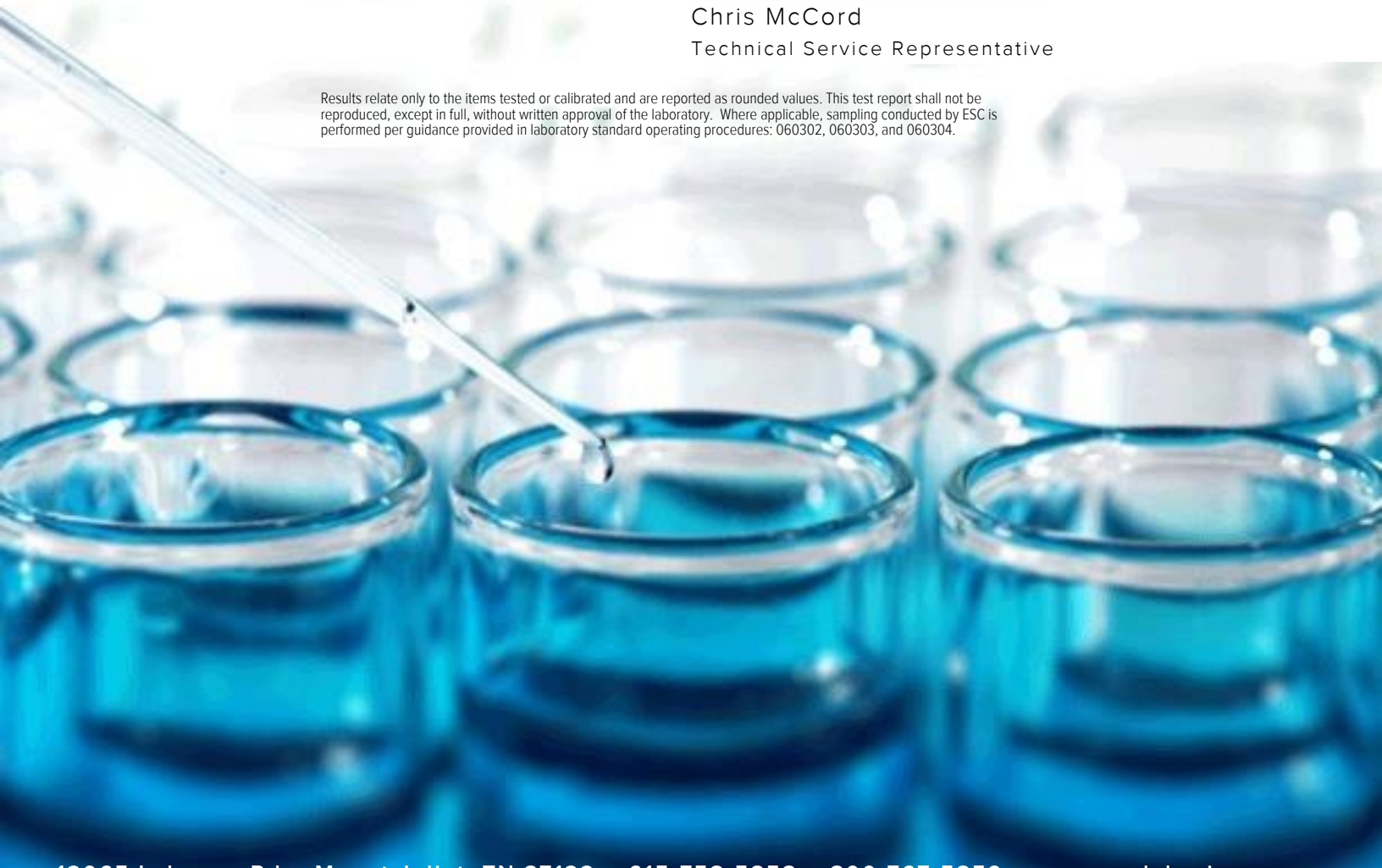
Civil & Environmental Consultants - TN

Sample Delivery Group:	L1003188
Samples Received:	06/20/2018
Project Number:	171-873
Description:	EWS Camden Class 2 Landfill
Site:	CAMDEN, TN
Report To:	Philip Campbell 325 Seaboard Lane, Suite 170 Franklin, TN 37067

Entire Report Reviewed By:

Chris McCord
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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MW-1 L1003188-01 GW

Collected by	Collected date/time	Received date/time
Philip Campbell	06/19/18 12:35	06/20/18 16:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1127266	1	06/21/18 15:25	06/21/18 15:25	KK
Wet Chemistry by Method 2320 B-2011	WG1129765	1	06/26/18 14:05	06/26/18 14:05	GB
Wet Chemistry by Method 350.1	WG1127820	1	06/25/18 16:37	06/25/18 16:37	JER
Wet Chemistry by Method 410.4	WG1127455	1	06/20/18 19:41	06/20/18 22:31	MZ
Wet Chemistry by Method 9056A	WG1127206	1	06/20/18 22:59	06/20/18 22:59	MAJ
Mercury by Method 7470A	WG1127641	1	06/21/18 11:04	06/22/18 09:39	ABL
Mercury by Method 7470A	WG1127826	1	06/21/18 22:29	06/22/18 11:48	ABL
Metals (ICP) by Method 6010B	WG1127249	1	06/21/18 09:57	06/21/18 15:27	TRB
Metals (ICP) by Method 6010B	WG1127928	1	06/22/18 08:37	06/23/18 14:36	WBD
Metals (ICPMS) by Method 6020	WG1127137	1	06/21/18 00:45	06/21/18 19:04	LD
Metals (ICPMS) by Method 6020	WG1127137	1	06/21/18 00:45	06/22/18 00:04	RDS
Metals (ICPMS) by Method 6020	WG1127540	1	06/22/18 08:18	06/23/18 14:02	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1128014	1	06/21/18 18:37	06/21/18 18:37	TJJ
EDB / DBCP by Method 8011	WG1127560	.998	06/21/18 12:59	06/22/18 01:51	JNS

MW-3 L1003188-02 GW

Collected by	Collected date/time	Received date/time
Philip Campbell	06/19/18 15:20	06/20/18 16:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1127266	1	06/21/18 15:26	06/21/18 15:26	KK
Wet Chemistry by Method 2320 B-2011	WG1129765	1	06/26/18 14:11	06/26/18 14:11	GB
Wet Chemistry by Method 350.1	WG1127820	1	06/25/18 16:38	06/25/18 16:38	JER
Wet Chemistry by Method 410.4	WG1127455	1	06/20/18 19:41	06/20/18 22:31	MZ
Wet Chemistry by Method 9056A	WG1127206	1	06/20/18 23:15	06/20/18 23:15	MAJ
Mercury by Method 7470A	WG1127641	1	06/21/18 11:04	06/22/18 09:47	ABL
Mercury by Method 7470A	WG1127826	1	06/21/18 22:29	06/22/18 11:41	ABL
Metals (ICP) by Method 6010B	WG1127249	1	06/21/18 09:57	06/21/18 15:29	TRB
Metals (ICP) by Method 6010B	WG1127928	1	06/22/18 08:37	06/23/18 14:39	WBD
Metals (ICPMS) by Method 6020	WG1127137	1	06/21/18 00:45	06/21/18 20:13	LD
Metals (ICPMS) by Method 6020	WG1127137	1	06/21/18 00:45	06/22/18 16:54	LAT
Metals (ICPMS) by Method 6020	WG1127540	1	06/22/18 08:18	06/23/18 14:07	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1128014	1	06/21/18 18:57	06/21/18 18:57	TJJ
EDB / DBCP by Method 8011	WG1127562	1	06/21/18 13:00	06/22/18 03:41	JNS

MW-4 L1003188-03 GW

Collected by	Collected date/time	Received date/time
Philip Campbell	06/19/18 13:55	06/20/18 16:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1127772	1	06/21/18 15:54	06/21/18 15:54	KK
Wet Chemistry by Method 2320 B-2011	WG1129765	1	06/26/18 14:18	06/26/18 14:18	GB
Wet Chemistry by Method 350.1	WG1127820	1	06/25/18 16:40	06/25/18 16:40	JER
Wet Chemistry by Method 410.4	WG1127455	1	06/20/18 19:41	06/20/18 22:31	MZ
Wet Chemistry by Method 9056A	WG1127206	1	06/21/18 00:16	06/21/18 00:16	MAJ
Mercury by Method 7470A	WG1127641	1	06/21/18 11:04	06/22/18 09:54	ABL
Mercury by Method 7470A	WG1127826	1	06/21/18 22:29	06/22/18 11:50	ABL
Metals (ICP) by Method 6010B	WG1127249	1	06/21/18 09:57	06/21/18 15:32	TRB
Metals (ICP) by Method 6010B	WG1127928	1	06/22/18 08:37	06/23/18 14:46	WBD
Metals (ICPMS) by Method 6020	WG1127137	1	06/21/18 00:45	06/21/18 20:18	LD
Metals (ICPMS) by Method 6020	WG1127137	1	06/21/18 00:45	06/22/18 16:58	LAT
Metals (ICPMS) by Method 6020	WG1127540	1	06/22/18 08:18	06/23/18 14:11	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1128014	1	06/21/18 19:17	06/21/18 19:17	TJJ
EDB / DBCP by Method 8011	WG1127562	1.01	06/21/18 13:00	06/22/18 03:53	JNS

MW-5 L1003188-04 GW

Collected by	Collected date/time	Received date/time
Philip Campbell	06/19/18 12:50	06/20/18 16:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1127772	1	06/21/18 15:54	06/21/18 15:54	KK
Wet Chemistry by Method 2320 B-2011	WG1129765	1	06/26/18 14:26	06/26/18 14:26	GB
Wet Chemistry by Method 350.1	WG1127820	1	06/25/18 16:42	06/25/18 16:42	JER
Wet Chemistry by Method 410.4	WG1127455	1	06/20/18 19:41	06/20/18 22:32	MZ
Wet Chemistry by Method 9056A	WG1127206	1	06/21/18 00:32	06/21/18 00:32	MAJ
Mercury by Method 7470A	WG1127641	1	06/21/18 11:04	06/22/18 09:56	ABL
Mercury by Method 7470A	WG1127826	1	06/21/18 22:29	06/22/18 11:52	ABL
Metals (ICP) by Method 6010B	WG1127249	1	06/21/18 09:57	06/21/18 15:35	TRB
Metals (ICP) by Method 6010B	WG1127928	1	06/22/18 08:37	06/23/18 14:49	WBD
Metals (ICPMS) by Method 6020	WG1127137	1	06/21/18 00:45	06/21/18 20:23	LD
Metals (ICPMS) by Method 6020	WG1127137	1	06/21/18 00:45	06/22/18 17:02	LAT
Metals (ICPMS) by Method 6020	WG1127540	1	06/22/18 08:18	06/23/18 14:16	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1128014	1	06/21/18 19:37	06/21/18 19:37	TJJ
EDB / DBCP by Method 8011	WG1127562	.998	06/21/18 13:00	06/22/18 04:06	JNS

TMW-1 L1003188-05 GW

Collected by	Collected date/time	Received date/time
Philip Campbell	06/19/18 12:30	06/20/18 16:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1127772	1	06/21/18 15:55	06/21/18 15:55	KK
Wet Chemistry by Method 2320 B-2011	WG1129765	1	06/26/18 14:32	06/26/18 14:32	GB
Wet Chemistry by Method 350.1	WG1127820	1	06/25/18 16:43	06/25/18 16:43	JER
Wet Chemistry by Method 410.4	WG1127455	1	06/20/18 19:41	06/20/18 22:32	MZ
Wet Chemistry by Method 9056A	WG1127206	1	06/21/18 00:47	06/21/18 00:47	MAJ
Mercury by Method 7470A	WG1127641	1	06/21/18 11:04	06/22/18 09:58	ABL
Mercury by Method 7470A	WG1127826	1	06/21/18 22:29	06/22/18 11:54	ABL
Metals (ICP) by Method 6010B	WG1127249	1	06/21/18 09:57	06/21/18 15:45	TRB
Metals (ICP) by Method 6010B	WG1127928	1	06/22/18 08:37	06/23/18 14:52	WBD
Metals (ICPMS) by Method 6020	WG1127137	1	06/21/18 00:45	06/21/18 20:38	LD
Metals (ICPMS) by Method 6020	WG1127137	1	06/21/18 00:45	06/22/18 17:06	LAT
Metals (ICPMS) by Method 6020	WG1127540	1	06/22/18 08:18	06/23/18 14:21	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1128014	1	06/21/18 19:57	06/21/18 19:57	TJJ
EDB / DBCP by Method 8011	WG1127562	.998	06/21/18 13:00	06/22/18 04:18	JNS

TMW-2 L1003188-06 GW

Collected by	Collected date/time	Received date/time
Philip Campbell	06/19/18 14:15	06/20/18 16:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1127772	1	06/21/18 15:56	06/21/18 15:56	KK
Wet Chemistry by Method 2320 B-2011	WG1129765	1	06/26/18 14:39	06/26/18 14:39	GB
Wet Chemistry by Method 350.1	WG1127820	1	06/25/18 16:45	06/25/18 16:45	JER
Wet Chemistry by Method 410.4	WG1127455	1	06/20/18 19:41	06/20/18 22:32	MZ
Wet Chemistry by Method 9056A	WG1127206	1	06/21/18 01:03	06/21/18 01:03	MAJ
Mercury by Method 7470A	WG1127641	1	06/21/18 11:04	06/22/18 10:00	ABL
Mercury by Method 7470A	WG1127826	1	06/21/18 22:29	06/22/18 11:56	ABL
Metals (ICP) by Method 6010B	WG1127249	1	06/21/18 09:57	06/21/18 15:48	TRB
Metals (ICP) by Method 6010B	WG1127928	1	06/22/18 08:37	06/23/18 14:54	WBD
Metals (ICPMS) by Method 6020	WG1127137	1	06/21/18 00:45	06/21/18 20:43	LD
Metals (ICPMS) by Method 6020	WG1127137	1	06/21/18 00:45	06/22/18 17:10	LAT
Metals (ICPMS) by Method 6020	WG1127540	1	06/22/18 08:18	06/23/18 14:25	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1128014	1	06/21/18 20:17	06/21/18 20:17	TJJ
EDB / DBCP by Method 8011	WG1127562	.998	06/21/18 13:00	06/22/18 04:30	JNS

TMW-3 L1003188-07 GW

Collected by: Philip Campbell | Collected date/time: 06/19/18 16:50 | Received date/time: 06/20/18 16:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1127772	1	06/21/18 16:18	06/21/18 16:18	KK
Wet Chemistry by Method 2320 B-2011	WG1129765	1	06/26/18 16:04	06/26/18 16:04	GB
Wet Chemistry by Method 350.1	WG1127820	1	06/25/18 16:46	06/25/18 16:46	JER
Wet Chemistry by Method 410.4	WG1127455	1	06/20/18 19:41	06/20/18 22:33	MZ
Wet Chemistry by Method 9056A	WG1127206	1	06/21/18 01:18	06/21/18 01:18	MAJ
Mercury by Method 7470A	WG1127641	1	06/21/18 11:04	06/22/18 10:02	ABL
Mercury by Method 7470A	WG1127826	1	06/21/18 22:29	06/22/18 12:05	ABL
Metals (ICP) by Method 6010B	WG1127249	1	06/21/18 09:57	06/21/18 15:51	TRB
Metals (ICP) by Method 6010B	WG1127928	1	06/22/18 08:37	06/23/18 14:57	WBD
Metals (ICPMS) by Method 6020	WG1127137	1	06/21/18 00:45	06/21/18 20:47	LD
Metals (ICPMS) by Method 6020	WG1127137	1	06/21/18 00:45	06/22/18 17:14	LAT
Metals (ICPMS) by Method 6020	WG1127540	1	06/22/18 08:18	06/23/18 14:30	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1128014	1	06/21/18 20:37	06/21/18 20:37	TJJ
EDB / DBCP by Method 8011	WG1127562	1	06/21/18 13:00	06/22/18 04:42	JNS

DUPLICATE L1003188-08 GW

Collected by: Philip Campbell | Collected date/time: 06/19/18 00:00 | Received date/time: 06/20/18 16:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1127772	1	06/21/18 16:19	06/21/18 16:19	KK
Wet Chemistry by Method 2320 B-2011	WG1129765	1	06/26/18 16:11	06/26/18 16:11	GB
Wet Chemistry by Method 350.1	WG1127820	1	06/25/18 16:48	06/25/18 16:48	JER
Wet Chemistry by Method 410.4	WG1127455	1	06/20/18 19:41	06/20/18 22:33	MZ
Wet Chemistry by Method 9056A	WG1130696	1	06/27/18 17:23	06/27/18 17:23	DR
Wet Chemistry by Method 9056A	WG1131469	1	06/29/18 02:06	06/29/18 02:06	MAJ
Wet Chemistry by Method 9056A	WG1131834	1	06/29/18 18:31	06/29/18 18:31	MCG
Mercury by Method 7470A	WG1127641	1	06/21/18 11:04	06/22/18 10:04	ABL
Mercury by Method 7470A	WG1127826	1	06/21/18 22:29	06/22/18 12:07	ABL
Metals (ICP) by Method 6010B	WG1127249	1	06/21/18 09:57	06/21/18 15:53	TRB
Metals (ICP) by Method 6010B	WG1127928	1	06/22/18 08:37	06/23/18 15:00	WBD
Metals (ICPMS) by Method 6020	WG1127137	1	06/21/18 00:45	06/21/18 20:52	LD
Metals (ICPMS) by Method 6020	WG1127137	1	06/21/18 00:45	06/22/18 17:26	LAT
Metals (ICPMS) by Method 6020	WG1127540	1	06/22/18 08:18	06/23/18 14:50	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1128014	1	06/21/18 20:56	06/21/18 20:56	TJJ
EDB / DBCP by Method 8011	WG1127562	1.01	06/21/18 13:00	06/22/18 03:29	JNS

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Collected by: Philip Campbell | Collected date/time: 06/19/18 16:10 | Received date/time: 06/20/18 16:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1127772	1	06/21/18 16:20	06/21/18 16:20	KK
Wet Chemistry by Method 2320 B-2011	WG1129765	1	06/26/18 16:19	06/26/18 16:19	GB
Wet Chemistry by Method 350.1	WG1127820	1	06/25/18 16:50	06/25/18 16:50	JER
Wet Chemistry by Method 410.4	WG1127455	1	06/20/18 19:41	06/20/18 22:34	MZ
Wet Chemistry by Method 9056A	WG1130696	1	06/27/18 17:37	06/27/18 17:37	DR
Wet Chemistry by Method 9056A	WG1131469	1	06/29/18 02:20	06/29/18 02:20	DR
Mercury by Method 7470A	WG1127641	1	06/21/18 11:04	06/22/18 10:06	ABL
Mercury by Method 7470A	WG1127826	1	06/21/18 22:29	06/22/18 12:09	ABL
Metals (ICP) by Method 6010B	WG1127249	1	06/21/18 09:57	06/21/18 15:56	TRB
Metals (ICP) by Method 6010B	WG1127928	1	06/22/18 08:37	06/23/18 15:02	WBD
Metals (ICPMS) by Method 6020	WG1127137	1	06/21/18 00:45	06/21/18 20:56	LD
Metals (ICPMS) by Method 6020	WG1127137	1	06/21/18 00:45	06/22/18 17:30	LAT
Metals (ICPMS) by Method 6020	WG1127540	1	06/22/18 08:18	06/23/18 14:54	JPD

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Collected by	Collected date/time	Received date/time
Philip Campbell	06/19/18 16:10	06/20/18 16:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICPMS) by Method 6020	WG1130986	1	07/02/18 16:46	07/03/18 12:12	LAT
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1128014	1	06/21/18 17:37	06/21/18 17:37	TJJ
EDB / DBCP by Method 8011	WG1127562	1.01	06/21/18 13:00	06/22/18 03:04	JNS

TRIP BLANK L1003188-10 GW

Collected by	Collected date/time	Received date/time
Philip Campbell	06/19/18 00:00	06/20/18 16:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1128014	1	06/21/18 17:57	06/21/18 17:57	TJJ

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All 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.

Chris McCord
Technical Service Representative

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	ND		30.0	1	06/21/2018 15:25	WG1127266

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	24.1		20.0	1	06/26/2018 14:05	WG1129765

Sample Narrative:
L1003188-01 WG1129765: 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	06/25/2018 16:37	WG1127820

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
COD	ND		10.0	1	06/20/2018 22:31	WG1127455

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	06/20/2018 22:59	WG1127206
Chloride	2.24		1.00	1	06/20/2018 22:59	WG1127206
Fluoride	ND		0.100	1	06/20/2018 22:59	WG1127206
Nitrate	ND		0.100	1	06/20/2018 22:59	WG1127206
Sulfate	ND		5.00	1	06/20/2018 22:59	WG1127206

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	0.00319		0.000200	1	06/22/2018 09:39	WG1127641
Mercury,Dissolved	0.000223		0.000200	1	06/22/2018 11:48	WG1127826

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	06/23/2018 14:36	WG1127928
Boron,Dissolved	ND		0.200	1	06/21/2018 15:27	WG1127249

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	06/23/2018 14:02	WG1127540
Aluminum,Dissolved	ND		0.100	1	06/22/2018 00:04	WG1127137
Antimony	ND		0.00200	1	06/23/2018 14:02	WG1127540
Antimony,Dissolved	ND		0.00200	1	06/21/2018 19:04	WG1127137
Arsenic	0.00630		0.00200	1	06/23/2018 14:02	WG1127540
Arsenic,Dissolved	0.00784		0.00200	1	06/21/2018 19:04	WG1127137
Barium	0.0163		0.00500	1	06/23/2018 14:02	WG1127540
Barium,Dissolved	0.0175		0.00500	1	06/21/2018 19:04	WG1127137

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Beryllium	ND		0.00200	1	06/23/2018 14:02	WG1127540
Beryllium,Dissolved	ND		0.00200	1	06/21/2018 19:04	WG1127137
Cadmium	ND		0.00100	1	06/23/2018 14:02	WG1127540
Cadmium,Dissolved	ND		0.00100	1	06/21/2018 19:04	WG1127137
Calcium	3.31		1.00	1	06/23/2018 14:02	WG1127540
Calcium,Dissolved	3.47		1.00	1	06/22/2018 00:04	WG1127137
Chromium	ND		0.00200	1	06/23/2018 14:02	WG1127540
Chromium,Dissolved	ND		0.00200	1	06/21/2018 19:04	WG1127137
Cobalt	0.0206		0.00200	1	06/23/2018 14:02	WG1127540
Cobalt,Dissolved	0.0222		0.00200	1	06/21/2018 19:04	WG1127137
Copper	ND		0.00500	1	06/23/2018 14:02	WG1127540
Copper,Dissolved	ND		0.00500	1	06/21/2018 19:04	WG1127137
Iron	6.39		0.100	1	06/23/2018 14:02	WG1127540
Iron,Dissolved	6.47		0.100	1	06/21/2018 19:04	WG1127137
Lead	ND		0.00200	1	06/23/2018 14:02	WG1127540
Lead,Dissolved	ND		0.00200	1	06/21/2018 19:04	WG1127137
Magnesium	2.06		1.00	1	06/23/2018 14:02	WG1127540
Magnesium,Dissolved	2.12		1.00	1	06/22/2018 00:04	WG1127137
Manganese	0.431		0.00500	1	06/23/2018 14:02	WG1127540
Manganese,Dissolved	0.440		0.00500	1	06/21/2018 19:04	WG1127137
Nickel	0.00637		0.00200	1	06/23/2018 14:02	WG1127540
Nickel,Dissolved	0.00635		0.00200	1	06/21/2018 19:04	WG1127137
Potassium	1.13		1.00	1	06/23/2018 14:02	WG1127540
Potassium,Dissolved	1.11		1.00	1	06/22/2018 00:04	WG1127137
Selenium	ND		0.00200	1	06/23/2018 14:02	WG1127540
Selenium,Dissolved	ND		0.00200	1	06/21/2018 19:04	WG1127137
Silver	ND		0.00200	1	06/23/2018 14:02	WG1127540
Silver,Dissolved	ND		0.00200	1	06/21/2018 19:04	WG1127137
Sodium	2.88		1.00	1	06/23/2018 14:02	WG1127540
Sodium,Dissolved	3.04	B	1.00	1	06/22/2018 00:04	WG1127137
Thallium	ND		0.00200	1	06/23/2018 14:02	WG1127540
Thallium,Dissolved	ND		0.00200	1	06/21/2018 19:04	WG1127137
Vanadium	ND		0.00500	1	06/23/2018 14:02	WG1127540
Vanadium,Dissolved	ND		0.00500	1	06/21/2018 19:04	WG1127137
Zinc	ND		0.0250	1	06/23/2018 14:02	WG1127540
Zinc,Dissolved	ND		0.0250	1	06/21/2018 19:04	WG1127137

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	06/21/2018 18:37	WG1128014
Acrylonitrile	ND		0.0100	1	06/21/2018 18:37	WG1128014
Benzene	ND		0.00100	1	06/21/2018 18:37	WG1128014
Bromochloromethane	ND		0.00100	1	06/21/2018 18:37	WG1128014
Bromodichloromethane	ND		0.00100	1	06/21/2018 18:37	WG1128014
Bromoform	ND		0.00100	1	06/21/2018 18:37	WG1128014
Bromomethane	ND		0.00500	1	06/21/2018 18:37	WG1128014
Carbon disulfide	ND		0.00100	1	06/21/2018 18:37	WG1128014
Carbon tetrachloride	ND		0.00100	1	06/21/2018 18:37	WG1128014
Chlorobenzene	ND		0.00100	1	06/21/2018 18:37	WG1128014
Chlorodibromomethane	ND		0.00100	1	06/21/2018 18:37	WG1128014
Chloroethane	ND		0.00500	1	06/21/2018 18:37	WG1128014
Chloroform	ND		0.00500	1	06/21/2018 18:37	WG1128014
Chloromethane	ND		0.00250	1	06/21/2018 18:37	WG1128014
Dibromomethane	ND		0.00100	1	06/21/2018 18:37	WG1128014
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	06/21/2018 18:37	WG1128014

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,2-Dibromoethane	ND		0.00100	1	06/21/2018 18:37	WG1128014
1,2-Dichlorobenzene	ND		0.00100	1	06/21/2018 18:37	WG1128014
1,4-Dichlorobenzene	ND		0.00100	1	06/21/2018 18:37	WG1128014
trans-1,4-Dichloro-2-butene	ND		0.00250	1	06/21/2018 18:37	WG1128014
1,1-Dichloroethane	ND		0.00100	1	06/21/2018 18:37	WG1128014
1,2-Dichloroethane	ND		0.00100	1	06/21/2018 18:37	WG1128014
1,1-Dichloroethene	ND		0.00100	1	06/21/2018 18:37	WG1128014
cis-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 18:37	WG1128014
trans-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 18:37	WG1128014
1,2-Dichloropropane	ND		0.00100	1	06/21/2018 18:37	WG1128014
cis-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 18:37	WG1128014
trans-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 18:37	WG1128014
Ethylbenzene	ND		0.00100	1	06/21/2018 18:37	WG1128014
2-Hexanone	ND		0.0100	1	06/21/2018 18:37	WG1128014
Iodomethane	ND		0.0100	1	06/21/2018 18:37	WG1128014
2-Butanone (MEK)	ND		0.0100	1	06/21/2018 18:37	WG1128014
Methylene Chloride	ND		0.00500	1	06/21/2018 18:37	WG1128014
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	06/21/2018 18:37	WG1128014
Styrene	ND		0.00100	1	06/21/2018 18:37	WG1128014
1,1,1,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 18:37	WG1128014
1,1,2,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 18:37	WG1128014
Tetrachloroethene	ND		0.00100	1	06/21/2018 18:37	WG1128014
Toluene	ND		0.00100	1	06/21/2018 18:37	WG1128014
1,1,1-Trichloroethane	ND		0.00100	1	06/21/2018 18:37	WG1128014
1,1,2-Trichloroethane	ND		0.00100	1	06/21/2018 18:37	WG1128014
Trichloroethene	ND		0.00100	1	06/21/2018 18:37	WG1128014
Trichlorofluoromethane	ND		0.00500	1	06/21/2018 18:37	WG1128014
1,2,3-Trichloropropane	ND		0.00250	1	06/21/2018 18:37	WG1128014
Vinyl acetate	ND	J4	0.0100	1	06/21/2018 18:37	WG1128014
Vinyl chloride	ND		0.00100	1	06/21/2018 18:37	WG1128014
Xylenes, Total	ND		0.00300	1	06/21/2018 18:37	WG1128014
(S) Toluene-d8	*101*		*80.0-120*		*06/21/2018 18:37*	WG1128014
(S) Dibromofluoromethane	*97.1*		*76.0-123*		*06/21/2018 18:37*	WG1128014
(S) a,a,a-Trifluorotoluene	*104*		*80.0-120*		*06/21/2018 18:37*	WG1128014
(S) 4-Bromofluorobenzene	*105*		*80.0-120*		*06/21/2018 18:37*	WG1128014

EDB / DBCP by Method 8011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ethylene Dibromide	ND		0.0000100	.998	06/22/2018 01:51	WG1127560
1,2-Dibromo-3-Chloropropane	ND		0.0000200	.998	06/22/2018 01:51	WG1127560

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	110		30.0	1	06/21/2018 15:26	WG1127266

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	06/26/2018 14:11	WG1129765

Sample Narrative:
L1003188-02 WG1129765: 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	0.142		0.100	1	06/25/2018 16:38	WG1127820

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
COD	ND		10.0	1	06/20/2018 22:31	WG1127455

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	06/20/2018 23:15	WG1127206
Chloride	99.0		1.00	1	06/20/2018 23:15	WG1127206
Fluoride	0.248		0.100	1	06/20/2018 23:15	WG1127206
Nitrate	1.06		0.100	1	06/20/2018 23:15	WG1127206
Sulfate	30.1		5.00	1	06/20/2018 23:15	WG1127206

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/22/2018 09:47	WG1127641
Mercury,Dissolved	ND		0.000200	1	06/22/2018 11:41	WG1127826

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	06/23/2018 14:39	WG1127928
Boron,Dissolved	ND		0.200	1	06/21/2018 15:29	WG1127249

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	06/23/2018 14:07	WG1127540
Aluminum,Dissolved	ND		0.100	1	06/22/2018 16:54	WG1127137
Antimony	ND		0.00200	1	06/23/2018 14:07	WG1127540
Antimony,Dissolved	ND		0.00200	1	06/21/2018 20:13	WG1127137
Arsenic	ND		0.00200	1	06/23/2018 14:07	WG1127540
Arsenic,Dissolved	ND		0.00200	1	06/21/2018 20:13	WG1127137
Barium	0.135		0.00500	1	06/23/2018 14:07	WG1127540
Barium,Dissolved	0.136		0.00500	1	06/21/2018 20:13	WG1127137

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Beryllium	ND		0.00200	1	06/23/2018 14:07	WG1127540
Beryllium,Dissolved	ND		0.00200	1	06/21/2018 20:13	WG1127137
Cadmium	0.0312		0.00100	1	06/23/2018 14:07	WG1127540
Cadmium,Dissolved	0.0292		0.00100	1	06/21/2018 20:13	WG1127137
Calcium	22.7		1.00	1	06/23/2018 14:07	WG1127540
Calcium,Dissolved	24.0		1.00	1	06/22/2018 16:54	WG1127137
Chromium	ND		0.00200	1	06/23/2018 14:07	WG1127540
Chromium,Dissolved	0.00235	B	0.00200	1	06/21/2018 20:13	WG1127137
Cobalt	ND		0.00200	1	06/23/2018 14:07	WG1127540
Cobalt,Dissolved	ND		0.00200	1	06/21/2018 20:13	WG1127137
Copper	ND		0.00500	1	06/23/2018 14:07	WG1127540
Copper,Dissolved	ND		0.00500	1	06/21/2018 20:13	WG1127137
Iron	ND		0.100	1	06/23/2018 14:07	WG1127540
Iron,Dissolved	ND		0.100	1	06/21/2018 20:13	WG1127137
Lead	ND		0.00200	1	06/23/2018 14:07	WG1127540
Lead,Dissolved	ND		0.00200	1	06/21/2018 20:13	WG1127137
Magnesium	9.92		1.00	1	06/23/2018 14:07	WG1127540
Magnesium,Dissolved	10.3		1.00	1	06/22/2018 16:54	WG1127137
Manganese	0.401		0.00500	1	06/23/2018 14:07	WG1127540
Manganese,Dissolved	0.366		0.00500	1	06/21/2018 20:13	WG1127137
Nickel	0.00376		0.00200	1	06/23/2018 14:07	WG1127540
Nickel,Dissolved	0.00404		0.00200	1	06/21/2018 20:13	WG1127137
Potassium	18.3		1.00	1	06/23/2018 14:07	WG1127540
Potassium,Dissolved	19.2		1.00	1	06/22/2018 16:54	WG1127137
Selenium	ND		0.00200	1	06/23/2018 14:07	WG1127540
Selenium,Dissolved	ND		0.00200	1	06/21/2018 20:13	WG1127137
Silver	ND		0.00200	1	06/23/2018 14:07	WG1127540
Silver,Dissolved	ND		0.00200	1	06/21/2018 20:13	WG1127137
Sodium	35.3		1.00	1	06/23/2018 14:07	WG1127540
Sodium,Dissolved	34.9		1.00	1	06/22/2018 16:54	WG1127137
Thallium	ND		0.00200	1	06/23/2018 14:07	WG1127540
Thallium,Dissolved	ND		0.00200	1	06/21/2018 20:13	WG1127137
Vanadium	ND		0.00500	1	06/23/2018 14:07	WG1127540
Vanadium,Dissolved	ND		0.00500	1	06/21/2018 20:13	WG1127137
Zinc	0.109		0.0250	1	06/23/2018 14:07	WG1127540
Zinc,Dissolved	0.107		0.0250	1	06/21/2018 20:13	WG1127137

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	06/21/2018 18:57	WG1128014
Acrylonitrile	ND		0.0100	1	06/21/2018 18:57	WG1128014
Benzene	ND		0.00100	1	06/21/2018 18:57	WG1128014
Bromochloromethane	ND		0.00100	1	06/21/2018 18:57	WG1128014
Bromodichloromethane	ND		0.00100	1	06/21/2018 18:57	WG1128014
Bromoform	ND		0.00100	1	06/21/2018 18:57	WG1128014
Bromomethane	ND		0.00500	1	06/21/2018 18:57	WG1128014
Carbon disulfide	ND		0.00100	1	06/21/2018 18:57	WG1128014
Carbon tetrachloride	ND		0.00100	1	06/21/2018 18:57	WG1128014
Chlorobenzene	ND		0.00100	1	06/21/2018 18:57	WG1128014
Chlorodibromomethane	ND		0.00100	1	06/21/2018 18:57	WG1128014
Chloroethane	ND		0.00500	1	06/21/2018 18:57	WG1128014
Chloroform	ND		0.00500	1	06/21/2018 18:57	WG1128014
Chloromethane	ND		0.00250	1	06/21/2018 18:57	WG1128014
Dibromomethane	ND		0.00100	1	06/21/2018 18:57	WG1128014
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	06/21/2018 18:57	WG1128014

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,2-Dibromoethane	ND		0.00100	1	06/21/2018 18:57	WG1128014
1,2-Dichlorobenzene	ND		0.00100	1	06/21/2018 18:57	WG1128014
1,4-Dichlorobenzene	ND		0.00100	1	06/21/2018 18:57	WG1128014
trans-1,4-Dichloro-2-butene	ND		0.00250	1	06/21/2018 18:57	WG1128014
1,1-Dichloroethane	ND		0.00100	1	06/21/2018 18:57	WG1128014
1,2-Dichloroethane	ND		0.00100	1	06/21/2018 18:57	WG1128014
1,1-Dichloroethene	ND		0.00100	1	06/21/2018 18:57	WG1128014
cis-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 18:57	WG1128014
trans-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 18:57	WG1128014
1,2-Dichloropropane	ND		0.00100	1	06/21/2018 18:57	WG1128014
cis-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 18:57	WG1128014
trans-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 18:57	WG1128014
Ethylbenzene	ND		0.00100	1	06/21/2018 18:57	WG1128014
2-Hexanone	ND		0.0100	1	06/21/2018 18:57	WG1128014
Iodomethane	ND		0.0100	1	06/21/2018 18:57	WG1128014
2-Butanone (MEK)	ND		0.0100	1	06/21/2018 18:57	WG1128014
Methylene Chloride	ND		0.00500	1	06/21/2018 18:57	WG1128014
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	06/21/2018 18:57	WG1128014
Styrene	ND		0.00100	1	06/21/2018 18:57	WG1128014
1,1,1,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 18:57	WG1128014
1,1,2,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 18:57	WG1128014
Tetrachloroethene	ND		0.00100	1	06/21/2018 18:57	WG1128014
Toluene	ND		0.00100	1	06/21/2018 18:57	WG1128014
1,1,1-Trichloroethane	ND		0.00100	1	06/21/2018 18:57	WG1128014
1,1,2-Trichloroethane	ND		0.00100	1	06/21/2018 18:57	WG1128014
Trichloroethene	ND		0.00100	1	06/21/2018 18:57	WG1128014
Trichlorofluoromethane	ND		0.00500	1	06/21/2018 18:57	WG1128014
1,2,3-Trichloropropane	ND		0.00250	1	06/21/2018 18:57	WG1128014
Vinyl acetate	ND	J4	0.0100	1	06/21/2018 18:57	WG1128014
Vinyl chloride	ND		0.00100	1	06/21/2018 18:57	WG1128014
Xylenes, Total	ND		0.00300	1	06/21/2018 18:57	WG1128014
(S) Toluene-d8	*103*		*80.0-120*		*06/21/2018 18:57*	WG1128014
(S) Dibromofluoromethane	*98.7*		*76.0-123*		*06/21/2018 18:57*	WG1128014
(S) a,a,a-Trifluorotoluene	*104*		*80.0-120*		*06/21/2018 18:57*	WG1128014
(S) 4-Bromofluorobenzene	*104*		*80.0-120*		*06/21/2018 18:57*	WG1128014

EDB / DBCP by Method 8011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ethylene Dibromide	ND		0.0000100	1	06/22/2018 03:41	WG1127562
1,2-Dibromo-3-Chloropropane	ND		0.0000200	1	06/22/2018 03:41	WG1127562

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	ND		30.0	1	06/21/2018 15:54	WG1127772

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	06/26/2018 14:18	WG1129765

Sample Narrative:
L1003188-03 WG1129765: 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	06/25/2018 16:40	WG1127820

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
COD	ND		10.0	1	06/20/2018 22:31	WG1127455

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	06/21/2018 00:16	WG1127206
Chloride	6.71		1.00	1	06/21/2018 00:16	WG1127206
Fluoride	ND		0.100	1	06/21/2018 00:16	WG1127206
Nitrate	0.495		0.100	1	06/21/2018 00:16	WG1127206
Sulfate	ND		5.00	1	06/21/2018 00:16	WG1127206

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/22/2018 09:54	WG1127641
Mercury,Dissolved	ND		0.000200	1	06/22/2018 11:50	WG1127826

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	06/23/2018 14:46	WG1127928
Boron,Dissolved	ND		0.200	1	06/21/2018 15:32	WG1127249

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	06/23/2018 14:11	WG1127540
Aluminum,Dissolved	ND		0.100	1	06/22/2018 16:58	WG1127137
Antimony	ND		0.00200	1	06/23/2018 14:11	WG1127540
Antimony,Dissolved	ND		0.00200	1	06/21/2018 20:18	WG1127137
Arsenic	ND		0.00200	1	06/23/2018 14:11	WG1127540
Arsenic,Dissolved	ND		0.00200	1	06/21/2018 20:18	WG1127137
Barium	0.00646		0.00500	1	06/23/2018 14:11	WG1127540
Barium,Dissolved	0.00788		0.00500	1	06/21/2018 20:18	WG1127137

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Beryllium	ND		0.00200	1	06/23/2018 14:11	WG1127540
Beryllium,Dissolved	ND		0.00200	1	06/21/2018 20:18	WG1127137
Cadmium	ND		0.00100	1	06/23/2018 14:11	WG1127540
Cadmium,Dissolved	ND		0.00100	1	06/21/2018 20:18	WG1127137
Calcium	4.40		1.00	1	06/23/2018 14:11	WG1127540
Calcium,Dissolved	4.77		1.00	1	06/22/2018 16:58	WG1127137
Chromium	ND		0.00200	1	06/23/2018 14:11	WG1127540
Chromium,Dissolved	0.00258	B	0.00200	1	06/21/2018 20:18	WG1127137
Cobalt	ND		0.00200	1	06/23/2018 14:11	WG1127540
Cobalt,Dissolved	ND		0.00200	1	06/21/2018 20:18	WG1127137
Copper	ND		0.00500	1	06/23/2018 14:11	WG1127540
Copper,Dissolved	ND		0.00500	1	06/21/2018 20:18	WG1127137
Iron	ND		0.100	1	06/23/2018 14:11	WG1127540
Iron,Dissolved	ND		0.100	1	06/21/2018 20:18	WG1127137
Lead	ND		0.00200	1	06/23/2018 14:11	WG1127540
Lead,Dissolved	ND		0.00200	1	06/21/2018 20:18	WG1127137
Magnesium	2.72		1.00	1	06/23/2018 14:11	WG1127540
Magnesium,Dissolved	2.82		1.00	1	06/22/2018 16:58	WG1127137
Manganese	0.0300		0.00500	1	06/23/2018 14:11	WG1127540
Manganese,Dissolved	0.0220		0.00500	1	06/21/2018 20:18	WG1127137
Nickel	ND		0.00200	1	06/23/2018 14:11	WG1127540
Nickel,Dissolved	ND		0.00200	1	06/21/2018 20:18	WG1127137
Potassium	ND		1.00	1	06/23/2018 14:11	WG1127540
Potassium,Dissolved	1.41		1.00	1	06/22/2018 16:58	WG1127137
Selenium	ND		0.00200	1	06/23/2018 14:11	WG1127540
Selenium,Dissolved	ND		0.00200	1	06/21/2018 20:18	WG1127137
Silver	ND		0.00200	1	06/23/2018 14:11	WG1127540
Silver,Dissolved	ND		0.00200	1	06/21/2018 20:18	WG1127137
Sodium	3.77		1.00	1	06/23/2018 14:11	WG1127540
Sodium,Dissolved	3.63		1.00	1	06/22/2018 16:58	WG1127137
Thallium	ND		0.00200	1	06/23/2018 14:11	WG1127540
Thallium,Dissolved	ND		0.00200	1	06/21/2018 20:18	WG1127137
Vanadium	ND		0.00500	1	06/23/2018 14:11	WG1127540
Vanadium,Dissolved	ND		0.00500	1	06/21/2018 20:18	WG1127137
Zinc	ND		0.0250	1	06/23/2018 14:11	WG1127540
Zinc,Dissolved	ND		0.0250	1	06/21/2018 20:18	WG1127137

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	06/21/2018 19:17	WG1128014
Acrylonitrile	ND		0.0100	1	06/21/2018 19:17	WG1128014
Benzene	ND		0.00100	1	06/21/2018 19:17	WG1128014
Bromochloromethane	ND		0.00100	1	06/21/2018 19:17	WG1128014
Bromodichloromethane	ND		0.00100	1	06/21/2018 19:17	WG1128014
Bromoform	ND		0.00100	1	06/21/2018 19:17	WG1128014
Bromomethane	ND		0.00500	1	06/21/2018 19:17	WG1128014
Carbon disulfide	ND		0.00100	1	06/21/2018 19:17	WG1128014
Carbon tetrachloride	ND		0.00100	1	06/21/2018 19:17	WG1128014
Chlorobenzene	ND		0.00100	1	06/21/2018 19:17	WG1128014
Chlorodibromomethane	ND		0.00100	1	06/21/2018 19:17	WG1128014
Chloroethane	ND		0.00500	1	06/21/2018 19:17	WG1128014
Chloroform	ND		0.00500	1	06/21/2018 19:17	WG1128014
Chloromethane	ND		0.00250	1	06/21/2018 19:17	WG1128014
Dibromomethane	ND		0.00100	1	06/21/2018 19:17	WG1128014
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	06/21/2018 19:17	WG1128014

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,2-Dibromoethane	ND		0.00100	1	06/21/2018 19:17	WG1128014
1,2-Dichlorobenzene	ND		0.00100	1	06/21/2018 19:17	WG1128014
1,4-Dichlorobenzene	ND		0.00100	1	06/21/2018 19:17	WG1128014
trans-1,4-Dichloro-2-butene	ND		0.00250	1	06/21/2018 19:17	WG1128014
1,1-Dichloroethane	ND		0.00100	1	06/21/2018 19:17	WG1128014
1,2-Dichloroethane	ND		0.00100	1	06/21/2018 19:17	WG1128014
1,1-Dichloroethene	ND		0.00100	1	06/21/2018 19:17	WG1128014
cis-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 19:17	WG1128014
trans-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 19:17	WG1128014
1,2-Dichloropropane	ND		0.00100	1	06/21/2018 19:17	WG1128014
cis-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 19:17	WG1128014
trans-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 19:17	WG1128014
Ethylbenzene	ND		0.00100	1	06/21/2018 19:17	WG1128014
2-Hexanone	ND		0.0100	1	06/21/2018 19:17	WG1128014
Iodomethane	ND		0.0100	1	06/21/2018 19:17	WG1128014
2-Butanone (MEK)	ND		0.0100	1	06/21/2018 19:17	WG1128014
Methylene Chloride	ND		0.00500	1	06/21/2018 19:17	WG1128014
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	06/21/2018 19:17	WG1128014
Styrene	ND		0.00100	1	06/21/2018 19:17	WG1128014
1,1,1,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 19:17	WG1128014
1,1,2,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 19:17	WG1128014
Tetrachloroethene	ND		0.00100	1	06/21/2018 19:17	WG1128014
Toluene	ND		0.00100	1	06/21/2018 19:17	WG1128014
1,1,1-Trichloroethane	ND		0.00100	1	06/21/2018 19:17	WG1128014
1,1,2-Trichloroethane	ND		0.00100	1	06/21/2018 19:17	WG1128014
Trichloroethene	ND		0.00100	1	06/21/2018 19:17	WG1128014
Trichlorofluoromethane	ND		0.00500	1	06/21/2018 19:17	WG1128014
1,2,3-Trichloropropane	ND		0.00250	1	06/21/2018 19:17	WG1128014
Vinyl acetate	ND	J4	0.0100	1	06/21/2018 19:17	WG1128014
Vinyl chloride	ND		0.00100	1	06/21/2018 19:17	WG1128014
Xylenes, Total	ND		0.00300	1	06/21/2018 19:17	WG1128014
(S) Toluene-d8	*101*		*80.0-120*		*06/21/2018 19:17*	WG1128014
(S) Dibromofluoromethane	*97.6*		*76.0-123*		*06/21/2018 19:17*	WG1128014
(S) a,a,a-Trifluorotoluene	*103*		*80.0-120*		*06/21/2018 19:17*	WG1128014
(S) 4-Bromofluorobenzene	*98.8*		*80.0-120*		*06/21/2018 19:17*	WG1128014

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	06/22/2018 03:53	WG1127562
1,2-Dibromo-3-Chloropropane	ND		0.0000202	1.01	06/22/2018 03:53	WG1127562

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	82.8		30.0	1	06/21/2018 15:54	WG1127772

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	06/26/2018 14:26	WG1129765

Sample Narrative:
L1003188-04 WG1129765: 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	06/25/2018 16:42	WG1127820

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
COD	ND		10.0	1	06/20/2018 22:32	WG1127455

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	06/21/2018 00:32	WG1127206
Chloride	62.2		1.00	1	06/21/2018 00:32	WG1127206
Fluoride	ND		0.100	1	06/21/2018 00:32	WG1127206
Nitrate	1.25		0.100	1	06/21/2018 00:32	WG1127206
Sulfate	ND		5.00	1	06/21/2018 00:32	WG1127206

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/22/2018 09:56	WG1127641
Mercury,Dissolved	ND		0.000200	1	06/22/2018 11:52	WG1127826

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	06/23/2018 14:49	WG1127928
Boron,Dissolved	ND		0.200	1	06/21/2018 15:35	WG1127249

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	0.180		0.100	1	06/23/2018 14:16	WG1127540
Aluminum,Dissolved	ND		0.100	1	06/22/2018 17:02	WG1127137
Antimony	ND		0.00200	1	06/23/2018 14:16	WG1127540
Antimony,Dissolved	ND		0.00200	1	06/21/2018 20:23	WG1127137
Arsenic	ND		0.00200	1	06/23/2018 14:16	WG1127540
Arsenic,Dissolved	ND		0.00200	1	06/21/2018 20:23	WG1127137
Barium	0.0320		0.00500	1	06/23/2018 14:16	WG1127540
Barium,Dissolved	0.0331		0.00500	1	06/21/2018 20:23	WG1127137

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Beryllium	ND		0.00200	1	06/23/2018 14:16	WG1127540
Beryllium,Dissolved	ND		0.00200	1	06/21/2018 20:23	WG1127137
Cadmium	ND		0.00100	1	06/23/2018 14:16	WG1127540
Cadmium,Dissolved	ND		0.00100	1	06/21/2018 20:23	WG1127137
Calcium	14.1		1.00	1	06/23/2018 14:16	WG1127540
Calcium,Dissolved	14.9		1.00	1	06/22/2018 17:02	WG1127137
Chromium	0.00436		0.00200	1	06/23/2018 14:16	WG1127540
Chromium,Dissolved	0.00303	B	0.00200	1	06/21/2018 20:23	WG1127137
Cobalt	0.00233		0.00200	1	06/23/2018 14:16	WG1127540
Cobalt,Dissolved	0.00246		0.00200	1	06/21/2018 20:23	WG1127137
Copper	ND		0.00500	1	06/23/2018 14:16	WG1127540
Copper,Dissolved	ND		0.00500	1	06/21/2018 20:23	WG1127137
Iron	0.307		0.100	1	06/23/2018 14:16	WG1127540
Iron,Dissolved	ND		0.100	1	06/21/2018 20:23	WG1127137
Lead	ND		0.00200	1	06/23/2018 14:16	WG1127540
Lead,Dissolved	ND		0.00200	1	06/21/2018 20:23	WG1127137
Magnesium	9.78		1.00	1	06/23/2018 14:16	WG1127540
Magnesium,Dissolved	10.2		1.00	1	06/22/2018 17:02	WG1127137
Manganese	0.0953		0.00500	1	06/23/2018 14:16	WG1127540
Manganese,Dissolved	0.0844		0.00500	1	06/21/2018 20:23	WG1127137
Nickel	0.00772		0.00200	1	06/23/2018 14:16	WG1127540
Nickel,Dissolved	0.00772		0.00200	1	06/21/2018 20:23	WG1127137
Potassium	1.24		1.00	1	06/23/2018 14:16	WG1127540
Potassium,Dissolved	1.27		1.00	1	06/22/2018 17:02	WG1127137
Selenium	ND		0.00200	1	06/23/2018 14:16	WG1127540
Selenium,Dissolved	ND		0.00200	1	06/21/2018 20:23	WG1127137
Silver	ND		0.00200	1	06/23/2018 14:16	WG1127540
Silver,Dissolved	ND		0.00200	1	06/21/2018 20:23	WG1127137
Sodium	16.7		1.00	1	06/23/2018 14:16	WG1127540
Sodium,Dissolved	16.6		1.00	1	06/22/2018 17:02	WG1127137
Thallium	ND		0.00200	1	06/23/2018 14:16	WG1127540
Thallium,Dissolved	ND		0.00200	1	06/21/2018 20:23	WG1127137
Vanadium	ND		0.00500	1	06/23/2018 14:16	WG1127540
Vanadium,Dissolved	ND		0.00500	1	06/21/2018 20:23	WG1127137
Zinc	ND		0.0250	1	06/23/2018 14:16	WG1127540
Zinc,Dissolved	ND		0.0250	1	06/21/2018 20:23	WG1127137

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	06/21/2018 19:37	WG1128014
Acrylonitrile	ND		0.0100	1	06/21/2018 19:37	WG1128014
Benzene	ND		0.00100	1	06/21/2018 19:37	WG1128014
Bromochloromethane	ND		0.00100	1	06/21/2018 19:37	WG1128014
Bromodichloromethane	ND		0.00100	1	06/21/2018 19:37	WG1128014
Bromoform	ND		0.00100	1	06/21/2018 19:37	WG1128014
Bromomethane	ND		0.00500	1	06/21/2018 19:37	WG1128014
Carbon disulfide	ND		0.00100	1	06/21/2018 19:37	WG1128014
Carbon tetrachloride	ND		0.00100	1	06/21/2018 19:37	WG1128014
Chlorobenzene	ND		0.00100	1	06/21/2018 19:37	WG1128014
Chlorodibromomethane	ND		0.00100	1	06/21/2018 19:37	WG1128014
Chloroethane	ND		0.00500	1	06/21/2018 19:37	WG1128014
Chloroform	ND		0.00500	1	06/21/2018 19:37	WG1128014
Chloromethane	ND		0.00250	1	06/21/2018 19:37	WG1128014
Dibromomethane	ND		0.00100	1	06/21/2018 19:37	WG1128014
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	06/21/2018 19:37	WG1128014

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,2-Dibromoethane	ND		0.00100	1	06/21/2018 19:37	WG1128014
1,2-Dichlorobenzene	ND		0.00100	1	06/21/2018 19:37	WG1128014
1,4-Dichlorobenzene	ND		0.00100	1	06/21/2018 19:37	WG1128014
trans-1,4-Dichloro-2-butene	ND		0.00250	1	06/21/2018 19:37	WG1128014
1,1-Dichloroethane	ND		0.00100	1	06/21/2018 19:37	WG1128014
1,2-Dichloroethane	ND		0.00100	1	06/21/2018 19:37	WG1128014
1,1-Dichloroethene	ND		0.00100	1	06/21/2018 19:37	WG1128014
cis-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 19:37	WG1128014
trans-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 19:37	WG1128014
1,2-Dichloropropane	ND		0.00100	1	06/21/2018 19:37	WG1128014
cis-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 19:37	WG1128014
trans-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 19:37	WG1128014
Ethylbenzene	ND		0.00100	1	06/21/2018 19:37	WG1128014
2-Hexanone	ND		0.0100	1	06/21/2018 19:37	WG1128014
Iodomethane	ND		0.0100	1	06/21/2018 19:37	WG1128014
2-Butanone (MEK)	ND		0.0100	1	06/21/2018 19:37	WG1128014
Methylene Chloride	ND		0.00500	1	06/21/2018 19:37	WG1128014
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	06/21/2018 19:37	WG1128014
Styrene	ND		0.00100	1	06/21/2018 19:37	WG1128014
1,1,1,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 19:37	WG1128014
1,1,2,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 19:37	WG1128014
Tetrachloroethene	ND		0.00100	1	06/21/2018 19:37	WG1128014
Toluene	ND		0.00100	1	06/21/2018 19:37	WG1128014
1,1,1-Trichloroethane	ND		0.00100	1	06/21/2018 19:37	WG1128014
1,1,2-Trichloroethane	ND		0.00100	1	06/21/2018 19:37	WG1128014
Trichloroethene	ND		0.00100	1	06/21/2018 19:37	WG1128014
Trichlorofluoromethane	ND		0.00500	1	06/21/2018 19:37	WG1128014
1,2,3-Trichloropropane	ND		0.00250	1	06/21/2018 19:37	WG1128014
Vinyl acetate	ND	J4	0.0100	1	06/21/2018 19:37	WG1128014
Vinyl chloride	ND		0.00100	1	06/21/2018 19:37	WG1128014
Xylenes, Total	ND		0.00300	1	06/21/2018 19:37	WG1128014
(S) Toluene-d8	*104*		*80.0-120*		*06/21/2018 19:37*	WG1128014
(S) Dibromofluoromethane	*97.3*		*76.0-123*		*06/21/2018 19:37*	WG1128014
(S) a,a,a-Trifluorotoluene	*105*		*80.0-120*		*06/21/2018 19:37*	WG1128014
(S) 4-Bromofluorobenzene	*102*		*80.0-120*		*06/21/2018 19:37*	WG1128014

EDB / DBCP by Method 8011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ethylene Dibromide	ND		0.0000100	.998	06/22/2018 04:06	WG1127562
1,2-Dibromo-3-Chloropropane	ND	P	0.0000200	.998	06/22/2018 04:06	WG1127562

Wet Chemistry by Method 130.1

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (colorimetric) as CaCO3	34.3	B	30.0	1	06/21/2018 15:55	WG1127772

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	ND		20.0	1	06/26/2018 14:32	WG1129765

Sample Narrative:
L1003188-05 WG1129765: Endpoint pH 4.5

Wet Chemistry by Method 350.1

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.100	1	06/25/2018 16:43	WG1127820

Wet Chemistry by Method 410.4

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
COD	ND		10.0	1	06/20/2018 22:32	WG1127455

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	06/21/2018 00:47	WG1127206
Chloride	11.7		1.00	1	06/21/2018 00:47	WG1127206
Fluoride	ND		0.100	1	06/21/2018 00:47	WG1127206
Nitrate	1.46		0.100	1	06/21/2018 00:47	WG1127206
Sulfate	ND		5.00	1	06/21/2018 00:47	WG1127206

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.000200	1	06/22/2018 09:58	WG1127641
Mercury,Dissolved	ND		0.000200	1	06/22/2018 11:54	WG1127826

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	06/23/2018 14:52	WG1127928
Boron,Dissolved	ND		0.200	1	06/21/2018 15:45	WG1127249

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Aluminum	1.35		0.100	1	06/23/2018 14:21	WG1127540
Aluminum,Dissolved	ND		0.100	1	06/22/2018 17:06	WG1127137
Antimony	ND		0.00200	1	06/23/2018 14:21	WG1127540
Antimony,Dissolved	ND		0.00200	1	06/21/2018 20:38	WG1127137
Arsenic	0.00217		0.00200	1	06/23/2018 14:21	WG1127540
Arsenic,Dissolved	ND		0.00200	1	06/21/2018 20:38	WG1127137
Barium	0.0233		0.00500	1	06/23/2018 14:21	WG1127540
Barium,Dissolved	0.00817		0.00500	1	06/21/2018 20:38	WG1127137

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Beryllium	ND		0.00200	1	06/23/2018 14:21	WG1127540
Beryllium,Dissolved	ND		0.00200	1	06/21/2018 20:38	WG1127137
Cadmium	ND		0.00100	1	06/23/2018 14:21	WG1127540
Cadmium,Dissolved	ND		0.00100	1	06/21/2018 20:38	WG1127137
Calcium	8.65		1.00	1	06/23/2018 14:21	WG1127540
Calcium,Dissolved	8.87		1.00	1	06/22/2018 17:06	WG1127137
Chromium	0.00429		0.00200	1	06/23/2018 14:21	WG1127540
Chromium,Dissolved	0.00233	B	0.00200	1	06/21/2018 20:38	WG1127137
Cobalt	ND		0.00200	1	06/23/2018 14:21	WG1127540
Cobalt,Dissolved	ND		0.00200	1	06/21/2018 20:38	WG1127137
Copper	0.00584		0.00500	1	06/23/2018 14:21	WG1127540
Copper,Dissolved	ND		0.00500	1	06/21/2018 20:38	WG1127137
Iron	2.04		0.100	1	06/23/2018 14:21	WG1127540
Iron,Dissolved	ND		0.100	1	06/21/2018 20:38	WG1127137
Lead	0.00438		0.00200	1	06/23/2018 14:21	WG1127540
Lead,Dissolved	ND		0.00200	1	06/21/2018 20:38	WG1127137
Magnesium	2.48		1.00	1	06/23/2018 14:21	WG1127540
Magnesium,Dissolved	2.43		1.00	1	06/22/2018 17:06	WG1127137
Manganese	0.0303		0.00500	1	06/23/2018 14:21	WG1127540
Manganese,Dissolved	ND		0.00500	1	06/21/2018 20:38	WG1127137
Nickel	0.00209		0.00200	1	06/23/2018 14:21	WG1127540
Nickel,Dissolved	ND		0.00200	1	06/21/2018 20:38	WG1127137
Potassium	1.13		1.00	1	06/23/2018 14:21	WG1127540
Potassium,Dissolved	ND		1.00	1	06/22/2018 17:06	WG1127137
Selenium	ND		0.00200	1	06/23/2018 14:21	WG1127540
Selenium,Dissolved	ND		0.00200	1	06/21/2018 20:38	WG1127137
Silver	ND		0.00200	1	06/23/2018 14:21	WG1127540
Silver,Dissolved	ND		0.00200	1	06/21/2018 20:38	WG1127137
Sodium	3.30		1.00	1	06/23/2018 14:21	WG1127540
Sodium,Dissolved	2.91	B	1.00	1	06/22/2018 17:06	WG1127137
Thallium	ND		0.00200	1	06/23/2018 14:21	WG1127540
Thallium,Dissolved	ND		0.00200	1	06/21/2018 20:38	WG1127137
Vanadium	0.00615		0.00500	1	06/23/2018 14:21	WG1127540
Vanadium,Dissolved	ND		0.00500	1	06/21/2018 20:38	WG1127137
Zinc	ND		0.0250	1	06/23/2018 14:21	WG1127540
Zinc,Dissolved	ND		0.0250	1	06/21/2018 20:38	WG1127137

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	06/21/2018 19:57	WG1128014
Acrylonitrile	ND		0.0100	1	06/21/2018 19:57	WG1128014
Benzene	ND		0.00100	1	06/21/2018 19:57	WG1128014
Bromochloromethane	ND		0.00100	1	06/21/2018 19:57	WG1128014
Bromodichloromethane	ND		0.00100	1	06/21/2018 19:57	WG1128014
Bromoform	ND		0.00100	1	06/21/2018 19:57	WG1128014
Bromomethane	ND		0.00500	1	06/21/2018 19:57	WG1128014
Carbon disulfide	ND		0.00100	1	06/21/2018 19:57	WG1128014
Carbon tetrachloride	ND		0.00100	1	06/21/2018 19:57	WG1128014
Chlorobenzene	ND		0.00100	1	06/21/2018 19:57	WG1128014
Chlorodibromomethane	ND		0.00100	1	06/21/2018 19:57	WG1128014
Chloroethane	ND		0.00500	1	06/21/2018 19:57	WG1128014
Chloroform	ND		0.00500	1	06/21/2018 19:57	WG1128014
Chloromethane	ND		0.00250	1	06/21/2018 19:57	WG1128014
Dibromomethane	ND		0.00100	1	06/21/2018 19:57	WG1128014
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	06/21/2018 19:57	WG1128014

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,2-Dibromoethane	ND		0.00100	1	06/21/2018 19:57	WG1128014
1,2-Dichlorobenzene	ND		0.00100	1	06/21/2018 19:57	WG1128014
1,4-Dichlorobenzene	ND		0.00100	1	06/21/2018 19:57	WG1128014
trans-1,4-Dichloro-2-butene	ND		0.00250	1	06/21/2018 19:57	WG1128014
1,1-Dichloroethane	ND		0.00100	1	06/21/2018 19:57	WG1128014
1,2-Dichloroethane	ND		0.00100	1	06/21/2018 19:57	WG1128014
1,1-Dichloroethene	ND		0.00100	1	06/21/2018 19:57	WG1128014
cis-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 19:57	WG1128014
trans-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 19:57	WG1128014
1,2-Dichloropropane	ND		0.00100	1	06/21/2018 19:57	WG1128014
cis-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 19:57	WG1128014
trans-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 19:57	WG1128014
Ethylbenzene	ND		0.00100	1	06/21/2018 19:57	WG1128014
2-Hexanone	ND		0.0100	1	06/21/2018 19:57	WG1128014
Iodomethane	ND		0.0100	1	06/21/2018 19:57	WG1128014
2-Butanone (MEK)	ND		0.0100	1	06/21/2018 19:57	WG1128014
Methylene Chloride	ND		0.00500	1	06/21/2018 19:57	WG1128014
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	06/21/2018 19:57	WG1128014
Styrene	ND		0.00100	1	06/21/2018 19:57	WG1128014
1,1,1,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 19:57	WG1128014
1,1,2,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 19:57	WG1128014
Tetrachloroethene	ND		0.00100	1	06/21/2018 19:57	WG1128014
Toluene	ND		0.00100	1	06/21/2018 19:57	WG1128014
1,1,1-Trichloroethane	ND		0.00100	1	06/21/2018 19:57	WG1128014
1,1,2-Trichloroethane	ND		0.00100	1	06/21/2018 19:57	WG1128014
Trichloroethene	ND		0.00100	1	06/21/2018 19:57	WG1128014
Trichlorofluoromethane	ND		0.00500	1	06/21/2018 19:57	WG1128014
1,2,3-Trichloropropane	ND		0.00250	1	06/21/2018 19:57	WG1128014
Vinyl acetate	ND	J4	0.0100	1	06/21/2018 19:57	WG1128014
Vinyl chloride	ND		0.00100	1	06/21/2018 19:57	WG1128014
Xylenes, Total	ND		0.00300	1	06/21/2018 19:57	WG1128014
(S) Toluene-d8	*102*		*80.0-120*		*06/21/2018 19:57*	WG1128014
(S) Dibromofluoromethane	*98.0*		*76.0-123*		*06/21/2018 19:57*	WG1128014
(S) a,a,a-Trifluorotoluene	*104*		*80.0-120*		*06/21/2018 19:57*	WG1128014
(S) 4-Bromofluorobenzene	*100*		*80.0-120*		*06/21/2018 19:57*	WG1128014

EDB / DBCP by Method 8011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ethylene Dibromide	ND		0.0000100	.998	06/22/2018 04:18	WG1127562
1,2-Dibromo-3-Chloropropane	ND		0.0000200	.998	06/22/2018 04:18	WG1127562

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	37.1	B	30.0	1	06/21/2018 15:56	WG1127772

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	06/26/2018 14:39	WG1129765

Sample Narrative:
L1003188-06 WG1129765: 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	06/25/2018 16:45	WG1127820

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
COD	ND		10.0	1	06/20/2018 22:32	WG1127455

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	06/21/2018 01:03	WG1127206
Chloride	16.8		1.00	1	06/21/2018 01:03	WG1127206
Fluoride	ND		0.100	1	06/21/2018 01:03	WG1127206
Nitrate	0.689		0.100	1	06/21/2018 01:03	WG1127206
Sulfate	ND		5.00	1	06/21/2018 01:03	WG1127206

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/22/2018 10:00	WG1127641
Mercury,Dissolved	ND		0.000200	1	06/22/2018 11:56	WG1127826

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	06/23/2018 14:54	WG1127928
Boron,Dissolved	ND		0.200	1	06/21/2018 15:48	WG1127249

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	11.0		0.100	1	06/23/2018 14:25	WG1127540
Aluminum,Dissolved	2.63		0.100	1	06/22/2018 17:10	WG1127137
Antimony	ND		0.00200	1	06/23/2018 14:25	WG1127540
Antimony,Dissolved	ND		0.00200	1	06/21/2018 20:43	WG1127137
Arsenic	0.00680		0.00200	1	06/23/2018 14:25	WG1127540
Arsenic,Dissolved	0.00289		0.00200	1	06/21/2018 20:43	WG1127137
Barium	0.0960		0.00500	1	06/23/2018 14:25	WG1127540
Barium,Dissolved	0.0491		0.00500	1	06/21/2018 20:43	WG1127137

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Beryllium	ND		0.00200	1	06/23/2018 14:25	WG1127540
Beryllium,Dissolved	ND		0.00200	1	06/21/2018 20:43	WG1127137
Cadmium	ND		0.00100	1	06/23/2018 14:25	WG1127540
Cadmium,Dissolved	ND		0.00100	1	06/21/2018 20:43	WG1127137
Calcium	7.72		1.00	1	06/23/2018 14:25	WG1127540
Calcium,Dissolved	7.74		1.00	1	06/22/2018 17:10	WG1127137
Chromium	0.0179		0.00200	1	06/23/2018 14:25	WG1127540
Chromium,Dissolved	0.00703	B	0.00200	1	06/21/2018 20:43	WG1127137
Cobalt	0.00385		0.00200	1	06/23/2018 14:25	WG1127540
Cobalt,Dissolved	ND		0.00200	1	06/21/2018 20:43	WG1127137
Copper	0.00867		0.00500	1	06/23/2018 14:25	WG1127540
Copper,Dissolved	ND		0.00500	1	06/21/2018 20:43	WG1127137
Iron	15.1		0.100	1	06/23/2018 14:25	WG1127540
Iron,Dissolved	4.13		0.100	1	06/21/2018 20:43	WG1127137
Lead	0.00839		0.00200	1	06/23/2018 14:25	WG1127540
Lead,Dissolved	0.00274		0.00200	1	06/21/2018 20:43	WG1127137
Magnesium	3.70		1.00	1	06/23/2018 14:25	WG1127540
Magnesium,Dissolved	2.98		1.00	1	06/22/2018 17:10	WG1127137
Manganese	0.170		0.00500	1	06/23/2018 14:25	WG1127540
Manganese,Dissolved	0.0517		0.00500	1	06/21/2018 20:43	WG1127137
Nickel	0.00730		0.00200	1	06/23/2018 14:25	WG1127540
Nickel,Dissolved	0.00268		0.00200	1	06/21/2018 20:43	WG1127137
Potassium	1.75		1.00	1	06/23/2018 14:25	WG1127540
Potassium,Dissolved	1.04		1.00	1	06/22/2018 17:10	WG1127137
Selenium	ND		0.00200	1	06/23/2018 14:25	WG1127540
Selenium,Dissolved	ND		0.00200	1	06/21/2018 20:43	WG1127137
Silver	ND		0.00200	1	06/23/2018 14:25	WG1127540
Silver,Dissolved	ND		0.00200	1	06/21/2018 20:43	WG1127137
Sodium	3.58		1.00	1	06/23/2018 14:25	WG1127540
Sodium,Dissolved	3.09	B	1.00	1	06/22/2018 17:10	WG1127137
Thallium	ND		0.00200	1	06/23/2018 14:25	WG1127540
Thallium,Dissolved	ND		0.00200	1	06/21/2018 20:43	WG1127137
Vanadium	0.0274		0.00500	1	06/23/2018 14:25	WG1127540
Vanadium,Dissolved	0.00729		0.00500	1	06/21/2018 20:43	WG1127137
Zinc	0.0254		0.0250	1	06/23/2018 14:25	WG1127540
Zinc,Dissolved	ND		0.0250	1	06/21/2018 20:43	WG1127137

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	06/21/2018 20:17	WG1128014
Acrylonitrile	ND		0.0100	1	06/21/2018 20:17	WG1128014
Benzene	ND		0.00100	1	06/21/2018 20:17	WG1128014
Bromochloromethane	ND		0.00100	1	06/21/2018 20:17	WG1128014
Bromodichloromethane	ND		0.00100	1	06/21/2018 20:17	WG1128014
Bromoform	ND		0.00100	1	06/21/2018 20:17	WG1128014
Bromomethane	ND		0.00500	1	06/21/2018 20:17	WG1128014
Carbon disulfide	ND		0.00100	1	06/21/2018 20:17	WG1128014
Carbon tetrachloride	ND		0.00100	1	06/21/2018 20:17	WG1128014
Chlorobenzene	ND		0.00100	1	06/21/2018 20:17	WG1128014
Chlorodibromomethane	ND		0.00100	1	06/21/2018 20:17	WG1128014
Chloroethane	ND		0.00500	1	06/21/2018 20:17	WG1128014
Chloroform	ND		0.00500	1	06/21/2018 20:17	WG1128014
Chloromethane	ND		0.00250	1	06/21/2018 20:17	WG1128014
Dibromomethane	ND		0.00100	1	06/21/2018 20:17	WG1128014
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	06/21/2018 20:17	WG1128014

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,2-Dibromoethane	ND		0.00100	1	06/21/2018 20:17	WG1128014
1,2-Dichlorobenzene	ND		0.00100	1	06/21/2018 20:17	WG1128014
1,4-Dichlorobenzene	ND		0.00100	1	06/21/2018 20:17	WG1128014
trans-1,4-Dichloro-2-butene	ND		0.00250	1	06/21/2018 20:17	WG1128014
1,1-Dichloroethane	ND		0.00100	1	06/21/2018 20:17	WG1128014
1,2-Dichloroethane	ND		0.00100	1	06/21/2018 20:17	WG1128014
1,1-Dichloroethene	ND		0.00100	1	06/21/2018 20:17	WG1128014
cis-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 20:17	WG1128014
trans-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 20:17	WG1128014
1,2-Dichloropropane	ND		0.00100	1	06/21/2018 20:17	WG1128014
cis-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 20:17	WG1128014
trans-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 20:17	WG1128014
Ethylbenzene	ND		0.00100	1	06/21/2018 20:17	WG1128014
2-Hexanone	ND		0.0100	1	06/21/2018 20:17	WG1128014
Iodomethane	ND		0.0100	1	06/21/2018 20:17	WG1128014
2-Butanone (MEK)	ND		0.0100	1	06/21/2018 20:17	WG1128014
Methylene Chloride	ND		0.00500	1	06/21/2018 20:17	WG1128014
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	06/21/2018 20:17	WG1128014
Styrene	ND		0.00100	1	06/21/2018 20:17	WG1128014
1,1,1,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 20:17	WG1128014
1,1,2,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 20:17	WG1128014
Tetrachloroethene	ND		0.00100	1	06/21/2018 20:17	WG1128014
Toluene	ND		0.00100	1	06/21/2018 20:17	WG1128014
1,1,1-Trichloroethane	ND		0.00100	1	06/21/2018 20:17	WG1128014
1,1,2-Trichloroethane	ND		0.00100	1	06/21/2018 20:17	WG1128014
Trichloroethene	ND		0.00100	1	06/21/2018 20:17	WG1128014
Trichlorofluoromethane	ND		0.00500	1	06/21/2018 20:17	WG1128014
1,2,3-Trichloropropane	ND		0.00250	1	06/21/2018 20:17	WG1128014
Vinyl acetate	ND	J4	0.0100	1	06/21/2018 20:17	WG1128014
Vinyl chloride	ND		0.00100	1	06/21/2018 20:17	WG1128014
Xylenes, Total	ND		0.00300	1	06/21/2018 20:17	WG1128014
(S) Toluene-d8	*103*		*80.0-120*		*06/21/2018 20:17*	WG1128014
(S) Dibromofluoromethane	*99.9*		*76.0-123*		*06/21/2018 20:17*	WG1128014
(S) a,a,a-Trifluorotoluene	*104*		*80.0-120*		*06/21/2018 20:17*	WG1128014
(S) 4-Bromofluorobenzene	*100*		*80.0-120*		*06/21/2018 20:17*	WG1128014

EDB / DBCP by Method 8011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ethylene Dibromide	ND		0.0000100	.998	06/22/2018 04:30	WG1127562
1,2-Dibromo-3-Chloropropane	ND		0.0000200	.998	06/22/2018 04:30	WG1127562

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	78.7		30.0	1	06/21/2018 16:18	WG1127772

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	06/26/2018 16:04	WG1129765

Sample Narrative:
L1003188-07 WG1129765: 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	06/25/2018 16:46	WG1127820

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
COD	ND		10.0	1	06/20/2018 22:33	WG1127455

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	06/21/2018 01:18	WG1127206
Chloride	53.2		1.00	1	06/21/2018 01:18	WG1127206
Fluoride	ND		0.100	1	06/21/2018 01:18	WG1127206
Nitrate	3.98		0.100	1	06/21/2018 01:18	WG1127206
Sulfate	ND		5.00	1	06/21/2018 01:18	WG1127206

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/22/2018 10:02	WG1127641
Mercury,Dissolved	ND		0.000200	1	06/22/2018 12:05	WG1127826

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	06/23/2018 14:57	WG1127928
Boron,Dissolved	ND		0.200	1	06/21/2018 15:51	WG1127249

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	0.696		0.100	1	06/23/2018 14:30	WG1127540
Aluminum,Dissolved	ND		0.100	1	06/22/2018 17:14	WG1127137
Antimony	ND		0.00200	1	06/23/2018 14:30	WG1127540
Antimony,Dissolved	ND		0.00200	1	06/21/2018 20:47	WG1127137
Arsenic	0.00232		0.00200	1	06/23/2018 14:30	WG1127540
Arsenic,Dissolved	ND		0.00200	1	06/21/2018 20:47	WG1127137
Barium	0.0414		0.00500	1	06/23/2018 14:30	WG1127540
Barium,Dissolved	0.0380		0.00500	1	06/21/2018 20:47	WG1127137

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Beryllium	ND		0.00200	1	06/23/2018 14:30	WG1127540
Beryllium,Dissolved	ND		0.00200	1	06/21/2018 20:47	WG1127137
Cadmium	ND		0.00100	1	06/23/2018 14:30	WG1127540
Cadmium,Dissolved	ND		0.00100	1	06/21/2018 20:47	WG1127137
Calcium	18.4		1.00	1	06/23/2018 14:30	WG1127540
Calcium,Dissolved	19.3		1.00	1	06/22/2018 17:14	WG1127137
Chromium	0.00208		0.00200	1	06/23/2018 14:30	WG1127540
Chromium,Dissolved	0.00217	B	0.00200	1	06/21/2018 20:47	WG1127137
Cobalt	ND		0.00200	1	06/23/2018 14:30	WG1127540
Cobalt,Dissolved	ND		0.00200	1	06/21/2018 20:47	WG1127137
Copper	ND		0.00500	1	06/23/2018 14:30	WG1127540
Copper,Dissolved	ND		0.00500	1	06/21/2018 20:47	WG1127137
Iron	2.09		0.100	1	06/23/2018 14:30	WG1127540
Iron,Dissolved	ND		0.100	1	06/21/2018 20:47	WG1127137
Lead	ND		0.00200	1	06/23/2018 14:30	WG1127540
Lead,Dissolved	ND		0.00200	1	06/21/2018 20:47	WG1127137
Magnesium	6.08		1.00	1	06/23/2018 14:30	WG1127540
Magnesium,Dissolved	6.25		1.00	1	06/22/2018 17:14	WG1127137
Manganese	0.0284		0.00500	1	06/23/2018 14:30	WG1127540
Manganese,Dissolved	0.0127		0.00500	1	06/21/2018 20:47	WG1127137
Nickel	ND		0.00200	1	06/23/2018 14:30	WG1127540
Nickel,Dissolved	ND		0.00200	1	06/21/2018 20:47	WG1127137
Potassium	1.63		1.00	1	06/23/2018 14:30	WG1127540
Potassium,Dissolved	1.56		1.00	1	06/22/2018 17:14	WG1127137
Selenium	ND		0.00200	1	06/23/2018 14:30	WG1127540
Selenium,Dissolved	ND		0.00200	1	06/21/2018 20:47	WG1127137
Silver	ND		0.00200	1	06/23/2018 14:30	WG1127540
Silver,Dissolved	ND		0.00200	1	06/21/2018 20:47	WG1127137
Sodium	10.5		1.00	1	06/23/2018 14:30	WG1127540
Sodium,Dissolved	10.0		1.00	1	06/22/2018 17:14	WG1127137
Thallium	ND		0.00200	1	06/23/2018 14:30	WG1127540
Thallium,Dissolved	ND		0.00200	1	06/21/2018 20:47	WG1127137
Vanadium	ND		0.00500	1	06/23/2018 14:30	WG1127540
Vanadium,Dissolved	ND		0.00500	1	06/21/2018 20:47	WG1127137
Zinc	ND		0.0250	1	06/23/2018 14:30	WG1127540
Zinc,Dissolved	ND		0.0250	1	06/21/2018 20:47	WG1127137

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	06/21/2018 20:37	WG1128014
Acrylonitrile	ND		0.0100	1	06/21/2018 20:37	WG1128014
Benzene	ND		0.00100	1	06/21/2018 20:37	WG1128014
Bromochloromethane	ND		0.00100	1	06/21/2018 20:37	WG1128014
Bromodichloromethane	ND		0.00100	1	06/21/2018 20:37	WG1128014
Bromoform	ND		0.00100	1	06/21/2018 20:37	WG1128014
Bromomethane	ND		0.00500	1	06/21/2018 20:37	WG1128014
Carbon disulfide	ND		0.00100	1	06/21/2018 20:37	WG1128014
Carbon tetrachloride	ND		0.00100	1	06/21/2018 20:37	WG1128014
Chlorobenzene	ND		0.00100	1	06/21/2018 20:37	WG1128014
Chlorodibromomethane	ND		0.00100	1	06/21/2018 20:37	WG1128014
Chloroethane	ND		0.00500	1	06/21/2018 20:37	WG1128014
Chloroform	ND		0.00500	1	06/21/2018 20:37	WG1128014
Chloromethane	ND		0.00250	1	06/21/2018 20:37	WG1128014
Dibromomethane	ND		0.00100	1	06/21/2018 20:37	WG1128014
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	06/21/2018 20:37	WG1128014

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,2-Dibromoethane	ND		0.00100	1	06/21/2018 20:37	WG1128014
1,2-Dichlorobenzene	ND		0.00100	1	06/21/2018 20:37	WG1128014
1,4-Dichlorobenzene	ND		0.00100	1	06/21/2018 20:37	WG1128014
trans-1,4-Dichloro-2-butene	ND		0.00250	1	06/21/2018 20:37	WG1128014
1,1-Dichloroethane	ND		0.00100	1	06/21/2018 20:37	WG1128014
1,2-Dichloroethane	ND		0.00100	1	06/21/2018 20:37	WG1128014
1,1-Dichloroethene	ND		0.00100	1	06/21/2018 20:37	WG1128014
cis-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 20:37	WG1128014
trans-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 20:37	WG1128014
1,2-Dichloropropane	ND		0.00100	1	06/21/2018 20:37	WG1128014
cis-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 20:37	WG1128014
trans-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 20:37	WG1128014
Ethylbenzene	ND		0.00100	1	06/21/2018 20:37	WG1128014
2-Hexanone	ND		0.0100	1	06/21/2018 20:37	WG1128014
Iodomethane	ND		0.0100	1	06/21/2018 20:37	WG1128014
2-Butanone (MEK)	ND		0.0100	1	06/21/2018 20:37	WG1128014
Methylene Chloride	ND		0.00500	1	06/21/2018 20:37	WG1128014
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	06/21/2018 20:37	WG1128014
Styrene	ND		0.00100	1	06/21/2018 20:37	WG1128014
1,1,1,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 20:37	WG1128014
1,1,2,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 20:37	WG1128014
Tetrachloroethene	ND		0.00100	1	06/21/2018 20:37	WG1128014
Toluene	ND		0.00100	1	06/21/2018 20:37	WG1128014
1,1,1-Trichloroethane	ND		0.00100	1	06/21/2018 20:37	WG1128014
1,1,2-Trichloroethane	ND		0.00100	1	06/21/2018 20:37	WG1128014
Trichloroethene	ND		0.00100	1	06/21/2018 20:37	WG1128014
Trichlorofluoromethane	ND		0.00500	1	06/21/2018 20:37	WG1128014
1,2,3-Trichloropropane	ND		0.00250	1	06/21/2018 20:37	WG1128014
Vinyl acetate	ND	J4	0.0100	1	06/21/2018 20:37	WG1128014
Vinyl chloride	ND		0.00100	1	06/21/2018 20:37	WG1128014
Xylenes, Total	ND		0.00300	1	06/21/2018 20:37	WG1128014
(S) Toluene-d8	*105*		*80.0-120*		*06/21/2018 20:37*	WG1128014
(S) Dibromofluoromethane	*99.6*		*76.0-123*		*06/21/2018 20:37*	WG1128014
(S) a,a,a-Trifluorotoluene	*104*		*80.0-120*		*06/21/2018 20:37*	WG1128014
(S) 4-Bromofluorobenzene	*99.5*		*80.0-120*		*06/21/2018 20:37*	WG1128014

EDB / DBCP by Method 8011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ethylene Dibromide	ND		0.0000100	1	06/22/2018 04:42	WG1127562
1,2-Dibromo-3-Chloropropane	ND		0.0000200	1	06/22/2018 04:42	WG1127562

Wet Chemistry by Method 130.1

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (colorimetric) as CaCO3	ND	P1	30.0	1	06/21/2018 16:19	WG1127772

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	ND		20.0	1	06/26/2018 16:11	WG1129765

Sample Narrative:
L1003188-08 WG1129765: Endpoint pH 4.5

Wet Chemistry by Method 350.1

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.100	1	06/25/2018 16:48	WG1127820

Wet Chemistry by Method 410.4

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
COD	ND		10.0	1	06/20/2018 22:33	WG1127455

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	06/27/2018 17:23	WG1130696
Chloride	7.14		1.00	1	06/29/2018 02:06	WG1131469
Fluoride	ND		0.100	1	06/29/2018 02:06	WG1131469
Nitrate	0.622	T8	0.100	1	06/29/2018 18:31	WG1131834
Sulfate	ND		5.00	1	06/27/2018 17:23	WG1130696

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.000200	1	06/22/2018 10:04	WG1127641
Mercury,Dissolved	ND		0.000200	1	06/22/2018 12:07	WG1127826

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	06/23/2018 15:00	WG1127928
Boron,Dissolved	ND		0.200	1	06/21/2018 15:53	WG1127249

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Aluminum	ND		0.100	1	06/23/2018 14:50	WG1127540
Aluminum,Dissolved	ND		0.100	1	06/22/2018 17:26	WG1127137
Antimony	ND		0.00200	1	06/23/2018 14:50	WG1127540
Antimony,Dissolved	ND		0.00200	1	06/21/2018 20:52	WG1127137
Arsenic	ND		0.00200	1	06/23/2018 14:50	WG1127540
Arsenic,Dissolved	ND		0.00200	1	06/21/2018 20:52	WG1127137
Barium	0.00780		0.00500	1	06/23/2018 14:50	WG1127540
Barium,Dissolved	0.00735		0.00500	1	06/21/2018 20:52	WG1127137

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Beryllium	ND		0.00200	1	06/23/2018 14:50	WG1127540
Beryllium,Dissolved	ND		0.00200	1	06/21/2018 20:52	WG1127137
Cadmium	ND		0.00100	1	06/23/2018 14:50	WG1127540
Cadmium,Dissolved	ND		0.00100	1	06/21/2018 20:52	WG1127137
Calcium	4.45		1.00	1	06/23/2018 14:50	WG1127540
Calcium,Dissolved	4.69		1.00	1	06/22/2018 17:26	WG1127137
Chromium	ND		0.00200	1	06/23/2018 14:50	WG1127540
Chromium,Dissolved	0.00227	B	0.00200	1	06/21/2018 20:52	WG1127137
Cobalt	ND		0.00200	1	06/23/2018 14:50	WG1127540
Cobalt,Dissolved	ND		0.00200	1	06/21/2018 20:52	WG1127137
Copper	ND		0.00500	1	06/23/2018 14:50	WG1127540
Copper,Dissolved	ND		0.00500	1	06/21/2018 20:52	WG1127137
Iron	ND		0.100	1	06/23/2018 14:50	WG1127540
Iron,Dissolved	ND		0.100	1	06/21/2018 20:52	WG1127137
Lead	ND		0.00200	1	06/23/2018 14:50	WG1127540
Lead,Dissolved	ND		0.00200	1	06/21/2018 20:52	WG1127137
Magnesium	2.70		1.00	1	06/23/2018 14:50	WG1127540
Magnesium,Dissolved	2.84		1.00	1	06/22/2018 17:26	WG1127137
Manganese	0.0264		0.00500	1	06/23/2018 14:50	WG1127540
Manganese,Dissolved	0.0246		0.00500	1	06/21/2018 20:52	WG1127137
Nickel	ND		0.00200	1	06/23/2018 14:50	WG1127540
Nickel,Dissolved	ND		0.00200	1	06/21/2018 20:52	WG1127137
Potassium	ND		1.00	1	06/23/2018 14:50	WG1127540
Potassium,Dissolved	ND		1.00	1	06/22/2018 17:26	WG1127137
Selenium	ND		0.00200	1	06/23/2018 14:50	WG1127540
Selenium,Dissolved	ND		0.00200	1	06/21/2018 20:52	WG1127137
Silver	ND		0.00200	1	06/23/2018 14:50	WG1127540
Silver,Dissolved	ND		0.00200	1	06/21/2018 20:52	WG1127137
Sodium	3.68		1.00	1	06/23/2018 14:50	WG1127540
Sodium,Dissolved	3.45		1.00	1	06/22/2018 17:26	WG1127137
Thallium	ND		0.00200	1	06/23/2018 14:50	WG1127540
Thallium,Dissolved	ND		0.00200	1	06/21/2018 20:52	WG1127137
Vanadium	ND		0.00500	1	06/23/2018 14:50	WG1127540
Vanadium,Dissolved	ND		0.00500	1	06/21/2018 20:52	WG1127137
Zinc	ND		0.0250	1	06/23/2018 14:50	WG1127540
Zinc,Dissolved	ND		0.0250	1	06/21/2018 20:52	WG1127137

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	06/21/2018 20:56	WG1128014
Acrylonitrile	ND		0.0100	1	06/21/2018 20:56	WG1128014
Benzene	ND		0.00100	1	06/21/2018 20:56	WG1128014
Bromochloromethane	ND		0.00100	1	06/21/2018 20:56	WG1128014
Bromodichloromethane	ND		0.00100	1	06/21/2018 20:56	WG1128014
Bromoform	ND		0.00100	1	06/21/2018 20:56	WG1128014
Bromomethane	ND		0.00500	1	06/21/2018 20:56	WG1128014
Carbon disulfide	ND		0.00100	1	06/21/2018 20:56	WG1128014
Carbon tetrachloride	ND		0.00100	1	06/21/2018 20:56	WG1128014
Chlorobenzene	ND		0.00100	1	06/21/2018 20:56	WG1128014
Chlorodibromomethane	ND		0.00100	1	06/21/2018 20:56	WG1128014
Chloroethane	ND		0.00500	1	06/21/2018 20:56	WG1128014
Chloroform	ND		0.00500	1	06/21/2018 20:56	WG1128014
Chloromethane	ND		0.00250	1	06/21/2018 20:56	WG1128014
Dibromomethane	ND		0.00100	1	06/21/2018 20:56	WG1128014
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	06/21/2018 20:56	WG1128014

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,2-Dibromoethane	ND		0.00100	1	06/21/2018 20:56	WG1128014
1,2-Dichlorobenzene	ND		0.00100	1	06/21/2018 20:56	WG1128014
1,4-Dichlorobenzene	ND		0.00100	1	06/21/2018 20:56	WG1128014
trans-1,4-Dichloro-2-butene	ND		0.00250	1	06/21/2018 20:56	WG1128014
1,1-Dichloroethane	ND		0.00100	1	06/21/2018 20:56	WG1128014
1,2-Dichloroethane	ND		0.00100	1	06/21/2018 20:56	WG1128014
1,1-Dichloroethene	ND		0.00100	1	06/21/2018 20:56	WG1128014
cis-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 20:56	WG1128014
trans-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 20:56	WG1128014
1,2-Dichloropropane	ND		0.00100	1	06/21/2018 20:56	WG1128014
cis-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 20:56	WG1128014
trans-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 20:56	WG1128014
Ethylbenzene	ND		0.00100	1	06/21/2018 20:56	WG1128014
2-Hexanone	ND		0.0100	1	06/21/2018 20:56	WG1128014
Iodomethane	ND		0.0100	1	06/21/2018 20:56	WG1128014
2-Butanone (MEK)	ND		0.0100	1	06/21/2018 20:56	WG1128014
Methylene Chloride	ND		0.00500	1	06/21/2018 20:56	WG1128014
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	06/21/2018 20:56	WG1128014
Styrene	ND		0.00100	1	06/21/2018 20:56	WG1128014
1,1,1,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 20:56	WG1128014
1,1,2,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 20:56	WG1128014
Tetrachloroethene	ND		0.00100	1	06/21/2018 20:56	WG1128014
Toluene	ND		0.00100	1	06/21/2018 20:56	WG1128014
1,1,1-Trichloroethane	ND		0.00100	1	06/21/2018 20:56	WG1128014
1,1,2-Trichloroethane	ND		0.00100	1	06/21/2018 20:56	WG1128014
Trichloroethene	ND		0.00100	1	06/21/2018 20:56	WG1128014
Trichlorofluoromethane	ND		0.00500	1	06/21/2018 20:56	WG1128014
1,2,3-Trichloropropane	ND		0.00250	1	06/21/2018 20:56	WG1128014
Vinyl acetate	ND	J4	0.0100	1	06/21/2018 20:56	WG1128014
Vinyl chloride	ND		0.00100	1	06/21/2018 20:56	WG1128014
Xylenes, Total	ND		0.00300	1	06/21/2018 20:56	WG1128014
(S) Toluene-d8	*101*		*80.0-120*		*06/21/2018 20:56*	WG1128014
(S) Dibromofluoromethane	*100*		*76.0-123*		*06/21/2018 20:56*	WG1128014
(S) a,a,a-Trifluorotoluene	*105*		*80.0-120*		*06/21/2018 20:56*	WG1128014
(S) 4-Bromofluorobenzene	*99.6*		*80.0-120*		*06/21/2018 20:56*	WG1128014

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	06/22/2018 03:29	WG1127562
1,2-Dibromo-3-Chloropropane	ND		0.0000202	1.01	06/22/2018 03:29	WG1127562

Wet Chemistry by Method 130.1

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (colorimetric) as CaCO3	ND		30.0	1	06/21/2018 16:20	WG1127772

Wet Chemistry by Method 2320 B-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Alkalinity	ND		20.0	1	06/26/2018 16:19	WG1129765

Sample Narrative:
L1003188-09 WG1129765: Endpoint pH 4.5

Wet Chemistry by Method 350.1

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.100	1	06/25/2018 16:50	WG1127820

Wet Chemistry by Method 410.4

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
COD	ND		10.0	1	06/20/2018 22:34	WG1127455

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	06/27/2018 17:37	WG1130696
Chloride	ND		1.00	1	06/29/2018 02:20	WG1131469
Fluoride	ND		0.100	1	06/29/2018 02:20	WG1131469
Nitrate	ND	Q	0.100	1	06/29/2018 02:20	WG1131469
Sulfate	ND		5.00	1	06/27/2018 17:37	WG1130696

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.000200	1	06/22/2018 10:06	WG1127641
Mercury,Dissolved	ND		0.000200	1	06/22/2018 12:09	WG1127826

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	06/23/2018 15:02	WG1127928
Boron,Dissolved	ND		0.200	1	06/21/2018 15:56	WG1127249

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Aluminum	ND		0.100	1	06/23/2018 14:54	WG1127540
Aluminum,Dissolved	ND		0.100	1	06/22/2018 17:30	WG1127137
Antimony	ND		0.00200	1	06/23/2018 14:54	WG1127540
Antimony,Dissolved	ND		0.00200	1	06/21/2018 20:56	WG1127137
Arsenic	ND		0.00200	1	06/23/2018 14:54	WG1127540
Arsenic,Dissolved	ND		0.00200	1	06/21/2018 20:56	WG1127137
Barium	ND		0.00500	1	06/23/2018 14:54	WG1127540
Barium,Dissolved	ND		0.00500	1	06/21/2018 20:56	WG1127137

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Beryllium	ND		0.00200	1	06/23/2018 14:54	WG1127540
Beryllium,Dissolved	ND		0.00200	1	06/22/2018 17:30	WG1127137
Cadmium	ND		0.00100	1	06/23/2018 14:54	WG1127540
Cadmium,Dissolved	ND		0.00100	1	06/21/2018 20:56	WG1127137
Calcium	ND		1.00	1	06/23/2018 14:54	WG1127540
Calcium,Dissolved	ND		1.00	1	06/22/2018 17:30	WG1127137
Chromium	ND		0.00200	1	06/23/2018 14:54	WG1127540
Chromium,Dissolved	ND		0.00200	1	07/03/2018 12:12	WG1130986
Cobalt	ND		0.00200	1	06/23/2018 14:54	WG1127540
Cobalt,Dissolved	ND		0.00200	1	06/21/2018 20:56	WG1127137
Copper	ND		0.00500	1	06/23/2018 14:54	WG1127540
Copper,Dissolved	0.00636	B	0.00500	1	07/03/2018 12:12	WG1130986
Iron	ND		0.100	1	06/23/2018 14:54	WG1127540
Iron,Dissolved	ND		0.100	1	06/21/2018 20:56	WG1127137
Lead	ND		0.00200	1	06/23/2018 14:54	WG1127540
Lead,Dissolved	ND		0.00200	1	06/21/2018 20:56	WG1127137
Magnesium	ND		1.00	1	06/23/2018 14:54	WG1127540
Magnesium,Dissolved	ND		1.00	1	06/22/2018 17:30	WG1127137
Manganese	ND		0.00500	1	06/23/2018 14:54	WG1127540
Manganese,Dissolved	ND		0.00500	1	06/21/2018 20:56	WG1127137
Nickel	ND		0.00200	1	06/23/2018 14:54	WG1127540
Nickel,Dissolved	ND		0.00200	1	06/21/2018 20:56	WG1127137
Potassium	ND		1.00	1	06/23/2018 14:54	WG1127540
Potassium,Dissolved	ND		1.00	1	06/22/2018 17:30	WG1127137
Selenium	ND		0.00200	1	06/23/2018 14:54	WG1127540
Selenium,Dissolved	ND		0.00200	1	06/21/2018 20:56	WG1127137
Silver	ND		0.00200	1	06/23/2018 14:54	WG1127540
Silver,Dissolved	ND		0.00200	1	06/21/2018 20:56	WG1127137
Sodium	ND		1.00	1	06/23/2018 14:54	WG1127540
Sodium,Dissolved	ND		1.00	1	06/22/2018 17:30	WG1127137
Thallium	ND		0.00200	1	06/23/2018 14:54	WG1127540
Thallium,Dissolved	ND		0.00200	1	06/21/2018 20:56	WG1127137
Vanadium	ND		0.00500	1	06/23/2018 14:54	WG1127540
Vanadium,Dissolved	ND		0.00500	1	06/21/2018 20:56	WG1127137
Zinc	ND		0.0250	1	06/23/2018 14:54	WG1127540
Zinc,Dissolved	ND		0.0250	1	06/21/2018 20:56	WG1127137

Sample Narrative:

L1003188-09 WG1130986: Copper detection confirmed with duplicate digestion and analysis.

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	06/21/2018 17:37	WG1128014
Acrylonitrile	ND		0.0100	1	06/21/2018 17:37	WG1128014
Benzene	ND		0.00100	1	06/21/2018 17:37	WG1128014
Bromochloromethane	ND		0.00100	1	06/21/2018 17:37	WG1128014
Bromodichloromethane	ND		0.00100	1	06/21/2018 17:37	WG1128014
Bromoform	ND		0.00100	1	06/21/2018 17:37	WG1128014
Bromomethane	ND		0.00500	1	06/21/2018 17:37	WG1128014
Carbon disulfide	ND		0.00100	1	06/21/2018 17:37	WG1128014
Carbon tetrachloride	ND		0.00100	1	06/21/2018 17:37	WG1128014
Chlorobenzene	ND		0.00100	1	06/21/2018 17:37	WG1128014
Chlorodibromomethane	ND		0.00100	1	06/21/2018 17:37	WG1128014
Chloroethane	ND		0.00500	1	06/21/2018 17:37	WG1128014
Chloroform	ND		0.00500	1	06/21/2018 17:37	WG1128014

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloromethane	ND		0.00250	1	06/21/2018 17:37	WG1128014
Dibromomethane	ND		0.00100	1	06/21/2018 17:37	WG1128014
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	06/21/2018 17:37	WG1128014
1,2-Dibromoethane	ND		0.00100	1	06/21/2018 17:37	WG1128014
1,2-Dichlorobenzene	ND		0.00100	1	06/21/2018 17:37	WG1128014
1,4-Dichlorobenzene	ND		0.00100	1	06/21/2018 17:37	WG1128014
trans-1,4-Dichloro-2-butene	ND		0.00250	1	06/21/2018 17:37	WG1128014
1,1-Dichloroethane	ND		0.00100	1	06/21/2018 17:37	WG1128014
1,2-Dichloroethane	ND		0.00100	1	06/21/2018 17:37	WG1128014
1,1-Dichloroethene	ND		0.00100	1	06/21/2018 17:37	WG1128014
cis-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 17:37	WG1128014
trans-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 17:37	WG1128014
1,2-Dichloropropane	ND		0.00100	1	06/21/2018 17:37	WG1128014
cis-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 17:37	WG1128014
trans-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 17:37	WG1128014
Ethylbenzene	ND		0.00100	1	06/21/2018 17:37	WG1128014
2-Hexanone	ND		0.0100	1	06/21/2018 17:37	WG1128014
Iodomethane	ND		0.0100	1	06/21/2018 17:37	WG1128014
2-Butanone (MEK)	ND		0.0100	1	06/21/2018 17:37	WG1128014
Methylene Chloride	ND		0.00500	1	06/21/2018 17:37	WG1128014
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	06/21/2018 17:37	WG1128014
Styrene	ND		0.00100	1	06/21/2018 17:37	WG1128014
1,1,1,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 17:37	WG1128014
1,1,2,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 17:37	WG1128014
Tetrachloroethene	ND		0.00100	1	06/21/2018 17:37	WG1128014
Toluene	ND		0.00100	1	06/21/2018 17:37	WG1128014
1,1,1-Trichloroethane	ND		0.00100	1	06/21/2018 17:37	WG1128014
1,1,2-Trichloroethane	ND		0.00100	1	06/21/2018 17:37	WG1128014
Trichloroethene	ND		0.00100	1	06/21/2018 17:37	WG1128014
Trichlorofluoromethane	ND		0.00500	1	06/21/2018 17:37	WG1128014
1,2,3-Trichloropropane	ND		0.00250	1	06/21/2018 17:37	WG1128014
Vinyl acetate	ND	J4	0.0100	1	06/21/2018 17:37	WG1128014
Vinyl chloride	ND		0.00100	1	06/21/2018 17:37	WG1128014
Xylenes, Total	ND		0.00300	1	06/21/2018 17:37	WG1128014
(S) Toluene-d8	*102*		*80.0-120*		*06/21/2018 17:37*	WG1128014
(S) Dibromofluoromethane	*96.4*		*76.0-123*		*06/21/2018 17:37*	WG1128014
(S) a,a,a-Trifluorotoluene	*104*		*80.0-120*		*06/21/2018 17:37*	WG1128014
(S) 4-Bromofluorobenzene	*101*		*80.0-120*		*06/21/2018 17:37*	WG1128014

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	06/22/2018 03:04	WG1127562
1,2-Dibromo-3-Chloropropane	ND		0.0000202	1.01	06/22/2018 03:04	WG1127562

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	06/21/2018 17:57	WG1128014
Acrylonitrile	ND		0.0100	1	06/21/2018 17:57	WG1128014
Benzene	ND		0.00100	1	06/21/2018 17:57	WG1128014
Bromochloromethane	ND		0.00100	1	06/21/2018 17:57	WG1128014
Bromodichloromethane	ND		0.00100	1	06/21/2018 17:57	WG1128014
Bromoform	ND		0.00100	1	06/21/2018 17:57	WG1128014
Bromomethane	ND		0.00500	1	06/21/2018 17:57	WG1128014
Carbon disulfide	ND		0.00100	1	06/21/2018 17:57	WG1128014
Carbon tetrachloride	ND		0.00100	1	06/21/2018 17:57	WG1128014
Chlorobenzene	ND		0.00100	1	06/21/2018 17:57	WG1128014
Chlorodibromomethane	ND		0.00100	1	06/21/2018 17:57	WG1128014
Chloroethane	ND		0.00500	1	06/21/2018 17:57	WG1128014
Chloroform	ND		0.00500	1	06/21/2018 17:57	WG1128014
Chloromethane	ND		0.00250	1	06/21/2018 17:57	WG1128014
Dibromomethane	ND		0.00100	1	06/21/2018 17:57	WG1128014
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	06/21/2018 17:57	WG1128014
1,2-Dibromoethane	ND		0.00100	1	06/21/2018 17:57	WG1128014
1,2-Dichlorobenzene	ND		0.00100	1	06/21/2018 17:57	WG1128014
1,4-Dichlorobenzene	ND		0.00100	1	06/21/2018 17:57	WG1128014
trans-1,4-Dichloro-2-butene	ND		0.00250	1	06/21/2018 17:57	WG1128014
1,1-Dichloroethane	ND		0.00100	1	06/21/2018 17:57	WG1128014
1,2-Dichloroethane	ND		0.00100	1	06/21/2018 17:57	WG1128014
1,1-Dichloroethene	ND		0.00100	1	06/21/2018 17:57	WG1128014
cis-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 17:57	WG1128014
trans-1,2-Dichloroethene	ND		0.00100	1	06/21/2018 17:57	WG1128014
1,2-Dichloropropane	ND		0.00100	1	06/21/2018 17:57	WG1128014
cis-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 17:57	WG1128014
trans-1,3-Dichloropropene	ND		0.00100	1	06/21/2018 17:57	WG1128014
Ethylbenzene	ND		0.00100	1	06/21/2018 17:57	WG1128014
2-Hexanone	ND		0.0100	1	06/21/2018 17:57	WG1128014
Iodomethane	ND		0.0100	1	06/21/2018 17:57	WG1128014
2-Butanone (MEK)	ND		0.0100	1	06/21/2018 17:57	WG1128014
Methylene Chloride	ND		0.00500	1	06/21/2018 17:57	WG1128014
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	06/21/2018 17:57	WG1128014
Styrene	ND		0.00100	1	06/21/2018 17:57	WG1128014
1,1,1,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 17:57	WG1128014
1,1,2,2-Tetrachloroethane	ND		0.00100	1	06/21/2018 17:57	WG1128014
Tetrachloroethene	ND		0.00100	1	06/21/2018 17:57	WG1128014
Toluene	ND		0.00100	1	06/21/2018 17:57	WG1128014
1,1,1-Trichloroethane	ND		0.00100	1	06/21/2018 17:57	WG1128014
1,1,2-Trichloroethane	ND		0.00100	1	06/21/2018 17:57	WG1128014
Trichloroethene	ND		0.00100	1	06/21/2018 17:57	WG1128014
Trichlorofluoromethane	ND		0.00500	1	06/21/2018 17:57	WG1128014
1,2,3-Trichloropropane	ND		0.00250	1	06/21/2018 17:57	WG1128014
Vinyl acetate	ND	J4	0.0100	1	06/21/2018 17:57	WG1128014
Vinyl chloride	ND		0.00100	1	06/21/2018 17:57	WG1128014
Xylenes, Total	ND		0.00300	1	06/21/2018 17:57	WG1128014
(S) Toluene-d8	*104*		*80.0-120*		*06/21/2018 17:57*	WG1128014
(S) Dibromofluoromethane	*98.1*		*76.0-123*		*06/21/2018 17:57*	WG1128014
(S) a,a,a-Trifluorotoluene	*104*		*80.0-120*		*06/21/2018 17:57*	WG1128014
(S) 4-Bromofluorobenzene	*104*		*80.0-120*		*06/21/2018 17:57*	WG1128014

Method Blank (MB)

(MB) R3319819-1 06/21/18 15:01

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hardness (colorimetric) as CaCO3	2.57	J	1.43	30.0

L1002590-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1002590-01 06/21/18 15:06 • (DUP) R3319819-4 06/21/18 15:07

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hardness (colorimetric) as CaCO3	140	137	1	2.17		20

L1002886-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1002886-01 06/21/18 15:15 • (DUP) R3319819-7 06/21/18 15:16

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hardness (colorimetric) as CaCO3	140	136	1	2.90		20

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

(LCS) R3319819-2 06/21/18 15:02 • (LCSD) R3319819-3 06/21/18 15:03

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 %
Hardness (colorimetric) as CaCO3	150	147	149	98.0	99.3	85.0-115			1.35	20

L1002603-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1002603-01 06/21/18 15:12 • (MS) R3319819-5 06/21/18 15:13 • (MSD) R3319819-6 06/21/18 15:13

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hardness (colorimetric) as CaCO3	150	130	220	223	60.0	62.0	1	80.0-120	E J6	E J6	1.35	20

Method Blank (MB)

(MB) R3319870-1 06/21/18 15:48

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hardness (colorimetric) as CaCO3	5.35	J	1.43	30.0

L1003188-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1003188-08 06/21/18 16:19 • (DUP) R3319870-4 06/21/18 16:20

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hardness (colorimetric) as CaCO3	ND	22.1	1	28.3	J P1	20

L1003214-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1003214-03 06/21/18 16:31 • (DUP) R3319870-7 06/21/18 16:32

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hardness (colorimetric) as CaCO3	64.1	59.0	1	8.29		20

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

(LCS) R3319870-2 06/21/18 15:49 • (LCSD) R3319870-3 06/21/18 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 %
Hardness (colorimetric) as CaCO3	150	158	152	105	101	85.0-115			3.87	20

L1003211-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003211-01 06/21/18 17:04 • (MS) R3319870-5 06/21/18 16:24 • (MSD) R3319870-6 06/21/18 16:25

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 %
Hardness (colorimetric) as CaCO3	150	52.2	179	178	84.5	83.9	1	80.0-120			0.560	20

L1002745-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1002745-01 06/26/18 12:06 • (DUP) R3320957-1 06/26/18 12:16

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	58.5	58.4	1	0.0729		20

Sample Narrative:

OS: Endpoint pH 4.5 headspace

DUP: Endpoint pH 4.5

L1003190-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1003190-10 06/26/18 16:26 • (DUP) R3320957-4 06/26/18 16:35

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	20.9	21.1	1	0.927		20

Sample Narrative:

OS: Endpoint pH 4.5 headspace

DUP: Endpoint pH 4.5

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

(LCS) R3320957-2 06/26/18 12:47 • (LCSD) R3320957-3 06/26/18 12:57

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 %
Alkalinity	100	101	101	101	101	85.0-115			0.0309	20

Sample Narrative:

LCS: Endpoint pH 4.5

LCSD: Endpoint pH 4.5

Method Blank (MB)

(MB) R3320731-1 06/25/18 16:15

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Ammonia Nitrogen	U		0.0317	0.100

L1003142-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1003142-02 06/25/18 16:26 • (DUP) R3320731-4 06/25/18 16:27

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Ammonia Nitrogen	ND	0.0560	1	0.000		10

L1003212-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1003212-01 06/25/18 17:01 • (DUP) R3320731-6 06/25/18 17:02

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Ammonia Nitrogen	0.327	0.315	1	3.74		10

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

(LCS) R3320731-2 06/25/18 16:16 • (LCSD) R3320731-3 06/25/18 16:18

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ammonia Nitrogen	7.50	7.31	7.59	97.4	101	90.0-110			3.80	10

L1003145-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1003145-03 06/25/18 16:29 • (MS) R3320731-5 06/25/18 16:35

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Ammonia Nitrogen	5.00	0.112	5.08	99.3	1	90.0-110	

L1003212-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003212-03 06/25/18 17:04 • (MS) R3320731-7 06/25/18 17:05 • (MSD) R3320731-8 06/25/18 17:07

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Ammonia Nitrogen	5.00	0.661	5.21	5.47	90.9	96.2	1	90.0-110			4.96	10

Method Blank (MB)

(MB) R3319545-1 06/20/18 22:26

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
COD	U		3.00	10.0

L1002912-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1002912-01 06/20/18 22:29 • (DUP) R3319545-4 06/20/18 22:29

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
COD	5630	5910	20	4.94		20

L1003198-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1003198-02 06/20/18 22:35 • (DUP) R3319545-7 06/20/18 22:35

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
COD	8780	8840	50	0.658		20

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

(LCS) R3319545-2 06/20/18 22:26 • (LCSD) R3319545-3 06/20/18 22:26

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 %
COD	242	219	224	90.7	92.6	90.0-110			2.09	20

L1003188-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003188-02 06/20/18 22:31 • (MS) R3319545-5 06/20/18 22:31 • (MSD) R3319545-6 06/20/18 22:31

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
COD	400	ND	404	398	101	99.5	1	80.0-120			1.48	20

Method Blank (MB)

(MB) R3319521-1 06/20/18 11:45

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Bromide	U		0.0790	1.00
Chloride	U		0.0519	1.00
Fluoride	U		0.00990	0.100
Nitrate	U		0.0227	0.100
Sulfate	0.373	J	0.0774	5.00

L1002928-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1002928-05 06/20/18 18:53 • (DUP) R3319521-4 06/20/18 19:08

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	ND	0.665	1	0.000		15
Fluoride	0.146	0.167	1	13.1		15
Nitrate	8.62	8.69	1	0.819		15

L1002958-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1002958-04 06/20/18 21:58 • (DUP) R3319521-6 06/20/18 22:13

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	U	0.000	1	0.000		15
Chloride	4.37	4.35	1	0.477		15
Fluoride	0.0659	0.0769	1	15.4	J P1	15
Nitrate	1.44	1.48	1	2.69		15
Sulfate	1.30	1.30	1	0.123	J	15

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

(LCS) R3319521-2 06/20/18 12:00 • (LCSD) R3319521-3 06/20/18 12:16

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 %
Bromide	40.0	39.0	39.0	97.5	97.5	80.0-120			0.0192	15
Chloride	40.0	38.9	38.9	97.2	97.3	80.0-120			0.112	15
Fluoride	8.00	8.06	8.05	101	101	80.0-120			0.109	15
Nitrate	8.00	8.16	8.18	102	102	80.0-120			0.255	15
Sulfate	40.0	39.5	39.6	98.9	98.9	80.0-120			0.0245	15

L1002928-05 Original Sample (OS) • Matrix Spike (MS)

(OS) L1002928-05 06/20/18 18:53 • (MS) R3319521-5 06/20/18 19:24

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Bromide	50.0	ND	48.8	96.3	1	80.0-120	
Fluoride	5.00	0.146	5.11	99.2	1	80.0-120	
Nitrate	5.00	8.62	13.7	102	1	80.0-120	E

L1002958-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1002958-04 06/20/18 21:58 • (MS) R3319521-7 06/20/18 22:29 • (MSD) R3319521-8 06/20/18 22:44

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	U	47.9	51.6	95.8	103	1	80.0-120			7.52	15
Chloride	50.0	4.37	57.8	56.4	107	104	1	80.0-120			2.35	15
Fluoride	5.00	0.0659	5.06	5.28	99.9	104	1	80.0-120			4.31	15
Nitrate	5.00	1.44	6.48	6.84	101	108	1	80.0-120			5.51	15
Sulfate	50.0	1.30	49.7	53.3	96.8	104	1	80.0-120			6.95	15

Method Blank (MB)

(MB) R3321486-1 06/27/18 13:17

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Bromide	U		0.0790	1.00
Sulfate	U		0.0774	5.00

L1002910-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1002910-02 06/27/18 16:14 • (DUP) R3321486-4 06/27/18 16:28

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	ND	0.000	1	0.000		15
Sulfate	85.1	85.4	1	0.335		15

L1003340-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1003340-02 06/27/18 19:54 • (DUP) R3321486-7 06/27/18 20:07

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	ND	0.000	1	0.000		15
Sulfate	ND	4.09	1	0.000		15

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

(LCS) R3321486-2 06/27/18 13:31 • (LCSD) R3321486-3 06/27/18 13:45

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 %
Bromide	40.0	40.3	40.4	101	101	80.0-120			0.114	15
Sulfate	40.0	40.7	40.7	102	102	80.0-120			0.0366	15

L1002910-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1002910-02 06/27/18 16:14 • (MS) R3321486-5 06/27/18 16:41 • (MSD) R3321486-6 06/27/18 16:55

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	48.2	49.9	96.5	99.9	1	80.0-120			3.47	15
Sulfate	50.0	85.1	133	135	95.3	99.4	1	80.0-120	E	E	1.54	15

L1003340-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1003340-02 06/27/18 19:54 • (MS) R3321486-8 06/27/18 20:49

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Bromide	50.0	ND	49.6	99.1	1	80.0-120	
Sulfate	50.0	ND	55.7	103	1	80.0-120	

Method Blank (MB)

(MB) R3321916-1 06/29/18 01:11

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.0519	1.00
Fluoride	U		0.00990	0.100
Nitrate	U		0.0227	0.100

L1004734-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1004734-01 06/29/18 03:02 • (DUP) R3321916-4 06/29/18 03:16

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	12.4	12.4	1	0.158		15
Fluoride	0.226	0.229	1	1.19		15

L1004735-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1004735-01 06/29/18 04:12 • (DUP) R3321916-6 06/29/18 04:26

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	9.06	9.06	1	0.0463		15
Fluoride	0.210	0.216	1	2.77		15

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

(LCS) R3321916-2 06/29/18 01:25 • (LCSD) R3321916-3 06/29/18 01:39

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chloride	40.0	39.9	40.0	99.8	100	80.0-120			0.225	15
Fluoride	8.00	8.55	8.60	107	108	80.0-120			0.637	15
Nitrate	8.00	8.73	8.74	109	109	80.0-120			0.143	15

L1004734-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1004734-01 06/29/18 03:02 • (MS) R3321916-5 06/29/18 03:30

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	12.4	69.4	114	1	80.0-120	
Fluoride	5.00	0.226	5.85	112	1	80.0-120	

L1004735-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1004735-01 06/29/18 04:12 • (MS) R3321916-7 06/29/18 04:40 • (MSD) R3321916-8 06/29/18 04:53

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50.0	9.06	59.5	62.5	101	107	1	80.0-120			4.99	15
Fluoride	5.00	0.210	5.17	5.82	99.2	112	1	80.0-120			11.9	15

Method Blank (MB)

(MB) R3322174-1 06/29/18 16:49

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Nitrate	U		0.0227	0.100

L1005538-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1005538-05 06/29/18 18:46 • (DUP) R3322174-4 06/29/18 19:01

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Nitrate	0.105	0.107	1	1.41		15

L1005576-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1005576-01 06/30/18 04:00 • (DUP) R3322174-7 06/30/18 04:15

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Nitrate	U	0.000	1	0.000		15

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

(LCS) R3322174-2 06/29/18 17:04 • (LCSD) R3322174-3 06/29/18 17:19

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 %
Nitrate	8.00	8.43	8.43	105	105	80.0-120			0.0557	15

L1005538-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1005538-05 06/29/18 18:46 • (MS) R3322174-5 06/29/18 19:17 • (MSD) R3322174-6 06/29/18 19:32

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 %
Nitrate	5.00	0.105	4.78	4.82	93.5	94.4	1	80.0-120			0.904	15

L1005576-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1005576-01 06/30/18 04:00 • (MS) R3322174-8 06/30/18 04:31

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Nitrate	5.00	U	3.78	75.6	1	80.0-120	J6

Method Blank (MB)

(MB) R3320066-1 06/22/18 09:33

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Mercury	U		0.0000490	0.000200

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

(LCS) R3320066-2 06/22/18 09:35 • (LCSD) R3320066-3 06/22/18 09:37

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	%	%	%			%	%
Mercury	0.00300	0.00303	0.00288	101	96.0	80.0-120			4.96	20

L1003188-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003188-01 06/22/18 09:39 • (MS) R3320066-4 06/22/18 09:41 • (MSD) R3320066-5 06/22/18 09:43

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	0.00300	0.00319	0.00603	0.00614	94.7	98.2	1	75.0-125			1.71	20

Method Blank (MB)

(MB) R3320110-1 06/22/18 11:31

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury,Dissolved	U		0.0000490	0.000200

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

(LCS) R3320110-2 06/22/18 11:37 • (LCSD) R3320110-3 06/22/18 11:39

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Mercury,Dissolved	0.00300	0.00291	0.00274	96.9	91.3	80.0-120			6.01	20

L1003188-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003188-02 06/22/18 11:41 • (MS) R3320110-4 06/22/18 11:44 • (MSD) R3320110-5 06/22/18 11:46

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 %
Mercury,Dissolved	0.00300	ND	0.00300	0.00281	100	93.7	1	75.0-125			6.52	20

Method Blank (MB)

(MB) R3319812-5 06/21/18 14:52

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

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

(LCS) R3319812-6 06/21/18 14:54 • (LCSD) R3319812-1 06/21/18 14:27

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Boron,Dissolved	1.00	0.988	0.981	98.8	98.1	80.0-120			0.746	20

L1002882-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1002882-04 06/21/18 14:29 • (MS) R3319812-3 06/21/18 14:34 • (MSD) R3319812-4 06/21/18 14:37

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron,Dissolved	1.00	U	0.934	0.959	93.4	95.9	1	75.0-125			2.56	20

Method Blank (MB)

(MB) R3320384-1 06/23/18 14:16

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Boron	U		0.0126	0.200

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

(LCS) R3320384-2 06/23/18 14:18 • (LCSD) R3320384-3 06/23/18 14:21

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	0.929	0.933	92.9	93.3	80.0-120			0.448	20

L1003274-23 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003274-23 06/23/18 14:23 • (MS) R3320384-5 06/23/18 14:28 • (MSD) R3320384-6 06/23/18 14:31

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron	1.00	0.215	1.16	1.19	94.4	97.7	1	75.0-125			2.78	20

Method Blank (MB)

(MB) R3319939-1 06/21/18 18:49

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Antimony,Dissolved	U		0.000754	0.00200
Arsenic,Dissolved	U		0.000250	0.00200
Barium,Dissolved	U		0.000360	0.00500
Beryllium,Dissolved	U		0.000120	0.00200
Cadmium,Dissolved	U		0.000160	0.00100
Chromium,Dissolved	0.00184	J	0.000540	0.00200
Copper,Dissolved	U		0.000520	0.00500
Cobalt,Dissolved	U		0.000260	0.00200
Iron,Dissolved	U		0.0150	0.100
Lead,Dissolved	U		0.000240	0.00200
Manganese,Dissolved	U		0.000250	0.00500
Nickel,Dissolved	U		0.000350	0.00200
Selenium,Dissolved	U		0.000380	0.00200
Silver,Dissolved	U		0.000310	0.00200
Thallium,Dissolved	U		0.000190	0.00200
Vanadium,Dissolved	U		0.000180	0.00500
Zinc,Dissolved	U		0.00256	0.0250

Method Blank (MB)

(MB) R3319940-1 06/21/18 23:50

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Aluminum,Dissolved	0.0207	J	0.00515	0.100
Calcium,Dissolved	U		0.0460	1.00
Magnesium,Dissolved	U		0.100	1.00
Potassium,Dissolved	0.0462	J	0.0370	1.00
Sodium,Dissolved	0.313	J	0.110	1.00

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

(LCS) R3319939-2 06/21/18 18:54 • (LCSD) R3319939-3 06/21/18 18:59

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 %
Antimony,Dissolved	0.0500	0.0479	0.0481	95.8	96.3	80.0-120			0.460	20
Arsenic,Dissolved	0.0500	0.0486	0.0485	97.2	97.0	80.0-120			0.256	20
Barium,Dissolved	0.0500	0.0469	0.0465	93.9	93.1	80.0-120			0.874	20
Beryllium,Dissolved	0.0500	0.0484	0.0491	96.8	98.2	80.0-120			1.39	20
Cadmium,Dissolved	0.0500	0.0485	0.0469	97.0	93.8	80.0-120			3.31	20

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

(LCS) R3319939-2 06/21/18 18:54 • (LCSD) R3319939-3 06/21/18 18:59

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 %
Chromium,Dissolved	0.0500	0.0485	0.0478	97.0	95.6	80.0-120			1.38	20
Copper,Dissolved	0.0500	0.0503	0.0494	101	98.8	80.0-120			1.78	20
Cobalt,Dissolved	0.0500	0.0505	0.0504	101	101	80.0-120			0.332	20
Iron,Dissolved	5.00	4.63	4.60	92.7	92.0	80.0-120			0.727	20
Lead,Dissolved	0.0500	0.0486	0.0488	97.3	97.6	80.0-120			0.324	20
Manganese,Dissolved	0.0500	0.0434	0.0437	86.8	87.5	80.0-120			0.765	20
Nickel,Dissolved	0.0500	0.0515	0.0515	103	103	80.0-120			0.0811	20
Selenium,Dissolved	0.0500	0.0465	0.0477	92.9	95.4	80.0-120			2.61	20
Silver,Dissolved	0.0500	0.0507	0.0495	101	99.1	80.0-120			2.31	20
Thallium,Dissolved	0.0500	0.0478	0.0482	95.6	96.5	80.0-120			0.908	20
Vanadium,Dissolved	0.0500	0.0452	0.0460	90.5	92.0	80.0-120			1.71	20
Zinc,Dissolved	0.0500	0.0484	0.0485	96.7	97.1	80.0-120			0.327	20

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

(LCS) R3319940-2 06/21/18 23:55 • (LCSD) R3319940-3 06/22/18 00:00

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 %
Aluminum,Dissolved	5.00	4.54	4.54	90.8	90.8	80.0-120			0.0900	20
Calcium,Dissolved	5.00	4.98	4.73	99.6	94.6	80.0-120			5.18	20
Magnesium,Dissolved	5.00	4.73	4.71	94.6	94.1	80.0-120			0.528	20
Potassium,Dissolved	5.00	4.85	4.75	97.1	94.9	80.0-120			2.27	20
Sodium,Dissolved	5.00	5.04	5.01	101	100	80.0-120			0.586	20

L1003188-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003188-01 06/21/18 19:04 • (MS) R3319939-5 06/21/18 19:13 • (MSD) R3319939-6 06/21/18 19:18

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony,Dissolved	0.0500	ND	0.0488	0.0488	97.7	97.6	1	75.0-125			0.0340	20
Arsenic,Dissolved	0.0500	0.00784	0.0557	0.0563	95.7	96.9	1	75.0-125			1.07	20
Barium,Dissolved	0.0500	0.0175	0.0664	0.0649	97.9	94.9	1	75.0-125			2.31	20
Beryllium,Dissolved	0.0500	ND	0.0496	0.0491	99.2	98.2	1	75.0-125			1.05	20
Cadmium,Dissolved	0.0500	ND	0.0485	0.0476	97.0	95.3	1	75.0-125			1.81	20
Chromium,Dissolved	0.0500	ND	0.0488	0.0479	93.8	91.9	1	75.0-125			1.95	20
Copper,Dissolved	0.0500	ND	0.0521	0.0512	99.4	97.5	1	75.0-125			1.83	20
Cobalt,Dissolved	0.0500	0.0222	0.0730	0.0735	102	103	1	75.0-125			0.661	20
Iron,Dissolved	5.00	6.47	11.3	11.3	97.4	97.0	1	75.0-125			0.168	20
Lead,Dissolved	0.0500	ND	0.0495	0.0490	99.0	98.1	1	75.0-125			0.945	20

L1003188-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003188-01 06/21/18 19:04 • (MS) R3319939-5 06/21/18 19:13 • (MSD) R3319939-6 06/21/18 19:18

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Manganese,Dissolved	0.0500	0.440	0.482	0.484	85.8	89.9	1	75.0-125			0.424	20
Nickel,Dissolved	0.0500	0.00635	0.0571	0.0573	102	102	1	75.0-125			0.391	20
Selenium,Dissolved	0.0500	ND	0.0486	0.0491	97.2	98.1	1	75.0-125			0.967	20
Silver,Dissolved	0.0500	ND	0.0509	0.0506	102	101	1	75.0-125			0.699	20
Thallium,Dissolved	0.0500	ND	0.0484	0.0482	96.9	96.5	1	75.0-125			0.420	20
Vanadium,Dissolved	0.0500	ND	0.0459	0.0448	91.7	89.5	1	75.0-125			2.42	20
Zinc,Dissolved	0.0500	ND	0.0568	0.0584	91.8	95.0	1	75.0-125			2.79	20

L1003188-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003188-01 06/22/18 00:04 • (MS) R3319940-5 06/22/18 00:13 • (MSD) R3319940-6 06/22/18 00:18

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum,Dissolved	5.00	ND	4.61	4.64	91.3	91.9	1	75.0-125			0.673	20
Calcium,Dissolved	5.00	3.47	8.27	8.35	96.1	97.6	1	75.0-125			0.906	20
Potassium,Dissolved	5.00	1.11	5.89	5.85	95.6	94.7	1	75.0-125			0.787	20
Magnesium,Dissolved	5.00	2.12	6.83	6.88	94.2	95.2	1	75.0-125			0.745	20
Sodium,Dissolved	5.00	3.04	7.80	7.88	95.2	96.8	1	75.0-125			0.985	20

Method Blank (MB)

(MB) R3320366-1 06/23/18 12:43

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Aluminum	0.0152	J	0.00515	0.100
Antimony	U		0.000754	0.00200
Arsenic	U		0.000250	0.00200
Barium	U		0.000360	0.00500
Beryllium	U		0.000120	0.00200
Cadmium	U		0.000160	0.00100
Calcium	U		0.0460	1.00
Chromium	U		0.000540	0.00200
Copper	U		0.000520	0.00500
Cobalt	U		0.000260	0.00200
Iron	0.0203	J	0.0150	0.100
Lead	U		0.000240	0.00200
Magnesium	U		0.100	1.00
Manganese	U		0.000250	0.00500
Nickel	U		0.000350	0.00200
Potassium	0.0468	J	0.0370	1.00
Selenium	U		0.000380	0.00200
Silver	U		0.000310	0.00200
Sodium	U		0.110	1.00
Thallium	U		0.000190	0.00200
Vanadium	U		0.000180	0.00500
Zinc	U		0.00256	0.0250

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

(LCS) R3320366-2 06/23/18 12:48 • (LCSD) R3320366-3 06/23/18 12:53

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	4.83	4.90	96.7	97.9	80.0-120			1.29	20
Antimony	0.0500	0.0488	0.0499	97.6	99.8	80.0-120			2.23	20
Arsenic	0.0500	0.0466	0.0483	93.2	96.5	80.0-120			3.45	20
Barium	0.0500	0.0470	0.0463	94.0	92.5	80.0-120			1.59	20
Beryllium	0.0500	0.0481	0.0480	96.1	96.1	80.0-120			0.0409	20
Cadmium	0.0500	0.0505	0.0507	101	101	80.0-120			0.347	20
Calcium	5.00	4.82	5.12	96.4	102	80.0-120			6.06	20
Chromium	0.0500	0.0500	0.0506	100	101	80.0-120			1.13	20
Copper	0.0500	0.0509	0.0516	102	103	80.0-120			1.41	20
Cobalt	0.0500	0.0508	0.0518	102	104	80.0-120			1.86	20
Iron	5.00	4.97	5.02	99.5	100	80.0-120			0.998	20

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

(LCS) R3320366-2 06/23/18 12:48 • (LCSD) R3320366-3 06/23/18 12:53

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	0.0500	0.0482	0.0494	96.5	98.8	80.0-120			2.35	20
Magnesium	5.00	4.89	5.02	97.8	100	80.0-120			2.66	20
Manganese	0.0500	0.0488	0.0497	97.7	99.3	80.0-120			1.66	20
Nickel	0.0500	0.0510	0.0510	102	102	80.0-120			0.0262	20
Potassium	5.00	4.73	4.93	94.5	98.6	80.0-120			4.23	20
Selenium	0.0500	0.0521	0.0544	104	109	80.0-120			4.25	20
Silver	0.0500	0.0491	0.0499	98.2	99.9	80.0-120			1.68	20
Sodium	5.00	4.92	5.03	98.4	101	80.0-120			2.22	20
Thallium	0.0500	0.0481	0.0487	96.2	97.4	80.0-120			1.24	20
Vanadium	0.0500	0.0489	0.0496	97.9	99.1	80.0-120			1.24	20
Zinc	0.0500	0.0502	0.0497	100	99.4	80.0-120			1.02	20

L1003087-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003087-01 06/23/18 12:57 • (MS) R3320366-5 06/23/18 13:06 • (MSD) R3320366-6 06/23/18 13:11

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	5.00	ND	4.87	4.79	96.8	95.2	1	75.0-125			1.73	20
Antimony	0.0500	ND	0.0508	0.0502	102	100	1	75.0-125			1.18	20
Arsenic	0.0500	0.00459	0.0520	0.0523	94.8	95.4	1	75.0-125			0.548	20
Barium	0.0500	0.0464	0.0946	0.0936	96.3	94.3	1	75.0-125			1.04	20
Beryllium	0.0500	ND	0.0474	0.0462	94.8	92.3	1	75.0-125			2.66	20
Cadmium	0.0500	ND	0.0485	0.0489	97.1	97.8	1	75.0-125			0.721	20
Calcium	5.00	39.0	43.2	42.6	85.5	72.2	1	75.0-125		V	1.55	20
Chromium	0.0500	0.00237	0.0507	0.0500	96.7	95.4	1	75.0-125			1.30	20
Copper	0.0500	ND	0.0493	0.0492	97.1	96.8	1	75.0-125			0.308	20
Cobalt	0.0500	ND	0.0492	0.0485	98.4	97.0	1	75.0-125			1.42	20
Potassium	5.00	11.3	16.0	16.1	94.1	95.0	1	75.0-125			0.265	20
Iron	5.00	ND	4.79	4.79	95.8	95.8	1	75.0-125			0.0338	20
Lead	0.0500	ND	0.0489	0.0485	97.8	97.0	1	75.0-125			0.862	20
Magnesium	5.00	34.6	39.1	38.2	89.6	72.8	1	75.0-125		V	2.18	20
Manganese	0.0500	ND	0.0472	0.0475	94.4	95.0	1	75.0-125			0.638	20
Nickel	0.0500	ND	0.0495	0.0493	96.8	96.4	1	75.0-125			0.346	20
Selenium	0.0500	0.00321	0.0521	0.0514	97.8	96.4	1	75.0-125			1.36	20
Silver	0.0500	ND	0.0493	0.0495	98.6	99.0	1	75.0-125			0.436	20
Sodium	5.00	52.2	56.2	55.0	79.6	55.6	1	75.0-125		V	2.16	20
Thallium	0.0500	ND	0.0488	0.0486	97.6	97.2	1	75.0-125			0.404	20
Vanadium	0.0500	0.0208	0.0690	0.0686	96.3	95.5	1	75.0-125			0.568	20
Zinc	0.0500	ND	0.0467	0.0467	93.5	93.3	1	75.0-125			0.156	20

Method Blank (MB)

(MB) R3322819-1 07/03/18 11:40

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chromium,Dissolved	U		0.000540	0.00200
Copper,Dissolved	0.000924	J	0.000520	0.00500

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

(LCS) R3322819-2 07/03/18 11:45 • (LCSD) R3322819-3 07/03/18 11:50

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 %
Chromium,Dissolved	0.0500	0.0502	0.0494	100	98.8	80.0-120			1.61	20
Copper,Dissolved	0.0500	0.0518	0.0513	104	103	80.0-120			0.966	20

L1005209-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1005209-10 07/03/18 11:54 • (MS) R3322819-5 07/03/18 12:03 • (MSD) R3322819-6 07/03/18 12:08

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chromium,Dissolved	0.0500	0.0346	0.0807	0.0821	92.4	95.1	1	75.0-125			1.68	20
Copper,Dissolved	0.0500	ND	0.0506	0.0492	94.7	92.0	1	75.0-125			2.72	20

Method Blank (MB)

(MB) R3320163-3 06/21/18 17:17

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

Method Blank (MB)

(MB) R3320163-3 06/21/18 17:17

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	*104*			*80.0-120*
(S) Dibromofluoromethane	*97.5*			*76.0-123*
(S) a,a,a-Trifluorotoluene	*103*			*80.0-120*
(S) 4-Bromofluorobenzene	*102*			*80.0-120*

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

(LCS) R3320163-1 06/21/18 16:17 • (LCSD) R3320163-2 06/21/18 16:37

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	0.156	130	124	10.0-160			4.05	23
Acrylonitrile	0.125	0.140	0.136	112	109	60.0-142			3.25	20
Benzene	0.0250	0.0235	0.0227	93.9	90.6	69.0-123			3.57	20
Bromodichloromethane	0.0250	0.0239	0.0237	95.4	94.6	76.0-120			0.799	20
Bromochloromethane	0.0250	0.0239	0.0229	95.6	91.7	76.0-122			4.21	20
Bromoform	0.0250	0.0295	0.0290	118	116	67.0-132			1.69	20
Bromomethane	0.0250	0.0214	0.0204	85.7	81.4	18.0-160			5.08	20
Carbon disulfide	0.0250	0.0257	0.0249	103	99.4	55.0-127			3.20	20
Carbon tetrachloride	0.0250	0.0273	0.0264	109	105	63.0-122			3.48	20
Chlorobenzene	0.0250	0.0258	0.0253	103	101	79.0-121			2.00	20
Chlorodibromomethane	0.0250	0.0265	0.0262	106	105	75.0-125			1.20	20
Chloroethane	0.0250	0.0218	0.0212	87.3	84.8	47.0-152			3.00	20
Chloroform	0.0250	0.0249	0.0236	99.5	94.6	72.0-121			5.14	20
Chloromethane	0.0250	0.0305	0.0294	122	118	48.0-139			3.41	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0210	0.0216	84.2	86.3	64.0-127			2.52	20
1,2-Dibromoethane	0.0250	0.0251	0.0247	100	99.0	77.0-123			1.47	20
Dibromomethane	0.0250	0.0252	0.0248	101	99.2	78.0-120			1.38	20
1,2-Dichlorobenzene	0.0250	0.0244	0.0244	97.5	97.8	80.0-120			0.235	20
1,4-Dichlorobenzene	0.0250	0.0259	0.0255	104	102	77.0-120			1.66	20
trans-1,4-Dichloro-2-butene	0.0250	0.0173	0.0161	69.2	64.2	55.0-134			7.50	20
1,1-Dichloroethane	0.0250	0.0253	0.0247	101	98.6	70.0-126			2.68	20
1,2-Dichloroethane	0.0250	0.0268	0.0254	107	102	67.0-126			5.19	20

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

(LCS) R3320163-1 06/21/18 16:17 • (LCSD) R3320163-2 06/21/18 16:37

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 %
1,1-Dichloroethene	0.0250	0.0266	0.0258	107	103	64.0-129			3.30	20
cis-1,2-Dichloroethene	0.0250	0.0231	0.0227	92.4	91.0	73.0-120			1.51	20
trans-1,2-Dichloroethene	0.0250	0.0242	0.0231	96.9	92.3	71.0-121			4.80	20
1,2-Dichloropropane	0.0250	0.0250	0.0251	99.9	101	75.0-125			0.703	20
cis-1,3-Dichloropropene	0.0250	0.0237	0.0240	94.9	96.1	79.0-123			1.17	20
trans-1,3-Dichloropropene	0.0250	0.0242	0.0251	96.9	100	74.0-127			3.39	20
Ethylbenzene	0.0250	0.0255	0.0254	102	102	77.0-120			0.242	20
2-Hexanone	0.125	0.141	0.137	113	109	58.0-147			3.00	20
Iodomethane	0.125	0.125	0.122	100	97.6	57.0-140			2.51	20
2-Butanone (MEK)	0.125	0.153	0.148	122	118	37.0-158			3.49	20
Methylene Chloride	0.0250	0.0220	0.0214	87.9	85.6	66.0-121			2.62	20
4-Methyl-2-pentanone (MIBK)	0.125	0.159	0.158	127	126	59.0-143			0.787	20
Styrene	0.0250	0.0283	0.0278	113	111	78.0-124			1.82	20
1,1,1,2-Tetrachloroethane	0.0250	0.0253	0.0251	101	100	75.0-122			0.720	20
1,1,2,2-Tetrachloroethane	0.0250	0.0206	0.0198	82.3	79.4	71.0-122			3.57	20
Tetrachloroethene	0.0250	0.0264	0.0263	106	105	70.0-127			0.344	20
Toluene	0.0250	0.0247	0.0239	98.6	95.5	77.0-120			3.25	20
1,1,1-Trichloroethane	0.0250	0.0274	0.0263	110	105	68.0-122			4.10	20
1,1,2-Trichloroethane	0.0250	0.0245	0.0246	98.0	98.4	78.0-120			0.410	20
Trichloroethene	0.0250	0.0265	0.0262	106	105	78.0-120			1.46	20
Trichlorofluoromethane	0.0250	0.0276	0.0265	110	106	56.0-137			4.18	20
1,2,3-Trichloropropane	0.0250	0.0251	0.0249	100	99.5	72.0-124			0.842	20
Vinyl acetate	0.125	0.0567	0.0624	45.4	49.9	46.0-160	J4		9.61	20
Vinyl chloride	0.0250	0.0239	0.0234	95.5	93.7	64.0-133			1.90	20
Xylenes, Total	0.0750	0.0757	0.0753	101	100	77.0-120			0.530	20
(S) Toluene-d8				*103*	*103*	*80.0-120*				
(S) Dibromofluoromethane				*97.4*	*94.5*	*76.0-123*				
(S) a,a,a-Trifluorotoluene				*104*	*106*	*80.0-120*				
(S) 4-Bromofluorobenzene				*102*	*105*	*80.0-120*				

Method Blank (MB)

(MB) R3320086-1 06/21/18 21:00

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Ethylene Dibromide	U		0.00000240	0.0000100
1,2-Dibromo-3-Chloropropane	U		0.00000430	0.0000200

L1002882-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1002882-01 06/21/18 21:46 • (DUP) R3320086-3 06/21/18 21:35

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Ethylene Dibromide	U	0.000	.998			20
1,2-Dibromo-3-Chloropropane	U	0.000	.998			20

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

(LCS) R3320086-4 06/21/18 23:49 • (LCSD) R3320086-5 06/22/18 02:15

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethylene Dibromide	0.000250	0.000256	0.000252	102	101	60.0-140			1.57	20
1,2-Dibromo-3-Chloropropane	0.000250	0.000258	0.000250	103	100	60.0-140			3.15	20

L1002882-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1002882-02 06/21/18 21:23 • (MS) R3320086-2 06/21/18 21:12

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Ethylene Dibromide	0.0000998	U	0.000123	123	.998	72.0-146	
1,2-Dibromo-3-Chloropropane	0.0000998	U	0.000110	110	.998	63.0-149	

Method Blank (MB)

(MB) R3320087-1 06/22/18 02:40

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Ethylene Dibromide	U		0.00000240	0.0000100
1,2-Dibromo-3-Chloropropane	U		0.00000430	0.0000200

L1003188-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1003188-08 06/22/18 03:29 • (DUP) R3320087-3 06/22/18 03:17

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Ethylene Dibromide	ND	0.000	1.01			20
1,2-Dibromo-3-Chloropropane	ND	0.000	1.01			20

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

(LCS) R3320087-4 06/22/18 05:31 • (LCSD) R3320087-5 06/22/18 06:32

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethylene Dibromide	0.000250	0.000243	0.000236	97.2	94.4	60.0-140			2.92	20
1,2-Dibromo-3-Chloropropane	0.000250	0.000243	0.000242	97.2	96.8	60.0-140			0.412	20

L1003188-09 Original Sample (OS) • Matrix Spike (MS)

(OS) L1003188-09 06/22/18 03:04 • (MS) R3320087-2 06/22/18 02:52

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Ethylene Dibromide	0.000101	ND	0.000117	116	1.01	72.0-146	
1,2-Dibromo-3-Chloropropane	0.000101	ND	0.000125	124	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, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
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.
J4	The associated batch QC was outside the established quality control range for accuracy.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P	RPD between the primary and confirmatory analysis exceeded 40%.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
Q	Sample was prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values.
T8	Sample(s) received past/too close to holding time expiration.
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.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

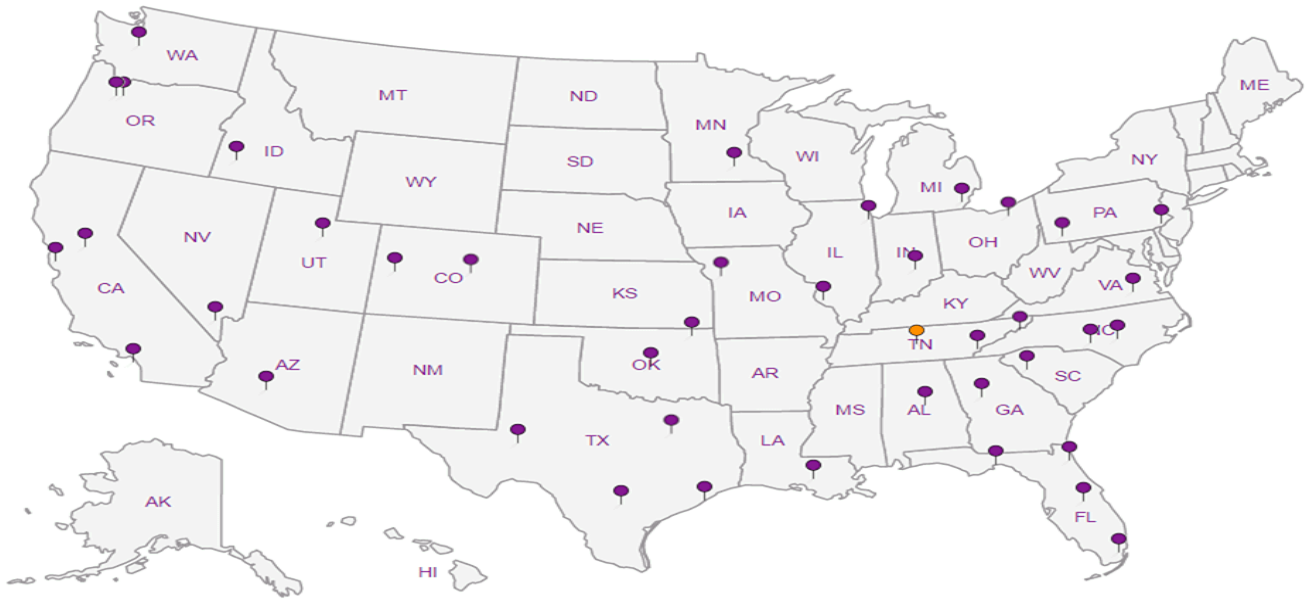
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

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

Report to: Philip Campbell

Email To: pcampbell@cecinc.com

Project Description: EWS Camden Class 2 Landfill

City/State Collected:

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

Client Project # 171-873

Lab Project # CEC-EWS CAMDEN LF

Collected by (print): Philip Campbell

Site/Facility ID # CAMDEN, TN

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

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

Date Results Needed

Quote #

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No of Cntrs	**WetChem** 250mlHDPE-NoPres	ALK 60mlAmb-NoPres	COD,NH3 250mlHDPE-H2SO4	Diss. Metals-FF 250mlHDPE-HNO3	SV8011 40mlClr-NaThio	Total Metals,HARD 250mlHDPE-HNO3	V8260AP1 40mlAmb-HCl	V8260AP1-Trip Blank 40mlAmb-HCl-Blk			Remarks	Sample # (lab only)
MW-1	Grab	GW		6-19-18	12:35	11	X	X	X	X	X	X	X					01
MW-3		GW			15:20	11	X	X	X	X	X	X	X					02
MW-4		GW			13:55	11	X	X	X	X	X	X	X					-7
MW-5		GW			12:50	11	X	X	X	X	X	X	X					04
TMW-1		GW			12:30	11	X	X	X	X	X	X	X					05
TMW-2		GW			14:15	11	X	X	X	X	X	X	X					06
TMW-3		GW			16:50	11	X	X	X	X	X	X	X					07
DUPLICATE		GW			—	11	X	X	X	X	X	X	X					08
FIELD BLANK		GW			16:10	11	X	X	X	X	X	X	X					15
EQUIPMENT BLANK		GW				11	X	X	X	X	X	X	X					

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

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

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier ✓

Tracking #

Chain of Custody Page 1 of 2

ESC LAB SCIENCES
a subsidiary of Accutest

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

L# 100388

Table #

Acctnum: CEC

Template: T133579

Prelogin: P657635

TSR: 526 - Chris McCord

PB: TB 6.5.18

Shipped Via: Courier

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)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
	6-20-18	10:05		2
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: 2.4 °C Bottles Received: 99
	6-20-18	16:50		
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 6/20/18 Time: 1616
			SG	

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Civil & Environmental Consultants - TN

325 Seaboard Lane, Suite 170

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

Pres Chk

Report to: Philip Campbell

Email To: pcampbell@cecinc.com

Project Description: EWS Camden Class 2 Landfill

City/State Collected:

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

Client Project # 171-873

Lab Project # CEC-EWS CAMDEN LF

Collected by (print): Ph- l.p Campbell

Site/Facility ID # CAMDEN, TN

P.O. #

Collected by (signature):

Immediately Packed on Ice N___ Y___

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

Quote #

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	**WetChem** 250mlHDPE-NoPres	ALK 60mlAmb-NoPres	COD,NH3 250mlHDPE-H2SO4	Diss. Metals-FF 250mlHDPE-HNO3	SV8011 40mlClr-NaThio	Total Metals,HARD 250mlHDPE-HNO3	V8260AP1 40mlAmb-HCl	V8260AP1-Trip Blank 40mlAmb-HCl-Blk			Remarks	Sample # (lab only)
TRIP BLANK	—	GW		—	—	1 2								X				10

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

ESC LAB SCIENCES
a subsidiary of Pace

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

L# 100388

Table #

Acctnum: CEC
Template: T133579
Prelogin: P657635
TSR: 526 - Chris McCord
PB: TB 6-5-18
Shipped Via: Courier

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

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

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier

Tracking #

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

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCl / MeoH TBR
	6-20-18	10:05		2
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: 2.4 °C Bottles Received: 99
	6-20-18	16:10		
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 6/20/18 Time: 1610

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

ANALYTICAL REPORT

June 29, 2018

Civil & Environmental Consultants - TN

Sample Delivery Group:	L1003198
Samples Received:	06/20/2018
Project Number:	171-873
Description:	EWS Camden Class 2 Landfill
Site:	CAMDEN, TN
Report To:	Philip Campbell 325 Seaboard Lane, Suite 170 Franklin, TN 37067

Entire Report Reviewed By:

Chris McCord
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.

TABLE OF CONTENTS

IWC-L L1003198-01 GW

Collected by	Collected date/time	Received date/time
Philip Campbell	06/19/18 15:00	06/20/18 16:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1127772	500	06/21/18 16:47	06/21/18 16:47	KK
Wet Chemistry by Method 2320 B-2011	WG1130506	1	06/27/18 16:36	06/27/18 16:36	GB
Wet Chemistry by Method 350.1	WG1127820	200	06/25/18 16:56	06/25/18 16:56	JER
Wet Chemistry by Method 410.4	WG1127455	20	06/20/18 19:41	06/20/18 22:34	MZ
Wet Chemistry by Method 9056A	WG1127774	1	06/21/18 11:01	06/21/18 11:01	MAJ
Wet Chemistry by Method 9056A	WG1127774	1000	06/21/18 22:42	06/21/18 22:42	MAJ
Wet Chemistry by Method 9056A	WG1130696	20	06/28/18 00:37	06/28/18 00:37	DR
Mercury by Method 7470A	WG1127641	1	06/21/18 11:04	06/22/18 10:09	ABL
Mercury by Method 7470A	WG1127826	1	06/21/18 22:29	06/22/18 12:11	ABL
Metals (ICP) by Method 6010B	WG1127414	10	06/21/18 14:15	06/23/18 13:37	WBD
Metals (ICP) by Method 6010B	WG1127928	10	06/22/18 08:37	06/23/18 15:05	WBD
Metals (ICPMS) by Method 6020	WG1127137	100	06/21/18 00:45	06/22/18 17:58	LAT
Metals (ICPMS) by Method 6020	WG1127137	500	06/21/18 00:45	06/22/18 18:15	LAT
Metals (ICPMS) by Method 6020	WG1127540	100	06/22/18 08:18	06/23/18 14:59	JPD
Metals (ICPMS) by Method 6020	WG1127540	500	06/22/18 08:18	06/23/18 15:08	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1128014	10	06/21/18 21:16	06/21/18 21:16	TJJ
EDB / DBCP by Method 8011	WG1127562	.993	06/21/18 13:00	06/22/18 04:54	JNS

APWC-L L1003198-02 GW

Collected by	Collected date/time	Received date/time
Philip Campbell	06/19/18 15:25	06/20/18 16:10

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1127772	5	06/21/18 16:36	06/21/18 16:36	KK
Wet Chemistry by Method 2320 B-2011	WG1130506	100	06/27/18 12:48	06/27/18 12:48	GB
Wet Chemistry by Method 350.1	WG1127820	1000	06/25/18 16:57	06/25/18 16:57	JER
Wet Chemistry by Method 410.4	WG1127455	50	06/20/18 19:41	06/20/18 22:35	MZ
Wet Chemistry by Method 9056A	WG1127774	1	06/21/18 11:14	06/21/18 11:14	MAJ
Wet Chemistry by Method 9056A	WG1127774	100	06/21/18 12:10	06/21/18 12:10	MAJ
Wet Chemistry by Method 9056A	WG1127774	5000	06/21/18 22:56	06/21/18 22:56	MAJ
Wet Chemistry by Method 9056A	WG1130696	100	06/27/18 18:33	06/27/18 18:33	DR
Mercury by Method 7470A	WG1127826	10	06/21/18 22:29	06/22/18 12:13	ABL
Mercury by Method 7470A	WG1129215	10	06/24/18 23:25	06/25/18 15:14	EL
Metals (ICP) by Method 6010B	WG1127414	20	06/21/18 14:15	06/23/18 13:40	WBD
Metals (ICP) by Method 6010B	WG1127928	20	06/22/18 08:37	06/23/18 15:08	WBD
Metals (ICPMS) by Method 6020	WG1127137	100	06/21/18 00:45	06/22/18 18:02	LAT
Metals (ICPMS) by Method 6020	WG1127137	500	06/21/18 00:45	06/22/18 18:19	LAT
Metals (ICPMS) by Method 6020	WG1127540	90	06/22/18 08:18	06/23/18 15:49	JDG
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1129462	1	06/25/18 19:35	06/25/18 19:35	BMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1129572	1	06/26/18 05:52	06/26/18 05:52	ACG
EDB / DBCP by Method 8011	WG1127562	.848	06/21/18 13:00	06/22/18 05:07	JNS

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All 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.

Chris McCord
Technical Service Representative

Sample Handling and Receiving

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

ESC Sample ID	Project Sample ID	Method
L1003198-02	APWC-L	6020, 7470A

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	27100		15000	500	06/21/2018 16:47	WG1127772

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	06/27/2018 16:36	WG1130506

Sample Narrative:

L1003198-01 WG1130506: Endpoint pH 4.5 HEADSPACE

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	893		20.0	200	06/25/2018 16:56	WG1127820

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
COD	2610		200	20	06/20/2018 22:34	WG1127455

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	42.9		20.0	20	06/28/2018 00:37	WG1130696
Chloride	48300		1000	1000	06/21/2018 22:42	WG1127774
Fluoride	ND		0.100	1	06/21/2018 11:01	WG1127774
Nitrate	ND		0.100	1	06/21/2018 11:01	WG1127774
Sulfate	1910		100	20	06/28/2018 00:37	WG1130696

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	0.000496		0.000200	1	06/22/2018 10:09	WG1127641
Mercury,Dissolved	0.000495		0.000200	1	06/22/2018 12:11	WG1127826

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		2.00	10	06/23/2018 15:05	WG1127928
Boron,Dissolved	ND		2.00	10	06/23/2018 13:37	WG1127414

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	319		10.0	100	06/23/2018 14:59	WG1127540
Aluminum,Dissolved	311		10.0	100	06/22/2018 17:58	WG1127137
Antimony	ND		0.200	100	06/23/2018 14:59	WG1127540
Antimony,Dissolved	ND		0.200	100	06/22/2018 17:58	WG1127137
Arsenic	0.455		0.200	100	06/23/2018 14:59	WG1127540
Arsenic,Dissolved	0.457		0.200	100	06/22/2018 17:58	WG1127137
Barium	2.06		0.500	100	06/23/2018 14:59	WG1127540
Barium,Dissolved	2.16		0.500	100	06/22/2018 17:58	WG1127137

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Beryllium	ND		0.200	100	06/23/2018 14:59	WG1127540
Beryllium,Dissolved	ND		0.200	100	06/22/2018 17:58	WG1127137
Cadmium	110		0.100	100	06/23/2018 14:59	WG1127540
Cadmium,Dissolved	115		0.100	100	06/22/2018 17:58	WG1127137
Calcium	7640		100	100	06/23/2018 14:59	WG1127540
Calcium,Dissolved	7960		100	100	06/22/2018 17:58	WG1127137
Chromium	ND		0.200	100	06/23/2018 14:59	WG1127540
Chromium,Dissolved	ND		0.200	100	06/22/2018 17:58	WG1127137
Cobalt	1.05		0.200	100	06/23/2018 14:59	WG1127540
Cobalt,Dissolved	1.13		0.200	100	06/22/2018 17:58	WG1127137
Copper	18.7		0.500	100	06/23/2018 14:59	WG1127540
Copper,Dissolved	17.7		0.500	100	06/22/2018 17:58	WG1127137
Iron	944		10.0	100	06/23/2018 14:59	WG1127540
Iron,Dissolved	970		10.0	100	06/22/2018 17:58	WG1127137
Lead	0.439		0.200	100	06/23/2018 14:59	WG1127540
Lead,Dissolved	0.462		0.200	100	06/22/2018 17:58	WG1127137
Magnesium	1290		100	100	06/23/2018 14:59	WG1127540
Magnesium,Dissolved	1380		100	100	06/22/2018 17:58	WG1127137
Manganese	205		0.500	100	06/23/2018 14:59	WG1127540
Manganese,Dissolved	213		0.500	100	06/22/2018 17:58	WG1127137
Nickel	1.29		0.200	100	06/23/2018 14:59	WG1127540
Nickel,Dissolved	1.29		0.200	100	06/22/2018 17:58	WG1127137
Potassium	7470		100	100	06/23/2018 14:59	WG1127540
Potassium,Dissolved	7750		100	100	06/22/2018 17:58	WG1127137
Selenium	0.355		0.200	100	06/23/2018 14:59	WG1127540
Selenium,Dissolved	0.681		0.200	100	06/22/2018 17:58	WG1127137
Silver	ND		0.200	100	06/23/2018 14:59	WG1127540
Silver,Dissolved	ND		0.200	100	06/22/2018 17:58	WG1127137
Sodium	14300		100	100	06/23/2018 14:59	WG1127540
Sodium,Dissolved	15100		100	100	06/22/2018 17:58	WG1127137
Thallium	ND		0.200	100	06/23/2018 14:59	WG1127540
Thallium,Dissolved	ND		0.200	100	06/22/2018 17:58	WG1127137
Vanadium	ND		0.500	100	06/23/2018 14:59	WG1127540
Vanadium,Dissolved	ND		0.500	100	06/22/2018 17:58	WG1127137
Zinc	1300		12.5	500	06/23/2018 15:08	WG1127540
Zinc,Dissolved	1370		12.5	500	06/22/2018 18:15	WG1127137

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Acetone	1.45		0.500	10	06/21/2018 21:16	WG1128014
Acrylonitrile	ND		0.100	10	06/21/2018 21:16	WG1128014
Benzene	ND		0.0100	10	06/21/2018 21:16	WG1128014
Bromochloromethane	ND		0.0100	10	06/21/2018 21:16	WG1128014
Bromodichloromethane	ND		0.0100	10	06/21/2018 21:16	WG1128014
Bromoform	ND		0.0100	10	06/21/2018 21:16	WG1128014
Bromomethane	ND		0.0500	10	06/21/2018 21:16	WG1128014
Carbon disulfide	ND		0.0100	10	06/21/2018 21:16	WG1128014
Carbon tetrachloride	ND		0.0100	10	06/21/2018 21:16	WG1128014
Chlorobenzene	ND		0.0100	10	06/21/2018 21:16	WG1128014
Chlorodibromomethane	ND		0.0100	10	06/21/2018 21:16	WG1128014
Chloroethane	ND		0.0500	10	06/21/2018 21:16	WG1128014
Chloroform	ND		0.0500	10	06/21/2018 21:16	WG1128014
Chloromethane	ND		0.0250	10	06/21/2018 21:16	WG1128014
Dibromomethane	ND		0.0100	10	06/21/2018 21:16	WG1128014
1,2-Dibromo-3-Chloropropane	ND		0.0500	10	06/21/2018 21:16	WG1128014

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,2-Dibromoethane	ND		0.0100	10	06/21/2018 21:16	WG1128014
1,2-Dichlorobenzene	ND		0.0100	10	06/21/2018 21:16	WG1128014
1,4-Dichlorobenzene	ND		0.0100	10	06/21/2018 21:16	WG1128014
trans-1,4-Dichloro-2-butene	ND		0.0250	10	06/21/2018 21:16	WG1128014
1,1-Dichloroethane	ND		0.0100	10	06/21/2018 21:16	WG1128014
1,2-Dichloroethane	ND		0.0100	10	06/21/2018 21:16	WG1128014
1,1-Dichloroethene	ND		0.0100	10	06/21/2018 21:16	WG1128014
cis-1,2-Dichloroethene	ND		0.0100	10	06/21/2018 21:16	WG1128014
trans-1,2-Dichloroethene	ND		0.0100	10	06/21/2018 21:16	WG1128014
1,2-Dichloropropane	ND		0.0100	10	06/21/2018 21:16	WG1128014
cis-1,3-Dichloropropene	ND		0.0100	10	06/21/2018 21:16	WG1128014
trans-1,3-Dichloropropene	ND		0.0100	10	06/21/2018 21:16	WG1128014
Ethylbenzene	ND		0.0100	10	06/21/2018 21:16	WG1128014
2-Hexanone	ND		0.100	10	06/21/2018 21:16	WG1128014
Iodomethane	ND		0.100	10	06/21/2018 21:16	WG1128014
2-Butanone (MEK)	0.171		0.100	10	06/21/2018 21:16	WG1128014
Methylene Chloride	ND		0.0500	10	06/21/2018 21:16	WG1128014
4-Methyl-2-pentanone (MIBK)	ND		0.100	10	06/21/2018 21:16	WG1128014
Styrene	ND		0.0100	10	06/21/2018 21:16	WG1128014
1,1,1,2-Tetrachloroethane	ND		0.0100	10	06/21/2018 21:16	WG1128014
1,1,2,2-Tetrachloroethane	ND		0.0100	10	06/21/2018 21:16	WG1128014
Tetrachloroethene	ND		0.0100	10	06/21/2018 21:16	WG1128014
Toluene	ND		0.0100	10	06/21/2018 21:16	WG1128014
1,1,1-Trichloroethane	ND		0.0100	10	06/21/2018 21:16	WG1128014
1,1,2-Trichloroethane	ND		0.0100	10	06/21/2018 21:16	WG1128014
Trichloroethene	ND		0.0100	10	06/21/2018 21:16	WG1128014
Trichlorofluoromethane	ND		0.0500	10	06/21/2018 21:16	WG1128014
1,2,3-Trichloropropane	ND		0.0250	10	06/21/2018 21:16	WG1128014
Vinyl acetate	ND	J4	0.100	10	06/21/2018 21:16	WG1128014
Vinyl chloride	ND		0.0100	10	06/21/2018 21:16	WG1128014
Xylenes, Total	ND		0.0300	10	06/21/2018 21:16	WG1128014
(S) Toluene-d8	*102*		*80.0-120*		*06/21/2018 21:16*	WG1128014
(S) Dibromofluoromethane	*98.7*		*76.0-123*		*06/21/2018 21:16*	WG1128014
(S) a,a,a-Trifluorotoluene	*105*		*80.0-120*		*06/21/2018 21:16*	WG1128014
(S) 4-Bromofluorobenzene	*100*		*80.0-120*		*06/21/2018 21:16*	WG1128014

EDB / DBCP by Method 8011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ethylene Dibromide	0.000245		0.0000100	.993	06/22/2018 04:54	WG1127562
1,2-Dibromo-3-Chloropropane	ND		0.0000200	.993	06/22/2018 04:54	WG1127562

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	735		150	5	06/21/2018 16:36	WG1127772

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	14000		2000	100	06/27/2018 12:48	WG1130506

Sample Narrative:

L1003198-02 WG1130506: Endpoint pH 4.5 HEADSPACE

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	6450		100	1000	06/25/2018 16:57	WG1127820

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
COD	8780		500	50	06/20/2018 22:35	WG1127455

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	149		100	100	06/27/2018 18:33	WG1130696
Chloride	150000		5000	5000	06/21/2018 22:56	WG1127774
Fluoride	ND		0.100	1	06/21/2018 11:14	WG1127774
Nitrate	40.8		10.0	100	06/21/2018 12:10	WG1127774
Sulfate	1240		500	100	06/27/2018 18:33	WG1130696

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.00200	10	06/25/2018 15:14	WG1129215
Mercury,Dissolved	ND		0.00200	10	06/22/2018 12:13	WG1127826

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		4.00	20	06/23/2018 15:08	WG1127928
Boron,Dissolved	8.20		4.00	20	06/23/2018 13:40	WG1127414

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		9.00	90	06/23/2018 15:49	WG1127540
Aluminum,Dissolved	ND		10.0	100	06/22/2018 18:02	WG1127137
Antimony	ND		0.180	90	06/23/2018 15:49	WG1127540
Antimony,Dissolved	ND		0.200	100	06/22/2018 18:02	WG1127137
Arsenic	ND		0.180	90	06/23/2018 15:49	WG1127540
Arsenic,Dissolved	ND		0.200	100	06/22/2018 18:02	WG1127137
Barium	1.60		0.450	90	06/23/2018 15:49	WG1127540
Barium,Dissolved	1.54		0.500	100	06/22/2018 18:02	WG1127137

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Beryllium	ND		0.180	90	06/23/2018 15:49	WG1127540
Beryllium,Dissolved	ND		0.200	100	06/22/2018 18:02	WG1127137
Cadmium	0.216		0.0900	90	06/23/2018 15:49	WG1127540
Cadmium,Dissolved	0.206		0.100	100	06/22/2018 18:02	WG1127137
Calcium	320		90.0	90	06/23/2018 15:49	WG1127540
Calcium,Dissolved	289		100	100	06/22/2018 18:02	WG1127137
Chromium	ND		0.180	90	06/23/2018 15:49	WG1127540
Chromium,Dissolved	ND		0.200	100	06/22/2018 18:02	WG1127137
Cobalt	ND		0.180	90	06/23/2018 15:49	WG1127540
Cobalt,Dissolved	ND		0.200	100	06/22/2018 18:02	WG1127137
Copper	25.8		0.450	90	06/23/2018 15:49	WG1127540
Copper,Dissolved	23.2		0.500	100	06/22/2018 18:02	WG1127137
Iron	ND		9.00	90	06/23/2018 15:49	WG1127540
Iron,Dissolved	ND		10.0	100	06/22/2018 18:02	WG1127137
Lead	ND		0.180	90	06/23/2018 15:49	WG1127540
Lead,Dissolved	ND		0.200	100	06/22/2018 18:02	WG1127137
Magnesium	ND		90.0	90	06/23/2018 15:49	WG1127540
Magnesium,Dissolved	ND		100	100	06/22/2018 18:02	WG1127137
Manganese	ND		0.450	90	06/23/2018 15:49	WG1127540
Manganese,Dissolved	ND		0.500	100	06/22/2018 18:02	WG1127137
Nickel	0.265		0.180	90	06/23/2018 15:49	WG1127540
Nickel,Dissolved	0.248		0.200	100	06/22/2018 18:02	WG1127137
Potassium	46500		90.0	90	06/23/2018 15:49	WG1127540
Potassium,Dissolved	45500		100	100	06/22/2018 18:02	WG1127137
Selenium	ND		0.180	90	06/23/2018 15:49	WG1127540
Selenium,Dissolved	ND		0.200	100	06/22/2018 18:02	WG1127137
Silver	ND		0.180	90	06/23/2018 15:49	WG1127540
Silver,Dissolved	ND		0.200	100	06/22/2018 18:02	WG1127137
Sodium	74600		90.0	90	06/23/2018 15:49	WG1127540
Sodium,Dissolved	73000		500	500	06/22/2018 18:19	WG1127137
Thallium	ND		0.180	90	06/23/2018 15:49	WG1127540
Thallium,Dissolved	ND		0.200	100	06/22/2018 18:02	WG1127137
Vanadium	ND		0.450	90	06/23/2018 15:49	WG1127540
Vanadium,Dissolved	ND		0.500	100	06/22/2018 18:02	WG1127137
Zinc	14.1		2.25	90	06/23/2018 15:49	WG1127540
Zinc,Dissolved	13.8		2.50	100	06/22/2018 18:02	WG1127137

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Acetone	0.419		0.0500	1	06/25/2018 19:35	WG1129462
Acrylonitrile	ND		0.0100	1	06/25/2018 19:35	WG1129462
Benzene	ND		0.00100	1	06/25/2018 19:35	WG1129462
Bromochloromethane	ND	J4	0.00100	1	06/25/2018 19:35	WG1129462
Bromodichloromethane	ND		0.00100	1	06/25/2018 19:35	WG1129462
Bromoform	ND		0.00100	1	06/25/2018 19:35	WG1129462
Bromomethane	ND	J3 J4	0.00500	1	06/25/2018 19:35	WG1129462
Carbon disulfide	ND		0.00100	1	06/25/2018 19:35	WG1129462
Carbon tetrachloride	ND		0.00100	1	06/25/2018 19:35	WG1129462
Chlorobenzene	ND		0.00100	1	06/25/2018 19:35	WG1129462
Chlorodibromomethane	ND		0.00100	1	06/25/2018 19:35	WG1129462
Chloroethane	ND		0.00500	1	06/25/2018 19:35	WG1129462
Chloroform	ND		0.00500	1	06/25/2018 19:35	WG1129462
Chloromethane	ND	J3	0.00250	1	06/25/2018 19:35	WG1129462
Dibromomethane	ND		0.00100	1	06/25/2018 19:35	WG1129462
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	06/25/2018 19:35	WG1129462

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,2-Dibromoethane	ND		0.00100	1	06/25/2018 19:35	WG1129462
1,2-Dichlorobenzene	ND		0.00100	1	06/25/2018 19:35	WG1129462
1,4-Dichlorobenzene	ND		0.00100	1	06/25/2018 19:35	WG1129462
trans-1,4-Dichloro-2-butene	ND		0.00250	1	06/25/2018 19:35	WG1129462
1,1-Dichloroethane	ND		0.00100	1	06/25/2018 19:35	WG1129462
1,2-Dichloroethane	ND		0.00100	1	06/25/2018 19:35	WG1129462
1,1-Dichloroethene	ND		0.00100	1	06/25/2018 19:35	WG1129462
cis-1,2-Dichloroethene	ND		0.00100	1	06/25/2018 19:35	WG1129462
trans-1,2-Dichloroethene	ND		0.00100	1	06/25/2018 19:35	WG1129462
1,2-Dichloropropane	ND		0.00100	1	06/25/2018 19:35	WG1129462
cis-1,3-Dichloropropene	ND		0.00100	1	06/25/2018 19:35	WG1129462
trans-1,3-Dichloropropene	ND		0.00100	1	06/25/2018 19:35	WG1129462
Ethylbenzene	ND		0.00100	1	06/25/2018 19:35	WG1129462
2-Hexanone	ND		0.0100	1	06/25/2018 19:35	WG1129462
Iodomethane	ND		0.0100	1	06/26/2018 05:52	WG1129572
2-Butanone (MEK)	0.0252		0.0100	1	06/25/2018 19:35	WG1129462
Methylene Chloride	ND		0.00500	1	06/25/2018 19:35	WG1129462
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	06/25/2018 19:35	WG1129462
Styrene	ND		0.00100	1	06/25/2018 19:35	WG1129462
1,1,1,2-Tetrachloroethane	ND		0.00100	1	06/25/2018 19:35	WG1129462
1,1,2,2-Tetrachloroethane	ND		0.00100	1	06/25/2018 19:35	WG1129462
Tetrachloroethene	ND		0.00100	1	06/25/2018 19:35	WG1129462
Toluene	ND		0.00100	1	06/25/2018 19:35	WG1129462
1,1,1-Trichloroethane	ND		0.00100	1	06/25/2018 19:35	WG1129462
1,1,2-Trichloroethane	ND		0.00100	1	06/25/2018 19:35	WG1129462
Trichloroethene	ND		0.00100	1	06/25/2018 19:35	WG1129462
Trichlorofluoromethane	ND		0.00500	1	06/25/2018 19:35	WG1129462
1,2,3-Trichloropropane	ND		0.00250	1	06/25/2018 19:35	WG1129462
Vinyl acetate	ND	J4	0.0100	1	06/25/2018 19:35	WG1129462
Vinyl chloride	ND		0.00100	1	06/25/2018 19:35	WG1129462
Xylenes, Total	ND		0.00300	1	06/25/2018 19:35	WG1129462
(S) Toluene-d8	*99.1*		*80.0-120*		*06/25/2018 19:35*	WG1129462
(S) Toluene-d8	*103*		*80.0-120*		*06/26/2018 05:52*	WG1129572
(S) Dibromofluoromethane	*99.6*		*76.0-123*		*06/25/2018 19:35*	WG1129462
(S) Dibromofluoromethane	*65.1*	J2	*76.0-123*		*06/26/2018 05:52*	WG1129572
(S) a,a,a-Trifluorotoluene	*95.2*		*80.0-120*		*06/25/2018 19:35*	WG1129462
(S) a,a,a-Trifluorotoluene	*92.8*		*80.0-120*		*06/26/2018 05:52*	WG1129572
(S) 4-Bromofluorobenzene	*92.4*		*80.0-120*		*06/25/2018 19:35*	WG1129462
(S) 4-Bromofluorobenzene	*96.7*		*80.0-120*		*06/26/2018 05:52*	WG1129572

EDB / DBCP by Method 8011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ethylene Dibromide	ND		0.0000100	.848	06/22/2018 05:07	WG1127562
1,2-Dibromo-3-Chloropropane	ND		0.0000200	.848	06/22/2018 05:07	WG1127562

Method Blank (MB)

(MB) R3319870-1 06/21/18 15:48

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hardness (colorimetric) as CaCO3	5.35	J	1.43	30.0

L1003188-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1003188-08 06/21/18 16:19 • (DUP) R3319870-4 06/21/18 16:20

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hardness (colorimetric) as CaCO3	ND	22.1	1	28.3	J P1	20

L1003214-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1003214-03 06/21/18 16:31 • (DUP) R3319870-7 06/21/18 16:32

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hardness (colorimetric) as CaCO3	64.1	59.0	1	8.29		20

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

(LCS) R3319870-2 06/21/18 15:49 • (LCSD) R3319870-3 06/21/18 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 %
Hardness (colorimetric) as CaCO3	150	158	152	105	101	85.0-115			3.87	20

L1003211-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003211-01 06/21/18 17:04 • (MS) R3319870-5 06/21/18 16:24 • (MSD) R3319870-6 06/21/18 16:25

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 %
Hardness (colorimetric) as CaCO3	150	52.2	179	178	84.5	83.9	1	80.0-120			0.560	20

L1002991-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1002991-03 06/27/18 16:02 • (DUP) R3321423-5 06/27/18 16:11

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	8.59	9.21	1	7.02	J	20

Sample Narrative:

OS: Endpoint pH 4.5 HEADSPACE

DUP: Endpoint pH 4.5

L1003198-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1003198-02 06/27/18 12:48 • (DUP) R3321423-1 06/27/18 12:57

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	14000	13800	100	1.76		20

Sample Narrative:

OS: Endpoint pH 4.5 HEADSPACE

DUP: Endpoint pH 4.5

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

(LCS) R3321423-3 06/27/18 14:03 • (LCSD) R3321423-4 06/27/18 15:29

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 %
Alkalinity	100	99.5	90.4	99.5	90.4	85.0-115			9.64	20

Sample Narrative:

LCS: Endpoint pH 4.5

LCSD: Endpoint pH 4.5

Method Blank (MB)

(MB) R3320731-1 06/25/18 16:15

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Ammonia Nitrogen	U		0.0317	0.100

L1003142-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1003142-02 06/25/18 16:26 • (DUP) R3320731-4 06/25/18 16:27

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Ammonia Nitrogen	ND	0.0560	1	0.000		10

L1003212-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1003212-01 06/25/18 17:01 • (DUP) R3320731-6 06/25/18 17:02

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Ammonia Nitrogen	0.327	0.315	1	3.74		10

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

(LCS) R3320731-2 06/25/18 16:16 • (LCSD) R3320731-3 06/25/18 16:18

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ammonia Nitrogen	7.50	7.31	7.59	97.4	101	90.0-110			3.80	10

L1003145-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1003145-03 06/25/18 16:29 • (MS) R3320731-5 06/25/18 16:35

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Ammonia Nitrogen	5.00	0.112	5.08	99.3	1	90.0-110	

L1003212-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003212-03 06/25/18 17:04 • (MS) R3320731-7 06/25/18 17:05 • (MSD) R3320731-8 06/25/18 17:07

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Ammonia Nitrogen	5.00	0.661	5.21	5.47	90.9	96.2	1	90.0-110			4.96	10

Method Blank (MB)

(MB) R3319545-1 06/20/18 22:26

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
COD	U		3.00	10.0

L1002912-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1002912-01 06/20/18 22:29 • (DUP) R3319545-4 06/20/18 22:29

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
COD	5630	5910	20	4.94		20

L1003198-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1003198-02 06/20/18 22:35 • (DUP) R3319545-7 06/20/18 22:35

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
COD	8780	8840	50	0.658		20

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

(LCS) R3319545-2 06/20/18 22:26 • (LCSD) R3319545-3 06/20/18 22:26

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 %
COD	242	219	224	90.7	92.6	90.0-110			2.09	20

L1003188-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003188-02 06/20/18 22:31 • (MS) R3319545-5 06/20/18 22:31 • (MSD) R3319545-6 06/20/18 22:31

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
COD	400	ND	404	398	101	99.5	1	80.0-120			1.48	20

Method Blank (MB)

(MB) R3321746-1 06/21/18 07:12

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.0519	1.00
Fluoride	U		0.00990	0.100
Nitrate	U		0.0227	0.100

L1003332-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1003332-03 06/21/18 17:07 • (DUP) R3321746-7 06/21/18 17:21

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

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

(LCS) R3321746-2 06/21/18 07:26 • (LCSD) R3321746-3 06/21/18 07:40

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 %
Chloride	40.0	38.6	38.6	96.6	96.4	80.0-120			0.248	15
Fluoride	8.00	7.84	7.83	98.0	97.8	80.0-120			0.202	15
Nitrate	8.00	8.34	8.29	104	104	80.0-120			0.508	15

L1003332-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1003332-03 06/21/18 17:07 • (MS) R3321746-8 06/21/18 17:35

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	ND	47.6	94.6	1	80.0-120	
Fluoride	5.00	ND	4.46	89.1	1	80.0-120	
Nitrate	5.00	ND	4.71	94.2	1	80.0-120	

Method Blank (MB)

(MB) R3321486-1 06/27/18 13:17

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Bromide	U		0.0790	1.00
Sulfate	U		0.0774	5.00

L1002910-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1002910-02 06/27/18 16:14 • (DUP) R3321486-4 06/27/18 16:28

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	ND	0.000	1	0.000		15
Sulfate	85.1	85.4	1	0.335		15

L1003340-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1003340-02 06/27/18 19:54 • (DUP) R3321486-7 06/27/18 20:07

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	ND	0.000	1	0.000		15
Sulfate	ND	4.09	1	0.000		15

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

(LCS) R3321486-2 06/27/18 13:31 • (LCSD) R3321486-3 06/27/18 13:45

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 %
Bromide	40.0	40.3	40.4	101	101	80.0-120			0.114	15
Sulfate	40.0	40.7	40.7	102	102	80.0-120			0.0366	15

L1002910-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1002910-02 06/27/18 16:14 • (MS) R3321486-5 06/27/18 16:41 • (MSD) R3321486-6 06/27/18 16:55

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	48.2	49.9	96.5	99.9	1	80.0-120			3.47	15
Sulfate	50.0	85.1	133	135	95.3	99.4	1	80.0-120	E	E	1.54	15

L1003340-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1003340-02 06/27/18 19:54 • (MS) R3321486-8 06/27/18 20:49

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Bromide	50.0	ND	49.6	99.1	1	80.0-120	
Sulfate	50.0	ND	55.7	103	1	80.0-120	

Method Blank (MB)

(MB) R3320066-1 06/22/18 09:33

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.0000490	0.000200

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

(LCS) R3320066-2 06/22/18 09:35 • (LCSD) R3320066-3 06/22/18 09:37

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 %
Mercury	0.00300	0.00303	0.00288	101	96.0	80.0-120			4.96	20

L1003188-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003188-01 06/22/18 09:39 • (MS) R3320066-4 06/22/18 09:41 • (MSD) R3320066-5 06/22/18 09:43

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.00300	0.00319	0.00603	0.00614	94.7	98.2	1	75.0-125			1.71	20

Method Blank (MB)

(MB) R3320110-1 06/22/18 11:31

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury,Dissolved	U		0.0000490	0.000200

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

(LCS) R3320110-2 06/22/18 11:37 • (LCSD) R3320110-3 06/22/18 11:39

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Mercury,Dissolved	0.00300	0.00291	0.00274	96.9	91.3	80.0-120			6.01	20

L1003188-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003188-02 06/22/18 11:41 • (MS) R3320110-4 06/22/18 11:44 • (MSD) R3320110-5 06/22/18 11:46

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 %
Mercury,Dissolved	0.00300	ND	0.00300	0.00281	100	93.7	1	75.0-125			6.52	20

Method Blank (MB)

(MB) R3320774-1 06/25/18 14:54

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.0000490	0.000200

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

(LCS) R3320774-2 06/25/18 14:57 • (LCSD) R3320774-3 06/25/18 14:59

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 %
Mercury	0.00300	0.00292	0.00288	97.5	95.8	80.0-120			1.72	20

L1003603-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003603-01 06/25/18 15:02 • (MS) R3320774-4 06/25/18 15:09 • (MSD) R3320774-5 06/25/18 15:11

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.00300	ND	0.00309	0.00295	103	98.4	1	75.0-125			4.67	20

Method Blank (MB)

(MB) R3320278-1 06/22/18 22:53

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

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

(LCS) R3320278-2 06/22/18 22:56 • (LCSD) R3320278-3 06/22/18 23:00

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 %
Boron,Dissolved	1.00	0.932	0.957	93.2	95.7	80.0-120			2.66	20

L1003065-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003065-01 06/22/18 23:03 • (MS) R3320278-5 06/22/18 23:10 • (MSD) R3320278-6 06/22/18 23:13

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron,Dissolved	1.00	ND	0.937	0.923	93.7	92.3	1	75.0-125			1.50	20

Method Blank (MB)

(MB) R3320384-1 06/23/18 14:16

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Boron	U		0.0126	0.200

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

(LCS) R3320384-2 06/23/18 14:18 • (LCSD) R3320384-3 06/23/18 14:21

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	0.929	0.933	92.9	93.3	80.0-120			0.448	20

L1003274-23 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003274-23 06/23/18 14:23 • (MS) R3320384-5 06/23/18 14:28 • (MSD) R3320384-6 06/23/18 14:31

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron	1.00	0.215	1.16	1.19	94.4	97.7	1	75.0-125			2.78	20

Method Blank (MB)

(MB) R3319939-1 06/21/18 18:49

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Antimony,Dissolved	U		0.000754	0.00200
Arsenic,Dissolved	U		0.000250	0.00200
Barium,Dissolved	U		0.000360	0.00500
Beryllium,Dissolved	U		0.000120	0.00200
Cadmium,Dissolved	U		0.000160	0.00100
Chromium,Dissolved	0.00184	J	0.000540	0.00200
Copper,Dissolved	U		0.000520	0.00500
Cobalt,Dissolved	U		0.000260	0.00200
Iron,Dissolved	U		0.0150	0.100
Lead,Dissolved	U		0.000240	0.00200
Manganese,Dissolved	U		0.000250	0.00500
Nickel,Dissolved	U		0.000350	0.00200
Selenium,Dissolved	U		0.000380	0.00200
Silver,Dissolved	U		0.000310	0.00200
Thallium,Dissolved	U		0.000190	0.00200
Vanadium,Dissolved	U		0.000180	0.00500
Zinc,Dissolved	U		0.00256	0.0250

Method Blank (MB)

(MB) R3319940-1 06/21/18 23:50

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Aluminum,Dissolved	0.0207	J	0.00515	0.100
Calcium,Dissolved	U		0.0460	1.00
Magnesium,Dissolved	U		0.100	1.00
Potassium,Dissolved	0.0462	J	0.0370	1.00
Sodium,Dissolved	0.313	J	0.110	1.00

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

(LCS) R3319939-2 06/21/18 18:54 • (LCSD) R3319939-3 06/21/18 18:59

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 %
Antimony,Dissolved	0.0500	0.0479	0.0481	95.8	96.3	80.0-120			0.460	20
Arsenic,Dissolved	0.0500	0.0486	0.0485	97.2	97.0	80.0-120			0.256	20
Barium,Dissolved	0.0500	0.0469	0.0465	93.9	93.1	80.0-120			0.874	20
Beryllium,Dissolved	0.0500	0.0484	0.0491	96.8	98.2	80.0-120			1.39	20
Cadmium,Dissolved	0.0500	0.0485	0.0469	97.0	93.8	80.0-120			3.31	20

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

(LCS) R3319939-2 06/21/18 18:54 • (LCSD) R3319939-3 06/21/18 18:59

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 %
Chromium,Dissolved	0.0500	0.0485	0.0478	97.0	95.6	80.0-120			1.38	20
Copper,Dissolved	0.0500	0.0503	0.0494	101	98.8	80.0-120			1.78	20
Cobalt,Dissolved	0.0500	0.0505	0.0504	101	101	80.0-120			0.332	20
Iron,Dissolved	5.00	4.63	4.60	92.7	92.0	80.0-120			0.727	20
Lead,Dissolved	0.0500	0.0486	0.0488	97.3	97.6	80.0-120			0.324	20
Manganese,Dissolved	0.0500	0.0434	0.0437	86.8	87.5	80.0-120			0.765	20
Nickel,Dissolved	0.0500	0.0515	0.0515	103	103	80.0-120			0.0811	20
Selenium,Dissolved	0.0500	0.0465	0.0477	92.9	95.4	80.0-120			2.61	20
Silver,Dissolved	0.0500	0.0507	0.0495	101	99.1	80.0-120			2.31	20
Thallium,Dissolved	0.0500	0.0478	0.0482	95.6	96.5	80.0-120			0.908	20
Vanadium,Dissolved	0.0500	0.0452	0.0460	90.5	92.0	80.0-120			1.71	20
Zinc,Dissolved	0.0500	0.0484	0.0485	96.7	97.1	80.0-120			0.327	20

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

(LCS) R3319940-2 06/21/18 23:55 • (LCSD) R3319940-3 06/22/18 00:00

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 %
Aluminum,Dissolved	5.00	4.54	4.54	90.8	90.8	80.0-120			0.0900	20
Calcium,Dissolved	5.00	4.98	4.73	99.6	94.6	80.0-120			5.18	20
Magnesium,Dissolved	5.00	4.73	4.71	94.6	94.1	80.0-120			0.528	20
Potassium,Dissolved	5.00	4.85	4.75	97.1	94.9	80.0-120			2.27	20
Sodium,Dissolved	5.00	5.04	5.01	101	100	80.0-120			0.586	20

L1003188-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003188-01 06/21/18 19:04 • (MS) R3319939-5 06/21/18 19:13 • (MSD) R3319939-6 06/21/18 19:18

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony,Dissolved	0.0500	ND	0.0488	0.0488	97.7	97.6	1	75.0-125			0.0340	20
Arsenic,Dissolved	0.0500	0.00784	0.0557	0.0563	95.7	96.9	1	75.0-125			1.07	20
Barium,Dissolved	0.0500	0.0175	0.0664	0.0649	97.9	94.9	1	75.0-125			2.31	20
Beryllium,Dissolved	0.0500	ND	0.0496	0.0491	99.2	98.2	1	75.0-125			1.05	20
Cadmium,Dissolved	0.0500	ND	0.0485	0.0476	97.0	95.3	1	75.0-125			1.81	20
Chromium,Dissolved	0.0500	ND	0.0488	0.0479	93.8	91.9	1	75.0-125			1.95	20
Copper,Dissolved	0.0500	ND	0.0521	0.0512	99.4	97.5	1	75.0-125			1.83	20
Cobalt,Dissolved	0.0500	0.0222	0.0730	0.0735	102	103	1	75.0-125			0.661	20
Iron,Dissolved	5.00	6.47	11.3	11.3	97.4	97.0	1	75.0-125			0.168	20
Lead,Dissolved	0.0500	ND	0.0495	0.0490	99.0	98.1	1	75.0-125			0.945	20

L1003188-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003188-01 06/21/18 19:04 • (MS) R3319939-5 06/21/18 19:13 • (MSD) R3319939-6 06/21/18 19:18

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Manganese,Dissolved	0.0500	0.440	0.482	0.484	85.8	89.9	1	75.0-125			0.424	20
Nickel,Dissolved	0.0500	0.00635	0.0571	0.0573	102	102	1	75.0-125			0.391	20
Selenium,Dissolved	0.0500	ND	0.0486	0.0491	97.2	98.1	1	75.0-125			0.967	20
Silver,Dissolved	0.0500	ND	0.0509	0.0506	102	101	1	75.0-125			0.699	20
Thallium,Dissolved	0.0500	ND	0.0484	0.0482	96.9	96.5	1	75.0-125			0.420	20
Vanadium,Dissolved	0.0500	ND	0.0459	0.0448	91.7	89.5	1	75.0-125			2.42	20
Zinc,Dissolved	0.0500	ND	0.0568	0.0584	91.8	95.0	1	75.0-125			2.79	20

L1003188-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003188-01 06/22/18 00:04 • (MS) R3319940-5 06/22/18 00:13 • (MSD) R3319940-6 06/22/18 00:18

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum,Dissolved	5.00	ND	4.61	4.64	91.3	91.9	1	75.0-125			0.673	20
Calcium,Dissolved	5.00	3.47	8.27	8.35	96.1	97.6	1	75.0-125			0.906	20
Potassium,Dissolved	5.00	1.11	5.89	5.85	95.6	94.7	1	75.0-125			0.787	20
Magnesium,Dissolved	5.00	2.12	6.83	6.88	94.2	95.2	1	75.0-125			0.745	20
Sodium,Dissolved	5.00	3.04	7.80	7.88	95.2	96.8	1	75.0-125			0.985	20

Method Blank (MB)

(MB) R3320366-1 06/23/18 12:43

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Aluminum	0.0152	J	0.00515	0.100
Antimony	U		0.000754	0.00200
Arsenic	U		0.000250	0.00200
Barium	U		0.000360	0.00500
Beryllium	U		0.000120	0.00200
Cadmium	U		0.000160	0.00100
Calcium	U		0.0460	1.00
Chromium	U		0.000540	0.00200
Copper	U		0.000520	0.00500
Cobalt	U		0.000260	0.00200
Iron	0.0203	J	0.0150	0.100
Lead	U		0.000240	0.00200
Magnesium	U		0.100	1.00
Manganese	U		0.000250	0.00500
Nickel	U		0.000350	0.00200
Potassium	0.0468	J	0.0370	1.00
Selenium	U		0.000380	0.00200
Silver	U		0.000310	0.00200
Sodium	U		0.110	1.00
Thallium	U		0.000190	0.00200
Vanadium	U		0.000180	0.00500
Zinc	U		0.00256	0.0250

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

(LCS) R3320366-2 06/23/18 12:48 • (LCSD) R3320366-3 06/23/18 12:53

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	4.83	4.90	96.7	97.9	80.0-120			1.29	20
Antimony	0.0500	0.0488	0.0499	97.6	99.8	80.0-120			2.23	20
Arsenic	0.0500	0.0466	0.0483	93.2	96.5	80.0-120			3.45	20
Barium	0.0500	0.0470	0.0463	94.0	92.5	80.0-120			1.59	20
Beryllium	0.0500	0.0481	0.0480	96.1	96.1	80.0-120			0.0409	20
Cadmium	0.0500	0.0505	0.0507	101	101	80.0-120			0.347	20
Calcium	5.00	4.82	5.12	96.4	102	80.0-120			6.06	20
Chromium	0.0500	0.0500	0.0506	100	101	80.0-120			1.13	20
Copper	0.0500	0.0509	0.0516	102	103	80.0-120			1.41	20
Cobalt	0.0500	0.0508	0.0518	102	104	80.0-120			1.86	20
Iron	5.00	4.97	5.02	99.5	100	80.0-120			0.998	20

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

(LCS) R3320366-2 06/23/18 12:48 • (LCSD) R3320366-3 06/23/18 12:53

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	0.0500	0.0482	0.0494	96.5	98.8	80.0-120			2.35	20
Magnesium	5.00	4.89	5.02	97.8	100	80.0-120			2.66	20
Manganese	0.0500	0.0488	0.0497	97.7	99.3	80.0-120			1.66	20
Nickel	0.0500	0.0510	0.0510	102	102	80.0-120			0.0262	20
Potassium	5.00	4.73	4.93	94.5	98.6	80.0-120			4.23	20
Selenium	0.0500	0.0521	0.0544	104	109	80.0-120			4.25	20
Silver	0.0500	0.0491	0.0499	98.2	99.9	80.0-120			1.68	20
Sodium	5.00	4.92	5.03	98.4	101	80.0-120			2.22	20
Thallium	0.0500	0.0481	0.0487	96.2	97.4	80.0-120			1.24	20
Vanadium	0.0500	0.0489	0.0496	97.9	99.1	80.0-120			1.24	20
Zinc	0.0500	0.0502	0.0497	100	99.4	80.0-120			1.02	20

L1003087-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1003087-01 06/23/18 12:57 • (MS) R3320366-5 06/23/18 13:06 • (MSD) R3320366-6 06/23/18 13:11

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	5.00	ND	4.87	4.79	96.8	95.2	1	75.0-125			1.73	20
Antimony	0.0500	ND	0.0508	0.0502	102	100	1	75.0-125			1.18	20
Arsenic	0.0500	0.00459	0.0520	0.0523	94.8	95.4	1	75.0-125			0.548	20
Barium	0.0500	0.0464	0.0946	0.0936	96.3	94.3	1	75.0-125			1.04	20
Beryllium	0.0500	ND	0.0474	0.0462	94.8	92.3	1	75.0-125			2.66	20
Cadmium	0.0500	ND	0.0485	0.0489	97.1	97.8	1	75.0-125			0.721	20
Calcium	5.00	39.0	43.2	42.6	85.5	72.2	1	75.0-125		V	1.55	20
Chromium	0.0500	0.00237	0.0507	0.0500	96.7	95.4	1	75.0-125			1.30	20
Copper	0.0500	ND	0.0493	0.0492	97.1	96.8	1	75.0-125			0.308	20
Cobalt	0.0500	ND	0.0492	0.0485	98.4	97.0	1	75.0-125			1.42	20
Potassium	5.00	11.3	16.0	16.1	94.1	95.0	1	75.0-125			0.265	20
Iron	5.00	ND	4.79	4.79	95.8	95.8	1	75.0-125			0.0338	20
Lead	0.0500	ND	0.0489	0.0485	97.8	97.0	1	75.0-125			0.862	20
Magnesium	5.00	34.6	39.1	38.2	89.6	72.8	1	75.0-125		V	2.18	20
Manganese	0.0500	ND	0.0472	0.0475	94.4	95.0	1	75.0-125			0.638	20
Nickel	0.0500	ND	0.0495	0.0493	96.8	96.4	1	75.0-125			0.346	20
Selenium	0.0500	0.00321	0.0521	0.0514	97.8	96.4	1	75.0-125			1.36	20
Silver	0.0500	ND	0.0493	0.0495	98.6	99.0	1	75.0-125			0.436	20
Sodium	5.00	52.2	56.2	55.0	79.6	55.6	1	75.0-125		V	2.16	20
Thallium	0.0500	ND	0.0488	0.0486	97.6	97.2	1	75.0-125			0.404	20
Vanadium	0.0500	0.0208	0.0690	0.0686	96.3	95.5	1	75.0-125			0.568	20
Zinc	0.0500	ND	0.0467	0.0467	93.5	93.3	1	75.0-125			0.156	20

Method Blank (MB)

(MB) R3320163-3 06/21/18 17:17

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

Method Blank (MB)

(MB) R3320163-3 06/21/18 17:17

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	*104*			*80.0-120*
(S) Dibromofluoromethane	*97.5*			*76.0-123*
(S) a,a,a-Trifluorotoluene	*103*			*80.0-120*
(S) 4-Bromofluorobenzene	*102*			*80.0-120*

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

(LCS) R3320163-1 06/21/18 16:17 • (LCSD) R3320163-2 06/21/18 16:37

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	0.156	130	124	10.0-160			4.05	23
Acrylonitrile	0.125	0.140	0.136	112	109	60.0-142			3.25	20
Benzene	0.0250	0.0235	0.0227	93.9	90.6	69.0-123			3.57	20
Bromodichloromethane	0.0250	0.0239	0.0237	95.4	94.6	76.0-120			0.799	20
Bromochloromethane	0.0250	0.0239	0.0229	95.6	91.7	76.0-122			4.21	20
Bromoform	0.0250	0.0295	0.0290	118	116	67.0-132			1.69	20
Bromomethane	0.0250	0.0214	0.0204	85.7	81.4	18.0-160			5.08	20
Carbon disulfide	0.0250	0.0257	0.0249	103	99.4	55.0-127			3.20	20
Carbon tetrachloride	0.0250	0.0273	0.0264	109	105	63.0-122			3.48	20
Chlorobenzene	0.0250	0.0258	0.0253	103	101	79.0-121			2.00	20
Chlorodibromomethane	0.0250	0.0265	0.0262	106	105	75.0-125			1.20	20
Chloroethane	0.0250	0.0218	0.0212	87.3	84.8	47.0-152			3.00	20
Chloroform	0.0250	0.0249	0.0236	99.5	94.6	72.0-121			5.14	20
Chloromethane	0.0250	0.0305	0.0294	122	118	48.0-139			3.41	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0210	0.0216	84.2	86.3	64.0-127			2.52	20
1,2-Dibromoethane	0.0250	0.0251	0.0247	100	99.0	77.0-123			1.47	20
Dibromomethane	0.0250	0.0252	0.0248	101	99.2	78.0-120			1.38	20
1,2-Dichlorobenzene	0.0250	0.0244	0.0244	97.5	97.8	80.0-120			0.235	20
1,4-Dichlorobenzene	0.0250	0.0259	0.0255	104	102	77.0-120			1.66	20
trans-1,4-Dichloro-2-butene	0.0250	0.0173	0.0161	69.2	64.2	55.0-134			7.50	20
1,1-Dichloroethane	0.0250	0.0253	0.0247	101	98.6	70.0-126			2.68	20
1,2-Dichloroethane	0.0250	0.0268	0.0254	107	102	67.0-126			5.19	20

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

(LCS) R3320163-1 06/21/18 16:17 • (LCSD) R3320163-2 06/21/18 16:37

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 %
1,1-Dichloroethene	0.0250	0.0266	0.0258	107	103	64.0-129			3.30	20
cis-1,2-Dichloroethene	0.0250	0.0231	0.0227	92.4	91.0	73.0-120			1.51	20
trans-1,2-Dichloroethene	0.0250	0.0242	0.0231	96.9	92.3	71.0-121			4.80	20
1,2-Dichloropropane	0.0250	0.0250	0.0251	99.9	101	75.0-125			0.703	20
cis-1,3-Dichloropropene	0.0250	0.0237	0.0240	94.9	96.1	79.0-123			1.17	20
trans-1,3-Dichloropropene	0.0250	0.0242	0.0251	96.9	100	74.0-127			3.39	20
Ethylbenzene	0.0250	0.0255	0.0254	102	102	77.0-120			0.242	20
2-Hexanone	0.125	0.141	0.137	113	109	58.0-147			3.00	20
Iodomethane	0.125	0.125	0.122	100	97.6	57.0-140			2.51	20
2-Butanone (MEK)	0.125	0.153	0.148	122	118	37.0-158			3.49	20
Methylene Chloride	0.0250	0.0220	0.0214	87.9	85.6	66.0-121			2.62	20
4-Methyl-2-pentanone (MIBK)	0.125	0.159	0.158	127	126	59.0-143			0.787	20
Styrene	0.0250	0.0283	0.0278	113	111	78.0-124			1.82	20
1,1,1,2-Tetrachloroethane	0.0250	0.0253	0.0251	101	100	75.0-122			0.720	20
1,1,2,2-Tetrachloroethane	0.0250	0.0206	0.0198	82.3	79.4	71.0-122			3.57	20
Tetrachloroethene	0.0250	0.0264	0.0263	106	105	70.0-127			0.344	20
Toluene	0.0250	0.0247	0.0239	98.6	95.5	77.0-120			3.25	20
1,1,1-Trichloroethane	0.0250	0.0274	0.0263	110	105	68.0-122			4.10	20
1,1,2-Trichloroethane	0.0250	0.0245	0.0246	98.0	98.4	78.0-120			0.410	20
Trichloroethene	0.0250	0.0265	0.0262	106	105	78.0-120			1.46	20
Trichlorofluoromethane	0.0250	0.0276	0.0265	110	106	56.0-137			4.18	20
1,2,3-Trichloropropane	0.0250	0.0251	0.0249	100	99.5	72.0-124			0.842	20
Vinyl acetate	0.125	0.0567	0.0624	45.4	49.9	46.0-160	J4		9.61	20
Vinyl chloride	0.0250	0.0239	0.0234	95.5	93.7	64.0-133			1.90	20
Xylenes, Total	0.0750	0.0757	0.0753	101	100	77.0-120			0.530	20
(S) Toluene-d8				*103*	*103*	*80.0-120*				
(S) Dibromofluoromethane				*97.4*	*94.5*	*76.0-123*				
(S) a,a,a-Trifluorotoluene				*104*	*106*	*80.0-120*				
(S) 4-Bromofluorobenzene				*102*	*105*	*80.0-120*				

Method Blank (MB)

(MB) R3320727-3 06/25/18 11:40

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
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
1,1,2-Trichloroethane	U		0.000383	0.00100

Method Blank (MB)

(MB) R3320727-3 06/25/18 11:40

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
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	*105*			*80.0-120*
(S) Dibromofluoromethane	*91.0*			*76.0-123*
(S) a,a,a-Trifluorotoluene	*100*			*80.0-120*
(S) 4-Bromofluorobenzene	*94.0*			*80.0-120*

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

(LCS) R3320727-1 06/25/18 09:55 • (LCSD) R3320727-2 06/25/18 10:16

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	0.114	0.114	91.0	91.3	10.0-160			0.308	23
Acrylonitrile	0.125	0.116	0.114	93.1	91.3	60.0-142			1.89	20
Benzene	0.0250	0.0232	0.0226	92.7	90.6	69.0-123			2.30	20
Bromodichloromethane	0.0250	0.0239	0.0233	95.8	93.2	76.0-120			2.76	20
Bromochloromethane	0.0250	0.0201	0.0185	80.4	74.0	76.0-122		J4	8.35	20
Bromoform	0.0250	0.0219	0.0225	87.5	90.0	67.0-132			2.74	20
Bromomethane	0.0250	0.00323	0.00518	12.9	20.7	18.0-160	J4	J3	46.2	20
Carbon disulfide	0.0250	0.0219	0.0210	87.5	83.9	55.0-127			4.13	20
Carbon tetrachloride	0.0250	0.0225	0.0221	89.8	88.5	63.0-122			1.46	20
Chlorobenzene	0.0250	0.0250	0.0257	100	103	79.0-121			2.85	20
Chlorodibromomethane	0.0250	0.0242	0.0242	96.8	96.9	75.0-125			0.108	20
Chloroethane	0.0250	0.0328	0.0316	131	126	47.0-152			3.75	20
Chloroform	0.0250	0.0237	0.0230	94.8	92.0	72.0-121			2.99	20
Chloromethane	0.0250	0.0188	0.0231	75.4	92.6	48.0-139		J3	20.5	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0233	0.0246	93.0	98.4	64.0-127			5.58	20
1,2-Dibromoethane	0.0250	0.0238	0.0238	95.3	95.3	77.0-123			0.00554	20
Dibromomethane	0.0250	0.0239	0.0224	95.8	89.6	78.0-120			6.70	20
1,2-Dichlorobenzene	0.0250	0.0253	0.0256	101	102	80.0-120			1.34	20
1,4-Dichlorobenzene	0.0250	0.0263	0.0260	105	104	77.0-120			1.04	20
trans-1,4-Dichloro-2-butene	0.0250	0.0180	0.0188	72.2	75.2	55.0-134			4.06	20
1,1-Dichloroethane	0.0250	0.0243	0.0239	97.0	95.7	70.0-126			1.41	20
1,2-Dichloroethane	0.0250	0.0253	0.0244	101	97.7	67.0-126			3.61	20
1,1-Dichloroethene	0.0250	0.0234	0.0223	93.7	89.3	64.0-129			4.78	20

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

(LCS) R3320727-1 06/25/18 09:55 • (LCSD) R3320727-2 06/25/18 10:16

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
cis-1,2-Dichloroethene	0.0250	0.0221	0.0218	88.6	87.1	73.0-120			1.72	20
trans-1,2-Dichloroethene	0.0250	0.0222	0.0217	88.9	86.7	71.0-121			2.56	20
1,2-Dichloropropane	0.0250	0.0260	0.0245	104	98.1	75.0-125			5.69	20
cis-1,3-Dichloropropene	0.0250	0.0265	0.0273	106	109	79.0-123			3.04	20
trans-1,3-Dichloropropene	0.0250	0.0270	0.0274	108	109	74.0-127			1.41	20
Ethylbenzene	0.0250	0.0249	0.0255	99.6	102	77.0-120			2.46	20
2-Hexanone	0.125	0.132	0.135	105	108	58.0-147			2.34	20
2-Butanone (MEK)	0.125	0.127	0.127	102	101	37.0-158			0.437	20
Methylene Chloride	0.0250	0.0222	0.0215	88.9	85.9	66.0-121			3.51	20
4-Methyl-2-pentanone (MIBK)	0.125	0.136	0.139	109	111	59.0-143			1.81	20
Styrene	0.0250	0.0220	0.0225	88.2	90.1	78.0-124			2.11	20
1,1,1,2-Tetrachloroethane	0.0250	0.0247	0.0245	98.7	98.0	75.0-122			0.737	20
1,1,2,2-Tetrachloroethane	0.0250	0.0278	0.0275	111	110	71.0-122			1.05	20
Tetrachloroethene	0.0250	0.0251	0.0256	101	102	70.0-127			1.86	20
Toluene	0.0250	0.0240	0.0245	95.8	98.1	77.0-120			2.34	20
1,1,1-Trichloroethane	0.0250	0.0237	0.0231	94.9	92.4	68.0-122			2.69	20
1,1,2-Trichloroethane	0.0250	0.0259	0.0256	104	102	78.0-120			1.17	20
Trichloroethene	0.0250	0.0212	0.0209	84.7	83.5	78.0-120			1.39	20
Trichlorofluoromethane	0.0250	0.0293	0.0287	117	115	56.0-137			2.05	20
1,2,3-Trichloropropane	0.0250	0.0239	0.0239	95.4	95.7	72.0-124			0.273	20
Vinyl acetate	0.125	0.430	0.414	344	331	46.0-160	J4	J4	3.84	20
Vinyl chloride	0.0250	0.0247	0.0240	98.7	96.0	64.0-133			2.83	20
Xylenes, Total	0.0750	0.0738	0.0749	98.4	99.9	77.0-120			1.48	20
(S) Toluene-d8				*102*	*105*	*80.0-120*				
(S) Dibromofluoromethane				*95.1*	*92.5*	*76.0-123*				
(S) a,a,a-Trifluorotoluene				*99.9*	*98.8*	*80.0-120*				
(S) 4-Bromofluorobenzene				*91.3*	*90.6*	*80.0-120*				

Method Blank (MB)

(MB) R3320800-3 06/25/18 20:11

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Iodomethane	U		0.00171	0.0100
(S) Toluene-d8	*106*			*80.0-120*
(S) Dibromofluoromethane	*92.1*			*76.0-123*
(S) a,a,a-Trifluorotoluene	*104*			*80.0-120*
(S) 4-Bromofluorobenzene	*92.1*			*80.0-120*

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

(LCS) R3320800-1 06/25/18 19:11 • (LCSD) R3320800-2 06/25/18 19:31

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 %
Iodomethane	0.125	0.111	0.106	89.2	84.4	57.0-140			5.45	20
(S) Toluene-d8				*108*	*103*	*80.0-120*				
(S) Dibromofluoromethane				*94.7*	*90.5*	*76.0-123*				
(S) a,a,a-Trifluorotoluene				*102*	*99.8*	*80.0-120*				
(S) 4-Bromofluorobenzene				*95.7*	*97.7*	*80.0-120*				

Method Blank (MB)

(MB) R3320087-1 06/22/18 02:40

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Ethylene Dibromide	U		0.00000240	0.0000100
1,2-Dibromo-3-Chloropropane	U		0.00000430	0.0000200

L1003188-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1003188-08 06/22/18 03:29 • (DUP) R3320087-3 06/22/18 03:17

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Ethylene Dibromide	ND	0.000	1.01			20
1,2-Dibromo-3-Chloropropane	ND	0.000	1.01			20

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

(LCS) R3320087-4 06/22/18 05:31 • (LCSD) R3320087-5 06/22/18 06:32

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethylene Dibromide	0.000250	0.000243	0.000236	97.2	94.4	60.0-140			2.92	20
1,2-Dibromo-3-Chloropropane	0.000250	0.000243	0.000242	97.2	96.8	60.0-140			0.412	20

L1003188-09 Original Sample (OS) • Matrix Spike (MS)

(OS) L1003188-09 06/22/18 03:04 • (MS) R3320087-2 06/22/18 02:52

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Ethylene Dibromide	0.000101	ND	0.000117	116	1.01	72.0-146	
1,2-Dibromo-3-Chloropropane	0.000101	ND	0.000125	124	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, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
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
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.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
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.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

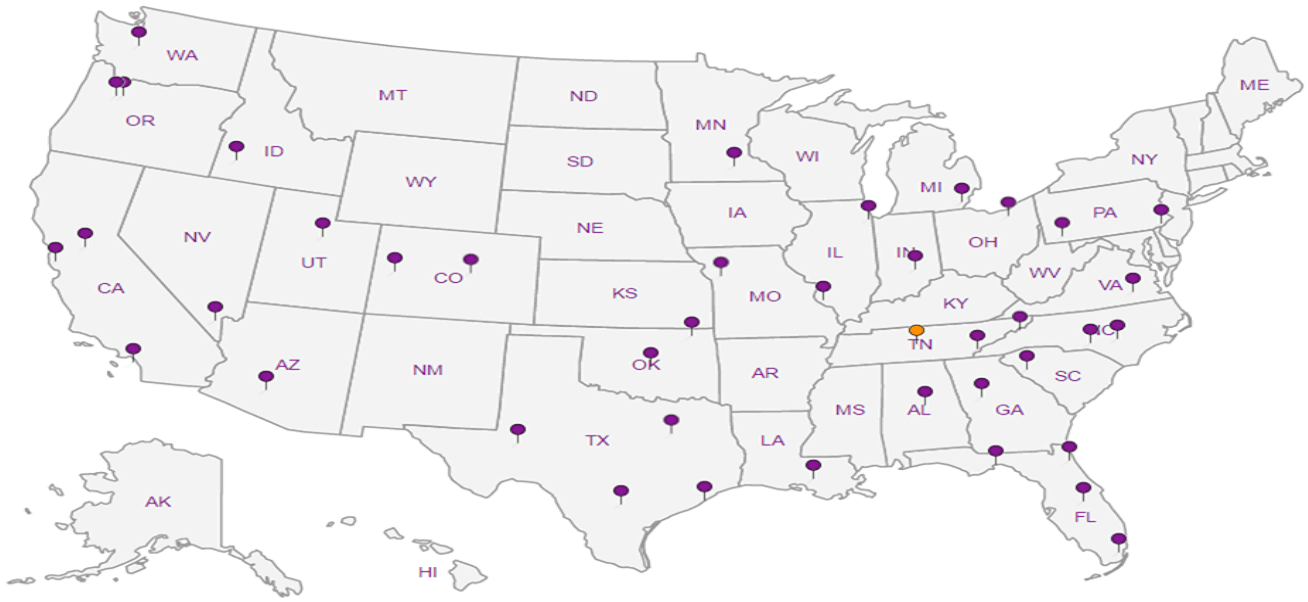
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

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

Pres Chk

Report to: **Philip Campbell**

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

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

City/State Collected:

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

Client Project # **171-873**

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

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

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

P.O. #

Collected by (signature): **Phil Campbell**

Immediately Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	**WetChem** 250mlHDPE-NoPres	ALK 60mlAmb-NoPres	COD,NH3 250mlHDPE-H2SO4	Diss.Metals 250mlHDPE-HNO3 No Preserv **	SV8011 40mlClr-NaThio	Total Metals,HARD 250mlHDPE-HNO3	V8260AP1 40mlAmb-HCl			Remarks	Sample # (lab only)
IWC-L	Grab	GW	—	6-19-18	1500	11	X	X	X	X	X	X	X				-01
APWC-L	Grab	GW	—	6-19-18	1525	11	X	X	X	X	X	X	X				-02

Chain of Custody Page 1 of 1

ESC LAB SCIENCES
a subsidiary of Accutest

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

L# 1003198

Table # A024

Acctnum: **CEC**

Template: **T133582**

Prelogin: **P657637**

TSR: **526 - Chris McCord**

PB: TB 6-5-18

Shipped Via: **Courier**

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

Remarks:**WetChem** = *NITRATE*,CHLORIDE,BROMIDE,SULFATE,FLUORIDE,ALK
Tot/Diss Metals=M6020AP1 + Al,Ca,Fe,K,Mg,Mn,Na,B(6010)
* Diss. Metals bottles unpreserved. Not F-Filtered in Field

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier ✓

Tracking #

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		✓ N
Bottles arrive intact:		✓ N
Correct bottles used:		✓ N
Sufficient volume sent:		✓ N
If Applicable		
VOA Zero Headspace:		✓ N
Preservation Correct/Checked:		✓ N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
Philip Campbell	6-20-18	10:05		/	Phenols due 6 months
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.6 °C Bottles Received: 22	
	6-20-18	16:10			
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 6/20/18 Time: 1610	Hold: Condition: NCF / OK

Ian White

ESC Lab Sciences
Non-Conformance Form

Login #: 1003198	Client: CEC	Date: 06/20/18	Evaluated by: Ian White

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
	Parameter(s) past holding time	x	Login Clarification Needed		**If Broken Container:**
	Improper temperature		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type		Please specify Metals requested.		Insufficient packing material inside cooler
	Improper preservation		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Courie
	Insufficient sample volume.		Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container		Client did not "X" analysis.		Received by:
	Broken container:		Chain of Custody is missing		Date/Time:
	Sufficient sample remains				Temp./Cont. Rec./pH:
					Carrier:
					Tracking#

Login Comments:volatiles vials received with headspace on "APWC-L"

Client informed by:		Call	x	Email		Voice Mail		Date: 6/21/18	Time: 17:04
TSR Initials:CM	Client Contact: Philip Campbell								

Login Instructions:

Run as received.

This E-mail and any attached files are confidential, and may be copyright protected. If you are not the addressee, any dissemination of this communication is strictly prohibited. If you have received this message in error, please contact the sender immediately and delete/destroy all information received.

ANALYTICAL REPORT

July 07, 2018

Civil & Environmental Consultants - TN

Sample Delivery Group:	L1005296
Samples Received:	06/28/2018
Project Number:	171-873
Description:	EWS Camden Class 2 Landfill
Site:	CAMDEN, TN
Report To:	Philip Campbell 325 Seaboard Lane, Suite 170 Franklin, TN 37067

Entire Report Reviewed By:

Chris McCord
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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CHARLIE CREEK US L1005296-01 GW

Collected by	Collected date/time	Received date/time
CL/MS	06/27/18 13:30	06/28/18 13:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1132236	1	07/03/18 09:57	07/03/18 09:57	KK
Wet Chemistry by Method 350.1	WG1131952	1	07/02/18 12:30	07/02/18 12:30	JER
Wet Chemistry by Method 9056A	WG1133123	1	07/03/18 19:22	07/03/18 19:22	DR
Mercury by Method 7470A	WG1132351	1	07/02/18 09:22	07/02/18 13:08	ABL
Mercury by Method 7470A	WG1132358	1	07/02/18 09:20	07/02/18 17:14	EL
Metals (ICP) by Method 6010B	WG1131346	1	06/29/18 10:47	07/01/18 17:21	CCE
Metals (ICP) by Method 6010B	WG1131821	1	06/30/18 13:48	07/03/18 14:35	TRB
Metals (ICPMS) by Method 6020	WG1130986	1	07/02/18 16:46	07/03/18 13:24	LAT
Metals (ICPMS) by Method 6020	WG1130986	1	07/02/18 16:46	07/04/18 20:15	LD
Metals (ICPMS) by Method 6020	WG1131609	1	06/30/18 11:33	07/03/18 13:38	LAT

CHARLIE CREEK MS L1005296-02 GW

Collected by	Collected date/time	Received date/time
CL/MS	06/27/18 12:00	06/28/18 13:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1132236	1	07/03/18 10:00	07/03/18 10:00	KK
Wet Chemistry by Method 350.1	WG1131952	1	07/02/18 12:31	07/02/18 12:31	JER
Wet Chemistry by Method 9056A	WG1133123	1	07/03/18 20:24	07/03/18 20:24	DR
Mercury by Method 7470A	WG1132351	1	07/02/18 09:22	07/02/18 13:10	ABL
Mercury by Method 7470A	WG1132358	1	07/02/18 09:20	07/02/18 17:16	EL
Metals (ICP) by Method 6010B	WG1131346	1	06/29/18 10:47	07/01/18 17:23	CCE
Metals (ICP) by Method 6010B	WG1131821	1	06/30/18 13:48	07/03/18 14:37	TRB
Metals (ICPMS) by Method 6020	WG1130986	1	07/02/18 16:46	07/03/18 13:28	LAT
Metals (ICPMS) by Method 6020	WG1130986	1	07/02/18 16:46	07/04/18 20:20	LD
Metals (ICPMS) by Method 6020	WG1131609	1	06/30/18 11:33	07/03/18 14:03	LAT
Metals (ICPMS) by Method 6020	WG1131609	1	06/30/18 11:33	07/03/18 16:26	LD

CANE CREEK US L1005296-03 GW

Collected by	Collected date/time	Received date/time
CL/MS	06/27/18 12:50	06/28/18 13:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1132236	1	07/03/18 10:01	07/03/18 10:01	KK
Wet Chemistry by Method 350.1	WG1131952	1	07/02/18 12:33	07/02/18 12:33	JER
Wet Chemistry by Method 9056A	WG1133123	1	07/03/18 21:10	07/03/18 21:10	DR
Mercury by Method 7470A	WG1132351	1	07/02/18 09:22	07/02/18 13:12	ABL
Mercury by Method 7470A	WG1132358	1	07/02/18 09:20	07/02/18 17:18	EL
Metals (ICP) by Method 6010B	WG1131346	1	06/29/18 10:47	07/01/18 17:26	CCE
Metals (ICP) by Method 6010B	WG1131821	1	06/30/18 13:48	07/03/18 14:40	TRB
Metals (ICPMS) by Method 6020	WG1130986	1	07/02/18 16:46	07/03/18 13:33	LAT
Metals (ICPMS) by Method 6020	WG1130986	1	07/02/18 16:46	07/04/18 20:24	LD
Metals (ICPMS) by Method 6020	WG1131609	1	06/30/18 11:33	07/03/18 14:07	LAT
Metals (ICPMS) by Method 6020	WG1131609	1	06/30/18 11:33	07/03/18 16:30	LD

CANE CREEK MS L1005296-04 GW

Collected by	Collected date/time	Received date/time
CL/MS	06/27/18 11:20	06/28/18 13:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1132236	1	07/03/18 10:02	07/03/18 10:02	KK
Wet Chemistry by Method 350.1	WG1131952	1	07/02/18 12:39	07/02/18 12:39	JER
Wet Chemistry by Method 9056A	WG1133123	1	07/03/18 21:26	07/03/18 21:26	DR
Mercury by Method 7470A	WG1132351	1	07/02/18 09:22	07/02/18 13:14	ABL
Mercury by Method 7470A	WG1132358	1	07/02/18 09:20	07/02/18 17:20	EL
Metals (ICP) by Method 6010B	WG1131346	1	06/29/18 10:47	07/01/18 17:29	CCE

CANE CREEK MS L1005296-04 GW

Collected by	Collected date/time	Received date/time
CL/MS	06/27/18 11:20	06/28/18 13:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1131821	1	06/30/18 13:48	07/03/18 14:43	TRB
Metals (ICPMS) by Method 6020	WG1130986	1	07/02/18 16:46	07/03/18 13:38	LAT
Metals (ICPMS) by Method 6020	WG1130986	1	07/02/18 16:46	07/04/18 20:38	LD
Metals (ICPMS) by Method 6020	WG1131609	1	06/30/18 11:33	07/03/18 14:11	LAT
Metals (ICPMS) by Method 6020	WG1131609	1	06/30/18 11:33	07/03/18 16:34	LD

CANE CREEK DS-1 L1005296-05 GW

Collected by	Collected date/time	Received date/time
CL/MS	06/27/18 10:25	06/28/18 13:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1132236	1	07/03/18 10:03	07/03/18 10:03	KK
Wet Chemistry by Method 350.1	WG1131952	1	07/02/18 12:41	07/02/18 12:41	JER
Wet Chemistry by Method 9056A	WG1133123	1	07/03/18 21:41	07/03/18 21:41	DR
Mercury by Method 7470A	WG1132351	1	07/02/18 09:22	07/02/18 13:16	ABL
Mercury by Method 7470A	WG1132358	1	07/02/18 09:20	07/02/18 17:22	EL
Metals (ICP) by Method 6010B	WG1131346	1	06/29/18 10:47	07/01/18 17:31	CCE
Metals (ICP) by Method 6010B	WG1131821	1	06/30/18 13:48	07/03/18 14:50	TRB
Metals (ICPMS) by Method 6020	WG1130986	1	07/02/18 16:46	07/03/18 13:42	LAT
Metals (ICPMS) by Method 6020	WG1130986	1	07/02/18 16:46	07/04/18 20:43	LD
Metals (ICPMS) by Method 6020	WG1131609	1	06/30/18 11:33	07/03/18 14:16	LAT
Metals (ICPMS) by Method 6020	WG1131609	1	06/30/18 11:33	07/03/18 16:38	LD

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All 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.

Chris McCord
Technical Service Representative

Wet Chemistry by Method 130.1

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (colorimetric) as CaCO3	47.9		30.0	1	07/03/2018 09:57	WG1132236

Wet Chemistry by Method 350.1

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.100	1	07/02/2018 12:30	WG1131952

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	07/03/2018 19:22	WG1133123
Chloride	8.12		1.00	1	07/03/2018 19:22	WG1133123
Fluoride	ND	P1	0.100	1	07/03/2018 19:22	WG1133123

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.000200	1	07/02/2018 13:08	WG1132351
Mercury,Dissolved	ND		0.000200	1	07/02/2018 17:14	WG1132358

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	07/01/2018 17:21	WG1131346
Boron,Dissolved	ND		0.200	1	07/03/2018 14:35	WG1131821

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Aluminum	ND		0.100	1	07/03/2018 13:38	WG1131609
Aluminum,Dissolved	ND		0.100	1	07/03/2018 13:24	WG1130986
Antimony	ND		0.00200	1	07/03/2018 13:38	WG1131609
Antimony,Dissolved	ND		0.00200	1	07/04/2018 20:15	WG1130986
Arsenic	ND		0.00200	1	07/03/2018 13:38	WG1131609
Arsenic,Dissolved	ND		0.00200	1	07/03/2018 13:24	WG1130986
Barium	0.0270		0.00500	1	07/03/2018 13:38	WG1131609
Barium,Dissolved	0.0275		0.00500	1	07/03/2018 13:24	WG1130986
Beryllium	ND		0.00200	1	07/03/2018 13:38	WG1131609
Beryllium,Dissolved	ND		0.00200	1	07/03/2018 13:24	WG1130986
Cadmium	ND		0.00100	1	07/03/2018 13:38	WG1131609
Cadmium,Dissolved	ND		0.00100	1	07/03/2018 13:24	WG1130986
Calcium	13.1		1.00	1	07/03/2018 13:38	WG1131609
Calcium,Dissolved	13.0		1.00	1	07/03/2018 13:24	WG1130986
Chromium	ND		0.00200	1	07/03/2018 13:38	WG1131609
Chromium,Dissolved	ND		0.00200	1	07/03/2018 13:24	WG1130986
Cobalt	ND		0.00200	1	07/03/2018 13:38	WG1131609
Cobalt,Dissolved	ND		0.00200	1	07/03/2018 13:24	WG1130986
Copper	ND		0.00500	1	07/03/2018 13:38	WG1131609
Copper,Dissolved	ND		0.00500	1	07/03/2018 13:24	WG1130986
Iron	0.333		0.100	1	07/03/2018 13:38	WG1131609
Iron,Dissolved	0.131		0.100	1	07/03/2018 13:24	WG1130986
Lead	ND		0.00200	1	07/03/2018 13:38	WG1131609
Lead,Dissolved	ND		0.00200	1	07/03/2018 13:24	WG1130986

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Magnesium	2.39		1.00	1	07/03/2018 13:38	WG1131609
Magnesium,Dissolved	2.31		1.00	1	07/03/2018 13:24	WG1130986
Manganese	0.113		0.00500	1	07/03/2018 13:38	WG1131609
Manganese,Dissolved	0.0120		0.00500	1	07/03/2018 13:24	WG1130986
Nickel	ND		0.00200	1	07/03/2018 13:38	WG1131609
Nickel,Dissolved	ND		0.00200	1	07/03/2018 13:24	WG1130986
Potassium	1.41		1.00	1	07/03/2018 13:38	WG1131609
Potassium,Dissolved	1.99		1.00	1	07/03/2018 13:24	WG1130986
Selenium	ND		0.00200	1	07/03/2018 13:38	WG1131609
Selenium,Dissolved	ND		0.00200	1	07/03/2018 13:24	WG1130986
Silver	ND		0.00200	1	07/03/2018 13:38	WG1131609
Silver,Dissolved	ND		0.00200	1	07/03/2018 13:24	WG1130986
Sodium	6.22		1.00	1	07/03/2018 13:38	WG1131609
Sodium,Dissolved	6.22		1.00	1	07/03/2018 13:24	WG1130986
Thallium	ND		0.00200	1	07/03/2018 13:38	WG1131609
Thallium,Dissolved	ND		0.00200	1	07/03/2018 13:24	WG1130986
Vanadium	ND		0.00500	1	07/03/2018 13:38	WG1131609
Vanadium,Dissolved	ND		0.00500	1	07/03/2018 13:24	WG1130986
Zinc	ND		0.0250	1	07/03/2018 13:38	WG1131609
Zinc,Dissolved	ND		0.0250	1	07/03/2018 13:24	WG1130986

Wet Chemistry by Method 130.1

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (colorimetric) as CaCO3	59.8		30.0	1	07/03/2018 10:00	WG1132236

Wet Chemistry by Method 350.1

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.100	1	07/02/2018 12:31	WG1131952

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	07/03/2018 20:24	WG1133123
Chloride	10.2		1.00	1	07/03/2018 20:24	WG1133123
Fluoride	ND		0.100	1	07/03/2018 20:24	WG1133123

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.000200	1	07/02/2018 13:10	WG1132351
Mercury,Dissolved	ND		0.000200	1	07/02/2018 17:16	WG1132358

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	07/01/2018 17:23	WG1131346
Boron,Dissolved	ND		0.200	1	07/03/2018 14:37	WG1131821

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Aluminum	0.124	B	0.100	1	07/03/2018 14:03	WG1131609
Aluminum,Dissolved	ND		0.100	1	07/03/2018 13:28	WG1130986
Antimony	ND		0.00200	1	07/03/2018 14:03	WG1131609
Antimony,Dissolved	ND		0.00200	1	07/04/2018 20:20	WG1130986
Arsenic	ND		0.00200	1	07/03/2018 14:03	WG1131609
Arsenic,Dissolved	ND		0.00200	1	07/03/2018 13:28	WG1130986
Barium	0.0347		0.00500	1	07/03/2018 14:03	WG1131609
Barium,Dissolved	0.0338		0.00500	1	07/03/2018 13:28	WG1130986
Beryllium	ND		0.00200	1	07/03/2018 14:03	WG1131609
Beryllium,Dissolved	ND		0.00200	1	07/03/2018 13:28	WG1130986
Cadmium	ND		0.00100	1	07/03/2018 14:03	WG1131609
Cadmium,Dissolved	ND		0.00100	1	07/03/2018 13:28	WG1130986
Calcium	15.6		1.00	1	07/03/2018 14:03	WG1131609
Calcium,Dissolved	15.7		1.00	1	07/03/2018 13:28	WG1130986
Chromium	ND		0.00200	1	07/03/2018 14:03	WG1131609
Chromium,Dissolved	0.0136		0.00200	1	07/03/2018 13:28	WG1130986
Cobalt	ND		0.00200	1	07/03/2018 14:03	WG1131609
Cobalt,Dissolved	ND		0.00200	1	07/03/2018 13:28	WG1130986
Copper	ND		0.00500	1	07/03/2018 14:03	WG1131609
Copper,Dissolved	ND		0.00500	1	07/03/2018 13:28	WG1130986
Iron	0.424		0.100	1	07/03/2018 14:03	WG1131609
Iron,Dissolved	0.229		0.100	1	07/03/2018 13:28	WG1130986
Lead	ND		0.00200	1	07/03/2018 16:26	WG1131609
Lead,Dissolved	ND		0.00200	1	07/03/2018 13:28	WG1130986

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Magnesium	2.95		1.00	1	07/03/2018 14:03	WG1131609
Magnesium,Dissolved	2.85		1.00	1	07/03/2018 13:28	WG1130986
Manganese	0.232		0.00500	1	07/03/2018 14:03	WG1131609
Manganese,Dissolved	0.0951		0.00500	1	07/03/2018 13:28	WG1130986
Nickel	ND		0.00200	1	07/03/2018 14:03	WG1131609
Nickel,Dissolved	0.00786		0.00200	1	07/03/2018 13:28	WG1130986
Potassium	2.48		1.00	1	07/03/2018 14:03	WG1131609
Potassium,Dissolved	2.16		1.00	1	07/03/2018 13:28	WG1130986
Selenium	ND		0.00200	1	07/03/2018 14:03	WG1131609
Selenium,Dissolved	ND		0.00200	1	07/03/2018 13:28	WG1130986
Silver	ND		0.00200	1	07/03/2018 14:03	WG1131609
Silver,Dissolved	ND		0.00200	1	07/03/2018 13:28	WG1130986
Sodium	6.71		1.00	1	07/03/2018 14:03	WG1131609
Sodium,Dissolved	6.45		1.00	1	07/03/2018 13:28	WG1130986
Thallium	ND		0.00200	1	07/03/2018 16:26	WG1131609
Thallium,Dissolved	ND		0.00200	1	07/03/2018 13:28	WG1130986
Vanadium	ND		0.00500	1	07/03/2018 14:03	WG1131609
Vanadium,Dissolved	ND		0.00500	1	07/03/2018 13:28	WG1130986
Zinc	ND		0.0250	1	07/03/2018 14:03	WG1131609
Zinc,Dissolved	ND		0.0250	1	07/03/2018 13:28	WG1130986

Wet Chemistry by Method 130.1

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hardness (colorimetric) as CaCO3	72.9		30.0	1	07/03/2018 10:01	WG1132236

Wet Chemistry by Method 350.1

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.100	1	07/02/2018 12:33	WG1131952

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	07/03/2018 21:10	WG1133123
Chloride	8.06		1.00	1	07/03/2018 21:10	WG1133123
Fluoride	0.161		0.100	1	07/03/2018 21:10	WG1133123

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.000200	1	07/02/2018 13:12	WG1132351
Mercury,Dissolved	ND		0.000200	1	07/02/2018 17:18	WG1132358

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	07/01/2018 17:26	WG1131346
Boron,Dissolved	ND		0.200	1	07/03/2018 14:40	WG1131821

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Aluminum	0.275		0.100	1	07/03/2018 14:07	WG1131609
Aluminum,Dissolved	ND		0.100	1	07/03/2018 13:33	WG1130986
Antimony	ND		0.00200	1	07/03/2018 14:07	WG1131609
Antimony,Dissolved	ND		0.00200	1	07/04/2018 20:24	WG1130986
Arsenic	ND		0.00200	1	07/03/2018 14:07	WG1131609
Arsenic,Dissolved	ND		0.00200	1	07/03/2018 13:33	WG1130986
Barium	0.0242		0.00500	1	07/03/2018 14:07	WG1131609
Barium,Dissolved	0.0240		0.00500	1	07/03/2018 13:33	WG1130986
Beryllium	ND		0.00200	1	07/03/2018 14:07	WG1131609
Beryllium,Dissolved	ND		0.00200	1	07/03/2018 13:33	WG1130986
Cadmium	ND		0.00100	1	07/03/2018 14:07	WG1131609
Cadmium,Dissolved	ND		0.00100	1	07/03/2018 13:33	WG1130986
Calcium	19.9		1.00	1	07/03/2018 14:07	WG1131609
Calcium,Dissolved	20.1		1.00	1	07/03/2018 13:33	WG1130986
Chromium	ND		0.00200	1	07/03/2018 14:07	WG1131609
Chromium,Dissolved	ND		0.00200	1	07/03/2018 13:33	WG1130986
Cobalt	ND		0.00200	1	07/03/2018 14:07	WG1131609
Cobalt,Dissolved	ND		0.00200	1	07/03/2018 13:33	WG1130986
Copper	ND		0.00500	1	07/03/2018 14:07	WG1131609
Copper,Dissolved	ND		0.00500	1	07/03/2018 13:33	WG1130986
Iron	0.863		0.100	1	07/03/2018 14:07	WG1131609
Iron,Dissolved	0.169		0.100	1	07/03/2018 13:33	WG1130986
Lead	ND		0.00200	1	07/03/2018 16:30	WG1131609
Lead,Dissolved	ND		0.00200	1	07/03/2018 13:33	WG1130986

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Magnesium	3.79		1.00	1	07/03/2018 14:07	WG1131609
Magnesium,Dissolved	3.62		1.00	1	07/03/2018 13:33	WG1130986
Manganese	0.136		0.00500	1	07/03/2018 14:07	WG1131609
Manganese,Dissolved	0.0239		0.00500	1	07/03/2018 13:33	WG1130986
Nickel	ND		0.00200	1	07/03/2018 14:07	WG1131609
Nickel,Dissolved	ND		0.00200	1	07/03/2018 13:33	WG1130986
Potassium	3.64		1.00	1	07/03/2018 14:07	WG1131609
Potassium,Dissolved	3.87		1.00	1	07/03/2018 13:33	WG1130986
Selenium	ND		0.00200	1	07/03/2018 14:07	WG1131609
Selenium,Dissolved	ND		0.00200	1	07/03/2018 13:33	WG1130986
Silver	ND		0.00200	1	07/03/2018 14:07	WG1131609
Silver,Dissolved	ND		0.00200	1	07/03/2018 13:33	WG1130986
Sodium	7.02		1.00	1	07/03/2018 14:07	WG1131609
Sodium,Dissolved	6.81		1.00	1	07/03/2018 13:33	WG1130986
Thallium	ND		0.00200	1	07/03/2018 16:30	WG1131609
Thallium,Dissolved	ND		0.00200	1	07/03/2018 13:33	WG1130986
Vanadium	ND		0.00500	1	07/03/2018 14:07	WG1131609
Vanadium,Dissolved	ND		0.00500	1	07/03/2018 13:33	WG1130986
Zinc	ND		0.0250	1	07/03/2018 14:07	WG1131609
Zinc,Dissolved	ND		0.0250	1	07/03/2018 13:33	WG1130986

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	68.2		30.0	1	07/03/2018 10:02	WG1132236

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	0.169		0.100	1	07/02/2018 12:39	WG1131952

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	07/03/2018 21:26	WG1133123
Chloride	10.6		1.00	1	07/03/2018 21:26	WG1133123
Fluoride	0.101		0.100	1	07/03/2018 21:26	WG1133123

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/02/2018 13:14	WG1132351
Mercury,Dissolved	ND		0.000200	1	07/02/2018 17:20	WG1132358

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	07/01/2018 17:29	WG1131346
Boron,Dissolved	ND		0.200	1	07/03/2018 14:43	WG1131821

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	0.195		0.100	1	07/03/2018 14:11	WG1131609
Aluminum,Dissolved	ND		0.100	1	07/03/2018 13:38	WG1130986
Antimony	ND		0.00200	1	07/03/2018 14:11	WG1131609
Antimony,Dissolved	ND		0.00200	1	07/04/2018 20:38	WG1130986
Arsenic	ND		0.00200	1	07/03/2018 14:11	WG1131609
Arsenic,Dissolved	ND		0.00200	1	07/03/2018 13:38	WG1130986
Barium	0.0286		0.00500	1	07/03/2018 14:11	WG1131609
Barium,Dissolved	0.0246		0.00500	1	07/03/2018 13:38	WG1130986
Beryllium	ND		0.00200	1	07/03/2018 14:11	WG1131609
Beryllium,Dissolved	ND		0.00200	1	07/03/2018 13:38	WG1130986
Cadmium	ND		0.00100	1	07/03/2018 14:11	WG1131609
Cadmium,Dissolved	ND		0.00100	1	07/03/2018 13:38	WG1130986
Calcium	18.4		1.00	1	07/03/2018 14:11	WG1131609
Calcium,Dissolved	18.5		1.00	1	07/03/2018 13:38	WG1130986
Chromium	ND		0.00200	1	07/03/2018 14:11	WG1131609
Chromium,Dissolved	ND		0.00200	1	07/03/2018 13:38	WG1130986
Cobalt	ND		0.00200	1	07/03/2018 14:11	WG1131609
Cobalt,Dissolved	ND		0.00200	1	07/03/2018 13:38	WG1130986
Copper	ND		0.00500	1	07/03/2018 14:11	WG1131609
Copper,Dissolved	ND		0.00500	1	07/03/2018 13:38	WG1130986
Iron	0.794		0.100	1	07/03/2018 14:11	WG1131609
Iron,Dissolved	ND		0.100	1	07/03/2018 13:38	WG1130986
Lead	ND		0.00200	1	07/03/2018 16:34	WG1131609
Lead,Dissolved	ND		0.00200	1	07/03/2018 13:38	WG1130986

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Magnesium	3.72		1.00	1	07/03/2018 14:11	WG1131609
Magnesium,Dissolved	3.61		1.00	1	07/03/2018 13:38	WG1130986
Manganese	0.177		0.00500	1	07/03/2018 14:11	WG1131609
Manganese,Dissolved	ND		0.00500	1	07/03/2018 13:38	WG1130986
Nickel	ND		0.00200	1	07/03/2018 14:11	WG1131609
Nickel,Dissolved	ND		0.00200	1	07/03/2018 13:38	WG1130986
Potassium	4.06		1.00	1	07/03/2018 14:11	WG1131609
Potassium,Dissolved	4.84		1.00	1	07/03/2018 13:38	WG1130986
Selenium	ND		0.00200	1	07/03/2018 14:11	WG1131609
Selenium,Dissolved	ND		0.00200	1	07/03/2018 13:38	WG1130986
Silver	ND		0.00200	1	07/03/2018 14:11	WG1131609
Silver,Dissolved	ND		0.00200	1	07/03/2018 13:38	WG1130986
Sodium	7.77		1.00	1	07/03/2018 14:11	WG1131609
Sodium,Dissolved	7.43		1.00	1	07/03/2018 13:38	WG1130986
Thallium	ND		0.00200	1	07/03/2018 16:34	WG1131609
Thallium,Dissolved	ND		0.00200	1	07/03/2018 13:38	WG1130986
Vanadium	ND		0.00500	1	07/03/2018 14:11	WG1131609
Vanadium,Dissolved	ND		0.00500	1	07/03/2018 13:38	WG1130986
Zinc	ND		0.0250	1	07/03/2018 14:11	WG1131609
Zinc,Dissolved	ND		0.0250	1	07/03/2018 13:38	WG1130986

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	73.9		30.0	1	07/03/2018 10:03	WG1132236

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	0.239		0.100	1	07/02/2018 12:41	WG1131952

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	07/03/2018 21:41	WG1133123
Chloride	14.1		1.00	1	07/03/2018 21:41	WG1133123
Fluoride	0.143		0.100	1	07/03/2018 21:41	WG1133123

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/02/2018 13:16	WG1132351
Mercury,Dissolved	ND		0.000200	1	07/02/2018 17:22	WG1132358

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	07/01/2018 17:31	WG1131346
Boron,Dissolved	ND		0.200	1	07/03/2018 14:50	WG1131821

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	0.137		0.100	1	07/03/2018 14:16	WG1131609
Aluminum,Dissolved	ND		0.100	1	07/03/2018 13:42	WG1130986
Antimony	ND		0.00200	1	07/03/2018 14:16	WG1131609
Antimony,Dissolved	ND		0.00200	1	07/04/2018 20:43	WG1130986
Arsenic	ND		0.00200	1	07/03/2018 14:16	WG1131609
Arsenic,Dissolved	ND		0.00200	1	07/03/2018 13:42	WG1130986
Barium	0.0318		0.00500	1	07/03/2018 14:16	WG1131609
Barium,Dissolved	0.0274		0.00500	1	07/03/2018 13:42	WG1130986
Beryllium	ND		0.00200	1	07/03/2018 14:16	WG1131609
Beryllium,Dissolved	ND		0.00200	1	07/03/2018 13:42	WG1130986
Cadmium	ND		0.00100	1	07/03/2018 14:16	WG1131609
Cadmium,Dissolved	ND		0.00100	1	07/03/2018 13:42	WG1130986
Calcium	19.8		1.00	1	07/03/2018 14:16	WG1131609
Calcium,Dissolved	19.4		1.00	1	07/03/2018 13:42	WG1130986
Chromium	ND		0.00200	1	07/03/2018 14:16	WG1131609
Chromium,Dissolved	ND		0.00200	1	07/03/2018 13:42	WG1130986
Cobalt	ND		0.00200	1	07/03/2018 14:16	WG1131609
Cobalt,Dissolved	ND		0.00200	1	07/03/2018 13:42	WG1130986
Copper	ND		0.00500	1	07/03/2018 14:16	WG1131609
Copper,Dissolved	ND		0.00500	1	07/03/2018 13:42	WG1130986
Iron	0.843		0.100	1	07/03/2018 14:16	WG1131609
Iron,Dissolved	ND		0.100	1	07/03/2018 13:42	WG1130986
Lead	ND		0.00200	1	07/03/2018 16:38	WG1131609
Lead,Dissolved	ND		0.00200	1	07/03/2018 13:42	WG1130986

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Magnesium	4.18		1.00	1	07/03/2018 14:16	WG1131609
Magnesium,Dissolved	4.01		1.00	1	07/03/2018 13:42	WG1130986
Manganese	0.202		0.00500	1	07/03/2018 14:16	WG1131609
Manganese,Dissolved	ND		0.00500	1	07/03/2018 13:42	WG1130986
Nickel	ND		0.00200	1	07/03/2018 14:16	WG1131609
Nickel,Dissolved	ND		0.00200	1	07/03/2018 13:42	WG1130986
Potassium	3.97		1.00	1	07/03/2018 14:16	WG1131609
Potassium,Dissolved	3.65		1.00	1	07/03/2018 13:42	WG1130986
Selenium	ND		0.00200	1	07/03/2018 14:16	WG1131609
Selenium,Dissolved	ND		0.00200	1	07/03/2018 13:42	WG1130986
Silver	ND		0.00200	1	07/03/2018 14:16	WG1131609
Silver,Dissolved	ND		0.00200	1	07/03/2018 13:42	WG1130986
Sodium	9.02		1.00	1	07/03/2018 14:16	WG1131609
Sodium,Dissolved	8.64		1.00	1	07/03/2018 13:42	WG1130986
Thallium	ND		0.00200	1	07/03/2018 16:38	WG1131609
Thallium,Dissolved	ND		0.00200	1	07/03/2018 13:42	WG1130986
Vanadium	ND		0.00500	1	07/03/2018 14:16	WG1131609
Vanadium,Dissolved	ND		0.00500	1	07/03/2018 13:42	WG1130986
Zinc	ND		0.0250	1	07/03/2018 14:16	WG1131609
Zinc,Dissolved	ND		0.0250	1	07/03/2018 13:42	WG1130986

Method Blank (MB)

(MB) R3322684-1 07/03/18 09:40

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hardness (colorimetric) as CaCO3	3.38	J	1.43	30.0

L1004419-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1004419-04 07/03/18 09:46 • (DUP) R3322684-4 07/03/18 09:47

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hardness (colorimetric) as CaCO3	174	172	1	1.16		20

L1005296-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1005296-03 07/03/18 10:01 • (DUP) R3322684-7 07/03/18 10:01

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hardness (colorimetric) as CaCO3	72.9	68.4	1	6.37		20

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

(LCS) R3322684-2 07/03/18 09:40 • (LCSD) R3322684-3 07/03/18 09:41

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 %
Hardness (colorimetric) as CaCO3	150	146	143	97.3	95.3	85.0-115			2.08	20

L1005172-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1005172-01 07/03/18 09:54 • (MS) R3322684-5 07/03/18 09:55 • (MSD) R3322684-6 07/03/18 09:56

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 %
Hardness (colorimetric) as CaCO3	150	132	214	214	54.7	54.7	1	80.0-120	E J6	E J6	0.000	20

Method Blank (MB)

(MB) R3322545-1 07/02/18 12:19

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Ammonia Nitrogen	U		0.0317	0.100

L1004373-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1004373-04 07/02/18 12:23 • (DUP) R3322545-4 07/02/18 12:25

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Ammonia Nitrogen	ND	0.0630	1	0.000		10

L1006058-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1006058-03 07/02/18 13:05 • (DUP) R3322545-6 07/02/18 13:06

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Ammonia Nitrogen	ND	0.0640	1	0.000		10

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

(LCS) R3322545-2 07/02/18 12:20 • (LCSD) R3322545-3 07/02/18 12:22

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 %
Ammonia Nitrogen	7.50	7.92	7.92	106	106	90.0-110			0.0505	10

L1004419-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L1004419-04 07/02/18 12:27 • (MS) R3322545-5 07/02/18 12:28

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Ammonia Nitrogen	5.00	ND	5.19	102	1	90.0-110	

L1006058-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1006058-04 07/02/18 13:08 • (MS) R3322545-7 07/02/18 13:09 • (MSD) R3322545-8 07/02/18 13:11

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Ammonia Nitrogen	5.00	ND	5.18	4.92	102	96.6	1	90.0-110			5.13	10

Method Blank (MB)

(MB) R3323299-1 07/03/18 11:25

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Bromide	U		0.0790	1.00
Chloride	U		0.0519	1.00
Fluoride	U		0.00990	0.100

L1005296-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1005296-01 07/03/18 19:22 • (DUP) R3323299-4 07/03/18 19:38

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	ND	0.000	1	0.000		15
Chloride	8.12	8.01	1	1.35		15
Fluoride	ND	0.0775	1	24.6	J P1	15

L1005329-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1005329-07 07/04/18 00:31 • (DUP) R3323299-7 07/04/18 00:46

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	0.142	0.159	1	11.9	J	15
Chloride	13.5	13.8	1	2.63		15
Fluoride	0.0539	0.0716	1	28.2	J P1	15

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

(LCS) R3323299-2 07/03/18 11:41 • (LCSD) R3323299-3 07/03/18 11:56

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 %
Bromide	40.0	40.0	40.0	100	99.9	80.0-120			0.185	15
Chloride	40.0	39.7	39.5	99.1	98.9	80.0-120			0.274	15
Fluoride	8.00	8.20	8.20	102	102	80.0-120			0.0122	15

L1005296-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1005296-01 07/03/18 19:22 • (MS) R3323299-5 07/03/18 19:53 • (MSD) R3323299-6 07/03/18 20:09

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Bromide	50.0	ND	48.6	54.2	97.2	108	1	80.0-120			10.8	15
Chloride	50.0	8.12	62.4	62.8	109	109	1	80.0-120			0.691	15
Fluoride	5.00	ND	5.41	5.75	107	114	1	80.0-120			5.99	15

L1005329-07 Original Sample (OS) • Matrix Spike (MS)

(OS) L1005329-07 07/04/18 00:31 • (MS) R3323299-8 07/04/18 01:02

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Bromide	50.0	0.142	44.9	89.4	1	80.0-120	
Chloride	50.0	13.5	60.5	94.1	1	80.0-120	
Fluoride	5.00	0.0539	4.85	95.9	1	80.0-120	

Method Blank (MB)

(MB) R3322487-1 07/02/18 12:47

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Mercury	U		0.0000490	0.000200

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

(LCS) R3322487-2 07/02/18 12:49 • (LCSD) R3322487-3 07/02/18 12:51

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	0.00300	0.00297	0.00258	99.1	86.1	80.0-120			14.1	20

L1005576-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1005576-01 07/02/18 12:57 • (MS) R3322487-4 07/02/18 12:59 • (MSD) R3322487-5 07/02/18 13:01

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	0.00300	U	0.00243	0.00240	81.1	79.9	1	75.0-125			1.50	20

Method Blank (MB)

(MB) R3322591-1 07/02/18 16:48

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury,Dissolved	U		0.0000490	0.000200

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

(LCS) R3322591-2 07/02/18 16:51 • (LCSD) R3322591-3 07/02/18 16:53

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 %
Mercury,Dissolved	0.00300	0.00319	0.00301	106	100	80.0-120			5.80	20

L1005147-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1005147-01 07/02/18 16:55 • (MS) R3322591-4 07/02/18 16:57 • (MSD) R3322591-5 07/02/18 16:59

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury,Dissolved	0.00300	ND	0.00324	0.00306	108	102	1	75.0-125			5.92	20

Method Blank (MB)

(MB) R3322358-1 07/01/18 16:15

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Boron	U		0.0126	0.200

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

(LCS) R3322358-2 07/01/18 16:18 • (LCSD) R3322358-3 07/01/18 16:20

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	1.02	1.04	102	104	80.0-120			2.43	20

L1005130-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1005130-01 07/01/18 16:23 • (MS) R3322358-5 07/01/18 16:28 • (MSD) R3322358-6 07/01/18 16:30

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron	1.00	ND	1.12	1.13	103	104	1	75.0-125			0.960	20

Method Blank (MB)

(MB) R3322975-1 07/03/18 13:48

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

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

(LCS) R3322975-2 07/03/18 13:50 • (LCSD) R3322975-3 07/03/18 13:53

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,Dissolved	1.00	1.02	1.01	102	101	80.0-120			0.886	20

L1005554-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1005554-06 07/03/18 13:55 • (MS) R3322975-5 07/03/18 14:01 • (MSD) R3322975-6 07/03/18 14:03

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron,Dissolved	1.00	0.405	1.41	1.40	100	99.3	1	75.0-125			0.744	20

Method Blank (MB)

(MB) R3322819-1 07/03/18 11:40

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Aluminum,Dissolved	U		0.00515	0.100
Arsenic,Dissolved	U		0.000250	0.00200
Barium,Dissolved	U		0.000360	0.00500
Beryllium,Dissolved	U		0.000120	0.00200
Cadmium,Dissolved	U		0.000160	0.00100
Calcium,Dissolved	U		0.0460	1.00
Chromium,Dissolved	U		0.000540	0.00200
Copper,Dissolved	0.000924	J	0.000520	0.00500
Cobalt,Dissolved	U		0.000260	0.00200
Iron,Dissolved	U		0.0150	0.100
Lead,Dissolved	U		0.000240	0.00200
Magnesium,Dissolved	U		0.100	1.00
Manganese,Dissolved	U		0.000250	0.00500
Nickel,Dissolved	U		0.000350	0.00200
Potassium,Dissolved	U		0.0370	1.00
Selenium,Dissolved	U		0.000380	0.00200
Silver,Dissolved	U		0.000310	0.00200
Sodium,Dissolved	0.161	J	0.110	1.00
Thallium,Dissolved	U		0.000190	0.00200
Vanadium,Dissolved	U		0.000180	0.00500
Zinc,Dissolved	U		0.00256	0.0250

Method Blank (MB)

(MB) R3323046-1 07/04/18 19:43

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Antimony,Dissolved	U		0.000754	0.00200

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

(LCS) R3322819-2 07/03/18 11:45 • (LCSD) R3322819-3 07/03/18 11:50

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	4.57	4.55	91.3	91.1	80.0-120			0.278	20
Arsenic,Dissolved	0.0500	0.0483	0.0492	96.5	98.5	80.0-120			1.98	20
Barium,Dissolved	0.0500	0.0464	0.0460	92.7	92.1	80.0-120			0.695	20
Beryllium,Dissolved	0.0500	0.0447	0.0437	89.4	87.4	80.0-120			2.27	20
Cadmium,Dissolved	0.0500	0.0476	0.0473	95.2	94.7	80.0-120			0.522	20

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

(LCS) R3322819-2 07/03/18 11:45 • (LCSD) R3322819-3 07/03/18 11:50

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 %
Calcium,Dissolved	5.00	4.82	4.73	96.4	94.6	80.0-120			1.83	20
Chromium,Dissolved	0.0500	0.0502	0.0494	100	98.8	80.0-120			1.61	20
Copper,Dissolved	0.0500	0.0518	0.0513	104	103	80.0-120			0.966	20
Cobalt,Dissolved	0.0500	0.0510	0.0514	102	103	80.0-120			0.759	20
Iron,Dissolved	5.00	5.11	5.12	102	102	80.0-120			0.140	20
Lead,Dissolved	0.0500	0.0479	0.0473	95.7	94.6	80.0-120			1.18	20
Magnesium,Dissolved	5.00	4.81	4.78	96.2	95.7	80.0-120			0.483	20
Manganese,Dissolved	0.0500	0.0474	0.0477	94.9	95.3	80.0-120			0.497	20
Nickel,Dissolved	0.0500	0.0511	0.0513	102	103	80.0-120			0.342	20
Potassium,Dissolved	5.00	4.67	4.69	93.4	93.7	80.0-120			0.363	20
Selenium,Dissolved	0.0500	0.0489	0.0461	97.8	92.3	80.0-120			5.84	20
Silver,Dissolved	0.0500	0.0491	0.0487	98.1	97.4	80.0-120			0.767	20
Sodium,Dissolved	5.00	4.85	4.84	97.1	96.7	80.0-120			0.386	20
Thallium,Dissolved	0.0500	0.0483	0.0479	96.7	95.8	80.0-120			0.910	20
Vanadium,Dissolved	0.0500	0.0488	0.0479	97.6	95.7	80.0-120			1.92	20
Zinc,Dissolved	0.0500	0.0505	0.0524	101	105	80.0-120			3.63	20

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

(LCS) R3323046-2 07/04/18 19:48 • (LCSD) R3323046-3 07/04/18 19:52

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 %
Antimony,Dissolved	0.0500	0.0560	0.0558	112	112	80.0-120			0.277	20

L1005209-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1005209-10 07/03/18 11:54 • (MS) R3322819-5 07/03/18 12:03 • (MSD) R3322819-6 07/03/18 12:08

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum,Dissolved	5.00	0.284	4.70	4.73	88.3	88.8	1	75.0-125			0.605	20
Arsenic,Dissolved	0.0500	ND	0.0481	0.0484	93.6	94.2	1	75.0-125			0.626	20
Barium,Dissolved	0.0500	0.00924	0.0542	0.0544	89.9	90.4	1	75.0-125			0.457	20
Beryllium,Dissolved	0.0500	ND	0.0432	0.0429	86.4	85.7	1	75.0-125			0.745	20
Cadmium,Dissolved	0.0500	ND	0.0477	0.0473	95.3	94.7	1	75.0-125			0.683	20
Calcium,Dissolved	5.00	16.9	21.3	21.6	87.7	93.3	1	75.0-125			1.30	20
Chromium,Dissolved	0.0500	0.0346	0.0807	0.0821	92.4	95.1	1	75.0-125			1.68	20
Copper,Dissolved	0.0500	ND	0.0506	0.0492	94.7	92.0	1	75.0-125			2.72	20
Cobalt,Dissolved	0.0500	ND	0.0492	0.0497	98.5	99.4	1	75.0-125			0.976	20
Potassium,Dissolved	5.00	2.19	6.77	6.82	91.4	92.6	1	75.0-125			0.846	20

L1005209-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1005209-10 07/03/18 11:54 • (MS) R3322819-5 07/03/18 12:03 • (MSD) R3322819-6 07/03/18 12:08

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Iron,Dissolved	5.00	ND	4.92	4.97	98.0	98.9	1	75.0-125			0.948	20
Lead,Dissolved	0.0500	ND	0.0478	0.0485	94.4	95.8	1	75.0-125			1.42	20
Magnesium,Dissolved	5.00	ND	5.42	5.48	94.2	95.4	1	75.0-125			1.08	20
Manganese,Dissolved	0.0500	ND	0.0480	0.0496	89.0	92.1	1	75.0-125			3.13	20
Nickel,Dissolved	0.0500	ND	0.0499	0.0500	99.0	99.2	1	75.0-125			0.162	20
Selenium,Dissolved	0.0500	ND	0.0478	0.0499	93.8	98.1	1	75.0-125			4.35	20
Silver,Dissolved	0.0500	ND	0.0483	0.0484	96.6	96.8	1	75.0-125			0.202	20
Sodium,Dissolved	5.00	9.97	15.0	15.1	100	102	1	75.0-125			0.741	20
Thallium,Dissolved	0.0500	ND	0.0473	0.0479	94.6	95.8	1	75.0-125			1.25	20
Vanadium,Dissolved	0.0500	0.0687	0.113	0.114	88.4	90.0	1	75.0-125			0.738	20
Zinc,Dissolved	0.0500	ND	0.0501	0.0514	91.0	93.4	1	75.0-125			2.44	20

L1005209-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1005209-10 07/04/18 19:57 • (MS) R3323046-5 07/04/18 20:06 • (MSD) R3323046-6 07/04/18 20:11

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony,Dissolved	0.0500	ND	0.0574	0.0590	113	116	1	75.0-125			2.69	20

Method Blank (MB)

(MB) R3322812-1 07/03/18 11:43

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Aluminum	0.0126	J	0.00515	0.100
Antimony	U		0.000754	0.00200
Arsenic	U		0.000250	0.00200
Barium	U		0.000360	0.00500
Beryllium	U		0.000120	0.00200
Cadmium	U		0.000160	0.00100
Calcium	U		0.0460	1.00
Chromium	U		0.000540	0.00200
Copper	U		0.000520	0.00500
Cobalt	U		0.000260	0.00200
Iron	U		0.0150	0.100
Lead	U		0.000240	0.00200
Magnesium	U		0.100	1.00
Manganese	U		0.000250	0.00500
Nickel	U		0.000350	0.00200
Potassium	U		0.0370	1.00
Selenium	U		0.000380	0.00200
Silver	U		0.000310	0.00200
Sodium	U		0.110	1.00
Thallium	U		0.000190	0.00200
Vanadium	U		0.000180	0.00500
Zinc	U		0.00256	0.0250

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

(LCS) R3322812-2 07/03/18 11:48 • (LCSD) R3322812-3 07/03/18 11:52

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	4.80	4.77	96.0	95.4	80.0-120			0.670	20
Antimony	0.0500	0.0490	0.0475	98.0	94.9	80.0-120			3.13	20
Arsenic	0.0500	0.0473	0.0476	94.6	95.2	80.0-120			0.661	20
Barium	0.0500	0.0436	0.0439	87.1	87.8	80.0-120			0.765	20
Beryllium	0.0500	0.0449	0.0432	89.8	86.4	80.0-120			3.92	20
Cadmium	0.0500	0.0488	0.0488	97.6	97.6	80.0-120			0.0344	20
Calcium	5.00	4.90	4.76	98.1	95.2	80.0-120			2.92	20
Chromium	0.0500	0.0485	0.0486	97.0	97.1	80.0-120			0.168	20
Copper	0.0500	0.0495	0.0497	98.9	99.3	80.0-120			0.438	20
Cobalt	0.0500	0.0507	0.0502	101	100	80.0-120			0.980	20
Iron	5.00	5.07	5.07	101	101	80.0-120			0.0235	20

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

(LCS) R3322812-2 07/03/18 11:48 • (LCSD) R3322812-3 07/03/18 11:52

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	0.0500	0.0477	0.0476	95.5	95.3	80.0-120			0.239	20
Magnesium	5.00	5.09	5.09	102	102	80.0-120			0.0259	20
Manganese	0.0500	0.0476	0.0477	95.1	95.3	80.0-120			0.182	20
Nickel	0.0500	0.0516	0.0509	103	102	80.0-120			1.34	20
Potassium	5.00	4.91	4.91	98.3	98.3	80.0-120			0.0211	20
Selenium	0.0500	0.0491	0.0476	98.2	95.3	80.0-120			3.05	20
Silver	0.0500	0.0470	0.0473	94.0	94.6	80.0-120			0.575	20
Sodium	5.00	5.18	5.16	104	103	80.0-120			0.363	20
Thallium	0.0500	0.0485	0.0480	96.9	96.0	80.0-120			0.902	20
Vanadium	0.0500	0.0480	0.0483	95.9	96.6	80.0-120			0.730	20
Zinc	0.0500	0.0490	0.0477	98.1	95.4	80.0-120			2.77	20

L1005340-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1005340-02 07/03/18 11:56 • (MS) R3322812-5 07/03/18 12:05 • (MSD) R3322812-6 07/03/18 12:10

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	5.00	ND	4.79	4.77	94.9	94.5	1	75.0-125			0.422	20
Antimony	0.0500	ND	0.0493	0.0493	98.7	98.6	1	75.0-125			0.104	20
Arsenic	0.0500	0.0222	0.0679	0.0690	91.4	93.7	1	75.0-125			1.63	20
Barium	0.0500	0.196	0.236	0.237	79.2	81.9	1	75.0-125			0.571	20
Beryllium	0.0500	ND	0.0447	0.0448	89.4	89.6	1	75.0-125			0.199	20
Cadmium	0.0500	0.00253	0.0504	0.0528	95.7	101	1	75.0-125			4.70	20
Calcium	5.00	152	156	155	72.5	55.4	1	75.0-125	V	V	0.550	20
Chromium	0.0500	ND	0.0476	0.0487	95.1	97.4	1	75.0-125			2.43	20
Copper	0.0500	ND	0.0481	0.0479	94.8	94.5	1	75.0-125			0.372	20
Cobalt	0.0500	ND	0.0485	0.0493	95.4	97.1	1	75.0-125			1.76	20
Potassium	5.00	5.72	10.5	10.5	96.2	96.0	1	75.0-125			0.105	20
Iron	5.00	12.1	16.6	16.9	90.4	96.0	1	75.0-125			1.68	20
Lead	0.0500	ND	0.0479	0.0481	95.2	95.5	1	75.0-125			0.372	20
Magnesium	5.00	35.3	39.9	39.6	92.5	85.6	1	75.0-125			0.869	20
Manganese	0.0500	0.739	0.778	0.784	76.4	88.9	1	75.0-125			0.802	20
Nickel	0.0500	ND	0.0487	0.0499	95.7	98.2	1	75.0-125			2.50	20
Selenium	0.0500	ND	0.0488	0.0495	97.6	99.0	1	75.0-125			1.43	20
Silver	0.0500	ND	0.0476	0.0479	95.3	95.8	1	75.0-125			0.569	20
Sodium	5.00	12.5	17.3	17.3	96.5	96.9	1	75.0-125			0.122	20
Thallium	0.0500	ND	0.0489	0.0488	97.8	97.5	1	75.0-125			0.310	20
Vanadium	0.0500	ND	0.0470	0.0481	94.0	96.1	1	75.0-125			2.26	20
Zinc	0.0500	ND	0.114	0.0856	214	157	1	75.0-125	J5	J3 J5	28.6	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

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, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
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.
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.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

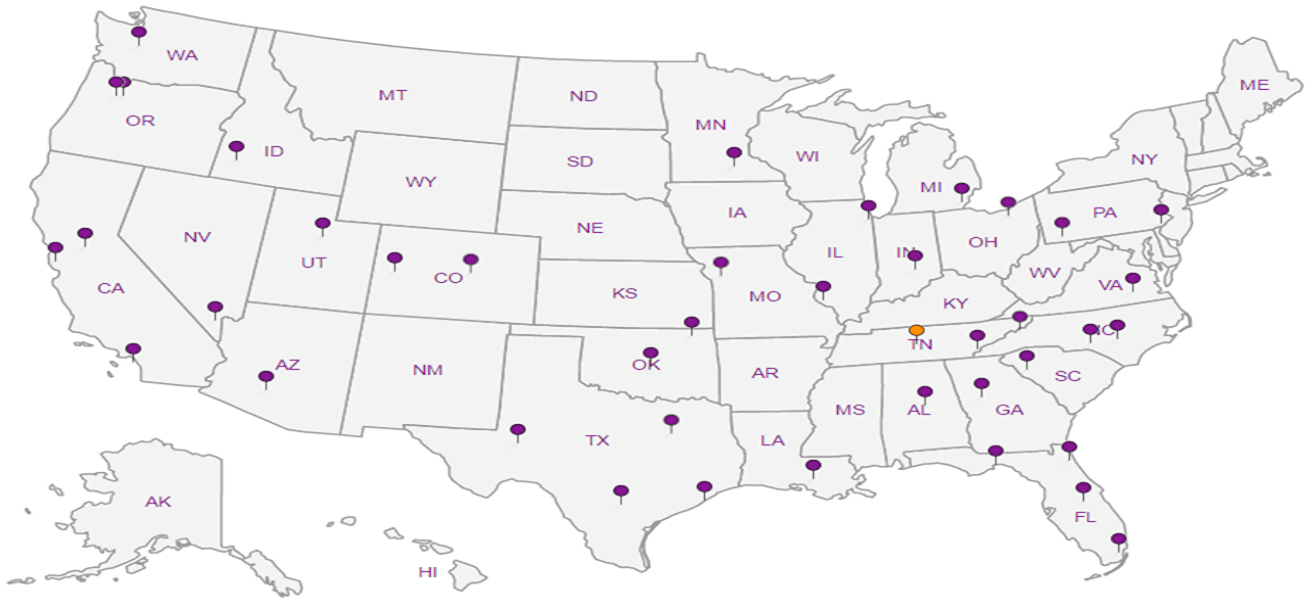
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

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

Report to: Philip Campbell

Email To: pcampbell@cecinc.com

Project Description: EWS Camden Class 2 Landfill

City/State Collected: Camden, TN

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

Client Project # 171-873

Lab Project # CEC-EWS CAMDEN LF

Collected by (print): Cole Liggett, Matthew Skelton

Site/Facility ID # CAMDEN, TN

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

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

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Anions(Br,Cl,Fl) 125mlHDPE-NoPres	Diss. Metals-LF 250mlHDPE-NoPres	NH3 125mlHDPE-H2SO4	Total Metals,HARD 250mlHDPE-HNO3	Remarks	Sample # (lab only)
CHARLIE CREEK US	Grab	GW	0"	6/27/18	1330	4	X	X	X	X		-04
CHARLIE CREEK MS		GW			1200	4	X	X	X	X		-02
CANE CREEK US		GW			1250	4	X	X	X	X		-03
CANE CREEK MS		GW			1120	4	X	X	X	X		-01
CANE CREEK DS-1		GW			1025	4	X	X	X	X		-05

Chain of Custody Page ___ of ___

ESC LAB SCIENCES
a subsidiary of Pace Analytical

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

L# 1005216

A244

Acctnum: CEC
Template: T133580
Prelogin: P657634
TSR: 526 - Chris McCord
PB: TB 6-5-18
Shipped Via: Courier

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

Remarks: Tot/Diss.Metals = M6020AP1 + Al,Ca,Fe,K,Mg,Mn,Na,B(6010/7470)

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)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
	6/28/2018	8:25		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:
	6/28/18	10:10		20
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:
	6/28/18	13:45		6/28/18 1345

If preservation required by Login: Date/Time

Hold: Condition: NCF / OK

ANALYTICAL REPORT

July 05, 2018

Civil & Environmental Consultants - TN

Sample Delivery Group:	L1005291
Samples Received:	06/28/2018
Project Number:	142-059
Description:	EWS Landfill Sediment & Stream Sampling
Site:	CAMDEN, TN
Report To:	Philip Campbell 325 Seaboard Lane, Suite 170 Franklin, TN 37067

Entire Report Reviewed By:

Chris McCord
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.

TABLE OF CONTENTS

CHARLIE CREEK US L1005291-01 Solid

Collected by: CL/MS | Collected date/time: 06/27/18 00:00 | Received date/time: 06/28/18 13:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1131343	1	06/28/18 16:09	06/29/18 02:58	MAJ
Mercury by Method 7471A	WG1131848	1	06/29/18 13:29	07/02/18 08:38	EL
Metals (ICP) by Method 6010B	WG1131612	1	06/29/18 14:09	07/02/18 19:28	TRB
Metals (ICP) by Method 6010B	WG1131612	1	06/29/18 14:09	07/03/18 16:07	TRB

CHARLIE CREEK MS L1005291-02 Solid

Collected by: CL/MS | Collected date/time: 06/27/18 00:00 | Received date/time: 06/28/18 13:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1131343	1	06/28/18 16:09	06/29/18 03:13	MAJ
Mercury by Method 7471A	WG1131848	1	06/29/18 13:29	07/02/18 09:34	EL
Metals (ICP) by Method 6010B	WG1131612	1	06/29/18 14:09	07/02/18 19:36	TRB
Metals (ICP) by Method 6010B	WG1131612	1	06/29/18 14:09	07/03/18 16:10	TRB

CANE CREEK US L1005291-03 Solid

Collected by: CL/MS | Collected date/time: 06/27/18 00:00 | Received date/time: 06/28/18 13:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1131343	1	06/28/18 16:09	06/29/18 03:29	MAJ
Mercury by Method 7471A	WG1131848	1	06/29/18 13:29	07/02/18 09:37	EL
Metals (ICP) by Method 6010B	WG1131612	1	06/29/18 14:09	07/02/18 19:38	TRB
Metals (ICP) by Method 6010B	WG1131612	1	06/29/18 14:09	07/03/18 16:20	TRB

CANE CREEK MS L1005291-04 Solid

Collected by: CL/MS | Collected date/time: 06/27/18 00:00 | Received date/time: 06/28/18 13:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1132143	1	06/30/18 14:59	07/02/18 03:01	MCG
Wet Chemistry by Method 9056A	WG1133112	1	07/02/18 23:36	07/03/18 06:37	MAJ
Mercury by Method 7471A	WG1131848	1	06/29/18 13:29	07/02/18 09:39	EL
Metals (ICP) by Method 6010B	WG1131612	1	06/29/18 14:09	07/02/18 19:41	TRB
Metals (ICP) by Method 6010B	WG1131612	1	06/29/18 14:09	07/03/18 16:24	TRB

CANE CREEK DS-1 L1005291-05 Solid

Collected by: CL/MS | Collected date/time: 06/27/18 00:00 | Received date/time: 06/28/18 13:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1132143	1	06/30/18 14:59	07/02/18 03:32	MCG
Wet Chemistry by Method 9056A	WG1133112	1	07/02/18 23:36	07/03/18 06:53	MAJ
Mercury by Method 7471A	WG1131848	1	06/29/18 13:29	07/02/18 09:42	EL
Metals (ICP) by Method 6010B	WG1131612	1	06/29/18 14:09	07/02/18 19:44	TRB
Metals (ICP) by Method 6010B	WG1131612	1	06/29/18 14:09	07/03/18 16:27	TRB

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All 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.

Chris McCord
Technical Service Representative

Wet Chemistry by Method 9056A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Bromide	ND		10.0	1	06/29/2018 02:58	WG1131343
Chloride	ND		10.0	1	06/29/2018 02:58	WG1131343
Fluoride	ND		1.00	1	06/29/2018 02:58	WG1131343

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0445	B	0.0200	1	07/02/2018 08:38	WG1131848

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Aluminum	579		10.0	1	07/02/2018 19:28	WG1131612
Antimony	ND		2.00	1	07/02/2018 19:28	WG1131612
Arsenic	ND		2.00	1	07/02/2018 19:28	WG1131612
Barium	30.1		0.500	1	07/03/2018 16:07	WG1131612
Beryllium	ND		0.200	1	07/02/2018 19:28	WG1131612
Boron	ND		10.0	1	07/02/2018 19:28	WG1131612
Cadmium	ND		0.500	1	07/02/2018 19:28	WG1131612
Calcium	ND		100	1	07/02/2018 19:28	WG1131612
Chromium	1.82		1.00	1	07/02/2018 19:28	WG1131612
Cobalt	1.19		1.00	1	07/02/2018 19:28	WG1131612
Copper	ND		2.00	1	07/02/2018 19:28	WG1131612
Iron	2270		10.0	1	07/02/2018 19:28	WG1131612
Lead	1.45		0.500	1	07/02/2018 19:28	WG1131612
Magnesium	ND		100	1	07/02/2018 19:28	WG1131612
Manganese	68.4		1.00	1	07/02/2018 19:28	WG1131612
Nickel	ND		2.00	1	07/02/2018 19:28	WG1131612
Potassium	ND		100	1	07/02/2018 19:28	WG1131612
Selenium	ND		2.00	1	07/02/2018 19:28	WG1131612
Silver	ND		1.00	1	07/02/2018 19:28	WG1131612
Sodium	ND		100	1	07/03/2018 16:07	WG1131612
Thallium	ND		2.00	1	07/02/2018 19:28	WG1131612
Vanadium	4.35		2.00	1	07/02/2018 19:28	WG1131612
Zinc	6.69		5.00	1	07/02/2018 19:28	WG1131612

Wet Chemistry by Method 9056A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Bromide	ND		10.0	1	06/29/2018 03:13	WG1131343
Chloride	17.3		10.0	1	06/29/2018 03:13	WG1131343
Fluoride	ND		1.00	1	06/29/2018 03:13	WG1131343

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0470	B	0.0200	1	07/02/2018 09:34	WG1131848

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Aluminum	991		10.0	1	07/02/2018 19:36	WG1131612
Antimony	ND		2.00	1	07/02/2018 19:36	WG1131612
Arsenic	ND		2.00	1	07/02/2018 19:36	WG1131612
Barium	17.4		0.500	1	07/03/2018 16:10	WG1131612
Beryllium	ND		0.200	1	07/02/2018 19:36	WG1131612
Boron	ND		10.0	1	07/02/2018 19:36	WG1131612
Cadmium	ND		0.500	1	07/02/2018 19:36	WG1131612
Calcium	268		100	1	07/02/2018 19:36	WG1131612
Chromium	4.96		1.00	1	07/02/2018 19:36	WG1131612
Cobalt	1.54		1.00	1	07/02/2018 19:36	WG1131612
Copper	ND		2.00	1	07/02/2018 19:36	WG1131612
Iron	3490		10.0	1	07/02/2018 19:36	WG1131612
Lead	2.05		0.500	1	07/02/2018 19:36	WG1131612
Magnesium	ND		100	1	07/02/2018 19:36	WG1131612
Manganese	149		1.00	1	07/02/2018 19:36	WG1131612
Nickel	ND		2.00	1	07/02/2018 19:36	WG1131612
Potassium	133		100	1	07/02/2018 19:36	WG1131612
Selenium	ND		2.00	1	07/02/2018 19:36	WG1131612
Silver	ND		1.00	1	07/02/2018 19:36	WG1131612
Sodium	ND		100	1	07/03/2018 16:10	WG1131612
Thallium	ND		2.00	1	07/02/2018 19:36	WG1131612
Vanadium	6.80		2.00	1	07/02/2018 19:36	WG1131612
Zinc	15.1		5.00	1	07/02/2018 19:36	WG1131612

Wet Chemistry by Method 9056A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Bromide	ND		10.0	1	06/29/2018 03:29	WG1131343
Chloride	ND		10.0	1	06/29/2018 03:29	WG1131343
Fluoride	ND		1.00	1	06/29/2018 03:29	WG1131343

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0454	B	0.0200	1	07/02/2018 09:37	WG1131848

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Aluminum	1120		10.0	1	07/02/2018 19:38	WG1131612
Antimony	ND		2.00	1	07/02/2018 19:38	WG1131612
Arsenic	ND		2.00	1	07/02/2018 19:38	WG1131612
Barium	8.77		0.500	1	07/03/2018 16:20	WG1131612
Beryllium	ND		0.200	1	07/02/2018 19:38	WG1131612
Boron	ND		10.0	1	07/02/2018 19:38	WG1131612
Cadmium	ND		0.500	1	07/02/2018 19:38	WG1131612
Calcium	785		100	1	07/02/2018 19:38	WG1131612
Chromium	4.59		1.00	1	07/02/2018 19:38	WG1131612
Cobalt	ND		1.00	1	07/02/2018 19:38	WG1131612
Copper	ND		2.00	1	07/02/2018 19:38	WG1131612
Iron	3510		10.0	1	07/02/2018 19:38	WG1131612
Lead	4.21		0.500	1	07/02/2018 19:38	WG1131612
Magnesium	230		100	1	07/02/2018 19:38	WG1131612
Manganese	129		1.00	1	07/02/2018 19:38	WG1131612
Nickel	ND		2.00	1	07/02/2018 19:38	WG1131612
Potassium	247		100	1	07/02/2018 19:38	WG1131612
Selenium	ND		2.00	1	07/02/2018 19:38	WG1131612
Silver	ND		1.00	1	07/02/2018 19:38	WG1131612
Sodium	ND		100	1	07/03/2018 16:20	WG1131612
Thallium	ND		2.00	1	07/02/2018 19:38	WG1131612
Vanadium	5.69		2.00	1	07/02/2018 19:38	WG1131612
Zinc	15.1		5.00	1	07/02/2018 19:38	WG1131612

Wet Chemistry by Method 9056A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Bromide	ND		10.0	1	07/03/2018 06:37	WG1133112
Chloride	43.0		10.0	1	07/02/2018 03:01	WG1132143
Fluoride	ND		1.00	1	07/02/2018 03:01	WG1132143

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	ND		0.0200	1	07/02/2018 09:39	WG1131848

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Aluminum	540		10.0	1	07/02/2018 19:41	WG1131612
Antimony	ND		2.00	1	07/02/2018 19:41	WG1131612
Arsenic	ND		2.00	1	07/02/2018 19:41	WG1131612
Barium	6.58		0.500	1	07/03/2018 16:24	WG1131612
Beryllium	ND		0.200	1	07/02/2018 19:41	WG1131612
Boron	ND		10.0	1	07/02/2018 19:41	WG1131612
Cadmium	ND		0.500	1	07/02/2018 19:41	WG1131612
Calcium	107		100	1	07/02/2018 19:41	WG1131612
Chromium	2.37		1.00	1	07/02/2018 19:41	WG1131612
Cobalt	ND		1.00	1	07/02/2018 19:41	WG1131612
Copper	ND		2.00	1	07/02/2018 19:41	WG1131612
Iron	1580		10.0	1	07/02/2018 19:41	WG1131612
Lead	1.86		0.500	1	07/02/2018 19:41	WG1131612
Magnesium	ND		100	1	07/02/2018 19:41	WG1131612
Manganese	126		1.00	1	07/02/2018 19:41	WG1131612
Nickel	ND		2.00	1	07/02/2018 19:41	WG1131612
Potassium	ND		100	1	07/02/2018 19:41	WG1131612
Selenium	ND		2.00	1	07/02/2018 19:41	WG1131612
Silver	ND		1.00	1	07/02/2018 19:41	WG1131612
Sodium	ND		100	1	07/03/2018 16:24	WG1131612
Thallium	ND		2.00	1	07/02/2018 19:41	WG1131612
Vanadium	2.85		2.00	1	07/02/2018 19:41	WG1131612
Zinc	6.99		5.00	1	07/02/2018 19:41	WG1131612

Wet Chemistry by Method 9056A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Bromide	ND		10.0	1	07/03/2018 06:53	WG1133112
Chloride	39.2		10.0	1	07/02/2018 03:32	WG1132143
Fluoride	ND		1.00	1	07/02/2018 03:32	WG1132143

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.0316	B	0.0200	1	07/02/2018 09:42	WG1131848

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Aluminum	1010		10.0	1	07/02/2018 19:44	WG1131612
Antimony	ND		2.00	1	07/02/2018 19:44	WG1131612
Arsenic	ND		2.00	1	07/02/2018 19:44	WG1131612
Barium	14.1		0.500	1	07/03/2018 16:27	WG1131612
Beryllium	ND		0.200	1	07/02/2018 19:44	WG1131612
Boron	ND		10.0	1	07/02/2018 19:44	WG1131612
Cadmium	ND		0.500	1	07/02/2018 19:44	WG1131612
Calcium	213		100	1	07/02/2018 19:44	WG1131612
Chromium	5.53		1.00	1	07/02/2018 19:44	WG1131612
Cobalt	1.65		1.00	1	07/02/2018 19:44	WG1131612
Copper	ND		2.00	1	07/02/2018 19:44	WG1131612
Iron	4460		10.0	1	07/02/2018 19:44	WG1131612
Lead	3.90		0.500	1	07/02/2018 19:44	WG1131612
Magnesium	ND		100	1	07/02/2018 19:44	WG1131612
Manganese	213		1.00	1	07/02/2018 19:44	WG1131612
Nickel	ND		2.00	1	07/02/2018 19:44	WG1131612
Potassium	105		100	1	07/02/2018 19:44	WG1131612
Selenium	ND		2.00	1	07/02/2018 19:44	WG1131612
Silver	ND		1.00	1	07/02/2018 19:44	WG1131612
Sodium	ND		100	1	07/03/2018 16:27	WG1131612
Thallium	ND		2.00	1	07/02/2018 19:44	WG1131612
Vanadium	8.05		2.00	1	07/02/2018 19:44	WG1131612
Zinc	18.1		5.00	1	07/02/2018 19:44	WG1131612

Method Blank (MB)

(MB) R3322090-1 06/28/18 18:52

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Bromide	U		0.133	10.0
Chloride	0.964	J	0.795	10.0
Fluoride	U		0.261	1.00

L1004934-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1004934-03 06/28/18 20:48 • (DUP) R3322090-4 06/28/18 21:03

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	U	0.000	1	0.000		15
Chloride	39.0	48.6	1	22.0	P1	15
Fluoride	19.2	19.9	1	3.69		15

L1005291-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1005291-03 06/29/18 03:29 • (DUP) R3322090-7 06/29/18 03:44

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

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

(LCS) R3322090-2 06/28/18 19:08 • (LCSD) R3322090-3 06/28/18 19:23

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	195	193	97.5	96.7	80.0-120			0.822	15
Chloride	200	201	199	100	99.5	80.0-120			0.868	15
Fluoride	20.0	21.0	21.2	105	106	80.0-120			1.29	15

L1004934-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1004934-04 06/28/18 21:19 • (MS) R3322090-5 06/28/18 21:34 • (MSD) R3322090-6 06/28/18 21:49

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 %
Bromide	500	U	528	508	106	102	1	80.0-120			3.88	15
Chloride	500	32.9	584	547	110	103	1	80.0-120			6.46	15
Fluoride	50.0	17.1	30.7	32.6	27.0	30.9	1	80.0-120	J6	J6	6.14	15

Method Blank (MB)

(MB) R3322586-1 07/01/18 23:25

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Chloride	2.48	J	0.795	10.0
Fluoride	U		0.261	1.00

L1005526-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1005526-10 07/02/18 04:03 • (DUP) R3322586-4 07/02/18 04:34

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	93.7	100	1	7.02		15
Fluoride	4.90	4.85	1	1.13		15

L1005858-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1005858-04 07/02/18 14:53 • (DUP) R3322586-7 07/02/18 15:24

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	61.0	47.6	1	24.7	J3	15
Fluoride	3.08	2.05	1	40.1	P1	15

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

(LCS) R3322586-2 07/01/18 23:56 • (LCSD) R3322586-3 07/02/18 00:27

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 %
Chloride	200	212	211	106	105	80.0-120			0.421	15
Fluoride	20.0	20.1	20.0	100	100	80.0-120			0.224	15

L1005526-22 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1005526-22 07/02/18 08:42 • (MS) R3322586-5 07/02/18 09:12 • (MSD) R3322586-6 07/02/18 09:43

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 %
Chloride	500	38.4	577	579	108	108	1	80.0-120			0.213	15
Fluoride	50.0	ND	35.3	36.7	68.8	71.5	1	80.0-120	J6	J6	3.76	15

Method Blank (MB)

(MB) R3322740-1 07/03/18 03:17

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Bromide	90.4		0.133	10.0

L1004552-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1004552-01 07/03/18 04:18 • (DUP) R3322740-4 07/03/18 04:34

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	U	0.000	1	0.000		15

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

(LCS) R3322740-7 07/03/18 09:42 • (LCSD) R3322740-8 07/03/18 09:58

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	191	190	95.3	95.2	80.0-120			0.0924	15

L1005291-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1005291-05 07/03/18 06:53 • (MS) R3322740-5 07/03/18 07:08 • (MSD) R3322740-6 07/03/18 07:23

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 %
Bromide	500	ND	533	506	107	101	1	80.0-120			5.10	15

Method Blank (MB)

(MB) R3322445-1 07/02/18 08:31

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	0.00648	J	0.00280	0.0200

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

(LCS) R3322445-2 07/02/18 08:33 • (LCSD) R3322445-3 07/02/18 08:36

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 %
Mercury	0.300	0.269	0.266	89.6	88.8	80.0-120			0.920	20

L1005291-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1005291-01 07/02/18 08:38 • (MS) R3322445-4 07/02/18 08:41 • (MSD) R3322445-5 07/02/18 08:43

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 %
Mercury	0.300	0.0445	0.273	0.283	76.2	79.5	1	75.0-125			3.54	20

Method Blank (MB)

(MB) R3322625-1 07/02/18 18:35

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Aluminum	U		3.50	10.0
Antimony	U		0.750	2.00
Arsenic	U		0.650	2.00
Beryllium	U		0.0700	0.200
Boron	U		1.26	10.0
Cadmium	U		0.0700	0.500
Calcium	U		4.63	100
Chromium	U		0.140	1.00
Cobalt	U		0.230	1.00
Copper	U		0.530	2.00
Iron	2.13	J	1.41	10.0
Lead	U		0.190	0.500
Magnesium	U		1.11	100
Manganese	U		0.120	1.00
Nickel	U		0.490	2.00
Potassium	U		10.2	100
Selenium	U		0.740	2.00
Silver	U		0.280	1.00
Thallium	U		0.650	2.00
Vanadium	U		0.240	2.00
Zinc	U		0.590	5.00

Method Blank (MB)

(MB) R3323062-1 07/04/18 10:12

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Barium	U		0.170	0.500
Sodium	10.7	J	9.85	100

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

(LCS) R3322625-2 07/02/18 18:37 • (LCSD) R3322625-3 07/02/18 18:40

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	1080	1080	108	108	80.0-120			0.520	20
Antimony	100	103	104	103	104	80.0-120			1.03	20
Arsenic	100	102	103	102	103	80.0-120			1.15	20
Beryllium	100	106	106	106	106	80.0-120			0.304	20

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

(LCS) R3322625-2 07/02/18 18:37 • (LCSD) R3322625-3 07/02/18 18:40

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 %
Boron	100	105	105	105	105	80.0-120			0.183	20
Cadmium	100	103	104	103	104	80.0-120			0.185	20
Calcium	1000	1080	1090	108	109	80.0-120			0.498	20
Chromium	100	109	108	109	108	80.0-120			0.120	20
Cobalt	100	103	102	103	102	80.0-120			0.555	20
Copper	100	111	111	111	111	80.0-120			0.643	20
Iron	1000	1070	1080	107	108	80.0-120			0.442	20
Lead	100	103	104	103	104	80.0-120			0.552	20
Magnesium	1000	1070	1080	107	108	80.0-120			0.308	20
Manganese	100	103	103	103	103	80.0-120			0.192	20
Nickel	100	103	103	103	103	80.0-120			0.419	20
Potassium	1000	1070	1060	107	106	80.0-120			0.227	20
Selenium	100	103	104	103	104	80.0-120			1.23	20
Silver	20.0	19.7	19.5	98.4	97.5	80.0-120			0.914	20
Thallium	100	104	105	104	105	80.0-120			1.11	20
Vanadium	100	104	105	104	105	80.0-120			0.984	20
Zinc	100	104	104	104	104	80.0-120			0.00404	20

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

(LCS) R3323062-2 07/04/18 10:14 • (LCSD) R3323062-3 07/04/18 10:17

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 %
Barium	100	102	104	102	104	80.0-120			1.55	20
Sodium	1000	1010	1020	101	102	80.0-120			1.31	20

L1005049-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1005049-01 07/02/18 18:42 • (MS) R3322625-6 07/02/18 18:49 • (MSD) R3322625-7 07/02/18 18:52

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 %
Aluminum	1000	18600	24300	23300	570	472	1	75.0-125	V	V	4.13	20
Antimony	100	ND	54.6	53.7	53.4	52.4	1	75.0-125	J6	J6	1.79	20
Arsenic	100	4.49	106	105	101	100	1	75.0-125			1.33	20
Beryllium	100	0.656	102	105	101	104	1	75.0-125			2.71	20
Boron	100	ND	89.2	93.2	89.2	93.2	1	75.0-125			4.40	20
Cadmium	100	ND	101	103	101	103	1	75.0-125			2.39	20
Calcium	1000	1080	2090	2160	101	108	1	75.0-125			3.40	20
Chromium	100	17.4	127	126	109	109	1	75.0-125			0.343	20

L1005049-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1005049-01 07/02/18 18:42 • (MS) R3322625-6 07/02/18 18:49 • (MSD) R3322625-7 07/02/18 18:52

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 %
Cobalt	100	5.23	105	106	99.8	101	1	75.0-125			0.665	20
Copper	100	5.21	117	120	112	114	1	75.0-125			2.07	20
Iron	1000	16900	24500	17900	755	99.8	1	75.0-125	V	J3	30.9	20
Lead	100	8.27	120	110	112	102	1	75.0-125			8.96	20
Magnesium	1000	2060	3230	3300	116	124	1	75.0-125			2.27	20
Manganese	100	99.1	373	207	273	108	1	75.0-125	J5	J3	57.3	20
Nickel	100	11.6	113	113	102	101	1	75.0-125			0.315	20
Potassium	1000	1580	2830	2820	125	124	1	75.0-125			0.246	20
Selenium	100	ND	100	102	100	102	1	75.0-125			1.56	20
Silver	20.0	ND	17.6	18.5	88.2	92.7	1	75.0-125			4.91	20
Thallium	100	ND	101	104	101	104	1	75.0-125			2.31	20
Vanadium	100	31.3	144	132	113	101	1	75.0-125			8.28	20
Zinc	100	26.8	130	130	103	103	1	75.0-125			0.401	20

L1005049-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1005049-01 07/03/18 15:51 • (MS) R3323073-6 07/03/18 16:01 • (MSD) R3323073-7 07/03/18 16:04

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 %
Barium	100	53.4	160	168	106	115	1	75.0-125			5.19	20
Sodium	1000	167	1140	1180	97.4	101	1	75.0-125			3.26	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, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
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.
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.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

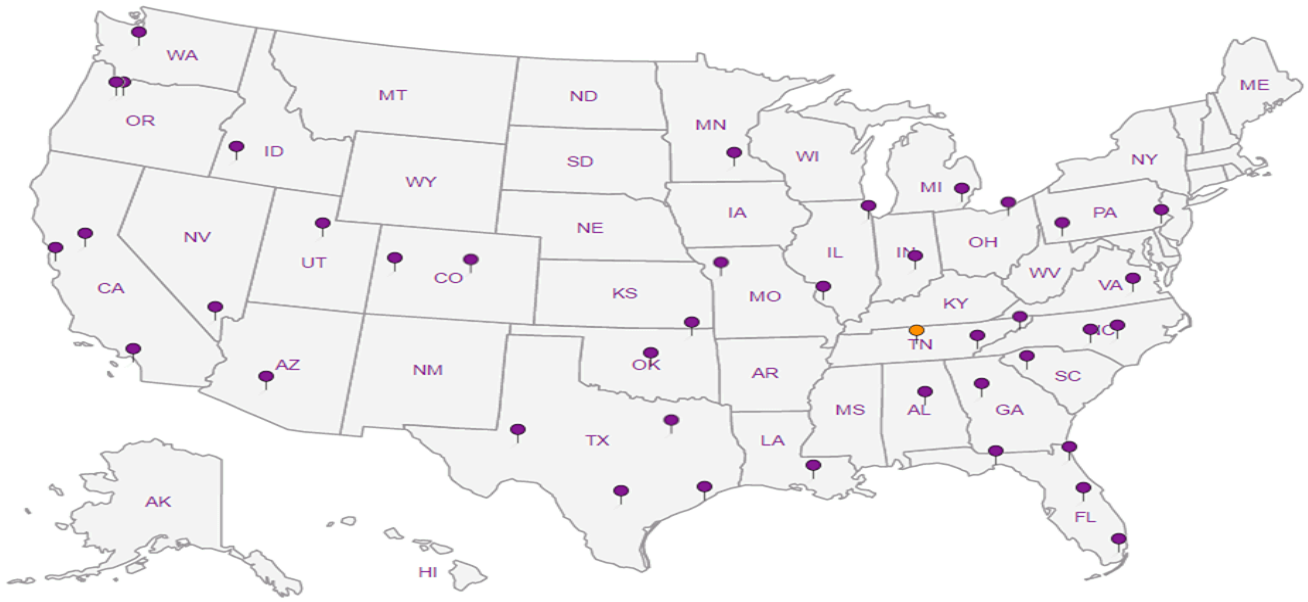
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

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

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

Report to: Philip Campbell

Email To: pcampbell@cecinc.com

Project Description: EWS Camden Class 2 Landfill

City/State Collected: Camden, TN

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

Client Project # 142-059

Lab Project # CEC-EWS CAMDEN LF

Collected by (print): Cole Liggett, Matthew Skelton

Site/Facility ID # CAMDEN, TN

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

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

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No of Cntrs	Bromide, Cl, F 4ozClr-NoPres	Total Metals 2ozClr-NoPres								Remarks	Sample # (lab only)
CHARLIE CREEK US	Comp	SS		6/27/18		2	X	X									-04
CHARLIE CREEK MS		SS				2	X	X									-02
CANE CREEK US		SS				2	X	X									-03
CANE CREEK MS		SS				2	X	X									-04
CANE CREEK DS-1		SS				2	X	X									-01

Chain of Custody Page ___ of ___

ESC LAB SCIENCES
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L# 200591

A001

Acctnum: CEC

Template: T134050

Prelogin: P657636

TSR: 526 - Chris McCord

PB: TK 6-5-18

Shipped Via: Courier

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

Remarks: Total Metals = M6010AP1+Al,Ca,Fe,K,Mg,Mn,Na

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx X Courier ___ _____

Tracking #

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

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes (No) HCL / MeoH TBR
	6/28/2018	8:15		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 3.8 °C Bottles Received: 60
	6/28/18	10:10		
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 6/28/18 Time: 1345
	6/28/18	13:45		

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

EQUIPMENT CALIBRATION LOG

EQUIPMENT CALIBRATION FORM

NAME OF REPRESENTATIVE	Baugh
LOCATION	
DATE AND TIME	6/18/18
Equipment and Model # (ex. YSI Pro Plus 556)	YSI Pro plus
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	1/2020	3.93	124.1	160 to 180	N	4.00	Y
7	8/2018	6.92	-42.4	+/-50	Y	7.00	Y
10	6/2018	9.87	-204.5	-160 to -180	N	10.00	

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)
1000	1/20	1028	1000	240	10/22	239.5	240.0

Hach Model 2100P Turbidimeter Calibration					
Calibration verification Test performed and passed?	NTU Standard	Within Range? (Yes/No)	Measured Value	Stored?	Final Verification test passed? (Yes/No)
(Yes)	20				
No	100				
Note: if verification passed, calibration not required	800				

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	**MONITORING WELL I.D.**	MW-1
LOCATION	Camden, TN	**TEMPERATURE & WEATHER**	80s Sunny
DATE & TIME	6/19/18 1145	**EVENT FREQUENCY**	Quarterly
PURGE METHOD	Peristaltic Pump	**FIELD REPRESENTATIVE**	Philip Campbell
TOTAL WELL DEPTH (feet)	30.5	**SAMPLING EQUIPMENT**	~~Bailer~~ Bladder Pump
DEPTH TO WATER (feet)	21.74	**IS SAMPLE EQUIPMENT DEDICATED?**	~~No~~ Yes
CASING DIAMETER (inches)	2	**DUPLICATE COLLECTED?**	NO
WATER COLUMN (feet)	8.76	**FIELD BLANK COLLECTED?**	NO
PURGE VOLUME (gallons)	1.30	**EQUIPMENT BLANK COLLECTED?**	N/A

PURGE INFORMATION

Gallons Purged	Time (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
0	1155	0	19.7	5.36	133.6	5.28	206.1	46.5
.10	1158	3	19.0	5.25	87.6	5.34	229.6	61.3
.25	1201	6	18.6	5.11	41.8	5.37	279.5	73.2
.45	1206	11	18.7	5.20	41.3	5.33	318.9	66.3
.60	1211	16	18.2	5.32	44.0	5.12	212.0	37.8
.75	1216	21	18.2	5.37	47.0	4.50	188.3	22.4
1.1	1226	31	18.0	5.50	55.2	4.15	152.1	12.0
1.30	1234	39	18.2	5.56	59.4	4.05	140.7	8.31

SAMPLE DATA

Gallons Purged	Time Collected (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
1.30	1235	39	18.2	5.56	59.4	4.05	140.7	8.31

Sample Charateristics (Odor, Color)	Clear	**Preservatives Used**	See COC
Number of Containers	See COC	**Sampler Signature**	P Campbell

WELL DATA

Number of Baffles	4	**Well Cap Dedicated/In Place?**	yes
Well Clear of Weeds/Accessible?	weeds	**Fittings/Well Head Condition**	good
Pad/Casing Quality	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.cecinc.com

SITE AND MONITORING WELL DATA

FACILITY NAME	EWS	**MONITORING WELL I.D.**	MW-2
LOCATION	Camden, TN	**TEMPERATURE & WEATHER**	80s Sunny
DATE & TIME	6/14/18 1545	**EVENT FREQUENCY**	Quarterly
PURGE METHOD	NA, parameters only	**FIELD REPRESENTATIVE**	Philip Campbell /A.Baugh
TOTAL WELL DEPTH (feet)	10	**SAMPLING EQUIPMENT**	YSI 600 pro plus
DEPTH TO WATER (feet)	5.03	**IS SAMPLE EQUIPMENT DEDICATED?**	No
CASING DIAMETER (inches)	2	**DUPLICATE COLLECTED?**	NO
WATER COLUMN (feet)	4.97	**FIELD BLANK COLLECTED?**	
PURGE VOLUME (gallons)	—	**EQUIPMENT BLANK COLLECTED?**	NO

SAMPLE DATA

Gallons Purged	Time Collected (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
—	1551	—	24.8	6.11	293.4	1.19	207.8	14.2

Sample Charateristics (Odor, Color)	Clear	**Preservatives Used**	—
Number of Containers	—	**Sampler Signature**	A.Baugh

WELL DATA

Number of Baffles	4	**Well Cap Dedicated/In Place?**	NO
Well Clear of Weeds/Accessible?	Yes	**Fittings/Well Head Condition**	NA
Pad/Casing Quality	Okay	**Lock Condition**	good

GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 225 Seaboard Lane, Ste. 170 Franklin, Tennessee 37067 - 800-763-2326 - www.cecinc.com

SITE AND MONITORING WELL DATA

FACILITY NAME	EWS	**MONITORING WELL I.D.**	MW-3
LOCATION	Camden, TN	**TEMPERATURE & WEATHER**	80's clear
DATE & TIME	6/12/18	**EVENT FREQUENCY**	Quarterly
PURGE METHOD	~~Peristaltic Pump~~ Low-flow	**FIELD REPRESENTATIVE**	Philip Campbell / A. Baugh
TOTAL WELL DEPTH (feet)	27	**SAMPLING EQUIPMENT**	~~Bailer~~ Bladder Pump
DEPTH TO WATER (feet)	19.43	**IS SAMPLE EQUIPMENT DEDICATED?**	~~No~~ Yes
CASING DIAMETER (inches)	2	**DUPLICATE COLLECTED?**	No
WATER COLUMN (feet)	7.57	**FIELD BLANK COLLECTED?**	No
PURGE VOLUME (gallons)	1.65	**EQUIPMENT BLANK COLLECTED?**	N/A

PURGE INFORMATION

Gallons Purged	Time (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
0	1445	0	22.1	5.94	333.4	5.47	166.5	14.6
.45	1450	5	19.5	5.59	373.7	2.88	196.6	3.73
.75	1455	10	19.7	5.61	377.8	2.14	204.2	3.15
1.0	1500	15	19.7	5.75	398.8	1.70	203.4	3.35
1.35	1505	20	19.7	5.80	412.8	1.43	201.9	4.09
1.65	1510	25	19.8	5.82	420.3	1.12	201.3	4.92

SAMPLE DATA

Gallons Purged	Time Collected (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
1.65	1520	25	19.8	5.82	420.3	1.12	201.3	4.92

Sample Charateristics (Odor, Color)	clear	**Preservatives Used**	See COC
Number of Containers	See COC	**Sampler Signature**	A. Baugh

WELL DATA

Number of Baffles	4	**Well Cap Dedicated/In Place?**	Yes
Well Clear of Weeds/Accessible?	Yes	**Fittings/Well Head Condition**	good
Pad/Casing Quality	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.cecinc.com

SITE AND MONITORING WELL DATA

FACILITY NAME	EWS	**MONITORING WELL I.D.**	MW-4
LOCATION	Camden, TN	**TEMPERATURE & WEATHER**	80s sunny
DATE & TIME	6/19/18 1315	**EVENT FREQUENCY**	Quarterly
PURGE METHOD	~~Peristaltic Pump~~ low Flow	**FIELD REPRESENTATIVE**	Philip Campbell / A.Baugh
TOTAL WELL DEPTH (feet)	23.1	**SAMPLING EQUIPMENT**	~~Bailer~~ Bladder Pump
DEPTH TO WATER (feet)	11.25	**IS SAMPLE EQUIPMENT DEDICATED?**	~~No~~ Yes
CASING DIAMETER (inches)	2	**DUPLICATE COLLECTED?**	YES
WATER COLUMN (feet)	11.85	**FIELD BLANK COLLECTED?**	NO
PURGE VOLUME (gallons)	2.25	**EQUIPMENT BLANK COLLECTED?**	NO

PURGE INFORMATION

Gallons Purged	Time (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
0	1330	0	16.6	5.98	60.0	11.32	-149.8	.99
.75	1335	5	16.0	5.96	57.9	9.25	184.6	.84
1.0	1340	10	15.9	5.95	57.1	8.65	266.1	.37
1.65	1345	15	15.8	5.95	57.0	8.52	264.3	.45
2.25	1350	20	15.8	5.95	56.9	8.11	264.7	.41

SAMPLE DATA

Gallons Purged	Time Collected (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
2.25	1355	20	15.8	5.95	56.9	8.11	264	.41

Sample Charateristics (Odor, Color)	clear	**Preservatives Used**	See COC
Number of Containers	See COC	**Sampler Signature**	A.Baugh

WELL DATA

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

SITE AND MONITORING WELL DATA

FACILITY NAME	EWS	**MONITORING WELL I.D.**	MW-5
LOCATION	Camden, TN	**TEMPERATURE & WEATHER**	80s Sunny
DATE & TIME	6/19/18 1215	**EVENT FREQUENCY**	Quarterly
PURGE METHOD	~~Peristaltic Pump~~ low flow	**FIELD REPRESENTATIVE**	Philip Campbell / A Baugh
TOTAL WELL DEPTH (feet)	33.85	**SAMPLING EQUIPMENT**	~~Bailer~~ Bladder pump
DEPTH TO WATER (feet)	9.50	**IS SAMPLE EQUIPMENT DEDICATED?**	~~No~~
CASING DIAMETER (inches)	2	**DUPLICATE COLLECTED?**	NO
WATER COLUMN (feet)	24.35	**FIELD BLANK COLLECTED?**	No
PURGE VOLUME (gallons)	2.0	**EQUIPMENT BLANK COLLECTED?**	N/A

PURGE INFORMATION

Gallons Purged	Time (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
0	1216	0	18.8	5.43	249.8	1.26	214.6	143
.5	1221	5	17.9	5.31	253.6	.44	223.8	52.8
.8	1226	10	17.5	5.32	246.8	.58	230.4	32.1
1.15	1231	15	17.5	5.33	242.9	.63	235.3	27.6
1.5	1236	20	17.5	5.33	240.8	.61	237.9	22.8
1.75	1241	25	17.5	5.34	238.4	.63	240.7	17.7
2.0	1246	30	17.4	5.35	235.9	.68	242.9	14.3

12.5 @ mins

SAMPLE DATA

Gallons Purged	Time Collected (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
2.0	1250	30	17.4	5.35	235.9	.68	242.9	12.5

Sample Charateristics (Odor, Color)	mostly clear	**Preservatives Used**	See COC
Number of Containers	See COC	**Sampler Signature**	A Baugh

WELL DATA

Number of Baffles	4	**Well Cap Dedicated/In Place?**	yes
Well Clear of Weeds/Accessible?	yes	**Fittings/Well Head Condition**	good
Pad/Casing Quality	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.cecinc.com

SITE AND MONITORING WELL DATA

FACILITY NAME	EWS	**MONITORING WELL I.D.**	TMW-1
LOCATION	Camden, TN	**TEMPERATURE & WEATHER**	Cloudy, humid, 90's
DATE & TIME	6-19-18	**EVENT FREQUENCY**	Quarterly
PURGE METHOD	Peristaltic Pump Low-Flow 3 volumes	**FIELD REPRESENTATIVE**	Philip Campbell
TOTAL WELL DEPTH (feet)	32.5	**SAMPLING EQUIPMENT**	~~Bailer~~ peristaltic pump
DEPTH TO WATER (feet)	7.25	**IS SAMPLE EQUIPMENT DEDICATED?**	No
CASING DIAMETER (inches)	1	**DUPLICATE COLLECTED?**	No
WATER COLUMN (feet)	25.25	**FIELD BLANK COLLECTED?**	No
PURGE VOLUME (gallons)	1 vol ≈ 1.03 gallons → 3 vol = 3.10 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	11:16	0	18.2	5.25	81.3	6.42	46.7	>1000
1.0	11:28	12	18.5	4.91	82.3	6.22	80.8	>1000
2.0	11:42	26	18.9	4.91	82.3	6.31	86.3	>1000
3.0	11:56	40	18.8	5.06	82.4	5.96	93.9	>1000
4.0	12:10	54	19.1	5.06	82.2	6.15	100.3	305
5.0	12:24	68	18.7	5.10	81.6	5.86	103.0	131
								120 — total arsenic NTU = 2.62 after Field Filter

SAMPLE DATA

Gallons Purged	Time Collected (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
5.0	12:30	68	18.7	5.10	81.6	5.86	103.0	120

Sample Charateristics (Odor, Color)	No odor, very light hazy color	**Preservatives Used**	
Number of Containers	11	**Sampler Signature**	

WELL DATA

Number of Baffles	0	**Well Cap Dedicated/In Place?**	~~No~~ yes/yes
Well Clear of Weeds/Accessible?	yes/yes	**Fittings/Well Head Condition**	OK/OK
Pad/Casing Quality	No pad, no protective (ground) casing.	**Lock Condition**	good

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	**MONITORING WELL I.D.**	TMW-2
LOCATION	Camden, TN	**TEMPERATURE & WEATHER**	Cloudy, 90's, humid
DATE & TIME	6-19-18 / 11:50	**EVENT FREQUENCY**	Quarterly
PURGE METHOD	Peristaltic Pump	**FIELD REPRESENTATIVE**	Philip Campbell
TOTAL WELL DEPTH (feet)	27.50	**SAMPLING EQUIPMENT**	~~Bailer~~ Peristaltic
DEPTH TO WATER (feet)	11.20	**IS SAMPLE EQUIPMENT DEDICATED?**	No
CASING DIAMETER (inches)	1	**DUPLICATE COLLECTED?**	No
WATER COLUMN (feet)	16.30	**FIELD BLANK COLLECTED?**	No
PURGE VOLUME (gallons)	1 vol = 0.66 gal, 3 vol = 2.0 gallons	**EQUIPMENT BLANK COLLECTED?**	No

PURGE INFORMATION

Gallons Purged	Time (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
0	13:00	0	18.6	5.52	70.9	7.58	111.2	185
0.75	13:07	7	19.0	5.25	77.0	6.86	116.5	>1000
1.50	13:19	19	18.5	5.30	74.5	7.04	121.6	>1000
2.25	13:34	35	20.1	5.25	77.2	6.81	124.3	>1000
3.00	13:52	53	20.9	5.32	79.1	5.77	122.8	123
3.75	14:12	67	21.3	5.33	81.2	5.80	120.8	128

SAMPLE DATA

Gallons Purged	Time Collected (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
3.75	1415	67	21.3	5.33	81.2	5.80	120.8	128

Sample Charateristics (Odor, Color)	Light orange / No odor	**Preservatives Used**	see COC
Number of Containers	see COC	**Sampler Signature**	[signature]

NTU = 106 after field filtering (very small soil particles)

WELL DATA

Number of Baffles	0	**Well Cap Dedicated/In Place?**	yes yes
Well Clear of Weeds/Accessible?	yes / yes	**Fittings/Well Head Condition**	good / good
d/Casing Quality	No pad / No prot. casing PVC casing 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.cecinc.com

SITE AND MONITORING WELL DATA

FACILITY NAME	EWS	**MONITORING WELL I.D.**	TMW-3
LOCATION	Camden, TN	**TEMPERATURE & WEATHER**	PCy 90's
DATE & TIME	6-19-18 / 15:50	**EVENT FREQUENCY**	Quarterly
PURGE METHOD	Peristaltic Pump	**FIELD REPRESENTATIVE**	Philip Campbell
TOTAL WELL DEPTH (feet)	28.00	**SAMPLING EQUIPMENT**	~~Bailer~~ Peristaltic pump.
DEPTH TO WATER (feet)	9.50	**IS SAMPLE EQUIPMENT DEDICATED?**	No
CASING DIAMETER (inches)	1	**DUPLICATE COLLECTED?**	No
WATER COLUMN (feet)	18.50	**FIELD BLANK COLLECTED?**	Yes – 16:10
PURGE VOLUME (gallons)	1 vol = 0.75 gallons 3 vol = 2.25 gallons	**EQUIPMENT BLANK COLLECTED?**	No

PURGE INFORMATION

Gallons Purged	Time (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
0	15:55	0	18.4	6.87	243.5	0.94	145.7	44.2
0.75	16:01	6	18.1	5.21	212.1	1.72	157.6	>1000
1.50	16:09	14	19.1	4.99	208.6	1.83	160.3	196
2.25	16:16	21	19.6	4.99	212.3	1.76	155.3	166
3.00	16:26	31	19.7	4.99	212.6	1.70	154.4	128
								58.4 @ metals
								NTU = 1.25 after filtering

SAMPLE DATA

Gallons Purged	Time Collected (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
3.00	1650	31	19.7	4.99	212.6	1.70	154.4	58.4

Sample Charateristics (Odor, Color)	very light orange/no odor	**Preservatives Used**	See COC
Number of Containers	See COC	**Sampler Signature**	Phil P-Campbell

WELL DATA

Number of Baffles	0	**Well Cap Dedicated/In Place?**	Yes / yes
Well Clear of Weeds/Accessible?	yes / yes	**Fittings/Well Head Condition**	OK
Pad/Casing Quality	No pad / PVC casing ok	**Lock Condition**	Good

Civil & Environmental Consultants - TN

325 Seaboard Lane, Suite 170

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

Report to: **Philip Campbell**

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

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

City/State Collected:

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

Client Project # **171-873**

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

Collected by (print): Philip Campbell

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

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ___

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

Date Results Needed

Quote #

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	**WetChem** 250mlHDPE-NoPres	ALK 60mlAmb-NoPres	COD,NH3 250mlHDPE-H2SO4	Diss. Metals-FF 250mlHDPE-HNO3	SV8011 40mlClr-NaThio	Total Metals,HARD 250mlHDPE-HNO3	V8260AP1 40mlAmb-HCl	V8260AP1-Trip Blank 40mlAmb-HCl-Blk			Remarks	Sample # (lab only)
MW-1	Grab	GW		6-19-18	12:35	11	X	X	X	X	X	X	X					
MW-3		GW			15:20	11	X	X	X	X	X	X	X					
MW-4		GW			13:55	11	X	X	X	X	X	X	X					
MW-5		GW			12:50	11	X	X	X	X	X	X	X					
TMW-1		GW			12:30	11	X	X	X	X	X	X	X					
TMW-2		GW			14:15	11	X	X	X	X	X	X	X					
TMW-3		GW			16:50	11	X	X	X	X	X	X	X					
DUPLICATE		GW			—	11	X	X	X	X	X	X	X					
FIELD BLANK		GW			16:10	11	X	X	X	X	X	X	X					
~~EQUIPMENT BLANK~~		GW				11	X	X	X	X	X	X	X					

Chain of Custody Page ___ of ___

ESC LABORATORY SCIENCES
a subsidiary of Pace Analytical

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

L #

Table #

Acctnum: **CEC**
Template: **T133579**
Prelogin: **P657635**
TSR: **526 - Chris McCord**
PB: 7/6/18

Shipped Via: **Courier**

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

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

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier X

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
Philip Campbell	6-20-18	10:05			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: / Condition: NCF / OK

Civil & Environmental Consultants - TN

325 Seaboard Lane, Suite 170

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

Pres Chk

Report to: **Philip Campbell**

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

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

City/State Collected:

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

Client Project # **171-873**

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

Collected by (print): P. Campbell

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

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ___

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

Date Results Needed

Quote #

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	**WetChem** 250mlHDPE-NoPres	ALK 60mlAmb-NoPres	COD,NH3 250mlHDPE-H2SO4	Diss. Metals-FF 250mlHDPE-HNO3	SV8011 40mlClr-NaThio	Total Metals,HARD 250mlHDPE-HNO3	V8260AP1 40mlAmb-HCl	V8260AP1-Trip Blank 40mlAmb-HCl-Blk			Remarks	Sample # (lab only)
TRIP BLANK	—	GW		—	—	1								X				

Chain of Custody Page ___ of ___

ESC LABS
a subsidiary of ACZ Analytical

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

L # ___

Table # ___

Acctnum: **CEC**
Template: **T133579**
Prelogin: **P657635**
TSR: **526 - Chris McCord**
PB: 5-8-18
Shipped Via: **Courier**

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

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

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier X

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: __NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
P. Campbell	6-20-18	10:05		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Civil & Environmental Consultants - TN

325 Seaboard Lane, Suite 170

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

Pres Chk

Report to: **Philip Campbell**

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

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

City/State Collected:

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

Client Project # **171-873**

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

Collected by (print): Ph. P. Campbell

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

P.O. #

Collected by (signature): Phil Campbell

Immediately
Packed on Ice N ___ Y ✓

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

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	**WetChem** 250mlHDPE-NoPres	ALK 60mlAmb-NoPres	COD,NH3 250mlHDPE-H2SO4	Diss. Metals-FF 250mlHDPE-HNO3	SV8011 40mlClr-NaThio	Total Metals,HARD 250mlHDPE-HNO3	V8260AP1 40mlAmb-HCl				
IWC-L	Grab	GW	—	6-19-18	1500	11	X	X	X	X	X	X	X				
APWC-L	Grab	GW	—	6-19-18	1325	11	X	X	X	X	X	X	X				

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LABS
a subsidiary of Accutest

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

L # ___

Table # ___

Acctnum: **CEC**
Template: **T133582**
Prelogin: **P657637**
TSR: **526 - Chris McCord**
PB: TL 6.5.18

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:**WetChem** = *NITRATE*,CHLORIDE,BROMIDE,SULFATE,FLUORIDE,ALK
Tot/Diss Metals=M6020AP1 + Al,Ca,Fe,K,Mg,Mn,Na,B(6010)
* Diss. Metals bottles unpreserved. Not filtered in lab

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier ✓

Tracking #

Sample Receipt Checklist

COC Seal Present/Intact:	__NP	__Y __N
COC Signed/Accurate:		__Y __N
Bottles arrive intact:		__Y __N
Correct bottles used:		__Y __N
Sufficient volume sent:		__Y __N
If Applicable		
VOA Zero Headspace:		__Y __N
Preservation Correct/Checked:		__Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
Phil Campbell	6-20-18	10:05			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: / Condition: NCF / OK


EWS
Groundwater Sampling Locations
CEC #181-364
Legend
Permanent Well
Surface water
Temporary Well
MW-1 (upgradient)
MW-5
EWS LF
SED. POND
FRENCH DRAIN
TMW-1
MW-3
TMW-2
TMW-3
MW-2
MW-4
Omar Cir
Hilton Head Rd
N
1000 ft
Google Earth
© 2018 Google

EWS Quarterly Stream + Sediment Sampling, Camden

6/28/18 M. SKELTON, C. Liggett ~87° Sunny

Sample	Time	Pics
[redacted] D/S-1 Cane Creek	10:25	1

TEMP - 24.4°C
pH - 6.76
Cond - 199.4
DO - 5.29 mg/L
ORP - 91.4
TURB - 12.6

Sample	Time	Pics
Cane Creek MS (open)	11:15	2+3

TEMP - 24.7
pH - 6.79
Cond - 180.6
DO - 6.11 mg/L
ORP - 96.2
TURB - 14.5

Sample	Time	Pics
Charlie Creek · MS	12:00	4

TEMP - 24.6
pH - 6.45
Cond - 149.4
DO - 7.43 mg/L
ORP - 113.2
TURB - 6.38 NTU

Sample	Time	Pics
Cane Creek U/S	~~12:00~~ 12:45	5

TEMP – 25.7 °C
pH – 6.84
Cond – 182.2
DO – 7.43
ORP – 108.3
TURB – 14.6 NTU

Sample	Time	Pics
Charlie Creek U/S	1:30	6-7

TEMP - 25.3
pH - 6.77
Cond - 131.3
DO - 8.15
ORP - 102.0
TURB - 2.37 NTU

APPENDIX D
CEC STANDARD OPERATING PROCEDURES

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 EQUIPMENT BLANKS

I. SCOPE AND APPLICABILITY: Equipment blanks are collected to assess the adequacy of decontamination procedures and to determine whether sampling equipment and methods are contributing contaminants to samples.

II. PROJECT-SPECIFIC REQUIREMENTS:

WATER TYPES TO BE USED FOR BLANKS: *[distilled water, deionized water, HPLC-grade water, etc.]*

III. METHODOLOGY

A. Review the SOP for the medium sampled to establish the frequency for collection of blanks.

B. Assemble a complete set of decontaminated sampling equipment for the subject sampling effort.

C. Rinse the blank water across the sampling equipment, catching it in a decontaminated stainless-steel bucket. 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.

D. Fill a complete set of sample bottles.

E. Assign the blank a sample number of the same format as the other samples in the series.

F. Store, handle, and ship the blanks in the same manner as the samples.

IV. PRECAUTIONS AND COMMON PROBLEMS

A. The selection of stock solution 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
- ≅ 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 07-02-04).

VI. REFERENCES

EPA, 1986. Test Methods for Evaluating Solid Waste: SW-846; Volume II. Washington, DC.

04-01-02 TRIP BLANKS

I. SCOPE AND APPLICABILITY: Trip blanks are prepared to evaluate whether volatile constituents have migrated into samples from the air on-site, during shipping, or at the laboratory.

II. PROJECT-SPECIFIC REQUIREMENTS:

A. Frequency:

B. Other Criteria:

III. METHODOLOGY

A. When ordering bottles from the laboratory for the sampling event, request that trip blanks be sent also.

B. Keep the supplied blanks with the samples being collected throughout the sampling event. Handle the blanks in the same manner as the filled sample vials.

C. Assign the trip blank a sample number of the format used for the sampling event.

D. Return the trip blanks to the laboratory with the samples. Include the samples on the Chain-of-Custody form (SOP 07-02-02). Analysis is typically performed for volatile organic compounds only.

IV. PRECAUTIONS AND COMMON PROBLEMS: None.

V. DOCUMENTATION: Describe handling on the trip blanks in the Trip Report (SOP 07-02-04). Include the sample numbers assigned.

VI. REFERENCES

EPA, 1986. Test Methods for Evaluating Solid Waste: SW-846; Volume II. Washington, DC.

04-02-01 LIQUID DUPLICATES

I. SCOPE AND APPLICABILITY: Duplicate samples are collected to evaluate the precision involved in the sampling effort. Duplicate samples must be collected to be as similar as possible to the original sample. This procedure is applicable of collection of duplicate samples of all liquids and flowable sludges.

II. PROJECT-SPECIFIC REQUIREMENTS:

NUMBER/FREQUENCY OF DUPLICATE SAMPLING:

DUPLICATE NUMBERING SYSTEM: *[Indicate how sample numbers are to be assigned to duplicates, and whether "blind" numbers should be assigned.]*

III. METHODOLOGY

A. Prepare sample bottles for the target sample and its duplicate.

B. Collect the liquid sample in accordance with the appropriate SOP.

C. When filling sample bottles, fill each type of bottle for the sample and duplicate in sequence. Fill both VOA vials, then both metals bottles, etc. This will assure that the duplicate is as similar to the original sample as possible.

D. Preserve the sample and duplicate identically.

IV. PRECAUTIONS AND COMMON PROBLEMS

A. Failure to fill bottles alternately between the sample and duplicate may result in poor reproducibility between analyses.

B. Samples with free product or multiple phases present special problems. The phase distribution must be the same in both aliquots.

V. DOCUMENTATION: List the sample and duplicate on the Groundwater Monitoring Data Sheet as separate samples, describing the duplicate in the "Comments" column. If a Groundwater Monitoring Data Sheet is not appropriate, incorporate this information into the Trip Report (SOP 07-02-04).

VI. REFERENCES: None.

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.

06-01-01 WATER-LEVEL MEASUREMENT IN MONITORING WELLS

I. SCOPE AND APPLICABILITY: This procedure is applicable to the measurement of water levels in monitoring wells and open boreholes.

II. PROJECT-SPECIFIC REQUIREMENTS

A. REQUIRED READINGS:

B. APPLICABLE METHODS:

III. METHODOLOGY: Water levels should always be recorded to ±0.01 foot. Measurements should be made from a marked point on the inner casing for monitoring wells, and from the ground surface for open boreholes. Equipment should be decontaminated in accordance with SOP 01-01-00 after each measurement. The following methods may be used:

A. CHALKED-TAPE METHOD

1. Check records for historic water levels in the well, if available.

2. Rub the first five feet of a steel surveyor's chain or fiberglass tape with carpenter's chalk.

3. Lower the tape into the well until the end of the tape enters the water.

4. Record the tape footing at the wellhead to within 0.01 feet.

5. Pull the tape out of the well and read the tape footage of the water mark to within 0.01 feet. The difference between the readings is the water level.

B. SOUNDING

1. Attach a small float or hollow-bottom weight or sounder to the end of a tape measure.

2. Lower the sounder into the well and listen for the sound of the weight hitting the water surface.

3. When this is heard, pull the sounder back a few inches and redrop it by 1/4-inch increments until the sound is heard again.

4. Subsequent smaller increments of lowering the sounder will allow water-level measurements to within 0.01 feet.

5. Measure the length from the zero mark on the tape measure to the bottom of the weight. Add this value to all field measurements made with the sounder.

C. ELECTRIC-WATER LEVEL METER (Solinst)

1. Turn the Solinst on by turning the knob clockwise. This knob is also the volume control. Test the Solinst to see if the battery is dead by pushing the button next to the volume knob.If the battery is charged the Solinst will emit an audible tone and the red indicator light will illuminate.
2. Lower the end of the probe into the well or borehole. The probe will cause the unit to emit the tone and illuminate the light when it contacts water.

3. Pull the probe back a few inches and lower the probe in smaller increments until the water level is measured to within 0.01 feet.

4. The water level is read directly from the Solinst tape, and already includes a correction for the length of the probe on the bottom of the tape.

D. INTERFACE PROBE: This is the only reliable method for wells with floating free product.

1. Push the On/Off button to turn unit on. Lower the probe into the liquid. The horn will sound a steady tone and the yellow light will illuminate when the probe contacts an oil product. Slowly raise probe until sound stops, lower until sound is heard again to refine the oil level.

2. Read the tape marking and note as the surface level of product.

3. Slowly lower the probe through the oil product, searching for the oil-water interface. When the probe reaches water the tone will switch from steady to a beeping tone and the red light will illuminate. Slowly move probe up and down to refine the oil/water interface to within 0.01 feet. Read the water level directly from the tape. The length of the probe is already considered.

NOTE: Auto Shutoff Feature: After approximately five minutes of power on, the unit will auto-shut off. A chirping sound will be heard, warning impending shut off. Press

<POWER ON/RENEW> to continue operation. During five minute interval, short "alive" beep is heard.

IV. PRECAUTIONS AND COMMON PROBLEMS:

1. Be sure to allow sufficient time after development, purging or pumping to allow the well to recover to static conditions.

2. Sounding may be difficult with very deep water levels or in noisy conditions because the sound is hard to hear.

3. Measurement of water levels in pumping wells or wells/boreholes with cascading water can be difficult. Installing a narrow PVC access tube inside the well casing can make obtaining accurate readings easier.

4. Free product floating on the water table depresses the natural water level. If a true water level is required, the product of the oil thickness and the oil specific gravity must be added to the oil/water interface elevation.

5. If there is no measurement mark on the well riser, add one in indelible ink.

V. DOCUMENTATION

1. Record water levels in a field notebook or Groundwater Monitoring Data Sheet (SOP 07-02-01). Be sure to record the date and time of the measurement.

2. Data should be incorporated into the Trip Report (SOP 07-02-04). Method of measurement should be reported.

VI. REFERENCES: None

07-01-01 MAINTAINING SAMPLE CHAIN OF CUSTODY

I. SCOPE AND APPLICABILITY: This procedure is to be employed whenever samples are collected for laboratory analysis, and is designed to ensure that sample integrity is maintained. These procedures are necessary to assure that samples are defensible.

II. PROJECT-SPECIFIC REQUIREMENTS: None.

III. METHODOLOGY

A. SAMPLE CUSTODY: The sampling personnel must maintain custody of the samples until they are delivered to the laboratory, at which time the laboratory takes over the custody record. A sample is considered to be in custody if:

- it is in the investigator's actual possession
- it is in view of the investigator
- it has been placed in a secure area
- a signed custody seal has been placed on the sample container such that the seal would be destroyed if the container was opened.

B. CUSTODY RECORD

1. Complete a Chain-of-Custody Form for each shipping container of samples as described in SOP 07-02-02. Place the white copy of the completed form in the shipping container with the samples, as discussed in SOP 07-01-03.

2. Affix a signed custody seal to secure all samples. Seals may be placed across the lids of individual sample bottles, or on each shipping container of samples. If seals are placed on shipping containers, at least two seals must be used, and they must be placed such that the container cannot be opened without breaking the seals.

IV. PRECAUTIONS AND COMMON PROBLEMS

A. It may be necessary to cover custody seals with clear postal tape to prevent them from falling off.

B. Deliver or fax a copy of the custody form to the Project Manager within 24 hours of shipping the samples so that any errors can be corrected before the laboratory begins processing the samples.

V. DOCUMENTATION

A. The pink copy of the Chain-of-Custody Form should be submitted to the Project Manager as soon as possible after the samples are shipped.

B. The Project Manager or a designee must review the form for completeness and correctness. Any errors should be flagged, and the laboratory should be contacted if errors could affect analysis. The reviewer should initial and date the form, then place it in the Project File.

C. Compliance or problems with custody procedures should be documented in the Trip Report (SOP 07-02-04).

VI. REFERENCES

EPA Region IV; 1991. Environmental Compliance Branch, Standard Operating Procedures and Quality Assurance Manual. Athens, Georgia.

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.