

**GROUNDWATER MONITORING PROGRAM
2018 QUARTER THREE STATUS REPORT
FOR
REMEDIAL ACTION AT
THE DEFENSE NATIONAL STOCKPILE CENTER SCOTIA
DEPOT
GLENVILLE, NEW YORK**

Prepared For:



U.S. Army Corps of Engineers

Prepared By:



AECOM Technical Services

January 2019

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1 INTRODUCTION

This report has been prepared by AECOM on behalf of the United States Army Corps of Engineers (USACE) and the United States General Services Administration (GSA) to document the groundwater monitoring activities performed at the Former Scotia Navy Depot (FSND) (Site) for the third quarter of 2018 (June 23, 2018, through September 21, 2018). This report presents the results of the eighth groundwater sampling event after the completion of the construction of the zero valent iron (ZVI) permeable reactive barrier (PRB) which was installed across the volatile organic compound (VOC) plume to remediate groundwater at the Site. This groundwater sampling event included collection of groundwater samples from 12 monitoring wells. Installation of the PRB was completed from February 2016 to December 2016. The Site is adjacent to the north side of New York State (NYS) Route 5 (Amsterdam Road) in the Town of Glenville, Schenectady County, New York. A Site location map is provided in Figure 1-1.

1.1 Site Description

The Site and adjacent properties are zoned for commercial use. Residential properties are located to the south between Amsterdam Road and the Mohawk River. The Mohawk River is located approximately 1,500 feet west-southwest of the Site and represents the major drainage feature in Schenectady County. The water table beneath the Site is approximately 65 feet below ground surface (bgs), and groundwater beneath the Site flows from northeast to southwest toward the Mohawk River.

The Site overlies a United States Environmental Protection Agency (US EPA) designated Sole Source Aquifer referred to as the Schenectady or Great Flats Aquifer system, which is adjacent to and extends beneath the Mohawk River over a distance of approximately 12 miles in Schenectady County. Relative to a series of four aquifer protection zones established to protect five municipal water supplies relying on the aquifer system, the Site lies in Zone III or the General Aquifer Recharge Area. The Site is located approximately 1,500 feet southwest of the Village of Scotia well field and approximately 1.25 miles north of the Town of Rotterdam and City of Schenectady well fields.

Portions of the original Scotia Naval Depot have been subdivided and sold since 1972 by the United States Government. The Site now consists of several large privately held parcels in addition to a portion of land still administered by the GSA. The private parcels contain a variety of industrial tenants; while the GSA leases its remaining portion to the Defense Logistics Agency/Defense National Stockpile Center and the Navy.

1.2 Site History

The Scotia Depot was built in 1942 and 1943 and was commissioned as a United States Navy facility on March 30, 1943. It served as a storage and supply depot for naval forces along the Atlantic coast and Europe, and as a storage and distribution point for National Stockpile materials. On January 1, 1960, the Navy turned the facility over to the GSA. During the period between early 1966 and approximately 1973, the USACE/Army Material Command (AMC) leased buildings from the Navy for the fabrication and storage of vehicles as well as other military equipment. Additionally, between 1967 and 1969, the GSA and the Navy leased to the

United States Army/Defense Supply Agency, Buildings 202 and 203. The agreement indicates these buildings were used for the preservation and rail loading of trucks; and storage of trucks and vehicles.

1.2.1 Summary of Previous Investigations

In the late 1980s, trichloroethene (TCE) was detected at low-level concentrations of less than 1 microgram per liter ($\mu\text{g/L}$) in the Town of Rotterdam and City of Schenectady well fields. In an effort to determine the potential source(s) of the TCE, the New York State Department of Health (NYSDOH) performed sampling of private water supply wells in the area during 1991. The private water supply sampling included residences located on NYS Route 5 in the Town of Glenville hydraulically downgradient of the Defense National Stockpile Center Scotia Depot Site. VOCs, including TCE, 1,1,1-trichloroethane (1,1,1-TCA), and tetrachloroethene (PCE), were detected in groundwater collected in some of these residential wells. The sampling results were consistent with the known groundwater contamination concentrations at the Defense National Stockpile Center Scotia Depot Site, including TCE which was detected in the NYS Route 5 residential well water samples at concentrations up to 320 $\mu\text{g/L}$. Following a recommendation by the NYSDOH to connect to public water, the homes on NYS Route 5 were subsequently connected to public water provided by the Town of Glenville. Although the drinking water standard was never exceeded in the City of Schenectady and the Town of Rotterdam municipal water supply wells, increased groundwater quality monitoring was initiated following the identification of the contamination.

Subsequent to the NYSDOH residential groundwater sampling, six subsurface investigations were completed to identify the possible source of TCE in the residential wells and to delineate the extent of the TCE groundwater plume. The investigations were completed between 1995 and 2007 and focused on the assemblage of properties comprising the former 337-acre Defense National Stockpile Center Scotia Depot. The New York State Department of Environmental Conservation (NYSDEC) 2007 Expanded Site Investigation (ESI) (NYSDEC, 2007) provides details on each of these investigations. Investigation data indicated that TCE disposal may have also occurred in the northeast corner of the 401 sub-block and the area near the north corner of the 403 sub-block.

Based on these investigations, a Record of Decision (ROD) specifying a groundwater remedy was approved by the NYSDEC in March 2010 (NYSDEC, 2010). The ROD specified a remedial action for the groundwater plume which included treatment of the plume through the installation of a zero valent iron (ZVI) PRB. During this time investigations were also conducted in relation to a carbon tetrachloride plume that was identified as a source for potential soil vapor intrusion. In addition to the groundwater remedy, the ROD also identified the need for soil vapor intrusion mitigation at the building 201 sub-block. Details on the installation and monitoring of the SVI portion of the remedy are provided in the Final Engineering Report (FER) (AECOM, 2017a). A Site Layout Map is provided in Figure 1-2.

1.2.2 Pre-Design Groundwater Investigation – 2013

A pre-design investigation (PDI) was completed by Stone Environmental in 2013 to verify the location and dimensions of the TCE plume to better estimate the appropriate location and depth of the PRB. The PDI was completed as a component of the ROD selected remedy to aid in the PRB design. The pre-design investigation included:

- Baseline groundwater sampling of 24 existing onsite monitoring wells
- Synoptic measurement of groundwater elevations in 35 on-site and off-site monitoring wells
- Vertical groundwater profile of VOC plume at 16 locations (WP-01 to WP-16)
- Installation and development of four on-site monitoring wells (MW-24 through MW-27)
- Hydraulic conductivity measurements
- Geotechnical soil sampling (laboratory sieve, bulk density, and effective porosity analyses)
- ZVI treatability study (bench-scale column test) using Site soil and groundwater

The results of the PDI indicated that the plume location had shifted to the south/southeast from the estimated plume delineation shown in the 2010 ROD (see Figure 3 from the ROD and Figures 6 and 10 from Final PDI Report) (Stone, 2013). The PDI also delineated the vertical and horizontal limits of the plume across a transect of groundwater profile locations, which had not been well defined in previous investigations. The results of the ZVI treatability study indicated that ZVI would be effective in remediating the TCE plume at the detected maximum concentrations and Site-specific geochemical conditions. The PDI evaluated a preliminary PRB design approximately 850-feet long centered on the highest concentration axis of the TCE plume and extending to estimated lateral limits of the plume based on the results of the vertical groundwater profile locations. Subsequent evaluation of the data to maximize effectiveness and efficiency of the remedial design suggested a 700-feet long deep section centered on the TCE plume with a shallower 250-feet long section to treat lower TCE concentrations would be effective at mitigating the groundwater contamination.

1.2.3 Baseline Groundwater Investigation

As part of the remedial design investigation work plan (RDIWP) (AECOM, 2015) various field activities were conducted during the fall of 2015 in order to gather data and information needed to complete the final PRB design. The main components of the remedial design investigation (RDI) field activities that related to the PRB design included:

- Installation and development of four compliance well pairs (MW-28 to MW-35) and one additional monitoring well (MW-36) to confirm upgradient edge of groundwater plume

-
- Collection of 33 baseline groundwater samples
 - Performance of a confirmatory ZVI bench scale test
 - Performance of aquifer tests including slug testing and hydraulic pulse interference testing (HPIT)

Detailed methods and results of these field activities were presented in the Remedial Action Work Plan (PRB-RAWP) (AECOM, 2016) and the 2015 RDI Work Summary Memo presented in Appendix A of the PRB-RAWP.

1.3 PRB Design Summary

The remedial investigation activities at the Site indicated that variable hydraulic conductivity and hydraulic gradient, and therefore groundwater velocity, conditions may exist at the Site. Therefore, various design cases were analyzed within the range of the measured values to determine the optimum design for the PRB. Three design cases in particular were outlined in the (PRB-RAWP) (AECOM, 2016). These design cases were based on average values from the slug test data and HPIT data from the 2015 RDI activities and historic data from the Stone PDI (Stone, 2013). The three design cases used an average value of 0.004 ft/ft for the hydraulic gradient and varied the hydraulic conductivity from 15.66 ft/day to 193.8 ft/day. This variability of hydraulic conductivity results in a range of groundwater velocity at the Site from 0.128 ft/day to 2.83 ft/day. GeoSierra Environmental, Inc. (GeoSierra), the PRB installation subcontractor, performed a sensitivity analysis based on these design cases and the design of the PRB was chosen based on design scenarios that reflected a conservative approach. A full description of the PRB design including details of each design case is presented in the PRB-RAWP (AECOM, 2016).

1.4 Remedial Action Implementation

In accordance with the ROD for the remedial action at the FSND, a ZVI PRB was installed in order to mitigate the impacted groundwater plume at the Site. AECOM, and its subcontractor GeoSierra, performed the installation of the PRB over the course of 10 months in 2016. The design and installation procedures of the PRB are outlined in the PRB-RAWP (AECOM, 2016). The main components of PRB installation were as follows:

- Installation of 77 injection wells
- Installation of 31 Resistivity strings
- Placement of ZVI into the formation via injection wells
- Post PRB installation HPIT testing

The installation of the ZVI PRB was successfully completed in November of 2016. Details of the PRB construction activities of the PRB are provided in the FER (AECOM, 2017a) for the Site.

2 QUARTERLY GROUNDWATER MONITORING PROGRAM

The eight compliance monitoring wells (MW-28 through MW-35) were installed in pairs so that groundwater quality could be monitored directly upgradient and directly downgradient of the PRB. The four monitoring well pairs are installed 20 feet apart on opposite sides of the wall, one being upgradient and one being downgradient, with corresponding screen depths. Figure 2-1 provides a profile of the compliance monitoring wells showing the screened interval in relation to the PRB. Results from the groundwater monitoring program will be used to evaluate the effectiveness of the remedy at decreasing chlorinated VOC concentrations in groundwater and preventing the migration of contaminated groundwater off-site. The compliance well pairs, in addition to MW-24 (downgradient), MW-26 (downgradient), MW-15 (upgradient) and MW-16 (outside of plume), will be sampled quarterly for the first two years (eight quarters) then annually thereafter. The first quarterly sampling event was conducted in December 2016. Monitoring well locations are shown on Figure 1-2 and are described in Table 2-1 below.

Table 2-1: Location of Monitoring Wells

Monitoring Well ID	Location in Relation to PRB
MW-15	Upgradient
MW-16	Outside of Plume
MW-24	Downgradient
MW-26	Downgradient
MW-28	Downgradient
MW-29	Upgradient
MW-30	Downgradient
MW-31	Upgradient
MW-32	Downgradient
MW-33	Upgradient
MW-34	Downgradient
MW-35	Upgradient

Table 2-2 provides the monitoring well sample schedule and analytical information for the groundwater monitoring program. The groundwater monitoring program will be carried out in accordance with the schedule and sampling protocol outlined in the Site Management Plan (SMP) (AECOM, 2017b).

2.1 Sample Collection Methods

Prior to sample collection, depth to water measurements were collected with an electronic water level meter from all accessible wells on Site. Depth to water measurements were taken to the hundredth of a foot from a designated measuring point on the well casing.

The groundwater sampling event was performed in accordance with EPA's low stress, often referred to as low-flow, sampling technique (Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures, EPA/540/S-95/504) (EPA, 2010) and is discussed below.

A bladder pump was used to purge the monitoring wells with the pump intake set at the midpoint of the saturated screened interval. During purging, the pump was operated at a flow rate of approximately 100 to 500 milliliters per minute (mL/min) and water levels were monitored to ensure that the pumping rate caused minimal/no drawdown. Dedicated tubing for each monitoring well was used for groundwater sample collection. Field parameters were recorded on the Well Sampling Forms every five minutes during purging, including:

- Purge rate (mL/min)
- Depth to water (0.01 ft)
- Temperature (degrees Celsius)
- pH
- Specific conductance (millisiemens per centimeter [ms/cm])
- Dissolved Oxygen (DO) (milligrams per liter [mg/L])
- Oxidation-Reduction Potential (ORP) (millivolts [mV])
- Turbidity (NTU)

A flow-through cell was used to obtain temperature, pH, specific conductance, DO, and ORP. Turbidity will be measured using a separate instrument. Purging was considered complete when the indicator parameters have stabilized over three consecutive readings. Stabilization parameters include the following:

- Drawdown: less than 0.3 ft drawdown during purging
- pH: ± 0.1 standard unit
- Specific Conductivity: $\pm 3\%$
- DO: $\pm 10\%$ (mg/L) for values greater than 0.5 mg/L or 3 readings < 0.5 mg/L
- ORP: ± 10 mV

-
- Turbidity: < 5 NTU or $\pm$ 10% for readings >5 NTU

Groundwater sample collection forms with the field parameter readings for each monitoring well are included as Appendix A. Sampling instruments were calibrated daily prior to starting sampling activities, or as needed throughout the day. A log of the field equipment calibration records is provided in Appendix B.

Prior to sample collection, the flow-through cell was disconnected from the dedicated sample tubing and the sample was collected directly from the tubing into the laboratory supplied sample containers. The target flow rate during sample collection was approximately 100 mL/min and sample collection was completed within a single bladder pulse for VOC analysis. Once sampling was complete, the purge water was placed in a 55-gallon drum at the conclusion of the sampling event. More detailed procedures for sample collection and handling and waste handling, are included in Appendix H of the SMP (AECOM, 2017b). Appendix G of the SMP includes the analytical QAPP for the site management activities. Appendix I of the SMP includes the HASP for the site management activities.

Groundwater samples were packaged on ice and delivered to ALS Laboratory daily via courier during the sample collection timeframe. Standard chain of custody procedures were used for sample transport. In total, 12 groundwater samples were collected and analyzed for targeted VOCs (EPA method 8260C) and monitored natural attenuation (MNA) parameters including TOC (SM 5310B), alkalinity (SM 2320B), chloride, nitrate, sulfate (EPA Method 300.0), and dissolved gases (methane, ethane, and ethene; Method RSK 175).

3 RESULTS

3.1 Hydrogeologic Results

The groundwater elevations for the Site were determined based on the initial depth to groundwater measurements that were taken prior to sample collection. Table 3-1 shows the groundwater elevation data for the September 2018 sampling event and compares it to the December 2015 baseline sampling event and past sampling event levels. A potentiometric Site map indicating the overburden, groundwater elevation and direction of groundwater flow during the September 2018 sampling event is included as Figure 3-1. Observed general groundwater flow direction in September 2018 was from northeast to southwest. Groundwater elevations in September 2018 were slightly different than past sampling events and there appears to be some slight rise in the area of MW-24 and slight depression in the area of MW-27. There appears to be a flat gradient during some sampling events including the September 2018 event.

Based on observed trends during the past sampling events it appears that the groundwater elevation at the Site is subject to seasonal variability. The December and March sampling events exhibit lower groundwater elevations than the June and September sampling events. The similarities between the winter events and summer events indicate a seasonal groundwater level trend. Groundwater elevation data for the September 2018 event indicate that groundwater levels are currently equal to top of the PRB wall at the north most monitoring well pairs along the PRB. Meanwhile, the groundwater elevation levels are slightly above the top of the PRB for the southern-most monitoring well pairs (MW-34 and MW-35). The current potentiometric surface in relation to the PRB is shown in profile on Figure 2-1A and in relation to along the axis of the estimate plume in Figure 2-1B. AECOM has reviewed the vertical COC groundwater concentration data from the 2013 PDI and found that there were no detected COCs at elevations above the wall in this area. AECOM does not believe that groundwater being slightly above the top of the wall in this area is cause for concern because the concentrations of COCs in the elevations around the top of the wall were low or non-detect. The majority of the higher COC concentrations were detected at locations in the lower section of the wall.

The hydraulic gradient is change in hydraulic head, or water level, per unit distance. The average hydraulic gradient at the Site in the vicinity of the PRB, estimated based on the September 2018 hydrogeologic conditions, was determined to be 0.0019 ft/ft. The September 2018 hydraulic gradient is slightly lower than the past three quarterly sampling events where the hydraulic gradient was 0.0028 ft/ft in June 2018, 0.0031 ft/ft in March 2018 and 0.0039ft/ft in December 2017. The groundwater seepage velocity is the rate of solute transport through the open pore space in the soil. Based on the September 2018 hydraulic gradient of 0.0019 ft/ft and the range of hydraulic conductivities evaluated for the PRB design (15.66 ft/day to 193.8 ft/day) groundwater seepage velocity at the Site could vary between approximately 0.07 ft/day and 0.91 ft/day. The range of estimated groundwater seepage velocities based on the September 2018 Site conditions (0.07 ft/day-0.91 ft/day) is lower than the range of estimated groundwater velocities used for the PRB design (0.128 ft/day-2.83 ft/day). Calculations for hydraulic gradient and velocity estimates are included in Appendix C.

The drum of purge water from the September 2018 sampling event was removed from the Site on November 8, 2018 and its contents properly disposed of by the environmental waste services contractor.

3.2 Groundwater MNA and Field Parameter Results

Results of groundwater MNA parameters obtained from the baseline sampling event through the September 2018 quarterly sampling event for the PRB monitoring compliance wells are presented in Table 3-2 and Table 3-3. MNA parameters were compared between compliance well pairs. In general, specific conductivity values are significantly higher throughout all the compliance well pairs when compared to past sampling events.

During previous quarterly sampling events no significant changes have been observed in DO and ORP concentrations and measurements were variable with some well pairs showing an increase and some pairs showing a decrease. DO measurements during the September 2018 event were again variable. ORP levels were more variable and some measurements showed increases and decreases between each upgradient and downgradient pair. ORP levels decreased significantly from upgradient to downgradient at well pairs MW-31/30 and MW-33/32. These conditions are expected downgradient of the PRB indicating reducing conditions as the groundwater passes through the PRB, however we expect to see ORP levels in the range of the -300 to -400 range for the Beta elimination CVOC reduction to occur.

The September 2018 groundwater results showed a general increase in methane, ethane, and ethene in most downgradient compliance monitoring wells. For methane, there was a particular increase in downgradient monitoring wells MW-30 and MW-32. The largest increase in methane, was seen in compliance monitoring well pairs in the middle of the PRB.. Initially methane, ethane and ethene concentrations increased from the breakdown of the ZVI carrier fluids (guar). The continued presence of ethane and ethene in downgradient well pairs is indicative of the β -elimination abiotic reaction of CVOCs with the PRB. These compounds, along with acetylene, are final products from the interaction of the ZVI and CVOCs. The June 2018 results did not indicate the presence of acetylene, however the detection of acetylene is very rare since it is extremely volatile. Acetylene could be produced as a byproduct of abiotic TCE reduction. Its presence would be an indicator of an abiotic TCE reduction, but its absence does not necessarily provide any insight into the reactions that may be occurring within the ZVI PRB. While acetylene was not analyzed for during the September 2018 sampling event, it will be in the December 2018 event and going forward as noted in the revised SMP which was accepted by the NYSDEC on November 5, 2018. It should be noted that there were some increases in DO concentrations noted during the past few sampling events suggesting that anaerobic conditions may not be sustained.

The laboratory data was validated by an AECOM chemist and a full data usability summary report (DUSR) was prepared. The DUSR, included in Appendix E, indicated that all data points were usable and no data points were rejected, except for some of the nitrate samples. During the September 2018 event the nitrate results for samples from MW-30, MW-31, and MW-32 were rejected because the sample holding time was exceeded by the lab. Further detail is provided in

the DUSR, and AECOM has discussed these issues with the lab and identified a corrective action to make sure holding times will no longer be exceeded.

To date nitrate and sulfate levels have been variable since the 2015 baseline sampling event including for the September 2018 event. Some downgradient wells showed an increase in nitrate and sulfate from their upgradient counterparts, while others showed a decrease. Nitrate and sulfate concentrations are expected to decrease from upgradient to downgradient wells as this would further indicate that bioactivity is occurring.

The September 2018 event included sampling for dissolved hydrogen at the eight compliance wells to monitor for the expected geochemical conditions present from the CVOC reactions with the ZVI wall. Dissolved hydrogen is a byproduct of the CVOCs degradation reactions taking place in the wall and may serve as an indicator of ZVI reactivity. Results showed very low concentrations of dissolved hydrogen in the vicinity of the wall at both upgradient and downgradient locations; however, the lack of detections of dissolved hydrogen is not unusual since dissolved hydrogen is quickly consumed in the subsurface. Dissolved iron and total iron were sampled for at all wells sampling during this quarter to evaluate the natural geochemistry at locations away from the wall, and to monitor for reaction byproducts in the vicinity of the wall. Dissolved iron is another byproduct of ZVI redox reactions with CVOCs and it is expected to see increased concentrations in the subsurface at monitoring wells downgradient of the wall. Neither dissolved nor total iron was detected in concentrations at wells downgradient of the PRB that are indicative of presence of ZVI redox reaction byproducts. AECOM will continue to monitor for dissolved hydrogen, dissolved iron and total iron during future sampling events, as noted by the revised SMP.

Overall the MNA data does not show consistency in the well pairs throughout the expanse of the PRB. The well pair MW-28/MW-29 is screened in the more transmissive upper sand and gravel and does not appear to show the same MNA parameter behavior as the other well pairs. The September 2018 monitoring data may indicate that the groundwater conditions at the site are shifting away from the anaerobic conditions that were created in the wake of the PRB wall installation, to conditions that indicate that abiotic reductive dechlorination reactions are occurring in the middle of the wall. AECOM will continue to monitor MNA parameters during subsequent sampling events to confirm this trend.

3.3 Groundwater VOC results

The VOC results from the September 2018 quarterly sampling event are presented in Table 3-2 and Table 3-3. This groundwater sampling event included collection of 12 groundwater samples. Figure 3-2 provides a summary of the groundwater VOC results for the monitoring well compliance pairs, and quarterly wells that exceed the NYSDEC Ambient Water Quality Standards (AWQS) and Guidance Values (GV) found in the Technical and Operational Guidance Series (TOGS) 1.1.1 (NYSDEC, 1998) and compares the September 2018 sampling event results to the historic sampling event results.

Full analytical reports are included in Appendix D.

The laboratory data was validated by an AECOM chemist and a full DUSR was prepared. The DUSR, included in Appendix E, indicated that all data points were usable except for some nitrate results as described above.

A narrative summary of the results is presented below:

- TCE, the primary constituent of concern, was detected in all 8 of the compliance wells, all of which were above the AWQS of 5 µg/L. TCE was also detected at varying levels in many of the other wells that were sampled. At this time there does not seem to be a clear pattern in the results.
- For the September 2018 event all downgradient wells of the compliance well monitoring pairs showed lower levels of TCE concentrations than their upgradient counterparts with the exception of monitoring well pair MW-28/29, which showed an increase of TCE in the downgradient well. The downgradient TCE concentrations ranged from 6.9 µg/L (MW-34) to 232 µg/L (MW-28).
- In general detected concentrations of TCE, as well as other CVOCS, for the September 2018 sampling event were consistent with previous groundwater sample results. However, as noted in the preceding bullet, there appears to be some reduction in TCE concentrations downgradient of the PRB based on the results of the compliance well pairs.
- Wells with detectable levels of tetrachloroethene (PCE) were MW-15, MW-28, and MW-29. The concentration of PCE measured in, MW-28 and MW-29 were above the AWGS of 5 µg/L and in MW-15 was below the AWQS.

Graphs showing concentrations of CVOCS were created for the monitoring well compliance pairs to monitor groundwater concentration trends. Data shown includes the baseline sampling event in December 2015 through the most recent sampling event in September 2018. These trend plots are included in Appendix F as Figures F-1 through F-4. To date no definitive trends have been observed as groundwater concentrations have been generally consistent with the baseline sampling event.

4 SUMMARY AND CONCLUSIONS

The September 2018 groundwater monitoring event was the eighth quarterly groundwater sampling event since the completion of the wall. The September 2018 sampling event was the last event in the 2 year quarterly monitoring period. Sampling will now be conducted on a semiannual basis as described in the SMP. The first semiannual event will be conducted during December 2018 and will include sampling of 12 wells. Details regarding the groundwater sampling program for the Site are included in the SMP (AECOM 2017b). To help with analyzing groundwater and subsurface trends acetylene, dissolved hydrogen, dissolved iron and total iron will continue to be monitored at the 8 compliance well locations.

The laboratory results suggest that concentrations of dissolved VOCs in Site groundwater are currently similar to the baseline concentrations before installation of the ZVI PRB and no significant changes has been observed to date. Recent increased methane and ethane concentrations at some downgradient monitoring wells, particularly in the center of the wall, indicate the presence of anaerobic conditions within the subsurface in the vicinity of the PRB. While there had been increased TOC concentrations at the MW compliance pairs noted in the previous sampling events it appears TOC has moved toward baseline conditions. Results from the future sampling rounds will help to verify this trend. Since the installation of the wall downgradient parameters including the presence of ethane, ethene, and methane suggest that the abiotic degradation of TCE may be taking place as impacted groundwater flows through the PRB in most well pairs. However, more recent dissolved gasses data indicates that a shift from biotic reductive dechlorination to abiotic reductive dechlorination conditions and reactions may be occurring in the subsurface. The data from the MW-28/MW-29 well pair at the northern end of the wall indicates that geochemical data from the shallow well pair is inconsistent with the geochemical data in the other compliance well pairs. This may be due to the shallow well pair being screened in the more transmissive sand and gravel layer.

Current Site groundwater flow conditions indicate that the on average the hydraulic gradient is consistent with the design. The PRB was designed based on a hydraulic gradient of 0.004 ft/ft which is similar to the estimated hydraulic gradient of 0.0019 ft/ft measured in September 2018. There appears to be a seasonal variability in groundwater elevation and hydraulic gradient which will be better understood as the groundwater monitoring program continues. The gradient at the site is slight and at times there appears to be a reverse gradient in the MW-28/MW-29 well pair at the northern edge of the wall. In actuality this is likely an area with a flat gradient and the minor variability in groundwater levels between the well pair is due to margin of error in the survey of the well casing or with the field measurements. Historic data indicates a range of gradients from 0.001 to 0.006 ft/ft measured at the Site (Stone 2013). Based on the current gradient and estimated groundwater seepage velocity the groundwater flowing through the PRB should have traveled the distance between the compliance monitoring well pairs.

A number of monitoring wells, including MW-8, MW-11 and MW-12, are scheduled to be repaired/replaced as needed during early 2019. These wells will be sampled upon completion of the repairs, and then reentered into the annually scheduled Site-wide groundwater sampling events. The next annual Site-wide sampling event is scheduled for June 2019.

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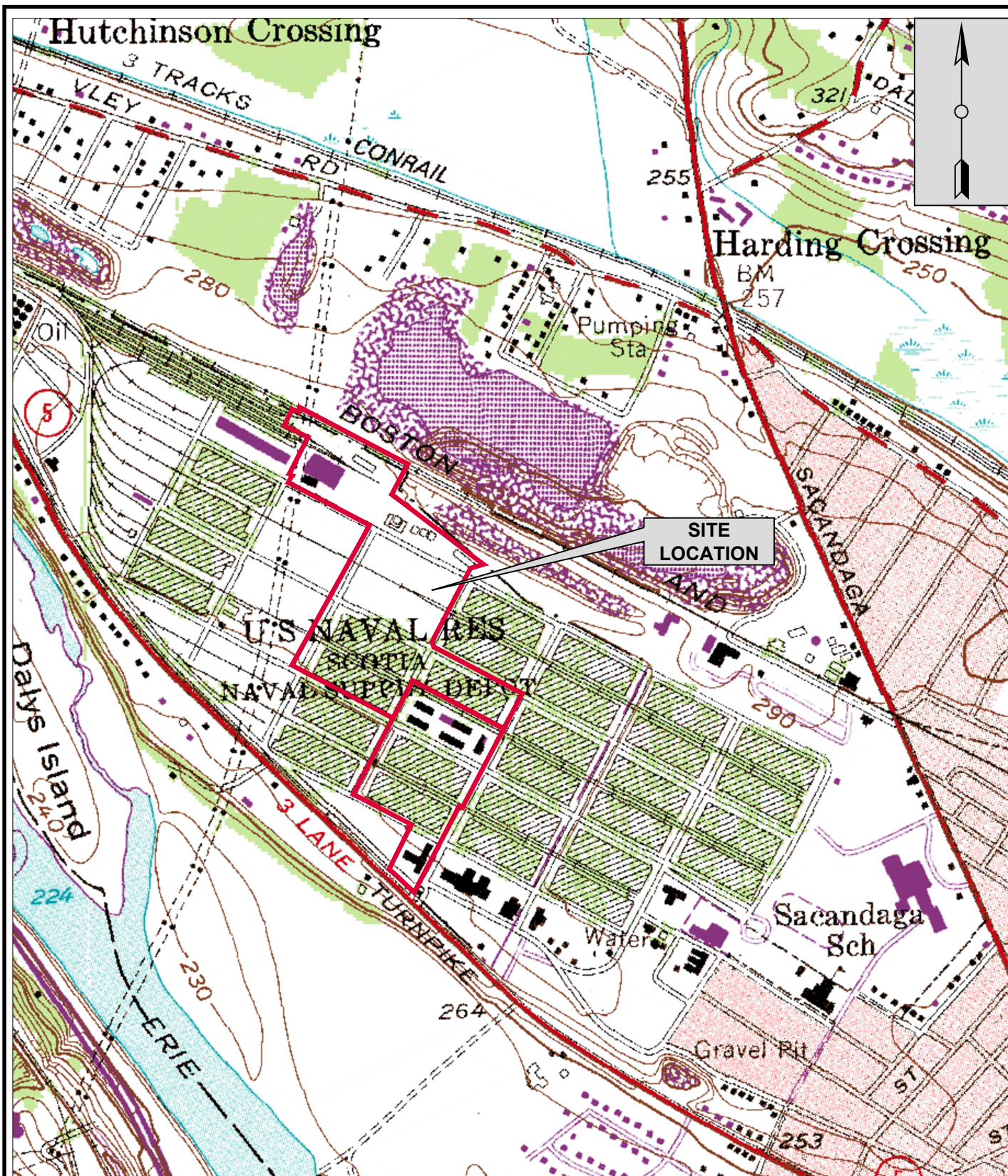
AECOM, 2018b. Groundwater Monitoring Program 2018 First Quarter Status Report for the Defense National Stockpile Center Scotia Depot, Town of Glenville, NY. June.

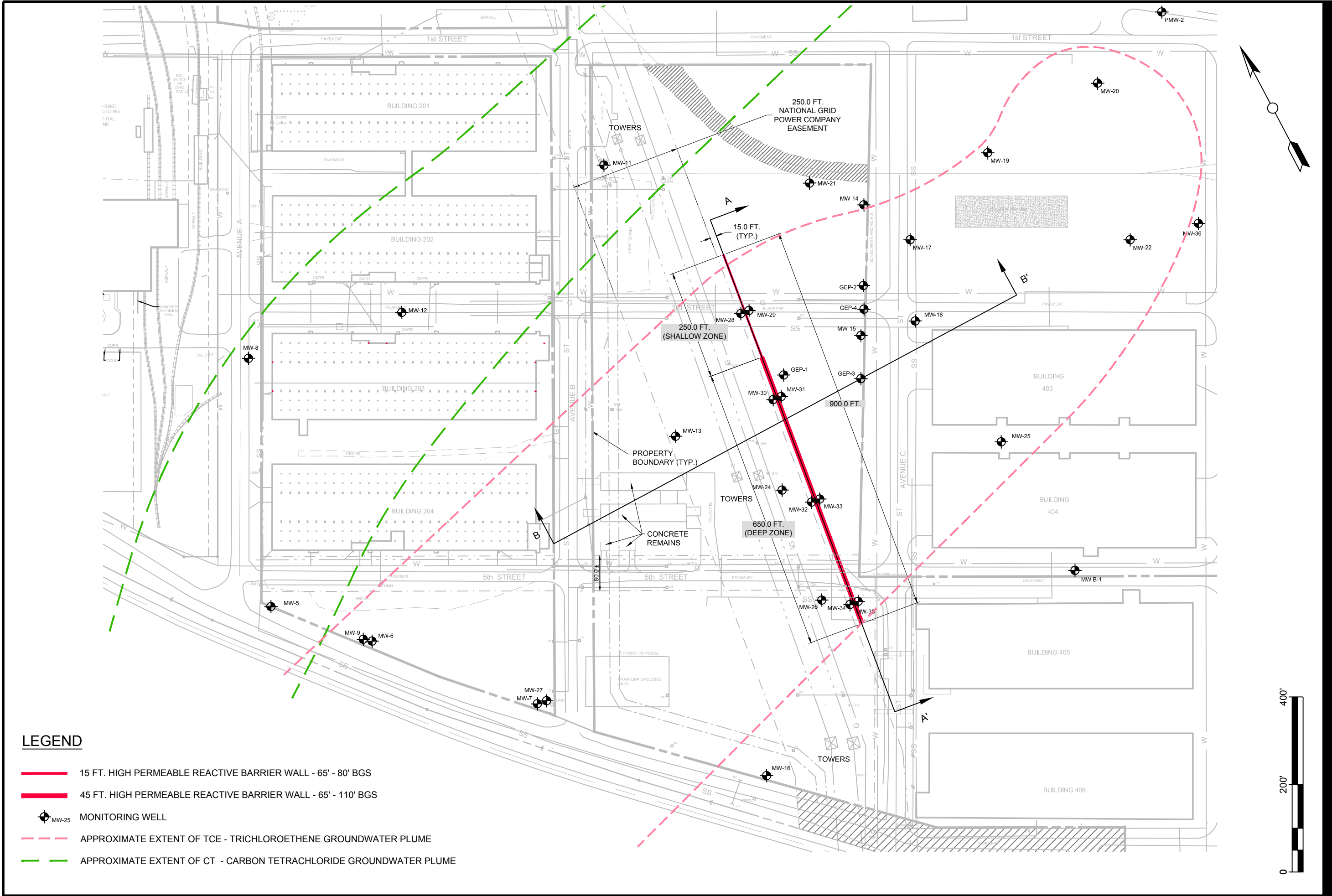
AECOM, 2018c. Groundwater Monitoring Program 2018 Second Quarter Status Report for the Defense National Stockpile Center Scotia Depot, Town of Glenville, NY. October.

NYSDEC, 2010. Record of Decision for Defense National Stockpile Center Scotia Depot Site State Superfund Project, Site Number 447023, Town of Glenville, NY, March.

Stone Environmental, 2013. Final Pre-Design Investigation Report, Defense Nation Stockpile Center Scotia Depot Site, Town of Glenville, NY, December.

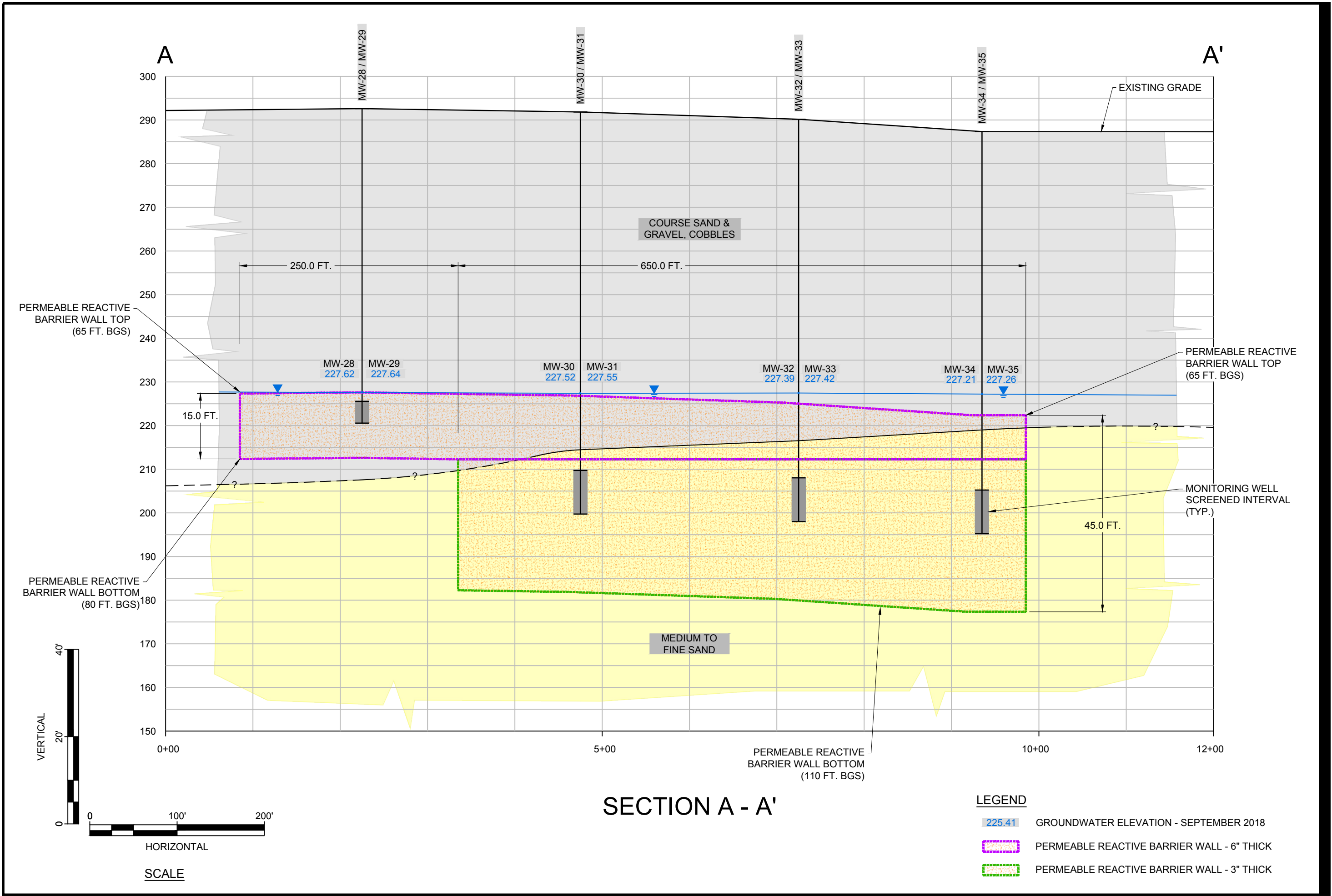
FIGURES

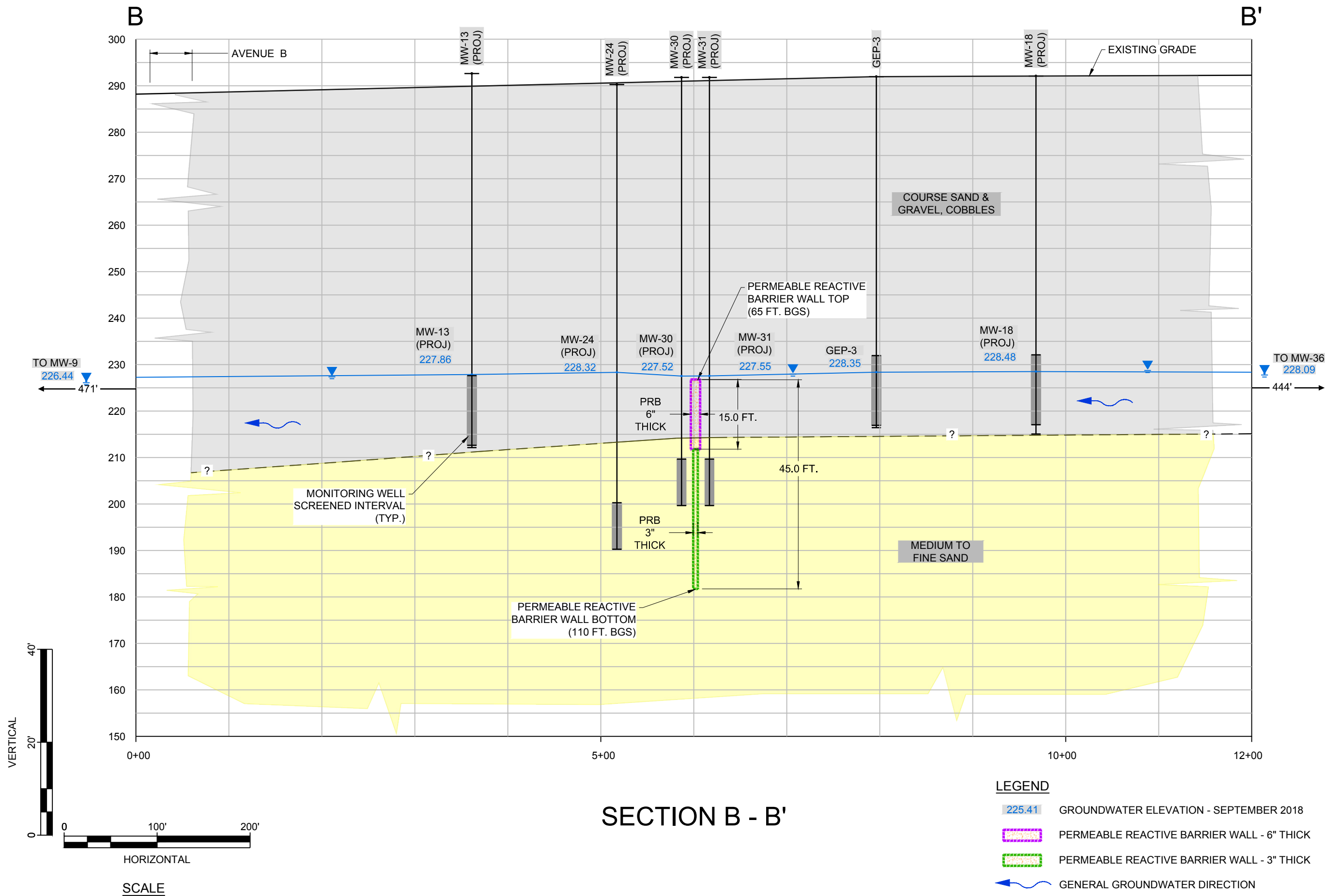




LEGEND

- 15 FT. HIGH PERMEABLE REACTIVE BARRIER WALL - 65' - 80' BGS
- 45 FT. HIGH PERMEABLE REACTIVE BARRIER WALL - 65' - 110' BGS
- MONITORING WELL
- APPROXIMATE EXTENT OF TCE - TRICHLOROETHENE GROUNDWATER PLUME
- APPROXIMATE EXTENT OF CT - CARBON TETRACHLORIDE GROUNDWATER PLUME





LEGEND

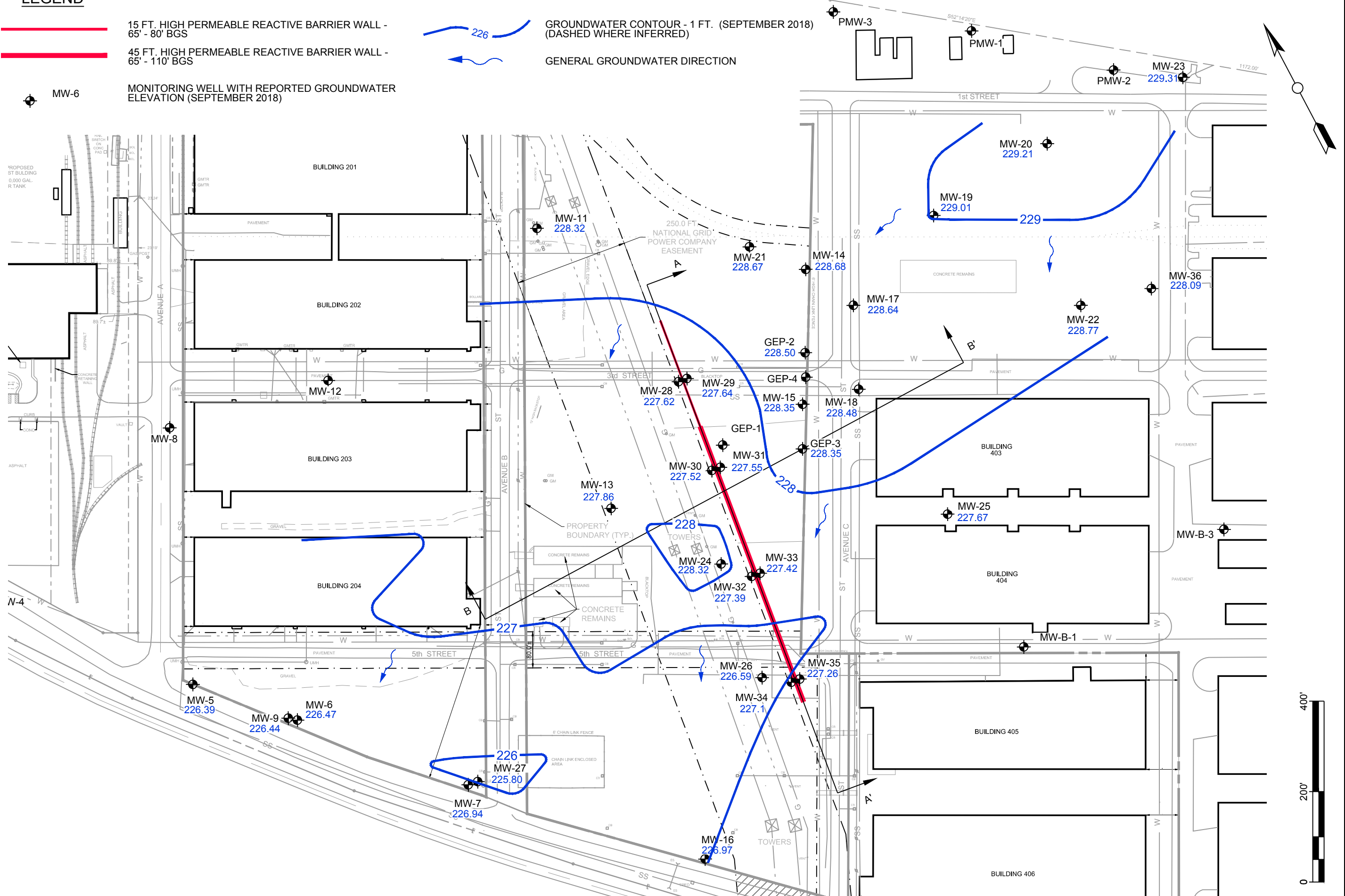
15 FT. HIGH PERMEABLE REACTIVE BARRIER WALL -
65' - 80' BGS

45 FT. HIGH PERMEABLE REACTIVE BARRIER WALL -
65' - 110' BGS

GROUNDWATER CONTOUR - 1 FT. (SEPTEMBER 2018)
(DASHED WHERE INFERRED)

GENERAL GROUNDWATER DIRECTION

MONITORING WELL WITH REPORTED GROUNDWATER
ELEVATION (SEPTEMBER 2018)

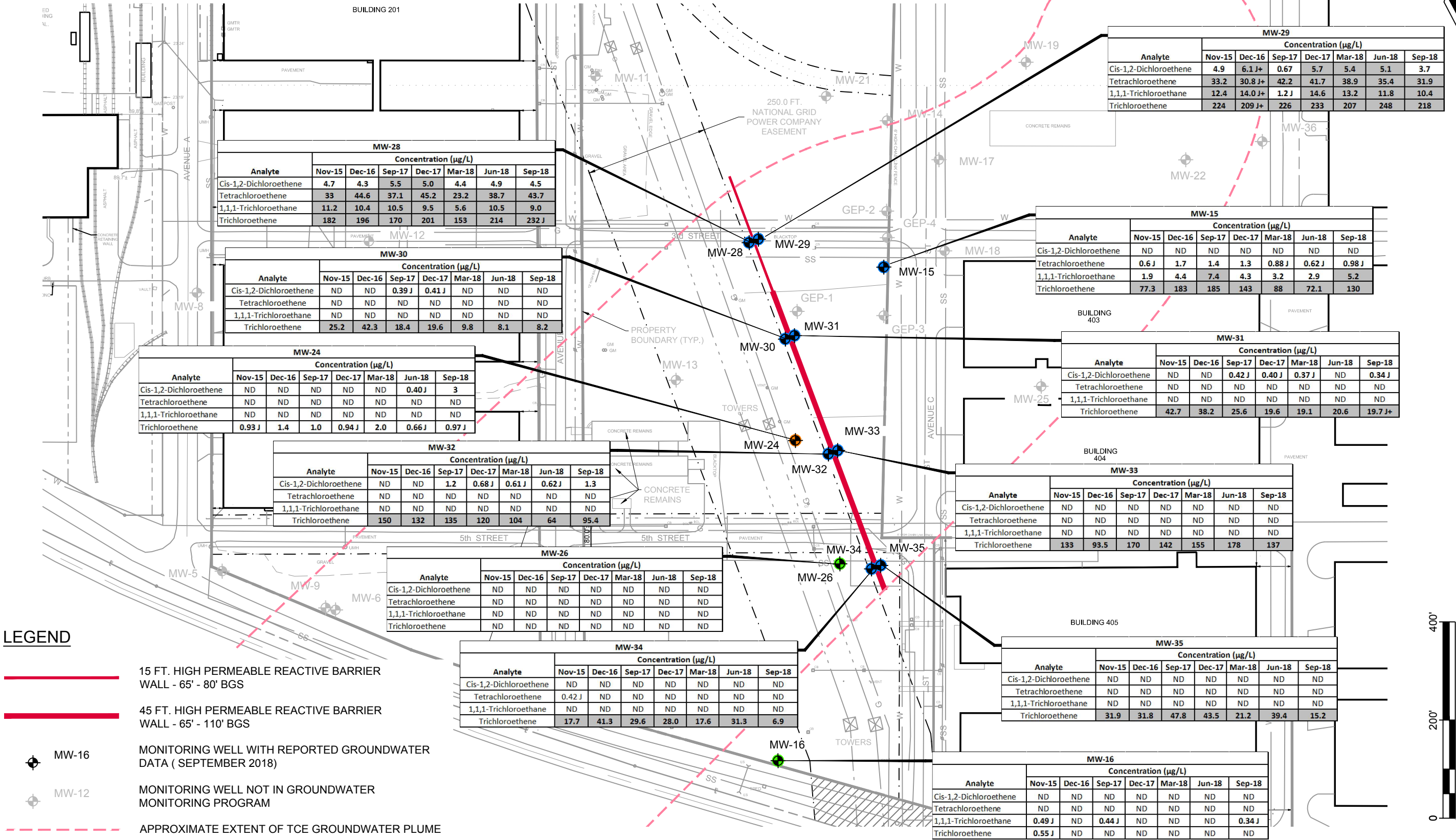


SAMPLE KEY

- VOC's NOT DETECTED
- VOC's DETECTED OF CONCENTRATIONS BELOW NYSDEC AWQSGV
- VOC's DETECTED OF CONCENTRATIONS AT OR ABOVE NYSDEC AWQSGV

SAMPLE NOTES

- Detected concentrations are in bold font.
- Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray. For listed compounds the NYSDEC AWQS is 5 mg/L.
- J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
- J+ - The result is an estimated quantity, likely to be biased high.
- ND - Indicates that the analyte was not detected above the method detection limit



TABLES

Monitoring Well ID ¹	Rationale ²	Sampling Frequency	Analytes ³	Screen Interval (ft bgs)
MW-15	Upgradient	Quarterly for 2 years then semi-annually	VOCs/MNA	65-80
MW-16	Outside Plume	Quarterly for 2 years then semi-annually	VOCs/MNA	55-70
MW-24	Downgradient	Quarterly for 2 years then semi-annually	VOCs/MNA	100-110
MW-26	Downgradient	Quarterly for 2 years then semi-annually	VOCs/MNA	100-110
MW-28	Downgradient	Quarterly for 2 years then semi-annually	VOCs/MNA	67-72
MW-29	Upgradient	Quarterly for 2 years then semi-annually	VOCs/MNA	67-72
MW-30	Downgradient	Quarterly for 2 years then semi-annually	VOCs/MNA	82-92
MW-31	Upgradient	Quarterly for 2 years then semi-annually	VOCs/MNA	82-92
MW-32	Downgradient	Quarterly for 2 years then semi-annually	VOCs/MNA	82-92
MW-33	Upgradient	Quarterly for 2 years then semi-annually	VOCs/MNA	82-92
MW-34	Downgradient	Quarterly for 2 years then semi-annually	VOCs/MNA	82-92
MW-35	Upgradient	Quarterly for 2 years then semi-annually	VOCs/MNA	82-92
GEP-3	Upgradient	Annually	VOCs	59.6-74.6
MW-B-3	Outside Plume	Annually	VOCs	47.5-67.5
MW-5	Downgradient	Annually	VOCs	62.5-72.5
MW-6	Downgradient	Annually	VOCs	58.5-68.5
MW-7	Outside Plume	Annually	VOCs	61-71
MW-8	CT Plume	Annually	VOCs	66-76
MW-9	Downgradient	Annually	VOCs	110-120

Monitoring Well ID ¹	Rationale ²	Sampling Frequency	Analytes ³	Screen Interval (ft bgs)
MW-11	CT Plume	Annually	VOCs	65-80
MW-12	CT Plume	Annually	VOCs	65-80
MW-14	Upgradient	Annually	VOCs	65-80
MW-17	Upgradient	Annually	VOCs	60-75
MW-18	Upgradient	Annually	VOCs	60-75
MW-19	Upgradient	Annually	VOCs	62-77
MW-20	Upgradient	Annually	VOCs	63-78
MW-22	Upgradient	Annually	VOCs	63-78
MW-23	Outside Plume	Annually	VOCs	63-78
MW-24	Downgradient	Annually	VOCs	90-100
MW-25	Upgradient	Annually	VOCs	65-75
MW-26	Downgradient	Annually	VOCs	100-110
MW-27	Downgradient	Annually	VOCs	100-110
MW-36	Upgradient	Annually	VOCs	70-80
GEP-2	Upgradient	Annually	VOCs	60.6-75.6
GEP-1	Upgradient	Annually	VOCs	59.6-74.6
GEP-4	Upgradient	Annually	VOCs	60.15-75.15

Notes:

¹ *2015 Compliance monitoring well² Rationale: Upgradient of PRB wall; Downgradient of PRB wall; Outside of any plume; Within Carbon Tetrachloride (CT) plume³ Monitored natural attenuation (MNA) parameters include TOC (EPA SM 5310B), alkalinity (EPA SM 2320B), Chloride, nitrate, sulfate (EPA Method 300.0), and Dissolved Gases (Methane, ethane, and ethene; Method RSK 175).

Table 3-1
Groundwater Elevations Data
The Defense National Stockpile Center Scotia Depot
3rd Quarter 2018 Status Report
AECOM Project 60440641

Well IDs	Screened Interval (ft bgs)	Ground Surface Elevation (ft)	Reference Point Elevation (ft)	Depth To Water (ft bgs) Q1 2017	Depth to Water (ft bgs) Q2 2017	Depth To Water (ft bgs) Q3 2017	Depth To Water (ft bgs) Q4 2017	Depth To Water (ft bgs) Q1 2018	Depth To Water (ft bgs) Q2 2018	Depth To Water (ft bgs) Q3 2018	Groundwater Elevation 2015	Groundwater Elevation 2016	Groundwater Elevation Q1 2017	Groundwater Elevation Q2 2017	Groundwater Elevation Q3 2017	Groundwater Elevation Q4 2017	Groundwater Elevation Q1 2018	Groundwater Elevation Q2 2018	Groundwater Elevation Q3 2018
B-1	48-68	-	287.14	-	57.34		-		dry	dry	227.74	-	-	229.80	-	-	-	-	-
B-3	47.5-67.5	-	287.05	-	-		-	-	58.61	58.74	227.95	-	-	-	-	-	-	228.44	228.31
MW-4	63.8-73.8	289.58	291.74	-	-		-	-	-	-	225.74	-	-	-	-	-	-	-	-
MW-5	62.5-72.5	287.95	290.11	70.50	63.82	64.00	72.12	71.83	64.30	63.72	225.75	219.29	219.61	226.29	226.11	217.99	218.28	225.81	226.39
MW-6	58.5-68.5	286.28	288.58	68.78	62.03	62.27	70.19	69.96	62.57	62.11	225.86	219.80	219.80	226.55	226.31	218.39	218.62	226.01	226.47
MW-7	61-71	286.8	289.26	68.47	61.96	61.95	67.84	68.22	62.80	62.32	226.28	223.16	220.79	227.30	227.31	221.42	221.04	226.46	226.94
MW-9	110-120	285.98	288.33	68.55	61.85	62.04	69.70	69.74	62.40	61.89	225.83	219.75	219.78	226.48	226.29	218.63	218.59	225.93	226.44
MW-10	65-80	290.94	293.15	-	-	-	-	-	-	-	228.24	-	-	-	-	-	-	-	-
MW-11	65-80	295.73	295.12	70.12	64.36	65.36	69.55	70.15	66.12	66.80	227.7	225.91	225.00	230.76	229.76	225.57	224.97	229.00	228.32
MW-13	65-80	292.62	293.85	69.90	64.25	64.40	68.86	69.72	65.75	65.99	227.32	225.43	223.95	229.60	229.45	224.99	224.13	228.10	227.86
MW-14	65-80	-	296.2	70.13	64.88	65.60	69.13	70.17	66.81	67.52	228.08	226.56	226.07	231.32	230.60	227.07	226.03	229.39	228.68
MW-15	65-80	-	293.67	68.35	63.07	63.49	67.00	68.20	64.88	65.32	227.8	226.27	225.32	230.60	230.18	226.67	225.47	228.79	228.35
MW-16	55-70	-	288.33	66.38	60.7	60.28	63.72	65.13	62.14	61.36	226.39	225.38	221.95	227.63	228.05	224.61	223.20	226.19	226.97
MW-17	60-75	-	295.24	69.25	64.09	64.66	67.99	69.20	65.98	66.60	228.08	226.55	225.99	231.15	230.58	227.25	226.04	229.26	228.64
MW-18	60-75	-	295.24	69.56	64.49	64.86	68.15	69.48	66.34	66.76	227.94	226.46	225.68	230.75	230.38	227.09	225.76	228.90	228.48
MW-19	62-77	-	297.67	70.54	65.74	66.42	69.63	70.80	67.80	68.66	228.43	226.85	227.13	231.93	231.25	228.04	226.87	229.87	229.01
MW-20	63-78	-	301.55	73.72	69.22	69.90	72.93	74.10	71.35	72.34	228.71	227.01	227.83	232.33	231.65	228.62	227.45	230.20	229.21
MW-21	57-72	-	296.52	70.55	65.19	65.40	69.70	-	*	67.85	*	*	*	*	*	*	*	*	228.67
MW-22	63-78	-	298.91	72.08	67.64	67.80	70.61	72.20	69.65	70.14	228.29	226.73	226.83	231.27	231.11	228.30	226.71	229.26	228.77
MW-23	63-78	-	300.54	72.14	67.98	68.55	-	-	70.70	71.23	228.9	227.06	228.40	232.56	231.99	-	-	229.84	229.31
MW-24	90-100	290.24	292.45	68.85	63.4	63.62	67.33	68.46	65.02	65.13	226.79	225.30	223.60	229.05	228.83	225.12	223.99	227.43	227.32
MW-25	65-75	288.16	290.26	65.44	60.61	60.57	63.56	65.13	62.48	62.59	227.16	225.82	224.82	229.65	229.69	226.70	225.13	227.78	227.67
MW-26	100-110	287.23	286.45	63.85	58.44	58.35	61.80	63.19	60.02	59.86	226.06	224.75	222.60	228.01	228.10	224.65	223.26	226.43	226.59
MW-27	100-110	286.08	288.32	68.67	61.89	62.00	67.35	67.93	63.11	62.52	225.5	223.44	219.65	226.43	226.32	220.97	220.39	225.21	225.80
MW-28	67-72	292.55	292.25	67.94	62.46	63.06	66.72	67.81	64.18	64.63	227.07	225.41	224.31	229.79	229.19	225.53	224.44	228.07	227.62
MW-29	67-72	292.50	292.13	67.80	62.31	62.94	66.90	67.70	64.04	64.49	227.05	225.38	224.33	229.82	229.19	225.23	224.43	228.09	227.64
MW-30	82-92	291.76	291.63	67.65	62.19	62.59	66.35	67.35	63.83	64.11	226.98	225.35	223.98	229.44	229.04	225.28	224.28	227.80	227.52
MW-31	82-92	291.80	291.54	67.42	62.02	62.43	66.14	67.20	63.70	63.99	226.95	225.40	224.12	229.52	229.11	225.40	224.34	227.84	227.55
MW-32	82-92	290.12	289.75	66.05	60.7	60.82	64.33	65.57	62.30	62.36	226.86	225.45	223.70	229.05	228.93	225.42	224.18	227.45	227.39
MW-33	82-92	290.27	289.91	66.11	60.8	60.86	64.37	65.65	62.40	62.49	226.89	225.51	223.80	229.11	229.05	225.54	224.26	227.51	227.42
MW-34	82-92	287.30	287.05	63.70	58.39	58.28	61.54	63.16	60.02	59.84	226.73	225.48	223.35	228.66	228.77	225.51	223.89	227.03	227.21
MW-35	82-92	287.25	286.96	63.56	58.28	58.15	61.40	62.88	59.92	59.70	226.69	225.46	223.40	228.68	228.81	225.56	224.08	227.04	227.26
MW-36	70-80	292.61	292.36	66.10	61.87	60.98	64.42	66.40	63.23	64.27	227.8	226.12	226.26	230.49	231.38	227.94	225.96	229.13	228.09
GEP-1	59.6-74.6	-	294.98	70.55	65.06	-	69.30	70.33	-	-	227.36	-	224.43	229.92	-	225.68	224.65	-	-
GEP-2	60.6-75.6	-	296.02	70.43	65.18	65.69	69.19	70.35	67.00	67.52	227.9	226.38	225.59	230.84	230.33	226.83	225.67	229.02	228.50
GEP-3	59.6-74.6	-	292.97	67.71	62.47	62.85	66.30	67.54	64.25	64.62	227.81	226.31	225.26	230.50	230.12	226.67	225.43	228.72	228.35
GEP-4	60.15-75.15	-	295.62	70.23	65.01	65.50	68.98	-	-	-	227.73	226.22	225.39	230.61	230.12	226.64	-	-	-

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value									
		MW-15								
		11/9/2015	12/14/2016	3/22/2017	6/21/2017	9/28/2017	12/14/2017	3/14/2018	6/20/2018	9/18/2018
		Upgradient								
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	1.9	4.4	1.9	3.8	7.4	4.3	3.2	2.9	5.2
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.44 J	0.75 U	0.75 U	0.69 J	0.75 U	0.75 U	0.75 U	0.35 J
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.45 J	0.75 U	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene (PCE; PERC)	5	0.6 J	1.7	0.84 J	0.66 J	1.4	1.3	0.88 J	0.62 J	0.98 J
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	77.3	183	80.5	122	185	143	87.8	72.1	130
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters										
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.10
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U
Alkalinity, Total (as CaCO ₃) (mg/L)	NS	182	212	201	217	229	216	223	209	236
Chloride (mg/L)	NS	28.9	14.3	28.3	40.1	30.6	39.7	24.0	46.4	42.5
Nitrate (mg/L)	NS	0.58	0.56	0.90	0.52	0.58	0.60	0.70	0.48	0.54
Sulfate (mg/L)	NS	12.3	12.4	21.3	20.5	14.3	20.5	12.4	15.2	13.2
Methane (µg/L)	NS	0.19 J	0.21 J	0.21 J	0.25 J	0.21 J	0.50 U	0.18 J	1.3 J+	1.5 U
Ethane (µg/L)	NS	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	3.3 U
Ethene (µg/L)	NS	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	2.4 U
Total Organic Carbon (mg/L)	NS	0.55 J	0.57 J	0.47 J	0.21 J	0.59 J	0.33 J	0.26 J	0.41 J	0.46 J
Field Parameters										
pH (pH Unit)	NS	7.73	7.31	7.53	7.42	7.16	7.38	7.94	7.62	7.49
Turbidity (NTU)	NS	11.1	7.00	15.7	2.10	52.1	6.30	9.22	153.0	8.7
ORP (MeV)	NS	91.4	54.6	-0.6	114.6	92.8	16.6	-1.1	67.2	135.2
Conductivity (mS/cm)	NS	0.358	0.250	0.387	0.487	0.709	0.416	0.295	0.369	0.458
Dissolved Oxygen (mg/L)	NS	31.45	8.04	6.37	4.90	9.22	8.38	7.64	6.72	9.44
Groundwater Elevation (ft)	NS	227.80	226.27	225.32	230.60	230.18	226.67	225.47	228.79	228.35

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO₃/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value									
		MW-16								
		11/11/2015	12/12/2016	3/20/2017	6/20/2017	9/25/2017	12/11/2017	3/13/2018	6/19/2018	9/18/2018
		Outside Plume								
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.49 J	0.75 U	0.53 J	0.50 J	0.44 J	0.75 U	0.75 U	0.75 U	0.34 J
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	0.55 J	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters										
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.15
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U
Alkalinity, Total (as CaCO ₃) (mg/L)	NS	248	312	317	322	480	322	295	317	339
Chloride (mg/L)	NS	13.6	9.0	5.6	20.2	4.3	4.0	2.9	3.9	2.3
Nitrate (mg/L)	NS	1.6	1.6	2.1	3.7	1.4	1.1	1.6	2.0	1.9
Sulfate (mg/L)	NS	35.2	44.8	65.3	75.5	64.8	119	123	27.3	28.7
Methane (µg/L)	NS	0.25 U	0.14 J	0.50 U	0.19 J	0.23 J	0.50 U	0.25 U	1.1 U	1.2 U
Ethane (µg/L)	NS	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	3.3 U
Ethene (µg/L)	NS	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	2.4 U
Total Organic Carbon (mg/L)	NS	3.6	0.96 J	1.1	0.67 J	0.64 J	0.9 J	0.86 J	1.2	0.62 J
Field Parameters										
pH (pH Unit)	NS	7.64	7.27	10.8	6.57	7.12	7.1	6.76	7.89	7.08
Turbidity (NTU)	NS	8.01	14.8	7.71	4.40	199	30.9	8.14	10.77	20.50
ORP (MeV)	NS	137.6	139.9	115.9	298.7	82.2	94.5	118.7	16.2	215.7
Conductivity (mS/cm)	NS	0.361	0.388	0.436	0.486	0.928	0.596	0.462	0.441	0.511
Dissolved Oxygen (mg/L)	NS	22.27	9.50	10.40	10.82	9.81	10.30	10.09	11.71	10.04
Groundwater Elevation (ft)	NS	226.39	225.38	221.95	227.63	228.05	224.61	223.20	226.19	226.97

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO₃/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value									
		MW-24								
		11/10/2015	12/13/2016	3/21/2017	6/26/2017	9/26/2017	12/12/2017	3/14/2018	6/21/2018	9/18/2018
		Downgradient								
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.37 J	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.40 J	3.0
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	0.93 J	1.4	1.7	1.2	1.0	0.94 J	2.0	0.66 J	0.97 J
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters										
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	1.4
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U
Alkalinity, Total (as CaCO ₃) (mg/L)	NS	168	198	205	195	282	352	313	159	200
Chloride (mg/L)	NS	36.3	38.5	59.0	41.0	110	155	60.8	37.1	36.7
Nitrate (mg/L)	NS	0.9	0.06 U	0.06 U	0.04 J	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
Sulfate (mg/L)	NS	15.5	21.4	24.1	22.1	0.5 U	0.48 J	0.22 J	21.5	14.2
Methane (µg/L)	NS	0.82	1.6	1.7	2.2	7.8	431	927	1.3 J+	13.9
Ethane (µg/L)	NS	0.34 J	0.50 U	0.50 U	0.50 U	0.29 J	0.50 U	0.50 U	0.50 U	1.5 J
Ethene (µg/L)	NS	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	1.0 J	0.20 J	9.5
Total Organic Carbon (mg/L)	NS	3.5	1.9	1.0 J	0.79 J	94.6	96.2	44.1	4.5	3.1
Field Parameters										
pH (pH Unit)	NS	7.75	7.22	7.83	7.78	7.40	7.29	7.97	7.95	7.70
Turbidity (NTU)	NS	9.33	13.9	16.3	35.2	88.37	2.8	16.0	19.5	7.94
ORP (MeV)	NS	-80.2	-93.2	-111.3	-108.6	-169.9	-83.1	-127.6	-147.3	-162.2
Conductivity (mS/cm)	NS	0.327	0.570	0.438	0.365	1.396	8.411	0.409	0.204	0.403
Dissolved Oxygen (mg/L)	NS	0.94	0.44	0.55	1.20	0.30	0.15	0.55	11.71	7.23
Groundwater Elevation (ft)	NS	226.79	225.30	223.60	229.05	228.83	225.12	223.99	227.43	227.32

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO₃/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value									
		MW-26								
		11/17/2015	12/13/2016	3/21/2017	6/26/2017	9/25/2017	12/12/2017	3/14/2018	6/20/2018	9/18/2018
		Downgradient								
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.57 J	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters										
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.61
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.43
Alkalinity, Total (as CaCO ₃) (mg/L)	NS	204	197	196	223	317	204	196	225	178
Chloride (mg/L)	NS	45.2	44.9	53.4	133	86.2	56.7	32.3	49.1	21
Nitrate (mg/L)	NS	0.06 U	0.04 J	0.06 U	0.02 J	0.06 U	0.06 U	0.06 U	0.06 U	0.04 J
Sulfate (mg/L)	NS	25.1	24.6	29.4	20.9	5.9	25.7	10.6	16.3	4.8
Methane (µg/L)	NS	34.8	2.7	1.4 J	2.1	444	20.7	26.6	80	12.9
Ethane (µg/L)	NS	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	3.3 U
Ethene (µg/L)	NS	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	2.4 U
Total Organic Carbon (mg/L)	NS	9.3	2.6	1.3 J	30.7	52.1	1.1	5.8 J	0.50 J	12.9
Field Parameters										
pH (pH Unit)	NS	7.52	7.22	7.80	7.23	7.39	7.65	7.56	7.57	7.29
Turbidity (NTU)	NS	68.3	21.8	31.9	0.4	60.96	57.38	18.6	36.2	9.12
ORP (MeV)	NS	-103.6	-28.9	-46.4	-26.9	-138.7	-173.0	-89.4	-75.3	82.0
Conductivity (mS/cm)	NS	0.324	0.590	0.469	0.630	1.347	0.426	0.260	0.415	0.270
Dissolved Oxygen (mg/L)	NS	0.00	0.33	0.27	0.62	0.33	0.66	0.27	1.38	8.9
Groundwater Elevation (ft)	NS	226.06	224.75	222.60	228.01	228.10	224.65	223.26	226.43	226.59

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO₃/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.



Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well								
		MW-28								
		12/1/2015	12/14/2016	3/22/2017	6/27/2017	9/27/2017	12/14/2017	3/15/2018	6/22/2018	9/21/2018
		Downgradient								
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	11.2	10.4	9.9	8.9 J	10.5	9.5	5.6	10.5	9.0
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.46 J	0.75 U	0.75 U	0.75 U	0.75 U	0.33 J	0.75 U	0.44 J	0.42 J
1,1-Dichloroethane (1,1-DCA)	5	1.0	0.77 J	0.88 J	1.0 J	1.3	0.84 J	0.69 J	0.86 J	1.2
1,1-Dichloroethene (1,1-DCE)	5	0.53 J	0.43 J	0.53 J	0.38 J	0.76 J	0.45 J	0.75 U	0.39 J	0.34 J
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.61 J	0.75 U	0.62 J	0.75 U	0.53 J	0.57 J	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	4.7	4.3	4.4	4.7 J	5.5	5.0	4.4	4.9	4.5
Tetrachloroethene (PCE; PERC)	5	33	44.6	42.4	36.3 J	37.1	45.2	23.2	38.7	43.7
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.47 J	0.42 J	0.37 J	0.35 J	0.49 J	0.75 U	0.36 J	0.33 J
Trichloroethene (TCE)	5	182	196	181	195	170	201	153	214	232 J
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters										
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	3.9
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.045 U
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U
Alkalinity, Total (as CaCO ₃) (mg/L)	NS	352	316	295	352	380	383	360	422	345
Chloride (mg/L)	NS	22.1	32.4	25.7	29.0	25.7	20.4	20.9	33.1	42.7
Nitrate (mg/L)	NS	0.06 U	0.06 J	0.44	1.5	0.18 J	1.2	1.5	0.58	0.58
Sulfate (mg/L)	NS	22.4	20.9	21.6	13.0	10.3	22.4	20.2	23.1	13.2
Methane (µg/L)	NS	3.4	3.0	0.94	1.0	0.37 J	0.50 U	0.25 U	1800	60.8
Ethane (µg/L)	NS	0.50 U	3.6	1.0	0.50 U	0.45 J	0.50 U	0.50 U	0.50 U	1.3 J
Ethene (µg/L)	NS	0.75 U	1.3 J	1.9	0.75 U	0.72 J	0.75 U	0.75 U	0.75 U	1.4 J
Total Organic Carbon (mg/L)	NS	1.9	2.3	0.81 J	0.76 J	1.9	0.94 J	0.36 J	4.1	0.85 J
Field Parameters										
pH (pH Unit)	NS	6.83	7.03	7.12	7.05	6.87	7.15	8.17	7.33	7.08
Turbidity (NTU)	NS	209	1.5	2.07	-3	61.1	229.80	8.52	1.32	0.02
ORP (MeV)	NS	273	71.2	77.1	97.4	32.1	19.0	-16.3	11.1	120.9
Conductivity (mS/cm)	NS	0.324	0.366	0.520	0.554	1.045	0.564	0.406	7.33	0.797
Dissolved Oxygen (mg/L)	NS	6.75	3.94	5.2	7.59	4.3	8.45	11.96	0.63	8.83
Groundwater Elevation (ft)	NS	227.07	225.41	224.31	229.79	229.19	225.53	224.44	228.07	227.62

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO₃/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper control limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well								
		MW-29								
		12/1/2015	12/14/2016	3/22/2017	6/27/2017	9/27/2017	12/14/2017	3/15/2018	6/22/2018	9/20/2018
		Upgradient								
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	5	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	12.4	14.0 J	10.4	11.8 J	13.6	14.6	13.2	11.8	10.4
1,1,2,2-Tetrachloroethane	5	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.45 J	0.34 J
1,1-Dichloroethane (1,1-DCA)	5	0.97 J	3.8 U	0.45 J	1.0 J	1.2	0.88 J	0.91 J	0.84 J	0.87 J
1,1-Dichloroethene (1,1-DCE)	5	0.68 J	3.8 U	0.55 J	0.63 J	0.99 J	0.96 J	0.77 J	0.48 J	0.41 J
1,2-Dichloroethane (EDC)	0.6	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	3.8 U	0.63 J	0.75 U	0.85 J	0.71 J	0.72 J	0.82 J	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	4.9	6.1 J	3.1	5.8 J	5.6	5.7	5.4	5.1	3.7
Tetrachloroethene (PCE; PERC)	5	33.2	30.8 J	37.2	38.1 J	42.2	41.7	38.9	35.4	31.9
Toluene	5	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	3.8 U	0.61 J	0.70 J	0.67 J	0.62 J	0.44 J	0.59 J	0.35 J
Trichloroethene (TCE)	5	224	209 J	197	264	226	233	207	248	218
Vinyl Chloride (VC)	2	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters										
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	2.8
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.062 J
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U
Alkalinity, Total (as CaCO ₃) (mg/L)	NS	327	301	258	361	374	348	360	370	374
Chloride (mg/L)	NS	28.2	28.4	21.3	49.4	24.2	21.3	23.4	28	29.9
Nitrate (mg/L)	NS	0.1 J	0.26	0.52	1.3	0.12 J	0.86	1.3	0.38	0.48 J
Sulfate (mg/L)	NS	29.2	24.9	20.1	13.8	16.1	22.7	15	21	11.8
Methane (µg/L)	NS	13.9	0.62	1.1	0.20 J	0.21 J	0.50 U	0.25 U	210	1.5 U
Ethane (µg/L)	NS	0.81 J	0.50 U	0.5 U	0.50	0.50 U	0.50 U	0.50 U	0.50 U	3.3 U
Ethene (µg/L)	NS	0.59 J	0.75 U	0.75 U	0.75	0.75 U	0.75 U	0.75 U	0.75 U	2.4 U
Total Organic Carbon (mg/L)	NS	2.3	1.4	0.91 J	0.92 J	2.1	1.2	0.38 J	3.2	1.3
Field Parameters										
pH (pH Unit)	NS	7.06	7.02	7.43	7.02	6.91	7.01	7.79	7.33	7.14
Turbidity (NTU)	NS	82.4	0.62	2.73	2.80	65.1	1.50	8.11	15.2	0.02
ORP (MeV)	NS	-25.1	60.9	46.1	120	41.7	33.7	2.8	52.3	90.9
Conductivity (mS/cm)	NS	0.325	0.354	0.424	0.619	1.058	0.559	0.420	0.61	0.683
Dissolved Oxygen (mg/L)	NS	4.29	6.17	9.26	7.12	6.46	8.65	7.42	2.98	9.66
Groundwater Elevation (ft)	NS	227.05	225.38	224.33	229.79	229.19	225.23	224.43	228.09	227.64

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO₃/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well								
		MW-30								
		12/1/2015	12/13/2016	3/21/2017	6/26/2017	9/27/2017	12/13/2017	3/15/2018	6/21/2018	9/20/2018
		Downgradient								
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.74 J	0.61 J	0.39 J	0.41 J	0.75 U	0.75 U	0.75 U
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	25.2	42.3	66.3	24.3	18.4	19.6	9.8	8.1	8.2
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters										
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	12
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 UJ	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.16
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.04 U
Alkalinity, Total (as CaCO ₃) (mg/L)	NS	143	319	210	154	104	347	141	58	59
Chloride (mg/L)	NS	38.4	182	136	49.6	35.3	87.3	43.6	38.8	40.7
Nitrate (mg/L)	NS	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
Sulfate (mg/L)	NS	35.9	2.9	0.5 U	0.32 J	0.5 U	0.22 J	0.5 U	0.34 J	0.5 U
Methane (µg/L)	NS	47.4	146	870	3210	3560	12900	5860	3700	4410
Ethane (µg/L)	NS	4.7	5.4	23.5	36.7	39.7	40.5	31.1	52	42.2
Ethene (µg/L)	NS	2.2	3.3	9.1	12.7	8.5	4.2	2.2	6.3	4.3
Total Organic Carbon (mg/L)	NS	2.2	225	139	75.2	27.0	366	50.9	9.7 J	10.2
Field Parameters										
pH (pH Unit)	NS	8.91	6.83	7.60	8.01	8.01	7.41	8.54	8.28	8.48
Turbidity (NTU)	NS	58.2	3.55	3.82	3	69.1	16.1	3.12	950.5	0.02
ORP (MeV)	NS	-278.4	-166.3	-166.9	-173.3	-212.2	-170.1	-122.8	12.1	-217.6
Conductivity (mS/cm)	NS	0.210	1.410	0.740	0.320	0.412	0.758	0.212	0.238	0.235
Dissolved Oxygen (mg/L)	NS	3.70	0.29	0.17	0.48	0.06	0.80	0.19	0.98	8.41
Groundwater Elevation (ft)	NS	226.98	225.35	223.98	229.44	229.04	225.28	224.28	227.80	227.52

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO₃/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well								
		MW-31								
		12/1/2015	12/14/2016	3/22/2017	6/26/2017	9/27/2017	12/13/2017	3/15/2018	6/21/2018	9/20/2018
		Upgradient								
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.41 J	0.50 J	0.42 J	0.40 J	0.37 J	0.75 U	0.34 J
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	42.7	38.2	35.0	29.0	25.6	19.6	19.1	20.6	19.7 J+
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters										
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	4.1
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.76
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.04 U
Alkalinity, Total (as CaCO ₃) (mg/L)	NS	178	222	381	150	132	119	143	169	169
Chloride (mg/L)	NS	41.9	56.6	98.5	31.0	31.7	36.3	50.6	39.9	32
Nitrate (mg/L)	NS	0.06 U	0.06 U	0.04 J	0.02 J	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
Sulfate (mg/L)	NS	26.3	10.9	2.6	5.6	5.6	7.8	6.7	7.8	4.6
Methane (µg/L)	NS	20.7	3.5	106	56.5	29.1	59.4	34.4	120	90.6
Ethane (µg/L)	NS	2.2	1.5	10.1	2.7	2.6	3.3	2.6	5.7	4.2
Ethene (µg/L)	NS	0.91 J	0.84 J	4.7	3.2	2.3	1.9	1.6	104	1.4 J
Total Organic Carbon (mg/L)	NS	2.1	43.9	257	2.8	1.5	1.3	1.1	2.1	0.69 J
Field Parameters										
pH (pH Unit)	NS	7.80	7.20	7.61	9.79	7.63	7.68	8.31	7.83	7.85
Turbidity (NTU)	NS	51.7	8.03	11.4	4.60	8.60	8.62	2.95	2.6	0.02
ORP (MeV)	NS	-319.7	-163.1	-201.5	-283.2	-174.4	-208.0	-161.7	-155.1	-180.6
Conductivity (mS/cm)	NS	0.243	0.348	0.850	0.280	0.526	0.294	0.261	0.324	0.378
Dissolved Oxygen (mg/L)	NS	1.29	0.28	0.22	0.70	0.13	0.19	0.17	0.22	7.99
Groundwater Elevation (ft)	NS	226.95	225.40	224.12	229.52	229.11	225.40	224.34	227.84	227.55

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO₃/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well								
		MW-32								
		11/30/2015	12/13/2016	3/21/2017	6/26/2017	9/26/2017	12/13/2017	3/14/2018	6/21/2018	9/20/2018
		Downgradient								
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.40 J	0.48 J	0.60 J	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	1.2	1.3	1.2	0.68 J	0.61 J	0.62 J	1.3
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	150	132	191	130	135	120	104	64.1	95.4
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters										
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	7.4
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.51
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U
Alkalinity, Total (as CaCO ₃) (mg/L)	NS	196	277	214	129	129	141	162	128	129
Chloride (mg/L)	NS	35.6	138	84.6	38.0	30.7	28.2	25.4	29.5	27.8
Nitrate (mg/L)	NS	0.06 U	0.06 U	0.02 J	0.02 J	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
Sulfate (mg/L)	NS	21.1	2.8	0.68 J	0.50 J	0.4 J	6.0	7.1	2.3	1.4 J
Methane (µg/L)	NS	6.8	16.5	309	817	835	233 J	583	130	2650
Ethane (µg/L)	NS	0.5 J	1.5	19.3	35.9	29.4	5.6 J	10.7	2	21.1
Ethene (µg/L)	NS	0.75 U	1.8	10.3	15.6	5.4	2.3 J	3.3	0.25 J	4.7
Total Organic Carbon (mg/L)	NS	2.6	133	98.0	22.0	5.0	5.4 J	2.7	6.4	3.9
Field Parameters										
pH (pH Unit)	NS	8.00	6.69	7.54	9.28	7.65	7.43	7.97	8.03	7.94
Turbidity (NTU)	NS	180	5.92	4.01	5.10	3.91	5.11	1.36	0.02	0.02
ORP (MeV)	NS	-234.2	-107.7	-140.7	-238.7	-149.4	-181.9	-106.4	-149.4	-201
Conductivity (mS/cm)	NS	0.239	1.180	0.640	0.261	0.478	0.257	0.239	0.206	0.291
Dissolved Oxygen (mg/L)	NS	0.64	1.81	1.77	2.50	1.80	1.50	0.25	8.26	8.44
Groundwater Elevation (ft)	NS	226.86	225.45	223.70	229.05	228.93	225.42	224.18	227.45	227.39

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO₃/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well								
		MW-33								
		11/24/2015	12/14/2016	3/22/2017	6/26/2017	9/26/2017	12/13/2017	3/14/2018	6/21/2018	9/19/2018
		Upgradient								
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	133	93.5	151	152	170	142	155	178	137
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters										
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	3.9
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.05 U
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.045 J
Alkalinity, Total (as CaCO ₃) (mg/L)	NS	172	218	194	205	202	212	215	215	213
Chloride (mg/L)	NS	41.8	43.2	29.2	22.8	24.6	28.1	23.0	22.5	24.8 J-
Nitrate (mg/L)	NS	0.06 U	0.06 U	0.32	0.32	0.30	0.32	0.34	0.42	0.4 J
Sulfate (mg/L)	NS	25.1	8.2	15.0	11.8	12.6	14.8	11.6	14.3	14.6
Methane (µg/L)	NS	64	3.4	9.2	16.0	17.8	7.2	6.1	17	1.5 U
Ethane (µg/L)	NS	7	0.25 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	3.3 U
Ethene (µg/L)	NS	3.6	0.48 J	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	2.4 U
Total Organic Carbon (mg/L)	NS	8.1	30.9	2.1	0.54 J	0.44 J	0.44 J	0.83 J	1.6	0.58 J
Field Parameters										
pH (pH Unit)	NS	8.39	7.18	7.58	8.8	7.51	7.53	7.99	7.66	7.69
Turbidity (NTU)	NS	23.1	9.31	11.7	3.40	51.2	6.38	9.18	2.78	0.02
ORP (MeV)	NS	-471.2	-126.8	-64.3	44.9	-3.2	-20.4	-49.9	17.6	98.7
Conductivity (mS/cm)	NS	0.247	0.303	0.386	0.350	0.648	0.370	0.285	0.385	0.456
Dissolved Oxygen (mg/L)	NS	0.92	0.41	2.50	2.99	2.87	6.80	1.89	3.41	9.21
Groundwater Elevation (ft)	NS	226.89	225.51	223.80	229.11	229.05	225.54	224.26	227.51	227.42

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO₃/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well								
		MW-34								
		11/24/2015	12/13/2016	3/21/2017	6/26/2017	9/26/2017	12/12/2017	3/13/2018	6/20/2018	9/19/2018
		Downgradient								
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene (PCE; PERC)	5	0.42 J	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	17.7	41.3	48.3	34.0	29.6	28.0	17.6	31.3	6.9
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters										
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	3.1
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.05 U
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.04 U
Alkalinity, Total (as CaCO ₃) (mg/L)	NS	99	191	597	201	197	203	174	226	183
Chloride (mg/L)	NS	48.5	62.3	461	15.7	11.7	12.9	15.4	16.3	2.0 U
Nitrate (mg/L)	NS	0.56	0.06 J	0.06 U	0.04 J	0.06 U	0.02 J	0.02 J	0.06 U	0.56 J
Sulfate (mg/L)	NS	64.3	23.8	0.56 J	13.4	9.0	7.3	8.5	11.2	3.9
Methane (µg/L)	NS	14.5	1.2	1780	12.4	88.1	531	1260	35	1.5 U
Ethane (µg/L)	NS	2.2	0.50 U	17.3	0.50 U	0.45 J	1.1	1.3	0.50 U	3.31 U
Ethene (µg/L)	NS	1.8	0.75 U	4.4	0.75 U	0.58 J	0.75 U	0.75 U	0.75 U	2.41 U
Total Organic Carbon (mg/L)	NS	5.9	12.0	631	3.3	3.8	4.1	3.4	0.93 J	6.8
Field Parameters										
pH (pH Unit)	NS	12.68	7.14	7.45	7.26	7.26	7.40	7.37	7.30	7.12
Turbidity (NTU)	NS	44.7	3.23	4.59	-4	4.40	4.20	5.63	1.4	0.02
ORP (MeV)	NS	-185.4	-8.4	-144.0	-139.4	-63.1	-133.4	25.0	-76.3	118.1
Conductivity (mS/cm)	NS	0.361	0.630	2.280	0.332	0.578	0.310	0.234	0.332	0.312
Dissolved Oxygen (mg/L)	NS	6.9	1.12	0.12	0.46	0.62	2.70	0.34	1.31	8.69
Groundwater Elevation (ft)	NS	226.73	225.48	223.35	228.66	228.77	225.51	223.89	227.03	227.21

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO₃/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well								
		MW-35								
		11/24/2015	12/15/2016	3/22/2017	6/26/2017	9/26/2017	12/12/2017	3/13/2018	6/20/2018	9/19/20118
		Upgradient								
VOCs (µg/L)										
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	31.9	31.8	12.5	43.8 J	47.8	43.5	21.2	39.4	15.2
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters										
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	2.6
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.45
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U
Alkalinity, Total (as CaCO ₃) (mg/L)	NS	181	223	51	202	192	210	171	197	115
Chloride (mg/L)	NS	42.2	53.9	2.0	17.1	14.4	22.2 J+	14.5	15.7	2.1
Nitrate (mg/L)	NS	0.06 U	0.04 J	0.14 J	0.66	0.6	0.44	0.44	0.64	0.68 J
Sulfate (mg/L)	NS	48.1	7.2	3.5	13.6	10.8	10.2	8.5	10.7	2.5
Methane (µg/L)	NS	13.8	0.90	5.8	7.2	7.5	7.9	32.7	23	50.5
Ethane (µg/L)	NS	2.9	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	3.31 U
Ethene (µg/L)	NS	1.6	0.75 U	0.32 J	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	2.41 U
Total Organic Carbon (mg/L)	NS	7.7	18.3	1.4	0.75 J	0.68 J	0.56 J	1.2	0.6 J	3.5
Field Parameters										
pH (pH Unit)	NS	9.68	7.09	8.79	7.66	7.46	7.44	7.46	7.55	7.49
Turbidity (NTU)	NS	381	5.99	16.3	38.2	31.91	13.81	11.00	25.8	33.8
ORP (MeV)	NS	-404	-167.9	-68.4	-10.6	30	0.40	57.10	69.5	65.6
Conductivity (mS/cm)	NS	0.287	0.329	0.078	0.324	0.600	0.338	0.218	0.335	0.204
Dissolved Oxygen (mg/L)	NS	0.79	0.41	6.63	3.67	4.58	4.84	1.32	3.54	9.57
Groundwater Elevation (ft)	NS	226.69	225.46	223.40	228.68	228.81	225.56	224.08	227.04	227.26

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO₃/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

APPENDICES

APPENDIX A: Groundwater Sample Collection Field Forms

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-16

Date: 09/18/18

Samplers:

Gerlinde Wolf and Dan Servetas

Sample Number:

MW-16

QA/QC Collected? NO

Purging / Sampling Method:

Low Flow with Bladder Pump

1. L = Well Depth:

69.51 feet

2. D = Riser Diameter (I.D.):

feet

3. W = Depth to Water:

61.36 feet

4. C = Column of Water in Well:

feet

5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$

gal

6. 3(V) = Target Purge Volume

gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using

YSI Pro DSS + Turb. Meter

Parameter	Units	Readings						
Time	24 hr	940	945	950	955	1000	1005	1010
Water Level (0.33)	feet	61.36	61.35	61.39	61.36		61.36	
Volume Purged	gal							
Flow Rate	mL/min		350	100	-	-	-	-
Turbidity (+/- 10%) ✓	NTU	-	40.0	29.7	37.7	34.8	30.8	25.5
Dissolved Oxygen (+/- 10%)	%	100.1	100.2	100.2	99.9	99.5	99.4	99.4
Dissolved Oxygen (+/- 10%)	mg/L	10.09	10.04	9.96	9.93	9.95	9.96	9.98
Eh / ORP (+/- 10)	MeV	231.6	227.0	225.1	225.8	225.1	212.7	214.9
Specific Conductivity (+/- 3%)	mS/cm ^c							
Conductivity (+/- 3%)	mS/cm	.516	.517	.514	.516	.515	.513	0.513
pH (+/- 0.1)	pH unit	7.09	7.05	7.06	7.06	7.06	7.07	7.07
Temp (+/- 0.5)	C°	15.0	15.2	15.6	15.5	15.4	15.2	15.1
Color	Visual	clear	clear	"	"	"	"	"
Odor	Olfactory	-	-	"	"	"	"	"

Comments:

Sample @ 1040

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-16

Date: 9/18/18

Samplers:

Gerlinde Wolf and Dan Servetas

Sample Number:

MW-16

QA/QC Collected?

No

Purging / Sampling Method:

Low Flow with Bladder Pump

1. L = Well Depth:

_____ feet

2. D = Riser Diameter (I.D.):

_____ feet

3. W = Depth to Water:

_____ feet

4. C = Column of Water in Well:

_____ feet

5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$

_____ gal

6. 3(V) = Target Purge Volume

_____ gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using _____

Parameter

Units

✓

✓

✓

Readings

Time	24 hr	1015	1620	1025				
Water Level (0.33)	feet							
Volume Purged	gal		3					
Flow Rate	mL/min	100	100	100				
Turbidity (+/- 10%)	NTU	21.1	19.8	20.5				
Dissolved Oxygen (+/- 10%)	%	100.1	100.1	100.2				
Dissolved Oxygen (+/- 10%)	mg/L	10.06	10.06	10.04				
Eh / ORP (+/- 10)	MeV	216.4	216.4	215.7				
Specific Conductivity (+/- 3%)	mS/cm ^c							
Conductivity (+/- 3%)	mS/cm	.513	.512	.511				
pH (+/- 0.1)	pH unit	7.07	7.08	7.08				
Temp (+/- 0.5)	C°	15.1	15.1	15.2				
Color	Visual	"	"	"				
Odor	Olfactory	"	"	"				

Comments:

Sample @ 1040

ZZ

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-15

Date: 9/18/18

Samplers: Gerlinde Wolf and Dan Servetas

Sample Number: MW-15

QA/QC Collected? NO

Purging / Sampling Method:

Low Flow with Bladder Pump

1. L = Well Depth:

81.76 feet

2. D = Riser Diameter (I.D.):

feet

3. W = Depth to Water:

65.32 feet

4. C = Column of Water in Well:

feet

5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$

gal

6. 3(V) = Target Purge Volume

gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using

YSI PRODS + Turbi. Meter

Parameter	Units	Readings							
Time	24 hr	1505	1510	1515	1520	1525	1530	1535	1540
Water Level (0.33)	feet	65.31	65.30	65.31	65.32	65.3	65.3	65.3	65.31
Volume Purged	gal	1	1.2	1.4	1.5	1.5	1.75	2	2.5
Flow Rate	mL/min	100	100	100	100	100	100	100	100
Turbidity (+/- 10%)	NTU	11.7	78.5	68.5	59.6	40.0	27.6	16.8	13.1
Dissolved Oxygen (+/- 10%)	%	98.7	98.8	98.6	98.4	98.0	97.9	97.8	97.3
Dissolved Oxygen (+/- 10%)	mg/L	9.46	9.42	9.45	9.47	9.47	9.49	9.5	9.45
Eh / ORP (+/- 10)	MeV	120	123.7	126.4	127.7	129.8	131.7	133.5	134.8
Specific Conductivity (+/- 3%)	mS/cm ^c	.461	.458	.458	.458	.458	0.457	.458	.458
Conductivity (+/- 3%)	mS/cm								
pH (+/- 0.1)	pH unit	7.57	7.56	7.54	7.53	7.52	7.50	7.49	7.49
Temp (+/- 0.5)	C	17.5	17.6	17.3	17.1	17.0	16.8	16.7	16.7
Color	Visual	Brownish	"	"	"	"			
Odor	Olfactory	-	"	"	"	"			

Comments:

Sample @ 1545

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-24

Date: 9/18/18

Samplers: Gerlinde Wolf and Dan Servetas

Sample Number: MW-24

QA/QC Collected? No

Purging / Sampling Method:

Low Flow with Bladder Pump

1. L = Well Depth:

104.3 feet

2. D = Riser Diameter (I.D.):

feet

3. W = Depth to Water:

65.13 feet

4. C = Column of Water in Well:

feet

5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$

gal

6. 3(V) = Target Purge Volume

gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using

YSI Pro DSS + Turb. Meter

Parameter	Units	Readings							
Time	24 hr	13:25	1330	1335	1340	1345	1350	1355	1400
Water Level (0.33)	feet	65.13	65.26	65.18	65.14	65.15	65.15	65.15	65.15
Volume Purged	gal	1	1.5	2.0	2.5	2.8	3.2	3.5	3.8
Flow Rate	mL/min	100	100	100	100	100	100	100	100
Turbidity (+/- 10%)	NTU	37.7	36.3	40.0	34.7	28.2	21.4	16.9	14.6
Dissolved Oxygen (+/- 10%)	%	82.4	79.6	77.5	76.5	76.8	75.4	75.0	74.9
Dissolved Oxygen (+/- 10%)	mg/L	7.91	7.65	7.47	7.38	7.31	7.68	7.24	7.22
Eh / ORP (+/- 10)	MeV	-108.7	-121.4	-133.5	-136.5	-142.3	-145.3	-155.3	-155.1
Specific Conductivity (+/- 3%)	mS/cm ^c	-	-	-	-	-	-	-	-
Conductivity (+/- 3%)	mS/cm	.402	.402	.401	0.401	0.400	0.401	0.401	0.402
pH (+/- 0.1)	pH unit	7.72	7.69	7.67	7.67	7.67	7.27	7.68	7.69
Temp (+/- 0.5)	C	17.3	17.3	17.1	17.1	17.0	17.1	17.0	17.1
Color	Visual	Grayish	"	Clear	"	"	"	"	"
Odor	Olfactory	No	"	"	"	"	"	"	"

Comments:

Sample @ 1415

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-26

Date: 9/18/18

Samplers: Gerlinde Wolf and Dan Servetas

Sample Number: MW-26

QA/QC Collected? NO

Purging / Sampling Method: Low Flow with Bladder Pump

1. L = Well Depth: 108.69 feet

2. D = Riser Diameter (I.D.): 59.86 feet

3. W = Depth to Water: 59.86 feet

4. C = Column of Water in Well: 59.86 feet

5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ gal

6. 3(V) = Target Purge Volume 59.86 gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI Pro DSS + TurbMeter

Parameter	Units	1155 Readings							
Time	24 hr	1140	1145	1150	1200	1200	1205	1210	1215
Water Level (0.33)	feet	59.02	58.78	59.24	59.24	"	"	59.80	58.95
Volume Purged	gal	1	1.2	1.35	1.2	2.2	2.6	2.8	3.0
Flow Rate	mL/min	100	100	100	100	100	100	100	100
Turbidity (+/- 10%)	NTU	31.6	20.24	20.64	27.57	33.57	43.95	8.87	* 8.77
Dissolved Oxygen (+/- 10%)	%	92.5	94.4	94.2	94.5	94.5	95.0	96.7	96.9
Dissolved Oxygen (+/- 10%)	mg/L	8.3	8.6	8.7	8.74	8.72	8.72	8.89	8.90
Eh / ORP (+/- 10)	MeV	96.4	89.5	94.0	92.3	99.6	103.9	75.2	78.7
Specific Conductivity (+/- 3%)	mS/cm ^c	-	-	-	-	-	-	-	-
Conductivity (+/- 3%)	mS/cm	.259	.257	.257	.258	.258	.258	.269	.269
pH (+/- 0.1)	pH unit	7.23	7.20	7.23	7.23	7.23	7.25	7.28	7.28
Temp (+/- 0.5)	C	20.3	19.5	19.0	19.1	19.2	19.5	19.5	19.5
Color	Visual	Clear / Brownish	"	"	"	"	"	"	"
Odor	Olfactory	No/A	"	"	"	"	"	"	"

Comments:

turbidity untill 1205
with YSI, readings seem
Strange
*Switch to Geotech turb.
meter
Sample @ 1225

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-35

Date: 9/19/18

Samplers: Gerlinde Wolf and Dan Servetas

Sample Number: MW-35

QA/QC Collected? NO

Purging / Sampling Method: Low Flow with Bladder Pump

1. L = Well Depth: 92.33 feet

2. D = Riser Diameter (I.D.): 59.70 feet

3. W = Depth to Water: 59.70 feet

4. C = Column of Water in Well: feet

5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ gal

6. 3(V) = Target Purge Volume gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI pro DSS -Turb Meter

Parameter	Units	Readings							
Time	24 hr	845	850	855	900	905	910	915	
Water Level (0.33)	feet	59.72	59.81	59.85	59.83	59.86	59.85	59.78	
Volume Purged	gal	1	1.2	1.8	2	2.3	2.5	3	
Flow Rate	mL/min	100	100	100	100	100	100	100	
Turbidity (+/- 10%)	NTU	82.3	83.1	86.2	78.2	74.1	65.9	51.2	
Dissolved Oxygen (+/- 10%)	%	100.2	98.4	98.2	97.1	96.3	95.8	95.7	
Dissolved Oxygen (+/- 10%)	mg/L	10.12	9.99	9.96	9.89	9.85	9.77	9.74	
Eh / ORP (+/- 10)	MeV	100.8	87.4	83.8	72.0	65.6	60.4	61.2	
Specific Conductivity (+/- 3%)	mS/cm ^c	.212	.198	.198	.198	.198	.196	.196	
Conductivity (+/- 3%)	mS/cm								
pH (+/- 0.1)	pH unit	7.5	7.39	7.37	7.37	7.37	7.37	7.39	
Temp (+/- 0.5)	C	19.9	14.7	14.7	14.5	14.4	14.5	14.6	
Color	Visual	Brownish							
Odor	Olfactory								

Comments:

Sample @ 945

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-3S

Date: 9/19/18

Samplers:

Gerlinde Wolf and Dan Servetas

Sample Number:

MW-3S

QA/QC Collected? NO

Purging / Sampling Method:

Low Flow with Bladder Pump

1. L = Well Depth:

_____ feet

2. D = Riser Diameter (I.D.):

_____ feet

3. W = Depth to Water:

_____ feet

4. C = Column of Water in Well:

_____ feet

5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$

_____ gal

6. 3(V) = Target Purge Volume

_____ gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using _____

Parameter	Units	Readings				
Time	24 hr	920	925	930	935	940
Water Level (0.33)	feet	59.79	59.9	59.8	59.8	59.83
Volume Purged	gal	3.2	3.5	3.8	4.0	4.2
Flow Rate	mL/min	100	100	100	100	100
Turbidity (+/- 10%)	NTU	50.8	45.3	41.4	40.0	33.8
Dissolved Oxygen (+/- 10%)	%	94.8	94.4	94.2	93.7	93.6
Dissolved Oxygen (+/- 10%)	mg/L	9.7	9.6	9.62	9.59	9.57
Eh / ORP (+/- 10)	MeV	59.1	60.7	63.3	62.7	65.6
Specific Conductivity (+/- 3%)	mS/cm ^c					
Conductivity (+/- 3%)	mS/cm	.198	.199	.199	.203	.204
pH (+/- 0.1)	pH unit	7.41	7.44	7.44	7.48	7.49
Temp (+/- 0.5)	C	14.3	14.3	14.3	14.3	14.3
Color	Visual	brackish	"	"	"	"
Odor	Olfactory	-	"	"	"	"

Comments:

Sample @ 945

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-34

Date: 9/19/18

Samplers: Gerlinde Wolf and Dan Servetas

Sample Number: MW-34

QA/QC Collected? NO

Purging / Sampling Method: Low Flow with Bladder Pump

1. L = Well Depth: 88.18 feet

2. D = Riser Diameter (I.D.): _____ feet

3. W = Depth to Water: 59.84 feet

4. C = Column of Water in Well: _____ feet

5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ _____ gal

6. 3(V) = Target Purge Volume _____ gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using Turb Meter + YSI PRO OSS

Parameter	Units	Readings						
Time	24 hr	1125	1130	1135	1140	1145		
Water Level (0.33)	feet	59.86	59.96	59.94	59.91	59.90		
Volume Purged	gal	.5	.7	1	1.5	1.8		
Flow Rate	mL/min	200	200	200	200	200		
Turbidity (+/- 10%)	NTU	6.75	2.36	2.88	0.19	0.02		
Dissolved Oxygen (+/- 10%)	%	95.5	92.3	89.4	88.6	84.7		
Dissolved Oxygen (+/- 10%)	mg/L	9.63	9.37	9.12	9.01	8.69		
Eh / ORP (+/- 10)	MeV	130.1	131.2	127.6	124.0	118.1		
Specific Conductivity (+/- 3%)	mS/cm ^c							
Conductivity (+/- 3%)	mS/cm	.287	.288	.293	.297	.312		
pH (+/- 0.1)	pH unit	7.30	7.15	7.15	7.17	7.22		
Temp (+/- 0.5)	C°	15.1	14.7	14.5	14.5	14.2		
Color	Visual	Clear	"	"	"			
Odor	Olfactory	-	"	"	"			

Comments:

Sample @ 1150

* tried to drop pump slowly without letting it touch bottom and this greatly helped turbidity.

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-31

Date: 9/20/18

Samplers: Gerlinde Wolf and Dan Servetas

Sample Number: MW-31

QA/QC Collected? NO

Purging / Sampling Method: Low Flow with Bladder Pump

1. L = Well Depth: 91.43 feet

2. D = Riser Diameter (I.D.): 64.20 feet

3. W = Depth to Water: 64.20 feet

4. C = Column of Water in Well: feet

5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ gal

6. 3(V) = Target Purge Volume gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI Pro DSS + turbidimeter

Parameter	Units	Readings ✓ ✓ ✓					
Time	24 hr	1020	1025	1030	1035	1040	1045
Water Level (0.33)	feet	64.2	64.2	64.2	64.2	64.24	64.24
Volume Purged	gal	.1	.2	.5	1	1.2	1.5
Flow Rate	mL/min	200	200	200	200	200	200
Turbidity (+/- 10%) ✗	NTU	3.16	0.61	0.02	0.02	0.02	0.02
Dissolved Oxygen (+/- 10%)	%	93.7	80.2	79.7	79.6	79.3	79.4
Dissolved Oxygen (+/- 10%)	mg/L	9.62	8.47	8.35	8.30	8.16	7.99
Eh / ORP (+/- 10)	MeV	-117.5	-168.8	-174.5	-177.4	-179.5	-180.6
Specific Conductivity (+/- 3%)	mS/cm ^c						
Conductivity (+/- 3%)	mS/cm	.352	.374	.371	.372	.373	.378
pH (+/- 0.1)	pH unit	7.55	7.82	7.84	7.84	7.84	7.85
Temp (+/- 0.5)	C°	14.3	13.3	13.1	13.5	14.0	14.6
Color	Visual	Clear	Clear	Clear	Clear	"	
Odor	Olfactory	"	"	"	"	"	

Comments:

Pump did not touch bottom
Sample @ 1050

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-32

Date: 9/20/18

Samplers:

Gerlinde Wolf and Dan Servetas

Sample Number:

MW-32

QA/QC Collected? NO

Purging / Sampling Method:

Low Flow with Bladder Pump

1. L = Well Depth:

91.43 feet

2. D = Riser Diameter (I.D.):

feet

3. W = Depth to Water:

62.41 feet

4. C = Column of Water in Well:

feet

5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$

gal

6. 3(V) = Target Purge Volume

gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using

YSI PSS Pro + Turbometer

Parameter	Units	Readings					
Time	24 hr	840	845	850	855	900	905
Water Level (0.33)	feet	62.41	62.4	62.42	62.4	62.49	62.5
Volume Purged	gal	.2	.5	.8	1.5	1.8	2
Flow Rate	mL/min	200	200	200	200	200	200
Turbidity (+/- 10%) *	NTU	0.02	0.02	0.02	0.02	0.02	0.02
Dissolved Oxygen (+/- 10%)	%	81.6	79.6	79.3	79.2	79.1	79.0
Dissolved Oxygen (+/- 10%)	mg/L	8.68	8.50	8.46	8.45	8.45	8.44
Eh / ORP (+/- 10)	MeV	-175.7	-190.4	-194	-197	-199	-201
Specific Conductivity (+/- 3%)	mS/cm ^c						
Conductivity (+/- 3%)	mS/cm	.254	.267	.289	.293	.294	.291
pH (+/- 0.1)	pH unit	8.51	8.02	7.94	7.93	7.93	7.94
Temp (+/- 0.5)	C	12.97	12.4	12.4	12.4	12.3	12.3
Color	Visual	Clear	Clear	"	"	"	"
Odor	Olfactory	"	"	"	"	"	"

Comments:

* pump did not touch bottom

Sample @ 910

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-33

Date: 9/19/18

Samplers:

Gerlinde Wolf and Dan Servetas

Sample Number:

MW-33

QA/QC Collected?

Dup, MS/MSD

Purging / Sampling Method:

Low Flow with Bladder Pump

1. L = Well Depth:

92.32 feet

2. D = Riser Diameter (I.D.):

feet

3. W = Depth to Water:

62.49 feet

4. C = Column of Water in Well:

feet

5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$

gal

6. 3(V) = Target Purge Volume

gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using

YSI PRO DSS + Turbidity Meter

Parameter	Units	Readings						
Time	24 hr	1300	1305	1310	1315	1320		
Water Level (0.33)	feet	62.72	62.78	62.81	62.7	62.7		
Volume Purged	gal	.2	.5	1	1.5	2		
Flow Rate	mL/min	200	200	200	200	200		
Turbidity (+/- 10%)	NTU	5.34	0.02	.02	.02	.02		
Dissolved Oxygen (+/- 10%)	%	97.1	89.5	88.9	88.7	88.7		
Dissolved Oxygen (+/- 10%)	mg/L	9.74	9.32	9.21	9.26	9.21		
Eh / ORP (+/- 10)	MeV	98.6	102.5	99.6	100.1	98.7		
Specific Conductivity (+/- 3%)	mS/cm ^c							
Conductivity (+/- 3%)	mS/cm	.452	.455	.457	.456	.456		
pH (+/- 0.1)	pH unit	7.67	7.69	7.69	7.69	7.69		
Temp (+/- 0.5)	C	15.6	13.5	13.7	13.00	13.6		
Color	Visual	clear	"	"	"	"		
Odor	Olfactory	no	"	"	"	"		

Comments:

Sample @ 1330

Pump did not touch bottom

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-30

Date: 9/20/18

Samplers:

Gerlinde Wolf and Dan Servetas

Sample Number:

MW-30

QA/QC Collected?

NO

Purging / Sampling Method:

Low Flow with Bladder Pump

1. L = Well Depth:

91.31 feet

2. D = Riser Diameter (I.D.):

feet

3. W = Depth to Water:

64.11 feet

4. C = Column of Water in Well:

feet

5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$

gal

6. 3(V) = Target Purge Volume

gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using

YSI Pro DSS / Turb Meter

Parameter	Units	1300 Readings							
Time	24 hr	1250	1255	1260	1305	1310	1315	1320	
Water Level (0.33)	feet	64.11	64.1	64.1	64.1	64.12	64.12	64.12	
Volume Purged	gal	.1	.5	.8	1.2	2	2.2	2.5	
Flow Rate	mL/min	200	200	200	200	200	200	200	
Turbidity (+/- 10%) *	NTU	0.02	0.02	0.02	0.02	0.02	.02	.02	
Dissolved Oxygen (+/- 10%)	%	101.7	82.3	81.0	80.6	80.4	80.3	80.2	
Dissolved Oxygen (+/- 10%)	mg/L	9.70	8.59	8.50	8.44	8.41	8.46	8.41	
Eh / ORP (+/- 10)	MeV	-85.5	-184.0	-196.2	-205	-212	-215.4	-217.6	
Specific Conductivity (+/- 3%)	mS/cm°								
Conductivity (+/- 3%)	mS/cm	.249	.240	.238	.233	.233	.234	.235	
pH (+/- 0.1)	pH unit	8.36	8.36	8.38	8.42	8.46	8.48	8.48	
Temp (+/- 0.5)	C°	13.3	13.6	13.2	13.3	13.1	13.0	13.1	
Color	Visual	clear	"	"	"	"	"	"	
Odor	Olfactory	no	"	"	"	"	"	"	

Comments:

pump did not touch bottom

Sample @ 1320

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-29

Date: 9/20/18

Samplers:

Gerlinde Wolf and Dan Servetas

Sample Number:

MW-29

QA/QC Collected?

NO

Purging / Sampling Method:

Low Flow with Bladder Pump

1. L = Well Depth:

71.20 feet

2. D = Riser Diameter (I.D.):

feet

3. W = Depth to Water:

64.52 feet

4. C = Column of Water in Well:

feet

5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$

gal

6. 3(V) = Target Purge Volume

gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using

Ysi DSS Pro / Turb. meter

Parameter	Units	Readings					
Time	24 hr	1430	1435	1440	1445	1450	1455
Water Level (0.33)	feet	64.52	64.70	64.65	64.65		
Volume Purged	gal	.1	.3	.5	1	1.5	2
Flow Rate	mL/min	200	200	200	200	200	200
Turbidity (+/- 10%)	NTU	27.5	10.4	6.21	2.41	0.02	.02
Dissolved Oxygen (+/- 10%)	%	105.0	100.4	97.4	97.2	97.2	97.0
Dissolved Oxygen (+/- 10%)	mg/L	9.87	9.96	9.73	9.72	9.63	9.66
Eh / ORP (+/- 10)	MeV	74	93.6	94.0	94.0	91.7	90.9
Specific Conductivity (+/- 3%)	mS/cm ^c						
Conductivity (+/- 3%)	mS/cm	.181	.610	.668	.674	.671	.683
pH (+/- 0.1)	pH unit	7.62	7.25	7.19	7.18	7.15	7.14
Temp (+/- 0.5)	C°	18.5	15.6	15.4	15.3	15.5	15.5
Color	Visual	clw	"				
Odor	Olfactory	no	"				

Comments:

pump did not touch bottom

sample @ 1500

Monitoring Well Purging / Sampling Form

Project Name and Number:

Former Scotia Navy Depot 60440641

Monitoring Well Number:

MW-28

Date:

9/21/18

Samplers:

Gerlinde Wolf and Dan Servetas

Sample Number:

MW-28

QA/QC Collected?

NO

Purging / Sampling Method:

Low Flow with Bladder Pump

1. L = Well Depth:

71.9 feet

2. D = Riser Diameter (I.D.):

feet

3. W = Depth to Water:

64.71 feet

4. C = Column of Water in Well:

feet

5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$

gal

6. 3(V) = Target Purge Volume

gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using

YSI Pro DSS / Turb Meter

Parameter	Units	Readings							
Time	24 hr	1015	1020	1025	1030	1035	1040	1045	
Water Level (0.33)	feet	64.71	64.8	64.8	64.85	64.85	64.85	64.85	
Volume Purged	gal	.1	.3	.5	.8	1	1.3	1.8	
Flow Rate	mL/min	200	200	200	200	200	200	200	
Turbidity (+/- 10%)	NTU	.02	.02	.02	.02	.02	.02	.02	
Dissolved Oxygen (+/- 10%)	%	88.1	86.1	85.2	85.4	85.8	86.5	86.4	
Dissolved Oxygen (+/- 10%)	mg/L	8.83	8.72	8.68	8.72	8.74	8.78	8.81	
Eh / ORP (+/- 10)	MeV	213.6	195.1	179	158.3	143.5	132.3	127.3	
Specific Conductivity (+/- 3%)	mS/cm ^c								
Conductivity (+/- 3%)	mS/cm	.830	.802	.798	.797	.797	.796	.796	
pH (+/- 0.1)	pH unit	7.35	7.09	7.06	7.05	7.05	7.05	7.06	
Temp (+/- 0.5)	C ^o	15.3	14.6	14.4	14.3	14.4	14.4	14.4	
Color	Visual	Clear	Clear	Clear	Clear	"	"	"	
Odor	Olfactory	no	no	no	"	"	"	"	

Comments:

Sample @ 1105

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-28 Date: 9/21/18

Samplers: Gerlinde Wolf and Dan Servetas

Sample Number: MW-28 QA/QC Collected? _____

Purging / Sampling Method: Low Flow with Bladder Pump

1. L = Well Depth:	_____	feet	D (inches)	D (feet)
2. D = Riser Diameter (I.D.):	_____	feet	1-inch	0.08
3. W = Depth to Water:	_____	feet	2-inch	0.17
4. C = Column of Water in Well:	_____	feet	3-inch	0.25
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	_____	gal	4-inch	0.33
6. 3(V) = Target Purge Volume	_____	gal	6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using _____

Parameter	Units	✓	✓	✓	Readings			
Time	24 hr	1050	1056	1100				
Water Level (0.33)	feet	64.85	64.85	64.85				
Volume Purged	gal	2	2.2	2.5				
Flow Rate	mL/min	200	200	200				
Turbidity (+/- 10%)	NTU	.02	.02	.02				
Dissolved Oxygen (+/- 10%)	%	86.6	86.6	86.7				
Dissolved Oxygen (+/- 10%)	mg/L	8.79	8.80	8.83				
Eh / ORP (+/- 10)	MeV	123	122.6	120.9				
Specific Conductivity (+/- 3%)	mS/cm°	797	796	797				
Conductivity (+/- 3%)	mS/cm							
pH (+/- 0.1)	pH unit	7.07	7.07	7.08				
Temp (+/- 0.5)	C°	14.6	14.6	14.5				
Color	Visual	"	"	"				
Odor	Olfactory	"	"	"				

Comments:

APPENDIX B: Field Calibration Forms

Calibration Log

Site: Scotia Depot
Personnel: D. Servetas + G. Wolf

Day 1

Date: 9/18/18 Time: 8:35am Instrument: YSI Pro DSS + Turb. Meter
PH1 3.92 -> 4.01 ORP 210.1 -> 220
PH2 7.05 -> 7.00 Cond. 1.407 -> 1.413
PH3 9.94 -> 10.01 Turb. 4 Point cal ✓

Day 2

Date: 9/19/18 Time: 7:40am Instrument: YSI Pro DSS + Turb Meter
PH1 3.99 -> 4.00 ORP 216.8 -> 220
PH2 7.02 -> 7.00 Cond. 1.422 -> 1.413
PH3 9.98 -> 10.01 Turb. 4 Point cal ✓

Day 3

Date: 9/20/18 Time: 8:40am Instrument: YSI Pro DSS + Turb Meter
PH1 3.93 -> 4.00 ORP 231.7 -> 220
PH2 6.91 -> 6.99 Cond. 1.412 -> 1.413
PH3 10.02 -> 10.01 Turb. 4 point cal ✓

Day 4

Date: 9/21/18 Time: 10:05am Instrument: YSI Pro DSS + Turb. Meter
PH1 3.98 -> 4.00 ORP 228.1 -> 220
PH2 6.93 -> 7.01 Cond. 1.433 -> 1.413
PH3 9.89 -> 10.00 Turb. 4 Point cal ✓

Date: _____ Time: _____ Instrument: _____
PH1 _____ -> _____ ORP _____ -> _____
PH2 _____ -> _____ Cond. _____ -> _____
PH3 _____ -> _____ Turb. _____

APPENDIX C: Hydraulic Gradient and Velocity Calculations

September 2018 Quarterly Monitoring Report
The Defense National Stockpile Center Scotia Depot
Appendix C Hydraulic Gradient and Velocity Calculations

Hydraulic Gradient Calculation						
$hydraulic\ gradient = \frac{change\ in\ groundwater\ elevation}{change\ in\ distance} = \frac{\Delta h}{\Delta L}$						
Dec 2017 Data		GW Elevation (ft)	Delta Elevation (ft)	Delta Distance (ft)	Gradient	Average Gradient (ft/ft)
Pair 1	MW-25	227.67	1.08	540	0.002	0.001885
	MW-26	226.59				
Pair 2	GEP-3	228.35	0.49	420	0.001167	
	MW-13	227.86				
Pair 3	MW-17	228.64	1.02	410	0.002488	
	MW-28	227.62				
Groundwater Darcy Velocity						
$Darcy\ Velocity = K \times hydraulic\ gradient = K \times \frac{\Delta h}{\Delta L}$						
Low Hydraulic Conductivity (K) (ft/day)		15.66				
High Hydraulic Conductivity (K) (ft/day)		193.8				
Darcy Velocity Low (ft/day)		0.03				
Darcy Velocity High (ft/day)		0.37				
Seepage Velocity						
$Seepage\ Velocity = \frac{K \times hydraulic\ gradient}{n} = \frac{Darcy\ Velocity}{n}$						
Porosity (n)	0.4					
Seepage Velocity Low (ft/day)		0.07				
Seepage Velocity High (ft/day)		0.91				

APPENDIX D: Laboratory Reports

September 27, 2018

Ms. Kelly Lurie
AECOM - Mechanicsburg
100 Sterling Parkway
Suite 205
Mechanicsburg, PA 17055

Certificate of Analysis

Project Name:	2015-SCOTIA NAVY DEPOT-PO 60440641	Workorder:	2339171
Purchase Order:	66432/60440641.11	Workorder ID:	ASN039 60440641

Dear Ms. Lurie:

Enclosed are the analytical results for samples received by the laboratory on Wednesday, September 19, 2018.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Greg Malzone , Mr. John Santacroce , Mr. Scott Underhill

*This page is included as part of the Analytical Report and
must be retained as a permanent record thereof.*



Mrs. Vanessa N Badman
Project Coordinator

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SAMPLE SUMMARY

Workorder: 2339171 ASN039|60440641

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2339171001	MW-16	Ground Water	9/18/2018 10:40	9/19/2018 10:54	Collected by Client
2339171002	MW-26	Ground Water	9/18/2018 12:25	9/19/2018 10:54	Collected by Client
2339171003	MW-24	Ground Water	9/18/2018 14:15	9/19/2018 10:54	Collected by Client
2339171004	MW-15	Ground Water	9/18/2018 15:45	9/19/2018 10:54	Collected by Client
2339171005	Trip Blank	Ground Water	9/19/2018 10:54	9/19/2018 10:54	Collected by Client

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SAMPLE SUMMARY

Workorder: 2339171 ASN039|60440641

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 2339171 ASN039|60440641

Lab ID: **2339171001**

Date Collected: 9/18/2018 10:40

Matrix: Ground Water

Sample ID: **MW-16**

Date Received: 9/19/2018 10:54

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
1,1,1-Trichloroethane	0.34J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	114		%	81 - 118			SW846 8260C		9/20/18 17:17	TMP	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C		9/20/18 17:17	TMP	A
Dibromofluoromethane (S)	110		%	80 - 119			SW846 8260C		9/20/18 17:17	TMP	A
Toluene-d8 (S)	99.7		%	89 - 112			SW846 8260C		9/20/18 17:17	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.31		ug/L	3.3	3.3	0.23	RSK 175		9/20/18 23:40	EGO	C
Ethene	2.41		ug/L	2.4	2.4	0.40	RSK 175		9/20/18 23:40	EGO	C
Methane	1.51		ug/L	1.5	1.5	0.34	RSK 175		9/20/18 23:40	EGO	C
WET CHEMISTRY											
Alkalinity, Total	339	1	mg/L	5	5	0.8	SM2320B-2011		9/20/18 15:49	MSA	H
Chloride	2.3		mg/L	2.0	0.50	0.16	EPA 300.0		9/20/18 06:31	CHW	G
Nitrate-N	1.9		mg/L	0.20	0.060	0.020	EPA 300.0		9/20/18 06:31	CHW	G
Sulfate	28.7		mg/L	2.0	0.50	0.20	EPA 300.0		9/20/18 06:31	CHW	G
Total Organic Carbon (TOC)	0.62J	J	mg/L	1.0	0.50	0.18	SM5310B-2011		9/25/18 06:46	PAG	E
METALS											
Iron, Total	0.15		mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 10:57	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 09:28	SRT	K1

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ANALYTICAL RESULTS

Workorder: 2339171 ASN039|60440641

Lab ID: **2339171001**
Sample ID: **MW-16**Date Collected: 9/18/2018 10:40 Matrix: Ground Water
Date Received: 9/19/2018 10:54

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
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Project Coordinator**ALS Environmental Laboratory Locations Across North America**Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay
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ANALYTICAL RESULTS

Workorder: 2339171 ASN039|60440641

Lab ID: **2339171002**

Date Collected: 9/18/2018 12:25

Matrix: Ground Water

Sample ID: **MW-26**

Date Received: 9/19/2018 10:54

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	115		%	81 - 118			SW846 8260C		9/20/18 17:40	TMP	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C		9/20/18 17:40	TMP	A
Dibromofluoromethane (S)	111		%	80 - 119			SW846 8260C		9/20/18 17:40	TMP	A
Toluene-d8 (S)	98.7		%	89 - 112			SW846 8260C		9/20/18 17:40	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.31		ug/L	3.3	3.3	0.23	RSK 175		9/20/18 23:56	EGO	C
Ethene	2.41		ug/L	2.4	2.4	0.40	RSK 175		9/20/18 23:56	EGO	C
Methane	12.9		ug/L	1.5	1.5	0.34	RSK 175		9/20/18 23:56	EGO	C
WET CHEMISTRY											
Alkalinity, Total	178	1	mg/L	5	5	0.8	SM2320B-2011		9/20/18 15:59	MSA	H
Chloride	21.0		mg/L	2.0	0.50	0.16	EPA 300.0		9/20/18 06:48	CHW	G
Nitrate-N	0.040J	J	mg/L	0.20	0.060	0.020	EPA 300.0		9/20/18 06:48	CHW	G
Sulfate	4.8		mg/L	2.0	0.50	0.20	EPA 300.0		9/20/18 06:48	CHW	G
Total Organic Carbon (TOC)	12.9		mg/L	5.0	2.5	0.92	SM5310B-2011		9/25/18 21:08	PAG	E
METALS											
Iron, Total	0.61		mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 11:01	SRT	J1
Iron, Dissolved	0.43		mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 09:31	SRT	K1

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ANALYTICAL RESULTS

Workorder: 2339171 ASN039|60440641

Lab ID: **2339171002**

Date Collected: 9/18/2018 12:25

Matrix: Ground Water

Sample ID: **MW-26**

Date Received: 9/19/2018 10:54

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
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Mrs. Vanessa N Badman

Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2339171 ASN039|60440641

Lab ID: **2339171003**

Date Collected: 9/18/2018 14:15

Matrix: Ground Water

Sample ID: **MW-24**

Date Received: 9/19/2018 10:54

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
cis-1,2-Dichloroethene	3.0		ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
Trichloroethene	0.97J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	113		%	81 - 118			SW846 8260C		9/20/18 18:03	TMP	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C		9/20/18 18:03	TMP	A
Dibromofluoromethane (S)	108		%	80 - 119			SW846 8260C		9/20/18 18:03	TMP	A
Toluene-d8 (S)	98.3		%	89 - 112			SW846 8260C		9/20/18 18:03	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	1.5J	J	ug/L	3.3	3.3	0.23	RSK 175		9/21/18 00:12	EGO	C
Ethene	9.5		ug/L	2.4	2.4	0.40	RSK 175		9/21/18 00:12	EGO	C
Methane	13.9		ug/L	1.5	1.5	0.34	RSK 175		9/21/18 00:12	EGO	C
WET CHEMISTRY											
Alkalinity, Total	200	1	mg/L	5	5	0.8	SM2320B-2011		9/20/18 16:10	MSA	H
Chloride	36.7		mg/L	2.0	0.50	0.16	EPA 300.0		9/20/18 07:05	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		9/20/18 07:05	CHW	G
Sulfate	14.2		mg/L	2.0	0.50	0.20	EPA 300.0		9/20/18 07:05	CHW	G
Total Organic Carbon (TOC)	3.1		mg/L	1.0	0.50	0.18	SM5310B-2011		9/25/18 06:46	PAG	E
METALS											
Iron, Total	1.4		mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 11:08	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 09:39	SRT	K1

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ANALYTICAL RESULTS

Workorder: 2339171 ASN039|60440641

Lab ID: **2339171003**

Date Collected: 9/18/2018 14:15

Matrix: Ground Water

Sample ID: **MW-24**

Date Received: 9/19/2018 10:54

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
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Mrs. Vanessa N Badman

Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2339171 ASN039|60440641

Lab ID: **2339171004**

Date Collected: 9/18/2018 15:45

Matrix: Ground Water

Sample ID: **MW-15**

Date Received: 9/19/2018 10:54

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
1,1-Dichloroethene	0.35J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
Tetrachloroethene	0.98J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
1,1,1-Trichloroethane	5.2		ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
Trichloroethene	130		ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	116		%	81 - 118			SW846 8260C		9/20/18 18:26	TMP	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C		9/20/18 18:26	TMP	A
Dibromofluoromethane (S)	110		%	80 - 119			SW846 8260C		9/20/18 18:26	TMP	A
Toluene-d8 (S)	100		%	89 - 112			SW846 8260C		9/20/18 18:26	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.31		ug/L	3.3	3.3	0.23	RSK 175		9/21/18 00:52	EGO	C
Ethene	2.41		ug/L	2.4	2.4	0.40	RSK 175		9/21/18 00:52	EGO	C
Methane	1.51		ug/L	1.5	1.5	0.34	RSK 175		9/21/18 00:52	EGO	C
WET CHEMISTRY											
Alkalinity, Total	236	1	mg/L	5	5	0.8	SM2320B-2011		9/20/18 16:21	MSA	H
Chloride	42.5		mg/L	2.0	0.50	0.16	EPA 300.0		9/20/18 07:22	CHW	G
Nitrate-N	0.54		mg/L	0.20	0.060	0.020	EPA 300.0		9/20/18 07:22	CHW	G
Sulfate	13.2		mg/L	2.0	0.50	0.20	EPA 300.0		9/20/18 07:22	CHW	G
Total Organic Carbon (TOC)	0.46J	J	mg/L	1.0	0.50	0.18	SM5310B-2011		9/25/18 06:46	PAG	E
METALS											
Iron, Total	0.097		mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 11:12	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 09:43	SRT	K1

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ANALYTICAL RESULTS

Workorder: 2339171 ASN039|60440641

Lab ID: **2339171004**
Sample ID: **MW-15**Date Collected: 9/18/2018 15:45 Matrix: Ground Water
Date Received: 9/19/2018 10:54

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
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ANALYTICAL RESULTS

Workorder: 2339171 ASN039|60440641

Lab ID: **2339171005**
Sample ID: **Trip Blank**

Date Collected: 9/19/2018 10:54 Matrix: Ground Water
Date Received: 9/19/2018 10:54

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	108		%	81 - 118			SW846 8260C		9/20/18 13:29	TMP	A
4-Bromofluorobenzene (S)	101		%	85 - 114			SW846 8260C		9/20/18 13:29	TMP	A
Dibromofluoromethane (S)	106		%	80 - 119			SW846 8260C		9/20/18 13:29	TMP	A
Toluene-d8 (S)	98.6		%	89 - 112			SW846 8260C		9/20/18 13:29	TMP	A



Mrs. Vanessa N Badman
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ANALYTICAL RESULTS

Workorder: 2339171 ASN039|60440641

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2339171001	1	MW-16	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2339171002	1	MW-26	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2339171003	1	MW-24	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2339171004	1	MW-15	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 2339171 ASN039|60440641

Lab ID	Sample ID	Analysis Method	Prep Method
2339171001	MW-16	EPA 300.0	
2339171001	MW-16	In-House	
2339171001	MW-16	RSK 175	
2339171001	MW-16	SM2320B-2011	
2339171001	MW-16	SM5310B-2011	
2339171001	MW-16	SW846 6010C	SW846 3015
2339171001	MW-16	SW846 6010C	SW846 6010C
2339171001	MW-16	SW846 8260C	
2339171002	MW-26	EPA 300.0	
2339171002	MW-26	In-House	
2339171002	MW-26	RSK 175	
2339171002	MW-26	SM2320B-2011	
2339171002	MW-26	SM5310B-2011	
2339171002	MW-26	SW846 6010C	SW846 3015
2339171002	MW-26	SW846 6010C	SW846 6010C
2339171002	MW-26	SW846 8260C	
2339171003	MW-24	EPA 300.0	
2339171003	MW-24	In-House	
2339171003	MW-24	RSK 175	
2339171003	MW-24	SM2320B-2011	
2339171003	MW-24	SM5310B-2011	
2339171003	MW-24	SW846 6010C	SW846 3015
2339171003	MW-24	SW846 6010C	SW846 6010C
2339171003	MW-24	SW846 8260C	
2339171004	MW-15	EPA 300.0	
2339171004	MW-15	In-House	
2339171004	MW-15	RSK 175	
2339171004	MW-15	SM2320B-2011	
2339171004	MW-15	SM5310B-2011	
2339171004	MW-15	SW846 6010C	SW846 3015
2339171004	MW-15	SW846 6010C	SW846 6010C
2339171004	MW-15	SW846 8260C	
2339171005	Trip Blank	SW846 8260C	

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QUALITY CONTROL DATA

Workorder: 2339171 ASN039|60440641

QC Batch: MDIG/73808 **Analysis Method:** SW846 6010C
QC Batch Method: SW846 3015
Associated Lab Samples: 2339171001, 2339171002, 2339171003, 2339171004

METHOD BLANK: 2815580

Parameter	Blank Result	Units	Reporting Limit
Iron, Total	0.045U	mg/L	0.067

LABORATORY CONTROL SAMPLE: 2815581

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Total	90.4	mg/L	1.1	1.0	87 - 115

MATRIX SPIKE: 2815582 DUPLICATE: 2815583 ORIGINAL: 2339919003

***NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Iron, Total	.01056	mg/L	1.1	1.11221	1.07488	99.1	95.8	87 - 115	3.41	20

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QUALITY CONTROL DATA

Workorder: 2339171 ASN039|60440641

QC Batch: MDIG/73809 **Analysis Method:** SW846 6010C
QC Batch Method: SW846 6010C
Associated Lab Samples: 2339171001, 2339171002, 2339171003, 2339171004

METHOD BLANK: 2815584

Parameter	Blank Result	Units	Reporting Limit
Iron, Dissolved	0.044U	mg/L	0.067

LABORATORY CONTROL SAMPLE: 2815585

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Dissolved	94.6	mg/L	1.1	1.1	87 - 115

MATRIX SPIKE: 2815586 DUPLICATE: 2815587 ORIGINAL: 2339919003

***NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Iron, Dissolved	.04522	mg/L	1.1	1.07867	1.11444	93	96.2	87 - 115	3.26	20

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QUALITY CONTROL DATA

Workorder: 2339171 ASN039|60440641

QC Batch: SVGC/50711 **Analysis Method:** RSK 175
QC Batch Method: RSK 175
Associated Lab Samples: 2339171001, 2339171002, 2339171003, 2339171004

METHOD BLANK: 2813247

Parameter	Blank Result	Units	Reporting Limit
Ethane	3.31	ug/L	3.3
Ethene	2.41	ug/L	2.4
Methane	1.51	ug/L	1.5

SAMPLE DUPLICATE: 2813248 ORIGINAL: 2339109001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	0	NC	20
Methane	0	ug/L	0	NC	20

SAMPLE DUPLICATE: 2813249 ORIGINAL: 2339112001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	0	NC	20
Methane	1.95	ug/L	1.59	20.3*	20

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QUALITY CONTROL DATA

Workorder: 2339171 ASN039|60440641

QC Batch: VOMS/48051 **Analysis Method:** SW846 8260C
QC Batch Method: SW846 8260C
Associated Lab Samples: 2339171001, 2339171002, 2339171003, 2339171004, 2339171005

METHOD BLANK: 2812813

Parameter	Blank Result	Units	Reporting Limit
Carbon Tetrachloride	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	106	%	81 - 118
4-Bromofluorobenzene (S)	101	%	85 - 114
Dibromofluoromethane (S)	104	%	80 - 119
Toluene-d8 (S)	101	%	89 - 112

LABORATORY CONTROL SAMPLE: 2812814

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	106	ug/L	20	21.2	72 - 136
1,1-Dichloroethane	105	ug/L	20	21.0	77 - 125
1,2-Dichloroethane	97.5	ug/L	20	19.5	73 - 128
1,1-Dichloroethene	119	ug/L	20	23.8	71 - 131
cis-1,2-Dichloroethene	101	ug/L	20	20.2	78 - 123
trans-1,2-Dichloroethene	116	ug/L	20	23.2	75 - 124
1,1,1,2-Tetrachloroethane	103	ug/L	20	20.5	78 - 124
1,1,2,2-Tetrachloroethane	97	ug/L	20	19.4	71 - 121
Tetrachloroethene	107	ug/L	20	21.4	74 - 129
Toluene	108	ug/L	20	21.5	80 - 121
1,1,1-Trichloroethane	107	ug/L	20	21.4	74 - 131
1,1,2-Trichloroethane	96.8	ug/L	20	19.4	80 - 119
Trichloroethene	101	ug/L	20	20.2	79 - 123

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QUALITY CONTROL DATA

Workorder: 2339171 ASN039|60440641

Vinyl Chloride	93.9	ug/L	20	18.8	58 - 137
1,2-Dichloroethane-d4 (S)	105	%			81 - 118
4-Bromofluorobenzene (S)	106	%			85 - 114
Dibromofluoromethane (S)	101	%			80 - 119
Toluene-d8 (S)	102	%			89 - 112

MATRIX SPIKE: 2813019 DUPLICATE: 2813020 ORIGINAL: 2339171001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Carbon Tetrachloride	0	ug/L	20	22.4077	21.9992	112	110	72 - 136	1.84	30
1,1-Dichloroethane	0	ug/L	20	22.558	22.0714	113	110	77 - 125	2.18	30
1,2-Dichloroethane	0	ug/L	20	21.807	20.8267	109	104	73 - 128	4.6	30
1,1-Dichloroethene	0	ug/L	20	24.8475	23.9136	124	120	71 - 131	3.83	30
cis-1,2-Dichloroethene	0	ug/L	20	21.8407	21.054	109	105	78 - 123	3.67	30
trans-1,2-Dichloroethene	0	ug/L	20	23.8682	23.2145	119	116	75 - 124	2.78	30
1,1,1,2-Tetrachloroethane	0	ug/L	20	21.2562	21.6451	106	108	78 - 124	1.81	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	20.4664	20.7636	102	104	71 - 121	1.44	30
Tetrachloroethene	0	ug/L	20	21.7236	21.5649	109	108	74 - 129	.73	30
Toluene	0	ug/L	20	22.0449	22.2397	110	111	80 - 121	.88	30
1,1,1-Trichloroethane	.3425	ug/L	20	23.1613	22.711	114	112	74 - 131	1.96	30
1,1,2-Trichloroethane	0	ug/L	20	21.0276	20.1714	105	101	80 - 119	4.16	30
Trichloroethene	0	ug/L	20	21.8976	21.7168	109	109	79 - 123	.83	30
Vinyl Chloride	0	ug/L	20	17.8639	18.0149	89.3	90.1	58 - 137	.84	30
1,2-Dichloroethane-d4 (S)	114	%				114	105	81 - 118		
4-Bromofluorobenzene (S)	103	%				103	106	85 - 114		
Dibromofluoromethane (S)	105	%				105	102	80 - 119		
Toluene-d8 (S)	98	%				98	99.5	89 - 112		

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QUALITY CONTROL DATA

Workorder: 2339171 ASN039|60440641

QC Batch: WETC/210628 **Analysis Method:** SM2320B-2011
QC Batch Method: SM2320B-2011
Associated Lab Samples: 2339171001, 2339171002, 2339171003, 2339171004

METHOD BLANK: 2812584

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

SAMPLE DUPLICATE: 2812563 ORIGINAL: 2338941001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	111.46279	mg/L	106.75235	4.32	20

METHOD BLANK: 2812566

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2812567 ORIGINAL: 2339061001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	277.52814	mg/L	254.69608	8.58	20

METHOD BLANK: 2812570

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2812571 ORIGINAL: 2339073001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
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QUALITY CONTROL DATA

Workorder: 2339171 ASN039|60440641

Alkalinity, Total	129.18246	mg/L	116.1685	10.6	20
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METHOD BLANK: 2812574

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2812575 ORIGINAL: 2339086002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	1190.8045	mg/L	1180.8024	.84	20

METHOD BLANK: 2812578

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2812579 ORIGINAL: 2339112001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	421.46799	mg/L	433.48694	2.81	20

METHOD BLANK: 2812582

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2812583 ORIGINAL: 2339171001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	339.30505	mg/L	335.91739	1	20

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QUALITY CONTROL DATA

Workorder: 2339171 ASN039|60440641

METHOD BLANK: 2812662

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2812663 ORIGINAL: 2339242007

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	97.76693	mg/L	92.72901	5.29	20

METHOD BLANK: 2812691

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

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QUALITY CONTROL DATA

Workorder: 2339171 ASN039|60440641

QC Batch: WETC/210636 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 2339171001, 2339171002, 2339171003, 2339171004

METHOD BLANK: 2812679

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.25U	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2812681

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	100	mg/L	20	20.1	87 - 111
Nitrate-N	92.8	mg/L	2.5	2.3	88 - 111
Sulfate	100	mg/L	20	20.1	87 - 112

METHOD BLANK: 2813291

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.25U	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

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QUALITY CONTROL DATA

Workorder: 2339171 ASN039|60440641

QC Batch: WETC/210807 **Analysis Method:** SM5310B-2011

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 2339171001, 2339171002, 2339171003, 2339171004

METHOD BLANK: 2814766

Parameter	Blank Result	Units	Reporting Limit
Total Organic Carbon (TOC)	0.50U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2814767

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	98.5	mg/L	1	0.99J	85 - 115

MATRIX SPIKE: 2814768 DUPLICATE: 2814769 ORIGINAL: 2339422001

***NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	1.465	mg/L	6	7.571	7.596	102	102	85 - 115	.33	20

MATRIX SPIKE: 2814770 DUPLICATE: 2814771 ORIGINAL: 2339443005

***NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	.439	mg/L	6	6.538	6.582	102	102	85 - 115	.67	20

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QUALITY CONTROL DATA

Workorder: 2339171 ASN039|60440641

QC Batch: WETC/210875 **Analysis Method:** SM5310B-2011
QC Batch Method: 415.1/9060/5310B
Associated Lab Samples: 2339171002

METHOD BLANK: 2815863

Parameter	Blank Result	Units	Reporting Limit
Total Organic Carbon (TOC)	0.50U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2815864

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	98.5	mg/L	1	0.99J	85 - 115

MATRIX SPIKE: 2815865 DUPLICATE: 2815866 ORIGINAL: 2339443003

***NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	18.2	mg/L	60	79.38	79.38	102	102	85 - 115	0	20

MATRIX SPIKE: 2815867 DUPLICATE: 2815868 ORIGINAL: 2339919001

***NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	3.525	mg/L	6	9.378	9.479	97.6	99.2	85 - 115	1.07	20

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2339171 ASN039|60440641

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2339171001	MW-16			SM2320B-2011	WETC/210628
2339171002	MW-26			SM2320B-2011	WETC/210628
2339171003	MW-24			SM2320B-2011	WETC/210628
2339171004	MW-15			SM2320B-2011	WETC/210628
2339171001	MW-16			EPA 300.0	WETC/210636
2339171002	MW-26			EPA 300.0	WETC/210636
2339171003	MW-24			EPA 300.0	WETC/210636
2339171004	MW-15			EPA 300.0	WETC/210636
2339171001	MW-16			SW846 8260C	VOMS/48051
2339171002	MW-26			SW846 8260C	VOMS/48051
2339171003	MW-24			SW846 8260C	VOMS/48051
2339171004	MW-15			SW846 8260C	VOMS/48051
2339171005	Trip Blank			SW846 8260C	VOMS/48051
2339171001	MW-16			RSK 175	SVGC/50711
2339171002	MW-26			RSK 175	SVGC/50711
2339171003	MW-24			RSK 175	SVGC/50711
2339171004	MW-15			RSK 175	SVGC/50711
2339171001	MW-16			SM5310B-2011	WETC/210807
2339171003	MW-24			SM5310B-2011	WETC/210807
2339171004	MW-15			SM5310B-2011	WETC/210807
2339171001	MW-16	SW846 3015	MDIG/73808	SW846 6010C	META/63887
2339171002	MW-26	SW846 3015	MDIG/73808	SW846 6010C	META/63887
2339171003	MW-24	SW846 3015	MDIG/73808	SW846 6010C	META/63887
2339171004	MW-15	SW846 3015	MDIG/73808	SW846 6010C	META/63887
2339171001	MW-16	SW846 6010C	MDIG/73809	SW846 6010C	META/63886

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2339171 ASN039|60440641

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2339171002	MW-26	SW846 6010C	MDIG/73809	SW846 6010C	META/63886
2339171003	MW-24	SW846 6010C	MDIG/73809	SW846 6010C	META/63886
2339171004	MW-15	SW846 6010C	MDIG/73809	SW846 6010C	META/63886
2339171002	MW-26			SM5310B-2011	WETC/210875

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34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT /
SAMPLER. INSTRUCTIONS ON THE BACK.

Environmental

Co. Name: **AECOM**
Contact (Report to): **Gerlinde Wolf** Phone: **518 951-2370**
Address: **40 British American Blvd.
Latham, NY 12110**

Bill to (if different from Report to):

PO#:

Project Name/ID: **60440641** ALS Quote #:

TAT: ☒ Normal-Standard TAT is 10-12 business days. Data Required:

☐ Rush-Subject to ALS approval and surcharges. Approved By:

Email? ☒ **gerlinde.wolf@AECOM.COM**

Fax? ☐ No.

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time
1 MW-16		9/18/18	1640
2 MW-26		1225	
3 MW-24		1415	
4 MW-15		1545	
5 Trip Blank		-	-
6			
7			
8			

SAMPLED BY (Please Print):

Gerlinde Wolf

Project Comments:

Send results to gerlinde.wolf@AECOM.COM

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Gerlinde Wolf / AECOM	9/18/18	1600	2 Belva W. Chubb / ALS	9/18/18	1848
3 Belva W. Chubb - ALS	9/18/18	5:30 PM	4 COMMON COURIER / ALS COURIER		
5 COMMON COURIER / ALS COURIER			6 W. K. Sullivan / ALS	9/18/18	1054
7			8		
9			10		

Container Type C	Container Size 40	Preservative HCL	ANALYSES/METHOD REQUESTED
AV	40	HCL	TOC
P	250	—	Alkalinity
P	250	—	C, NO3, SO4
P	250	—	Total Fe
P	250	—	Diss. Fe

Receptor Information (continued from back)
Received by (Print) & Signed: **SPS**
Cooler Temp: **1**
Therm. ID: **359**
No. of Coolers:
Notes:

Correct containers?	Correct sample volume?	Correct preservation?	Receptor/Methoding?	Container in good condition?
☒	☒	☒	☒	☒

ALS FIELD SERVICES
☐ Pickup
☐ Labor
☐ Composite Sampling
☐ Rental Equipment
☐ Other:

October 3, 2018

Ms. Kelly Lurie
AECOM - Mechanicsburg
100 Sterling Parkway
Suite 205
Mechanicsburg, PA 17055

Certificate of Analysis

Project Name:	2015-SCOTIA NAVY DEPOT-PO 60440641	Workorder:	2339926
Purchase Order:	66432/60440641.11	Workorder ID:	ASN042 2015-SCOTIA NAVY DEPOT-

Dear Ms. Lurie:

Enclosed are the analytical results for samples received by the laboratory on Saturday, September 22, 2018.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

CC: Mr. Greg Malzone , Mr. John Santacroce , Mr. Scott Underhill

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Mrs. Vanessa N Badman
Project Coordinator

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October 3, 2018

Ms. Kelly Lurie
AECOM - Mechanicsburg
100 Sterling Parkway
Suite 205
Mechanicsburg, PA 17055

Certificate of Analysis

Project Name:	2015-SCOTIA NAVY DEPOT-PO 60440641	Workorder:	2339926
Purchase Order:	66432/60440641.11	Workorder ID:	ASN042 2015-SCOTIA NAVY DEPOT-

Dear Ms. Lurie:

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Greg Malzone , Mr. John Santacroce , Mr. Scott Underhill

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Mrs. Vanessa N Badman
Project Coordinator

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**SAMPLE SUMMARY**

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2339926001	MW-28	Ground Water	9/21/2018 11:05	9/22/2018 09:25	Collected by Client
2339926002	Trip Blank	Ground Water	9/22/2018 09:25	9/22/2018 09:25	Collected by Client

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SAMPLE SUMMARY

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

Lab ID: **2339926001**
Sample ID: **MW-28**

Date Collected: 9/21/2018 11:05 Matrix: Ground Water
Date Received: 9/22/2018 09:25

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
1,1-Dichloroethane	1.2		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
1,1-Dichloroethene	0.34J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
cis-1,2-Dichloroethene	4.5		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
trans-1,2-Dichloroethene	0.33J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
Tetrachloroethene	43.7		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
1,1,1-Trichloroethane	9.0		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
1,1,2-Trichloroethane	0.42J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
Trichloroethene	232		ug/L	5.0	3.8	1.7	SW846 8260C		10/2/18 21:27	TMP	K
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	129	2	%	81 - 118			SW846 8260C		10/2/18 21:27	TMP	K
1,2-Dichloroethane-d4 (S)	118		%	81 - 118			SW846 8260C		9/27/18 20:51	TMP	B
4-Bromofluorobenzene (S)	121	4	%	85 - 114			SW846 8260C		10/2/18 21:27	TMP	K
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C		9/27/18 20:51	TMP	B
Dibromofluoromethane (S)	116		%	80 - 119			SW846 8260C		10/2/18 21:27	TMP	K
Dibromofluoromethane (S)	113		%	80 - 119			SW846 8260C		9/27/18 20:51	TMP	B
Toluene-d8 (S)	77.2	3	%	89 - 112			SW846 8260C		10/2/18 21:27	TMP	K
Toluene-d8 (S)	105		%	89 - 112			SW846 8260C		9/27/18 20:51	TMP	B
LIGHT HYDROCARBON GASES											
Ethane	1.3J	J	ug/L	3.3	3.3	0.23	RSK 175		9/25/18 01:01	EGO	A
Ethene	1.4J	J	ug/L	2.4	2.4	0.40	RSK 175		9/25/18 01:01	EGO	A
Methane	60.8		ug/L	1.5	1.5	0.34	RSK 175		9/25/18 01:01	EGO	A
WET CHEMISTRY											
Alkalinity, Total	345	1	mg/L	5	5	0.8	SM2320B-2011		9/28/18 05:28	MSA	F
Chloride	42.7		mg/L	2.0	0.50	0.16	EPA 300.0		9/22/18 14:47	CHW	E
Nitrate-N	0.58		mg/L	0.20	0.060	0.020	EPA 300.0		9/22/18 14:47	CHW	E
Sulfate	13.2		mg/L	2.0	0.50	0.20	EPA 300.0		9/22/18 14:47	CHW	E
Total Organic Carbon (TOC)	0.85J	J	mg/L	1.0	0.50	0.18	SM5310B-2011		9/28/18 19:54	PAG	C
METALS											
Iron, Total	0.045U	U	mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 12:08	SRT	H1

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ANALYTICAL RESULTS

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

Lab ID: **2339926001**
Sample ID: **MW-28**Date Collected: 9/21/2018 11:05 Matrix: Ground Water
Date Received: 9/22/2018 09:25

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 10:34	SRT	I1

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Project Coordinator**ALS Environmental Laboratory Locations Across North America**Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay
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ANALYTICAL RESULTS

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

Lab ID: **2339926002**

Date Collected: 9/22/2018 09:25

Matrix: Ground Water

Sample ID: **Trip Blank**

Date Received: 9/22/2018 09:25

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	112		%	81 - 118			SW846 8260C		9/27/18 17:25	TMP	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C		9/27/18 17:25	TMP	A
Dibromofluoromethane (S)	106		%	80 - 119			SW846 8260C		9/27/18 17:25	TMP	A
Toluene-d8 (S)	103		%	89 - 112			SW846 8260C		9/27/18 17:25	TMP	A



Mrs. Vanessa N Badman
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2339926001	1	MW-28	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2339926001	2	MW-28	SW846 8260C	1,2-Dichloroethane-d4
The surrogate 1,2-Dichloroethane-d4 for method SW846 8260C was outside of control limits. The % Recovery was reported as 129 and the control limits were 81 to 118. This result was reported at a dilution of 5.				
2339926001	3	MW-28	SW846 8260C	Toluene-d8
The surrogate Toluene-d8 for method SW846 8260C was outside of control limits. The % Recovery was reported as 77.2 and the control limits were 89 to 112. This result was reported at a dilution of 5.				
2339926001	4	MW-28	SW846 8260C	4-Bromofluorobenzene
The surrogate 4-Bromofluorobenzene for method SW846 8260C was outside of control limits. The % Recovery was reported as 121 and the control limits were 85 to 114. This result was reported at a dilution of 5.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Analysis Method	Prep Method
2339926001	MW-28	EPA 300.0	
2339926001	MW-28	In-House	
2339926001	MW-28	RSK 175	
2339926001	MW-28	SM2320B-2011	
2339926001	MW-28	SM5310B-2011	
2339926001	MW-28	SW846 6010C	SW846 3015
2339926001	MW-28	SW846 6010C	SW846 6010C
2339926001	MW-28	SW846 8260C	
2339926002	Trip Blank	SW846 8260C	

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QUALITY CONTROL DATA

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

QC Batch: MDIG/73808 **Analysis Method:** SW846 6010C
QC Batch Method: SW846 3015
Associated Lab Samples: 2339926001

METHOD BLANK: 2815580

Parameter	Blank Result	Units	Reporting Limit
Iron, Total	0.045U	mg/L	0.067

LABORATORY CONTROL SAMPLE: 2815581

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Total	90.4	mg/L	1.1	1.0	87 - 115

MATRIX SPIKE: 2815582 DUPLICATE: 2815583 ORIGINAL: 2339919003

***NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Iron, Total	.01056	mg/L	1.1	1.11221	1.07488	99.1	95.8	87 - 115	3.41	20

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QUALITY CONTROL DATA

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

QC Batch: MDIG/73809 **Analysis Method:** SW846 6010C
QC Batch Method: SW846 6010C
Associated Lab Samples: 2339926001

METHOD BLANK: 2815584

Parameter	Blank Result	Units	Reporting Limit
Iron, Dissolved	0.044U	mg/L	0.067

LABORATORY CONTROL SAMPLE: 2815585

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Dissolved	94.6	mg/L	1.1	1.1	87 - 115

MATRIX SPIKE: 2815586 DUPLICATE: 2815587 ORIGINAL: 2339919003

***NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Iron, Dissolved	.04522	mg/L	1.1	1.07867	1.11444	93	96.2	87 - 115	3.26	20

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QUALITY CONTROL DATA

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

QC Batch: SVGC/50739 **Analysis Method:** RSK 175
QC Batch Method: RSK 175
Associated Lab Samples: 2339926001

METHOD BLANK: 2815082

Parameter	Blank Result	Units	Reporting Limit
Ethane	3.31	ug/L	3.3
Ethene	2.41	ug/L	2.4
Methane	1.51	ug/L	1.5

SAMPLE DUPLICATE: 2815083 ORIGINAL: 2339919003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	0	NC	20
Ethene	0	ug/L	0	NC	20
Methane	.25	ug/L	.13	63.2*	20

SAMPLE DUPLICATE: 2815211 ORIGINAL: 2339928001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	0	NC	20
Methane	0	ug/L	0	NC	20

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QUALITY CONTROL DATA

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

QC Batch: VOMS/48077 **Analysis Method:** SW846 8260C
QC Batch Method: SW846 8260C
Associated Lab Samples: 2339926001, 2339926002

METHOD BLANK: 2814603

Parameter	Blank Result	Units	Reporting Limit
Carbon Tetrachloride	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.53J	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	111	%	81 - 118
4-Bromofluorobenzene (S)	107	%	85 - 114
Dibromofluoromethane (S)	109	%	80 - 119
Toluene-d8 (S)	104	%	89 - 112

LABORATORY CONTROL SAMPLE: 2814604

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	106	ug/L	20	21.1	72 - 136
1,1-Dichloroethane	104	ug/L	20	20.7	77 - 125
1,2-Dichloroethane	103	ug/L	20	20.5	73 - 128
1,1-Dichloroethene	106	ug/L	20	21.3	71 - 131
cis-1,2-Dichloroethene	99.5	ug/L	20	19.9	78 - 123
trans-1,2-Dichloroethene	109	ug/L	20	21.7	75 - 124
1,1,1,2-Tetrachloroethane	103	ug/L	20	20.6	78 - 124
1,1,2,2-Tetrachloroethane	104	ug/L	20	20.8	71 - 121
Tetrachloroethene	106	ug/L	20	21.3	74 - 129
Toluene	105	ug/L	20	21.0	80 - 121
1,1,1-Trichloroethane	101	ug/L	20	20.2	74 - 131
1,1,2-Trichloroethane	103	ug/L	20	20.6	80 - 119
Trichloroethene	98.9	ug/L	20	19.8	79 - 123

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QUALITY CONTROL DATA

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

Vinyl Chloride	87.3	ug/L	20	17.5	58 - 137
1,2-Dichloroethane-d4 (S)	107	%			81 - 118
4-Bromofluorobenzene (S)	107	%			85 - 114
Dibromofluoromethane (S)	107	%			80 - 119
Toluene-d8 (S)	106	%			89 - 112

MATRIX SPIKE: 2817710 DUPLICATE: 2817711 ORIGINAL: 2339919003

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Carbon Tetrachloride	0	ug/L	20	25.4923	24.0603	127	120	72 - 136	5.78	30
1,1-Dichloroethane	0	ug/L	20	22.9354	23.6192	115	118	77 - 125	2.94	30
1,2-Dichloroethane	0	ug/L	20	22.3863	21.3962	112	107	73 - 128	4.52	30
1,1-Dichloroethene	0	ug/L	20	25.3824	25.6415	127	128	71 - 131	1.02	30
cis-1,2-Dichloroethene	0	ug/L	20	21.9962	22.0809	110	110	78 - 123	.38	30
trans-1,2-Dichloroethene	0	ug/L	20	24.1283	23.9698	121	120	75 - 124	.66	30
1,1,1,2-Tetrachloroethane	0	ug/L	20	21.6696	21.7803	108	109	78 - 124	.51	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	20.0111	21.0808	100	105	71 - 121	5.21	30
Tetrachloroethene	0	ug/L	20	22.6459	23.0551	113	115	74 - 129	1.79	30
Toluene	0	ug/L	20	21.7424	22.2536	109	111	80 - 121	2.32	30
1,1,1-Trichloroethane	0	ug/L	20	24.191	23.6808	121	118	74 - 131	2.13	30
1,1,2-Trichloroethane	0	ug/L	20	19.7264	20.2524	98.6	101	80 - 119	2.63	30
Trichloroethene	136.644	ug/L	20	178.718	181.756	NC	NC	79 - 123	1.69	30
Vinyl Chloride	0	ug/L	20	22.8873	23.0921	114	115	58 - 137	.89	30
1,2-Dichloroethane-d4 (S)	115	%				115	117	81 - 118		
4-Bromofluorobenzene (S)	105	%				105	106	85 - 114		
Dibromofluoromethane (S)	109	%				109	108	80 - 119		
Toluene-d8 (S)	102	%				102	103	89 - 112		

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QUALITY CONTROL DATA

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

QC Batch: VOMS/48171 **Analysis Method:** SW846 8260C
QC Batch Method: SW846 8260C
Associated Lab Samples: 2339926001

METHOD BLANK: 2820164

Parameter	Blank Result	Units	Reporting Limit
Trichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
Carbon Tetrachloride	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	125	%	81 - 118
4-Bromofluorobenzene (S)	102	%	85 - 114
Dibromofluoromethane (S)	114	%	80 - 119
Toluene-d8 (S)	91.4	%	89 - 112

LABORATORY CONTROL SAMPLE: 2820165

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Trichloroethene	103	ug/L	20	20.5	79 - 123
1,1,1,2-Tetrachloroethane	103	ug/L	20	20.6	78 - 124
1,1,1-Trichloroethane	126	ug/L	20	25.1	74 - 131
1,1,2,2-Tetrachloroethane	99.8	ug/L	20	20.0	71 - 121
1,1,2-Trichloroethane	97.8	ug/L	20	19.6	80 - 119
1,1-Dichloroethane	117	ug/L	20	23.5	77 - 125
1,1-Dichloroethene	135*	ug/L	20	27.0	71 - 131
1,2-Dichloroethane	104	ug/L	20	20.8	73 - 128
Carbon Tetrachloride	125	ug/L	20	25.1	72 - 136
Tetrachloroethene	102	ug/L	20	20.4	74 - 129
Toluene	94.6	ug/L	20	18.9	80 - 121
Vinyl Chloride	88.2	ug/L	20	17.6	58 - 137
cis-1,2-Dichloroethene	116	ug/L	20	23.2	78 - 123

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QUALITY CONTROL DATA

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

trans-1,2-Dichloroethene	125*	ug/L	20	25.1	75 - 124
1,2-Dichloroethane-d4 (S)	99.9	%			81 - 118
4-Bromofluorobenzene (S)	104	%			85 - 114
Dibromofluoromethane (S)	112	%			80 - 119
Toluene-d8 (S)	77.5*	%			89 - 112

MATRIX SPIKE: 2820499 DUPLICATE: 2820500 ORIGINAL: 2341146001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Trichloroethene	1.35951	ug/L	20	22.9755	22.7294	108	107	79 - 123	1.08	30
1,1,1-Trichloroethane	0	ug/L	20	24.0899	25.4815	120	127	74 - 131	5.61	30
1,1-Dichloroethane	0	ug/L	20	21.8008	25.2044	109	126*	77 - 125	14.5	30
1,1-Dichloroethene	0	ug/L	20	24.5426	28.5541	123	143*	71 - 131	15.1	30
1,2-Dichloroethane	0	ug/L	20	20.9369	22.013	105	110	73 - 128	5.01	30
Tetrachloroethene	0	ug/L	20	23.9732	20.4106	120	102	74 - 129	16.1	30
Vinyl Chloride	0	ug/L	20	17.2975	20.5347	86.5	103	58 - 137	17.1	30
cis-1,2-Dichloroethene	.9968	ug/L	20	22.2341	25.5894	106	123	78 - 123	14	30
trans-1,2-Dichloroethene	0	ug/L	20	23.354	26.677	117	133*	75 - 124	13.3	30
1,2-Dichloroethane-d4 (S)	112	%				112	108	81 - 118		
4-Bromofluorobenzene (S)	106	%				106	90.4	85 - 114		
Dibromofluoromethane (S)	101	%				101	110	80 - 119		
Toluene-d8 (S)	90.7	%				90.7	80.3*	89 - 112		

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QUALITY CONTROL DATA

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/210831 **Analysis Method:** EPA 300.0
QC Batch Method: EPA 300.0
Associated Lab Samples: 2339926001

LABORATORY CONTROL SAMPLE: 2815244

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	100	mg/L	20	20.0	87 - 111
Nitrate-N	95.2	mg/L	2.5	2.4	88 - 111
Sulfate	101	mg/L	20	20.2	87 - 112

METHOD BLANK: 2815246

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.18J	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

METHOD BLANK: 2815248

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.19J	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

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QUALITY CONTROL DATA

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/210997 **Analysis Method:** SM2320B-2011
QC Batch Method: SM2320B-2011
Associated Lab Samples: 2339926001

METHOD BLANK: 2817316

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

SAMPLE DUPLICATE: 2817321 ORIGINAL: 2339919003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	212.61134	mg/L	212.41206	.09	20

METHOD BLANK: 2817324

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2817325 ORIGINAL: 2340512001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	93.56151	mg/L	89.60468	4.32	20

METHOD BLANK: 2817328

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2817329 ORIGINAL: 2340512002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
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QUALITY CONTROL DATA

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

Alkalinity, Total	88.99052	mg/L	85.88464	3.55	20
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METHOD BLANK: 2817332

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2817333 ORIGINAL: 2340564001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	39.22836	mg/L	39.03287	.5	20

METHOD BLANK: 2817336

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2817337 ORIGINAL: 2340617001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	111.96096	mg/L	107.59691	3.98	20

METHOD BLANK: 2817340

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2817341 ORIGINAL: 2340617003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	370.67017	mg/L	375.13303	1.2	20

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QUALITY CONTROL DATA

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

METHOD BLANK: 2817344

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2817345 ORIGINAL: 2340672001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	23.5484	mg/L	22.66004	3.84	20

METHOD BLANK: 2818106

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	1J	mg/L	5

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QUALITY CONTROL DATA

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/211017 **Analysis Method:** SM5310B-2011
QC Batch Method: 415.1/9060/5310B
Associated Lab Samples: 2339926001

METHOD BLANK: 2817668

Parameter	Blank Result	Units	Reporting Limit
Total Organic Carbon (TOC)	0.50U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2817669

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	99	mg/L	1	0.99J	85 - 115

MATRIX SPIKE: 2817670 DUPLICATE: 2817671 ORIGINAL: 2340190003

***NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	3.449	mg/L	6	9.385	9.414	98.9	99.4	85 - 115	.31	20

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QUALITY CONTROL DATA QUALIFIERS

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

QUALITY CONTROL PARAMETER QUALIFIERS

Lab ID	#	Sample Type	Analytical Method	Analyte
2820165	1	Lab Control Standard	SW846 8260C	trans-1,2-Dichloroethene
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 125 and the control limits were 75 to 124.				
2820165	2	Lab Control Standard	SW846 8260C	1,1-Dichloroethene
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,1-Dichloroethene. The % Recovery was reported as 135 and the control limits were 71 to 131.				

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2339926001	MW-28			SW846 8260C	VOMS/48077
2339926002	Trip Blank			SW846 8260C	VOMS/48077
2339926001	MW-28			RSK 175	SVGC/50739
2339926001	MW-28			EPA 300.0	WETC/210831
2339926001	MW-28	SW846 3015	MDIG/73808	SW846 6010C	META/63887
2339926001	MW-28	SW846 6010C	MDIG/73809	SW846 6010C	META/63886
2339926001	MW-28			SM2320B-2011	WETC/210997
2339926001	MW-28			SM5310B-2011	WETC/211017
2339926001	MW-28			SW846 8260C	VOMS/48171

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September 30, 2018

Ms. Kelly Lurie
AECOM - Mechanicsburg
100 Sterling Parkway
Suite 205
Mechanicsburg, PA 17055

Certificate of Analysis

Project Name:	2015-SCOTIA NAVY DEPOT-PO 60440641	Workorder:	2339740
Purchase Order:	66432/60440641.11	Workorder ID:	ASN040 60440641

Dear Ms. Lurie:

Enclosed are the analytical results for samples received by the laboratory on Friday, September 21, 2018.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Greg Malzone , Mr. John Santacroce , Mr. Scott Underhill

*This page is included as part of the Analytical Report and
must be retained as a permanent record thereof.*



Mrs. Vanessa N Badman
Project Coordinator

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SAMPLE SUMMARY

Workorder: 2339740 ASN040|60440641

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2339740001	MW-32	Ground Water	9/20/2018 09:10	9/21/2018 09:05	Collected by Client
2339740002	MW-31	Ground Water	9/20/2018 10:50	9/21/2018 09:05	Collected by Client
2339740003	MW-30	Ground Water	9/20/2018 13:20	9/21/2018 09:05	Collected by Client
2339740004	MW-29	Ground Water	9/20/2018 15:00	9/21/2018 09:05	Collected by Client
2339740005	Equipment Blank	Ground Water	9/20/2018 00:00	9/21/2018 09:05	Collected by Client
2339740006	Trip Blank	Ground Water	9/21/2018 09:05	9/21/2018 09:05	Collected by Client

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SAMPLE SUMMARY

Workorder: 2339740 ASN040|60440641

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 2339740 ASN040|60440641

Lab ID: **2339740001**

Date Collected: 9/20/2018 09:10

Matrix: Ground Water

Sample ID: **MW-32**

Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
cis-1,2-Dichloroethene	1.3		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
Trichloroethene	95.4		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	117		%	81 - 118			SW846 8260C		9/27/18 19:43	TMP	B
4-Bromofluorobenzene (S)	108		%	85 - 114			SW846 8260C		9/27/18 19:43	TMP	B
Dibromofluoromethane (S)	112		%	80 - 119			SW846 8260C		9/27/18 19:43	TMP	B
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C		9/27/18 19:43	TMP	B
LIGHT HYDROCARBON GASES											
Ethane	21.1		ug/L	3.3	3.3	0.23	RSK 175		9/24/18 23:21	EGO	H
Ethene	4.7		ug/L	2.4	2.4	0.40	RSK 175		9/24/18 23:21	EGO	H
Methane	2650		ug/L	1.5	1.5	0.34	RSK 175		9/25/18 10:44	KJH	H
WET CHEMISTRY											
Alkalinity, Total	129	1	mg/L	5	5	0.8	SM2320B-2011		9/25/18 20:10	MSA	F
Chloride	27.8		mg/L	2.0	0.50	0.16	EPA 300.0		9/22/18 07:04	CHW	E
Nitrate-N	0.060U	U,2	mg/L	0.20	0.060	0.020	EPA 300.0		9/25/18 04:00	CHW	E
Sulfate	1.4J	J	mg/L	2.0	0.50	0.20	EPA 300.0		9/25/18 04:00	CHW	E
Total Organic Carbon (TOC)	3.9		mg/L	1.0	0.50	0.18	SM5310B-2011		9/27/18 10:09	PAG	C
METALS											
Iron, Total	0.51		mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 11:53	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 10:19	SRT	K1

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ANALYTICAL RESULTS

Workorder: 2339740 ASN040|60440641

Lab ID: **2339740001**

Date Collected: 9/20/2018 09:10

Matrix: Ground Water

Sample ID: **MW-32**

Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
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Mrs. Vanessa N Badman

Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2339740 ASN040|60440641

Lab ID: **2339740002**

Date Collected: 9/20/2018 10:50

Matrix: Ground Water

Sample ID: **MW-31**

Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
cis-1,2-Dichloroethene	0.34J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
Trichloroethene	19.7		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	119	3	%	81 - 118			SW846 8260C		9/27/18 20:06	TMP	B
4-Bromofluorobenzene (S)	104		%	85 - 114			SW846 8260C		9/27/18 20:06	TMP	B
Dibromofluoromethane (S)	112		%	80 - 119			SW846 8260C		9/27/18 20:06	TMP	B
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C		9/27/18 20:06	TMP	B
LIGHT HYDROCARBON GASES											
Ethane	4.2		ug/L	3.3	3.3	0.23	RSK 175		9/24/18 23:37	EGO	H
Ethene	1.4J	J	ug/L	2.4	2.4	0.40	RSK 175		9/24/18 23:37	EGO	H
Methane	90.6		ug/L	1.5	1.5	0.34	RSK 175		9/24/18 23:37	EGO	H
WET CHEMISTRY											
Alkalinity, Total	169	2	mg/L	5	5	0.8	SM2320B-2011		9/25/18 20:20	MSA	F
Chloride	32.0		mg/L	2.0	0.50	0.16	EPA 300.0		9/22/18 07:21	CHW	E
Nitrate-N	0.060U	U,4	mg/L	0.20	0.060	0.020	EPA 300.0		9/25/18 04:12	CHW	E
Sulfate	4.6		mg/L	2.0	0.50	0.20	EPA 300.0		9/25/18 04:12	CHW	E
Total Organic Carbon (TOC)	0.69J	J	mg/L	1.0	0.50	0.18	SM5310B-2011		9/27/18 10:09	PAG	C
METALS											
Iron, Total	0.76		mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 11:57	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 10:23	SRT	K1

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ANALYTICAL RESULTS

Workorder: 2339740 ASN040|60440641

Lab ID: **2339740002**

Date Collected: 9/20/2018 10:50

Matrix: Ground Water

Sample ID: **MW-31**

Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
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Mrs. Vanessa N Badman

Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2339740 ASN040|60440641

Lab ID: **2339740003**

Date Collected: 9/20/2018 13:20

Matrix: Ground Water

Sample ID: **MW-30**

Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
Trichloroethene	8.2		ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	114		%	81 - 118			SW846 8260C		9/22/18 19:02	TMP	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C		9/22/18 19:02	TMP	A
Dibromofluoromethane (S)	111		%	80 - 119			SW846 8260C		9/22/18 19:02	TMP	A
Toluene-d8 (S)	96.9		%	89 - 112			SW846 8260C		9/22/18 19:02	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	42.2		ug/L	3.3	3.3	0.23	RSK 175		9/24/18 23:53	EGO	H
Ethene	4.3		ug/L	2.4	2.4	0.40	RSK 175		9/24/18 23:53	EGO	H
Methane	4410		ug/L	1.5	1.5	0.34	RSK 175		9/25/18 11:06	KJH	H
WET CHEMISTRY											
Alkalinity, Total	59	1	mg/L	5	5	0.8	SM2320B-2011		9/25/18 20:30	MSA	F
Chloride	40.7		mg/L	2.0	0.50	0.16	EPA 300.0		9/22/18 07:38	CHW	E
Nitrate-N	0.060U	U,2	mg/L	0.20	0.060	0.020	EPA 300.0		9/25/18 04:24	CHW	E
Sulfate	0.50U	U	mg/L	2.0	0.50	0.20	EPA 300.0		9/25/18 04:24	CHW	E
Total Organic Carbon (TOC)	10.2		mg/L	2.0	1.0	0.37	SM5310B-2011		9/27/18 10:09	PAG	C
METALS											
Iron, Total	0.16		mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 12:01	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 10:26	SRT	K1

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ANALYTICAL RESULTS

Workorder: 2339740 ASN040|60440641

Lab ID: **2339740003**

Date Collected: 9/20/2018 13:20

Matrix: Ground Water

Sample ID: **MW-30**

Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
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Mrs. Vanessa N Badman

Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2339740 ASN040|60440641

Lab ID: **2339740004**

Date Collected: 9/20/2018 15:00

Matrix: Ground Water

Sample ID: **MW-29**

Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
1,1-Dichloroethane	0.87J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
1,1-Dichloroethene	0.41J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
cis-1,2-Dichloroethene	3.7		ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
trans-1,2-Dichloroethene	0.35J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
Tetrachloroethene	31.9		ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
1,1,1-Trichloroethane	10.4		ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
1,1,2-Trichloroethane	0.34J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
Trichloroethene	218		ug/L	5.0	3.8	1.7	SW846 8260C		9/27/18 20:28	TMP	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	117		%	81 - 118			SW846 8260C		9/22/18 19:24	TMP	A
1,2-Dichloroethane-d4 (S)	118		%	81 - 118			SW846 8260C		9/27/18 20:28	TMP	B
4-Bromofluorobenzene (S)	107		%	85 - 114			SW846 8260C		9/27/18 20:28	TMP	B
4-Bromofluorobenzene (S)	106		%	85 - 114			SW846 8260C		9/22/18 19:24	TMP	A
Dibromofluoromethane (S)	111		%	80 - 119			SW846 8260C		9/22/18 19:24	TMP	A
Dibromofluoromethane (S)	110		%	80 - 119			SW846 8260C		9/27/18 20:28	TMP	B
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C		9/27/18 20:28	TMP	B
Toluene-d8 (S)	96.4		%	89 - 112			SW846 8260C		9/22/18 19:24	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.31		ug/L	3.3	3.3	0.23	RSK 175		9/25/18 00:10	EGO	H
Ethene	2.41		ug/L	2.4	2.4	0.40	RSK 175		9/25/18 00:10	EGO	H
Methane	1.51		ug/L	1.5	1.5	0.34	RSK 175		9/25/18 00:10	EGO	H
WET CHEMISTRY											
Alkalinity, Total	374	1	mg/L	5	5	0.8	SM2320B-2011		9/25/18 20:42	MSA	F
Chloride	29.9		mg/L	2.0	0.50	0.16	EPA 300.0		9/22/18 07:55	CHW	E
Nitrate-N	0.48	2	mg/L	0.20	0.060	0.020	EPA 300.0		9/25/18 04:37	CHW	E
Sulfate	11.8		mg/L	2.0	0.50	0.20	EPA 300.0		9/25/18 04:37	CHW	E
Total Organic Carbon (TOC)	1.3		mg/L	1.0	0.50	0.18	SM5310B-2011		9/27/18 10:09	PAG	C
METALS											
Iron, Total	0.062J	J	mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 12:04	SRT	J1

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ANALYTICAL RESULTS

Workorder: 2339740 ASN040|60440641

Lab ID: **2339740004**
Sample ID: **MW-29**

Date Collected: 9/20/2018 15:00 Matrix: Ground Water
Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 10:30	SRT	K1



Mrs. Vanessa N Badman
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2339740 ASN040|60440641

Lab ID: **2339740005**
Sample ID: **Equipment Blank**

Date Collected: 9/20/2018 00:00 Matrix: Ground Water
Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	115		%	81 - 118			SW846 8260C		9/22/18 17:53	TMP	A
4-Bromofluorobenzene (S)	106		%	85 - 114			SW846 8260C		9/22/18 17:53	TMP	A
Dibromofluoromethane (S)	111		%	80 - 119			SW846 8260C		9/22/18 17:53	TMP	A
Toluene-d8 (S)	97.3		%	89 - 112			SW846 8260C		9/22/18 17:53	TMP	A



Mrs. Vanessa N Badman
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ANALYTICAL RESULTS

Workorder: 2339740 ASN040|60440641

Lab ID: **2339740006**

Date Collected: 9/21/2018 09:05

Matrix: Ground Water

Sample ID: **Trip Blank**

Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	115		%	81 - 118			SW846 8260C		9/22/18 17:31	TMP	A
4-Bromofluorobenzene (S)	108		%	85 - 114			SW846 8260C		9/22/18 17:31	TMP	A
Dibromofluoromethane (S)	111		%	80 - 119			SW846 8260C		9/22/18 17:31	TMP	A
Toluene-d8 (S)	98.5		%	89 - 112			SW846 8260C		9/22/18 17:31	TMP	A



Mrs. Vanessa N Badman
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2339740 ASN040|60440641

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2339740001	1	MW-32	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2339740001	2	MW-32	EPA 300.0	Nitrate-N
The sample was originally run within hold time, but required further analysis that exceeded hold time.				
2339740002	2	MW-31	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2339740002	3	MW-31	SW846 8260C	1,2-Dichloroethane-d4
The surrogate 1,2-Dichloroethane-d4 for method SW846 8260C was outside of control limits. The % Recovery was reported as 119 and the control limits were 81 to 118. This result was reported at a dilution of 1.				
2339740002	4	MW-31	EPA 300.0	Nitrate-N
The sample was originally run within hold time, but required further analysis that exceeded hold time.				
2339740003	1	MW-30	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2339740003	2	MW-30	EPA 300.0	Nitrate-N
The sample was originally run within hold time, but required further analysis that exceeded hold time.				
2339740004	1	MW-29	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2339740004	2	MW-29	EPA 300.0	Nitrate-N
The sample was originally run within hold time, but required further analysis that exceeded hold time.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 2339740 ASN040|60440641

Lab ID	Sample ID	Analysis Method	Prep Method
2339740001	MW-32	EPA 300.0	
2339740001	MW-32	In-House	
2339740001	MW-32	RSK 175	
2339740001	MW-32	SM2320B-2011	
2339740001	MW-32	SM5310B-2011	
2339740001	MW-32	SW846 6010C	SW846 3015
2339740001	MW-32	SW846 6010C	SW846 6010C
2339740001	MW-32	SW846 8260C	
2339740002	MW-31	EPA 300.0	
2339740002	MW-31	In-House	
2339740002	MW-31	RSK 175	
2339740002	MW-31	SM2320B-2011	
2339740002	MW-31	SM5310B-2011	
2339740002	MW-31	SW846 6010C	SW846 3015
2339740002	MW-31	SW846 6010C	SW846 6010C
2339740002	MW-31	SW846 8260C	
2339740003	MW-30	EPA 300.0	
2339740003	MW-30	In-House	
2339740003	MW-30	RSK 175	
2339740003	MW-30	SM2320B-2011	
2339740003	MW-30	SM5310B-2011	
2339740003	MW-30	SW846 6010C	SW846 3015
2339740003	MW-30	SW846 6010C	SW846 6010C
2339740003	MW-30	SW846 8260C	
2339740004	MW-29	EPA 300.0	
2339740004	MW-29	In-House	
2339740004	MW-29	RSK 175	
2339740004	MW-29	SM2320B-2011	
2339740004	MW-29	SM5310B-2011	
2339740004	MW-29	SW846 6010C	SW846 3015
2339740004	MW-29	SW846 6010C	SW846 6010C
2339740004	MW-29	SW846 8260C	
2339740005	Equipment Blank	SW846 8260C	
2339740006	Trip Blank	SW846 8260C	

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QUALITY CONTROL DATA

Workorder: 2339740 ASN040|60440641

QC Batch: MDIG/73808 **Analysis Method:** SW846 6010C
QC Batch Method: SW846 3015
Associated Lab Samples: 2339740001, 2339740002, 2339740003, 2339740004

METHOD BLANK: 2815580

Parameter	Blank Result	Units	Reporting Limit
Iron, Total	0.045U	mg/L	0.067

LABORATORY CONTROL SAMPLE: 2815581

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Total	90.4	mg/L	1.1	1.0	87 - 115

MATRIX SPIKE: 2815582 DUPLICATE: 2815583 ORIGINAL: 2339919003

***NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Iron, Total	.01056	mg/L	1.1	1.11221	1.07488	99.1	95.8	87 - 115	3.41	20

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QUALITY CONTROL DATA

Workorder: 2339740 ASN040|60440641

QC Batch: MDIG/73809 **Analysis Method:** SW846 6010C
QC Batch Method: SW846 6010C
Associated Lab Samples: 2339740001, 2339740002, 2339740003, 2339740004

METHOD BLANK: 2815584

Parameter	Blank Result	Units	Reporting Limit
Iron, Dissolved	0.044U	mg/L	0.067

LABORATORY CONTROL SAMPLE: 2815585

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Dissolved	94.6	mg/L	1.1	1.1	87 - 115

MATRIX SPIKE: 2815586 DUPLICATE: 2815587 ORIGINAL: 2339919003

***NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Iron, Dissolved	.04522	mg/L	1.1	1.07867	1.11444	93	96.2	87 - 115	3.26	20

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QUALITY CONTROL DATA

Workorder: 2339740 ASN040|60440641

QC Batch: SVGC/50739 **Analysis Method:** RSK 175
QC Batch Method: RSK 175
Associated Lab Samples: 2339740001, 2339740002, 2339740003, 2339740004

METHOD BLANK: 2815082

Parameter	Blank Result	Units	Reporting Limit
Ethane	3.31	ug/L	3.3
Ethene	2.41	ug/L	2.4
Methane	1.51	ug/L	1.5

SAMPLE DUPLICATE: 2815083 ORIGINAL: 2339919003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	0	NC	20
Ethene	0	ug/L	0	NC	20
Methane	.25	ug/L	.13	63.2*	20

SAMPLE DUPLICATE: 2815211 ORIGINAL: 2339928001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	0	NC	20
Methane	0	ug/L	0	NC	20

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QUALITY CONTROL DATA

Workorder: 2339740 ASN040|60440641

QC Batch: VOMS/48068 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 2339740001, 2339740002, 2339740003, 2339740004, 2339740005, 2339740006

METHOD BLANK: 2814149

Parameter	Blank Result	Units	Reporting Limit
Carbon Tetrachloride	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	110	%	81 - 118
4-Bromofluorobenzene (S)	106	%	85 - 114
Dibromofluoromethane (S)	108	%	80 - 119
Toluene-d8 (S)	100	%	89 - 112

LABORATORY CONTROL SAMPLE: 2814150

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	107	ug/L	20	21.3	72 - 136
1,1-Dichloroethane	102	ug/L	20	20.3	77 - 125
1,2-Dichloroethane	101	ug/L	20	20.3	73 - 128
1,1-Dichloroethene	113	ug/L	20	22.5	71 - 131
cis-1,2-Dichloroethene	101	ug/L	20	20.2	78 - 123
trans-1,2-Dichloroethene	111	ug/L	20	22.2	75 - 124
1,1,1,2-Tetrachloroethane	104	ug/L	20	20.8	78 - 124
1,1,2,2-Tetrachloroethane	92.4	ug/L	20	18.5	71 - 121
Tetrachloroethene	106	ug/L	20	21.1	74 - 129
Toluene	107	ug/L	20	21.3	80 - 121
1,1,1-Trichloroethane	108	ug/L	20	21.6	74 - 131
1,1,2-Trichloroethane	96	ug/L	20	19.2	80 - 119
Trichloroethene	102	ug/L	20	20.4	79 - 123

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QUALITY CONTROL DATA

Workorder: 2339740 ASN040|60440641

Vinyl Chloride	73.3	ug/L	20	14.7	58 - 137
1,2-Dichloroethane-d4 (S)	104	%			81 - 118
4-Bromofluorobenzene (S)	104	%			85 - 114
Dibromofluoromethane (S)	100	%			80 - 119
Toluene-d8 (S)	98.9	%			89 - 112

MATRIX SPIKE: 2814153 DUPLICATE: 2814154 ORIGINAL: 2339478006

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Carbon Tetrachloride	0	ug/L	20	24.5922	23.9402	123	120	72 - 136	2.69	30
1,1-Dichloroethane	0	ug/L	20	22.564	22.6106	113	113	77 - 125	.21	30
1,2-Dichloroethane	0	ug/L	20	22.4038	22.0293	112	110	73 - 128	1.69	30
1,1-Dichloroethene	0	ug/L	20	25.2565	24.4513	126	122	71 - 131	3.24	30
cis-1,2-Dichloroethene	0	ug/L	20	21.754	21.3656	109	107	78 - 123	1.8	30
trans-1,2-Dichloroethene	0	ug/L	20	23.7182	23.2365	119	116	75 - 124	2.05	30
1,1,1,2-Tetrachloroethane	0	ug/L	20	21.7852	21.8822	109	109	78 - 124	.44	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	19.0293	18.8945	95.1	94.5	71 - 121	.71	30
Tetrachloroethene	0	ug/L	20	22.937	22.8242	115	114	74 - 129	.49	30
Toluene	0	ug/L	20	22.3663	22.148	112	111	80 - 121	.98	30
1,1,1-Trichloroethane	0	ug/L	20	24.3046	23.4061	122	117	74 - 131	3.77	30
1,1,2-Trichloroethane	0	ug/L	20	19.5549	19.7729	97.8	98.9	80 - 119	1.11	30
Trichloroethene	0	ug/L	20	21.9796	21.7086	110	109	79 - 123	1.24	30
Vinyl Chloride	0	ug/L	20	17.0418	16.8234	85.2	84.1	58 - 137	1.29	30
1,2-Dichloroethane-d4 (S)	114	%				114	111	81 - 118		
4-Bromofluorobenzene (S)	99.7	%				99.7	104	85 - 114		
Dibromofluoromethane (S)	104	%				104	103	80 - 119		
Toluene-d8 (S)	97.1	%				97.1	98.2	89 - 112		

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QUALITY CONTROL DATA

Workorder: 2339740 ASN040|60440641

QC Batch: VOMS/48077 **Analysis Method:** SW846 8260C
QC Batch Method: SW846 8260C
Associated Lab Samples: 2339740001, 2339740002, 2339740004

METHOD BLANK: 2814603

Parameter	Blank Result	Units	Reporting Limit
Carbon Tetrachloride	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.53J	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	111	%	81 - 118
4-Bromofluorobenzene (S)	107	%	85 - 114
Dibromofluoromethane (S)	109	%	80 - 119
Toluene-d8 (S)	104	%	89 - 112

LABORATORY CONTROL SAMPLE: 2814604

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	106	ug/L	20	21.1	72 - 136
1,1-Dichloroethane	104	ug/L	20	20.7	77 - 125
1,2-Dichloroethane	103	ug/L	20	20.5	73 - 128
1,1-Dichloroethene	106	ug/L	20	21.3	71 - 131
cis-1,2-Dichloroethene	99.5	ug/L	20	19.9	78 - 123
trans-1,2-Dichloroethene	109	ug/L	20	21.7	75 - 124
1,1,1,2-Tetrachloroethane	103	ug/L	20	20.6	78 - 124
1,1,2,2-Tetrachloroethane	104	ug/L	20	20.8	71 - 121
Tetrachloroethene	106	ug/L	20	21.3	74 - 129
Toluene	105	ug/L	20	21.0	80 - 121
1,1,1-Trichloroethane	101	ug/L	20	20.2	74 - 131
1,1,2-Trichloroethane	103	ug/L	20	20.6	80 - 119
Trichloroethene	98.9	ug/L	20	19.8	79 - 123

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QUALITY CONTROL DATA

Workorder: 2339740 ASN040|60440641

Vinyl Chloride	87.3	ug/L	20	17.5	58 - 137
1,2-Dichloroethane-d4 (S)	107	%			81 - 118
4-Bromofluorobenzene (S)	107	%			85 - 114
Dibromofluoromethane (S)	107	%			80 - 119
Toluene-d8 (S)	106	%			89 - 112

MATRIX SPIKE: 2817710 DUPLICATE: 2817711 ORIGINAL: 2339919003

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Carbon Tetrachloride	0	ug/L	20	25.4923	24.0603	127	120	72 - 136	5.78	30
1,1-Dichloroethane	0	ug/L	20	22.9354	23.6192	115	118	77 - 125	2.94	30
1,2-Dichloroethane	0	ug/L	20	22.3863	21.3962	112	107	73 - 128	4.52	30
1,1-Dichloroethene	0	ug/L	20	25.3824	25.6415	127	128	71 - 131	1.02	30
cis-1,2-Dichloroethene	0	ug/L	20	21.9962	22.0809	110	110	78 - 123	.38	30
trans-1,2-Dichloroethene	0	ug/L	20	24.1283	23.9698	121	120	75 - 124	.66	30
1,1,1,2-Tetrachloroethane	0	ug/L	20	21.6696	21.7803	108	109	78 - 124	.51	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	20.0111	21.0808	100	105	71 - 121	5.21	30
Tetrachloroethene	0	ug/L	20	22.6459	23.0551	113	115	74 - 129	1.79	30
Toluene	0	ug/L	20	21.7424	22.2536	109	111	80 - 121	2.32	30
1,1,1-Trichloroethane	0	ug/L	20	24.191	23.6808	121	118	74 - 131	2.13	30
1,1,2-Trichloroethane	0	ug/L	20	19.7264	20.2524	98.6	101	80 - 119	2.63	30
Trichloroethene	136.644	ug/L	20	178.718	181.756	NC	NC	79 - 123	1.69	30
Vinyl Chloride	0	ug/L	20	22.8873	23.0921	114	115	58 - 137	.89	30
1,2-Dichloroethane-d4 (S)	115	%				115	117	81 - 118		
4-Bromofluorobenzene (S)	105	%				105	106	85 - 114		
Dibromofluoromethane (S)	109	%				109	108	80 - 119		
Toluene-d8 (S)	102	%				102	103	89 - 112		

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QUALITY CONTROL DATA

Workorder: 2339740 ASN040|60440641

QC Batch: WETC/210750 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 2339740001, 2339740002, 2339740003, 2339740004

METHOD BLANK: 2814013

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.25U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2814015

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	106	mg/L	20	21.1	87 - 111

METHOD BLANK: 2814018

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.25U	mg/L	1.0

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QUALITY CONTROL DATA

Workorder: 2339740 ASN040|60440641

QC Batch: WETC/210822 **Analysis Method:** SM2320B-2011

QC Batch Method: SM2320B-2011

Associated Lab Samples: 2339740001, 2339740002, 2339740003, 2339740004

METHOD BLANK: 2815015

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

METHOD BLANK: 2815023

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

METHOD BLANK: 2815027

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2815028 ORIGINAL: 2339619003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	109.43001	mg/L	108.44718	.9	20

METHOD BLANK: 2815031

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2815032 ORIGINAL: 2339619004

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
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QUALITY CONTROL DATA

Workorder: 2339740 ASN040|60440641

Alkalinity, Total	174.57675	mg/L	166.18297	4.93	20
-------------------	-----------	------	-----------	------	----

METHOD BLANK: 2815035

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2815036 ORIGINAL: 2339621002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	39.32563	mg/L	41.17321	4.59	20

METHOD BLANK: 2815039

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2815040 ORIGINAL: 2339632001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	.8875	mg/L	.9241	4.04	20

METHOD BLANK: 2815043

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2815044 ORIGINAL: 2339710001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	111.04765	mg/L	105.12995	5.47	20

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QUALITY CONTROL DATA

Workorder: 2339740 ASN040|60440641

METHOD BLANK: 2815047

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2815048 ORIGINAL: 2339791001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	299.17905	mg/L	295.90921	1.1	20

METHOD BLANK: 2815051

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2815052 ORIGINAL: 2339791003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	126.54004	mg/L	118.59071	6.49	20

METHOD BLANK: 2815055

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	1J	mg/L	5

METHOD BLANK: 2815059

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

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QUALITY CONTROL DATA

Workorder: 2339740 ASN040|60440641

SAMPLE DUPLICATE: 2815060 ORIGINAL: 2339916001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	364.69922	mg/L	343.28699	6.05	20

METHOD BLANK: 2815063

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

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QUALITY CONTROL DATA

Workorder: 2339740 ASN040|60440641

QC Batch: WETC/210836 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 2339740001, 2339740002, 2339740003, 2339740004

METHOD BLANK: 2815338

Parameter	Blank Result	Units	Reporting Limit
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0
Chloride	0.25U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2815340

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Nitrate-N	90.8	mg/L	2.5	2.3	88 - 111
Sulfate	97.6	mg/L	20	19.5	87 - 112
Chloride	97.7	mg/L	20	19.5	87 - 111

MATRIX SPIKE: 2815342 DUPLICATE: 2815343 ORIGINAL: 2339919003

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Nitrate-N	.4	mg/L	5	4.8	4.86	88	89.2	88 - 111	1.24	15
Sulfate	14.6	mg/L	40	50.96	51.04	90.9	91.1	87 - 112	.16	15
Chloride	24.8	mg/L	40	59.14	58.64	85.9*	84.6*	87 - 111	.85	15

METHOD BLANK: 2815345

Parameter	Blank Result	Units	Reporting Limit
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0
Chloride	0.13J	mg/L	1.0

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QUALITY CONTROL DATA

Workorder: 2339740 ASN040|60440641

QC Batch: WETC/210945 **Analysis Method:** SM5310B-2011
QC Batch Method: 415.1/9060/5310B
Associated Lab Samples: 2339740001, 2339740002, 2339740003, 2339740004

METHOD BLANK: 2816781

Parameter	Blank Result	Units	Reporting Limit
Total Organic Carbon (TOC)	0.50U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2816782

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	101	mg/L	1	1.0	85 - 115

MATRIX SPIKE: 2816783 DUPLICATE: 2816784 ORIGINAL: 2339740002

***NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	.689	mg/L	6	6.976	6.874	105	103	85 - 115	1.47	20

MATRIX SPIKE: 2816785 DUPLICATE: 2816786 ORIGINAL: 2340045003

***NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	2.491	mg/L	6	8.423	8.418	98.9	98.8	85 - 115	.06	20

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2339740 ASN040|60440641

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2339740001	MW-32			EPA 300.0	WETC/210750
2339740002	MW-31			EPA 300.0	WETC/210750
2339740003	MW-30			EPA 300.0	WETC/210750
2339740004	MW-29			EPA 300.0	WETC/210750
2339740003	MW-30			SW846 8260C	VOMS/48068
2339740004	MW-29			SW846 8260C	VOMS/48068
2339740005	Equipment Blank			SW846 8260C	VOMS/48068
2339740006	Trip Blank			SW846 8260C	VOMS/48068
2339740001	MW-32			SW846 8260C	VOMS/48077
2339740002	MW-31			SW846 8260C	VOMS/48077
2339740004	MW-29			SW846 8260C	VOMS/48077
2339740001	MW-32			SM2320B-2011	WETC/210822
2339740002	MW-31			SM2320B-2011	WETC/210822
2339740003	MW-30			SM2320B-2011	WETC/210822
2339740004	MW-29			SM2320B-2011	WETC/210822
2339740001	MW-32			RSK 175	SVGC/50739
2339740002	MW-31			RSK 175	SVGC/50739
2339740003	MW-30			RSK 175	SVGC/50739
2339740004	MW-29			RSK 175	SVGC/50739
2339740001	MW-32			EPA 300.0	WETC/210836
2339740002	MW-31			EPA 300.0	WETC/210836
2339740003	MW-30			EPA 300.0	WETC/210836
2339740004	MW-29			EPA 300.0	WETC/210836
2339740001	MW-32	SW846 3015	MDIG/73808	SW846 6010C	META/63887
2339740002	MW-31	SW846 3015	MDIG/73808	SW846 6010C	META/63887

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2339740 ASN040|60440641

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2339740003	MW-30	SW846 3015	MDIG/73808	SW846 6010C	META/63887
2339740004	MW-29	SW846 3015	MDIG/73808	SW846 6010C	META/63887
2339740001	MW-32	SW846 6010C	MDIG/73809	SW846 6010C	META/63886
2339740002	MW-31	SW846 6010C	MDIG/73809	SW846 6010C	META/63886
2339740003	MW-30	SW846 6010C	MDIG/73809	SW846 6010C	META/63886
2339740004	MW-29	SW846 6010C	MDIG/73809	SW846 6010C	META/63886
2339740001	MW-32			SM5310B-2011	WETC/210945
2339740002	MW-31			SM5310B-2011	WETC/210945
2339740003	MW-30			SM5310B-2011	WETC/210945
2339740004	MW-29			SM5310B-2011	WETC/210945

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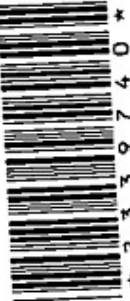


34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT /
SAMPLER. INSTRUCTIONS ON THE BACK.

Page 1 of 1
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Co. Name: **AECOM** Phone: **518-951-2370**
Contact (Report to): **Gerlinde Wolf**
Address: **40 British American Blvd
Latham NY 12110**
PO#:

Project Name#: **60440641** ALS Quote #:
TAT: ☒ Normal Standard TAT is 10-12 business days.
☐ Rush-Subject to ALS approval and surcharges.
Date Required:
Approved By:
Email? **Vy gerlinde.wolf@aecom.com**
Fax? **Vy No.**

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time
1 MW-32		9/20/18	910
2 MW-31			1050
3 MW-30			1320
4 MW-29			1500
5 Equipment Blank			NA
6 Trip Blank			X
7			
8			

SAMPLED BY (Please Print): **Gerlinde Wolf**
Relinquished By / Company Name: **Gerlinde Wolf AECOM** Date: **9/20/18** Time: **1600**
1 **Gerlinde Wolf AECOM** Date: **9/20/18** Time: **1600** 2 **Gerlinde Wolf AECOM** Date: **9/20/18** Time: **1600**
3 **Gerlinde Wolf AECOM** Date: **9/20/18** Time: **1700** 4 **Gerlinde Wolf AECOM** Date: **9/20/18** Time: **1700**
5 **Gerlinde Wolf AECOM** Date: **9/20/18** Time: **1700** 6 **Gerlinde Wolf AECOM** Date: **9/20/18** Time: **1700**
7 **Gerlinde Wolf AECOM** Date: **9/20/18** Time: **1700** 8 **Gerlinde Wolf AECOM** Date: **9/20/18** Time: **1700**
9

Project Comments:
Bill to (if different than Report to):
Project Name: **60440641** ALS Quote #:
TAT: ☒ Normal Standard TAT is 10-12 business days.
☐ Rush-Subject to ALS approval and surcharges.
Date Required:
Approved By:
Email? **Vy gerlinde.wolf@aecom.com**
Fax? **Vy No.**

September 29, 2018

Ms. Kelly Lurie
AECOM - Mechanicsburg
100 Sterling Parkway
Suite 205
Mechanicsburg, PA 17055

Certificate of Analysis

Project Name:	2015-SCOTIA NAVY DEPOT-PO 60440641	Workorder:	2339919
Purchase Order:	66432/60440641.11	Workorder ID:	ASN041 2015-SCOTIA NAVY DEPOT-

Dear Ms. Lurie:

Enclosed are the analytical results for samples received by the laboratory on Thursday, September 20, 2018.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

CC: Mr. Greg Malzone , Mr. John Santacroce , Mr. Scott Underhill

*This page is included as part of the Analytical Report and
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Mrs. Vanessa N Badman
Project Coordinator

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September 29, 2018

Ms. Kelly Lurie
AECOM - Mechanicsburg
100 Sterling Parkway
Suite 205
Mechanicsburg, PA 17055

Certificate of Analysis

Project Name:	2015-SCOTIA NAVY DEPOT-PO 60440641	Workorder:	2339919
Purchase Order:	66432/60440641.11	Workorder ID:	ASN041 2015-SCOTIA NAVY DEPOT-

Dear Ms. Lurie:

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Greg Malzone , Mr. John Santacroce , Mr. Scott Underhill

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Mrs. Vanessa N Badman
Project Coordinator

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SAMPLE SUMMARY

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2339919001	MW-35	Ground Water	9/19/2018 09:45	9/20/2018 09:26	Collected by Client
2339919002	MW-34	Ground Water	9/19/2018 11:50	9/20/2018 09:26	Collected by Client
2339919003	MW-33	Ground Water	9/19/2018 13:30	9/20/2018 09:26	Collected by Client
2339919004	DUP	Ground Water	9/19/2018 00:00	9/20/2018 09:26	Collected by Client
2339919005	TRIP BLANK	Ground Water	9/19/2018 00:00	9/20/2018 09:26	Collected by Client

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SAMPLE SUMMARY

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID: **2339919001**
Sample ID: **MW-35**

Date Collected: 9/19/2018 09:45 Matrix: Ground Water
Date Received: 9/20/2018 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
Trichloroethene	15.2		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	115		%	81 - 118			SW846 8260C		9/27/18 18:11	TMP	A
4-Bromofluorobenzene (S)	106		%	85 - 114			SW846 8260C		9/27/18 18:11	TMP	A
Dibromofluoromethane (S)	110		%	80 - 119			SW846 8260C		9/27/18 18:11	TMP	A
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C		9/27/18 18:11	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.31		ug/L	3.3	3.3	0.23	RSK 175		9/24/18 21:45	EGO	H
Ethene	2.41		ug/L	2.4	2.4	0.40	RSK 175		9/24/18 21:45	EGO	H
Methane	50.5		ug/L	1.5	1.5	0.34	RSK 175		9/24/18 21:45	EGO	H
WET CHEMISTRY											
Alkalinity, Total	115	2	mg/L	5	5	0.8	SM2320B-2011		9/28/18 04:56	MSA	F
Chloride	2.1		mg/L	2.0	0.50	0.16	EPA 300.0		9/25/18 04:49	CHW	E
Nitrate-N	0.68	1	mg/L	0.20	0.060	0.020	EPA 300.0		9/25/18 04:49	CHW	E
Sulfate	2.5		mg/L	2.0	0.50	0.20	EPA 300.0		9/25/18 04:49	CHW	E
Total Organic Carbon (TOC)	3.5		mg/L	1.0	0.50	0.18	SM5310B-2011		9/26/18 03:43	PAG	C
METALS											
Iron, Total	0.45		mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 11:15	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 09:46	SRT	K1

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ANALYTICAL RESULTS

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID: **2339919001**

Date Collected: 9/19/2018 09:45

Matrix: Ground Water

Sample ID: **MW-35**

Date Received: 9/20/2018 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
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Mrs. Vanessa N Badman

Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID: **2339919002**

Date Collected: 9/19/2018 11:50

Matrix: Ground Water

Sample ID: **MW-34**

Date Received: 9/20/2018 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
Trichloroethene	6.9		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	116		%	81 - 118			SW846 8260C		9/27/18 18:34	TMP	A
4-Bromofluorobenzene (S)	106		%	85 - 114			SW846 8260C		9/27/18 18:34	TMP	A
Dibromofluoromethane (S)	108		%	80 - 119			SW846 8260C		9/27/18 18:34	TMP	A
Toluene-d8 (S)	103		%	89 - 112			SW846 8260C		9/27/18 18:34	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.31		ug/L	3.3	3.3	0.23	RSK 175		9/24/18 22:00	EGO	H
Ethene	2.41		ug/L	2.4	2.4	0.40	RSK 175		9/24/18 22:00	EGO	H
Methane	1.51		ug/L	1.5	1.5	0.34	RSK 175		9/24/18 22:00	EGO	H
WET CHEMISTRY											
Alkalinity, Total	183	2	mg/L	5	5	0.8	SM2320B-2011		9/28/18 05:07	MSA	F
Chloride	1.1J	J	mg/L	2.0	0.50	0.16	EPA 300.0		9/25/18 05:01	CHW	E
Nitrate-N	0.56	1	mg/L	0.20	0.060	0.020	EPA 300.0		9/25/18 05:01	CHW	E
Sulfate	3.9		mg/L	2.0	0.50	0.20	EPA 300.0		9/25/18 05:01	CHW	E
Total Organic Carbon (TOC)	6.8		mg/L	1.0	0.50	0.18	SM5310B-2011		9/26/18 08:50	PAG	C
METALS											
Iron, Total	0.045U	U	mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 11:19	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 09:50	SRT	K1

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ANALYTICAL RESULTS

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID: **2339919002**

Date Collected: 9/19/2018 11:50

Matrix: Ground Water

Sample ID: **MW-34**

Date Received: 9/20/2018 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
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ANALYTICAL RESULTS

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID: **2339919003**

Date Collected: 9/19/2018 13:30

Matrix: Ground Water

Sample ID: **MW-33**

Date Received: 9/20/2018 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
Trichloroethene	137	1,2	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	117		%	81 - 118			SW846 8260C		9/27/18 18:57	TMP	A
4-Bromofluorobenzene (S)	109		%	85 - 114			SW846 8260C		9/27/18 18:57	TMP	A
Dibromofluoromethane (S)	113		%	80 - 119			SW846 8260C		9/27/18 18:57	TMP	A
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C		9/27/18 18:57	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.31		ug/L	3.3	3.3	0.23	RSK 175		9/24/18 22:16	EGO	H
Ethene	2.41		ug/L	2.4	2.4	0.40	RSK 175		9/24/18 22:16	EGO	H
Methane	1.51	4	ug/L	1.5	1.5	0.34	RSK 175		9/24/18 22:16	EGO	H
WET CHEMISTRY											
Alkalinity, Total	213	5	mg/L	5	5	0.8	SM2320B-2011		9/28/18 03:55	MSA	F
Chloride	24.8		mg/L	2.0	0.50	0.16	EPA 300.0		9/25/18 05:25	CHW	E
Nitrate-N	0.40	3	mg/L	0.20	0.060	0.020	EPA 300.0		9/25/18 05:25	CHW	E
Sulfate	14.6		mg/L	2.0	0.50	0.20	EPA 300.0		9/25/18 05:25	CHW	E
Total Organic Carbon (TOC)	0.58J	J	mg/L	1.0	0.50	0.18	SM5310B-2011		9/26/18 08:50	PAG	C
METALS											
Iron, Total	0.045U	U	mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 11:39	SRT	J1
Iron, Dissolved	0.045J	J	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 10:05	SRT	K1

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State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID: **2339919003**

Date Collected: 9/19/2018 13:30

Matrix: Ground Water

Sample ID: **MW-33**

Date Received: 9/20/2018 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
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ANALYTICAL RESULTS

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID: **2339919004**
Sample ID: **DUP**

Date Collected: 9/19/2018 00:00 Matrix: Ground Water
Date Received: 9/20/2018 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
Trichloroethene	155		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	118		%	81 - 118			SW846 8260C		9/27/18 19:20	TMP	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C		9/27/18 19:20	TMP	A
Dibromofluoromethane (S)	113		%	80 - 119			SW846 8260C		9/27/18 19:20	TMP	A
Toluene-d8 (S)	105		%	89 - 112			SW846 8260C		9/27/18 19:20	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.31		ug/L	3.3	3.3	0.23	RSK 175		9/24/18 23:05	EGO	H
Ethene	2.41		ug/L	2.4	2.4	0.40	RSK 175		9/24/18 23:05	EGO	H
Methane	1.51		ug/L	1.5	1.5	0.34	RSK 175		9/24/18 23:05	EGO	H
WET CHEMISTRY											
Alkalinity, Total	218	2	mg/L	5	5	0.8	SM2320B-2011		9/28/18 05:17	MSA	F
Chloride	25.6		mg/L	2.0	0.50	0.16	EPA 300.0		9/25/18 05:13	CHW	E
Nitrate-N	0.42	1	mg/L	0.20	0.060	0.020	EPA 300.0		9/25/18 05:13	CHW	E
Sulfate	14.7		mg/L	2.0	0.50	0.20	EPA 300.0		9/25/18 05:13	CHW	E
Total Organic Carbon (TOC)	0.49J	J	mg/L	1.0	0.50	0.18	SM5310B-2011		9/26/18 08:50	PAG	C
METALS											
Iron, Total	0.045U	U	mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 11:23	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 09:54	SRT	K1

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ANALYTICAL RESULTS

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID: **2339919004**

Date Collected: 9/19/2018 00:00

Matrix: Ground Water

Sample ID: **DUP**

Date Received: 9/20/2018 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
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ANALYTICAL RESULTS

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID: **2339919005**
Sample ID: **TRIP BLANK**

Date Collected: 9/19/2018 00:00 Matrix: Ground Water
Date Received: 9/20/2018 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	115		%	81 - 118			SW846 8260C		9/27/18 17:48	TMP	A
4-Bromofluorobenzene (S)	109		%	85 - 114			SW846 8260C		9/27/18 17:48	TMP	A
Dibromofluoromethane (S)	108		%	80 - 119			SW846 8260C		9/27/18 17:48	TMP	A
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C		9/27/18 17:48	TMP	A



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ANALYTICAL RESULTS

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2339919001	1	MW-35	EPA 300.0	Nitrate-N
Analyte was analyzed past the 48 hour holding time.				
2339919001	2	MW-35	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2339919002	1	MW-34	EPA 300.0	Nitrate-N
Analyte was analyzed past the 48 hour holding time.				
2339919002	2	MW-34	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2339919003	1	MW-33	SW846 8260C	Trichloroethene
The QC sample type MS for method SW846 8260C was outside the control limits for the analyte Trichloroethene. The % Recovery was reported as 210 and the control limits were 79 to 123.				
2339919003	2	MW-33	SW846 8260C	Trichloroethene
The QC sample type MSD for method SW846 8260C was outside the control limits for the analyte Trichloroethene. The % Recovery was reported as 226 and the control limits were 79 to 123.				
2339919003	3	MW-33	EPA 300.0	Nitrate-N
Analyte was analyzed past the 48 hour holding time.				
2339919003	4	MW-33	RSK 175	Methane
The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 63.2 and the upper control limit is 20.				
2339919003	5	MW-33	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2339919004	1	DUP	EPA 300.0	Nitrate-N
Analyte was analyzed past the 48 hour holding time.				
2339919004	2	DUP	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Analysis Method	Prep Method
2339919001	MW-35	EPA 300.0	
2339919001	MW-35	In-House	
2339919001	MW-35	RSK 175	
2339919001	MW-35	SM2320B-2011	
2339919001	MW-35	SM5310B-2011	
2339919001	MW-35	SW846 6010C	SW846 3015
2339919001	MW-35	SW846 6010C	SW846 6010C
2339919001	MW-35	SW846 8260C	
2339919002	MW-34	EPA 300.0	
2339919002	MW-34	In-House	
2339919002	MW-34	RSK 175	
2339919002	MW-34	SM2320B-2011	
2339919002	MW-34	SM5310B-2011	
2339919002	MW-34	SW846 6010C	SW846 3015
2339919002	MW-34	SW846 6010C	SW846 6010C
2339919002	MW-34	SW846 8260C	
2339919003	MW-33	EPA 300.0	
2339919003	MW-33	In-House	
2339919003	MW-33	RSK 175	
2339919003	MW-33	SM2320B-2011	
2339919003	MW-33	SM5310B-2011	
2339919003	MW-33	SW846 6010C	SW846 3015
2339919003	MW-33	SW846 6010C	SW846 6010C
2339919003	MW-33	SW846 8260C	
2339919004	DUP	EPA 300.0	
2339919004	DUP	In-House	
2339919004	DUP	RSK 175	
2339919004	DUP	SM2320B-2011	
2339919004	DUP	SM5310B-2011	
2339919004	DUP	SW846 6010C	SW846 3015
2339919004	DUP	SW846 6010C	SW846 6010C
2339919004	DUP	SW846 8260C	
2339919005	TRIP BLANK	SW846 8260C	

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QUALITY CONTROL DATA

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

QC Batch: MDIG/73808 **Analysis Method:** SW846 6010C
QC Batch Method: SW846 3015
Associated Lab Samples: 2339919001, 2339919002, 2339919003, 2339919004

METHOD BLANK: 2815580

Parameter	Blank Result	Units	Reporting Limit
Iron, Total	0.045U	mg/L	0.067

LABORATORY CONTROL SAMPLE: 2815581

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Total	90.4	mg/L	1.1	1.0	87 - 115

MATRIX SPIKE: 2815582 DUPLICATE: 2815583 ORIGINAL: 2339919003

***NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Iron, Total	.01056	mg/L	1.1	1.11221	1.07488	99.1	95.8	87 - 115	3.41	20

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QUALITY CONTROL DATA

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

QC Batch: MDIG/73809 **Analysis Method:** SW846 6010C
QC Batch Method: SW846 6010C
Associated Lab Samples: 2339919001, 2339919002, 2339919003, 2339919004

METHOD BLANK: 2815584

Parameter	Blank Result	Units	Reporting Limit
Iron, Dissolved	0.044U	mg/L	0.067

LABORATORY CONTROL SAMPLE: 2815585

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Dissolved	94.6	mg/L	1.1	1.1	87 - 115

MATRIX SPIKE: 2815586 DUPLICATE: 2815587 ORIGINAL: 2339919003

*****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.**

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Iron, Dissolved	.04522	mg/L	1.1	1.07867	1.11444	93	96.2	87 - 115	3.26	20

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QUALITY CONTROL DATA

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

QC Batch: SVGC/50739 **Analysis Method:** RSK 175
QC Batch Method: RSK 175
Associated Lab Samples: 2339919001, 2339919002, 2339919003, 2339919004

METHOD BLANK: 2815082

Parameter	Blank Result	Units	Reporting Limit
Ethane	3.31	ug/L	3.3
Ethene	2.41	ug/L	2.4
Methane	1.51	ug/L	1.5

SAMPLE DUPLICATE: 2815083 ORIGINAL: 2339919003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	0	NC	20
Ethene	0	ug/L	0	NC	20
Methane	.25	ug/L	.13	63.2*	20

SAMPLE DUPLICATE: 2815211 ORIGINAL: 2339928001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	0	NC	20
Methane	0	ug/L	0	NC	20

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QUALITY CONTROL DATA

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

QC Batch: VOMS/48077 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 2339919001, 2339919002, 2339919003, 2339919004, 2339919005

METHOD BLANK: 2814603

Parameter	Blank Result	Units	Reporting Limit
Carbon Tetrachloride	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.53J	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	111	%	81 - 118
4-Bromofluorobenzene (S)	107	%	85 - 114
Dibromofluoromethane (S)	109	%	80 - 119
Toluene-d8 (S)	104	%	89 - 112

LABORATORY CONTROL SAMPLE: 2814604

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	106	ug/L	20	21.1	72 - 136
1,1-Dichloroethane	104	ug/L	20	20.7	77 - 125
1,2-Dichloroethane	103	ug/L	20	20.5	73 - 128
1,1-Dichloroethene	106	ug/L	20	21.3	71 - 131
cis-1,2-Dichloroethene	99.5	ug/L	20	19.9	78 - 123
trans-1,2-Dichloroethene	109	ug/L	20	21.7	75 - 124
1,1,1,2-Tetrachloroethane	103	ug/L	20	20.6	78 - 124
1,1,2,2-Tetrachloroethane	104	ug/L	20	20.8	71 - 121
Tetrachloroethene	106	ug/L	20	21.3	74 - 129
Toluene	105	ug/L	20	21.0	80 - 121
1,1,1-Trichloroethane	101	ug/L	20	20.2	74 - 131
1,1,2-Trichloroethane	103	ug/L	20	20.6	80 - 119
Trichloroethene	98.9	ug/L	20	19.8	79 - 123

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QUALITY CONTROL DATA

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Vinyl Chloride	87.3	ug/L	20	17.5	58 - 137
1,2-Dichloroethane-d4 (S)	107	%			81 - 118
4-Bromofluorobenzene (S)	107	%			85 - 114
Dibromofluoromethane (S)	107	%			80 - 119
Toluene-d8 (S)	106	%			89 - 112

MATRIX SPIKE: 2817710 DUPLICATE: 2817711 ORIGINAL: 2339919003

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Carbon Tetrachloride	0	ug/L	20	25.4923	24.0603	127	120	72 - 136	5.78	30
1,1-Dichloroethane	0	ug/L	20	22.9354	23.6192	115	118	77 - 125	2.94	30
1,2-Dichloroethane	0	ug/L	20	22.3863	21.3962	112	107	73 - 128	4.52	30
1,1-Dichloroethene	0	ug/L	20	25.3824	25.6415	127	128	71 - 131	1.02	30
cis-1,2-Dichloroethene	0	ug/L	20	21.9962	22.0809	110	110	78 - 123	.38	30
trans-1,2-Dichloroethene	0	ug/L	20	24.1283	23.9698	121	120	75 - 124	.66	30
1,1,1,2-Tetrachloroethane	0	ug/L	20	21.6696	21.7803	108	109	78 - 124	.51	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	20.0111	21.0808	100	105	71 - 121	5.21	30
Tetrachloroethene	0	ug/L	20	22.6459	23.0551	113	115	74 - 129	1.79	30
Toluene	0	ug/L	20	21.7424	22.2536	109	111	80 - 121	2.32	30
1,1,1-Trichloroethane	0	ug/L	20	24.191	23.6808	121	118	74 - 131	2.13	30
1,1,2-Trichloroethane	0	ug/L	20	19.7264	20.2524	98.6	101	80 - 119	2.63	30
Trichloroethene	136.644	ug/L	20	178.718	181.756	NC	NC	79 - 123	1.69	30
Vinyl Chloride	0	ug/L	20	22.8873	23.0921	114	115	58 - 137	.89	30
1,2-Dichloroethane-d4 (S)	115	%				115	117	81 - 118		
4-Bromofluorobenzene (S)	105	%				105	106	85 - 114		
Dibromofluoromethane (S)	109	%				109	108	80 - 119		
Toluene-d8 (S)	102	%				102	103	89 - 112		

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QUALITY CONTROL DATA

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/210836 **Analysis Method:** EPA 300.0
QC Batch Method: EPA 300.0
Associated Lab Samples: 2339919001, 2339919002, 2339919003, 2339919004

METHOD BLANK: 2815338

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.25U	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2815340

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	97.7	mg/L	20	19.5	87 - 111
Nitrate-N	90.8	mg/L	2.5	2.3	88 - 111
Sulfate	97.6	mg/L	20	19.5	87 - 112

MATRIX SPIKE: 2815342 DUPLICATE: 2815343 ORIGINAL: 2339919003

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Chloride	24.8	mg/L	40	59.14	58.64	85.9*	84.6*	87 - 111	.85	15
Nitrate-N	.4	mg/L	5	4.8	4.86	88	89.2	88 - 111	1.24	15
Sulfate	14.6	mg/L	40	50.96	51.04	90.9	91.1	87 - 112	.16	15

METHOD BLANK: 2815345

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.13J	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

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QUALITY CONTROL DATA

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/210875 **Analysis Method:** SM5310B-2011
QC Batch Method: 415.1/9060/5310B
Associated Lab Samples: 2339919001

METHOD BLANK: 2815863

Parameter	Blank Result	Units	Reporting Limit
Total Organic Carbon (TOC)	0.50U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2815864

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	98.5	mg/L	1	0.99J	85 - 115

MATRIX SPIKE: 2815865 DUPLICATE: 2815866 ORIGINAL: 2339443003

***NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	18.2	mg/L	60	79.38	79.38	102	102	85 - 115	0	20

MATRIX SPIKE: 2815867 DUPLICATE: 2815868 ORIGINAL: 2339919001

***NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	3.525	mg/L	6	9.378	9.479	97.6	99.2	85 - 115	1.07	20

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QUALITY CONTROL DATA

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/210876 **Analysis Method:** SM5310B-2011
QC Batch Method: 415.1/9060/5310B
Associated Lab Samples: 2339919002, 2339919003, 2339919004

METHOD BLANK: 2815869

Parameter	Blank Result	Units	Reporting Limit
Total Organic Carbon (TOC)	0.50U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2815870

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	98.5	mg/L	1	0.99J	85 - 115

MATRIX SPIKE: 2815871 DUPLICATE: 2815872 ORIGINAL: 2339919003

***NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	.577	mg/L	6	6.851	6.888	105	105	85 - 115	.54	20

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QUALITY CONTROL DATA

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/210997 **Analysis Method:** SM2320B-2011

QC Batch Method: SM2320B-2011

Associated Lab Samples: 2339919001, 2339919002, 2339919003, 2339919004

METHOD BLANK: 2817316

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

SAMPLE DUPLICATE: 2817321 ORIGINAL: 2339919003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	212.61134	mg/L	212.41206	.09	20

METHOD BLANK: 2817324

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2817325 ORIGINAL: 2340512001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	93.56151	mg/L	89.60468	4.32	20

METHOD BLANK: 2817328

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2817329 ORIGINAL: 2340512002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD

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QUALITY CONTROL DATA

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Alkalinity, Total	88.99052	mg/L	85.88464	3.55	20
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METHOD BLANK: 2817332

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2817333 ORIGINAL: 2340564001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	39.22836	mg/L	39.03287	.5	20

METHOD BLANK: 2817336

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2817337 ORIGINAL: 2340617001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	111.96096	mg/L	107.59691	3.98	20

METHOD BLANK: 2817340

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2817341 ORIGINAL: 2340617003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	370.67017	mg/L	375.13303	1.2	20

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QUALITY CONTROL DATA

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

METHOD BLANK: 2817344

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	2J	mg/L	5

SAMPLE DUPLICATE: 2817345 ORIGINAL: 2340672001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	23.5484	mg/L	22.66004	3.84	20

METHOD BLANK: 2818106

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	1J	mg/L	5

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2339919001	MW-35			SW846 8260C	VOMS/48077
2339919002	MW-34			SW846 8260C	VOMS/48077
2339919003	MW-33			SW846 8260C	VOMS/48077
2339919004	DUP			SW846 8260C	VOMS/48077
2339919005	TRIP BLANK			SW846 8260C	VOMS/48077
2339919001	MW-35			RSK 175	SVGC/50739
2339919002	MW-34			RSK 175	SVGC/50739
2339919003	MW-33			RSK 175	SVGC/50739
2339919004	DUP			RSK 175	SVGC/50739
2339919001	MW-35			EPA 300.0	WETC/210836
2339919002	MW-34			EPA 300.0	WETC/210836
2339919003	MW-33			EPA 300.0	WETC/210836
2339919004	DUP			EPA 300.0	WETC/210836
2339919001	MW-35	SW846 3015	MDIG/73808	SW846 6010C	META/63887
2339919002	MW-34	SW846 3015	MDIG/73808	SW846 6010C	META/63887
2339919003	MW-33	SW846 3015	MDIG/73808	SW846 6010C	META/63887
2339919004	DUP	SW846 3015	MDIG/73808	SW846 6010C	META/63887
2339919001	MW-35	SW846 6010C	MDIG/73809	SW846 6010C	META/63886
2339919002	MW-34	SW846 6010C	MDIG/73809	SW846 6010C	META/63886
2339919003	MW-33	SW846 6010C	MDIG/73809	SW846 6010C	META/63886
2339919004	DUP	SW846 6010C	MDIG/73809	SW846 6010C	META/63886
2339919001	MW-35			SM5310B-2011	WETC/210875
2339919002	MW-34			SM5310B-2011	WETC/210876
2339919003	MW-33			SM5310B-2011	WETC/210876
2339919004	DUP			SM5310B-2011	WETC/210876

ALS Environmental Laboratory Locations Across North America

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Vancouver Waterloo · Winnipeg · Yellowknife **United States:** Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York **Mexico:** Monterrey

QUALITY CONTROL DATA CROSS REFERENCE TABLEWorkorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2339919001	MW-35			SM2320B-2011	WETC/210997
2339919002	MW-34			SM2320B-2011	WETC/210997
2339919003	MW-33			SM2320B-2011	WETC/210997
2339919004	DUP			SM2320B-2011	WETC/210997

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Middletown, PA 17057
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F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT /
SAMPLER. INSTRUCTIONS ON THE BACK.

Page 1 of 1
Courier:
Tracking #:

Environmental

Co. Name: **AECOM**
Contact (Report to): **Gerlinde Wolf** Phone: **518-951-2370**
Address: **40 British American Blvd
Latham NY 12110**

Bill to (if different than Report to):

PO#:

Project Name/ID: **60440641** ALS Quote #:

TAT: ☒ Normal-Standard TAT is 10-12 business days.
☐ Rush-Subject to ALS approval and surcharges.

Date Required:
Approved By:

Email: ☒ **gerlinde.wolf@aecom.com**
Fax? ☐ Y No:

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	Received By / Company Name	Date	Time
1 MW-35		9/18/18	945		9/18/18	1600
2 MW-34		1150				
3 MW-33		1330				
4 Dup						
5 MS/MSD (MW-33 per Gerlinde)						
6 Trip Blank						
7						
8						

Project Comments: **9/22/18 0950**

Relinquished By / Company Name	Date	Time
Gerlinde Wolf	9/18/18	1600
COMMON COURIER / ALS COURIER	9/18/18	1700
COMMON COURIER / ALS COURIER		

ANALYSES/METHOD REQUESTED		Enter Number of Containers Per Analysis	
8260C	Alkalinity	2	1
RSK 175	Total Fe	2	1
	Cl, NO ₃ , SO ₄	2	1
	Diss. Fe	2	1

Container	Type	Size	Preservative	Container	Type	Size	Preservative
40	C	40	HCl	250	P	250	-
40	C	40	HCl	250	P	250	-
40	C	40	HCl	250	P	250	-

Container	Type	Size	Preservative
40	C	40	HCl
40	C	40	HCl
40	C	40	HCl

Container	Type	Size	Preservative
40	C	40	HCl
40	C	40	HCl
40	C	40	HCl

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY
Matrix: AL=Air; DW=Drinking Water; GW=Groundwater; OL=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater
Container Type: AG-Amber Glass; CG-Clear Glass; PL-Plastic. Container Size: 250ml, 500ml, 1L, 5oz, etc. Preservative: HCl, HNO₃, NaOH, etc.
Rev 01-2013

APPENDIX E: AECOM Data Usability Summary Report (DUSR)



Prepared for:
U.S. Army Corps of Engineers
Huntsville and New York Districts

Prepared by:
AECOM
Pittsburgh, PA
60440641-14
October 2018

October 1, 2018

Data Usability Summary Report
Defense National Stockpile Center
Scotia Depot
Glenville, New York
Groundwater Sampling Event
September 2018
Final



Prepared for:
U.S. Army Corps of Engineers
Huntsville and New York Districts

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Data Usability Summary Report
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Final

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Appendix A Glossary of Data Qualifier Codes

Appendix B Data Qualification Summaries

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Executive Summary

Overview

Data validation was performed by Gregory A. Malzone of AECOM-Pittsburgh on the fixed-laboratory analytical data for groundwater samples collected from the Defense National Stockpile Center Scotia Depot, Glenville, New York, on September 18-22, 2018. Samples were collected as part of the baseline groundwater sampling round as described in Final Quality Assurance Project Plan for the Defense National Stockpile Center Scotia Depot Glenville, New York (the project-specific QAPP; AECOM, September 2016). Samples were submitted for analysis to ALS Environmental (ALS), 34 Dogwood Lane, Middletown, Pennsylvania 17057.

The list of field and field quality control samples submitted, the date sampled and the laboratory work order numbers are presented in Table 1. Data were reported by ALS in four deliverables. Each laboratory deliverable is identified by both a laboratory work order number and sample delivery group (SDG) number.

The following analytical methods were requested on the chain-of-custody (CoC) records.

- Volatile Organic Compounds (VOCs) by USEPA SW-846 Method 8260C
- Methane, Ethane and Ethene by RSK -175
- Total and Dissolved Iron by USEPA SW-846 Method 6010C
- Chloride, Nitrate as N and Sulfate by Method EPA Method 300.0
- Alkalinity by Standard Methods 2320B-2011
- Total Organic Carbon by Standard Methods 5310B-2011
- Dissolved Hydrogen by Bubble Strip (PACE Method AM20GAX)

The dissolved hydrogen samples for wells MW-28 through MW-35 were submitted to Pace Analytical Energy Services LLC (PACE), 220 William Pitt Way, Pittsburgh, PA 15238 for analysis.

The trip blank and equipment blank were analyzed for VOCs only. Sample MW-33-091918 was designated in the field to be processed as the quality control sample, that is, as the matrix spike/matrix spike duplicate (MS/MSD). Unless otherwise noted, analyses were performed in accordance with the project-specific QAPP which is based on the DoD QSM v5.0.

Table 1 - Sample Submittals

Field ID	ALS ID	Matrix	Field QC	Date Sampled	WO Number	SDG Number
MW-16-091818	2339171001	Groundwater	MS/MSD	9/18/2018	2339171	ASN039
MW-26-091818	2339171002	Groundwater		9/18/2018	2339171	ASN039
MW-24-081818	2339171003	Groundwater		9/18/2018	2339171	ASN039
MW-15-091818	2339171004	Groundwater		9/18/2018	2339171	ASN039
Trip Blank-01-091918	2339171005	Aqueous (QC)	trip blank	9/19/2018	2339171	ASN039
MW-35-090918	2339919001	Groundwater		9/19/2018	2339919	ASN041
MW-34-091918	2339919002	Groundwater		9/19/2018	2339919	ASN041
MW-33-091918	2339919003	Groundwater	MS/MSD	9/19/2018	2339919	ASN041
DUP-01-091918	2339919004	Groundwater (QC)	MW-33-091918	9/19/2018	2339919	ASN041
Trip Blank-02-091918	2339919005	Aqueous (QC)	trip blank	9/19/2018	2339919	ASN041
MW-32-092018	2339740001	Groundwater		9/20/2018	2339740	ASN040
MW-31-092018	2339740002	Groundwater		9/20/2018	2339740	ASN040

Field ID	ALS ID	Matrix	Field QC	Date Sampled	WO Number	SDG Number
MW-30-092018	2339740003	Groundwater		9/20/2018	2339740	ASN040
MW-29-092018	2339740004	Groundwater		9/20/2018	2339740	ASN040
Equipment Blank-092018	2339740005	Aqueous (QC)	equipment blank	9/20/2018	2339740	ASN040
Trip Blank-03-092118	2339740006	Aqueous (QC)	trip blank	9/20/2018	2339740	ASN040
MW-28-092118	2339926001	Groundwater		9/21/2018	2339926	ASN042
Trip Blank-04-092218	2339926002	Aqueous (QC)	trip blank	9/22/2018	2339926	ASN042

The data were evaluated for conformance to method specifications and qualifiers were applied using the USEPA Region II SOPs and the validation criteria set forth in the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review*, EPA-540-R-014-002, August 2014 and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review*, EPA-540-R-013-001, August 2014, as they apply to the analytical methods employed.

Field duplicate relative percent difference (RPD) review and applicable control limits were taken from the *USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses*, December 1996 and *USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses*, June 1988.

Summary

All data have been determined to be useable for the purpose of assessing the presence/absence and quantitative concentrations of the compounds and analytes in the media tested (i.e. groundwater) with the qualifications described below. Completeness of 100% was achieved for this data set. This is within the goal of 90-100% and is acceptable.

A glossary of data qualifier definitions is included in Appendix A of this report. The qualified data summaries are attached as Appendix B of this report.

Each nonconformance with specific data usability criteria is discussed below. Page references for the supporting documentation in the laboratory reports are provided in each item header. Support documentation for data qualifications was included in Appendix C of this report.

1.0 Volatile Organic Compounds

Measurement performance indicators which did not meet criteria for Volatile Organic Compounds (VOCs) analysis are presented below for each of the four laboratory reports. Analytical results for VOCs were reviewed for the following measurement performance indicators:

- Data Completeness
- Chain of Custody
- Sample Preservation
- Holding Time
- GC/MS Tunes
- Initial Calibration
- Initial Calibration Verification
- Continuing Calibration Verification
- Method Blanks
- Trip Blanks
- Surrogates
- Matrix Spike/Matrix Spike Duplicate
- Internal Standards
- Quantitation Limits
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 2339171 (SDG ASN039)

Matrix Spike Recoveries and RPDs (pp. 37-38): A batch quality control analysis was performed on sample MW-16-091818. All matrix spike recoveries and RPDs were within the advisory limits.

No data quality issues were noted. No data qualification was required.

Work Order 2339740 (SDG ASN040)

Surrogate Recovery (p. 36): The 1,2-dichloroethane-d4 surrogate recovery for sample MW-31-092018 was greater than the upper quality control limit. The cis-1,2-dichloroethene and trichloroethene results for sample MW-31-092018 were positive and were qualified "J/J+," as estimated concentrations, because of high method bias.

Method Blank (p. 2215): Toluene was detected in method blank 2814603 associated with QC batch VOMS/48077 at an estimated concentration of 0.53 µg/L. Toluene was not detected in associated samples MW-32-092018, MW-31-092018 and MW-29-092018. No data qualification was required.

Work Order 2339919 (SDG ASN041)

Method Blank (p. 1111): Toluene was detected in method blank 2814603 associated with QC batch VOMS/48077 at an estimated concentration of 0.53 µg/L. Toluene was not detected in associated samples MW-35-090918, MW-34-091918, MW-33-091918, DUP-01-091918 and Trip Blank-02-091918. No data qualification was required.

Matrix Spike Recoveries and RPDs (pp. 38-39): Sample MW-33-091918 was designated in the field to be processed as the quality control sample, that is, as the MS/MSD. The trichloroethene spike added to MW-33-091918 MS/MSD was less than 25% of the original sample result. The trichloroethene spike recoveries and RPD could not be calculated. All other target compound spike recoveries and RPDs were within the advisory limits.

No data quality issues were noted. No data qualification was required.

Work Order 2339926 (SDG ASN042)

Surrogate Recovery (p. 24): The 1,2-dichloroethane-d4 and 4-bromofluorobenzene surrogate recovery for sample MW-28-092118 were greater than the upper quality control limit. The toluene-d8 surrogate recovery for sample MW-28-092118 was less than the lower quality control limit, but greater than 10%. The trichloroethene result for sample MW-28-092118 was positive and was qualified "J," as an estimated concentration, because of poor method accuracy. The direction of bias could not be determined.

Method Blank (p. 2070): Toluene was detected in method blank 2814603 associated with QC batch VOMS/48077 at an estimated concentration of 0.53 µg/L. Toluene was not detected in associated samples MW-28-092118 and Trip Blank-04-092218. No data qualification was required.

2.0 Methane, Ethane, Ethene

Measurement performance indicators which did not meet criteria for methane, ethane, ethene (MEE) analysis are presented below for each of the four laboratory reports. Analytical results for MEE were reviewed for the following measurement performance indicators:

- Data Completeness
- Chain of Custody
- Sample Preservation
- Holding Time
- Initial Calibration
- Initial Calibration Verification
- Continuing Calibration Verification
- Method Blanks
- Matrix Spike/Matrix Spike Duplicate
- Laboratory Duplicate
- Quantitation Limits
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 2339171 (SDG ASN039)

No data quality issues were noted. No data qualification was required.

Work Order 2339740 (SDG ASN040)

No data quality issues were noted. No data qualification was required.

Work Order 2339919 (SDG ASN041)

No data quality issues were noted. No data qualification was required.

Work Order 2339926 (SDG ASN042)

No data quality issues were noted. No data qualification was required.

3.0 Total and Dissolved Iron

Measurement performance indicators which did not meet criteria for total and dissolved iron analysis are presented below for each of the four laboratory reports. Analytical results for total and dissolved iron were reviewed for the following measurement performance indicators:

- Chain of Custody
- Sample Preservation
- Holding Time
- Quantitation Limits
- Initial Calibration
- Continuing Calibration Verification
- Method Blanks
- Matrix Spike/Matrix Spike Duplicate
- Laboratory Duplicate
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 2339171 (SDG ASN039)

No data quality issues were noted. No data qualification was required.

Work Order 2339740 (SDG ASN040)

No data quality issues were noted. No data qualification was required.

Work Order 2339919 (SDG ASN041)

No data quality issues were noted. No data qualification was required.

Work Order 2339926 (SDG ASN042)

No data quality issues were noted. No data qualification was required.

4.0 Chloride, Sulfate, Nitrate as N

Measurement performance indicators which did not meet criteria for chloride, sulfate and nitrate as N analysis are presented below for each of the four laboratory reports. Analytical results for these anions were reviewed for the following measurement performance indicators:

- Chain of Custody
- Sample Preservation
- Holding Time
- Quantitation Limits
- Initial Calibration
- Continuing Calibration Verification
- Method Blanks
- Matrix Spike/Matrix Spike Duplicate
- Laboratory Duplicate
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 2339171 (SDG ASN039)

No data quality issues were noted. No data qualification was required.

Work Order 2339740 (SDG ASN040)

Holding Time (p. 2913): The nitrate analyses for samples MW-32-092018, MW-31-092018, MW-30-092018 and MW-29-092018 were performed three days beyond the USEPA-recommended holding time of 48 hours. The positive and non-detect nitrate results for samples MW-32-092018, MW-31-092018, MW-30-092018 and MW-29-092018 were originally qualified "J/R," as estimated concentrations, or rejected (if non-detect) because the holding time was grossly exceeded.

ALS was requested to investigate the nitrate results that were outside the holding time. The nitrate samples for MW-32-092018, MW-31-092018, MW-30-092018 and MW-29-092018 were originally analyzed within the holding time. Subsequent reanalyses were performed outside the holding time and the reanalysis results were reported. ALS revised SDG ASN040 to report both sets of results. The original and reanalysis results matched. The original results were reported without qualification.

Work Order 2339919 (SDG ASN041)

Method Blanks (p. 1873): The method blank 2815345 analyzed on September 25, 2018 had a chloride result 0.13 J mg/L. All samples were affected. The chloride result for associated sample MW-34-091918 less than the LOQ and was qualified "U," as undetected at the LOQ because of lab contamination. The chloride result for associated samples MW-35-091918, MW-33-091918 and DUP-01-091918 were greater than the LOQ and greater than ten times the blank level and did not require qualification.

Holding Time (p. 1883): The nitrate analyses for samples MW-35-091918, MW-34-091918, MW-33-091918 and DUP-01-091918 were performed four days beyond the USEPA-recommended holding time of 48 hours. The nitrate results for samples MW-35-091918, MW-34-091918, MW-33-091918 and DUP-01-091918 were positive and were qualified “J,” as estimated concentrations, because the holding time was grossly exceeded.

Matrix Spike Recoveries and RPDs (p. 1872): Sample MW-33-091918 was designated in the field to be processed as the quality control sample, that is, as the MS/MSD. The MS and MSD recoveries for chloride were less than the lower advisory limits, but greater than 30%. The chloride result for sample MW-33-091918 was positive and was qualified “J-,” as an estimated concentration, biased low because of matrix effects.

Work Order 2339926 (SDG ASN042)

Method Blanks (p. 2671): The method blank 2815346 analyzed on September 22, 2018 had a chloride result 0.18 J mg/L. The chloride results for associated sample MW-28-092118 was greater than the LOQ and greater than ten times the blank level and did not require qualification.

No data quality issues were noted. No data qualification was required.

5.0 Alkalinity

Measurement performance indicators which did not meet criteria for alkalinity analysis are presented below for each of the four laboratory reports. Analytical results for alkalinity were reviewed for the following measurement performance indicators:

- Chain of Custody
- Sample Preservation
- Holding Time
- Quantitation Limits
- Initial Calibration
- Continuing Calibration Verification
- Method Blanks
- Matrix Spike/Matrix Spike Duplicate
- Laboratory Duplicate
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 2339171 (SDG ASN039)

Method Blanks (p. 2074): Alkalinity was detected in method blanks 2812582 and 2812662 analyzed on September 20, 2018 at estimated concentrations of 2.0 J mg/L. The total alkalinity results for associated samples MW-16-091818, MW-26-091818, MW-24-081818 and MW-15-091818 were greater than the LOQ and greater than ten times blank levels and did not require qualification.

Work Order 2339740 (SDG ASN040)

Method Blanks (p. 2847): Alkalinity was detected in method blanks 2815015, 2815047 and 2815051 analyzed on September 25, 2018 at estimated concentrations of 2 J mg/L. The total alkalinity results for associated samples MW-32-092018, MW-31-092018, MW-30-092018 and MW-29-092018 were greater than the LOQ and greater than ten times the method blank levels. No data qualifications were required.

Work Order 2339919 (SDG ASN041)

Method Blanks (p. 1859): Alkalinity was detected in method blank 2817324 analyzed on September 28, 2018 at an estimated concentration of 2 J mg/L. The total alkalinity results for associated samples MW-35-090918, MW-34-091918, MW-33-091918 and DUP-01-091918 were greater than the LOQ and greater than ten times the method blank level. No data qualifications were required.

Work Order 2339926 (SDG ASN042)

Method Blanks (p. 2659): Alkalinity was detected in method blank 2817324 analyzed on September 28, 2018 at an estimated concentration of 2 J mg/L. The total alkalinity result for associated sample MW-28092118 was greater than the LOQ and greater than ten times the method blank level. No data qualification was required.

6.0 Total Organic Carbon

Measurement performance indicators which did not meet criteria for total organic carbon (TOC) analysis are presented below for each of the four laboratory reports. Analytical results for TOC were reviewed for the following measurement performance indicators:

- Chain of Custody
- Sample Preservation
- Holding Time
- Quantitation Limits
- Initial Calibration
- Initial Calibration Verification
- Continuing Calibration Verification
- Method Blanks
- Matrix Spike/Matrix Spike Duplicate
- Laboratory Duplicate
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 2339171 (SDG ASN039)

No data quality issues were noted. No data qualification was required.

Work Order 2339740 (SDG ASN040)

No data quality issues were noted. No data qualification was required.

Work Order 2339919 (SDG ASN041)

No data quality issues were noted. No data qualification was required.

Work Order 2339926 (SDG ASN042)

No data quality issues were noted. No data qualification was required.

7.0 Dissolved Hydrogen

Measurement performance indicators which did not meet criteria for dissolved hydrogen analysis are presented below for the PACE laboratory report. Analytical results for dissolved hydrogen were reviewed for the following measurement performance indicators:

- Data Completeness
- Chain of Custody
- Sample Preservation
- Holding Time
- Method Blanks
- Quantitation Limits
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 28154 FSND

No data quality issues were noted. No data qualification was required.

8.0 Field Duplicate Comparison

A field duplicate sample was collected at groundwater well MW-33. See Table 2 below for the calculated RPDs for all analytes/compounds for which there were detections. Field duplicate results were evaluated using the following criteria.

Organics: The RPD must be $\leq 30\%$ for groundwaters, for results greater than or equal to two times the LOQ. If one of the results is non-detect or less than two times the LOQ, and the duplicate is greater than two times the LOQ, the difference between the parent and field duplicate results must be less than or equal to two times the LOQ.

Action applies only to the affected analyte in the organic duplicate sample pair.

Inorganics: The RPD must be $\leq 30\%$ for groundwaters, for results greater than or equal to five times the LOQ. For results less than five times the reporting limit, the difference between the parent and field duplicate results must be less than or equal to two times the LOQ.

Action applies to the affected analyte in all inorganic samples of the same matrix prepared and analyzed by the same method.

The following notations are used in the field precision tables.

RPD: Relative percent difference

NC: RPD could not be calculated.

Qual: Qualification required

$\mu\text{g/L}$: micrograms per liter (ppb) and mg/L : milligrams per liter (ppm)

$\leq \pm 2\text{LOQ}$: The absolute difference between the parent and field duplicate results was less than two times the LOQ. Variation of this magnitude is acceptable.

Table 2 – Field Duplicate Precision

Parameter	Units	MW-33-031418	DUP-091918	RPD (%)	Qual
Trichloroethene	$\mu\text{g/L}$	137	155	12	None
Iron, dissolved	mg/L	0.045 J	0.044 U	NC	$\leq \pm 2\text{LOQ}$, None
Alkalinity, total	mg/L	213	218	2.3	None
Chloride	mg/L	24.8	25.6	3.2	None
Nitrate	mg/L	0.40	0.42	4.9	None
Sulfate	mg/L	14.6	14.7	0.68	None
Total Organic Carbon	mg/L	0.58 J	0.49 J	17	None

All parent and field duplicate results were within the advisory acceptance criteria. Field sampling/laboratory precision and sample homogeneity were acceptable. No data qualifications were required.

9.0 Notes

Positive organic and inorganic results between the method detection limit (MDL) and LOQ, were qualified “J,” as estimated concentrations, due to increased uncertainty near the MDL. The “J” qualifiers were maintained in the data validation. Sample results reported between the MDL and LOQ are usable as estimated values with an unknown directional bias.

Matrix spike and matrix spike duplicates and laboratory duplicates that were performed on non-project samples were not evaluated because matrix similarity to project samples could not be assumed.

Appendix A

Glossary of Data Qualifier Codes

Glossary of Data Qualifier Codes

- U The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
- UJ The analyte was analyzed for, but was not detected. The reported quantitation limit is approximated and may be inaccurate or imprecise.
- J The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The result is an estimated quantity, likely to be biased high. The associated numerical value is the approximate concentration of the analyte in the sample.
- J- The result is an estimated quantity, likely to be biased low. The associated numerical value is the approximate concentration of the analyte in the sample.
- R The data are unusable. The sample results are rejected due to serious deficiencies in the ability to meet quality control criteria. The presence or absence of the analyte cannot be verified.
- N (Organics) The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
- NJ (Organics) The analysis indicates the presence of an analyte that has been tentatively identified and the associated numerical value represents its approximate concentration.

Appendix B

Data Qualification Summaries



34 Dogwood Lane ■ Middletown, PA 17057 ■ Phone: 717-944-5541 ■ Fax: 717-944-1430 ■ www.alsglobal.com

NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11, MA PA0102, MD 128, VA 460157, WV 343

ANALYTICAL RESULTS

Workorder: 2339171 ASN039|60440641

Lab ID: 2339171001

Date Collected: 9/18/2018 10:40

Matrix: Ground Water

Sample ID: MW-16

Date Received: 9/19/2018 10:54

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
1,1,1-Trichloroethane	0.34J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:17	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	114		%	81 - 118			SW846 8260C		9/20/18 17:17	TMP	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C		9/20/18 17:17	TMP	A
Dibromofluoromethane (S)	110		%	80 - 119			SW846 8260C		9/20/18 17:17	TMP	A
Toluene-d8 (S)	99.7		%	89 - 112			SW846 8260C		9/20/18 17:17	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.31		ug/L	3.3	3.3	0.23	RSK 175		9/20/18 23:40	EGO	C
Ethene	2.41		ug/L	2.4	2.4	0.40	RSK 175		9/20/18 23:40	EGO	C
Methane	1.51		ug/L	1.5	1.5	0.34	RSK 175		9/20/18 23:40	EGO	C
WET CHEMISTRY											
Alkalinity, Total	339	✓	mg/L	5	5	0.8	SM2320B-2011		9/20/18 15:49	MSA	H
Chloride	2.3		mg/L	2.0	0.50	0.16	EPA 300.0		9/20/18 06:31	CHW	G
Nitrate-N	1.9		mg/L	0.20	0.060	0.020	EPA 300.0		9/20/18 06:31	CHW	G
Sulfate	28.7		mg/L	2.0	0.50	0.20	EPA 300.0		9/20/18 06:31	CHW	G
Total Organic Carbon (TOC)	0.62J	J	mg/L	1.0	0.50	0.18	SM5310B-2011		9/25/18 06:46	PAG	E
METALS											
Iron, Total	0.15		mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 10:57	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 09:28	SRT	K1

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ANALYTICAL RESULTS

Workorder: 2339171 ASN039|60440641

Lab ID: **2339171002**

Date Collected: 9/18/2018 12:25

Matrix: Ground Water

Sample ID: **MW-26**

Date Received: 9/19/2018 10:54

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 17:40	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	115		%	81 - 118			SW846 8260C		9/20/18 17:40	TMP	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C		9/20/18 17:40	TMP	A
Dibromofluoromethane (S)	111		%	80 - 119			SW846 8260C		9/20/18 17:40	TMP	A
Toluene-d8 (S)	98.7		%	89 - 112			SW846 8260C		9/20/18 17:40	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.31		ug/L	3.3	3.3	0.23	RSK 175		9/20/18 23:56	EGO	C
Ethene	2.41		ug/L	2.4	2.4	0.40	RSK 175		9/20/18 23:56	EGO	C
Methane	12.9		ug/L	1.5	1.5	0.34	RSK 175		9/20/18 23:56	EGO	C
WET CHEMISTRY											
Alkalinity, Total	178	✗	mg/L	5	5	0.8	SM2320B-2011		9/20/18 15:59	MSA	H
Chloride	21.0		mg/L	2.0	0.50	0.16	EPA 300.0		9/20/18 06:48	CHW	G
Nitrate-N	0.040J	J	mg/L	0.20	0.060	0.020	EPA 300.0		9/20/18 06:48	CHW	G
Sulfate	4.8		mg/L	2.0	0.50	0.20	EPA 300.0		9/20/18 06:48	CHW	G
Total Organic Carbon (TOC)	12.9		mg/L	5.0	2.5	0.92	SM5310B-2011		9/25/18 21:08	PAG	E
METALS											
Iron, Total	0.61		mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 11:01	SRT	J1
Iron, Dissolved	0.43		mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 09:31	SRT	K1

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ANALYTICAL RESULTS

Workorder: 2339171 ASN039|60440641

Lab ID: **2339171003**

Date Collected: 9/18/2018 14:15

Matrix: Ground Water

Sample ID: **MW-24**

Date Received: 9/19/2018 10:54

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
cis-1,2-Dichloroethene	3.0		ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
Trichloroethene	0.97J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:03	TMP	A
Surrogate Recoveries	Results	Flag	Units	Limits			Method	Prepared By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	113		%	81 - 118			SW846 8260C		9/20/18 18:03	TMP	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C		9/20/18 18:03	TMP	A
Dibromofluoromethane (S)	108		%	80 - 119			SW846 8260C		9/20/18 18:03	TMP	A
Toluene-d8 (S)	98.3		%	89 - 112			SW846 8260C		9/20/18 18:03	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	1.5J	J	ug/L	3.3	3.3	0.23	RSK 175		9/21/18 00:12	EGO	C
Ethene	9.5		ug/L	2.4	2.4	0.40	RSK 175		9/21/18 00:12	EGO	C
Methane	13.9		ug/L	1.5	1.5	0.34	RSK 175		9/21/18 00:12	EGO	C
WET CHEMISTRY											
Alkalinity, Total	200	↗	mg/L	5	5	0.8	SM2320B-2011		9/20/18 16:10	MSA	H
Chloride	36.7		mg/L	2.0	0.50	0.16	EPA 300.0		9/20/18 07:05	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		9/20/18 07:05	CHW	G
Sulfate	14.2		mg/L	2.0	0.50	0.20	EPA 300.0		9/20/18 07:05	CHW	G
Total Organic Carbon (TOC)	3.1		mg/L	1.0	0.50	0.18	SM5310B-2011		9/25/18 06:46	PAG	E
METALS											
Iron, Total	1.4		mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 11:08	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 09:39	SRT	K1

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State Certifications: DE ID 11, MA PA0102, MD 128, VA 460157, WV 343

ANALYTICAL RESULTS

Workorder: 2339171 ASN039|60440641

Lab ID: 2339171004

Date Collected: 9/18/2018 15:45

Matrix: Ground Water

Sample ID: MW-15

Date Received: 9/19/2018 10:54

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
1,1-Dichloroethene	0.35J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
Tetrachloroethene	0.98J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
1,1,1-Trichloroethane	5.2		ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
Trichloroethene	130		ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 18:26	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	116		%	81 - 118			SW846 8260C		9/20/18 18:26	TMP	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C		9/20/18 18:26	TMP	A
Dibromofluoromethane (S)	110		%	80 - 119			SW846 8260C		9/20/18 18:26	TMP	A
Toluene-d8 (S)	100		%	89 - 112			SW846 8260C		9/20/18 18:26	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.31		ug/L	3.3	3.3	0.23	RSK 175		9/21/18 00:52	EGO	C
Ethene	2.41		ug/L	2.4	2.4	0.40	RSK 175		9/21/18 00:52	EGO	C
Methane	1.51		ug/L	1.5	1.5	0.34	RSK 175		9/21/18 00:52	EGO	C
WET CHEMISTRY											
Alkalinity, Total	236	✗	mg/L	5	5	0.8	SM2320B-2011		9/20/18 16:21	MSA	H
Chloride	42.5		mg/L	2.0	0.50	0.16	EPA 300.0		9/20/18 07:22	CHW	G
Nitrate-N	0.54		mg/L	0.20	0.060	0.020	EPA 300.0		9/20/18 07:22	CHW	G
Sulfate	13.2		mg/L	2.0	0.50	0.20	EPA 300.0		9/20/18 07:22	CHW	G
Total Organic Carbon (TOC)	0.46J	J	mg/L	1.0	0.50	0.18	SM5310B-2011		9/25/18 06:46	PAG	E
METALS											
Iron, Total	0.097		mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 11:12	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 09:43	SRT	K1

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ANALYTICAL RESULTS

Workorder: 2339171 ASN039|60440641

Lab ID: 2339171005

Date Collected: 9/19/2018 10:54

Matrix: Ground Water

Sample ID: Trip Blank

Date Received: 9/19/2018 10:54

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/20/18 13:29	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	108		%	81 - 118			SW846 8260C		9/20/18 13:29	TMP	A
4-Bromofluorobenzene (S)	101		%	85 - 114			SW846 8260C		9/20/18 13:29	TMP	A
Dibromofluoromethane (S)	106		%	80 - 119			SW846 8260C		9/20/18 13:29	TMP	A
Toluene-d8 (S)	98.6		%	89 - 112			SW846 8260C		9/20/18 13:29	TMP	A

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

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State Certifications: FL E871113, WAC999, MD 128, VA 460157, WV DW 9961-C, WV 343

ANALYTICAL RESULTS

Workorder: 2339740 ASN040|60440641

Lab ID: 2339740001

Date Collected: 9/20/2018 09:10

Matrix: Ground Water

Sample ID: MW-32

Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
cis-1,2-Dichloroethene	1.3		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
Trichloroethene	95.4		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:43	TMP	B
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	117		%	81 - 118			SW846 8260C		9/27/18 19:43	TMP	B
4-Bromofluorobenzene (S)	108		%	85 - 114			SW846 8260C		9/27/18 19:43	TMP	B
Dibromofluoromethane (S)	112		%	80 - 119			SW846 8260C		9/27/18 19:43	TMP	B
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C		9/27/18 19:43	TMP	B
LIGHT HYDROCARBON GASES											
Ethane	21.1		ug/L	3.3	3.3	0.23	RSK 175		9/24/18 23:21	EGO	H
Ethene	4.7		ug/L	2.4	2.4	0.40	RSK 175		9/24/18 23:21	EGO	H
Methane	2650		ug/L	1.5	1.5	0.34	RSK 175		9/25/18 10:44	KJH	H
WET CHEMISTRY											
Alkalinity, Total	129	✓	mg/L	5	5	0.8	SM2320B-2011		9/25/18 20:10	MSA	F
Chloride	27.8		mg/L	2.0	0.50	0.16	EPA 300.0		9/22/18 07:04	CHW	E
Nitrate-N	0.060U	U ✓	mg/L	0.20	0.060	0.020	EPA 300.0		9/22/18 07:04	CHW	E
Nitrate-N	0.060U	U, 3	mg/L	0.20	0.060	0.020	EPA 300.0		9/25/18 04:00	CHW	E
Sulfate	1.4J	J	mg/L	2.0	0.50	0.20	EPA 300.0		9/25/18 04:00	CHW	E
Total Organic Carbon (TOC)	3.9		mg/L	1.0	0.50	0.18	SM5310B-2011		9/27/18 10:09	PAG	C
METALS											
Iron, Total	0.51		mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 11:53	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 10:19	SRT	K1

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ANALYTICAL RESULTS

Workorder: 2339740 ASN040|60440641

Lab ID: 2339740002

Date Collected: 9/20/2018 10:50

Matrix: Ground Water

Sample ID: MW-31

Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
cis-1,2-Dichloroethene	0.34J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
Trichloroethene	19.7	J+	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:06	TMP	B
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	119	4	%	81 - 118			SW846 8260C		9/27/18 20:06	TMP	B
4-Bromofluorobenzene (S)	104		%	85 - 114			SW846 8260C		9/27/18 20:06	TMP	B
Dibromofluoromethane (S)	112		%	80 - 119			SW846 8260C		9/27/18 20:06	TMP	B
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C		9/27/18 20:06	TMP	B
LIGHT HYDROCARBON GASES											
Ethane	4.2		ug/L	3.3	3.3	0.23	RSK 175		9/24/18 23:37	EGO	H
Ethene	1.4J	J	ug/L	2.4	2.4	0.40	RSK 175		9/24/18 23:37	EGO	H
Methane	90.6		ug/L	1.5	1.5	0.34	RSK 175		9/24/18 23:37	EGO	H
WET CHEMISTRY											
Alkalinity, Total	169	J	mg/L	5	5	0.8	SM2320B-2011		9/25/18 20:20	MSA	F
Chloride	32.0		mg/L	2.0	0.50	0.16	EPA 300.0		9/22/18 07:21	CHW	E
Nitrate-N	0.060U	U, J	mg/L	0.20	0.060	0.020	EPA 300.0		9/22/18 07:21	CHW	E
Nitrate-N	0.060U	U, J	mg/L	0.20	0.060	0.020	EPA 300.0		9/25/18 04:12	CHW	E
Sulfate	4.6		mg/L	2.0	0.50	0.20	EPA 300.0		9/25/18 04:12	CHW	E
Total Organic Carbon (TOC)	0.69J	J	mg/L	1.0	0.50	0.18	SM5310B-2011		9/27/18 10:09	PAG	C
METALS											
Iron, Total	0.76		mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 11:57	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 10:23	SRT	K1

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ANALYTICAL RESULTS

Workorder: 2339740 ASN040|60440641

Lab ID: 2339740003

Date Collected: 9/20/2018 13:20

Matrix: Ground Water

Sample ID: MW-30

Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
Trichloroethene	8.2		ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:02	TMP	A
Surrogate Recoveries	Results	Flag	Units	Limits			Method	Prepared By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	114		%	81 - 118			SW846 8260C		9/22/18 19:02	TMP	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C		9/22/18 19:02	TMP	A
Dibromofluoromethane (S)	111		%	80 - 119			SW846 8260C		9/22/18 19:02	TMP	A
Toluene-d8 (S)	96.9		%	89 - 112			SW846 8260C		9/22/18 19:02	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	42.2		ug/L	3.3	3.3	0.23	RSK 175		9/24/18 23:53	EGO	H
Ethene	4.3		ug/L	2.4	2.4	0.40	RSK 175		9/24/18 23:53	EGO	H
Methane	4410		ug/L	1.5	1.5	0.34	RSK 175		9/25/18 11:06	KJH	H
WET CHEMISTRY											
Alkalinity, Total	59	✓	mg/L	5	5	0.8	SM2320B-2011		9/25/18 20:30	MSA	F
Chloride	40.7		mg/L	2.0	0.50	0.16	EPA 300.0		9/22/18 07:38	CHW	E
Nitrate-N	0.060U	U✓	mg/L	0.20	0.060	0.020	EPA 300.0		9/22/18 07:38	CHW	E
Nitrate-N	0.060U	U,3	mg/L	0.20	0.060	0.020	EPA 300.0		9/25/18 04:24	CHW	E
Sulfate	0.50U	U	mg/L	2.0	0.50	0.20	EPA 300.0		9/25/18 04:24	CHW	E
Total Organic Carbon (TOC)	10.2		mg/L	2.0	1.0	0.37	SM5310B-2011		9/27/18 10:09	PAG	C
METALS											
Iron, Total	0.16		mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 12:01	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 10:26	SRT	K1

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ANALYTICAL RESULTS

Workorder: 2339740 ASN040|60440641

Lab ID: 2339740004

Date Collected: 9/20/2018 15:00

Matrix: Ground Water

Sample ID: MW-29

Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
1,1-Dichloroethane	0.87J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
1,1-Dichloroethene	0.41J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
cis-1,2-Dichloroethene	3.7		ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
trans-1,2-Dichloroethene	0.35J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
Tetrachloroethene	31.9		ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
1,1,1-Trichloroethane	10.4		ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
1,1,2-Trichloroethane	0.34J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
Trichloroethene	218		ug/L	5.0	3.8	1.7	SW846 8260C		9/27/18 20:28	TMP	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 19:24	TMP	A
Surrogate Recoveries	Results	Flag	Units	Limits			Method	Prepared By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	118		%	81 - 118			SW846 8260C		9/27/18 20:28	TMP	B
1,2-Dichloroethane-d4 (S)	117		%	81 - 118			SW846 8260C		9/22/18 19:24	TMP	A
4-Bromofluorobenzene (S)	107		%	85 - 114			SW846 8260C		9/27/18 20:28	TMP	B
4-Bromofluorobenzene (S)	106		%	85 - 114			SW846 8260C		9/22/18 19:24	TMP	A
Dibromofluoromethane (S)	111		%	80 - 119			SW846 8260C		9/22/18 19:24	TMP	A
Dibromofluoromethane (S)	110		%	80 - 119			SW846 8260C		9/27/18 20:28	TMP	B
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C		9/27/18 20:28	TMP	B
Toluene-d8 (S)	96.4		%	89 - 112			SW846 8260C		9/22/18 19:24	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175		9/25/18 00:10	EGO	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175		9/25/18 00:10	EGO	H
Methane	1.5U	U	ug/L	1.5	1.5	0.34	RSK 175		9/25/18 00:10	EGO	H
WET CHEMISTRY											
Alkalinity, Total	374	2	mg/L	5	5	0.8	SM2320B-2011		9/25/18 20:42	MSA	F
Chloride	29.9		mg/L	2.0	0.50	0.16	EPA 300.0		9/22/18 07:55	CHW	E
Nitrate-N	0.46	1	mg/L	0.20	0.060	0.020	EPA 300.0		9/22/18 07:55	CHW	E
Nitrate-N	0.48	3	mg/L	0.20	0.060	0.020	EPA 300.0		9/25/18 04:37	CHW	E
Sulfate	11.8		mg/L	2.0	0.50	0.20	EPA 300.0		9/25/18 04:37	CHW	E
Total Organic Carbon (TOC)	1.3		mg/L	1.0	0.50	0.18	SM5310B-2011		9/27/18 10:09	PAG	C
METALS											

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ANALYTICAL RESULTS

Workorder: 2339740 ASN040|60440641

Lab ID: **2339740004**

Date Collected: 9/20/2018 15:00

Matrix: Ground Water

Sample ID: **MW-29**

Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
Iron, Total	0.062J	J	mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 12:04	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 10:30	SRT	K1

Vanessa N. Badman

Mrs. Vanessa N Badman

Project Coordinator

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**ANALYTICAL RESULTS**

Workorder: 2339740 ASN040|60440641

Lab ID: **2339740005**
Sample ID: **Equipment Blank**Date Collected: 9/20/2018 00:00 Matrix: Ground Water
Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:53	TMP	A
Surrogate Recoveries	Results	Flag	Units	Limits			Method	Prepared By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	115		%	81 - 118			SW846 8260C		9/22/18 17:53	TMP	A
4-Bromofluorobenzene (S)	106		%	85 - 114			SW846 8260C		9/22/18 17:53	TMP	A
Dibromofluoromethane (S)	111		%	80 - 119			SW846 8260C		9/22/18 17:53	TMP	A
Toluene-d8 (S)	97.3		%	89 - 112			SW846 8260C		9/22/18 17:53	TMP	A

*Vanessa N. Badman*Mrs. Vanessa N Badman
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ANALYTICAL RESULTS

Workorder: 2339740 ASN040|60440641

Lab ID: 2339740006

Date Collected: 9/21/2018 09:05

Matrix: Ground Water

Sample ID: Trip Blank

Date Received: 9/21/2018 09:05

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/22/18 17:31	TMP	A
Surrogate Recoveries	Results	Flag	Units	Limits			Method	Prepared By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	115		%	81 - 118			SW846 8260C		9/22/18 17:31	TMP	A
4-Bromofluorobenzene (S)	108		%	85 - 114			SW846 8260C		9/22/18 17:31	TMP	A
Dibromofluoromethane (S)	111		%	80 - 119			SW846 8260C		9/22/18 17:31	TMP	A
Toluene-d8 (S)	98.5		%	89 - 112			SW846 8260C		9/22/18 17:31	TMP	A



Mrs. Vanessa N Badman

Project Coordinator

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State Certifications: DE ID 11, MA PA0102, MD 128, VA 460157, WV 343

ANALYTICAL RESULTS

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID: 2339919001

Date Collected: 9/19/2018 09:45

Matrix: Ground Water

Sample ID: MW-35

Date Received: 9/20/2018 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
Trichloroethene	15.2		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:11	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	115		%	81 - 118			SW846 8260C		9/27/18 18:11	TMP	A
4-Bromofluorobenzene (S)	106		%	85 - 114			SW846 8260C		9/27/18 18:11	TMP	A
Dibromofluoromethane (S)	110		%	80 - 119			SW846 8260C		9/27/18 18:11	TMP	A
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C		9/27/18 18:11	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175		9/24/18 21:45	EGO	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175		9/24/18 21:45	EGO	H
Methane	50.5		ug/L	1.5	1.5	0.34	RSK 175		9/24/18 21:45	EGO	H
WET CHEMISTRY											
Alkalinity, Total	115	<i>L</i>	mg/L	5	5	0.8	SM2320B-2011		9/28/18 04:56	MSA	F
Chloride	2.1		mg/L	2.0	0.50	0.16	EPA 300.0		9/25/18 04:49	CHW	E
Nitrate-N	0.68	<i>Jx</i>	mg/L	0.20	0.060	0.020	EPA 300.0		9/25/18 04:49	CHW	E
Sulfate	2.5		mg/L	2.0	0.50	0.20	EPA 300.0		9/25/18 04:49	CHW	E
Total Organic Carbon (TOC)	3.5		mg/L	1.0	0.50	0.18	SM5310B-2011		9/26/18 03:43	PAG	C
METALS											
Iron, Total	0.45		mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 11:15	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 09:46	SRT	K1

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State Certifications: DE ID 11, MA PA0102, MD 128, VA 460157, WV 343

ANALYTICAL RESULTS

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID: 2339919002

Date Collected: 9/19/2018 11:50

Matrix: Ground Water

Sample ID: MW-34

Date Received: 9/20/2018 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
Trichloroethene	6.9		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:34	TMP	A
Surrogate Recoveries	Results	Flag	Units	Limits			Method	Prepared By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	116		%	81 - 118			SW846 8260C		9/27/18 18:34	TMP	A
4-Bromofluorobenzene (S)	106		%	85 - 114			SW846 8260C		9/27/18 18:34	TMP	A
Dibromofluoromethane (S)	108		%	80 - 119			SW846 8260C		9/27/18 18:34	TMP	A
Toluene-d8 (S)	103		%	89 - 112			SW846 8260C		9/27/18 18:34	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175		9/24/18 22:00	EGO	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175		9/24/18 22:00	EGO	H
Methane	1.5U	U	ug/L	1.5	1.5	0.34	RSK 175		9/24/18 22:00	EGO	H
WET CHEMISTRY											
Alkalinity, Total	183		mg/L	5	5	0.8	SM2320B-2011		9/28/18 05:07	MSA	F
Chloride	2.0U		mg/L	2.0	0.50	0.16	EPA 300.0		9/25/18 05:01	CHW	E
Nitrate-N	0.56		mg/L	0.20	0.060	0.020	EPA 300.0		9/25/18 05:01	CHW	E
Sulfate	3.9		mg/L	2.0	0.50	0.20	EPA 300.0		9/25/18 05:01	CHW	E
Total Organic Carbon (TOC)	6.8		mg/L	1.0	0.50	0.18	SM5310B-2011		9/26/18 08:50	PAG	C
METALS											
Iron, Total	0.045U	U	mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 11:19	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 09:50	SRT	K1

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State Certifications: DE ID 11, MA PA0102, MD 128, VA 460157, WV 343

ANALYTICAL RESULTS

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID: 2339919003

Date Collected: 9/19/2018 13:30

Matrix: Ground Water

Sample ID: MW-33

Date Received: 9/20/2018 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
Trichloroethene	137	12	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 18:57	TMP	A
Surrogate Recoveries	Results	Flag	Units	Limits			Method	Prepared By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	117		%	81 - 118			SW846 8260C		9/27/18 18:57	TMP	A
4-Bromofluorobenzene (S)	109		%	85 - 114			SW846 8260C		9/27/18 18:57	TMP	A
Dibromofluoromethane (S)	113		%	80 - 119			SW846 8260C		9/27/18 18:57	TMP	A
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C		9/27/18 18:57	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175		9/24/18 22:16	EGO	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175		9/24/18 22:16	EGO	H
Methane	1.5U	U	ug/L	1.5	1.5	0.34	RSK 175		9/24/18 22:16	EGO	H
WET CHEMISTRY											
Alkalinity, Total	213	J	mg/L	5	5	0.8	SM2320B-2011		9/28/18 03:55	MSA	F
Chloride	24.8	J	mg/L	2.0	0.50	0.16	EPA 300.0		9/25/18 05:25	CHW	E
Nitrate-N	0.40	J	mg/L	0.20	0.060	0.020	EPA 300.0		9/25/18 05:25	CHW	E
Sulfate	14.6		mg/L	2.0	0.50	0.20	EPA 300.0		9/25/18 05:25	CHW	E
Total Organic Carbon (TOC)	0.58J	J	mg/L	1.0	0.50	0.18	SM5310B-2011		9/26/18 08:50	PAG	C
METALS											
Iron, Total	0.045U	U	mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 11:39	SRT	J1
Iron, Dissolved	0.045J	J	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 10:05	SRT	K1

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ANALYTICAL RESULTS

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID: 2339919004

Date Collected: 9/19/2018 00:00

Matrix: Ground Water

Sample ID: DUP

Date Received: 9/20/2018 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
Trichloroethene	155		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 19:20	TMP	A
Surrogate Recoveries	Results	Flag	Units	Limits			Method	Prepared By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	118		%	81 - 118			SW846 8260C		9/27/18 19:20	TMP	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C		9/27/18 19:20	TMP	A
Dibromofluoromethane (S)	113		%	80 - 119			SW846 8260C		9/27/18 19:20	TMP	A
Toluene-d8 (S)	105		%	89 - 112			SW846 8260C		9/27/18 19:20	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175		9/24/18 23:05	EGO	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175		9/24/18 23:05	EGO	H
Methane	1.5U	U	ug/L	1.5	1.5	0.34	RSK 175		9/24/18 23:05	EGO	H
WET CHEMISTRY											
Alkalinity, Total	218	J	mg/L	5	5	0.8	SM2320B-2011		9/28/18 05:17	MSA	F
Chloride	25.6		mg/L	2.0	0.50	0.16	EPA 300.0		9/25/18 05:13	CHW	E
Nitrate-N	0.42	JX	mg/L	0.20	0.060	0.020	EPA 300.0		9/25/18 05:13	CHW	E
Sulfate	14.7		mg/L	2.0	0.50	0.20	EPA 300.0		9/25/18 05:13	CHW	E
Total Organic Carbon (TOC)	0.49J	J	mg/L	1.0	0.50	0.18	SM5310B-2011		9/26/18 08:50	PAG	C
METALS											
Iron, Total	0.045U	U	mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 11:23	SRT	J1
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 09:54	SRT	K1

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ANALYTICAL RESULTS

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID: 2339919005

Date Collected: 9/19/2018 00:00

Matrix: Ground Water

Sample ID: TRIP BLANK

Date Received: 9/20/2018 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:48	TMP	A
Surrogate Recoveries	Results	Flag	Units	Limits			Method	Prepared By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	115		%	81 - 118			SW846 8260C		9/27/18 17:48	TMP	A
4-Bromofluorobenzene (S)	109		%	85 - 114			SW846 8260C		9/27/18 17:48	TMP	A
Dibromofluoromethane (S)	108		%	80 - 119			SW846 8260C		9/27/18 17:48	TMP	A
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C		9/27/18 17:48	TMP	A

Vanessa N. Badman

Mrs. Vanessa N Badman

Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

Lab ID: 2339926001

Date Collected: 9/21/2018 11:05

Matrix: Ground Water

Sample ID: MW-28

Date Received: 9/22/2018 09:25

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
1,1-Dichloroethane	1.2		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
1,1-Dichloroethene	0.34J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
cis-1,2-Dichloroethene	4.5		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
trans-1,2-Dichloroethene	0.33J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
Tetrachloroethene	43.7		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
1,1,1-Trichloroethane	9.0		ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
1,1,2-Trichloroethane	0.42J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
Trichloroethene	232	J	ug/L	5.0	3.8	1.7	SW846 8260C		10/2/18 21:27	TMP	K
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 20:51	TMP	B
Surrogate Recoveries	Results	Flag	Units	Limits			Method	Prepared By	Analyzed	By	Cntr
1,2-Dichloroethane-d4 (S)	129	2	%	81 - 118			SW846 8260C		10/2/18 21:27	TMP	K
1,2-Dichloroethane-d4 (S)	118		%	81 - 118			SW846 8260C		9/27/18 20:51	TMP	B
4-Bromofluorobenzene (S)	121	A	%	85 - 114			SW846 8260C		10/2/18 21:27	TMP	K
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C		9/27/18 20:51	TMP	B
Dibromofluoromethane (S)	116		%	80 - 119			SW846 8260C		10/2/18 21:27	TMP	K
Dibromofluoromethane (S)	113		%	80 - 119			SW846 8260C		9/27/18 20:51	TMP	B
Toluene-d8 (S)	77.2	3	%	89 - 112			SW846 8260C		10/2/18 21:27	TMP	K
Toluene-d8 (S)	105		%	89 - 112			SW846 8260C		9/27/18 20:51	TMP	B
LIGHT HYDROCARBON GASES											
Ethane	1.3J	J	ug/L	3.3	3.3	0.23	RSK 175		9/25/18 01:01	EGO	A
Ethene	1.4J	J	ug/L	2.4	2.4	0.40	RSK 175		9/25/18 01:01	EGO	A
Methane	60.8		ug/L	1.5	1.5	0.34	RSK 175		9/25/18 01:01	EGO	A
WET CHEMISTRY											
Alkalinity, Total	345	✓	mg/L	5	5	0.8	SM2320B-2011		9/28/18 05:28	MSA	F
Chloride	42.7		mg/L	2.0	0.50	0.16	EPA 300.0		9/22/18 14:47	CHW	E
Nitrate-N	0.58		mg/L	0.20	0.060	0.020	EPA 300.0		9/22/18 14:47	CHW	E
Sulfate	13.2		mg/L	2.0	0.50	0.20	EPA 300.0		9/22/18 14:47	CHW	E
Total Organic Carbon (TOC)	0.85J	J	mg/L	1.0	0.50	0.18	SM5310B-2011		9/28/18 19:54	PAG	C
METALS											
Iron, Total	0.045U	U	mg/L	0.067	0.045	0.022	SW846 6010C	9/25/18 SRT	9/26/18 12:08	SRT	H1

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ANALYTICAL RESULTS

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

Lab ID: **2339926001**

Date Collected: 9/21/2018 11:05

Matrix: Ground Water

Sample ID: **MW-28**

Date Received: 9/22/2018 09:25

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
Iron, Dissolved	0.044U	U	mg/L	0.067	0.044	0.022	SW846 6010C	9/25/18 SRT	9/26/18 10:34	SRT	I1

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

Lab ID: 2339926002

Date Collected: 9/22/2018 09:25

Matrix: Ground Water

Sample ID: Trip Blank

Date Received: 9/22/2018 09:25

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/18 17:25	TMP	A
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>			<i>Method</i>	<i>Prepared By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	112		%	81 - 118			SW846 8260C		9/27/18 17:25	TMP	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C		9/27/18 17:25	TMP	A
Dibromofluoromethane (S)	106		%	80 - 119			SW846 8260C		9/27/18 17:25	TMP	A
Toluene-d8 (S)	103		%	89 - 112			SW846 8260C		9/27/18 17:25	TMP	A

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 28154 FSND / 60440641-15

Lab ID: 281540001

Date Received: 9/25/2018 10:50 Matrix: Bubble Strip

Sample ID: MW-35

Date Collected: 9/19/2018 09:45

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
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RISK - PAES

Analysis Desc: AM20GAX

Analytical Method: AM20GAX

Hydrogen	2.6	nM	1.0	0.65	1	9/29/2018 11:06	TD	n
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ANALYTICAL RESULTS

Workorder: 28154 FSND / 60440641-15

Lab ID: 281540002

Date Received: 9/25/2018 10:50 Matrix: Bubble Strip

Sample ID: MW-34

Date Collected: 9/19/2018 11:50

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
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RISK - PAES

Analysis Desc: AM20GAX

Analytical Method: AM20GAX

Hydrogen	3.1	nM	1.0	0.65	1	9/29/2018 11:20	TD	n
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ANALYTICAL RESULTS

Workorder: 28154 FSND / 60440641-15

Lab ID: 281540003

Date Received: 9/25/2018 10:50 Matrix: Bubble Strip

Sample ID: MW-33

Date Collected: 9/19/2018 13:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Hydrogen	3.9	nM	1.0	0.65	1	9/29/2018 11:33	TD	n



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ANALYTICAL RESULTS

Workorder: 28154 FSND / 60440641-15

Lab ID: 281540004

Date Received: 9/25/2018 10:50 Matrix: Bubble Strip

Sample ID: MW-32

Date Collected: 9/20/2018 09:10

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Hydrogen	7.4	nM	1.0	0.65	1	9/29/2018 12:30	TD	n



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ANALYTICAL RESULTS

Workorder: 28154 FSND / 60440641-15

Lab ID: 281540005

Date Received: 9/25/2018 10:50 Matrix: Bubble Strip

Sample ID: MW-31

Date Collected: 9/20/2018 10:50

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Hydrogen	4.1	nM	1.0	0.65	1	9/29/2018 12:44	TD	n



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ANALYTICAL RESULTS

Workorder: 28154 FSND / 60440641-15

Lab ID: 281540006

Date Received: 9/25/2018 10:50 Matrix: Bubble Strip

Sample ID: MW-30

Date Collected: 9/20/2018 13:20

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Hydrogen	12	nM	1.0	0.65	1	9/29/2018 12:56	TD	n



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Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 28154 FSND / 60440641-15

Lab ID: 281540007

Date Received: 9/25/2018 10:50 Matrix: Bubble Strip

Sample ID: MW-29

Date Collected: 9/20/2018 15:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Hydrogen	2.8	nM	1.0	0.65	1	9/29/2018 13:09	TD	n



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Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 28154 FSND / 60440641-15

Lab ID: 281540008

Date Received: 9/25/2018 10:50 Matrix: Bubble Strip

Sample ID: MW-28

Date Collected: 9/21/2018 11:05

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
------------	---------	-------	-----	-----	----	----------	----	------------

RISK - PAES

Analysis Desc: AM20GAX

Analytical Method: AM20GAX

Hydrogen	3.9	nM	1.0	0.65	1	9/29/2018 13:22	TD	n
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Appendix C

Support Documentation



34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHARED AREAS MUST BE COMPLETED BY THE CLIENT /
SAMPLER. INSTRUCTIONS ON THE BACK

Page 1 of 1
Courier:
Tracking #:



Environmetal

Co. Name: **AECOM**
Contact (Report to): **Gerlinde Wolf** Phone: **518 951-2370**
Address: **40 British American Blvd.
Latham, NY 12110**

Bill to (if different than Report to):

PO#:

Project Name/ID: **60440641** ALS Quote #:

TAT: ☒ Normal-Standard TAT is 10-12 business days.
☐ Rush-Subject to ALS approval and surcharges.

Email? ☒ Y ☐ N gerlinde.wolf@AECOM.COM
Fax? ☐ Y ☐ N

Sample Description/Location (as it will appear on the lab report)

1 MW-16 9/18/18 1640 66W

2 MW-26 1225

3 MW-24 1415

4 MW-15 1545

5 Trip Blank

6

7

8

SAMPLED BY (Please Print):

Gerlinde Wolf

Relinquished By / Company Name

1 Gerlinde Wolf / AECOM

2 Bulwer's Wood - ALS 9/18/18 5:30 PM

3 COMMON COURIER / ALS COURIER

4

5

6

7

Project Comments:

Send results to gerlinde.wolf@AECOM.COM

Date Time

9/18/18 1600

23 Bulwer's Wood - ALS 9/18/18 4:45 PM

4 COMMON COURIER / ALS COURIER

5

6

7

8

Received By / Company Name

23 Bulwer's Wood - ALS 9/18/18 4:45 PM

4 COMMON COURIER / ALS COURIER

5

6

7

8

Date Time

9/18/18 1600

23 Bulwer's Wood - ALS 9/18/18 4:45 PM

4 COMMON COURIER / ALS COURIER

5

6

7

8

Container Type	Size	Preservative	ANALYSES/METHOD REQUESTED
C	40	ACI	TOC
C	40	ACI	Alkalinity
C	40	ACI	C1, NO3, SO4
C	40	ACI	Total Fe
C	40	ACI	Diss. Fe

Enter Number of Containers Per Analysis

8260 C

2

2

2

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2

2

2

2

2

2

RECEIVED BY (Signature)
No. of Containers: 359
Therm. ID: 359
Cooler Temp: 1.0

Notes:

Correct containers? ☒ Y ☐ N

Correct sample volume? ☒ Y ☐ N

Correct preservation? ☒ Y ☐ N

Reanalysis/Retesting? ☒ Y ☐ N

Container in good condition? ☒ Y ☐ N

COC labels completed/accurate? ☒ Y ☐ N

Received on ice? ☒ Y ☐ N

(If present) Seals intact? ☒ Y ☐ N

Custody seals Present? ☒ Y ☐ N

ALS FIELD SERVICES

Repack ☐

Labor ☐

Composite Sampling ☐

Rental Equipment ☐

Other ☐

State Sample Collected in? ☐ MD ☐ NJ ☐ NY ☐ PA

Standard ☐

CLP-Use ☐

NJ-Reduced ☐

NJ-Full ☐

Is yes, format type: Other ☐

DOO Criteria Required? ☐

DOO Criteria Required? ☐

DOO Criteria Required? ☐

DOO Criteria Required? ☐

DOO Criteria Required? ☐

SAMPLE SUMMARY

Workorder: 2339171 ASN039|60440641

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2339171001	MW-16	Ground Water	9/18/2018 10:40	9/19/2018 10:54	Collected by Client
2339171002	MW-26	Ground Water	9/18/2018 12:25	9/19/2018 10:54	Collected by Client
2339171003	MW-24	Ground Water	9/18/2018 14:15	9/19/2018 10:54	Collected by Client
2339171004	MW-15	Ground Water	9/18/2018 15:45	9/19/2018 10:54	Collected by Client
2339171005	Trip Blank	Ground Water	9/19/2018 10:54	9/19/2018 10:54	Collected by Client

ALS Environmental Laboratory Locations Across North America

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Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

**AECOM – Latham, NY
ALS-Middletown
Case Narrative
ASN-039 (2339171)**

Sample Management

This report contains the results of the analysis of five (5) ground water samples collected on September 18-19, 2018. Analytical results and quality control information are summarized in this data package.

Qualifier Symbol Definitions:

U = Qualifier indicates that the analyte was not detected above the LOD.
J = Qualifier indicates that the analyte value is between the DL and the LOQ.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds the calibration range.
P = Qualifier indicates that the RPD between the two analytical columns is > 40%.
NSC = Qualifier indicates that spike recoveries were not calculated based on the spiking concentration.

Result Symbol Definitions:

DL = The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
LOD = The smallest analyte concentration that must be present in a sample in order to be detected at a high level of confidence.
LOQ = The lowest concentration that produces a quantitative result within specified limits of precision or bias.

Manual Integration Symbol Definitions

I = Peak was not integrated properly by chromatographic software. This may be due to baseline irregularities resulting from sample matrix, elevated baseline, or incorrect integration by software on a sample. Integration was adjusted by operator to ensure proper quantitation.
H = The incorrect peak was identified or the chromatographic software did not identify an analyte peak. Operator manually identified the correct peak as the appropriate target analyte. This flag is automatically assigned by the Target software.
SP = Peak was erroneously split. The operator manually integrated the peak to include all the area of the analyte peak to ensure proper quantitation.
MP = Two peaks were erroneously merged. This may include two discrete peaks separated by a distinguishable valley or a larger peak with a clearly identifiable shoulder. Operator manually split peaks.
AB = Integration of group of adjacent peaks did not follow baseline. Operator manually assigned integration to follow baseline.
NP = Negative spike in the baseline resulted in overstating area of analyte peaks. Analyte peaks were re-assigned.
AC = Integration of aggregate or multi-component analyte to include area off all components of the analyte (i.e., toxaphene).

Sample Receipt

Samples arrived at ALS via courier on September 19, 2018. Upon receipt, the samples were inspected and compared to the Chain of Custody. Sample temperature was documented on the enclosed Chain of Custody. Samples were received intact and properly preserved, unless noted on the enclosed Certificate of Analysis and/or Chain of Custody.

Manual Integrations

If manual integrations were performed they are indicated on the raw data quantification files for each method.

Volatile Organics by SW-846 Method 8260

Sample Handling. Five (5) water samples were analyzed by SW-846 Method 8260 for volatile organic compounds. All analyses were performed within the holding time.

Initial Calibrations. Initial calibrations were properly analyzed and met method criteria for all target analytes. **Note:** The batch LCS also serves as a second source (ICV).

Initial Calibration Verifications. Initial calibration verification samples were properly analyzed and met method criteria.

Continuing Calibration Verification. Samples were run immediately following ICAL.

Blanks. Target analytes were not detected in the method blank.

Surrogates. Recoveries were within control limits.

Laboratory control samples. Target analytes were recovered within control limits in the laboratory control samples.

Matrix and Matrix Spike samples. Target analytes were recovered within control limits.

Internal Standards. Internal standard results met method criteria

Light Hydrocarbon Gases by RSK-175

Sample Handling. Four (4) water samples were submitted for the analysis of light hydrocarbon gases by Method RSK-175. The samples were analyzed within the method specified holding time of fourteen days.

Calibrations. The initial calibrations met method criteria for all target analytes.

Calibration verification. Prior to the analysis of samples in this group, the initial calibrations were successfully verified by the analysis of calibration verification standards. The samples were then successfully bracketed with alternating calibration verification standards (CCV) throughout the analysis.

Continuing Calibration. A continuing calibration standard were properly analyzed and met method criteria for all target analytes.

Blanks. Target analytes were not detected in the method blank.

Duplicate Samples. A duplicate sample, identified as 2813249, from non-project sample 2302814004 was analyzed. Target analytes were not detected.

Total Metals by SW-846 Method 6010C

Sample handling. Four (4) water samples were digested by SW-846 method 3015, and the digestates were analyzed for total metals on the ThermoFisher ICP6500_2, using SW-846 method 6010C. The samples were digested and analyzed within the six-month holding time established for the method.

Calibration. All criteria associated with the calibration and calibration verification standards were within control limits

Blanks. Metals were not detected in the blanks.

Laboratory Control Samples. Recoveries were within the control limits.

Spikes. A matrix spike/matrix spike duplicate were not digested or analyzed on the samples in deliverable group

Dissolved Metals by EPA Method 6010C

Sample handling. Four (4) water samples were filtered and analyzed for dissolved metals on the ThermoFisher ICP6500_2 using EPA Method 6010C. The samples were analyzed within the six-month holding time established for the method.

Calibration. All criteria associated with the calibration and check standards were within the control limits for this method.

Blanks. Metals were not detected in the blanks.

Laboratory Control Sample. The LCS recoveries were within the method control limits.

Spikes. A matrix spike/matrix spike duplicate were not digested or analyzed on the samples in deliverable group

Anions by EPA 300.0

Sample handling. Four (4) aqueous samples were analyzed for nitrate, chloride, and sulfate by EPA Method 300.0. The samples were analyzed within the method recommended holding time for each analyte.

Calibration. Initial calibrations, identified as Method A (high range) and Method L (low range), were properly established for instrument IC6 on 08/28/2018. Initial and continuing calibration verification standards were recovered within the QC limits.

Blanks. Initial and continuing blanks were analyzed with the samples. Anions were not detected above the reporting limits in the blanks.

Laboratory Control Samples. Laboratory control samples identified as SSL and 2812681 were analyzed initially and every 20 samples. Recoveries were within the QC limits.

Spikes. A matrix spike and spike duplicate were not performed on any samples from this data deliverable.

Total Alkalinity by SM 2320B

Sample handling. Four (4) aqueous samples were analyzed for total alkalinity by Standard Method 2320B. The samples were analyzed within the 14-day holding time established for the method.

Blanks. Method blanks were analyzed with the samples. Total alkalinity was not detected above the reporting limit of 5 mg/L in the blanks.

Calibration. The autotitrator was pH calibrated on the day of analysis and a continuing pH 7 buffer standard was analyzed throughout the run. All standards were found to be within QC limits of ± 0.05 pH units.

Total alkalinity standards were analyzed initially and throughout the analysis. The standards recovered within the alkalinity QC limits of 90-110%.

Duplicate. A duplicate analysis identified as 2812583 was performed on sample 2339171001 (MW-16). The relative percent difference between the results was within the QC limit of 20%.

Total Organic Carbon by SM 5310B

Sample handling. Four (4) aqueous samples were analyzed for total organic carbon by Standard Method 5310B. The preserved samples were analyzed within the 28-day holding time established for the method.

Blanks. Method blanks were analyzed with the samples. Total organic carbon was not detected above the reporting limit of 0.5 mg/L in the blanks.

Calibration. Initial calibrations were properly established on the days of analysis. Initial and continuing calibration standards were analyzed for verification, and recoveries were all within the QC limits.

Laboratory Control Spike. A laboratory control spike of 1.0 mg/L was analyzed with the samples. The recovery was within the QC limit of 85-115%.

Spikes. Matrix spike and matrix spike duplicate analyses were not performed on any samples from this data deliverable.

ANALYTICAL RESULTS

Workorder: 2339171 ASN039|60440641

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2339171001	1	MW-16	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2339171002	1	MW-26	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2339171003	1	MW-24	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2339171004	1	MW-15	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				

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 Vancouver · Waterloo · Winnipeg · Yellowknife
United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York
Mexico: Monterrey

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: _____ SAS No.: _____ SDG No.: ASN-039

Matrix Spike - Sample No: MW-16MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC#	QC LIMIT REC
Carbon Tetrachloride	20	0	22.4	112	(72-136)
1,1-Dichloroethane	20	0	22.6	113	(77-125)
1,2-Dichloroethane	20	0	21.8	109	(73-128)
1,1-Dichloroethene	20	0	24.8	124	(71-131)
cis-1,2-Dichloroethene	20	0	21.8	109	(78-123)
trans-1,2-Dichloroethene	20	0	23.9	119	(75-124)
1,1,1,2-Tetrachloroethane	20	0	21.3	106	(78-124)
1,1,2,2-Tetrachloroethane	20	0	20.5	102	(71-121)
Tetrachloroethene	20	0	21.7	109	(74-129)
Toluene	20	0	22.0	110	(80-121)
1,1,1-Trichloroethane	20	0.34	23.2	114	(74-131)
1,1,2-Trichloroethane	20	0	21.0	105	(80-119)
Trichloroethene	20	0	21.9	109	(79-123)
Vinyl Chloride	20	0	17.9	89.3	(58-137)

Column to be used to flag recovery and RPD values with an asterisk
 * Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 0 out of 14 outside limits

Comments: _____

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ALS GlobalContract: VOMSLab Code: VOA

Case No.: _____

SAS No.: _____

SDG No.: _____

ASN-039

Matrix Spike - Sample No:

MW-16MSD

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD		QC LIMITS	
			% REC #	% RPD #	RPD	REC
1,1-Dichloroethene	20	23.9	120	3.83	30	(71-131)
cis-1,2-Dichloroethene	20	21.1	105	3.67	30	(78-123)
trans-1,2-Dichloroethene	20	23.2	116	2.78	30	(75-124)
1,1,1,2-Tetrachloroethane	20	21.6	108	1.81	30	(78-124)
1,1,2,2-Tetrachloroethane	20	20.8	104	1.44	30	(71-121)
Tetrachloroethene	20	21.6	108	.73	30	(74-129)
Toluene	20	22.2	111	.88	30	(80-121)
1,1,1-Trichloroethane	20	22.7	112	1.96	30	(74-131)
1,1,2-Trichloroethane	20	20.2	101	4.16	30	(80-119)
Trichloroethene	20	21.7	109	.83	30	(79-123)
Vinyl Chloride	20	18.0	90.1	.84	30	(58-137)
Carbon Tetrachloride	20	22.0	110	1.84	30	(72-136)
1,1-Dichloroethane	20	22.1	110	2.18	30	(77-125)
1,2-Dichloroethane	20	20.8	104	4.6	30	(73-128)

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 14 outside limitsSpike Recovery: 0 out of 14 outside limits

Comments: _____

Form 4B

Inorganic Blank Summary

Analysis Method: SM2320B-2011
Instrument: AUTOT

SDG No.: ASN039[illegible]

(1) The following qualifiers are used:

U: The analyte concentration is less than the reporting limit listed
J: The analyte concentration is less than the reporting limit but greater than the method detection limit

Comments:

SAMPLE SUMMARY

Workorder: 2339740 ASN040|60440641

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2339740001	MW-32	Ground Water	9/20/2018 09:10	9/21/2018 09:05	Collected by Client
2339740002	MW-31	Ground Water	9/20/2018 10:50	9/21/2018 09:05	Collected by Client
2339740003	MW-30	Ground Water	9/20/2018 13:20	9/21/2018 09:05	Collected by Client
2339740004	MW-29	Ground Water	9/20/2018 15:00	9/21/2018 09:05	Collected by Client
2339740005	Equipment Blank	Ground Water	9/20/2018 00:00	9/21/2018 09:05	Collected by Client
2339740006	Trip Blank	Ground Water	9/21/2018 09:05	9/21/2018 09:05	Collected by Client

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Vancouver Waterloo • Winnipeg • Yellowknife United States: Cincinnati • Everett • Fort Collins • Holland • Houston • Middletown • Salt Lake City • Spring City • York Mexico: Monterrey

**AECOM – Latham, NY
ALS-Middletown
Case Narrative
ASN-040 (2339740)**

Sample Management

This report contains the results of the analysis of six (6) ground water samples collected on September 20-21, 2018. Analytical results and quality control information are summarized in this data package.

Qualifier Symbol Definitions:

U = Qualifier indicates that the analyte was not detected above the LOD.
J = Qualifier indicates that the analyte value is between the DL and the LOQ.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds the calibration range.
P = Qualifier indicates that the RPD between the two analytical columns is > 40%.
NSC = Qualifier indicates that spike recoveries were not calculated based on the spiking concentration.

Result Symbol Definitions:

DL = The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
LOD = The smallest analyte concentration that must be present in a sample in order to be detected at a high level of confidence.
LOQ = The lowest concentration that produces a quantitative result within specified limits of precision or bias.

Manual Integration Symbol Definitions

I = Peak was not integrated properly by chromatographic software. This may be due to baseline irregularities resulting from sample matrix, elevated baseline, or incorrect integration by software on a sample. Integration was adjusted by operator to ensure proper quantitation.
H = The incorrect peak was identified or the chromatographic software did not identify an analyte peak. Operator manually identified the correct peak as the appropriate target analyte. This flag is automatically assigned by the Target software.
SP = Peak was erroneously split. The operator manually integrated the peak to include all the area of the analyte peak to ensure proper quantitation.
MP = Two peaks were erroneously merged. This may include two discrete peaks separated by a distinguishable valley or a larger peak with a clearly identifiable shoulder. Operator manually split peaks.
AB = Integration of group of adjacent peaks did not follow baseline. Operator manually assigned integration to follow baseline.
NP = Negative spike in the baseline resulted in overstating area of analyte peaks. Analyte peaks were re-assigned.
AC = Integration of aggregate or multi-component analyte to include area off all components of the analyte (i.e., toxaphene).

Sample Receipt

Samples arrived at ALS via courier on September 21, 2018. Upon receipt, the samples were inspected and compared to the Chain of Custody. Sample temperature was documented on the enclosed Chain of Custody. Samples were received intact and properly preserved, unless noted on the enclosed Certificate of Analysis and/or Chain of Custody.

Manual Integrations

If manual integrations were performed they are indicated on the raw data quantification files for each method.

Volatile Organics by SW-846 Method 8260

Sample Handling. Six (6) water samples were analyzed by SW-846 Method 8260 for volatile organic compounds. All analyses were performed within the holding time.

Initial Calibrations. Initial calibrations were properly analyzed and met method criteria for all target analytes. **Note:** The batch LCS also serves as a second source (ICV).

Initial Calibration Verifications. Initial calibration verification samples were properly analyzed and met method criteria.

Continuing Calibration Verification. Continuing Calibration samples were properly analyzed and met method criteria.

Blanks. Target analytes were not detected in the method blank, except as follows:

- In 2814603 MB, Toluene was detected at 0.53J µg/L.

Surrogates. Recoveries were within control limits, except as follows:

- In 2339740002, 1,2-Dichloroethane-d4 was recovered above control limits.

Laboratory control samples. Target analytes were recovered within control limits in the laboratory control samples.

Internal Standards. Internal standard results met method criteria

Light Hydrocarbon Gases by RSK-175

Sample Handling. Four (4) water samples were submitted for the analysis of light hydrocarbon gases by Method RSK-175. The samples were analyzed within the method specified holding time of fourteen days.

Calibrations. The initial calibrations met method criteria for all target analytes.

Calibration verification. Prior to the analysis of samples in this group, the initial calibrations were successfully verified by the analysis of calibration verification standards. The samples were then successfully bracketed with alternating calibration verification standards (CCV) throughout the analysis.

Continuing Calibration. A continuing calibration standard were properly analyzed and met method criteria for all target analytes, except as follows:

- In file PORPAK Q (9/24/2018 20:15) and PORPAK Q (9/24/2018 20:32), Methane was recovered outside control limits.

Blanks. Target analytes were not detected in the method blank.

Total Metals by SW-846 Method 6010C

Sample handling. Four (4) water samples were digested by SW-846 method 3015, and the digestates were analyzed for total metals on the ThermoFisher ICP6500_2, using SW-846 method 6010C. The samples were digested and analyzed within the six-month holding time established for the method.

Calibration. All criteria associated with the calibration and calibration verification standards were within control limits

Blanks. Metals were not detected in the blanks.

Laboratory Control Samples. Recoveries were within the control limits.

Spikes. A matrix spike/matrix spike duplicate were not digested or analyzed on the samples in deliverable group

Dissolved Metals by EPA Method 6010C

Sample handling. Four (4) water samples were filtered and analyzed for dissolved metals on the ThermoFisher ICP6500_2 using EPA Method 6010C. The samples were analyzed within the six-month holding time established for the method.

Calibration. All criteria associated with the calibration and check standards were within the control limits for this method.

Blanks. Metals were not detected in the blanks.

Laboratory Control Sample. The LCS recoveries were within the method control limits.

Spikes. A matrix spike/matrix spike duplicate were not digested or analyzed on the samples in deliverable group

Anions by EPA 300.0

Sample handling. Four (4) aqueous samples were analyzed for chloride, nitrate, and sulfate by EPA Method 300.0. The samples were originally analyzed within the method recommended holding time for each analyte; however, additional testing was required which occurred outside the hold time.

Calibration. Initial calibrations, identified as Method A (high range) and Method L (low range), were properly established for instruments IC6 and IC8 on 08/28/2018 and 08/31/2018, respectively. Initial and continuing calibration verification standards were recovered within the QC limits.

Blanks. Initial and continuing blanks were analyzed with the samples. Anions were not detected above the reporting limits in any of the blanks.

Laboratory Control Samples. Laboratory control samples identified as 2814015, 2815340, and SSL were analyzed initially and every 20 samples. Recoveries were within the QC limits.

Spikes. A matrix spike and spike duplicate analysis was not performed on any samples from this data deliverable.

Total Alkalinity by SM 2320B

Sample handling. Four (4) aqueous samples were analyzed for total alkalinity by Standard Method 2320B. The samples were analyzed within the 14-day holding time established for the method.

Blanks. Method blanks were analyzed with the samples. Total alkalinity was not detected above the reporting limit of 5 mg/L in the blanks.

Calibration. The autotitrator was pH calibrated on the day of analysis and a continuing pH 7 buffer standard was analyzed throughout the run. All standards were found to be within QC limits of ± 0.05 pH units.

Total alkalinity standards were analyzed initially and throughout the analysis. The standards recovered within the alkalinity QC limits of 90-110%.

Duplicate. A duplicate analysis was not performed on any samples from this data deliverable.

Total Organic Carbon by SM 5310B

Sample handling. Four (4) aqueous samples were analyzed for total organic carbon by Standard Method 5310B. The preserved samples were analyzed within the 28-day holding time established for the method.

Calibration. Initial calibrations were properly established on the days of analysis. Initial and continuing calibration standards were analyzed for verification, and recoveries were all within the QC limits.

Laboratory Control Spike. A laboratory control spike of 1.0 mg/L was analyzed with the samples. The recovery was within the QC limit of 85-115%.

Blanks. Method blanks were analyzed with the samples. Total organic carbon was not detected above the reporting limit of 0.5 mg/L in the blanks.

Spikes. Matrix spike and matrix spike duplicate analyses were performed on sample 2339740002 (MW-31). The spike recoveries and the relative percent difference between the spikes were all within the QC limits.

2A
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA CASE No.: _____ SAS No.: _____ SDG NO.: ASN-040

	Sample NO.	SMC1 (BFB) #	SMC2 (DBFM)	SMC3 (DCE) #	SMC4 (TOL) #	TOT OUT
08	2814603 (MB)	107	109	111	104	0
09	2814604 (LCS)	107	107	107	106	0
10	MW-32	108	112	117	104	0
11	MW-31	104	112	119 *	104	1
12	MW-29	107	110	118	104	0

SMC1 (BFB) = 4-Bromofluorobenzene	(85-114)
SMC2 (DBFM) = Dibromofluoromethane	(80-119)
SMC3 (DCE) = 1,2-Dichloroethane-d4	(81-118)
SMC4 (TOL) = Toluene-d8	(89-112)

QC LIMITS

Column to be used to flag recovery values
* Values outside of contract required QC Limits
D Surrogate Diluted Out

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

2814603 (MB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: _____ SAS No.: _____ SDG No.: ASN-040

Matrix (soil/water): WATER Lab Sample ID: 2814603

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 718092713.D

Level (low/med): _____ Date Received: 9/24/18

% Moisture: not dec. 100.0 Date Analyzed: 9/27/18

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS No.	Compound	(ug/L or ug/Kg) UG/L	Q
56-23-5	Carbon Tetrachloride	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
630-20-6	1,1,1,2-Tetrachloroethane	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	0.75	U
108-88-3	Toluene	0.53	J
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-01-4	Vinyl Chloride	0.75	U



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NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11, MA PA0102, MD 128, VA 460157, WV 343

ANALYTICAL RESULTS

Workorder: 2339740 ASN040|60440641

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2339740001	1	MW-32	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2339740001	2	MW-32	EPA 300.0	Nitrate-N
The sample was originally run within hold time, but required further analysis that exceeded hold time.				
2339740002	2	MW-31	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2339740002	3	MW-31	SW846 8260C	1,2-Dichloroethane-d4
The surrogate 1,2-Dichloroethane-d4 for method SW846 8260C was outside of control limits. The % Recovery was reported as 119 and the control limits were 81 to 118. This result was reported at a dilution of 1.				
2339740002	4	MW-31	EPA 300.0	Nitrate-N
The sample was originally run within hold time, but required further analysis that exceeded hold time.				
2339740003	1	MW-30	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2339740003	2	MW-30	EPA 300.0	Nitrate-N
The sample was originally run within hold time, but required further analysis that exceeded hold time.				
2339740004	1	MW-29	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2339740004	2	MW-29	EPA 300.0	Nitrate-N
The sample was originally run within hold time, but required further analysis that exceeded hold time.				

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7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ALS GlobalSDG No.: ASN-040Instrument ID: gc03.iCalibration Date/Time: 9/25/2018 00:26Lab File ID: MIOA015.DInit. Calib. Date(s): 6/25/2018 6/25/2018Heated Purge: (Y/N) NInit. Calib. Time(s): 08:20 12:28GC Column: PORPAK Q ID: 2.0 (mm)

COMPOUND	RRF	RRF050	Conc. CC std	MIN RRF	%D	MAX%D	CT
METHANE	106		125		17.8 *	15.0	L
ETHENE	630	636.0000			1.1	15.0	A
ETHANE	629	626.0000			-0.4	15.0	A
PROPANE	850	912.0000			7.3	15.0	A
ISO-BUTANE	1155	1230.000			6.5	15.0	A
N-BUTANE	1146	1214.000			5.9	15.0	A

*Not associated with project samples.**6/26/18*

Calibration Type: A=Average Response Factor, L=Linear Regression, Q=Quadratic Regression
 Compounds with "Calibration Type" other than "A" are calculated as % Drift due to alternate calibration type.

Form VII VOA

8260B

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ALS Global SDG No.: ASN-040

Instrument ID: gc03.i Calibration Date/Time: 9/24/2018 20:15
 Lab File ID: MIOA001.D Init. Calib. Date(s): 6/25/2018 6/25/2018
 Heated Purge: (Y/N) N Init. Calib. Time(s): 08:20 12:28
 GC Column: PORPAK Q ID: 2.0 (mm)

COMPOUND	RRF	RRF050	Conc. CC std	MIN RRF	%D	MAX%D	CT
METHANE	106		128		21.2 *	15.0	L
ETHENE	630	636.0000			1.1	15.0	A
ETHANE	629	627.0000			-0.4	15.0	A
PROPANE	850	919.0000			8.2	15.0	A
ISO-BUTANE	1155	1229.000			6.4	15.0	A
N-BUTANE	1146	1219.000			6.4	15.0	A

*Not associated with project samples.**GAM 10/26/18*

Calibration Type: A=Average Response Factor, L=Linear Regression, Q=Quadratic Regression
 Compounds with "Calibration Type" other than "A" are calculated as % Drift due to alternate calibration type.

Form VII VOA

8260B

GC ANALYSIS - RSK175

DATE(S):	9/24/2018	Analyst:	EGT (1-21) KJH (22-25)		
DATA FILE:	MIOA		INSTRUMENT: GC03	METHOD(S)	RSK175
BATCH:	03180924.b		ICAL DATE: 6/25/2018	LIMS BATCH:	50739

Run #	ALS Sample ID (w/ Container ID)	Dilution	pH ¹	HDSP N/Y	Comment	Run #	ALS Sample ID (w/ Container ID)	Dilution	pH ¹	HDSP N/Y	Comment
01	CCV3,,,2	1		NA		33					
02	CCV5,,,2	1		NA		34					
03	2815082-MB	1	<2	N		35					
04	2339632001	1	<2	N		36					
05	2339632002	1	<2	N		37					
06	2339919001	1	<2	N		38					
07	2339919002	1	<2	N		39					
08	2339919003	1	<2	N		40					
09	2815083-DUP	1	<2	N		41					
10	2339919004	1	<2	N		42					
11	2339740001	1	<2	N		43					
12	2339740002	1	<2	N		44					
13	2339740003	1	<2	N		45					
14	2339740004	1	<2	N		46					
15	CCV3,,,2	1		NA		47					
16	CCV5,,,2	1		NA		48					
17	2339926001	1	<2	N		49					
18	2339928001	1	<2	N		50					
19	2815211-DUP	1	<2	N		51					
20	2339928002	1	<2	N		52					
21	CCV3,,,2	1		NA		53					
22	CCV5,,,2	1		NA		54					
23	2339740001	1	<2	N		55					
24	2339740003	1	<2	N		56					
25	CCV5,,,2	1		NA		57					
26						58					
27						59					
28						60					
29						61					
30						62					
31						63					
32						64					

¹Either <2 or >2

Form 4B

Inorganic Blank Summary

Analysis Method: SM2320B-2011
Instrument: AUTOT

SDG No.: ASN040[illegible]

(1) The following qualifiers are used:

U: The analyte concentration is less than the reporting limit listed
J: The analyte concentration is less than the reporting limit but greater than the method detection limit

Comments:



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Middletown, PA 17057
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F. 717-944-1430

Environmetal

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADDED AREAS MUST BE COMPLETED BY THE CLIENT /
↓
SAMPLER. INSTRUCTIONS ON THE BACK.

Page of
Courier:
Tracking #:

Co. Name: **AECOM** Phone: **518-951-2370**
Contact (Repeat to): **Gerlinde Wolf**
Address: **40 British American Blvd
Latham NY 12110**

Bill to (if different than Report to):

PO#:

Project Name#: **60440641** ALS Quote #:

TAT: ☒ Normal-Standard TAT to 10-12 business days.
☐ Rush-Subject to ALS approval and surcharges.

Email? ☒ Fax? ☐ Y No: **gerlinde.wolf@aecom.com**

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time
1 MW-35		9/18/18	0945
2 MW-34		1150	
3 MW-33		1330	
4 Dup			
5 MS/MSD (MW-33 per Gerlinde)			
6 Trip Blank			
7			
8			

SAMPLED BY (Please Print):

Gerlinde Wolf

Project Comments:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Gerlinde Wolf AECOM	9/18/18	1600	2 J. An	9/18/18	1600
3 J. An	9/18/18	1700	4 COMMON COURIER ALS COURIER		
5 COMMON COURIER ALS COURIER			6 J. An	9/20/18	0900
7			8		
9			10		

* Gr-Grab; C-Composites

**Basis: AB-Air; DW-Drinking Water; GW-Groundwater; OL-Other Liquid; SL-Solid; WP-Wipe; WW-Wastewater

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

Container Type: AG-Ambic Glass; CO-Clear Glass; PL-Plastic. Container Size: 250ml, 500ml, 1L, 5gal., etc. Preservatives: HCl, HNO3, NaOH, etc.

Rev 01-2013



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NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11, MA PA0102, MD 128, VA 460157, WV 343

SAMPLE SUMMARY

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2339919001	MW-35	Ground Water	9/19/2018 09:45	9/20/2018 09:26	Collected by Client
2339919002	MW-34	Ground Water	9/19/2018 11:50	9/20/2018 09:26	Collected by Client
2339919003	MW-33	Ground Water	9/19/2018 13:30	9/20/2018 09:26	Collected by Client
2339919004	DUP	Ground Water	9/19/2018 00:00	9/20/2018 09:26	Collected by Client
2339919005	TRIP BLANK	Ground Water	9/19/2018 00:00	9/20/2018 09:26	Collected by Client

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Vancouver Waterloo • Winnipeg • Yellowknife United States: Cincinnati • Everett • Fort Collins • Holland • Houston • Middletown • Salt Lake City • Spring City • York Mexico: Monterrey

**AECOM – Latham, NY
ALS-Middletown
Case Narrative
ASN-041 (2339919)**

Sample Management

This report contains the results of the analysis of five (5) ground water samples collected on September 19, 2018. Analytical results and quality control information are summarized in this data package.

Qualifier Symbol Definitions:

U = Qualifier indicates that the analyte was not detected above the LOD.
J = Qualifier indicates that the analyte value is between the DL and the LOQ.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds the calibration range.
P = Qualifier indicates that the RPD between the two analytical columns is > 40%.
NSC = Qualifier indicates that spike recoveries were not calculated based on the spiking concentration.

Result Symbol Definitions:

DL = The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
LOD = The smallest analyte concentration that must be present in a sample in order to be detected at a high level of confidence.
LOQ = The lowest concentration that produces a quantitative result within specified limits of precision or bias.

Manual Integration Symbol Definitions

I = Peak was not integrated properly by chromatographic software. This may be due to baseline irregularities resulting from sample matrix, elevated baseline, or incorrect integration by software on a sample. Integration was adjusted by operator to ensure proper quantitation.
H = The incorrect peak was identified or the chromatographic software did not identify an analyte peak. Operator manually identified the correct peak as the appropriate target analyte. This flag is automatically assigned by the Target software.
SP = Peak was erroneously split. The operator manually integrated the peak to include all the area of the analyte peak to ensure proper quantitation.
MP = Two peaks were erroneously merged. This may include two discrete peaks separated by a distinguishable valley or a larger peak with a clearly identifiable shoulder. Operator manually split peaks.
AB = Integration of group of adjacent peaks did not follow baseline. Operator manually assigned integration to follow baseline.
NP = Negative spike in the baseline resulted in overstating area of analyte peaks. Analyte peaks were re-assigned.
AC = Integration of aggregate or multi-component analyte to include area off all components of the analyte (i.e., toxaphene).

Sample Receipt

Samples arrived at ALS via courier on September 20, 2018. Upon receipt, the samples were inspected and compared to the Chain of Custody. Sample temperature was documented on the enclosed Chain of Custody. Samples were received intact and properly preserved, unless noted on the enclosed Certificate of Analysis and/or Chain of Custody.

Manual Integrations

If manual integrations were performed they are indicated on the raw data quantification files for each method.

Volatile Organics by SW-846 Method 8260

Sample Handling. Five (5) water samples were analyzed by SW-846 Method 8260 for volatile organic compounds. All analyses were performed within the holding time.

Initial Calibrations. Initial calibrations were properly analyzed and met method criteria for all target analytes. **Note:** The batch LCS also serves as a second source (ICV).

Initial Calibration Verifications. Initial calibration verification samples were properly analyzed and met method criteria.

Continuing Calibration Verification. Samples were run immediately following ICAL.

Blanks. Target analytes were not detected in the method blank, except as follows:

- In 2814603 MB, Toluene was detected at 0.53J µg/L.

Surrogates. Recoveries were within control limits.

Laboratory control samples. Target analytes were recovered within control limits in the laboratory control samples.

Matrix and Matrix Spike samples. Target analytes were recovered within control limits, except as follows:

- In 2817710 MS/ 2817711 MSD set, Trichloroethene was recovered above control limits.

Internal Standards. Internal standard results met method criteria

Light Hydrocarbon Gases by RSK-175

Sample Handling. Four (4) water samples were submitted for the analysis of light hydrocarbon gases by Method RSK-175. The samples were analyzed within the method specified holding time of fourteen days.

Calibrations. The initial calibrations met method criteria for all target analytes.

Calibration verification. Prior to the analysis of samples in this group, the initial calibrations were successfully verified by the analysis of calibration verification

standards. The samples were then successfully bracketed with alternating calibration verification standards (CCV) throughout the analysis.

Continuing Calibration. A continuing calibration standard were properly analyzed and met method criteria for all target analytes.

Blanks. Target analytes were not detected in the method blank.

Duplicate Samples. A duplicate sample, identified as 2815083, from non-project sample 2339919004 was analyzed. Target analytes were not detected.

Total Metals by SW-846 Method 6010C

Sample handling. Four (4) water samples were digested by SW-846 method 3015, and the digestates were analyzed for total metals on the ThermoFisher ICP6500_2, using SW-846 method 6010C. The samples were digested and analyzed within the six-month holding time established for the method.

Calibration. All criteria associated with the calibration and calibration verification standards were within control limits

Blanks. Metals were not detected in the blanks.

Laboratory Control Samples. Recoveries were within the control limits.

Spikes. A matrix spike/matrix spike duplicate identified as 2815582 and 2815583 were digested and analyzed on sample 2339919003 (MW-33) in this deliverable group. The MS/MSD recoveries and their RPDs were within method control limits.

Dissolved Metals by EPA Method 6010C

Sample handling. Four (4) water samples were filtered and analyzed for dissolved metals on the ThermoFisher ICP6500_2 using EPA Method 6010C. The samples were analyzed within the six-month holding time established for the method.

Calibration. All criteria associated with the calibration and check standards were within the control limits for this method.

Blanks. Metals were not detected in the blanks.

Laboratory Control Sample. The LCS recoveries were within the method control limits.

Spikes. A matrix spike/matrix spike duplicate identified as 2815586 and 2815587 were digested and analyzed on sample 2339919003 (MW-33) in this deliverable group. The MS/MSD recoveries and their RPDs were within method control limits.

Anions by EPA 300.0

Sample handling. Four (4) aqueous samples were analyzed for chloride, nitrate, and sulfate by EPA Method 300.0. The samples were not analyzed within the 48-hour hold time.

Calibration. Initial calibrations, identified as Method A (high range) and Method L (low range), were properly established for instrument IC8 on 08/31/2018. Initial and continuing calibration verification standards were recovered within the QC limits.

Blanks. Initial and continuing blanks were analyzed with the samples. Anions were not detected above the reporting limits in any of the blanks.

Laboratory Control Samples. Laboratory control samples identified as 2815340 and SSL were analyzed initially and every 20 samples. Recoveries were within the QC limits.

Spikes. A matrix spike and spike duplicate analysis identified as 2815342 and 2815343 was performed on sample 2339919003 (MW-33). CI recovered outside of the acceptable QC limit. All other recoveries were within QC criteria.

Total Alkalinity by SM 2320B

Sample handling. Four (4) aqueous samples were analyzed for total alkalinity by Standard Method 2320B. The samples were analyzed within the 14-day holding time established for the method.

Blanks. Method blanks were analyzed with the samples. Total alkalinity was not detected above the reporting limit of 5 mg/L in the blanks.

Calibration. The autotitrator was pH calibrated on the day of analysis and a continuing pH 7 buffer standard was analyzed throughout the run. All standards were found to be within QC limits of ± 0.05 pH units.

Total alkalinity standards were analyzed initially and throughout the analysis. The standards recovered within the alkalinity QC limits of 90-110%.

Duplicate. A duplicate analysis identified as 2817321 was performed on sample 2339919003 (MW-33). The RPD was within the acceptable limit.

Total Organic Carbon by SM 5310B

Sample handling. Four (4) aqueous samples were analyzed for total organic carbon by Standard Method 5310B. The preserved samples were analyzed within the 28-day holding time established for the method.

Calibration. Initial calibrations were properly established on the days of analysis. Initial and continuing calibration standards were analyzed for verification, and recoveries were all within the QC limits.

Laboratory Control Spike. Laboratory control spikes of 1.0 mg/L were analyzed with the samples. Recoveries were within the QC limit of 85-115%.

Blanks. Method blanks and continuing calibration blanks were analyzed with the samples. Total organic carbon was not detected above the reporting limit of 0.5 mg/L in the blanks.

Spikes. Matrix spike and matrix spike duplicate analyses were performed on sample 2339919001 (MW-35). The spike recoveries and the relative percent difference between the spikes were all within the QC limits.

Matrix spike and matrix spike duplicate analyses were performed on sample 2339919003 (MW-33). The spike recoveries and the relative percent difference between the spikes were all within the QC limits.

ANALYTICAL RESULTS

Workorder: 2339919 ASN041|2015-SCOTIA NAVY DEPOT-

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2339919001	1	MW-35	EPA 300.0	Nitrate-N
Analyte was analyzed past the 48 hour holding time.				
2339919001	2	MW-35	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2339919002	1	MW-34	EPA 300.0	Nitrate-N
Analyte was analyzed past the 48 hour holding time.				
2339919002	2	MW-34	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2339919003	1	MW-33	SW846 8260C	Trichloroethene
The QC sample type MS for method SW846 8260C was outside the control limits for the analyte Trichloroethene. The % Recovery was reported as 210 and the control limits were 79 to 123.				
2339919003	2	MW-33	SW846 8260C	Trichloroethene
The QC sample type MSD for method SW846 8260C was outside the control limits for the analyte Trichloroethene. The % Recovery was reported as 226 and the control limits were 79 to 123.				
2339919003	3	MW-33	EPA 300.0	Nitrate-N
Analyte was analyzed past the 48 hour holding time.				
2339919003	4	MW-33	RSK 175	Methane
The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 63.2 and the upper control limit is 20.				
2339919003	5	MW-33	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2339919004	1	DUP	EPA 300.0	Nitrate-N
Analyte was analyzed past the 48 hour holding time.				
2339919004	2	DUP	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

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Vancouver · Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMSLab Code: VOA Case No.: _____ SAS No.: _____ SDG No.: ASN-041Matrix Spike - Sample No: MW-33MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC#	QC LIMIT REC
Carbon Tetrachloride	20	0	25.5	127	(72-136)
1,1-Dichloroethane	20	0	22.9	115	(77-125)
1,2-Dichloroethane	20	0	22.4	112	(73-128)
1,1-Dichloroethene	20	0	25.4	127	(71-131)
cis-1,2-Dichloroethene	20	0	22.0	110	(78-123)
trans-1,2-Dichloroethene	20	0	24.1	121	(75-124)
1,1,1,2-Tetrachloroethane	20	0	21.7	108	(78-124)
1,1,2,2-Tetrachloroethane	20	0	20.0	100	(71-121)
Tetrachloroethene	20	0	22.6	113	(74-129)
Toluene	20	0	21.7	109	(80-121)
1,1,1-Trichloroethane	20	0	24.2	121	(74-131)
1,1,2-Trichloroethane	20	0	19.7	98.6	(80-119)
Trichloroethene	20	137	179	210*	(79-123)
Vinyl Chloride	20	0	22.9	114	(58-137)

Column to be used to flag recovery and RPD values with an asterisk
 * Values outside of QC limits

RPD: 0 out of 0 outside limitsSpike Recovery: 1 out of 14 outside limits

Comments: _____

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMSLab Code: VOA Case No.: _____ SAS No.: _____ SDG No.: ASN-041Matrix Spike - Sample No: MW-33MSD

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD		QC LIMITS	
			% REC #	% RPD #	RPD	REC
Carbon Tetrachloride	20	24.1	120	5.78	30	(72-136)
1,1-Dichloroethane	20	23.6	118	2.94	30	(77-125)
1,2-Dichloroethane	20	21.4	107	4.52	30	(73-128)
1,1-Dichloroethene	20	25.6	128	1.02	30	(71-131)
cis-1,2-Dichloroethene	20	22.1	110	.38	30	(78-123)
trans-1,2-Dichloroethene	20	24.0	120	.66	30	(75-124)
1,1,1,2-Tetrachloroethane	20	21.8	109	.51	30	(78-124)
1,1,2,2-Tetrachloroethane	20	21.1	105	5.21	30	(71-121)
Tetrachloroethene	20	23.1	115	1.79	30	(74-129)
Toluene	20	22.3	111	2.32	30	(80-121)
1,1,1-Trichloroethane	20	23.7	118	2.13	30	(74-131)
1,1,2-Trichloroethane	20	20.3	101	2.63	30	(80-119)
Trichloroethene	20	182	226*	1.69	30	(79-123)
Vinyl Chloride	20	23.1	115	.89	30	(58-137)

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 14 outside limitsSpike Recovery: 1 out of 14 outside limits

Comments: _____

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

2814603 (MB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: _____ SAS No.: _____ SDG No.: ASN-041

Matrix (soil/water): WATER Lab Sample ID: 2814603

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 718092713.D

Level (low/med): _____ Date Received: 9/24/18

% Moisture: not dec. 100.0 Date Analyzed: 9/27/18

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS No.	Compound	(ug/L or ug/Kg) UG/L	Q
56-23-5	Carbon Tetrachloride	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
630-20-6	1,1,1,2-Tetrachloroethane	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	0.75	U
108-88-3	Toluene	0.53	J
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-01-4	Vinyl Chloride	0.75	U

Form 4B

Inorganic Blank Summary

Analysis Method: EPA 300.0

Instrument: IC-8

SDG No.: ASN041

[illegible]

(1) The following qualifiers are used:

U: The analyte concentration is less than the reporting limit listed

J: The analyte concentration is less than the reporting limit but greater than the method detection limit

Comments:

Form 4B

Inorganic Blank Summary

Analysis Method: SM2320B-2011

Instrument: AUTOT

SDG No.: ASN041

[illegible]

(1) The following qualifiers are used:

U: The analyte concentration is less than the reporting limit listed

J: The analyte concentration is less than the reporting limit but greater than the method detection limit

Comments:

SAMPLE SUMMARY

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2339926001	MW-28	Ground Water	9/21/2018 11:05	9/22/2018 09:25	Collected by Client
2339926002	Trip Blank	Ground Water	9/22/2018 09:25	9/22/2018 09:25	Collected by Client

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Vancouver Waterloo • Winnipeg • Yellowknife United States: Cincinnati • Everett • Fort Collins • Holland • Houston • Middletown • Salt Lake City • Spring City • York Mexico: Monterrey

**AECOM – Latham, NY
ALS-Middletown
Case Narrative
ASN-042 (2339926)**

Sample Management

This report contains the results of the analysis of two (2) ground water samples collected on September 21-22, 2018. Analytical results and quality control information are summarized in this data package.

Qualifier Symbol Definitions:

U = Qualifier indicates that the analyte was not detected above the LOD.
J = Qualifier indicates that the analyte value is between the DL and the LOQ.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds the calibration range.
P = Qualifier indicates that the RPD between the two analytical columns is > 40%.
NSC = Qualifier indicates that spike recoveries were not calculated based on the spiking concentration.

Result Symbol Definitions:

DL = The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
LOD = The smallest analyte concentration that must be present in a sample in order to be detected at a high level of confidence.
LOQ = The lowest concentration that produces a quantitative result within specified limits of precision or bias.

Manual Integration Symbol Definitions

I = Peak was not integrated properly by chromatographic software. This may be due to baseline irregularities resulting from sample matrix, elevated baseline, or incorrect integration by software on a sample. Integration was adjusted by operator to ensure proper quantitation.
H = The incorrect peak was identified or the chromatographic software did not identify an analyte peak. Operator manually identified the correct peak as the appropriate target analyte. This flag is automatically assigned by the Target software.
SP = Peak was erroneously split. The operator manually integrated the peak to include all the area of the analyte peak to ensure proper quantitation.
MP = Two peaks were erroneously merged. This may include two discrete peaks separated by a distinguishable valley or a larger peak with a clearly identifiable shoulder. Operator manually split peaks.
AB = Integration of group of adjacent peaks did not follow baseline. Operator manually assigned integration to follow baseline.
NP = Negative spike in the baseline resulted in overstating area of analyte peaks. Analyte peaks were re-assigned.
AC = Integration of aggregate or multi-component analyte to include area off all components of the analyte (i.e., toxaphene).

Sample Receipt

Samples arrived at ALS via courier on September 22, 2018. Upon receipt, the samples were inspected and compared to the Chain of Custody. Sample temperature was documented on the enclosed Chain of Custody. Samples were received intact and properly preserved, unless noted on the enclosed Certificate of Analysis and/or Chain of Custody.

Manual Integrations

If manual integrations were performed they are indicated on the raw data quantification files for each method.

Volatile Organics by SW-846 Method 8260

Sample Handling. Two (2) water samples were analyzed by SW-846 Method 8260 for volatile organic compounds. All analyses were performed within the holding time.

Initial Calibrations. Initial calibrations were properly analyzed and met method criteria for all target analytes. **Note:** The batch LCS also serves as a second source (ICV).

Initial Calibration Verifications. Initial calibration verification samples were properly analyzed and met method criteria.

Continuing Calibration Verification. Samples were run immediately following ICAL.

Blanks. Target analytes were not detected in the method blank, except as follows:

- In 2814603 MB, Toluene was detected at 0.53J µg/L.

Surrogates. Recoveries were within control limits, except as follows:

- In 2820164 MB, 1,2-Dichloroethane-d4 was recovered above control limits.
- In 2820165LCS, Toluene-d8 was recovered below control limits.
- In 2339926001, BFB, 1,2-Dichloroethane-d4 and Toluene-d8 were recovered outside control limits.

Laboratory control samples. Target analytes were recovered within control limits in the laboratory control samples, except as follows:

- In 2820651LCS, Carbon Tetrachloride, 1,1-Dichloroethene, trans-1,2-Dichloroethene and 1,1,1-Trichloroethane were recovered above control limits.

Internal Standards. Internal standard results met method criteria

Light Hydrocarbon Gases by RSK-175

Sample Handling. One (1) water sample was submitted for the analysis of light hydrocarbon gases by Method RSK-175. The samples were analyzed within the method specified holding time of fourteen days.

Calibrations. The initial calibrations met method criteria for all target analytes.

Calibration verification. Prior to the analysis of samples in this group, the initial calibrations were successfully verified by the analysis of calibration verification standards. The samples were then successfully bracketed with alternating calibration verification standards (CCV) throughout the analysis.

Continuing Calibration. A continuing calibration standard were properly analyzed and met method criteria for all target analytes.

Blanks. Target analytes were not detected in the method blank.

Total Metals by SW-846 Method 6010C

Sample handling. One (1) water sample was digested by SW-846 method 3015, and the digestate was analyzed for total metals on the ThermoFisher ICP6500_2, using SW-846 method 6010C. The sample was digested and analyzed within the six-month holding time established for the method.

Calibration. All criteria associated with the calibration and calibration verification standards were within control limits

Blanks. Metals were not detected in the blanks.

Laboratory Control Samples. Recoveries were within the control limits.

Spikes. A matrix spike/matrix spike duplicate were not digested or analyzed on the samples in deliverable group

Dissolved Metals by EPA Method 6010C

Sample handling. One (1) water sample was filtered and analyzed for dissolved metals on the ThermoFisher ICP6500_2 using EPA Method 6010C. The sample was analyzed within the six-month holding time established for the method.

Calibration. All criteria associated with the calibration and check standards were within the control limits for this method.

Blanks. Metals were not detected in the blanks.

Laboratory Control Sample. The LCS recoveries were within the method control limits.

Spikes. A matrix spike/matrix spike duplicate were not digested or analyzed on the samples in deliverable group

Anions by EPA 300.0

Sample handling. One (1) aqueous sample was analyzed for chloride, nitrate, and sulfate by EPA Method 300.0. The sample was analyzed within the 48-hour hold time.

Calibration. Initial calibrations, identified as Method A (high range) and Method L (low range), were properly established for instrument IC5 on 08/29/2018. Initial and continuing calibration verification standards were recovered within the QC limits.

Blanks. Initial and continuing blanks were analyzed with the samples. Anions were not detected above the reporting limits in any of the blanks.

Laboratory Control Samples. Laboratory control samples identified as 2815205 and SSL were analyzed initially and every 20 samples. Recoveries were within the QC limits.

Spikes. A matrix spike and spike duplicate analysis was not performed on any samples from this data deliverable.

Total Alkalinity by SM 2320B

Sample handling. One (1) aqueous sample was analyzed for total alkalinity by Standard Method 2320B. The sample was analyzed within the 14-day holding time established for the method.

Blanks. Method blanks were analyzed with the samples. Total alkalinity was not detected above the reporting limit of 5 mg/L in the blanks.

Calibration. The autotitrator was pH calibrated on the day of analysis and a continuing pH 7 buffer standard was analyzed throughout the run. All standards were found to be within QC limits of ± 0.05 pH units.

Total alkalinity standards were analyzed initially and throughout the analysis. The standards recovered within the alkalinity QC limits of 90-110%.

Duplicate. A duplicate analysis was not performed on any samples from this data deliverable.

Total Organic Carbon by SM 5310B

Sample handling. One (1) aqueous sample was analyzed for total organic carbon by Standard Method 5310B. The preserved sample was analyzed within the 28-day holding time established for the method.

Calibration. Initial calibrations were properly established on the days of analysis. Initial and continuing calibration standards were analyzed for verification, and recoveries were all within the QC limits.

Laboratory Control Spike. Laboratory control spikes of 1.0 mg/L were analyzed with the samples. Recoveries were within the QC limit of 85-115%.

Blanks. Method blanks and continuing calibration blanks were analyzed with the samples. Total organic carbon was not detected above the reporting limit of 0.5 mg/L in the blanks.

Spikes. Matrix spike and matrix spike duplicate analyses were not performed on any samples from this data deliverable.

ANALYTICAL RESULTS

Workorder: 2339926 ASN042|2015-SCOTIA NAVY DEPOT-

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2339926001	1	MW-28	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2339926001	2	MW-28	SW846 8260C	1,2-Dichloroethane-d4
The surrogate 1,2-Dichloroethane-d4 for method SW846 8260C was outside of control limits. The % Recovery was reported as 129 and the control limits were 81 to 118. This result was reported at a dilution of 5.				
2339926001	3	MW-28	SW846 8260C	Toluene-d8
The surrogate Toluene-d8 for method SW846 8260C was outside of control limits. The % Recovery was reported as 77.2 and the control limits were 89 to 112. This result was reported at a dilution of 5.				
2339926001	4	MW-28	SW846 8260C	4-Bromofluorobenzene
The surrogate 4-Bromofluorobenzene for method SW846 8260C was outside of control limits. The % Recovery was reported as 121 and the control limits were 85 to 114. This result was reported at a dilution of 5.				

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Vancouver Waterloo • Winnipeg • Yellowknife United States: Cincinnati • Everett • Fort Collins • Holland • Houston • Middletown • Salt Lake City • Spring City • York Mexico: Monterrey

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

2814603 (MB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: _____ SAS No.: _____ SDG No.: ASN-042

Matrix (soil/water): WATER Lab Sample ID: 2814603

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 718092713.D

Level (low/med): _____ Date Received: 9/24/18

% Moisture: not dec. 100.0 Date Analyzed: 9/27/18

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS No.	Compound	(ug/L or ug/Kg) UG/L	Q
56-23-5	Carbon Tetrachloride	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
630-20-6	1,1,1,2-Tetrachloroethane	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	0.75	U
108-88-3	Toluene	0.53	J
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-01-4	Vinyl Chloride	0.75	U

2A
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: ALS Global Contract: VOMS
Lab Code: VOA CASE No.: _____ SAS No.: _____ SDG NO.: ASN-042

	Sample NO.	SMC1 (BFB) #	SMC2 (DBFM)	SMC3 (DCE) #	SMC4 (TOL) #	TOT OUT
05	2820164 (MB)	102	114	125 *	91.4	1
06	2820165 (LCS)	104	112	99.9	77.5 *	1
07	MW-28	121 *	116	129 *	77.2 *	3

QC LIMITS

SMC1 (BFB) = 4-Bromofluorobenzene	(85-114)
SMC2 (DBFM) = Dibromofluoromethane	(80-119)
SMC3 (DCE) = 1,2-Dichloroethane-d4	(81-118)
SMC4 (TOL) = Toluene-d8	(89-112)

Column to be used to flag recovery values
* Values outside of contract required QC Limits
D Surrogate Diluted Out

Form 4B

Inorganic Blank Summary

Analysis Method: EPA 300.0
Instrument: IC-5

SDG No.: ASN042

[illegible]

(1) The following qualifiers are used:

U: The analyte concentration is less than the reporting limit listed
J: The analyte concentration is less than the reporting limit but greater than the method detection limit

Comments:

Analysis Method: SM2320B-2011
Instrument: AUTOT

[illegible]

U: The analyte concentration is less than the reporting limit listed
J: The analyte concentration is less than the reporting limit but greater than the method detection limit

Page 2659 of 2734 Total Pages

Form 4B

Inorganic Blank Summary

Analysis Method: SM5310B-2011
Instrument: TOC

SDG No.: ASN042

[illegible]

(1) The following qualifiers are used:

U: The analyte concentration is less than the reporting limit listed

J: The analyte concentration is less than the reporting limit but greater than the method detection limit

Comments:

CHAIN-OF-CUSTODY / Analytical Request Document
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A
Required Client Information:

Section B
Required Project Information:

Section C
Invoice Information:

Company: ACCOM	Report To: Gerlinde Wolf	Company Name: USAP Imaging @ ACCOM	REGULATORY AGENCY
Address: 49 Britton American Blvd Latham NY 12110	Copy To:	Address: ACCOM	NPDES ☒ GROUND WATER
Email To: Gerlinde.Wolf@Accom.com	Phase Order No.: 60440641-15	Reference: ACCOM	UST ☐ ROCA
Phone: 518-951-2370	Project Name: FSND	Manager: ACCOM	DRINKING WATER ☐
Requested Due Date/TAT: Standard	Project Number: 60440641-15	Site Location: NY	OTHER ☐

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Analysis Test	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
					DATE	TIME	DATE	TIME			Unpreserved	H ₂ SO ₄	HNO ₃	HCl	TSP	BAK	Zinc Acetate & NaOH			
1	MW-35	Drinking Water	WT	ARG	9/19/18	945				1										
2	MW-34	Drinking Water	WT		9/19/18	1150														
3	MW-33	Drinking Water	WT		9/19/18	1330														
4	MW-32	Drinking Water	WT		9/20/18	910														
5	MW-31	Drinking Water	WT		9/20/18	1050														
6	MW-30	Drinking Water	WT		9/20/18	1320														
7	MW-29	Drinking Water	WT		9/20/18	1500														
8	MW-28	Drinking Water	WT		9/21/18	1105														
9																				
10																				
11																				
12																				

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Gerlinde Wolf - ACCOM	9/24/18	1600	KEP	9.25	1050	N/A	N/A	IV	✓

ORIGINAL

SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER: Gerlinde Wolf	DATE Signed (MM/DD/YY): 9/24/18
SIGNATURE of SAMPLER: <i>Gerlinde Wolf</i>	



Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

SAMPLE SUMMARY

Workorder: 28154 FSND / 60440641-15

Lab ID	Sample ID	Matrix	Date Collected	Date Received
281540001	MW-35	Bubble Strip	9/19/2018 09:45	9/25/2018 10:50
281540002	MW-34	Bubble Strip	9/19/2018 11:50	9/25/2018 10:50
281540003	MW-33	Bubble Strip	9/19/2018 13:30	9/25/2018 10:50
281540004	MW-32	Bubble Strip	9/20/2018 09:10	9/25/2018 10:50
281540005	MW-31	Bubble Strip	9/20/2018 10:50	9/25/2018 10:50
281540006	MW-30	Bubble Strip	9/20/2018 13:20	9/25/2018 10:50
281540007	MW-29	Bubble Strip	9/20/2018 15:00	9/25/2018 10:50
281540008	MW-28	Bubble Strip	9/21/2018 11:05	9/25/2018 10:50



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Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA

Workorder: 28154 FSND / 60440641-15

QC Batch: DISG/7099

Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 281540001, 281540002, 281540003, 281540004, 281540005, 281540006, 281540007, 281540008

METHOD BLANK: 57731

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK Hydrogen	nM	<1.0	1.0	n

LABORATORY CONTROL SAMPLE & LCSD: 57732

57733

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK Hydrogen	nM	24	26	25	106	104	80-120	1.3	20	n



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APPENDIX F: Groundwater Concentration Trend Plots

Figure E-1 MW Pair 28/29

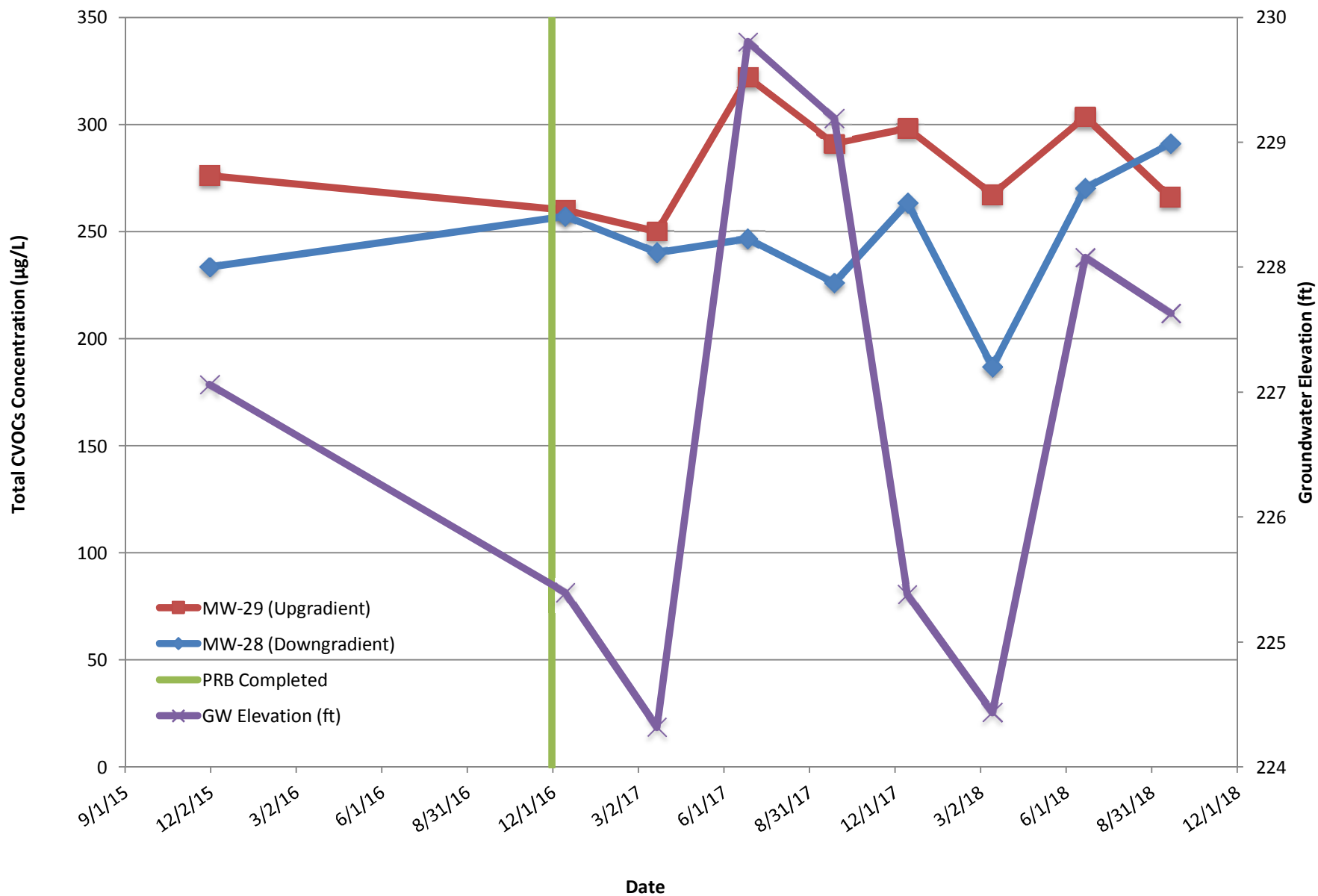


Figure E-2 MW Pair 30/31

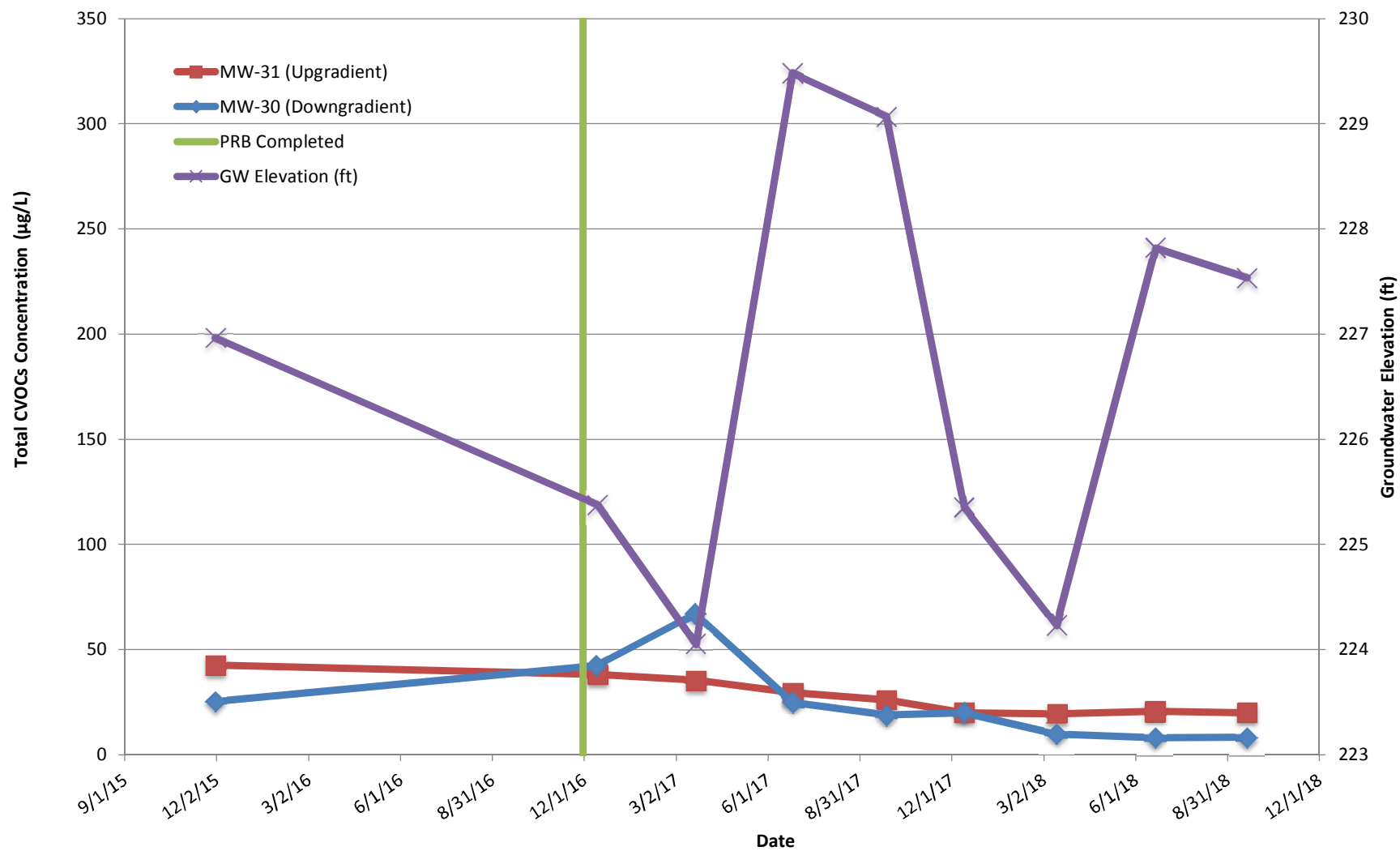


Figure E-3 MW Pair 32/33

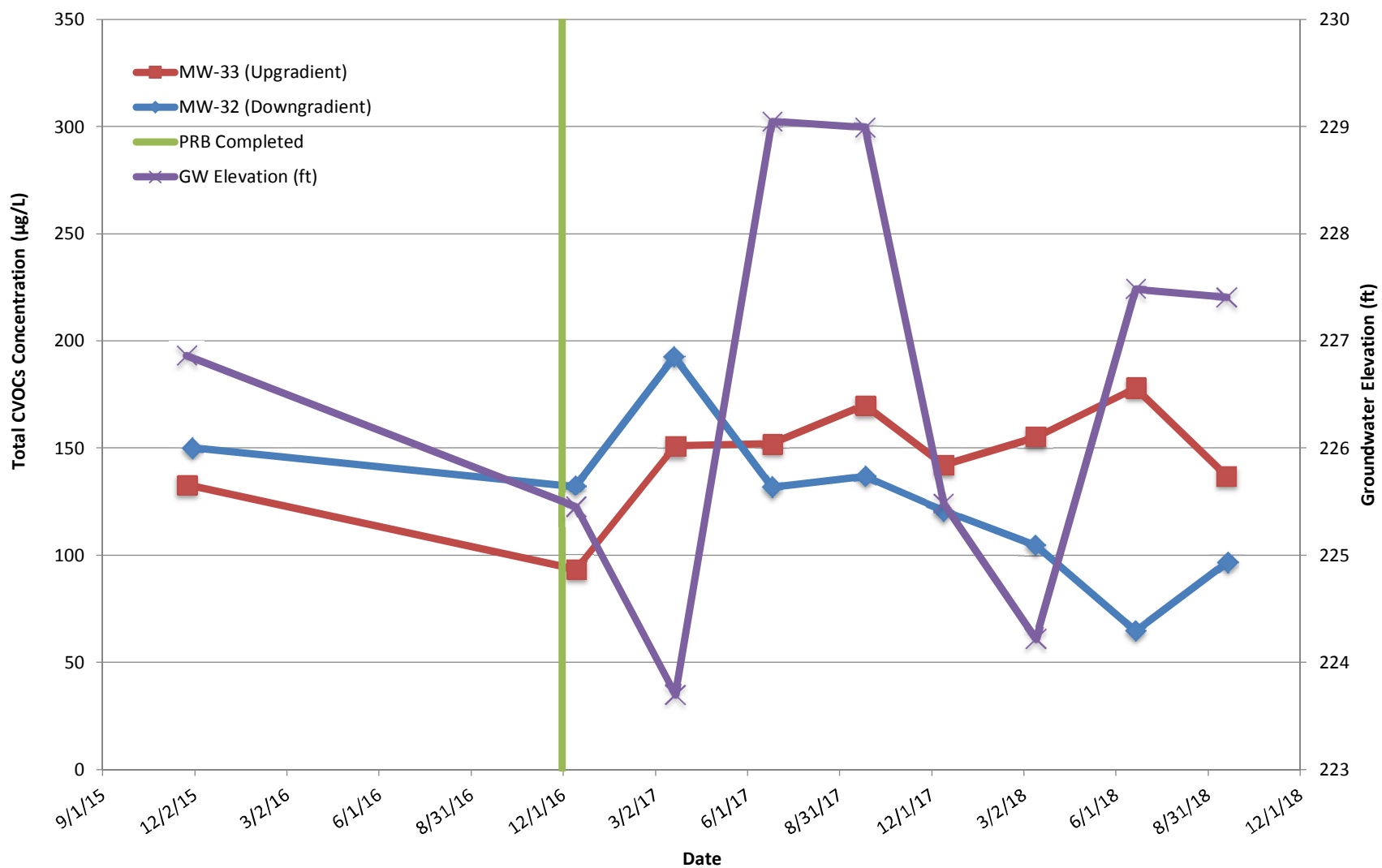


Figure E-4 MW Pair 34/35

