GROUNDWATER MONITORING PROGRAM
2018 QUARTER FOUR 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

April 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 fourth quarter of 2018 (December 17, 2018, through December 23, 2018). This report presents the results of the ninth 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, was the first semiannual event and 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 (µg/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 µg/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. Using an assumed porosity of 0.4 this variability of hydraulic conductivity results in an expected 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 semi-annually thereafter. The first quarterly sampling event was conducted in December 2016. The first semi-annual sampling event was conducted in December 2018. 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, indicating that formation water was being drawn. Stabilization parameters include the following:

- Drawdown: less than 0.3 ft drawdown during purging
- pH: ± 0.1 standard unit
- Specific Conductivity: ± 3%
- DO: ± 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 ± 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.

During past groundwater sampling events observed DO readings have been variable between sampling events and monitoring well locations, and sometimes readings were higher than expected. To get a better understanding of DO measurements in the field during the December 2018 event DO readings were collected with the flow through cell using a YSI Pro DSS, as well as a YSI 550A stand-alone DO meter placed directly in the monitoring well to compare differences in measurements. The YSI Pro DSS has an optical DO meter, and the YSI 550A Do meter is a membrane based DO meter. Periodic in field verification of the DO readings was performed by inserting the probes into a 0 mg/L DO solution.

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 December 2018 sampling event and compares it to the November/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 December 2018 sampling event is included as Figure 3-1. Observed general groundwater flow direction in December 2018 was from northeast to southwest, which is similar to past sampling events.

Based on observed trends during the past sampling events 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 December 2018 sampling 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-32, MW-33, 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 the 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 December 2018 hydrogeologic conditions, was determined to be 0.0044 ft/ft. The December 2018 hydraulic gradient is higher than the past three quarterly sampling events where the hydraulic gradient was 0.0019 ft/ft in September 2018, 0.0028 ft/ft in June 2018 and 0.0031ft/ft in March 2017. The increased hydraulic gradient is similar to the December 2017 level, 0.0039 ft/ft, emphasizing the seasonal variability at the Site. The groundwater seepage velocity is the rate of solute transport through the open pore space in the soil. Based on the December 2018 hydraulic gradient of 0.0044 ft/ft and the range of hydraulic conductivities evaluated for the PRB design (15.66 ft/day to 193.8 ft/day), and assuming a porosity of 0.4, groundwater seepage velocity at the Site could vary between approximately 0.17 ft/day and 2.14 ft/day, which is within 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 December 2018 sampling event was removed from the Site on January 28, 2019 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 December 2018 quarterly sampling event for the PRB monitoring compliance wells are presented in Table 3-2. MNA parameters were compared between compliance well pairs to observe changes in groundwater quality from upgradient to downgradient of the wall. Field parameter readings are primarily collected to demonstrate stabilization criteria as discussed in section 2.1, however they can also give insight as to subsurface conditions and served as indicators for reactions taking place.

During previous quarterly sampling events DO measurements were variable with some well pairs showing an increase and some pairs showing a decrease from upgradient to downgradient. ORP values downgradient of the wall are expected to be within the -300 to -400 range, and we should expect to see little to no DO in these monitoring locations. To date these expected values have not been observed on a consistent basis and no definitive trends on DO and ORP measurements have been defined.

As described above, DO measurements during the December 2018 event were collected with two different instruments for comparative purposes – an optical probe (YSI Pro DSS) located in a flow through cell and a membrane probe (YSI 550A) placed within the monitoring well approximately 2 feet above the bladder pump used for purging. DO readings obtained with the two different meters in wells sampled during the December 2018 event are similar in nine of the 12 wells sampled. For the three wells where results are more variable, the membrane probe always produced a higher result (an order of magnitude higher), which indicates a potential problem with the membrane probe. DO measurements obtained with the optical probe in three of the four compliance well pairs were lower on the downgradient side of the wall, with the DO in the fourth compliance pair being equivalent. Both sets of DO data are presented in Table 3-2. AECOM will continue sampling DO with two probes – one downhole and one in the flow through cell.

During the December 2018 sampling event ORP levels were again variable but measurements showed decreases between each upgradient and downgradient pair. However, ORP values were still not showing values that are typically expected downgradient of a ZVI PRB wall. ORP levels decreased significantly from upgradient to downgradient at well pairs MW-31/30, MW-33/32 and MW-35/34. Lower ORP values 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 December 2018 groundwater results showed a general increase in methane, ethane, and ethene in most downgradient compliance monitoring wells, when compared to their upgradient counterparts. For methane, there was a particular increase between upgradient and downgradient

monitoring well pairs MW-31/MW-30, MW-33/MW-32 and MW-35/MW-34. The largest increase in methane, was seen in compliance monitoring well pairs in the middle of the PRB. Increased downgradient methane concentrations began to be observed by mid-2017 and since then the methane levels have been relatively sustained. Initially methane, ethane and ethene concentrations increased from the breakdown of the ZVI carrier fluids (guar) and served as an indicator for biological reductive dechlorination activity in the subsurface. Elevated levels of methane continue to be observed in most downgradient compliance wells, suggesting the continued occurrence of anaerobic biological activity in the subsurface.

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 it 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 December 2018 sampling event, it will be in the June 2019 event and going forward as noted in the revised SMP which was accepted by the NYSDEC on November 5, 2018.

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 with some qualifications and no data points were rejected. During the December 2018 event the nitrate results for samples from MW-16 and MW-26 were qualified as estimated because the sample holding time was exceeded. AECOM has followed up with the lab regarding this issue and it was determined that there was a FedEx delay due to weather which caused the samples to be delivered one day later than expected. Because of this, the hold time for the 48 hour samples was exceeded. Further detail is provided in the DUSR.

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

The December 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, as well as one upgradient location and one downgradient location to get a better idea of background dissolved hydrogen calculations. 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. The background locations (MW-15 and MW-24) also showed very low dissolved hydrogen concentrations, similar to those within the compliance monitoring well locations.

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 December 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. However, MNA parameters to date have not yet shown signs indicative of the redox reactions that would be expected to take place as the COCs flow through the ZVI PRB wall. ZVI reactions typically show a significant increase in pH to about 9-10 in downgradient monitoring locations depending on the buffer capacity of the soil. However, pH measurements observed to date downgradient of the wall have been mostly the same since the installation of the PRB with only some minor increases throughout time. 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 December 2018 quarterly sampling event are presented in Table 3-2. 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 December 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. While there may be some seasonal variability in TCE concentrations, at this time there does not seem to be a clear pattern in the results.

- For the December 2018 event all downgradient wells of the compliance well monitoring pairs showed lower levels of TCE concentrations than their upgradient counterparts. The downgradient TCE concentrations ranged from 7.3 µg/L (MW-30) to 195 µg/L (MW-28).

- In general detected concentrations of TCE, as well as other CVOCs, for the December 2018 sampling event were consistent with previous groundwater sample results. However, as noted in the preceding bullet, there appears to be a decreasing trend in TCE concentrations at most downgradient compliance well pair locations.

- 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. This is consistent with the previous sampling event.

- MW-24 has shown a slight increasing trend in the concentration of carbon tetrachloride with the most recent results showing a concentration of 6.1 µg/L which is above of AWGS of 5 µg/L.

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 December 2018. These trend plots are included in Appendix F as Figures F-1 through F-4. Analysis of concentration trends so far indicates a decreasing trend in concentration of CVOCs in all downgradient compliance monitoring wells except MW-28. Over the last several monitoring events in particular a decrease in total CVOCs from upgradient to downgradient compliance well pair locations has been observed.

4 SUMMARY AND CONCLUSIONS

The December 2018 groundwater monitoring event was the first semi-annual sampling event and the ninth overall sampling event since the completion of the PRB wall. Sampling will now be conducted on a semiannual basis for a 3 year period as described in the SMP. 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.

Analysis of the laboratory results suggests that there is a decreasing trend in total CVOC concentrations at most downgradient compliance well pairs. CVOC concentrations at downgradient well pair locations have been lower than their upgradient counterparts for the last several monitoring events. Continued observations of elevated methane and ethane concentrations at some downgradient monitoring wells, particularly in the center of the wall, indicate the presence of anaerobic biological activity 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 biotic 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 laboratory and field data from the MW-28/MW-29 well pair at the northern end of the wall is noticeably different from the other three well pairs along the wall, and has not yet shown the decreasing trend of CVOCs at the downgradient monitoring location that has been observed in the other three well pairs. This well pair has consistently shown the presence of TCE degradation daughter products which are not very prevalent at any of the other well pairs. TOC was not detected at this downgradient location as it was in the other downgradient well pair locations. Furthermore, field parameters in this well pair are different from other locations along the wall. These differences in data could be due to MW-28/MW-29 well pair being screened in the upper portion of the PRB which is in a different geologic layer of the aquifer that is more transmissive than the lower layer. Groundwater hydrology also is different in this area of the Site and the hydraulic gradient appears to be flat at times. AECOM and the USACE are considering how to better evaluate the remedy for the area around the MW-28-MW-29 well pair, and will continue to closely review data to look for trends for this well pair during subsequent sampling events.

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 0.0044 ft/ft measured in December 2018. There is 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 measurments. 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 though the PRB should have traveled the distance between the compliance monitoring well pairs.

At this time monitoring results have not yet shown the expected decrease in COC concentrations; however, they have shown evidence of groundwater flow through the wall in that increased concentrations of methane have been observed at downgradient locations. As described in the PRB RAWP, expectations are that ZVI PRBs will function for at least 30 years with the possibility of a greater lifetime depending on site conditions. Approximately 2.5 years have elapsed since the completion of PRB construction, so the wall is well within the expected operational lifetime. Although concentrations of COCs at downgradient compliance wells are lower than their upgradient counterparts the observed concentrations are not as low as they were expected to be at this point in the project. Preliminary modeling conducted during the project proposal indicated that COC concentrations were originally estimated to be at or below MCL cleanup standards at 10 feet downgradient of the wall approximately 6 months after the PRB wall installation effort was completed. Subsequently, the slower than expected decline in COC concentrations have prompted discussions on possible investigative actions with the USACE in order to work on a path forward to get clarity on groundwater geochemistry and hydrogeology around the PRB wall in order to help evaluate remedy effectiveness.

Six monitoring wells, including MW-8, MW-11, MW-12, GEP-1, GEP-4 and B-1 were repaired/replaced in January 2019. The initial attempt to repair MW-11 was unsuccessful and this well will need to be decommissioned and replaced. All of these wells, with the exception of B-1 which is not included in the monitoring schedule indicated in the SMP, and MW-11 were sampled in January 2019 and results are currently undergoing data validation. AECOM will prepare a summary memo of the sampling event and results in a separate document. These wells will subsequently reenter the annually scheduled Site-wide groundwater sampling events. The repair of one injection well cover was also completed in this time frame. During the December 2018 sampling event, MW-22 was found to have been destroyed from an unknown cause. The decommissioning of MW-22 was added to the scope of work for repairs in January 2019. AECOM and the USACE are coordinating field activities to replace MW-11 and MW-22 during Spring of 2019.

The next groundwater sampling event is scheduled for June 2019 and will be a Site-wide sampling event.

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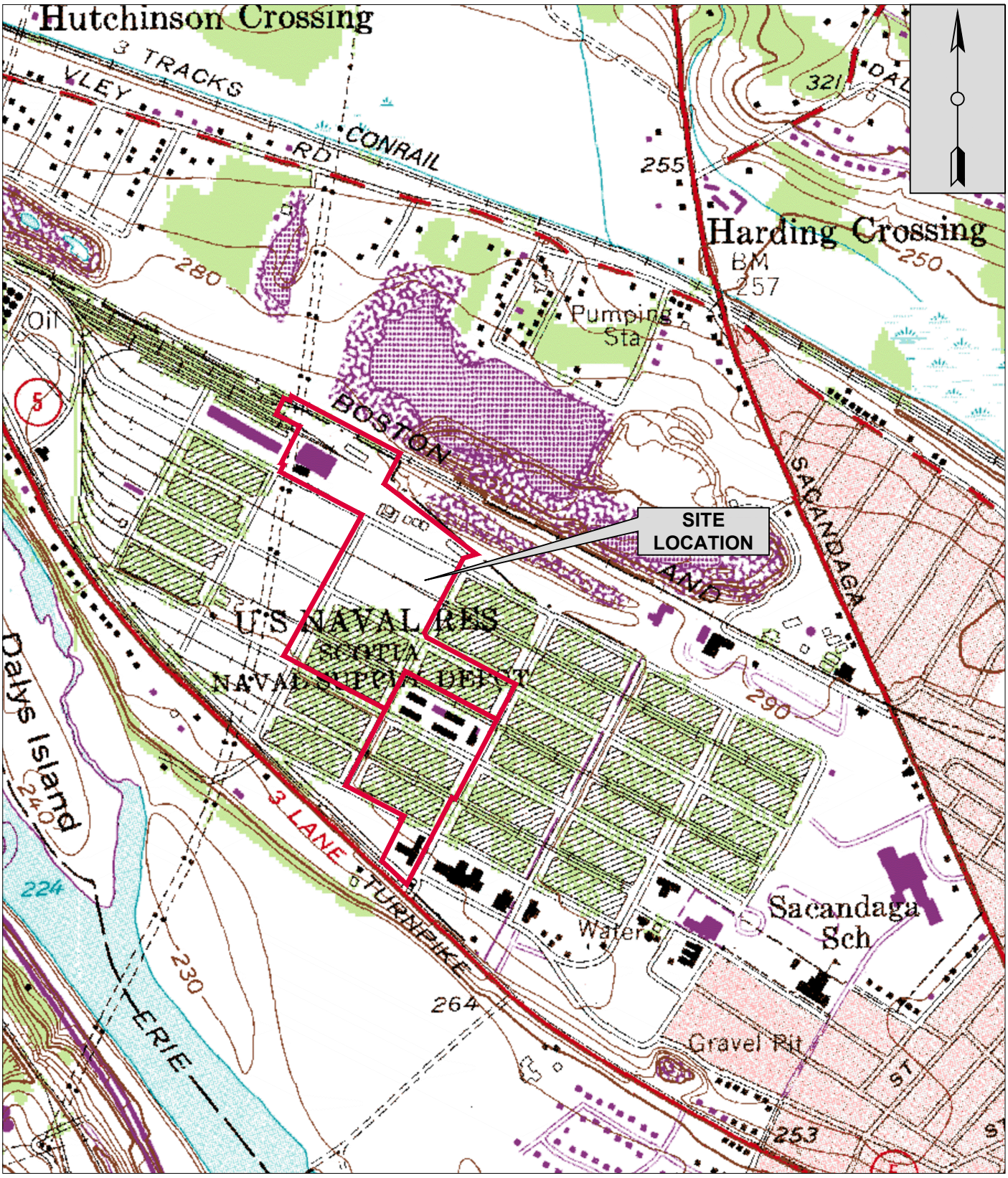
FIGURES



MAP REFERENCE:
IMAGE SHOWN FROM U.S.G.S.7.5 MINUTE
QUADRANGLE, SCHENECTADY SERIES

0 1000' 2000'

2018 4th QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: December 2018

US ARMY Corps
of Engineers

SITE LOCATION MAP

AECOM

Figure: 1-1

AECOM

Figure: 1-2

SITE LAYOUT MAP

250.0 FT. NATIONAL GRID POWER COMPANY EASEMENT

TOWERS

15.0 FT. (TYP.)

250.0 FT. (SHALLOW ZONE)

900.0 FT.

650.0 FT. (DEEP ZONE)

PROPERTY BOUNDARY (TYP.)

CONCRETE REMAINS

80.0'

1st STREET

5th STREET

AVENUE A

AVENUE B

AVENUE C

BUILDING 201

BUILDING 202

BUILDING 203

BUILDING 204

BUILDING 403

BUILDING 404

BUILDING 405

BUILDING 406

MW-5, MW-6, MW-7, MW-8, MW-9, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, MW-17, MW-18, MW-19, MW-20, MW-21, MW-22, MW-24, MW-25, MW-26, MW-27, MW-28, MW-29, MW-30, MW-31, MW-32, MW-33, MW-34, MW-35, MW-36, MW B-1, PMW-2

GEP-1, GEP-2, GEP-3, GEP-4

A, A'

B, B'

LEGEND

- 15 FT. HIGH PERMEABLE REACTIVE BARRIER WALL - 65' - 80' BGS
- 45 FT. HIGH PERMEABLE REACTIVE BARRIER WALL - 65' - 110' BGS
- MW-25 MONITORING WELL
- APPROXIMATE EXTENT OF TCE - TRICHLOROETHENE GROUNDWATER PLUME
- APPROXIMATE EXTENT OF CT - CARBON TETRACHLORIDE GROUNDWATER PLUME

0 200' 400'

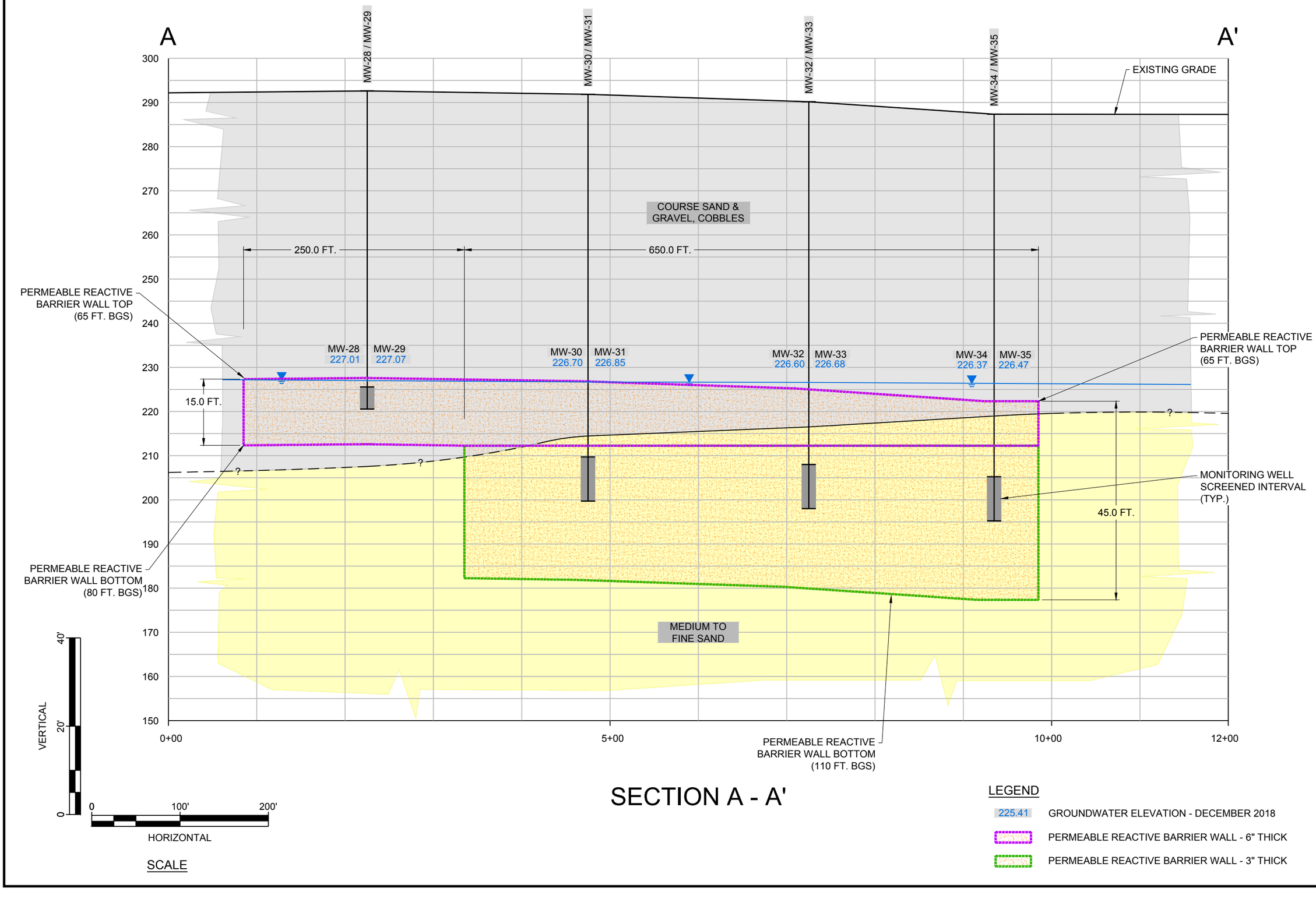
US ARMY Corps of Engineers

2018 4th QUARTER GROUNDWATER REPORT

DEFENSE NATIONAL STOCKPILE CENTER

SCOTIA DEPOT SITE - SCOTIA, NY

Project No.: 60440641 Date: December 2018



SECTION A - A'

LEGEND

- 225.41 GROUNDWATER ELEVATION - DECEMBER 2018
- PERMEABLE REACTIVE BARRIER WALL - 6" THICK
- PERMEABLE REACTIVE BARRIER WALL - 3" THICK

AECOM

Figure: 2-1A

COMPLIANCE MONITORING WELLS
AND PRB WALL PROFILE
GROUNDWATER SECTION A - A'
DECEMBER 2018

US ARMY Corps of Engineers

2018 4th QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE CENTER
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: December 2018

B

B'

AVENUE B

EXISTING GRADE

MW-13 (PROJ)

MW-24 (PROJ)

MW-30 (PROJ)

MW-31 (PROJ)

GEP-3

MW-18 (PROJ)

COURSE SAND & GRAVEL, COBBLES

PERMEABLE REACTIVE BARRIER WALL TOP (65 FT. BGS)

TO MW-9
219.27

471'

MW-13 (PROJ)
226.34

MW-24 (PROJ)
226.39

MW-30 (PROJ)
226.70

MW-31 (PROJ)
226.85

GEP-3
228.11

MW-18 (PROJ)
228.62

TO MW-36
229.00

444'

PRB
6"
THICK

15.0 FT.

45.0 FT.

?

MONITORING WELL SCREENED INTERVAL (TYP.)

PRB
3"
THICK

MEDIUM TO FINE SAND

PERMEABLE REACTIVE BARRIER WALL BOTTOM (110 FT. BGS)

300
290
280
270
260
250
240
230
220
210
200
190
180
170
160
150

0+00
5+00
10+00
12+00

VERTICAL
40'
20'
0

0
100'
200'
HORIZONTAL

SCALE

SECTION B - B'

LEGEND

225.41 GROUNDWATER ELEVATION - DECEMBER 2018

PERMEABLE REACTIVE BARRIER WALL - 6" THICK

PERMEABLE REACTIVE BARRIER WALL - 3" THICK

GENERAL GROUNDWATER DIRECTION

AECOM

Figure: 2-1B

GROUNDWATER
SECTION B - B'
DECEMBER 2018

US ARMY Corps of Engineers

2018 4th QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE CENTER
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: December 2018

LEGEND

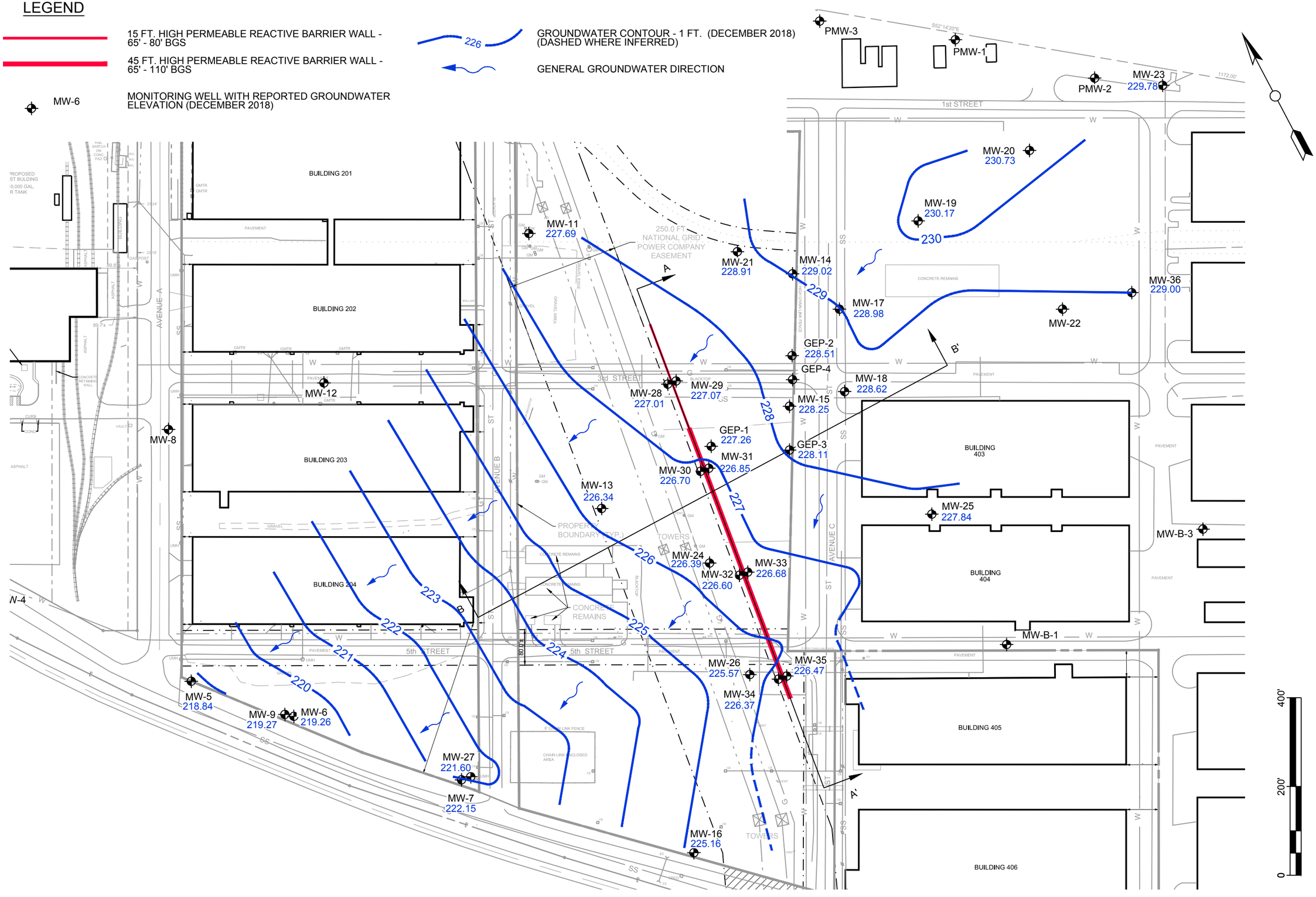
15 FT. HIGH PERMEABLE REACTIVE BARRIER WALL - 65' - 80' BGS

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

MW-6 — MONITORING WELL WITH REPORTED GROUNDWATER ELEVATION (DECEMBER 2018)

226 — GROUNDWATER CONTOUR - 1 FT. (DECEMBER 2018) (DASHED WHERE INFERRED)

GENERAL GROUNDWATER DIRECTION



POTENTIOMETRIC SITE MAP
DECEMBER 2018

Figure: 3-1

AECOM

US ARMY Corps of Engineers

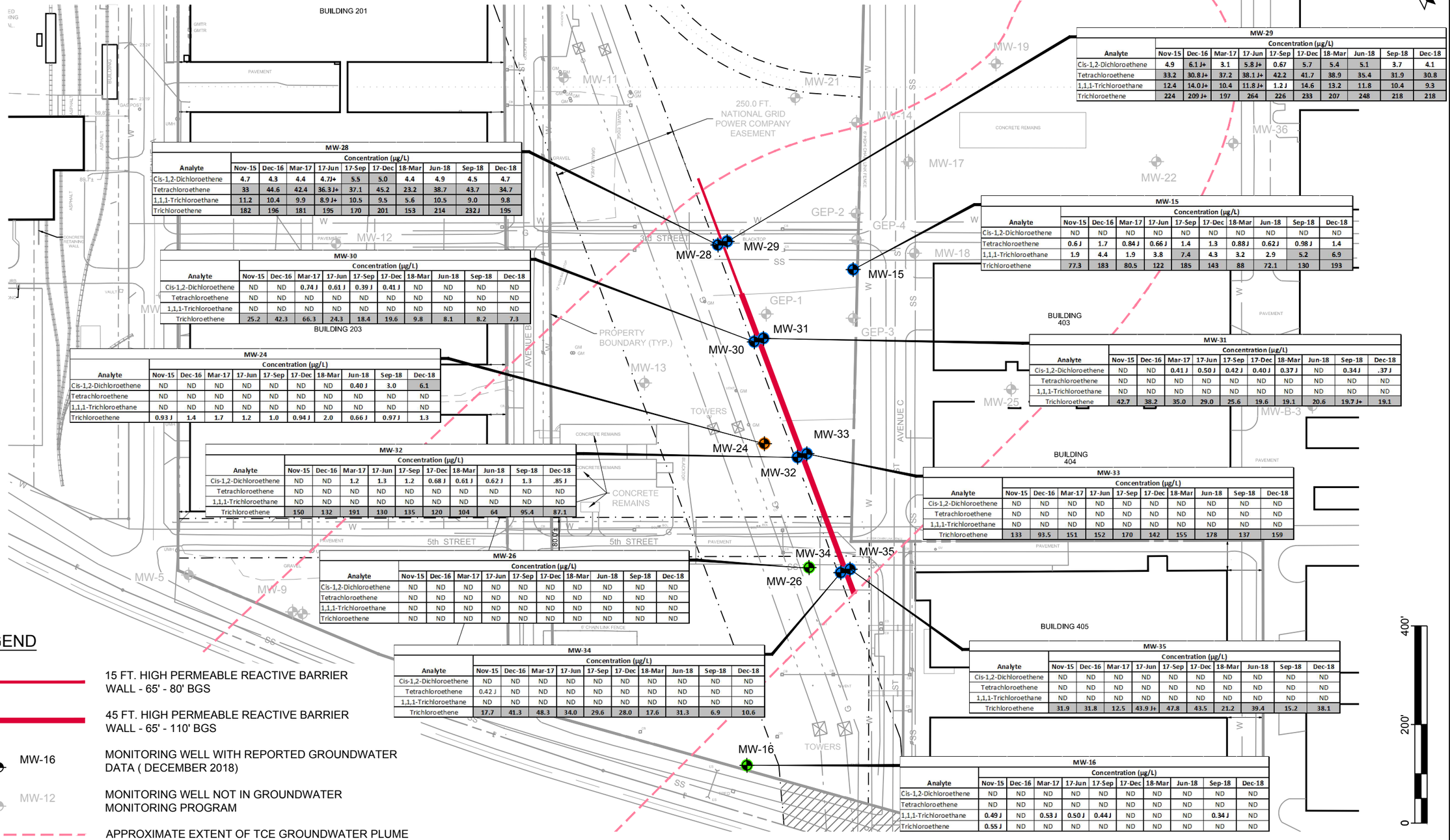
2018 4th QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE CENTER
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: December 2018

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

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



MW-28

Analyte	Concentration (µg/L)									
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18
Cis-1,2-Dichloroethene	4.7	4.3	4.4	4.7J+	5.5	5.0	4.4	4.9	4.5	4.7
Tetrachloroethene	33	44.6	42.4	36.3 J+	37.1	45.2	23.2	38.7	43.7	34.7
1,1,1-Trichloroethane	11.2	10.4	9.9	8.9 J+	10.5	9.5	5.6	10.5	9.0	9.8
Trichloroethene	182	196	181	195	170	201	153	214	232 J	195

MW-30

Analyte	Concentration (µg/L)									
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18
Cis-1,2-Dichloroethene	ND	ND	0.74 J	0.61 J	0.39 J	0.41 J	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	25.2	42.3	66.3	24.3	18.4	19.6	9.8	8.1	8.2	7.3

MW-24

Analyte	Concentration (µg/L)									
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	0.40 J	3.0	6.1
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	0.93 J	1.4	1.7	1.2	1.0	0.94 J	2.0	0.66 J	0.97 J	1.3

MW-32

Analyte	Concentration (µg/L)									
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18
Cis-1,2-Dichloroethene	ND	ND	1.2	1.3	1.2	0.68 J	0.61 J	0.62 J	1.3	.85 J
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	150	132	191	130	135	120	104	64	95.4	87.1

MW-26

Analyte	Concentration (µg/L)									
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MW-34

Analyte	Concentration (µg/L)									
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	0.42 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	17.7	41.3	48.3	34.0	29.6	28.0	17.6	31.3	6.9	10.6

MW-29

Analyte	Concentration (µg/L)									
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18
Cis-1,2-Dichloroethene	4.9	6.1 J+	3.1	5.8 J+	0.67	5.7	5.4	5.1	3.7	4.1
Tetrachloroethene	33.2	30.8 J+	37.2	38.1 J+	42.2	41.7	38.9	35.4	31.9	30.8
1,1,1-Trichloroethane	12.4	14.0 J+	10.4	11.8 J+	1.2 J	14.6	13.2	11.8	10.4	9.3
Trichloroethene	224	209 J+	197	264	226	233	207	248	218	218

MW-15

Analyte	Concentration (µg/L)									
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	0.6 J	1.7	0.84 J	0.66 J	1.4	1.3	0.88 J	0.62 J	0.98 J	1.4
1,1,1-Trichloroethane	1.9	4.4	1.9	3.8	7.4	4.3	3.2	2.9	5.2	6.9
Trichloroethene	77.3	183	80.5	122	185	143	88	72.1	130	193

MW-31

Analyte	Concentration (µg/L)									
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18
Cis-1,2-Dichloroethene	ND	ND	0.41 J	0.50 J	0.42 J	0.40 J	0.37 J	ND	0.34 J	.37 J
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	42.7	38.2	35.0	29.0	25.6	19.6	19.1	20.6	19.7 J+	19.1

MW-33

Analyte	Concentration (µg/L)									
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	133	93.5	151	152	170	142	155	178	137	159

MW-35

Analyte	Concentration (µg/L)									
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	31.9	31.8	12.5	43.9 J+	47.8	43.5	21.2	39.4	15.2	38.1

MW-16

Analyte	Concentration (µg/L)									
	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	0.49 J	ND	0.53 J	0.50 J	0.44 J	ND	ND	ND	0.34 J	ND
Trichloroethene	0.55 J	ND	ND	ND	ND	ND	ND	ND	ND	ND

LEGEND

- 15 FT. HIGH PERMEABLE REACTIVE BARRIER WALL - 65' - 80' BGS
- 45 FT. HIGH PERMEABLE REACTIVE BARRIER WALL - 65' - 110' BGS
- MW-16 — MONITORING WELL WITH REPORTED GROUNDWATER DATA (DECEMBER 2018)
- MW-12 — MONITORING WELL NOT IN GROUNDWATER MONITORING PROGRAM
- APPROXIMATE EXTENT OF TCE GROUNDWATER PLUME

400' 200' 0

AECOM

Figure: 3-2

GROUNDWATER RESULTS
QUARTERLY MONITORING LOCATIONS
DECEMBER 2018

US ARMY Corps of Engineers

2018 4th QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE CENTER
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: December 2018

TABLES

Table 2-2
Monitoring Well Sampling Schedule and Guidelines
The Defense National Stockpile Center Scotia Depot

Monitoring Well ID[1]	Rationale[2]	Sampling Frequency	Analytes[3]	Screen Interval (ft bgs)
MW-15	Upgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	65-80
MW-16	Outside Plume	Quarterly for 2 years then semi-anually	VOCs/MNA	55-70
MW-24	Downgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	100-110
MW-26	Downgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	100-110
MW-28	Downgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	67-72
MW-29	Upgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	67-72
MW-30	Downgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	82-92
MW-31	Upgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	82-92
MW-32	Downgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	82-92
MW-33	Upgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	82-92
MW-34	Downgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	82-92
MW-35	Upgradient	Quarterly for 2 years then semi-anually	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

Table 2-2
Monitoring Well Sampling Schedule and Guidelines
The Defense National Stockpile Center Scotia Depot

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 well

[2] Rationale: Upgradient of PRB wall; Downgradient of PRB wall; Outside of any plume; Within Carbon Tetrachloride (CT) plume

[3] 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
4th 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	Depth To Water (ft bgs) Q4 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	Groundwater Elevation Q4 2018
B-1	48-68	-	287.14	-	57.34		-		dry	dry	dry	**227.74**	-	-	**229.80**	-	-	-	-	-	-
B-3	47.5-67.5	-	287.05	-	-		-	-	58.61	58.74	59.74	**227.95**	-	-	-	-	-	-	**228.44**	**228.31**	**227.31**
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	71.27	**225.75**	**219.29**	**219.61**	**226.29**	**226.11**	**217.99**	**218.28**	**225.81**	**226.39**	**218.84**
MW-6	58.5-68.5	286.28	288.58	68.78	62.03	62.27	70.19	69.96	62.57	62.11	69.32	**225.86**	**219.80**	**219.80**	**226.55**	**226.31**	**218.39**	**218.62**	**226.01**	**226.47**	**219.26**
MW-7	61-71	286.8	289.26	68.47	61.96	61.95	67.84	68.22	62.80	62.32	67.11	**226.28**	**223.16**	**220.79**	**227.30**	**227.31**	**221.42**	**221.04**	**226.46**	**226.94**	**222.15**
MW-9	110-120	285.98	288.33	68.55	61.85	62.04	69.70	69.74	62.40	61.89	69.06	**225.83**	**219.75**	**219.78**	**226.48**	**226.29**	**218.63**	**218.59**	**225.93**	**226.44**	**219.27**
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	67.43	**227.7**	**225.91**	**225.00**	**230.76**	**229.76**	**225.57**	**224.97**	**229.00**	**228.32**	**227.69**
MW-13	65-80	292.62	293.85	69.90	64.25	64.40	68.86	69.72	65.75	65.99	67.51	**227.32**	**225.43**	**223.95**	**229.60**	**229.45**	**224.99**	**224.13**	**228.10**	**227.86**	**226.34**
MW-14	65-80	-	296.2	70.13	64.88	65.60	69.13	70.17	66.81	67.52	67.18	**228.08**	**226.56**	**226.07**	**231.32**	**230.60**	**227.07**	**226.03**	**229.39**	**228.68**	**229.02**
MW-15	65-80	-	293.67	68.35	63.07	63.49	67.00	68.20	64.88	65.32	65.42	**227.8**	**226.27**	**225.32**	**230.60**	**230.18**	**226.67**	**225.47**	**228.79**	**228.35**	**228.25**
MW-16	55-70	-	288.33	66.38	60.7	60.28	63.72	65.13	62.14	61.36	63.17	**226.39**	**225.38**	**221.95**	**227.63**	**228.05**	**224.61**	**223.20**	**226.19**	**226.97**	**225.16**
MW-17	60-75	-	295.24	69.25	64.09	64.66	67.99	69.20	65.98	66.60	66.26	**228.08**	**226.55**	**225.99**	**231.15**	**230.58**	**227.25**	**226.04**	**229.26**	**228.64**	**228.98**
MW-18	60-75	-	295.24	69.56	64.49	64.86	68.15	69.48	66.34	66.76	66.62	**227.94**	**226.46**	**225.68**	**230.75**	**230.38**	**227.09**	**225.76**	**228.90**	**228.48**	**228.62**
MW-19	62-77	-	297.67	70.54	65.74	66.42	69.63	70.80	67.80	68.66	67.50	**228.43**	**226.85**	**227.13**	**231.93**	**231.25**	**228.04**	**226.87**	**229.87**	**229.01**	**230.17**
MW-20	63-78	-	301.55	73.72	69.22	69.90	72.93	74.10	71.35	72.34	70.82	**228.71**	**227.01**	**227.83**	**232.33**	**231.65**	**228.62**	**227.45**	**230.20**	**229.21**	**230.73**
MW-21	57-72	-	296.52	70.55	65.19	65.40	69.70	-	-	67.85	67.61	-	-	-	-	-	-	-	-	**228.67**	**228.91**
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	70.76	**228.9**	**227.06**	**228.40**	**232.56**	**231.99**	-	-	**229.84**	**229.31**	**229.78**
MW-24	90-100	290.24	292.45	68.85	63.4	63.62	67.33	68.46	65.02	65.13	66.06	**226.79**	**225.30**	**223.60**	**229.05**	**228.83**	**225.12**	**223.99**	**227.43**	**227.32**	**226.39**
MW-25	65-75	288.16	290.26	65.44	60.61	60.57	63.56	65.13	62.48	62.59	62.42	**227.16**	**225.82**	**224.82**	**229.65**	**229.69**	**226.70**	**225.13**	**227.78**	**227.67**	**227.84**
MW-26	100-110	287.23	286.45	63.85	58.44	58.35	61.80	63.19	60.02	59.86	60.88	**226.06**	**224.75**	**222.60**	**228.01**	**228.10**	**224.65**	**223.26**	**226.43**	**226.59**	**225.57**
MW-27	100-110	286.08	288.32	68.67	61.89	62.00	67.35	67.93	63.11	62.52	66.72	**225.5**	**223.44**	**219.65**	**226.43**	**226.32**	**220.97**	**220.39**	**225.21**	**225.80**	**221.60**
MW-28	67-72	292.55	292.25	67.94	62.46	63.06	66.72	67.81	64.18	64.63	65.24	**227.07**	**225.41**	**224.31**	**229.79**	**229.19**	**225.53**	**224.44**	**228.07**	**227.62**	**227.01**
MW-29	67-72	292.50	292.13	67.80	62.31	62.94	66.90	67.70	64.04	64.49	65.06	**227.05**	**225.38**	**224.33**	**229.82**	**229.19**	**225.23**	**224.43**	**228.09**	**227.64**	**227.07**
MW-30	82-92	291.76	291.63	67.65	62.19	62.59	66.35	67.35	63.83	64.11	64.93	**226.98**	**225.35**	**223.98**	**229.44**	**229.04**	**225.28**	**224.28**	**227.80**	**227.52**	**226.70**
MW-31	82-92	291.80	291.54	67.42	62.02	62.43	66.14	67.20	63.70	63.99	64.69	**226.95**	**225.40**	**224.12**	**229.52**	**229.11**	**225.40**	**224.34**	**227.84**	**227.55**	**226.85**
MW-32	82-92	290.12	289.75	66.05	60.7	60.82	64.33	65.57	62.30	62.36	63.15	**226.86**	**225.45**	**223.70**	**229.05**	**228.93**	**225.42**	**224.18**	**227.45**	**227.39**	**226.60**
MW-33	82-92	290.27	289.91	66.11	60.8	60.86	64.37	65.65	62.40	62.49	63.23	**226.89**	**225.51**	**223.80**	**229.11**	**229.05**	**225.54**	**224.26**	**227.51**	**227.42**	**226.68**
MW-34	82-92	287.30	287.05	63.70	58.39	58.28	61.54	63.16	60.02	59.84	60.68	**226.73**	**225.48**	**223.35**	**228.66**	**228.77**	**225.51**	**223.89**	**227.03**	**227.21**	**226.37**
MW-35	82-92	287.25	286.96	63.56	58.28	58.15	61.40	62.88	59.92	59.70	60.49	**226.69**	**225.46**	**223.40**	**228.68**	**228.81**	**225.56**	**224.08**	**227.04**	**227.26**	**226.47**
MW-36	70-80	292.61	292.36	66.10	61.87	60.98	64.42	66.40	63.23	64.27	63.36	**227.8**	**226.12**	**226.26**	**230.49**	**231.38**	**227.94**	**225.96**	**229.13**	**228.09**	**229.00**
GEP-1	59.6-74.6	-	294.98	70.55	65.06	-	69.30	70.33	-	-	67.72	**227.36**	-	**224.43**	**229.92**	-	**225.68**	**224.65**	-	-	**227.26**
GEP-2	60.6-75.6	-	296.02	70.43	65.18	65.69	69.19	70.35	67.00	67.52	67.51	**227.9**	**226.38**	**225.59**	**230.84**	**230.33**	**226.83**	**225.67**	**229.02**	**228.50**	**228.51**
GEP-3	59.6-74.6	-	292.97	67.71	62.47	62.85	66.30	67.54	64.25	64.62	64.86	**227.81**	**226.31**	**225.26**	**230.50**	**230.12**	**226.67**	**225.43**	**228.72**	**228.35**	**228.11**
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**	-	-	-	-

Notes:
"-" data is not available due to inaccessibility or damage to monitoring well location

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	12/20/2018
		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	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**	**6.9**
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	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	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	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**	**0.51 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	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	**0.48 J**
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	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**	**1.4**
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	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	0.75 U
Trichloroethene (TCE)	5	**77.3**	**183**	**80.5**	**122**	**185**	**143**	**87.8**	**72.1**	**130**	**193**
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	0.75 U
MNA Parameters											
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.4**
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.10**	**0.26**
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U	0.04 U
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**182**	**212**	**201**	**217**	**229**	**216**	**223**	**209**	**236**	**224**
Chloride (mg/L)	NS	**28.9**	**14.3**	**28.3**	**40.1**	**30.6**	**39.7**	**24.0**	**46.4**	**42.5**	**37.1**
Nitrate (mg/L)	NS	**0.58**	**0.56**	**0.90**	**0.52**	**0.58**	**0.60**	**0.70**	**0.48**	**0.54**	**0.70**
Sulfate (mg/L)	NS	**12.3**	**12.4**	**21.3**	**20.5**	**14.3**	**20.5**	**12.4**	**15.2**	**13.2**	**11.3**
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	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	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	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**	**1.0 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	7.43
Turbidity (NTU)	NS	11.1	7.00	15.7	2.10	52.1	6.30	9.22	153.0	8.7	17.9
ORP (MeV)	NS	91.4	54.6	-0.6	114.6	92.8	16.6	-1.1	67.2	135.2	320.4
Conductivity (mS/cm)	NS	0.358	0.250	0.387	0.487	0.709	0.416	0.295	0.369	0.458	0.585
Dissolved Oxygen (mg/L)	NS	31.45	8.04	6.37	4.90	9.22	8.38	7.64	6.72	9.44	9.4
Dissolved Oxygen- Membrane Probe (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.9
Groundwater Elevation (ft)	NS	227.80	226.27	225.32	230.60	230.18	226.67	225.47	228.79	228.35	228.25

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 $CaCO_3$/L.

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	12/18/2018
		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	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**	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	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	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	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	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	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	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	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	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	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	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	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	0.75 U
MNA Parameters											
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.15**	NA
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U	NA
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**248**	**312**	**317**	**322**	**480**	**322**	**295**	**317**	**339**	**321**
Chloride (mg/L)	NS	**13.6**	**9.0**	**5.6**	**20.2**	**4.3**	**4.0**	**2.9**	**3.9**	**2.3**	**2.8**
Nitrate (mg/L)	NS	**1.6**	**1.6**	**2.1**	**3.7**	**1.4**	**1.1**	**1.6**	**2.0**	**1.9**	**0.88 J**
Sulfate (mg/L)	NS	**35.2**	**44.8**	**65.3**	**75.5**	**64.8**	**119**	**123**	**27.3**	**28.7**	**46.0**
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	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	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	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**	**1.5 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	7.25
Turbidity (NTU)	NS	8.01	14.8	7.71	4.40	199	30.9	8.14	10.77	20.50	1.53
ORP (MeV)	NS	137.6	139.9	115.9	298.7	82.2	94.5	118.7	16.2	215.7	138.2
Conductivity (mS/cm)	NS	0.361	0.388	0.436	0.486	0.928	0.596	0.462	0.441	0.511	0.874
Dissolved Oxygen (mg/L)	NS	22.27	9.50	10.40	10.82	9.81	10.30	10.09	11.71	10.04	10.93
Dissolved Oxygen- Membrane Probe (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.2
Groundwater Elevation (ft)	NS	226.39	225.38	221.95	227.63	228.05	224.61	223.20	226.19	226.97	225.16

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 $CaCO_3$/L.

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	12/20/2018
		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	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	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	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	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	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	**0.37 J**	0.75 U	0.75 U	**0.55 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	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	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**	**6.1**
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	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	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	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**	**1.3**
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	0.75 U
MNA Parameters											
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3.4**
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**1.4**	**1.4**
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U	0.04 U
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**168**	**198**	**205**	**195**	**282**	**352**	**313**	**159**	**200**	**185**
Chloride (mg/L)	NS	**36.3**	**38.5**	**59.0**	**41.0**	**110**	**155**	**60.8**	**37.1**	**36.7**	**32.6**
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	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**	**2.7**
Methane (µg/L)	NS	**0.82**	**1.6**	**1.7**	**2.2**	**7.8**	**431**	**927**	**1.3 J+**	**13.9**	**102**
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**	**11.2**
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**	**9.7**
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**	**4.0**
Field Parameters											
pH (pH Unit)	NS	7.75	7.22	7.83	7.78	7.40	7.29	7.97	7.95	7.70	7.92
Turbidity (NTU)	NS	9.33	13.9	16.3	35.2	88.37	2.8	16.0	19.5	7.94	2.77
ORP (MeV)	NS	-80.2	-93.2	-111.3	-108.6	-169.9	-83.1	-127.6	-147.3	-162.2	-185.0
Conductivity (mS/cm)	NS	0.327	0.570	0.438	0.365	1.396	8.411	0.409	0.204	0.403	0.436
Dissolved Oxygen (mg/L)	NS	0.94	0.44	0.55	1.20	0.30	0.15	0.55	11.71	7.23	0.5
Dissolved Oxygen- Membrane Probe (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.1
Groundwater Elevation (ft)	NS	226.79	225.30	223.60	229.05	228.83	225.12	223.99	227.43	227.32	226.39

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 $CaCO_3$/L.

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	12/18/2018
		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	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	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	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	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	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	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	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	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	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	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	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	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	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	0.75 U
MNA Parameters											
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.61**	**0.23**
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.43**	**0.029 J**
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**204**	**197**	**196**	**223**	**317**	**204**	**196**	**225**	**178**	**179**
Chloride (mg/L)	NS	**45.2**	**44.9**	**53.4**	**133**	**86.2**	**56.7**	**32.3**	**49.1**	**21**	**48.3**
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**	**0.06 J**
Sulfate (mg/L)	NS	**25.1**	**24.6**	**29.4**	**20.9**	**5.9**	**25.7**	**10.6**	**16.3**	**4.8**	**22.4**
Methane (µg/L)	NS	**34.8**	**2.7**	**1.4 J**	**2.1**	**444**	**20.7**	**26.6**	**80**	**12.9**	**19.7 J+**
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	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	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**	**2.2**
Field Parameters											
pH (pH Unit)	NS	7.52	7.22	7.80	7.23	7.39	7.65	7.56	7.57	7.29	7.43
Turbidity (NTU)	NS	68.3	21.8	31.9	0.4	60.96	57.38	18.6	36.2	9.12	7.65
ORP (MeV)	NS	-103.6	-28.9	-46.4	-26.9	-138.7	-173.0	-89.4	-75.3	82.0	-44.9
Conductivity (mS/cm)	NS	0.324	0.590	0.469	0.630	1.347	0.426	0.260	0.415	0.270	0.715
Dissolved Oxygen (mg/L)	NS	0.00	0.33	0.27	0.62	0.33	0.66	0.27	1.38	8.9	0.55
Dissolved Oxygen- Membrane Probe (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.3
Groundwater Elevation (ft)	NS	226.06	224.75	222.60	228.01	228.10	224.65	223.26	226.43	226.59	225.57

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 $CaCO_3$/L.

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	12/20/2018
		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	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**	**9.8**
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	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**	**0.34 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**	**1.2**
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**	**0.42 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	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	**0.42 J**
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**	**4.7**
Tetrachloroethene (PCE; PERC)	5	**33**	**44.6**	**42.4**	**36.3 J**	**37.1**	**45.2**	**23.2**	**38.7**	**43.7**	**34.7**
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	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**	0.75 U
Trichloroethene (TCE)	5	**182**	**196**	**181**	**195**	**170**	**201**	**153**	**214**	**232 J**	**195**
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	0.75 U
MNA Parameters											
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**3.9**	**3.7**
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.045 U	**0.024 J**
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U	0.04 U
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**352**	**316**	**295**	**352**	**380**	**383**	**360**	**422**	**345**	**342**
Chloride (mg/L)	NS	**22.1**	**32.4**	**25.7**	**29.0**	**25.7**	**20.4**	**20.9**	**33.1**	**42.7**	**25.4**
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**	**0.16 J**
Sulfate (mg/L)	NS	**22.4**	**20.9**	**21.6**	**13.0**	**10.3**	**22.4**	**20.2**	**23.1**	**13.2**	**13.1**
Methane (µg/L)	NS	**3.4**	**3.0**	**0.94**	**1.0**	**0.37 J**	0.50 U	0.25 U	**1800**	**60.8**	1.5 U
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**	3.3 U
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**	2.4 U
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**	**2.1 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	7.21
Turbidity (NTU)	NS	209	1.5	2.07	-3	61.1	229.80	8.52	1.32	0.02	0.59
ORP (MeV)	NS	273	71.2	77.1	97.4	32.1	19.0	-16.3	11.1	120.9	81.7
Conductivity (mS/cm)	NS	0.324	0.366	0.520	0.554	1.045	0.564	0.406	0.733	0.797	0.759
Dissolved Oxygen (mg/L)	NS	6.75	3.94	5.2	7.59	4.3	8.45	11.96	0.63	8.83	4.13
Dissolved Oxygen- Membrane Probe (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.7
Groundwater Elevation (ft)	NS	227.07	225.41	224.31	229.79	229.19	225.53	224.44	228.07	227.62	227.01

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 $CaCO_3$/L.

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	12/20/2018
		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	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**	**9.3**
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	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**	**0.36 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**	**1.0 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**	**0.46 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	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	**0.67 J**
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**	**4.1**
Tetrachloroethene (PCE; PERC)	5	**33.2**	**30.8 J**	**37.2**	**38.1 J**	**42.2**	**41.7**	**38.9**	**35.4**	**31.9**	**30.8**
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	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**	**0.40 J**
Trichloroethene (TCE)	5	**224**	**209 J**	**197**	**264**	**226**	**233**	**207**	**248**	**218**	**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	0.75 U
MNA Parameters											
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**2.8**	**2**
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.062 J**	**0.14**
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U	0.040 U
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**327**	**301**	**258**	**361**	**374**	**348**	**360**	**370**	**374**	**380**
Chloride (mg/L)	NS	**28.2**	**28.4**	**21.3**	**49.4**	**24.2**	**21.3**	**23.4**	**28**	**29.9**	**28.8**
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**	**0.50**
Sulfate (mg/L)	NS	**29.2**	**24.9**	**20.1**	**13.8**	**16.1**	**22.7**	**15**	**21**	**11.8**	**21.0**
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	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	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	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**	**1.7 J+**
Field Parameters											
pH (pH Unit)	NS	7.06	7.02	7.43	7.02	6.91	7.01	7.79	7.33	7.14	7.2
Turbidity (NTU)	NS	82.4	0.62	2.73	2.80	65.1	1.50	8.11	15.2	0.02	4.55
ORP (MeV)	NS	-25.1	60.9	46.1	120	41.7	33.7	2.8	52.3	90.9	98.6
Conductivity (mS/cm)	NS	0.325	0.354	0.424	0.619	1.058	0.559	0.420	0.61	0.683	0.796
Dissolved Oxygen (mg/L)	NS	4.29	6.17	9.26	7.12	6.46	8.65	7.42	2.98	9.66	5.02
Dissolved Oxygen- Membrane Probe (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.6
Groundwater Elevation (ft)	NS	227.05	225.38	224.33	229.79	229.19	225.23	224.43	228.09	227.64	227.07

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 $CaCO_3$/L.

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	12/19/2018
		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	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	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	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	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	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	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	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	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	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	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	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	0.75 U
Trichloroethene (TCE)	5	**25.2**	**42.3**	**66.3**	**24.3**	**18.4**	**19.6**	**9.8**	**8.1**	**8.2**	**7.3**
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	0.75 U
MNA Parameters											
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**12**	**36**
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 UJ	NA	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.16**	**0.087**
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.04 U	0.040 U
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**143**	**319**	**210**	**154**	**104**	**347**	**141**	**58**	**59**	**51**
Chloride (mg/L)	NS	**38.4**	**182**	**136**	**49.6**	**35.3**	**87.3**	**43.6**	**38.8**	**40.7**	**39.2**
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	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	**0.76 J**
Methane (µg/L)	NS	**47.4**	**146**	**870**	**3210**	**3560**	**12900**	**5860**	**3700**	**4410**	**3790**
Ethane (µg/L)	NS	**4.7**	**5.4**	**23.5**	**36.7**	**39.7**	**40.5**	**31.1**	**52**	**42.2**	**46.4**
Ethene (µg/L)	NS	**2.2**	**3.3**	**9.1**	**12.7**	**8.5**	**4.2**	**2.2**	**6.3**	**4.3**	**2.8**
Total Organic Carbon (mg/L)	NS	**2.2**	**225**	**139**	**75.2**	**27.0**	**366**	**50.9**	**9.7 J**	**10.2**	**12.1**
Field Parameters											
pH (pH Unit)	NS	8.91	6.83	7.60	8.01	8.01	7.41	8.54	8.28	8.48	8.84
Turbidity (NTU)	NS	58.2	3.55	3.82	3	69.1	16.1	3.12	950.5	0.02	1.36
ORP (MeV)	NS	-278.4	-166.3	-166.9	-173.3	-212.2	-170.1	-122.8	12.1	-217.6	-208.4
Conductivity (mS/cm)	NS	0.210	1.410	0.740	0.320	0.412	0.758	0.212	0.238	0.235	0.216
Dissolved Oxygen (mg/L)	NS	3.70	0.29	0.17	0.48	0.06	0.80	0.19	0.98	8.41	0.44
Dissolved Oxygen- Membrane Probe (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.2
Groundwater Elevation (ft)	NS	226.98	225.35	223.98	229.44	229.04	225.28	224.28	227.80	227.52	226.70

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 $CaCO_3$/L.

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	12/19/2018
		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	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	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	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	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	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	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	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	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**	**0.37 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	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	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	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+**	**19.1**
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	0.75 U
MNA Parameters											
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**4.1**	**1.9**
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.76**	**0.87**
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.04 U	0.04 U
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**178**	**222**	**381**	**150**	**132**	**119**	**143**	**169**	**169**	**172**
Chloride (mg/L)	NS	**41.9**	**56.6**	**98.5**	**31.0**	**31.7**	**36.3**	**50.6**	**39.9**	**32**	**34.6**
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	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**	**7.1**
Methane (µg/L)	NS	**20.7**	**3.5**	**106**	**56.5**	**29.1**	**59.4**	**34.4**	**120**	**90.6**	**126**
Ethane (µg/L)	NS	**2.2**	**1.5**	**10.1**	**2.7**	**2.6**	**3.3**	**2.6**	**5.7**	**4.2**	**4.3**
Ethene (µg/L)	NS	**0.91 J**	**0.84 J**	**4.7**	**3.2**	**2.3**	**1.9**	**1.6**	**104**	**1.4 J**	**1.3 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**	**1.1 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	8.00
Turbidity (NTU)	NS	51.7	8.03	11.4	4.60	8.60	8.62	2.95	2.6	0.02	4.36
ORP (MeV)	NS	-319.7	-163.1	-201.5	-283.2	-174.4	-208.0	-161.7	-155.1	-180.6	-172.9
Conductivity (mS/cm)	NS	0.243	0.348	0.850	0.280	0.526	0.294	0.261	0.324	0.378	0.362
Dissolved Oxygen (mg/L)	NS	1.29	0.28	0.22	0.70	0.13	0.19	0.17	0.22	7.99	0.48
Dissolved Oxygen- Membrane Probe (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.1
Groundwater Elevation (ft)	NS	226.95	225.40	224.12	229.52	229.11	225.40	224.34	227.84	227.55	226.85

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 $CaCO_3$/L.

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well MW-32 Downgradient									
		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	12/19/2018
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	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	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	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	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	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	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	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	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**	**0.85 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	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	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	0.75 U
Trichloroethene (TCE)	5	**150**	**132**	**191**	**130**	**135**	**120**	**104**	**64.1**	**95.4**	**87.1**
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	0.75 U
MNA Parameters											
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**7.4**	**2.2**
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.51**	**1.0**
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U	0.04 U
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**196**	**277**	**214**	**129**	**129**	**141**	**162**	**128**	**129**	**158**
Chloride (mg/L)	NS	**35.6**	**138**	**84.6**	**38.0**	**30.7**	**28.2**	**25.4**	**29.5**	**27.8**	**24.5**
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	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**	**6.0**
Methane (µg/L)	NS	**6.8**	**16.5**	**309**	**817**	**835**	**233 J**	**583**	**130**	**2650**	**407**
Ethane (µg/L)	NS	**0.5 J**	**1.5**	**19.3**	**35.9**	**29.4**	**5.6 J**	**10.7**	**2**	**21.1**	**12.0**
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**	**1.5 J**
Total Organic Carbon (mg/L)	NS	**2.6**	**133**	**98.0**	**22.0**	**5.0**	**5.4 J**	**2.7**	**6.4**	**3.9**	**2.4**
Field Parameters											
pH (pH Unit)	NS	8.00	6.69	7.54	9.28	7.65	7.43	7.97	8.03	7.94	7.94
Turbidity (NTU)	NS	180	5.92	4.01	5.10	3.91	5.11	1.36	0.02	0.02	1.60
ORP (MeV)	NS	-234.2	-107.7	-140.7	-238.7	-149.4	-181.9	-106.4	-149.4	-201	-180.0
Conductivity (mS/cm)	NS	0.239	1.180	0.640	0.261	0.478	0.257	0.239	0.206	0.291	0.338
Dissolved Oxygen (mg/L)	NS	0.64	1.81	1.77	2.50	1.80	1.50	0.25	8.26	8.44	0.47
Dissolved Oxygen- Membrane Probe (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.4
Groundwater Elevation (ft)	NS	226.86	225.45	223.70	229.05	228.93	225.42	224.18	227.45	227.39	226.60

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 $CaCO_3$/L.

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	12/19/2018
		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	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	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	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	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	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	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	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	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	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	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	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	0.75 U
Trichloroethene (TCE)	5	**133**	**93.5**	**151**	**152**	**170**	**142**	**155**	**178**	**137**	**159**
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	0.75 U
MNA Parameters											
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**3.9**	**2.1**
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.05 U	**0.071**
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.045 J**	0.04 U
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**172**	**218**	**194**	**205**	**202**	**212**	**215**	**215**	**213**	**211**
Chloride (mg/L)	NS	**41.8**	**43.2**	**29.2**	**22.8**	**24.6**	**28.1**	**23.0**	**22.5**	**24.8 J-**	**23.9**
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**	**0.44**
Sulfate (mg/L)	NS	**25.1**	**8.2**	**15.0**	**11.8**	**12.6**	**14.8**	**11.6**	**14.3**	**14.6**	**12.1**
Methane (µg/L)	NS	**64**	**3.4**	**9.2**	**16.0**	**17.8**	**7.2**	**6.1**	**17**	1.5 U	**10.3 J+**
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	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	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**	**1.1 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	7.69
Turbidity (NTU)	NS	23.1	9.31	11.7	3.40	51.2	6.38	9.18	2.78	0.02	2.96
ORP (MeV)	NS	-471.2	-126.8	-64.3	44.9	-3.2	-20.4	-49.9	17.6	98.7	81.9
Conductivity (mS/cm)	NS	0.247	0.303	0.386	0.350	0.648	0.370	0.285	0.385	0.456	0.390
Dissolved Oxygen (mg/L)	NS	0.92	0.41	2.50	2.99	2.87	6.80	1.89	3.41	9.21	3.96
Dissolved Oxygen- Membrane Probe (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.3
Groundwater Elevation (ft)	NS	226.89	225.51	223.80	229.11	229.05	225.54	224.26	227.51	227.42	226.68

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 $CaCO_3$/L.

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well MW-34 Downgradient									
		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	12/20/2018
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	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	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	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	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	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	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	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	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	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	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	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	0.75 U
Trichloroethene (TCE)	5	**17.7**	**41.3**	**48.3**	**34.0**	**29.6**	**28.0**	**17.6**	**31.3**	**6.9**	**10.6**
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	0.75 U
MNA Parameters											
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**3.1**	**3.1**
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.05 U	**0.068**
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.04 U	0.04 U
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**99**	**191**	**597**	**201**	**197**	**203**	**174**	**226**	**183**	**162**
Chloride (mg/L)	NS	**48.5**	**62.3**	**461**	**15.7**	**11.7**	**12.9**	**15.4**	**16.3**	2.0 U	**12.6**
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**	0.06 U
Sulfate (mg/L)	NS	**64.3**	**23.8**	**0.56 J**	**13.4**	**9.0**	**7.3**	**8.5**	**11.2**	**3.9**	**3.3**
Methane (µg/L)	NS	**14.5**	**1.2**	**1780**	**12.4**	**88.1**	**531**	**1260**	**35**	1.5 U	**737**
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	**4.0**
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	2.4 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**	**3.2 J+**
Field Parameters											
pH (pH Unit)	NS	12.68	7.14	7.45	7.26	7.26	7.40	7.37	7.30	7.12	7.67
Turbidity (NTU)	NS	44.7	3.23	4.59	-4	4.40	4.20	5.63	1.4	0.02	4.26
ORP (MeV)	NS	-185.4	-8.4	-144.0	-139.4	-63.1	-133.4	25.0	-76.3	118.1	-29.2
Conductivity (mS/cm)	NS	0.361	0.630	2.280	0.332	0.578	0.310	0.234	0.332	0.312	0.341
Dissolved Oxygen (mg/L)	NS	6.9	1.12	0.12	0.46	0.62	2.70	0.34	1.31	8.69	0.47
Dissolved Oxygen- Membrane Probe (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.2
Groundwater Elevation (ft)	NS	226.73	225.48	223.35	228.66	228.77	225.51	223.89	227.03	227.21	226.37

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 $CaCO_3$/L.

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well MW-35 Upgradient									
		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	12/20/2018
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	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	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	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	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	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	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	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	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	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	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	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	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**	**38.1**
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	0.75 U
MNA Parameters											
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**2.6**	**2.1**
Acetylene	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.45**	**0.12**
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U	**0.093**
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**181**	**223**	**51**	**202**	**192**	**210**	**171**	**197**	**115**	**195**
Chloride (mg/L)	NS	**42.2**	**53.9**	**2.0**	**17.1**	**14.4**	**22.2 J+**	**14.5**	**15.7**	**2.1**	**24.4**
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**	**0.58**
Sulfate (mg/L)	NS	**48.1**	**7.2**	**3.5**	**13.6**	**10.8**	**10.2**	**8.5**	**10.7**	**2.5**	**9.7**
Methane (µg/L)	NS	**13.8**	**0.90**	**5.8**	**7.2**	**7.5**	**7.9**	**32.7**	**23**	**50.5**	**12.3 J+**
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	3.3 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	2.4 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**	**1.1 J**
Field Parameters											
pH (pH Unit)	NS	9.68	7.09	8.79	7.66	7.46	7.44	7.46	7.55	7.49	7.77
Turbidity (NTU)	NS	381	5.99	16.3	38.2	31.91	13.81	11.00	25.8	33.8	4.49
ORP (MeV)	NS	-404	-167.9	-68.4	-10.6	30	0.40	57.10	69.5	65.6	45.4
Conductivity (mS/cm)	NS	0.287	0.329	0.078	0.324	0.600	0.338	0.218	0.335	0.204	0.453
Dissolved Oxygen (mg/L)	NS	0.79	0.41	6.63	3.67	4.58	4.84	1.32	3.54	9.57	5.38
Dissolved Oxygen- Membrane Probe (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.5
Groundwater Elevation (ft)	NS	226.69	225.46	223.40	228.68	228.81	225.56	224.08	227.04	227.26	226.47

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.
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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 $CaCO_3$/L.

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: 12/18/18

Samplers: Chris French, Alex Golden, Dan Servetas

Sample Number: MW-16 121818 QA/QC Collected? No

Purging / Sampling Method: Low Flow with Bladder Pump

1. L = Well Depth:	69.59	feet
2. D = Riser Diameter (I.D.):		feet
3. W = Depth to Water:	63.17	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, Geotech Turbidity Meter, YSI 550A DO Meter

Parameter	Units	Readings					✓	✓	✓
Time	24 hr	1042	1047	1052	1057	1102	1107	1112	1117
Water Level (0.33)	feet	63.05	63.24	63.27	63.29	63.28	63.27	63.28	63.26
Volume Purged	gal	.5	.61	0.70	0.75	0.85	0.95	1.10	1.17
Flow Rate	mL/min	—	—	—	—	—	—	99	99
Turbidity (+/- 10%)	NTU	20.4	6.90	4.76	3.55	3.76	2.14	1.66	1.63
Dissolved Oxygen (+/- 10%)	%	89.1	92.8	93.1	94.8	94.0	93.2	94.4	93.8
Dissolved Oxygen (+/- 10%)	mg/L	10.92	10.85	10.84	10.85	10.88	10.90	10.94	10.93
Eh / ORP (+/- 10)	MeV	186.8	173.2	166.0	153.8	148.7	148.9	137.2	138.2
Specific Conductivity (+/- 3%)	mS/cm[c]	—	—	—	—	—	—	—	—
Conductivity (+/- 3%)	mS/cm	1029	884	881	872	879	875	874	874
pH (+/- 0.1)	pH unit	8.33	7.35	7.27	7.24	7.24	7.24	7.24	7.25
Temp (+/- 0.5)	C°	6.2	8.1	8.6	9.1	8.7	8.5	8.8	8.9
Color	Visual	clear	clear	clear	clear	clear	clear	clear	Clear
Odor	Olfactory	—	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	%	—	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	mg/L	5.5	5.0	5.4	5.9	6.6	7.5	8.9	9.2

Comments:

Well Sampled @ 1130

Flow Rate = 99 mL/min

$150\ ml/4\ cycles = 37.5\ ml/cycle$

$22.75\ sec/cycle$

$\frac{37.5\ ml/cycle}{22.75\ sec/cycle} = 1.65\ ml/sec$

$= 99\ ml/min$

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-26 Date: 12/18/18

Samplers: Chris French, Alex Golden, Dan Servetas

Sample Number: MW-26 121818 QA/QC Collected? —

Purging / Sampling Method: Low Flow with Bladder Pump

1. L = Well Depth:	108.79	feet
2. D = Riser Diameter (I.D.):		feet
3. W = Depth to Water:	60.88	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, Geotech Turbidity Meter, YSI 550A DO Meter

Parameter	Units	Readings							
Time	24 hr	1352	1357	1402	1407	1412	1417	1422	1427
Water Level (0.33)	feet	60.92	60.96	60.90	60.90	60.90	60.93	60.92	60.92
Volume Purged	gal	-	0.25	0.45	0.55	0.70	0.90	1.10	1.20
Flow Rate	mL/min	106	106	.106	106	106	106	106	106
Turbidity (+/- 10%)	NTU	16.0	20.7	23.5	16.7	14.4	10.3	11.9	13.2
Dissolved Oxygen (+/- 10%)	%	92.8	104.5	66.0	29.8	16.4	11.5	9.6	19.8
Dissolved Oxygen (+/- 10%)	mg/L	10.96	11.97	7.47	3.33	1.84	1.32	1.11	2.46
Eh / ORP (+/- 10)	MeV	19.3	31.8	35.8	26.8	21.6	16.5	11.7	19.1
Specific Conductivity (+/- 3%)	mS/cm[c]	—	—	—	—	—	—	—	—
Conductivity (+/- 3%)	mS/cm	480.1	435.5	498.9	509	520	540	557	595
pH (+/- 0.1)	pH unit	8.11	7.56	7.48	7.43	7.41	7.40	7.38	7.38
Temp (+/- 0.5)	C°	8.2	9.3	9.2	9.3	9.3	9.4	9.1	9.0
Color	Visual	clear	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	%	-	-	-	-	-	-	-	—
Dissolved Oxygen Downhole	mg/L	4.4	4.4	4.4	4.4	4.3	4.4	4.4	4.4

Comments:

- pump @ 103 ft, DO meter @ 97 ft

Sampled @ 1525

250 mL / 3 cycles

$(85 \text{ mL/cycle})\left(\frac{1 \text{ cycle}}{48 \text{ sec}}\right)\left(\frac{60 \text{ sec}}{1 \text{ min}}\right) = 106 \text{ mL/min}$

.77 ml

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-26 Date: 12/18/18

Samplers: Chris French, Alex Golden, Dan Servetas

Sample Number: MW-26 121818 QA/QC Collected? No

Purging / Sampling Method: Low Flow with Bladder Pump

1. L = Well Depth:	108.79	feet
2. D = Riser Diameter (I.D.):		feet
3. W = Depth to Water:	60.88	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, Geotech Turbidity Meter, YSI 550A DO Meter

Parameter	Units	Readings							
Time	24 hr	~~1432~~	1437	1442	1447	1452	1457	1502	1507
Water Level (0.33)	feet	60.96	61.02	61.1	61.2	60.94	60.94	61.00	60.97
Volume Purged	gal	1.30	1.40	1.5	1.6	1.90	2.15	2.30	2.41
Flow Rate	mL/min	~~600~~ 106	106	106	106	106	106	106	106
Turbidity (+/- 10%)	NTU	10.2	13.4	~~6.5~~ 103	8.33	7.42	6.44	7.61	~~7.01~~
Dissolved Oxygen (+/- 10%)	%	11.2	7.7	~~6.3~~	6.3	6.4	5.5	6.2	4.7
Dissolved Oxygen (+/- 10%)	mg/L	1.32	.89	.74	.71	0.65	0.63	0.60	.54
Eh / ORP (+/- 10)	MeV	8.3	-5.1	-16.0	-22.0	-29.1	-33.1	-37.2	-39.8
Specific Conductivity (+/- 3%)	mS/cm[c]	—	—	—	—	—	—	—	—
Conductivity (+/- 3%)	mS/cm	611	631	650	665	680	689	702	706
pH (+/- 0.1)	pH unit	7.38	7.39	7.40	7.40	7.41	7.41	7.42	7.43
Temp (+/- 0.5)	C°	9.0	9.4	9.2	9.1	9.1	9.3	9.2	8.8
Color	Visual	clear	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	%	—	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	mg/L	4.4	4.3	4.2	4.3	4.3	4.3	4.2	4.3

Comments:

Sampled @ 15:25

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW - 26 Date: 12/18/18

Samplers: Chris French, Alex Golden, Dan Servetas

Sample Number: MW-26 121818 QA/QC Collected? No

Purging / Sampling Method: Low Flow with Bladder Pump

1. L = Well Depth:	108.79	feet
2. D = Riser Diameter (I.D.):		feet
3. W = Depth to Water:	60.88	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, Geotech Turbidity Meter, YSI 550A DO Meter

Parameter	Units	1517 Readings							
Time	24 hr	1512	~~1518~~						
Water Level (0.33)	feet	60.96	60.93						
Volume Purged	gal	2.50	2.6						
Flow Rate	mL/min	106	106						
Turbidity (+/- 10%)	NTU	7.96	7.65						
Dissolved Oxygen (+/- 10%)	%	4.8	4.8						
Dissolved Oxygen (+/- 10%)	mg/L	.55	.55						
Eh / ORP (+/- 10)	MeV	-42.8	-41.9						
Specific Conductivity (+/- 3%)	mS/cm^c	—	—						
Conductivity (+/- 3%)	mS/cm	709	715						
pH (+/- 0.1)	pH unit	7.43	7.93						
Temp (+/- 0.5)	C°	8.7	8.9						
Color	Visual	Clear	clear						
Odor	Olfactory	—	—						
Dissolved Oxygen Downhole	%	—	—						
Dissolved Oxygen Downhole	mg/L	4.3	4.3						

Comments:

Sample @ 1525

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-32 Date: 12/19/18

Samplers: Chris French, Alex Golden, Dan Servetas

Sample Number: MW-321219 18 QA/QC Collected? —

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: 63.21 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, Geotech Turbidity Meter, YSI 550A DO Meter

Parameter	Units	Readings					✓	✓	✓
Time	24 hr	09:50	0955	1000	1005	1010	1015	1020	1025
Water Level (0.33)	feet	63.21	63.24	63.25	63.20	63.21	63.21	63.19	63.20
Volume Purged	gal	—	0.25	0.5	.75	.95	1.06	1.25	1.50
Flow Rate	mL/min	151.72	151.72	151.72	151.72	151.72	151.72	151.72	151.72
Turbidity (+/- 10%)	NTU	4.87	4.01	3.63	3.52	2.36	2.38	2.34	1.60
Dissolved Oxygen (+/- 10%)	%	75.9	11.0	5.8	5.0	4.4	4.2	4.1	4.0
Dissolved Oxygen (+/- 10%)	mg/L	9.32	1.34	0.68	.60	.53	.50	.49	.47
Eh / ORP (+/- 10)	MeV	159.8	-167.4	-174.2	-180.0	-178.3	-180.0	-180.7	-180.0
Specific Conductivity (+/- 3%)	mS/cm^c	—	—	—	—	—	—	—	—
Conductivity (+/- 3%)	mS/cm	367.2	392.3	376.2	367.4	349.6	343.1	339.5	338.9
pH (+/- 0.1)	pH unit	8.97	8.14	7.96	7.93	7.93	7.93	7.93	7.94
Temp (+/- 0.5)	C°	6.7	7.7	7.4	7.4	7.4	7.5	7.6	7.9
Color	Visual	clear	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	%	—	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	mg/L	0.5	.4	0.4	.8	3.1	1.0	5.0	6.4

Comments:

~~(15oz)(1ml/1oz)~~ (/1ml)

Sample @ 1030

$(440 ml)\left(\frac{1 cycle}{58 sec}\right)\left(\frac{60 sec}{1 min}\right) = 151.72$

3cycles

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-33 Date: 12/19/18

Samplers: Chris French, Alex Golden, Dan Servetas

Sample Number: MW-33 121918 QA/QC Collected? DUP

Purging / Sampling Method: Low Flow with Bladder Pump

1. L = Well Depth:	92.29	feet
2. D = Riser Diameter (I.D.):		feet
3. W = Depth to Water:	62.24	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, Geotech Turbidity Meter, YSI 550A DO Meter

Parameter	Units	Readings							
Time	24 hr	1125	1130	1135	1140	1145	1150	1155	1200
Water Level (0.33)	feet	63.31	63.30	63.3	63.28	63.32	63.23	63.30	63.26
Volume Purged	gal	.05	.75	1.00	1.10	1.25	1.50	1.60	1.85
Flow Rate	mL/min	203	203	203	203	203	203	203	203
Turbidity (+/- 10%)	NTU	58.9	61.1	71.3	53.4	53.0	52.5	50.3	41.6
Dissolved Oxygen (+/- 10%)	%	98.3	52.5	44.6	40.1	37.8	36.9	36.2	35.4
Dissolved Oxygen (+/- 10%)	mg/L	11.62	6.28	5.31	4.65	4.38	4.25	4.15	4.07
Eh / ORP (+/- 10)	MeV	69.6	66.6	61.8	53.3	49.5	52.5	55.9	59.6
Specific Conductivity (+/- 3%)	mS/cm[c]	—	—	—	—	—	—	—	—
Conductivity (+/- 3%)	mS/cm	375.2	342.3	386.7	388.8	389.4	388.4	387.3	386.2
pH (+/- 0.1)	pH unit	7.95	7.80	7.76	7.71	7.70	7.68	7.68	7.67
Temp (+/- 0.5)	C°	7.2	7.4	7.0	9.0	8.8	9.1	9.2	8.9
Color	Visual	clear	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	%	—	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	mg/L	3.6	3.5	3.4	3.3	3.2	3.2	3.2	3.0

Comments:

$\left(\frac{400\text{ mL}}{2\text{ cycle}}\right)\left(\frac{1\text{ cycle}}{59\text{ sec}}\right)\left(\frac{60\text{ sec}}{1\text{ min}}\right)$: 203 mL/min sample @ 1310

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-33 Date: 12/19/18

Samplers: Chris French, Alex Golden, Dan Servetas

Sample Number: MW-33 121918 QA/QC Collected? DUP

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 YSI Pro DSS, Geotech Turbidity Meter, YSI 550A DO Meter

Parameter	Units	Readings							
Time	24 hr	1205	1210	1215	1220	1225	1230	1235	1240
Water Level (0.33)	feet	63.25	63.3	63.33	63.31	63.36	63.3	63.29	63.3
Volume Purged	gal	2.00	2.10	2.90	3.1	3.30	3.35	3.40	3.42
Flow Rate	mL/min	203	203	203	203	203	203	203	203
Turbidity (+/- 10%)	NTU	38.6	33.5	29.3	21.5	17.2	13.5	10.6	8.02
Dissolved Oxygen (+/- 10%)	%	35.1	34.8	34.7	34.5	34.6	34.5	34.5	34.6
Dissolved Oxygen (+/- 10%)	mg/L	4.04	4.03	3.96	3.94	3.93	3.94	3.94	3.95
Eh / ORP (+/- 10)	MeV	61.0	63.3	64.5	66.8	68.5	71.4	74.0	75.5
Specific Conductivity (+/- 3%)	mS/cm[c]	—	—	—	—	—	—	—	—
Conductivity (+/- 3%)	mS/cm	386.7	387.4	388.9	388.0	387.8	387.6	388.5	389.3
pH (+/- 0.1)	pH unit	7.67	7.67	7.67	7.67	7.67	7.67	7.68	7.68
Temp (+/- 0.5)	C°	9.1	9.2	9.1	9.4	9.6	9.5	9.5	9.6
Color	Visual	clear	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	%	—	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	mg/L	3.1	3.0	3.1	3.1	3.2	3.1	3.2	3.2

Comments:

Sample @ 1310

* YSI clock 1hr Fast *

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-33 cont. Date: 12/19/18

Samplers: Chris French, Alex Golden, Dan Servetas

Sample Number: MW-33 121918 QA/QC Collected? Dup

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 YSI Pro DSS, Geotech Turbidity Meter, YSI 550A DO Meter

Parameter	Units	6.76	Readings						
Time	24 hr	1245	1250	12.55	1300				
Water Level (0.33)	feet	63.38	63.3	63.27	63.30				
Volume Purged	gal	3.7	3.8	3.85	4.5				
Flow Rate	mL/min	203	203	203	203				
Turbidity (+/- 10%)	NTU	~~7.15~~	5.86	4.42	8.96				
Dissolved Oxygen (+/- 10%)	%	34.6	34.6	34.5	34.7				
Dissolved Oxygen (+/- 10%)	mg/L	3.95	3.95	3.93	3.96				
Eh / ORP (+/- 10)	MeV	77.5	78.8	79.5	81.9				
Specific Conductivity (+/- 3%)	mS/cm[c]	—	—	—	—				
Conductivity (+/- 3%)	mS/cm	389.5	390.8	390.4	390.1				
pH (+/- 0.1)	pH unit	7.68	7.69	7.69	7.69				
Temp (+/- 0.5)	C°	9.5	9.5	9.4	9.5				
Color	Visual	clear	clear	clear	Clear				
Odor	Olfactory	—	—	—	—				
Dissolved Oxygen Downhole	%	—	—	—	—				
Dissolved Oxygen Downhole	mg/L	3.1	3.2	3.2	3.3				

Comments:

sample @ 1310

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-30 Date: 12/19/18

Samplers: Chris French, Alex Golden, Dan Servetas

Sample Number: MW-30 121918 QA/QC Collected? —

Purging / Sampling Method: Low Flow with Bladder Pump

1. L = Well Depth:	91.30	feet
2. D = Riser Diameter (I.D.):		feet
3. W = Depth to Water:	69.93	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, Geotech Turbidity Meter, YSI 550A DO Meter

Parameter	Units	Readings					✓	✓	✓
Time	24 hr	14:03	14:08	14:13	14:18	1423	1428	1433	1438
Water Level (0.33)	feet	65.01	65.01	65.01	65.04	64.96	65.09	65.02	65.06
Volume Purged	gal	—	0.2	0.35	.41	.51	0.70	.81	.9
Flow Rate	mL/min	173	173	173	173	173	173	173	173
Turbidity (+/- 10%)	NTU	2.98	2.01	1.89	1.47	1.57	1.56	1.40	1.36
Dissolved Oxygen (+/- 10%)	%	41.3	7.9	6.7	5.7	4.9	4.6	4.2	3.9
Dissolved Oxygen (+/- 10%)	mg/L	4.40	0.88	0.75	0.64	.55	0.52	.47	.44
Eh / ORP (+/- 10)	MeV	-55.1	-178.5	-191.9	-198.5	-201.6	-203.6	-206.8	-208.4
Specific Conductivity (+/- 3%)	mS/cm[c]	—	—	—	—	—	—	—	—
Conductivity (+/- 3%)	mS/cm	230.0	223.8	223.4	221.4	219.5	218.6	217.8	216.3
pH (+/- 0.1)	pH unit	8.93	8.86	8.86	8.85	8.85	8.83	8.83	8.84
Temp (+/- 0.5)	C°	10.3	10.2	10.4	10.3	10.1	10.1	9.9	10.1
Color	Visual	clear	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	%	—	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	mg/L	0.4	0.2	0.2	0.2	0.2	0.2	.1	.2

Comments:

Sample @ 1440

$\left(\frac{475\,mL}{3\,cycles}\right)\left(\frac{1\,cycle}{55\,sec}\right)\left(\frac{60\,sec}{1\,min}\right) = 173\,mL/min$

* bottom of tubing clear *

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-31 Date: 12/19/18

Samplers: Chris French, Alex Golden, Dan Servetas

Sample Number: MW-31 121918 QA/QC Collected? No

Purging / Sampling Method: Low Flow with Bladder Pump

1. L = Well Depth:	91.67	feet
2. D = Riser Diameter (I.D.):		feet
3. W = Depth to Water:	64.69	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, Geotech Turbidity Meter, YSI 550A DO Meter

Parameter	Units	Readings				✓	✓	✓
Time	24 hr	15:23	1528	1533	15:38	15:43	15:48	1553
Water Level (0.33)	feet	64.71	64.80	64.75	64.90	64.92	64.74	64.77
Volume Purged	gal	0.20	.50	0.70	0.90	1.10	1.20	1.30
Flow Rate	mL/min	130	130	130	130	130	130	130
Turbidity (+/- 10%)	NTU	9.49	9.59	9.38	7.27	7.37	5.72	4.36
Dissolved Oxygen (+/- 10%)	%	11.2	8.0	6.4	5.3	4.9	4.6	4.2
Dissolved Oxygen (+/- 10%)	mg/L	1.24	.89	0.71	0.59	0.55	.51	.48
Eh / ORP (+/- 10)	MeV	-159.2	-165.9	-168.4	-170.3	-171.3	-172.3	-172.9
Specific Conductivity (+/- 3%)	mS/cm[c]	—	—	—	—	—	—	—
Conductivity (+/- 3%)	mS/cm	348.0	348.1	348.4	352.8	355.9	360.2	362.1
pH (+/- 0.1)	pH unit	8.09	8.04	8.01	7.99	7.99	8.00	8.00
Temp (+/- 0.5)	C°	10.6	10.7	10.7	10.4	10.1	10.0	9.9
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	%	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	mg/L	0.2	.1	0.1	0.1	0.1	.1	.1

Comments:

1555

$\left(\frac{250\text{ml}}{2\text{cycle}}\right)\left(\frac{1\text{cycle}}{58\text{sec}}\right)\left(\frac{60\text{sec}}{1\text{min}}\right) = 130\text{ mL/min}$

*bottom of tubing black *

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-34 Date: 12/20/18

Samplers: Chris French, Alex Golden, Dan Servetas

Sample Number: MW-34 122018 QA/QC Collected? —

Purging / Sampling Method: Low Flow with Bladder Pump

1. L = Well Depth:	88.23	feet
2. D = Riser Diameter (I.D.):		feet
3. W = Depth to Water:	60.81	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, Geotech Turbidity Meter, YSI 550A DO Meter

Parameter	Units	Readings							
Time	24 hr	08:08	08:13	08:18	08:23	08:28	08:33	08:38	08:43
Water Level (0.33)	feet	60.81	60.91	60.80	60.80	60.80	60.80	60.80	60.80
Volume Purged	gal	—	0.50	0.85	1.10	1.35	1.55	1.69	1.81
Flow Rate	mL/min	169	169	169	169	169	169	169	169
Turbidity (+/- 10%)	NTU	9.62	4.79	5.69	4.68	4.53	4.76	4.26	4.26
Dissolved Oxygen (+/- 10%)	%	16.4	7.4	5.9	5.5	4.8	4.3	4.2	4.1
Dissolved Oxygen (+/- 10%)	mg/L	1.90	0.86	0.69	0.63	0.56	0.49	0.49	0.47
Eh / ORP (+/- 10)	MeV	183.7	165.2	99.0	47.8	2.9	-23.1	-26.2	-29.2
Specific Conductivity (+/- 3%)	mS/cm^c	386.5	319.5	324.7	328.8	332.0	337.0	339.9	341.5
Conductivity (+/- 3%)	mS/cm	—	—	—	—	—	—	—	—
pH (+/- 0.1)	pH unit	8.85	7.93	7.77	7.71	7.68	7.67	7.67	7.67
Temp (+/- 0.5)	C°	7.8	8.6	8.6	8.9	8.8	9.0	8.8	9.1
Color	Visual	clear	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	%	—	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	mg/L	4.2	4.2	4.2	4.2	4.2	4.1	4.2	4.2

Comments:

Flow Rate = $\frac{473\ mL}{3\ cycles} \cdot \frac{1\ cycle}{56\ sec} \cdot \frac{60\ sec}{1\ min} = 168.9 = 169\ mL/min$

sampled @ 8:50

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-35 Date: 12/20/18

Samplers: Chris French, Alex Golden, Dan Servetas

Sample Number: MW-35 122018 QA/QC Collected? MS/MSD

Purging / Sampling Method: Low Flow with Bladder Pump

1. L = Well Depth:	92.33	feet
2. D = Riser Diameter (I.D.):		feet
3. W = Depth to Water:	60.49	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, Geotech Turbidity Meter, YSI 550A DO Meter

Parameter	Units	Readings				✓	✓	✓
Time	24 hr	09:45	0950	0955	1000	1005	1010	1015
Water Level (0.33)	feet	60.5	60.71	60.58	60.55	60.58	60.69	60.60
Volume Purged	gal	–	–	–	–	–	–	–
Flow Rate	mL/min	130	130	130	130	130	130	130
Turbidity (+/- 10%)	NTU	10.3	8.03	7.20	5.59	5.98	5.05	4.49
Dissolved Oxygen (+/- 10%)	%	57.0	52.0	50.4	50.6	49.0	48.0	47.5
Dissolved Oxygen (+/- 10%)	mg/L	6.52	5.94	5.79	5.76	5.61	5.44	5.38
Eh / ORP (+/- 10)	MeV	32.5	32.2	34.5	36.5	39.6	44.3	45.4
Specific Conductivity (+/- 3%)	mS/cm[c]	–	–	–		–	–	–
Conductivity (+/- 3%)	mS/cm	447.2	452.6	452.7	454.4	455.9	452.2	453.4
pH (+/- 0.1)	pH unit	8.13	7.89	7.84	7.81	7.79	7.78	7.77
Temp (+/- 0.5)	C°	9.3	9.1	9.4	9.7	9.2	9.6	9.8
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	–	–	–	–	–	–	–
Dissolved Oxygen Downhole	%	–	–	–	–	–	–	–
Dissolved Oxygen Downhole	mg/L	3.7	3.6	3.6	3.5	3.6	3.5	3.5

Comments: 1025

$$\left(\frac{265\ mL}{2\ cycles}\right)\left(\frac{1\ cycle}{61\ sec}\right)\left(\frac{60\ sec}{1\ min}\right) = 130\ mL/min$$

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-28 Date: 12/20/18

Samplers: Chris French, Alex Golden, Dan Servetas

Sample Number: MW-28 122018 QA/QC Collected? —

Purging / Sampling Method: Low Flow with Bladder Pump

1. L = Well Depth:	71.84	feet
2. D = Riser Diameter (I.D.):		feet
3. W = Depth to Water:	65.24	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, Geotech Turbidity Meter, YSI 550A DO Meter

Parameter	Units	Readings							
Time	24 hr	1145	1150	1155	1200	1205	1210		
Water Level (0.33)	feet	65.29	65.27	65.26	65.28	65.28	65.27		
Volume Purged	gal	—	0.2	0.4	0.55	0.70	0.85		
Flow Rate	mL/min	134	134	134	134	134	134		
Turbidity (+/- 10%)	NTU	1.00	1.00	0.76	0.38	0.31	0.59		
Dissolved Oxygen (+/- 10%)	%	40.8	40.0	35.9	36.9	36.2	37.1		
Dissolved Oxygen (+/- 10%)	mg/L	4.50	4.49	4.05	4.12	4.04	4.13		
Eh / ORP (+/- 10)	MeV	56.9	65.7	73.4	76.5	79.3	81.7		
Specific Conductivity (+/- 3%)	mS/cm^c	-	—	—	—	—	—		
Conductivity (+/- 3%)	mS/cm	761	760	762	762	762	759		
pH (+/- 0.1)	pH unit	7.50	7.32	7.24	7.22	7.21	7.21		
Temp (+/- 0.5)	C°	9.9	10.2	10.1	10.4	10.3	10.4		
Color	Visual	clear	clear	clear	clear	clear	clear		
Odor	Olfactory	—	—	—	—	—	—		
Dissolved Oxygen Downhole	%	—	—	—	—	—	—		
Dissolved Oxygen Downhole	mg/L	2.9	2.8	2.7	2.7	2.7	2.7		

Comments:

sample @ 1215

$\left(\frac{250\ ml}{2\ cycles}\right)\left(\frac{1\ cycle}{56\ sec}\right)\left(\frac{60\ sec}{1\ min}\right) = 134\ cycle/min$

* Clear tubing, * bottom

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-29 Date: 12/20/18

Samplers: Chris French, Alex Golden, Dan Servetas

Sample Number: MW-29 122018 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:	64.49	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, Geotech Turbidity Meter, YSI 550A DO Meter

Parameter	Units	Readings							
Time	24 hr	1225	1230	1235	1240	1245	1250	1255	13:00
Water Level (0.33)	feet	65.10	65.12	65.10	65.12	65.14	65.10	65.12	65.10
Volume Purged	gal	—	0.2	0.4	0.6	.08	1.0	1.20	1.45
Flow Rate	mL/min	148	148	148	148	148	148	148	148
Turbidity (+/- 10%)	NTU	22.1	19.3	14.8	9.93	8.36	7.35	5.66	4.55
Dissolved Oxygen (+/- 10%)	%	44.2	42.5	43.6	43.9	44.2	45.2	45.4	45.5
Dissolved Oxygen (+/- 10%)	mg/L	4.85	4.68	4.81	4.87	4.92	4.99	5.01	5.02
Eh / ORP (+/- 10)	MeV	83.6	87.2	90.5	91.9	94.1	95.6	96.5	98.6
Specific Conductivity (+/- 3%)	mS/cm[c]	793	—	—	—	—	—	—	—
Conductivity (+/- 3%)	mS/cm	793	791	795	795	794	795	796	796
pH (+/- 0.1)	pH unit	7.21	7.22	7.20	7.20	7.20	7.20	7.20	7.20
Temp (+/- 0.5)	C°	11.0	10.9	10.8	10.6	10.6	10.9	10.9	10.7
Color	Visual	clear	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—		—	—	—
Dissolved Oxygen Downhole	%	—	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	mg/L	4.2	4.3	4.5	4.7	5.0	5.3	5.5	5.6

Comments: Sampled @ 13:10

$$\frac{300\ mL}{2\ cycles} \cdot \frac{1\ cycle}{61\ sec} \cdot \frac{60\ sec}{1\ min} = 148\ mL/min$$

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-15 Date: 12/20/18

Samplers: Chris French, Alex Golden, Dan Servetas

Sample Number: MW-15 122018 QA/QC Collected? —

Purging / Sampling Method: Low Flow with Bladder Pump

1. L = Well Depth:	81.72	feet
2. D = Riser Diameter (I.D.):		feet
3. W = Depth to Water:	65.42	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, Geotech Turbidity Meter, YSI 550A DO Meter

Parameter	Units	Readings				✓	✓	✓
Time	24 hr	1335	1340	1345	1350	1355	1400	1405
Water Level (0.33)	feet	65.42	65.46	65.47	65.51	65.48	65.47	65.49
Volume Purged	gal	—	.15	.30	.45	.57	.67	.78
Flow Rate	mL/min	155	155	155	155	155	155	155
Turbidity (+/- 10%)	NTU	169	112	47.9	25.1	19.0	18.3	17.9
Dissolved Oxygen (+/- 10%)	%	93.1	91.9	90.2	88.6	87.3	83.2	84.6
Dissolved Oxygen (+/- 10%)	mg/L	10.40	10.2	10.06	9.92	9.74	9.27	9.40
Eh / ORP (+/- 10)	MeV	298.8	326.7	272.8	321.7	324.9	322.9	320.4
Specific Conductivity (+/- 3%)	mS/cm[c]	—	—	—	—	—	—	—
Conductivity (+/- 3%)	mS/cm	620	579	584	591	591	586	585
pH (+/- 0.1)	pH unit	7.44	7.41	7.39	7.40	7.41	7.42	7.43
Temp (+/- 0.5)	C°	10.3	10.5	10.5	10.3	10.4	10.4	10.5
Color	Visual	murky	murky	murky	murky	clear	clear	clear
Odor	Olfactory	None	None	None	None	None	None	None
Dissolved Oxygen Downhole	%	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	mg/L	8.0	7.9	7.5	8.3	7.1	7.6	7.9

Comments: Sample @ 1410

$$\left(\frac{150\ mL}{cycle}\right)\left(\frac{1\ cycle}{58\ sec}\right)\left(\frac{60\ sec}{1\ min}\right) = 155\ mL/min$$

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-24 Date: 12/20/18

Samplers: Chris French, Alex Golden, Dan Servetas

Sample Number: MW-24 122018 QA/QC Collected? —

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:	66.52	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 Pro DSS, Geotech Turbidity Meter, YSI 550A DO Meter

Parameter	Units	Readings				✓	✓	✓
Time	24 hr	1445	1450	1455	1500	1505	1510	1515
Water Level (0.33)	feet	66.52	66.54	66.10	66.12	66.11	66.12	66.12
Volume Purged	gal	—	.10	.20	.30	.39	.49	.60
Flow Rate	mL/min	125	125	125	125	125	125	125
Turbidity (+/- 10%)	NTU	6.34	5.62	5.95	3.50	3.16	3.03	2.77
Dissolved Oxygen (+/- 10%)	%	18.2	9.4	7.3	6.2	5.1	4.2	4.4
Dissolved Oxygen (+/- 10%)	mg/L	2.04	1.07	.83	.73	.58	.53	.50
Eh / ORP (+/- 10)	MeV	-187	-185.2	-184.6	-184.8	-185.3	-185.3	-185.0
Specific Conductivity (+/- 3%)	mS/cm[c]	437.7	434.1	434.5	434.3	433.8	433.6	436.1
Conductivity (+/- 3%)	mS/cm	—	—	—	—	—	—	—
pH (+/- 0.1)	pH unit	8.23	8.11	8.01	7.96	7.94	7.92	7.92
Temp (+/- 0.5)	C°	9.5	9.7	9.7	9.7	9.7	9.7	9.5
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	%	—	—	—	—	—	—	—
Dissolved Oxygen Downhole	mg/L	~~0.2~~	~~0.2~~	.1	.1	.1	.1	.1

Comments:

Sample @ 1520

$\left(\frac{250\,mL}{20\,cycle}\right)\left(\frac{61\,sec}{cycle}\right)\left(\frac{1\,min}{60\,sec}\right) = 125\,ml/min$

* black tubing @ bottom

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-33 Date: 12/21/18

Samplers: Chris French, Alex Golden, Dan Servetas

Sample Number: — QA/QC Collected? —

Purging / Sampling Method: Low Flow with Bladder Pump

1. L = Well Depth:	92.29	feet
2. D = Riser Diameter (I.D.):		feet
3. W = Depth to Water:	64.31	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, Geotech Turbidity Meter, YSI 550A DO Meter

Parameter	Units	Readings							
Time	24 hr	0950	0955	1000	1005	1010	1015		
Water Level (0.33)	feet	64.31	63.35	63.26	63.30	63.29	63.24		
Volume Purged	gal	—	.20	.57	.41	.61	.75		
Flow Rate	mL/min	167	167	167	167	167	167		
Turbidity (+/- 10%)	NTU	38.8	31.8	31.8	26.6	24.5	25.6		
Dissolved Oxygen (+/- 10%)	%	51.6	40.8	40.1	39.2	38.1	37.8		
Dissolved Oxygen (+/- 10%)	mg/L	5.80	4.57	4.49	4.39	4.27	4.23		
Eh / ORP (+/- 10)	MeV	75.4	92.2	96.4	98.1	98.16	99.9		
Specific Conductivity (+/- 3%)	mS/cm[c]	328.1	279.0	277.1	277.2	277.7	276.9		
Conductivity (+/- 3%)	mS/cm	—	—	—	—	—	—		
pH (+/- 0.1)	pH unit	9.63	8.39	8.12	7.99	7.94	7.92		
Temp (+/- 0.5)	C°	9.9	10.2	10.3	10.4	10.3	10.4		
Color	Visual	clear	clear	clear	clear	clear	clear		
Odor	Olfactory	—	—	—	—	—	—		
Dissolved Oxygen Downhole	%	—	—	—	—	—	—		
Dissolved Oxygen Downhole	mg/L	3.3	3.2	3.2	3.2	3.2	3.2		

Comments: $\left(\frac{325\text{mL}}{2\text{ cycle}}\right)\left(\frac{1\text{ cycle}}{58\text{sec}}\right)\left(\frac{60\text{sec}}{1\text{min}}\right) = 167\text{ ml/min}$

* Hydrogen Sample Stabalization

Hydrogen sample taken @ 11:05

Monitoring Well Purging / Sampling Form

Project Name and Number: Former Scotia Navy Depot 60440641

Monitoring Well Number: MW-32 Date: 12/21/18

Samplers: Chris French, Alex Golden, Dan Servetas

Sample Number: — QA/QC Collected? —

Purging / Sampling Method: Low Flow with Bladder Pump

1. L = Well Depth:	91.57	feet
2. D = Riser Diameter (I.D.):		feet
3. W = Depth to Water:	63.15	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, Geotech Turbidity Meter, YSI 550A DO Meter

Parameter	Units	Readings							
Time	24 hr	09:53	09:58	10:03	10:08	10:13	10:18		
Water Level (0.33)	feet	63.15	63.18	63.18	63.18	63.18	63.18		
Volume Purged	gal	—	0.50	0.80	1.00	1.25	1.40		
Flow Rate	mL/min	145	145	145	145	145	145		
Turbidity (+/- 10%)	NTU	4.73	3.07	3.08	3.10	4.64	2.32		
Dissolved Oxygen (+/- 10%)	%	9.0	4.5	3.6	3.1	2.8	2.5		
Dissolved Oxygen (+/- 10%)	mg/L	0.97	0.50	0.40	0.34	0.31	0.28		
Eh / ORP (+/- 10)	MeV	-75.1	-107.0	-129.8	-124.0	-124.2	-126.0		
Specific Conductivity (+/- 3%)	mS/cm[c]	304.0	223.9	226.1	221.4	215.3	213.5		
Conductivity (+/- 3%)	mS/cm	—	—	—	—	—	—		
pH (+/- 0.1)	pH unit	7.97	7.93	7.93	7.93	7.92	7.94		
Temp (+/- 0.5)	C°	10.0	10.0	10.1	10.2	10.3	10.4		
Color	Visual	clear	clear	clear	clear	clear	clear		
Odor	Olfactory	—	—	—	—	—	—		
Dissolved Oxygen Downhole	%	—	—	—	—	—	—		
Dissolved Oxygen Downhole	mg/L	0.5	0.5	0.5	0.4	0.3	0.4		

Comments: $\left(\frac{300\,mL}{2\,cycles}\right)\left(\frac{1\,cycle}{62\,sec}\right)\left(\frac{60\,sec}{1\,min}\right) = 145\,mL/min$

* Hydrogen Sample Stabalization

Hydrogen sample taken @ 11:00

APPENDIX B: Field Calibration Forms

Calibration Log

Site: FSND Dec 2018 GW Monitoring Event
Personnel: Golden/Kosinski

Date: 12/18 Time: 10:16 Instrument: Pro DSS

PH1 5.01 -> 4.0 ORP 249.3 -> 220 DO: 0.07 (10 mins)
PH2 6.89 -> 7.0 Cond. 1,076 -> 1,413 DO downhole: 0.6 mg/l
PH3 10.07 -> 10.0 Turb. 5.9 -> 5.99

Date: 12/18 Time: 1515 Instrument: Pro DSS

PH1 4.26 -> 4.01 ~~ORP~~ Cond 1501 -> 1413
PH2 7.21 -> 7.00 ~~Cond.~~ ORP 236.7 -> 221
PH3 10.32 -> 10.01 Turb. 5.9 -> 5.99

Date: 12/19 Time: 0820 Instrument: Pro DSS

PH1 4.01 -> 4.0 ORP 191.0 -> 219.7
PH2 7.0 -> 7.0 Cond. 1,412 -> 1413
PH3 9.99 -> 10.00 Turb. 5.9 -> 5.82

Date: 12/19 Time: 16:30 Instrument: Pro DSS

PH1 4.50 -> 4.00 ORP 225.0 -> 220.0
PH2 6.60 -> 7.00 Cond. 1412 -> 1413
PH3 9.95 -> 10.00 Turb. 5.9 -> 5.99

Date: 12/20 Time: 07:00 Instrument: Pro DSS

PH1 4.80 -> 4.00 ORP 236.0 -> 220.0
PH2 6.09 -> 7.00 Cond. 1185 -> 1413
PH3 10.08 -> 10.00 Turb. 5.9 -> 5.99

Calibration Log

Site: FSND Dec 2018 GW Monitoring Event
Personnel: C. French

Date: 12/20/18 Time: 1210 Instrument: YSI Pro DSS 14L103127

PH1 10.24 -> 10.00 ORP 252.1 -> 220 mV
PH2 4.01 -> 4.00 Cond. 1223 -> 1413 uS/cm
PH3 6.95 -> 7.00 Turb. 5.74 -> 5.93

Date: 12/20/18 Time: 1600 Instrument: YSI Pro 5003

PH1 4.03 -> 4.00 ORP 209.6 -> 220.3
PH2 7.09 -> 7.00 Cond. 2010 -> 1413
PH3 10.00 -> 10.00 Turb. 5.9 -> 6.74 within limits

Date: 12/20/18 Time: 1600 Instrument: YSI Pro 5003

PH1 5.80 -> 4.00 ORP 208.5 -> 220.0
PH2 6.44 -> 7.00 Cond. 1820 -> 1413
PH3 9.88 -> 10.00 Turb. 5.9 -> 5.87

Date: 12/21/18 Time: 0830 Instrument: 5003

PH1 4.90 -> 4.00 ORP 252.0 -> 220.0
PH2 7.80 -> 7.00 Cond. 1457 -> 1413
PH3 9.98 -> 10.00 Turb. 5.80 -> 5.99

Date: 12/21/18 Time: 0830 Instrument: 5409

PH1 4.08 -> 4.00 ORP 216.2 -> 220
PH2 7.36 -> 7.00 Cond. 1345 -> 1413
PH3 9.82 -> 10.00 Turb. 5.82 -> 5.97

APPENDIX C: Hydraulic Gradient and Velocity Calculations

December 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 2018 Data		GW Elevation (ft)	Delta Elevation (ft)	Delta Distance (ft)	Gradient	Average Gradient (ft/ft)
Pair 1	MW-25	227.84	2.27	540	0.004204	**0.004408**
	MW-26	225.57				
Pair 2	GEP-3	228.11	1.77	420	0.004214	
	MW-13	226.34				
Pair 3	MW-17	228.98	1.97	410	0.004805	
	MW-28	227.01				

Groundwater Darcy Velocity

$$Darcy\ Velocty = K\ \times hydraulic\ gradient\ = K\ \times \frac{\Delta h}{\Delta L}$$

Low Hydraulic Conductivity (K) (ft/day)	15.66
High Hydraulic Conductivity (K) (ft/day)	193.8

Darcy Velocity Low (ft/day)	0.07
Darcy Velocity High (ft/day)	0.85

Seepage Velocity

$$\text{Seepage } Velocty = \frac{K \times hydraulic\ gradient}{n} = \frac{Darcy\ Velocity}{n}$$

Porosity (n)	0.4

Seepage Velocity Low (ft/day)	**0.17**
Seepage Velocity High (ft/day)	**2.14**

APPENDIX D: Laboratory Reports

ALS Environmental

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

December 31, 2018

Ms. Gerlinde Wolfe
AECOM - Latham NY

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO 60440641**	Workorder:	**3007296**
Purchase Order:	**66432/60440641.11**	Workorder ID:	**ASN044|2015-SCOTIA NAVY DEPOT**

Dear Ms. Wolfe:

Enclosed are the analytical results for samples received by the laboratory on Friday, December 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.

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

CC: Mr. Greg Malzone , Mr. Daniel Servetas , Mr. Scott Underhill

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

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3007296001	MW-34 122018	Ground Water	12/20/2018 08:50	12/21/2018 11:33	Collected by Client
3007296002	MW-35 122018	Ground Water	12/20/2018 10:25	12/21/2018 11:33	Collected by Client
3007296003	MW-28 122018	Ground Water	12/20/2018 12:15	12/21/2018 11:33	Collected by Client
3007296004	MW-29 122018	Ground Water	12/20/2018 13:10	12/21/2018 11:33	Collected by Client
3007296005	MW-15 122018	Ground Water	12/20/2018 14:10	12/21/2018 11:33	Collected by Client
3007296006	MW-24 122018	Ground Water	12/20/2018 15:20	12/21/2018 11:33	Collected by Client
3007296007	Trip Blank 122018	Ground Water	12/20/2018 15:25	12/21/2018 11:33	Collected by Client
3007296008	Equipment Blank	Ground Water	12/20/2018 15:27	12/21/2018 11:33	Collected by Client

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SAMPLE SUMMARY

Workorder: 3007296 ASN044|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 preformed 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.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

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: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296001** Date Collected: 12/20/2018 08:50 Matrix: Ground Water

Sample ID: **MW-34 122018** Date Received: 12/21/2018 11:33

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			12/28/18 16:20	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
Trichloroethene	10.6		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	113		%	81 - 118			SW846 8260C			12/28/18 16:20	TMP	A
4-Bromofluorobenzene (S)	104		%	85 - 114			SW846 8260C			12/28/18 16:20	TMP	A
Dibromofluoromethane (S)	103		%	80 - 119			SW846 8260C			12/28/18 16:20	TMP	A
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C			12/28/18 16:20	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	4.0		ug/L	3.3	3.3	0.23	RSK 175			12/28/18 07:58	CHS	C
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175			12/28/18 07:58	CHS	C
Methane	737		ug/L	30.0	30.0	6.8	RSK 175			12/28/18 10:00	CHS	C
WET CHEMISTRY												
Alkalinity, Total	162	1	mg/L	5	5	0.8	SM2320B-2011			12/22/18 10:16	MBW	H
Chloride	12.6		mg/L	2.0	0.50	0.16	EPA 300.0			12/22/18 05:12	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			12/22/18 05:12	CHW	G
Sulfate	3.3		mg/L	2.0	0.50	0.20	EPA 300.0			12/22/18 05:12	CHW	G
Total Organic Carbon (TOC)	3.2		mg/L	1.0	0.50	0.18	SM5310B-2011			12/29/18 00:07	PAG	E
METALS												
Iron, Total	0.068		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18	AHI	12/28/18 18:04	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18	SRT	12/31/18 09:41	SRT	K

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296001** Date Collected: 12/20/2018 08:50 Matrix: Ground Water

Sample ID: **MW-34 122018** Date Received: 12/21/2018 11:33

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

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296002** Date Collected: 12/20/2018 10:25 Matrix: Ground Water

Sample ID: **MW-35 122018** Date Received: 12/21/2018 11:33

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			12/28/18 16:43	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
Trichloroethene	38.1		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	111		%	81 - 118			SW846 8260C			12/28/18 16:43	TMP	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C			12/28/18 16:43	TMP	A
Dibromofluoromethane (S)	104		%	80 - 119			SW846 8260C			12/28/18 16:43	TMP	A
Toluene-d8 (S)	102		%	89 - 112			SW846 8260C			12/28/18 16:43	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175			12/28/18 08:31	CHS	G
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175			12/28/18 08:31	CHS	G
Methane	12.3		ug/L	1.5	1.5	0.34	RSK 175			12/28/18 08:31	CHS	G
WET CHEMISTRY												
Alkalinity, Total	195	1	mg/L	5	5	0.8	SM2320B-2011			12/22/18 10:37	MBW	V
Chloride	24.4		mg/L	2.0	0.50	0.16	EPA 300.0			12/22/18 05:25	CHW	S
Nitrate-N	0.58		mg/L	0.20	0.060	0.020	EPA 300.0			12/22/18 05:25	CHW	S
Sulfate	9.7		mg/L	2.0	0.50	0.20	EPA 300.0			12/22/18 05:25	CHW	S
Total Organic Carbon (TOC)	1.1J	J	mg/L	2.0	1.0	0.37	SM5310B-2011			12/29/18 00:07	PAG	M
METALS												
Iron, Total	0.12		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18	AHI	12/28/18 18:15	SRT	Z1
Iron, Dissolved	0.093		mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18	SRT	12/31/18 09:56	SRT	c

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296002** Date Collected: 12/20/2018 10:25 Matrix: Ground Water

Sample ID: **MW-35 122018** Date Received: 12/21/2018 11:33

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

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296003** Date Collected: 12/20/2018 12:15 Matrix: Ground Water

Sample ID: **MW-28 122018** Date Received: 12/21/2018 11:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.42J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 19:44	TMP	A
1,1-Dichloroethane	1.2		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 19:44	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 19:44	TMP	A
1,1-Dichloroethene	0.42J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 19:44	TMP	A
cis-1,2-Dichloroethene	4.7		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 19:44	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 19:44	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 19:44	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 19:44	TMP	A
Tetrachloroethene	34.7		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 19:44	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 19:44	TMP	A
1,1,1-Trichloroethane	9.8		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 19:44	TMP	A
1,1,2-Trichloroethane	0.34J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 19:44	TMP	A
Trichloroethene	195		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 19:44	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 19:44	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	111		%	81 - 118			SW846 8260C			12/28/18 19:44	TMP	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C			12/28/18 19:44	TMP	A
Dibromofluoromethane (S)	103		%	80 - 119			SW846 8260C			12/28/18 19:44	TMP	A
Toluene-d8 (S)	102		%	89 - 112			SW846 8260C			12/28/18 19:44	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175			12/28/18 08:50	CHS	C
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175			12/28/18 08:50	CHS	C
Methane	0.80J	J	ug/L	1.5	1.5	0.34	RSK 175			12/28/18 08:50	CHS	C
WET CHEMISTRY												
Alkalinity, Total	342	1	mg/L	5	5	0.8	SM2320B-2011			12/22/18 10:49	MBW	H
Chloride	25.4		mg/L	2.0	0.50	0.16	EPA 300.0			12/22/18 06:04	CHW	G
Nitrate-N	0.16J	J	mg/L	0.20	0.060	0.020	EPA 300.0			12/22/18 06:04	CHW	G
Sulfate	13.1		mg/L	2.0	0.50	0.20	EPA 300.0			12/22/18 06:04	CHW	G
Total Organic Carbon (TOC)	2.1		mg/L	1.0	0.50	0.18	SM5310B-2011			12/29/18 00:07	PAG	E
METALS												
Iron, Total	0.024J	J	mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18	AHI	12/28/18 18:26	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18	SRT	12/31/18 09:45	SRT	K

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID:	**3007296003**	Date Collected:	12/20/2018 12:15	Matrix:	Ground Water
Sample ID:	**MW-28 122018**	Date Received:	12/21/2018 11:33		

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

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296004** Date Collected: 12/20/2018 13:10 Matrix: Ground Water

Sample ID: **MW-29 122018** Date Received: 12/21/2018 11:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.67J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
1,1-Dichloroethane	1.0J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
1,1-Dichloroethene	0.46J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
cis-1,2-Dichloroethene	4.1		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
trans-1,2-Dichloroethene	0.40J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
Tetrachloroethene	30.8		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
1,1,1-Trichloroethane	9.3		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
1,1,2-Trichloroethane	0.36J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
Trichloroethene	218		ug/L	5.0	3.8	1.7	SW846 8260C			12/28/18 18:59	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	110		%	81 - 118			SW846 8260C			12/28/18 20:06	TMP	A
1,2-Dichloroethane-d4 (S)	112		%	81 - 118			SW846 8260C			12/28/18 18:59	TMP	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C			12/28/18 18:59	TMP	A
4-Bromofluorobenzene (S)	104		%	85 - 114			SW846 8260C			12/28/18 20:06	TMP	A
Dibromofluoromethane (S)	103		%	80 - 119			SW846 8260C			12/28/18 18:59	TMP	A
Dibromofluoromethane (S)	103		%	80 - 119			SW846 8260C			12/28/18 20:06	TMP	A
Toluene-d8 (S)	102		%	89 - 112			SW846 8260C			12/28/18 20:06	TMP	A
Toluene-d8 (S)	102		%	89 - 112			SW846 8260C			12/28/18 18:59	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175			12/28/18 09:06	CHS	C
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175			12/28/18 09:06	CHS	C
Methane	0.45J	J	ug/L	1.5	1.5	0.34	RSK 175			12/28/18 09:06	CHS	C
WET CHEMISTRY												
Alkalinity, Total	380	1	mg/L	5	5	0.8	SM2320B-2011			12/22/18 11:00	MBW	H
Chloride	28.8		mg/L	2.0	0.50	0.16	EPA 300.0			12/22/18 06:18	CHW	G
Nitrate-N	0.50		mg/L	0.20	0.060	0.020	EPA 300.0			12/22/18 06:18	CHW	G
Sulfate	21.0		mg/L	2.0	0.50	0.20	EPA 300.0			12/22/18 06:18	CHW	G
Total Organic Carbon (TOC)	1.7		mg/L	1.0	0.50	0.18	SM5310B-2011			12/29/18 00:07	PAG	E
METALS												
Iron, Total	0.14		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18	AHI	12/28/18 18:30	SRT	J1

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296004** Date Collected: 12/20/2018 13:10 Matrix: Ground Water

Sample ID: **MW-29 122018** Date Received: 12/21/2018 11:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18	SRT	12/31/18 10:07	SRT	K

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296005** Date Collected: 12/20/2018 14:10 Matrix: Ground Water

Sample ID: **MW-15 122018** Date Received: 12/21/2018 11:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.48J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 17:05	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 17:05	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 17:05	TMP	A
1,1-Dichloroethene	0.51J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 17:05	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 17:05	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 17:05	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 17:05	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 17:05	TMP	A
Tetrachloroethene	1.4		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 17:05	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 17:05	TMP	A
1,1,1-Trichloroethane	6.9		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 17:05	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 17:05	TMP	A
Trichloroethene	193		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 17:05	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 17:05	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	110		%	81 - 118			SW846 8260C			12/28/18 17:05	TMP	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C			12/28/18 17:05	TMP	A
Dibromofluoromethane (S)	103		%	80 - 119			SW846 8260C			12/28/18 17:05	TMP	A
Toluene-d8 (S)	101		%	89 - 112			SW846 8260C			12/28/18 17:05	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175			12/28/18 09:26	CHS	C
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175			12/28/18 09:26	CHS	C
Methane	0.70J	J	ug/L	1.5	1.5	0.34	RSK 175			12/28/18 09:26	CHS	C
WET CHEMISTRY												
Alkalinity, Total	224	1	mg/L	5	5	0.8	SM2320B-2011			12/22/18 11:11	MBW	H
Chloride	37.1		mg/L	2.0	0.50	0.16	EPA 300.0			12/22/18 06:31	CHW	G
Nitrate-N	0.70		mg/L	0.20	0.060	0.020	EPA 300.0			12/22/18 06:31	CHW	G
Sulfate	11.3		mg/L	2.0	0.50	0.20	EPA 300.0			12/22/18 06:31	CHW	G
Total Organic Carbon (TOC)	1.0		mg/L	1.0	0.50	0.18	SM5310B-2011			12/29/18 00:07	PAG	E
METALS												
Iron, Total	0.26		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18	AHI	12/28/18 18:33	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18	SRT	12/31/18 10:10	SRT	K

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296005** Date Collected: 12/20/2018 14:10 Matrix: Ground Water

Sample ID: **MW-15 122018** Date Received: 12/21/2018 11:33

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

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296006** Date Collected: 12/20/2018 15:20 Matrix: Ground Water

Sample ID: **MW-24 122018** Date Received: 12/21/2018 11:33

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			12/31/18 12:13	TMP	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
1,1-Dichloroethene	0.55J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
cis-1,2-Dichloroethene	6.1		ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
Trichloroethene	1.3		ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	108		%	81 - 118			SW846 8260C			12/31/18 12:13	TMP	B
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C			12/31/18 12:13	TMP	B
Dibromofluoromethane (S)	103		%	80 - 119			SW846 8260C			12/31/18 12:13	TMP	B
Toluene-d8 (S)	102		%	89 - 112			SW846 8260C			12/31/18 12:13	TMP	B
LIGHT HYDROCARBON GASES												
Ethane	11.2		ug/L	3.3	3.3	0.23	RSK 175			12/28/18 09:44	CHS	C
Ethene	9.7		ug/L	2.4	2.4	0.40	RSK 175			12/28/18 09:44	CHS	C
Methane	102		ug/L	3.0	3.0	0.68	RSK 175			12/28/18 10:34	CHS	C
WET CHEMISTRY												
Alkalinity, Total	185	4	mg/L	5	5	0.8	SM2320B-2011			12/22/18 11:22	MBW	H
Chloride	32.6		mg/L	2.0	0.50	0.16	EPA 300.0			12/22/18 06:44	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			12/22/18 06:44	CHW	G
Sulfate	2.7		mg/L	2.0	0.50	0.20	EPA 300.0			12/22/18 06:44	CHW	G
Total Organic Carbon (TOC)	4.0		mg/L	1.0	0.50	0.18	SM5310B-2011			12/31/18 17:45	PAG	E
METALS												
Iron, Total	1.4		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18	AHI	12/28/18 18:37	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18	SRT	12/31/18 10:14	SRT	K

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID:	**3007296006**	Date Collected:	12/20/2018 15:20	Matrix:	Ground Water
Sample ID:	**MW-24 122018**	Date Received:	12/21/2018 11:33		

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

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296007** Date Collected: 12/20/2018 15:25 Matrix: Ground Water

Sample ID: **Trip Blank 122018** Date Received: 12/21/2018 11:33

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			12/28/18 14:05	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	110		%	81 - 118	SW846 8260C			12/28/18 14:05	TMP	A
4-Bromofluorobenzene (S)	105		%	85 - 114	SW846 8260C			12/28/18 14:05	TMP	A
Dibromofluoromethane (S)	103		%	80 - 119	SW846 8260C			12/28/18 14:05	TMP	A
Toluene-d8 (S)	102		%	89 - 112	SW846 8260C			12/28/18 14:05	TMP	A

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296008** Date Collected: 12/20/2018 15:27 Matrix: Ground Water

Sample ID: **Equipment Blank** Date Received: 12/21/2018 11:33

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			12/28/18 14:27	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:27	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:27	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:27	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:27	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:27	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:27	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:27	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:27	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:27	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:27	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:27	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:27	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:27	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	109		%	81 - 118	SW846 8260C			12/28/18 14:27	TMP	A
4-Bromofluorobenzene (S)	103		%	85 - 114	SW846 8260C			12/28/18 14:27	TMP	A
Dibromofluoromethane (S)	101		%	80 - 119	SW846 8260C			12/28/18 14:27	TMP	A
Toluene-d8 (S)	102		%	89 - 112	SW846 8260C			12/28/18 14:27	TMP	A

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3007296001	1	MW-34 122018	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3007296002	1	MW-35 122018	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3007296003	1	MW-28 122018	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3007296004	1	MW-29 122018	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3007296005	1	MW-15 122018	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3007296006	4	MW-24 122018	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID	Sample ID	Analysis Method	Prep Method
3007296001	MW-34 122018	EPA 300.0	
3007296001	MW-34 122018	In-House	
3007296001	MW-34 122018	RSK 175	
3007296001	MW-34 122018	SM2320B-2011	
3007296001	MW-34 122018	SM5310B-2011	
3007296001	MW-34 122018	SW846 6010C	SW846 3015
3007296001	MW-34 122018	SW846 6010C	SW846 6010C
3007296001	MW-34 122018	SW846 8260C	
3007296002	MW-35 122018	EPA 300.0	
3007296002	MW-35 122018	In-House	
3007296002	MW-35 122018	RSK 175	
3007296002	MW-35 122018	SM2320B-2011	
3007296002	MW-35 122018	SM5310B-2011	
3007296002	MW-35 122018	SW846 6010C	SW846 3015
3007296002	MW-35 122018	SW846 6010C	SW846 6010C
3007296002	MW-35 122018	SW846 8260C	
3007296003	MW-28 122018	EPA 300.0	
3007296003	MW-28 122018	In-House	
3007296003	MW-28 122018	RSK 175	
3007296003	MW-28 122018	SM2320B-2011	
3007296003	MW-28 122018	SM5310B-2011	
3007296003	MW-28 122018	SW846 6010C	SW846 3015
3007296003	MW-28 122018	SW846 6010C	SW846 6010C
3007296003	MW-28 122018	SW846 8260C	
3007296004	MW-29 122018	EPA 300.0	
3007296004	MW-29 122018	In-House	
3007296004	MW-29 122018	RSK 175	
3007296004	MW-29 122018	SM2320B-2011	
3007296004	MW-29 122018	SM5310B-2011	
3007296004	MW-29 122018	SW846 6010C	SW846 3015
3007296004	MW-29 122018	SW846 6010C	SW846 6010C
3007296004	MW-29 122018	SW846 8260C	
3007296005	MW-15 122018	EPA 300.0	
3007296005	MW-15 122018	In-House	
3007296005	MW-15 122018	RSK 175	
3007296005	MW-15 122018	SM2320B-2011	
3007296005	MW-15 122018	SM5310B-2011	
3007296005	MW-15 122018	SW846 6010C	SW846 3015
3007296005	MW-15 122018	SW846 6010C	SW846 6010C
3007296005	MW-15 122018	SW846 8260C	
3007296006	MW-24 122018	EPA 300.0	
3007296006	MW-24 122018	In-House	
3007296006	MW-24 122018	RSK 175	
3007296006	MW-24 122018	SM2320B-2011	
3007296006	MW-24 122018	SM5310B-2011	
3007296006	MW-24 122018	SW846 6010C	SW846 3015

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID	Sample ID	Analysis Method	Prep Method
3007296006	MW-24 122018	SW846 6010C	SW846 6010C
3007296006	MW-24 122018	SW846 8260C	
3007296007	Trip Blank 122018	SW846 8260C	
3007296008	Equipment Blank	SW846 8260C	

QUALITY CONTROL DATA

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

QC Batch: MDIG/75470 **Analysis Method:** SW846 6010C

QC Batch Method: SW846 3015

Associated Lab Samples: 3007296001, 3007296002, 3007296003, 3007296004, 3007296005, 3007296006

METHOD BLANK: 2868441

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

LABORATORY CONTROL SAMPLE: 2868442

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Total	101	mg/L	1.1	1.1	87 - 115

MATRIX SPIKE: 2868443 DUPLICATE: 2868444 ORIGINAL: 3007296002

****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	.11878	mg/L	1.1	1.18221	1.24332	95.7	101	87 - 115	5.04	20

QUALITY CONTROL DATA

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

QC Batch: MDIG/75483 **Analysis Method:** SW846 6010C

QC Batch Method: SW846 6010C

Associated Lab Samples: 3007296001, 3007296002, 3007296003, 3007296004, 3007296005, 3007296006

METHOD BLANK: 2868784

Parameter	Blank Result	Units	Reporting Limit
Iron, Dissolved	0.040U	mg/L	0.060

LABORATORY CONTROL SAMPLE: 2869849

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Dissolved	100	mg/L	1	1.0	87 - 115

MATRIX SPIKE: 2868785 DUPLICATE: 2868786 ORIGINAL: 3007296002

****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	.0934	mg/L	1	1.02	.962	92.7	86.9*	87 - 115	5.85	20

QUALITY CONTROL DATA

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

QC Batch: SVGC/51573 **Analysis Method:** RSK 175

QC Batch Method: RSK 175

Associated Lab Samples: 3007296001, 3007296002, 3007296003, 3007296004, 3007296005, 3007296006

METHOD BLANK: 2868723

Parameter	Blank Result	Units	Reporting Limit
Ethane	3.3U	ug/L	3.3
Ethene	2.4U	ug/L	2.4
Methane	0.68J	ug/L	1.5

SAMPLE DUPLICATE: 2868724 ORIGINAL: 3007296001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	3.96	ug/L	4.1	3.47	20
Ethene	0	ug/L	0	NC	20
Methane	736.57	ug/L	644.75	13.3	20

QUALITY CONTROL DATA

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

QC Batch: VOMS/49198 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 3007296001, 3007296002, 3007296003, 3007296004, 3007296005, 3007296006, 3007296007, 3007296008

METHOD BLANK: 2868778

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)	109	%	81 - 118
4-Bromofluorobenzene (S)	104	%	85 - 114
Dibromofluoromethane (S)	103	%	80 - 119
Toluene-d8 (S)	102	%	89 - 112

LABORATORY CONTROL SAMPLE: 2868779

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	109	ug/L	20	21.7	72 - 136
1,1-Dichloroethane	106	ug/L	20	21.2	77 - 125
1,2-Dichloroethane	103	ug/L	20	20.6	73 - 128
1,1-Dichloroethene	105	ug/L	20	21.0	71 - 131
cis-1,2-Dichloroethene	103	ug/L	20	20.7	78 - 123
trans-1,2-Dichloroethene	107	ug/L	20	21.5	75 - 124
1,1,1,2-Tetrachloroethane	110	ug/L	20	21.9	78 - 124
1,1,2,2-Tetrachloroethane	94.4	ug/L	20	18.9	71 - 121
Tetrachloroethene	107	ug/L	20	21.4	74 - 129
Toluene	106	ug/L	20	21.2	80 - 121
1,1,1-Trichloroethane	107	ug/L	20	21.3	74 - 131
1,1,2-Trichloroethane	98.6	ug/L	20	19.7	80 - 119
Trichloroethene	98.6	ug/L	20	19.7	79 - 123

QUALITY CONTROL DATA

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Vinyl Chloride	93.8	ug/L	20	18.8	58 - 137
1,2-Dichloroethane-d4 (S)	104	%			81 - 118
4-Bromofluorobenzene (S)	107	%			85 - 114
Dibromofluoromethane (S)	105	%			80 - 119
Toluene-d8 (S)	104	%			89 - 112

MATRIX SPIKE: 2869067 DUPLICATE: 2869068 ORIGINAL: 3007296002

****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	80	96.3578	93.4029	120	117	72 - 136	3.11	30
1,1-Dichloroethane	0	ug/L	80	89.6622	86.1857	112	108	77 - 125	3.95	30
1,2-Dichloroethane	0	ug/L	80	85.1427	81.1358	106	101	73 - 128	4.82	30
1,1-Dichloroethene	0	ug/L	80	93.6616	89.2747	117	112	71 - 131	4.8	30
cis-1,2-Dichloroethene	0	ug/L	80	92.4099	84.39	116	105	78 - 123	9.07	30
trans-1,2-Dichloroethene	0	ug/L	80	90.9944	86.2577	114	108	75 - 124	5.34	30
1,1,1,2-Tetrachloroethane	0	ug/L	80	90.1746	88.0175	113	110	78 - 124	2.42	30
1,1,2,2-Tetrachloroethane	0	ug/L	80	81.4203	79.4757	102	99.3	71 - 121	2.42	30
Tetrachloroethene	0	ug/L	80	88.1551	87.3073	110	109	74 - 129	.97	30
Toluene	0	ug/L	80	90.0609	87.6942	113	110	80 - 121	2.66	30
1,1,1-Trichloroethane	0	ug/L	80	92.7937	90.5308	116	113	74 - 131	2.47	30
1,1,2-Trichloroethane	0	ug/L	80	83.4364	81.534	104	102	80 - 119	2.31	30
Trichloroethene	38.0693	ug/L	80	127.691	120.56	112	103	79 - 123	5.74	30
Vinyl Chloride	0	ug/L	80	86.9713	82.0747	109	103	58 - 137	5.79	30
1,2-Dichloroethane-d4 (S)	109	%				109	107	81 - 118		
4-Bromofluorobenzene (S)	106	%				106	106	85 - 114		
Dibromofluoromethane (S)	103	%				103	104	80 - 119		
Toluene-d8 (S)	104	%				104	105	89 - 112		

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QUALITY CONTROL DATA

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

QC Batch: VOMS/49227 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 3007296006

METHOD BLANK: 2869930

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)	107	%	85 - 114
Dibromofluoromethane (S)	103	%	80 - 119
Toluene-d8 (S)	103	%	89 - 112

LABORATORY CONTROL SAMPLE: 2869931

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	116	ug/L	20	23.2	72 - 136
1,1-Dichloroethane	109	ug/L	20	21.9	77 - 125
1,2-Dichloroethane	103	ug/L	20	20.7	73 - 128
1,1-Dichloroethene	116	ug/L	20	23.2	71 - 131
cis-1,2-Dichloroethene	109	ug/L	20	21.8	78 - 123
trans-1,2-Dichloroethene	112	ug/L	20	22.3	75 - 124
1,1,1,2-Tetrachloroethane	109	ug/L	20	21.9	78 - 124
1,1,2,2-Tetrachloroethane	94.6	ug/L	20	18.9	71 - 121
Tetrachloroethene	114	ug/L	20	22.9	74 - 129
Toluene	110	ug/L	20	22.1	80 - 121
1,1,1-Trichloroethane	113	ug/L	20	22.7	74 - 131
1,1,2-Trichloroethane	103	ug/L	20	20.7	80 - 119
Trichloroethene	110	ug/L	20	22.0	79 - 123

QUALITY CONTROL DATA

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Vinyl Chloride	111	ug/L	20	22.3	58 - 137
1,2-Dichloroethane-d4 (S)	103	%			81 - 118
4-Bromofluorobenzene (S)	106	%			85 - 114
Dibromofluoromethane (S)	106	%			80 - 119
Toluene-d8 (S)	102	%			89 - 112

QUALITY CONTROL DATA

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

QC Batch: WETC/215054 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 3007296001, 3007296002, 3007296003, 3007296004, 3007296005, 3007296006

METHOD BLANK: 2866165

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.15J	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2866167

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	98.4	mg/L	20	19.7	87 - 111
Nitrate-N	93.6	mg/L	2.5	2.3	88 - 111
Sulfate	96.6	mg/L	20	19.3	87 - 112

MATRIX SPIKE: 2866169 DUPLICATE: 2866170 ORIGINAL: 3007296002

****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	24.38	mg/L	40	64.22	65.68	99.6	103	87 - 111	2.25	15
Nitrate-N	.58	mg/L	5	5.8	5.98	104	108	88 - 111	3.06	15
Sulfate	9.7	mg/L	40	51.8	53.22	105	109	87 - 112	2.7	15

METHOD BLANK: 2866172

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.15J	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

QUALITY CONTROL DATA

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

QC Batch: WETC/215057 **Analysis Method:** SM2320B-2011

QC Batch Method: SM2320B-2011

Associated Lab Samples: 3007296001, 3007296002, 3007296003, 3007296004, 3007296005, 3007296006

METHOD BLANK: 2866186

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2866191 ORIGINAL: 3007164001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	335.33066	mg/L	364.04868	8.21	20

METHOD BLANK: 2866194

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2866195 ORIGINAL: 3007164011

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	281.30838	mg/L	277.86572	1.23	20

METHOD BLANK: 2866198

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2866199 ORIGINAL: 3007296002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD

QUALITY CONTROL DATA

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Alkalinity, Total	194.6235	mg/L	200.2235	2.84	20

METHOD BLANK: 2866202

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

QUALITY CONTROL DATA

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

QC Batch: WETC/215293 **Analysis Method:** SM5310B-2011

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 3007296001, 3007296002, 3007296003, 3007296004, 3007296005

METHOD BLANK: 2869055

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

LABORATORY CONTROL SAMPLE: 2869056

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	94.3	mg/L	1	0.94J	85 - 115

MATRIX SPIKE: 2869057 DUPLICATE: 2869058 ORIGINAL: 3007161009

****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)	2.03	mg/L	6	8.233	8.462	103	107	85 - 115	2.74	20

MATRIX SPIKE: 2869059 DUPLICATE: 2869060 ORIGINAL: 3007296002

****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)	1.088	mg/L	12	14.284	14.284	110	110	85 - 115	0	20

QUALITY CONTROL DATA

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

QC Batch: WETC/215294 **Analysis Method:** SM5310B-2011

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 3007296006

METHOD BLANK: 2869061

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

LABORATORY CONTROL SAMPLE: 2869062

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	95.8	mg/L	1	0.96J	85 - 115

MATRIX SPIKE: 2869063 DUPLICATE: 2869064 ORIGINAL: 3007344003

****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)	.706	mg/L	6	6.756	6.811	101	102	85 - 115	.81	20

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
3007296001	MW-34 122018			EPA 300.0	WETC/215054
3007296002	MW-35 122018			EPA 300.0	WETC/215054
3007296003	MW-28 122018			EPA 300.0	WETC/215054
3007296004	MW-29 122018			EPA 300.0	WETC/215054
3007296005	MW-15 122018			EPA 300.0	WETC/215054
3007296006	MW-24 122018			EPA 300.0	WETC/215054
3007296001	MW-34 122018			SM2320B-2011	WETC/215057
3007296002	MW-35 122018			SM2320B-2011	WETC/215057
3007296003	MW-28 122018			SM2320B-2011	WETC/215057
3007296004	MW-29 122018			SM2320B-2011	WETC/215057
3007296005	MW-15 122018			SM2320B-2011	WETC/215057
3007296006	MW-24 122018			SM2320B-2011	WETC/215057
3007296001	MW-34 122018	SW846 3015	MDIG/75470	SW846 6010C	META/65289
3007296002	MW-35 122018	SW846 3015	MDIG/75470	SW846 6010C	META/65289
3007296003	MW-28 122018	SW846 3015	MDIG/75470	SW846 6010C	META/65289
3007296004	MW-29 122018	SW846 3015	MDIG/75470	SW846 6010C	META/65289
3007296005	MW-15 122018	SW846 3015	MDIG/75470	SW846 6010C	META/65289
3007296006	MW-24 122018	SW846 3015	MDIG/75470	SW846 6010C	META/65289
3007296001	MW-34 122018			RSK 175	SVGC/51573
3007296002	MW-35 122018			RSK 175	SVGC/51573
3007296003	MW-28 122018			RSK 175	SVGC/51573
3007296004	MW-29 122018			RSK 175	SVGC/51573
3007296005	MW-15 122018			RSK 175	SVGC/51573
3007296006	MW-24 122018			RSK 175	SVGC/51573
3007296001	MW-34 122018			SW846 8260C	VOMS/49198
3007296002	MW-35 122018			SW846 8260C	VOMS/49198
3007296003	MW-28 122018			SW846 8260C	VOMS/49198
3007296004	MW-29 122018			SW846 8260C	VOMS/49198

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
3007296005	MW-15 122018			SW846 8260C	VOMS/49198
3007296007	Trip Blank 122018			SW846 8260C	VOMS/49198
3007296008	Equipment Blank			SW846 8260C	VOMS/49198
3007296001	MW-34 122018	SW846 6010C	MDIG/75483	SW846 6010C	META/65318
3007296002	MW-35 122018	SW846 6010C	MDIG/75483	SW846 6010C	META/65318
3007296003	MW-28 122018	SW846 6010C	MDIG/75483	SW846 6010C	META/65318
3007296004	MW-29 122018	SW846 6010C	MDIG/75483	SW846 6010C	META/65318
3007296005	MW-15 122018	SW846 6010C	MDIG/75483	SW846 6010C	META/65318
3007296006	MW-24 122018	SW846 6010C	MDIG/75483	SW846 6010C	META/65318
3007296001	MW-34 122018			SM5310B-2011	WETC/215293
3007296002	MW-35 122018			SM5310B-2011	WETC/215293
3007296003	MW-28 122018			SM5310B-2011	WETC/215293
3007296004	MW-29 122018			SM5310B-2011	WETC/215293
3007296005	MW-15 122018			SM5310B-2011	WETC/215293
3007296006	MW-24 122018			SM5310B-2011	WETC/215294
3007296006	MW-24 122018			SW846 8260C	VOMS/49227

ALS Environmental

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.

Courier:

Tracking #:

30072296

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/#: 60440641 ALS Quote #:

TAT: [✓] Normal-Standard TAT is 10-12 business days. Date Required:
[ ] Rush-Subject to ALS approval and surcharges. Approved By:

Email? [✓] Y gerlinde.wolf@aecom.com
Fax? [ ] Y No:

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	8260C	RSK 175	TOC	Alkalinity	Cl, NO3, SO4	Total Fe	Dissolved Fe			
***Container Type						C	C	AV	P	P	P	P			
***Container Size						40	40	40	250	250	250	250			
*** Preservative						HCl	HCl	HCl	—	—	HNO3	—			
						ANALYSES/METHOD REQUESTED									
						Enter Number of Containers Per Analysis									
1 MW-34 122018		12/20/18	0950	G	GW	2	2	2	1	1	1	1			
2 MW-25 122018	*MSD/MS taken		1025			2	2	2	1	1	1	1			
3 MS			—			2	2	2	1	1	1	1			
4 MSD			—			2	2	2	1	1	1	1			
5 MW-28 122018			1215			2	2	2	1	1	1	1			
6 MW-29 122018			1310			2	2	2	1	1	1	1			
7 MW-15 122018			1410			2	2	2	1	1	1	1			
8 MW-24 122018		↓	1520	↓	↓	2	2	2	1	1	1	1			

	Correct containers?	Correct sample volume?	Correct preservation?	Headspace/Volatiles?	Circle appropriate Y or N.
	N Y	N Y	N Y	N Y	
	N Y	N Y	N Y	N Y	
	N Y	N Y	N Y	N Y	
	N Y	N Y	N Y	N Y	

Custody seals Present?	(If present) Seals intact?	Received on Ice?	COC/Labels complete/accurate?	Container in good condition?
N Y	N Y	N Y	N Y	N Y
N Y	N Y	N Y	N Y	N Y
N Y	N Y	N Y	N Y	N Y
N Y	N Y	N Y	N Y	N Y

Performed by: INITIAL HERE

Cooler Temp:

Therm. ID:

No. of Coolers:

Notes:

SAMPLED BY (Please Print): Alexandra Golden

Project Comments: email to gerlinde.wolf@aecom.com

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Alexandra Golden / AECOM	12/20/18	1530	2 Brian McGuirk	12/20/18	1700
3 Brian McGuirk	12/20/18	1700	4 COMMON COURIER / ALS COURIER		
5 COMMON COURIER / ALS COURIER			6	12/21/18	1133
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ] other

EDDs Required? [ ] If yes, format type:

SDWA Forms? ⇨ yes [ ] yes [ ] yes [ ] yes [ ]

State Samples Collected In? MD [ ] NJ [ ] NY [ ] PA [ ]

Other

DOD Criteria Required?

ALS FIELD SERVICES
[ ] Pickup
[ ] Labor
[ ] Composite Sampling
[ ] Rental Equipment
[ ] Other:

* G=Grab; C=Composite

**Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Rev 01-2013

ALS Environmental

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 2 of 2

Courier:

Tracking #:

COC# 3007296

Co. Name:

Contact (Report to): Phone:

Address: See pg 1

Bill to (if different than Report to): PO#:

Project Name/#: ALS Quote #:

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

Date Required:

Approved By:

Email? -Y

Fax? -Y No.:

***Container Type: C
***Container Size: 40
***Preservative: HCl

ANALYSES/METHOD REQUESTED: 8260C

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	8260C									
1 Trip Blank 122018		122018	1525	G	GW	2									
2 Equipment blank		↓	1527	↓	↓	~~2~~ 4 gd 12/21/18									
3															
4															
5															
6															
7															
8															

Enter Number of Containers Per Analysis

Receipt Information (completed by Sample Receiving)

Performed by: INITIAL HERE

Cooler Temp:

Therm. ID:

No. of Coolers:

Notes:

Circle appropriate Y or N.

Correct containers? Y N
Correct sample volume? Y N
Correct preservation? Y N
Headspace/Volatiles? Y N

Custody seals Present? Y N
(If present) Seals intact? Y N
Received on ice? Y N
COC/Labels complete/accurate? Y N
Container in good condition? Y N

SAMPLED BY (Please Print): Alexandra Golden

Project Comments:

	Relinquished By / Company Name	Date	Time		Received By / Company Name	Date	Time
1	Alexandra Golden Arcadis	122018	1530	2	Bryan McQuivel	12/20/18	4hr
3	Bryan McQuivel	122018	1700	4	COMMON COURIER / ALS COURIER		
5	COMMON COURIER / ALS COURIER			6	[signature]	12/21/18	1133
7				8			
9				10			

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ]

EDDs Required? [ ] If yes, format type:

SDWA Forms? yes [ ] yes [ ] yes [ ] yes [ ]

State Samples Collected In? MD [ ] NJ [ ] NY [ ] PA [ ]

Other

DOD Criteria Required?

ALS FIELD SERVICES: [ ] Pickup [ ] Labor [ ] Composite Sampling [ ] Rental Equipment [ ] Other:

* G=Grab; C=Composite **Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY ***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Rev 01-2013

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: AECOM Work Order #: 3007296 Initials: gm Date: 12/21/18

1. Were airbills / tracking numbers present and recorded? Tracking number: 7845 8901 4820	NONE	(YES)	NO
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken or leaking, frozen, etc.)		(YES)	NO
10. Did we received trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	(YES)	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		(YES)	NO
13. Are the samples reportable? If yes, fill out Reportable Drinking Water questions below.		YES	(NO)
13a. Did the client provide a PWS ID#?	(N/A)	YES	NO
13b. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13c. Did the client provide the sample location ID/Description?	(N/A)	YES	NO
13d. Did the client provide the sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #:
Temperature (°C): 4 °C
Thermometer ID: 403

COMMENTS (Required for all NO responses above and any sample non-conformance):

ALS Environmental

301 Fulling Mill Road - 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: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

December 31, 2018

Ms. Gerlinde Wolfe
AECOM - Latham NY

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO 60440641**	Workorder:	**3006960**
Purchase Order:	**66432/60440641.11**	Workorder ID:	**ANL007|60440641**

Dear Ms. Wolfe:

Enclosed are the analytical results for samples received by the laboratory on Thursday, December 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.

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

CC: Mr. Greg Malzone , Mr. Daniel Servetas , Mr. Scott Underhill

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

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

301 Fulling Mill Road - 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: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3006960 ANL007|60440641

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3006960001	MW-32 121918	Ground Water	12/19/2018 10:30	12/20/2018 10:57	Collected by Client
3006960002	MW-33 121918	Ground Water	12/19/2018 13:10	12/20/2018 10:57	Collected by Client
3006960003	MW-30 121918	Ground Water	12/19/2018 14:40	12/20/2018 10:57	Collected by Client
3006960004	MW-31 121918	Ground Water	12/19/2018 15:55	12/20/2018 10:57	Collected by Client
3006960005	DUP	Ground Water	12/19/2018 00:00	12/20/2018 10:57	Collected by Client
3006960006	TRIP BLANK 121918	Ground Water	12/19/2018 16:00	12/20/2018 10:57	Collected by Client

ALS Environmental

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3006960 ANL007|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 preformed 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.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

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: 3006960 ANL007|60440641

Lab ID: **3006960001** Date Collected: 12/19/2018 10:30 Matrix: Ground Water

Sample ID: **MW-32 121918** Date Received: 12/20/2018 10:57

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			12/21/18 12:05	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:05	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:05	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:05	TMP	A
cis-1,2-Dichloroethene	0.85J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:05	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:05	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:05	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:05	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:05	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:05	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:05	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:05	TMP	A
Trichloroethene	87.1		ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:05	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:05	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	96.1		%	81 - 118			SW846 8260C			12/21/18 12:05	TMP	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C			12/21/18 12:05	TMP	A
Dibromofluoromethane (S)	90.3		%	80 - 119			SW846 8260C			12/21/18 12:05	TMP	A
Toluene-d8 (S)	97.6		%	89 - 112			SW846 8260C			12/21/18 12:05	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	12.0		ug/L	3.3	3.3	0.23	RSK 175			12/27/18 08:31	CHS	H
Ethene	1.5J	J	ug/L	2.4	2.4	0.40	RSK 175			12/27/18 08:31	CHS	H
Methane	407		ug/L	30.0	30.0	6.8	RSK 175			12/27/18 10:41	CHS	H
WET CHEMISTRY												
Alkalinity, Total	158	1	mg/L	5	5	0.8	SM2320B-2011			12/21/18 10:23	MSA	F
Chloride	24.5		mg/L	2.0	0.50	0.16	EPA 300.0			12/21/18 05:21	CHW	E
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			12/21/18 05:21	CHW	E
Sulfate	6.0		mg/L	2.0	0.50	0.20	EPA 300.0			12/21/18 05:21	CHW	E
Total Organic Carbon (TOC)	2.4		mg/L	1.0	0.50	0.18	SM5310B-2011			12/27/18 13:59	PAG	C
METALS												
Iron, Total	1.0		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18	AHI	12/28/18 17:42	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18	SRT	12/31/18 09:19	SRT	K

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ANALYTICAL RESULTS

Workorder: 3006960 ANL007|60440641

Lab ID: **3006960001** Date Collected: 12/19/2018 10:30 Matrix: Ground Water

Sample ID: **MW-32 121918** Date Received: 12/20/2018 10:57

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

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3006960 ANL007|60440641

Lab ID: **3006960002** Date Collected: 12/19/2018 13:10 Matrix: Ground Water

Sample ID: **MW-33 121918** Date Received: 12/20/2018 10:57

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			12/21/18 12:28	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:28	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:28	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:28	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:28	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:28	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:28	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:28	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:28	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:28	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:28	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:28	TMP	A
Trichloroethene	159		ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:28	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:28	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	98.2		%	81 - 118			SW846 8260C			12/21/18 12:28	TMP	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C			12/21/18 12:28	TMP	A
Dibromofluoromethane (S)	91.3		%	80 - 119			SW846 8260C			12/21/18 12:28	TMP	A
Toluene-d8 (S)	96		%	89 - 112			SW846 8260C			12/21/18 12:28	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175			12/27/18 09:03	CHS	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175			12/27/18 09:03	CHS	H
Methane	10.3		ug/L	1.5	1.5	0.34	RSK 175			12/27/18 09:03	CHS	H
WET CHEMISTRY												
Alkalinity, Total	211	1	mg/L	5	5	0.8	SM2320B-2011			12/21/18 10:34	MSA	F
Chloride	23.9		mg/L	2.0	0.50	0.16	EPA 300.0			12/21/18 05:34	CHW	E
Nitrate-N	0.44		mg/L	0.20	0.060	0.020	EPA 300.0			12/21/18 05:34	CHW	E
Sulfate	12.1		mg/L	2.0	0.50	0.20	EPA 300.0			12/21/18 05:34	CHW	E
Total Organic Carbon (TOC)	1.1		mg/L	1.0	0.50	0.18	SM5310B-2011			12/27/18 18:35	PAG	C
METALS												
Iron, Total	0.071		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18	AHI	12/28/18 17:46	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18	SRT	12/31/18 09:22	SRT	K

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ANALYTICAL RESULTS

Workorder: 3006960 ANL007|60440641

Lab ID: **3006960002** Date Collected: 12/19/2018 13:10 Matrix: Ground Water
Sample ID: **MW-33 121918** Date Received: 12/20/2018 10:57

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

Vanessa N. Badman
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ANALYTICAL RESULTS

Workorder: 3006960 ANL007|60440641

Lab ID: **3006960003** Date Collected: 12/19/2018 14:40 Matrix: Ground Water

Sample ID: **MW-30 121918** Date Received: 12/20/2018 10:57

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			12/21/18 12:51	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:51	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:51	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:51	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:51	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:51	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:51	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:51	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:51	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:51	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:51	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:51	TMP	A
Trichloroethene	7.3		ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:51	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 12:51	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	97.8		%	81 - 118			SW846 8260C			12/21/18 12:51	TMP	A
4-Bromofluorobenzene (S)	104		%	85 - 114			SW846 8260C			12/21/18 12:51	TMP	A
Dibromofluoromethane (S)	90.4		%	80 - 119			SW846 8260C			12/21/18 12:51	TMP	A
Toluene-d8 (S)	96.4		%	89 - 112			SW846 8260C			12/21/18 12:51	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	46.4		ug/L	3.3	3.3	0.23	RSK 175			12/27/18 09:19	CHS	H
Ethene	2.8		ug/L	2.4	2.4	0.40	RSK 175			12/27/18 09:19	CHS	H
Methane	3790		ug/L	150	150	34.0	RSK 175			12/27/18 11:16	CHS	H
WET CHEMISTRY												
Alkalinity, Total	51	1	mg/L	5	5	0.8	SM2320B-2011			12/21/18 11:34	MSA	F
Chloride	39.2		mg/L	2.0	0.50	0.16	EPA 300.0			12/21/18 05:47	CHW	E
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			12/21/18 05:47	CHW	E
Sulfate	0.76J	J	mg/L	2.0	0.50	0.20	EPA 300.0			12/21/18 05:47	CHW	E
Total Organic Carbon (TOC)	12.1		mg/L	2.0	1.0	0.37	SM5310B-2011			12/27/18 18:35	PAG	C
METALS												
Iron, Total	0.087		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18	AHI	12/28/18 17:49	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18	SRT	12/31/18 09:26	SRT	K

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ANALYTICAL RESULTS

Workorder: 3006960 ANL007|60440641

Lab ID: **3006960003** Date Collected: 12/19/2018 14:40 Matrix: Ground Water

Sample ID: **MW-30 121918** Date Received: 12/20/2018 10:57

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

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3006960 ANL007|60440641

Lab ID: **3006960004** Date Collected: 12/19/2018 15:55 Matrix: Ground Water

Sample ID: **MW-31 121918** Date Received: 12/20/2018 10:57

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			12/21/18 13:13	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:13	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:13	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:13	TMP	A
cis-1,2-Dichloroethene	0.37J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:13	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:13	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:13	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:13	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:13	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:13	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:13	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:13	TMP	A
Trichloroethene	19.1		ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:13	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:13	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	99.1		%	81 - 118			SW846 8260C			12/21/18 13:13	TMP	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C			12/21/18 13:13	TMP	A
Dibromofluoromethane (S)	92.5		%	80 - 119			SW846 8260C			12/21/18 13:13	TMP	A
Toluene-d8 (S)	97.5		%	89 - 112			SW846 8260C			12/21/18 13:13	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	4.3		ug/L	3.3	3.3	0.23	RSK 175			12/27/18 09:34	CHS	H
Ethene	1.3J	J	ug/L	2.4	2.4	0.40	RSK 175			12/27/18 09:34	CHS	H
Methane	126		ug/L	7.5	7.5	1.7	RSK 175			12/27/18 11:32	CHS	H
WET CHEMISTRY												
Alkalinity, Total	172	1	mg/L	5	5	0.8	SM2320B-2011			12/21/18 11:45	MSA	F
Chloride	34.6		mg/L	2.0	0.50	0.16	EPA 300.0			12/21/18 06:00	CHW	E
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			12/21/18 06:00	CHW	E
Sulfate	7.1		mg/L	2.0	0.50	0.20	EPA 300.0			12/21/18 06:00	CHW	E
Total Organic Carbon (TOC)	1.1		mg/L	1.0	0.50	0.18	SM5310B-2011			12/27/18 18:35	PAG	C
METALS												
Iron, Total	0.87		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18	AHI	12/28/18 17:53	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18	SRT	12/31/18 09:30	SRT	K

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3006960 ANL007|60440641

Lab ID: **3006960004** Date Collected: 12/19/2018 15:55 Matrix: Ground Water

Sample ID: **MW-31 121918** Date Received: 12/20/2018 10:57

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

Vanessa N. Badman

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ANALYTICAL RESULTS

Workorder: 3006960 ANL007|60440641

Lab ID: **3006960005** Date Collected: 12/19/2018 00:00 Matrix: Ground Water

Sample ID: **DUP** Date Received: 12/20/2018 10:57

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			12/21/18 13:36	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
Trichloroethene	155		ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	98.3		%	81 - 118			SW846 8260C			12/21/18 13:36	TMP	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C			12/21/18 13:36	TMP	A
Dibromofluoromethane (S)	92.2		%	80 - 119			SW846 8260C			12/21/18 13:36	TMP	A
Toluene-d8 (S)	96.6		%	89 - 112			SW846 8260C			12/21/18 13:36	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175			12/27/18 09:52	CHS	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175			12/27/18 09:52	CHS	H
Methane	9.4		ug/L	1.5	1.5	0.34	RSK 175			12/27/18 09:52	CHS	H
WET CHEMISTRY												
Alkalinity, Total	209	1	mg/L	5	5	0.8	SM2320B-2011			12/21/18 11:55	MSA	F
Chloride	24.2		mg/L	2.0	0.50	0.16	EPA 300.0			12/21/18 06:13	CHW	E
Nitrate-N	0.46		mg/L	0.20	0.060	0.020	EPA 300.0			12/21/18 06:13	CHW	E
Sulfate	12.4		mg/L	2.0	0.50	0.20	EPA 300.0			12/21/18 06:13	CHW	E
Total Organic Carbon (TOC)	0.84J	J	mg/L	1.0	0.50	0.18	SM5310B-2011			12/27/18 18:35	PAG	C
METALS												
Iron, Total	0.066J	J	mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18	AHI	12/28/18 17:57	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18	SRT	12/31/18 09:34	SRT	K

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ANALYTICAL RESULTS

Workorder: 3006960 ANL007|60440641

Lab ID: **3006960005** Date Collected: 12/19/2018 00:00 Matrix: Ground Water
Sample ID: **DUP** Date Received: 12/20/2018 10:57

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

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ANALYTICAL RESULTS

Workorder: 3006960 ANL007|60440641

Lab ID: **3006960006** Date Collected: 12/19/2018 16:00 Matrix: Ground Water

Sample ID: **TRIP BLANK 121918** Date Received: 12/20/2018 10:57

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			12/21/18 11:43	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 11:43	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 11:43	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 11:43	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 11:43	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 11:43	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 11:43	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 11:43	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 11:43	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 11:43	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 11:43	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 11:43	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 11:43	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 11:43	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	96.1		%	81 - 118	SW846 8260C			12/21/18 11:43	TMP	A
4-Bromofluorobenzene (S)	102		%	85 - 114	SW846 8260C			12/21/18 11:43	TMP	A
Dibromofluoromethane (S)	92		%	80 - 119	SW846 8260C			12/21/18 11:43	TMP	A
Toluene-d8 (S)	97.1		%	89 - 112	SW846 8260C			12/21/18 11:43	TMP	A

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ANALYTICAL RESULTS

Workorder: 3006960 ANL007|60440641

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3006960001	1	MW-32 121918	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3006960002	1	MW-33 121918	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3006960003	1	MW-30 121918	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3006960004	1	MW-31 121918	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3006960005	1	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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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3006960 ANL007|60440641

Lab ID	Sample ID	Analysis Method	Prep Method
3006960001	MW-32 121918	EPA 300.0	
3006960001	MW-32 121918	In-House	
3006960001	MW-32 121918	RSK 175	
3006960001	MW-32 121918	SM2320B-2011	
3006960001	MW-32 121918	SM5310B-2011	
3006960001	MW-32 121918	SW846 6010C	SW846 3015
3006960001	MW-32 121918	SW846 6010C	SW846 6010C
3006960001	MW-32 121918	SW846 8260C	
3006960002	MW-33 121918	EPA 300.0	
3006960002	MW-33 121918	In-House	
3006960002	MW-33 121918	RSK 175	
3006960002	MW-33 121918	SM2320B-2011	
3006960002	MW-33 121918	SM5310B-2011	
3006960002	MW-33 121918	SW846 6010C	SW846 3015
3006960002	MW-33 121918	SW846 6010C	SW846 6010C
3006960002	MW-33 121918	SW846 8260C	
3006960003	MW-30 121918	EPA 300.0	
3006960003	MW-30 121918	In-House	
3006960003	MW-30 121918	RSK 175	
3006960003	MW-30 121918	SM2320B-2011	
3006960003	MW-30 121918	SM5310B-2011	
3006960003	MW-30 121918	SW846 6010C	SW846 3015
3006960003	MW-30 121918	SW846 6010C	SW846 6010C
3006960003	MW-30 121918	SW846 8260C	
3006960004	MW-31 121918	EPA 300.0	
3006960004	MW-31 121918	In-House	
3006960004	MW-31 121918	RSK 175	
3006960004	MW-31 121918	SM2320B-2011	
3006960004	MW-31 121918	SM5310B-2011	
3006960004	MW-31 121918	SW846 6010C	SW846 3015
3006960004	MW-31 121918	SW846 6010C	SW846 6010C
3006960004	MW-31 121918	SW846 8260C	
3006960005	DUP	EPA 300.0	
3006960005	DUP	In-House	
3006960005	DUP	RSK 175	
3006960005	DUP	SM2320B-2011	
3006960005	DUP	SM5310B-2011	
3006960005	DUP	SW846 6010C	SW846 3015
3006960005	DUP	SW846 6010C	SW846 6010C
3006960005	DUP	SW846 8260C	
3006960006	TRIP BLANK 121918	SW846 8260C	

QUALITY CONTROL DATA

Workorder: 3006960 ANL007|60440641

QC Batch: MDIG/75470 **Analysis Method:** SW846 6010C

QC Batch Method: SW846 3015

Associated Lab Samples: 3006960001, 3006960002, 3006960003, 3006960004, 3006960005

METHOD BLANK: 2868441

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

LABORATORY CONTROL SAMPLE: 2868442

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Total	101	mg/L	1.1	1.1	87 - 115

MATRIX SPIKE: 2868443 DUPLICATE: 2868444 ORIGINAL: 3007296002

****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	.11878	mg/L	1.1	1.18221	1.24332	95.7	101	87 - 115	5.04	20

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QUALITY CONTROL DATA

Workorder: 3006960 ANL007|60440641

QC Batch: MDIG/75483 **Analysis Method:** SW846 6010C

QC Batch Method: SW846 6010C

Associated Lab Samples: 3006960001, 3006960002, 3006960003, 3006960004, 3006960005

METHOD BLANK: 2868784

Parameter	Blank Result	Units	Reporting Limit
Iron, Dissolved	0.040U	mg/L	0.060

LABORATORY CONTROL SAMPLE: 2869849

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Dissolved	100	mg/L	1	1.0	87 - 115

MATRIX SPIKE: 2868785 DUPLICATE: 2868786 ORIGINAL: 3007296002

****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	.0934	mg/L	1	1.02	.962	92.7	86.9*	87 - 115	5.85	20

QUALITY CONTROL DATA

Workorder: 3006960 ANL007|60440641

QC Batch: SVGC/51557 **Analysis Method:** RSK 175

QC Batch Method: RSK 175

Associated Lab Samples: 3006960001, 3006960002, 3006960003, 3006960004, 3006960005

METHOD BLANK: 2867832

Parameter	Blank Result	Units	Reporting Limit
Ethane	3.3U	ug/L	3.3
Ethene	2.4U	ug/L	2.4
Methane	0.60J	ug/L	1.5

SAMPLE DUPLICATE: 2867833 ORIGINAL: 3006960001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	12.69	NC	20
Ethene	0	ug/L	1.59	NC	20
Methane	406.85	ug/L	461.48	12.6	20

QUALITY CONTROL DATA

Workorder: 3006960 ANL007|60440641

QC Batch: VOMS/49139 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 3006960001, 3006960002, 3006960003, 3006960004, 3006960005, 3006960006

METHOD BLANK: 2865648

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)	98	%	81 - 118
4-Bromofluorobenzene (S)	104	%	85 - 114
Dibromofluoromethane (S)	93.5	%	80 - 119
Toluene-d8 (S)	97.6	%	89 - 112

LABORATORY CONTROL SAMPLE: 2865649

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	97.8	ug/L	20	19.6	72 - 136
1,1-Dichloroethane	96.9	ug/L	20	19.4	77 - 125
1,2-Dichloroethane	95	ug/L	20	19.0	73 - 128
1,1-Dichloroethene	99.2	ug/L	20	19.8	71 - 131
cis-1,2-Dichloroethene	98	ug/L	20	19.6	78 - 123
trans-1,2-Dichloroethene	97.1	ug/L	20	19.4	75 - 124
1,1,1,2-Tetrachloroethane	98.9	ug/L	20	19.8	78 - 124
1,1,2,2-Tetrachloroethane	87.2	ug/L	20	17.4	71 - 121
Tetrachloroethene	85.5	ug/L	20	17.1	74 - 129
Toluene	96.5	ug/L	20	19.3	80 - 121
1,1,1-Trichloroethane	94.6	ug/L	20	18.9	74 - 131
1,1,2-Trichloroethane	92.8	ug/L	20	18.6	80 - 119
Trichloroethene	98	ug/L	20	19.6	79 - 123

QUALITY CONTROL DATA

Workorder: 3006960 ANL007|60440641

Vinyl Chloride	88.6	ug/L	20	17.7	58 - 137
1,2-Dichloroethane-d4 (S)	93.6	%			81 - 118
4-Bromofluorobenzene (S)	104	%			85 - 114
Dibromofluoromethane (S)	94.2	%			80 - 119
Toluene-d8 (S)	98.2	%			89 - 112

QUALITY CONTROL DATA

Workorder: 3006960 ANL007|60440641

QC Batch: WETC/214985 **Analysis Method:** SM2320B-2011

QC Batch Method: SM2320B-2011

Associated Lab Samples: 3006960001, 3006960002, 3006960003, 3006960004, 3006960005

METHOD BLANK: 2865396

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

SAMPLE DUPLICATE: 2865401 ORIGINAL: 3006514001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	67.50336	mg/L	76.84368	12.9	20

METHOD BLANK: 2865404

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	4J	mg/L	5

SAMPLE DUPLICATE: 2865405 ORIGINAL: 3006565003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	189.65216	mg/L	192.28493	1.38	20

METHOD BLANK: 2865408

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2865409 ORIGINAL: 3006863001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD

QUALITY CONTROL DATA

Workorder: 3006960 ANL007|60440641

Parameter		Units			
Alkalinity, Total	27.25372	mg/L	30.39324	10.9	20

METHOD BLANK: 2865412

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	4J	mg/L	5

SAMPLE DUPLICATE: 2865413 ORIGINAL: 3006863007

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	91.76454	mg/L	90.98839	.85	20

METHOD BLANK: 2865416

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

SAMPLE DUPLICATE: 2865417 ORIGINAL: 3007014001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	288.19528	mg/L	289.87936	.58	20

METHOD BLANK: 2865420

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2865421 ORIGINAL: 3007014007

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	367.2001	mg/L	346.15189	5.9	20

QUALITY CONTROL DATA

Workorder: 3006960 ANL007|60440641

METHOD BLANK: 2865424

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	4J	mg/L	5

SAMPLE DUPLICATE: 2865425 ORIGINAL: 3007063001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	138.40735	mg/L	131.55873	5.07	20

METHOD BLANK: 2865429

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

QUALITY CONTROL DATA

Workorder: 3006960 ANL007|60440641

QC Batch: WETC/214994 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 3006960001, 3006960002, 3006960003, 3006960004, 3006960005

METHOD BLANK: 2865481

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.14J	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2865483

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	94.6	mg/L	20	18.9	87 - 111
Nitrate-N	92.4	mg/L	2.5	2.3	88 - 111
Sulfate	94.6	mg/L	20	18.9	87 - 112

METHOD BLANK: 2865486

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

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QUALITY CONTROL DATA

Workorder: 3006960 ANL007|60440641

QC Batch: WETC/215150 **Analysis Method:** SM5310B-2011

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 3006960001

METHOD BLANK: 2867425

Parameter	Blank Result	Units	Reporting Limit
Total Organic Carbon (TOC)	0.19J	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2867426

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	99.7	mg/L	1	1.0J	85 - 115

MATRIX SPIKE: 2867427 DUPLICATE: 2867428 ORIGINAL: 3006960001

****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)	2.43	mg/L	6	8.175	8.115	95.8	94.8	85 - 115	.74	20

QUALITY CONTROL DATA

Workorder: 3006960 ANL007|60440641

QC Batch: WETC/215219 **Analysis Method:** SM5310B-2011

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 3006960002, 3006960003, 3006960004, 3006960005

METHOD BLANK: 2868142

Parameter	Blank Result	Units	Reporting Limit
Total Organic Carbon (TOC)	0.19J	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2868143

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	99.7	mg/L	1	1.0J	85 - 115

MATRIX SPIKE: 2868144 DUPLICATE: 2868145 ORIGINAL: 3006960004

****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)	1.136	mg/L	6	7.077	7.014	99	98	85 - 115	.89	20

MATRIX SPIKE: 2868146 DUPLICATE: 2868147 ORIGINAL: 3007164004

****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)	2.501	mg/L	6	7.887	8.124	89.8	93.7	85 - 115	2.96	20

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 3006960 ANL007|60440641

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
3006960001	MW-32 121918			SM2320B-2011	WETC/214985
3006960002	MW-33 121918			SM2320B-2011	WETC/214985
3006960003	MW-30 121918			SM2320B-2011	WETC/214985
3006960004	MW-31 121918			SM2320B-2011	WETC/214985
3006960005	DUP			SM2320B-2011	WETC/214985
3006960001	MW-32 121918			EPA 300.0	WETC/214994
3006960002	MW-33 121918			EPA 300.0	WETC/214994
3006960003	MW-30 121918			EPA 300.0	WETC/214994
3006960004	MW-31 121918			EPA 300.0	WETC/214994
3006960005	DUP			EPA 300.0	WETC/214994
3006960001	MW-32 121918			SW846 8260C	VOMS/49139
3006960002	MW-33 121918			SW846 8260C	VOMS/49139
3006960003	MW-30 121918			SW846 8260C	VOMS/49139
3006960004	MW-31 121918			SW846 8260C	VOMS/49139
3006960005	DUP			SW846 8260C	VOMS/49139
3006960006	TRIP BLANK 121918			SW846 8260C	VOMS/49139
3006960001	MW-32 121918			SM5310B-2011	WETC/215150
3006960001	MW-32 121918			RSK 175	SVGC/51557
3006960002	MW-33 121918			RSK 175	SVGC/51557
3006960003	MW-30 121918			RSK 175	SVGC/51557
3006960004	MW-31 121918			RSK 175	SVGC/51557
3006960005	DUP			RSK 175	SVGC/51557
3006960002	MW-33 121918			SM5310B-2011	WETC/215219
3006960003	MW-30 121918			SM5310B-2011	WETC/215219
3006960004	MW-31 121918			SM5310B-2011	WETC/215219
3006960005	DUP			SM5310B-2011	WETC/215219

ALS Environmental

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 3006960 ANL007|60440641

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
3006960001	MW-32 121918	SW846 3015	MDIG/75470	SW846 6010C	META/65289
3006960002	MW-33 121918	SW846 3015	MDIG/75470	SW846 6010C	META/65289
3006960003	MW-30 121918	SW846 3015	MDIG/75470	SW846 6010C	META/65289
3006960004	MW-31 121918	SW846 3015	MDIG/75470	SW846 6010C	META/65289
3006960005	DUP	SW846 3015	MDIG/75470	SW846 6010C	META/65289
3006960001	MW-32 121918	SW846 6010C	MDIG/75483	SW846 6010C	META/65318
3006960002	MW-33 121918	SW846 6010C	MDIG/75483	SW846 6010C	META/65318
3006960003	MW-30 121918	SW846 6010C	MDIG/75483	SW846 6010C	META/65318
3006960004	MW-31 121918	SW846 6010C	MDIG/75483	SW846 6010C	META/65318
3006960005	DUP	SW846 6010C	MDIG/75483	SW846 6010C	META/65318

ALS Environmental
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

Courier:

Tracking #: 7843 6143 74

30006960

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/#: 60440641

ALS Quote #:

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

Date Required:

Approved By:

Email? ☑ Y gerlinde.wolf@aecom.com

Fax? ☐ Y No.:

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	***Container Type	***Container Size	*** Preservative	8260C	RSK175	TOC	Alkalinity	Cl, NO3, SO4	Total Fe	Diss. Fe
						C	C	AV	P	P	P	P			
						40	40	40	250	250	250	250			
						HCl	HCl	HCl	-	-	HNO3	-			
1 MW-32 121918		12/9/18	1030	G	GW				2	2	2	1	1	1	1
2 MW-33 121918			1310						2	2	2	1	1	1	1
3 MW-30 121918			1440						2	2	2	1	1	1	1
4 MW-31 121918			1555						2	2	2	1	1	1	1
5 DUP			—						2	2	2	1	1	1	1
6 Trip blank 121918	trip blank		1600						2						
7															
8															

ANALYSES/METHOD REQUESTED

Enter Number of Containers Per Analysis

(completed by Sample Receiving)

Performed by: INITIAL HERE

Cooler Temp: 2.8

Therm. ID: 403

No. of Coolers:

Notes:

	Correct containers?	Correct sample volume?	Correct preservation?	Headspace/Volatiles?	Circle appropriate Y or N.
	N / Y	N / Y	N / Y	N / Y	
1	N / Y	N / Y	N / Y	N / Y	N / Y
2	N / Y	N / Y	N / Y	N / Y	N / Y
3	N / Y	N / Y	N / Y	N / Y	N / Y
4	N / Y	N / Y	N / Y	N / Y	N / Y
5	N / Y	N / Y	N / Y	N / Y	N / Y
6	N / Y	N / Y	N / Y	N / Y	N / Y
7	N / Y	N / Y	N / Y	N / Y	N / Y
8	N / Y	N / Y	N / Y	N / Y	N / Y

	Custody seals Present?	(if present) Seals intact?	Received on ice?	COC/Labels complete/accurate?	Container in good condition?
	N / Y	N / Y	N / Y	N / Y	N / Y

SAMPLED BY (Please Print): Alexandra Golden

Project Comments: send results to email listed above

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Alexandra Golden	12/19/18	1605	2 Brian McGuirk	12/19/18	1605
3 Brian McGuirk	12/19/18	1700	4 COMMON COURIER / ALS COURIER		
5 COMMON COURIER / ALS COURIER			6	12/20/18	1057
7			8		
9			10		

Data Deliverables: ☐ Standard ☐ CLP-like ☐ NJ-Reduced ☐ NJ-Full ☐ New:

SDWA Forms? ⇨ yes ☐ yes ☐ yes ☐ yes ☐

State Samples Collected In? MD ☐ NJ ☐ NY ☐ PA ☐

EDDs Required? ☐ If yes, format type:

Other

DOD Criteria Required?

ALS FIELD SERVICES

☐ Pickup ☐ Labor ☐ Composite Sampling ☐ Rental Equipment ☐ Other:

* G=Grab; C=Composite

**Matrix: Al=Air; DW=Drinking Water; GW=Groundwater; Oi=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

***Container Type: AG-Amber Glass; CG-Clear Glass; PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Rev 01-2013

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: AECOM Work Order #: 30069160 Initials: LDS Date: 12/20/18

1. Were airbills / tracking numbers present and recorded?	NONE	YES	NO
Tracking number: 7845 6143 7462			
2. Are Custody Seals on shipping containers intact?	NONE	YES	NO
3. Are Custody Seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present?		YES	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
5a. Does the COC contain sample locations?		YES	NO
5b. Does the COC contain date and time of sample collection for all samples?		YES	NO
5c. Does the COC contain sample collectors name?		YES	NO
5d. Does the COC note the type(s) of preservation for all bottles?		YES	NO
5e. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab?		YES	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		YES	NO
8. Are all samples within holding times for the requested analyses?		YES	NO
9. Were all sample containers received intact and headspace free when required? (not broken or leaking, frozen, etc.)		YES	NO
10. Did we received trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES	NO
11. Were the samples received on ice?		YES	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	NO
13. Are the samples reportable? If yes, fill out Reportable Drinking Water questions below...		YES	NO
13a. Did the client provide a PWS ID#?	N/A	YES	NO
13b. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13c. Did the client provide the sample location ID/Description?	N/A	YES	NO
13d. Did the client provide the sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #:
Temperature (°C): 2.8
Thermometer ID: 403

COMMENTS (Required for all NO responses above and any sample non-conformance):

ALS Environmental

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December 31, 2018

Ms. Gerlinde Wolfe
AECOM - Latham NY

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO 60440641**	Workorder:	**3007109**
Purchase Order:	**66432/60440641.11**	Workorder ID:	**ASN043|2015-SCOTIA NAVY DEPOT**

Dear Ms. Wolfe:

Enclosed are the analytical results for samples received by the laboratory on Thursday, December 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.

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

CC: Mr. Greg Malzone , Mr. Daniel Servetas , Mr. Scott Underhill

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

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

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SAMPLE SUMMARY

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3007109001	MW-16 121818	Ground Water	12/18/2018 11:30	12/20/2018 10:57	Collected by Client
3007109002	MW-26 121818	Ground Water	12/18/2018 15:25	12/20/2018 10:57	Collected by Client

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SAMPLE SUMMARY

Workorder: 3007109 ASN043|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 preformed 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.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

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: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

Lab ID: **3007109001** Date Collected: 12/18/2018 11:30 Matrix: Ground Water

Sample ID: **MW-16 121818** Date Received: 12/20/2018 10:57

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			12/28/18 15:35	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:35	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:35	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:35	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:35	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:35	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:35	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:35	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:35	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:35	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:35	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:35	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:35	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:35	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	113		%	81 - 118			SW846 8260C			12/28/18 15:35	TMP	A
4-Bromofluorobenzene (S)	106		%	85 - 114			SW846 8260C			12/28/18 15:35	TMP	A
Dibromofluoromethane (S)	105		%	80 - 119			SW846 8260C			12/28/18 15:35	TMP	A
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C			12/28/18 15:35	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175			12/27/18 10:07	CHS	C
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175			12/27/18 10:07	CHS	C
Methane	1.5U	U	ug/L	1.5	1.5	0.34	RSK 175			12/27/18 10:07	CHS	C
WET CHEMISTRY												
Alkalinity, Total	321	2	mg/L	5	5	0.8	SM2320B-2011			12/25/18 02:17	MSA	H
Chloride	2.8		mg/L	2.0	0.50	0.16	EPA 300.0			12/21/18 06:26	CHW	G
Nitrate-N	0.88	1	mg/L	0.20	0.060	0.020	EPA 300.0			12/21/18 06:26	CHW	G
Sulfate	46.0		mg/L	2.0	0.50	0.20	EPA 300.0			12/21/18 06:26	CHW	G
Total Organic Carbon (TOC)	1.5		mg/L	1.0	0.50	0.18	SM5310B-2011			12/27/18 18:35	PAG	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

Lab ID: **3007109002** Date Collected: 12/18/2018 15:25 Matrix: Ground Water
Sample ID: **MW-26 121818** Date Received: 12/20/2018 10:57

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			12/28/18 15:58	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:58	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:58	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:58	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:58	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:58	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:58	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:58	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:58	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:58	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:58	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:58	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:58	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 15:58	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	111		%	81 - 118			SW846 8260C			12/28/18 15:58	TMP	A
4-Bromofluorobenzene (S)	104		%	85 - 114			SW846 8260C			12/28/18 15:58	TMP	A
Dibromofluoromethane (S)	103		%	80 - 119			SW846 8260C			12/28/18 15:58	TMP	A
Toluene-d8 (S)	103		%	89 - 112			SW846 8260C			12/28/18 15:58	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175			12/27/18 10:25	CHS	C
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175			12/27/18 10:25	CHS	C
Methane	19.7		ug/L	1.5	1.5	0.34	RSK 175			12/27/18 10:25	CHS	C
WET CHEMISTRY												
Alkalinity, Total	179	2	mg/L	5	5	0.8	SM2320B-2011			12/25/18 02:27	MSA	H
Chloride	48.3		mg/L	2.0	0.50	0.16	EPA 300.0			12/21/18 06:39	CHW	G
Nitrate-N	0.060J	J,1	mg/L	0.20	0.060	0.020	EPA 300.0			12/21/18 06:39	CHW	G
Sulfate	22.4		mg/L	2.0	0.50	0.20	EPA 300.0			12/21/18 06:39	CHW	G
Total Organic Carbon (TOC)	2.2		mg/L	1.0	0.50	0.18	SM5310B-2011			12/27/18 18:35	PAG	E
METALS												
Iron, Total	0.23		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18	AHI	12/28/18 18:00	SRT	J1
Iron, Dissolved	0.029J	J	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18	SRT	12/31/18 09:37	SRT	K

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ANALYTICAL RESULTS

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

Lab ID: **3007109002** Date Collected: 12/18/2018 15:25 Matrix: Ground Water

Sample ID: **MW-26 121818** Date Received: 12/20/2018 10:57

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

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3007109001	1	MW-16 121818	EPA 300.0	Nitrate-N
Analyte was analyzed past the 48 hour holding time.				
3007109001	2	MW-16 121818	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3007109002	1	MW-26 121818	EPA 300.0	Nitrate-N
Analyte was analyzed past the 48 hour holding time.				
3007109002	2	MW-26 121818	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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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

Lab ID	Sample ID	Analysis Method	Prep Method
3007109001	MW-16 121818	EPA 300.0	
3007109001	MW-16 121818	RSK 175	
3007109001	MW-16 121818	SM2320B-2011	
3007109001	MW-16 121818	SM5310B-2011	
3007109001	MW-16 121818	SW846 8260C	
3007109002	MW-26 121818	EPA 300.0	
3007109002	MW-26 121818	In-House	
3007109002	MW-26 121818	RSK 175	
3007109002	MW-26 121818	SM2320B-2011	
3007109002	MW-26 121818	SM5310B-2011	
3007109002	MW-26 121818	SW846 6010C	SW846 3015
3007109002	MW-26 121818	SW846 6010C	SW846 6010C
3007109002	MW-26 121818	SW846 8260C	

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QUALITY CONTROL DATA

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

QC Batch: MDIG/75470 **Analysis Method:** SW846 6010C

QC Batch Method: SW846 3015

Associated Lab Samples: 3007109002

METHOD BLANK: 2868441

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

LABORATORY CONTROL SAMPLE: 2868442

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Total	101	mg/L	1.1	1.1	87 - 115

MATRIX SPIKE: 2868443 DUPLICATE: 2868444 ORIGINAL: 3007296002

****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	.11878	mg/L	1.1	1.18221	1.24332	95.7	101	87 - 115	5.04	20

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

QUALITY CONTROL DATA

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

QC Batch: MDIG/75483 **Analysis Method:** SW846 6010C

QC Batch Method: SW846 6010C

Associated Lab Samples: 3007109002

METHOD BLANK: 2868784

Parameter	Blank Result	Units	Reporting Limit
Iron, Dissolved	0.040U	mg/L	0.060

LABORATORY CONTROL SAMPLE: 2869849

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Dissolved	100	mg/L	1	1.0	87 - 115

MATRIX SPIKE: 2868785 DUPLICATE: 2868786 ORIGINAL: 3007296002

****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	.0934	mg/L	1	1.02	.962	92.7	86.9*	87 - 115	5.85	20

QUALITY CONTROL DATA

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

QC Batch: SVGC/51557 **Analysis Method:** RSK 175

QC Batch Method: RSK 175

Associated Lab Samples: 3007109001, 3007109002

METHOD BLANK: 2867832

Parameter	Blank Result	Units	Reporting Limit
Ethane	3.3U	ug/L	3.3
Ethene	2.4U	ug/L	2.4
Methane	0.60J	ug/L	1.5

SAMPLE DUPLICATE: 2867833 ORIGINAL: 3006960001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	12.69	NC	20
Ethene	0	ug/L	1.59	NC	20
Methane	406.85	ug/L	461.48	12.6	20

QUALITY CONTROL DATA

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

QC Batch: VOMS/49198 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 3007109001, 3007109002

METHOD BLANK: 2868778

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)	109	%	81 - 118
4-Bromofluorobenzene (S)	104	%	85 - 114
Dibromofluoromethane (S)	103	%	80 - 119
Toluene-d8 (S)	102	%	89 - 112

LABORATORY CONTROL SAMPLE: 2868779

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	109	ug/L	20	21.7	72 - 136
1,1-Dichloroethane	106	ug/L	20	21.2	77 - 125
1,2-Dichloroethane	103	ug/L	20	20.6	73 - 128
1,1-Dichloroethene	105	ug/L	20	21.0	71 - 131
cis-1,2-Dichloroethene	103	ug/L	20	20.7	78 - 123
trans-1,2-Dichloroethene	107	ug/L	20	21.5	75 - 124
1,1,1,2-Tetrachloroethane	110	ug/L	20	21.9	78 - 124
1,1,2,2-Tetrachloroethane	94.4	ug/L	20	18.9	71 - 121
Tetrachloroethene	107	ug/L	20	21.4	74 - 129
Toluene	106	ug/L	20	21.2	80 - 121
1,1,1-Trichloroethane	107	ug/L	20	21.3	74 - 131
1,1,2-Trichloroethane	98.6	ug/L	20	19.7	80 - 119
Trichloroethene	98.6	ug/L	20	19.7	79 - 123

QUALITY CONTROL DATA

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

Vinyl Chloride	93.8	ug/L	20	18.8	58 - 137
1,2-Dichloroethane-d4 (S)	104	%			81 - 118
4-Bromofluorobenzene (S)	107	%			85 - 114
Dibromofluoromethane (S)	105	%			80 - 119
Toluene-d8 (S)	104	%			89 - 112

MATRIX SPIKE: 2869067 DUPLICATE: 2869068 ORIGINAL: 3007296002

****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	80	96.3578	93.4029	120	117	72 - 136	3.11	30
1,1-Dichloroethane	0	ug/L	80	89.6622	86.1857	112	108	77 - 125	3.95	30
1,2-Dichloroethane	0	ug/L	80	85.1427	81.1358	106	101	73 - 128	4.82	30
1,1-Dichloroethene	0	ug/L	80	93.6616	89.2747	117	112	71 - 131	4.8	30
cis-1,2-Dichloroethene	0	ug/L	80	92.4099	84.39	116	105	78 - 123	9.07	30
trans-1,2-Dichloroethene	0	ug/L	80	90.9944	86.2577	114	108	75 - 124	5.34	30
1,1,1,2-Tetrachloroethane	0	ug/L	80	90.1746	88.0175	113	110	78 - 124	2.42	30
1,1,2,2-Tetrachloroethane	0	ug/L	80	81.4203	79.4757	102	99.3	71 - 121	2.42	30
Tetrachloroethene	0	ug/L	80	88.1551	87.3073	110	109	74 - 129	.97	30
Toluene	0	ug/L	80	90.0609	87.6942	113	110	80 - 121	2.66	30
1,1,1-Trichloroethane	0	ug/L	80	92.7937	90.5308	116	113	74 - 131	2.47	30
1,1,2-Trichloroethane	0	ug/L	80	83.4364	81.534	104	102	80 - 119	2.31	30
Trichloroethene	38.0693	ug/L	80	127.691	120.56	112	103	79 - 123	5.74	30
Vinyl Chloride	0	ug/L	80	86.9713	82.0747	109	103	58 - 137	5.79	30
1,2-Dichloroethane-d4 (S)	109	%				109	107	81 - 118		
4-Bromofluorobenzene (S)	106	%				106	106	85 - 114		
Dibromofluoromethane (S)	103	%				103	104	80 - 119		
Toluene-d8 (S)	104	%				104	105	89 - 112		

QUALITY CONTROL DATA

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

QC Batch: WETC/214994 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 3007109001, 3007109002

METHOD BLANK: 2865481

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.14J	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2865483

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	94.6	mg/L	20	18.9	87 - 111
Nitrate-N	92.4	mg/L	2.5	2.3	88 - 111
Sulfate	94.6	mg/L	20	18.9	87 - 112

METHOD BLANK: 2865486

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

QUALITY CONTROL DATA

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

QC Batch: WETC/215106 **Analysis Method:** SM2320B-2011

QC Batch Method: SM2320B-2011

Associated Lab Samples: 3007109001, 3007109002

METHOD BLANK: 2866856

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

SAMPLE DUPLICATE: 2866861 ORIGINAL: 3006792003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	81.02377	mg/L	81.86895	1.04	20

METHOD BLANK: 2866864

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2866865 ORIGINAL: 3007121001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	184.19656	mg/L	177.44757	3.73	20

METHOD BLANK: 2866868

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2866869 ORIGINAL: 3007123001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD

QUALITY CONTROL DATA

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

Alkalinity, Total	79.31841	mg/L	80.97649	2.07	20

METHOD BLANK: 2866872

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	4J	mg/L	5

SAMPLE DUPLICATE: 2866873 ORIGINAL: 3007161001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	289.23257	mg/L	288.43988	.27	20

METHOD BLANK: 2866876

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2866877 ORIGINAL: 3007161003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	1477.9410	mg/L	1458.3614	1.33	20

METHOD BLANK: 2866880

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	3J	mg/L	5

SAMPLE DUPLICATE: 2866881 ORIGINAL: 3007163003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	10.9591	mg/L	11.84555	7.77	20

QUALITY CONTROL DATA

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

METHOD BLANK: 2866884

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

QUALITY CONTROL DATA

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

QC Batch: WETC/215219 **Analysis Method:** SM5310B-2011

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 3007109001, 3007109002

METHOD BLANK: 2868142

Parameter	Blank Result	Units	Reporting Limit
Total Organic Carbon (TOC)	0.19J	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2868143

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	99.7	mg/L	1	1.0J	85 - 115

MATRIX SPIKE: 2868144 DUPLICATE: 2868145 ORIGINAL: 3006960004

****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)	1.136	mg/L	6	7.077	7.014	99	98	85 - 115	.89	20

MATRIX SPIKE: 2868146 DUPLICATE: 2868147 ORIGINAL: 3007164004

****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)	2.501	mg/L	6	7.887	8.124	89.8	93.7	85 - 115	2.96	20

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
3007109001	MW-16 121818			EPA 300.0	WETC/214994
3007109002	MW-26 121818			EPA 300.0	WETC/214994
3007109001	MW-16 121818			SM2320B-2011	WETC/215106
3007109002	MW-26 121818			SM2320B-2011	WETC/215106
3007109001	MW-16 121818			RSK 175	SVGC/51557
3007109002	MW-26 121818			RSK 175	SVGC/51557
3007109001	MW-16 121818			SM5310B-2011	WETC/215219
3007109002	MW-26 121818			SM5310B-2011	WETC/215219
3007109002	MW-26 121818	SW846 3015	MDIG/75470	SW846 6010C	META/65289
3007109001	MW-16 121818			SW846 8260C	VOMS/49198
3007109002	MW-26 121818			SW846 8260C	VOMS/49198
3007109002	MW-26 121818	SW846 6010C	MDIG/75483	SW846 6010C	META/65318

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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 #:

3007109

Co. Name: AECOM

Contact (Report to): Gerlinde Wolf Phone: 518-917-2370

Address: 40 British American Blvd Latham, NY 12110

Bill to (if different than Report to): PO#:

Project Name/#: 60446041 ALS Quote #:

TAT: [✓] Normal-Standard TAT is 10-12 business days. Date Required:
[ ] Rush-Subject to ALS approval and surcharges. Approved By:

Email? [✓] Y gerlinde.wolf@aecom.com
Fax? [ ] Y No:

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	8260tc	RSK175	Total Fe	Diss. Fe	Alkalinity	Cl-NO3-SO4	TOC
1 MW-16 121818		12/18/18	11:30	G	GW	3	3	X	X	1	1	3
2 MW-26 121818		12/18/18	15:25	G	GW	3	3	1	1	1	1	3
3												
4												
5												
6												
7												
8												

	Container Type	Container Size	Preservative
1	CG	40	HCl
2	CG	60ml	HCl
3	PL	8oz	HNO3
4	PL	8oz	—
5	PL	8oz	—
6	PL	8oz	—
7	AG	40ml	HCl

ANALYSES/METHOD REQUESTED

Enter Number of Containers Per Analysis

(completed by Sample Receiving)

Performed by: INITIAL HERE

Cooler Temp:

Therm. ID:

No. of Coolers:

Notes:

	1	2	3	4	5
Correct containers?	N	N	N	N	N
Correct sample volume?	Y	Y	Y	Y	Y
Correct preservation?	N	N	N	N	N
Headspace/Volatiles?	N	N	N	N	N
COC/Labels complete/accurate?	Y	Y	Y	Y	Y
Custody seals Present?	N	N	N	N	N
(If present) Seals Intact?	Y	Y	Y	Y	Y
Received on Ice?	Y	Y	Y	Y	Y
Container in good condition?	Y	Y	Y	Y	Y

Circle appropriate Y or N.

SAMPLED BY (Please Print): Alexandra Golden

Project Comments:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Alexandra Golden / AECOM	12/18/18	3:00	2 [illegible]	12/18/18	3:00
3 [illegible]	12/18/18	17:00	4 COMMON COURIER / ALS COURIER		
5 COMMON COURIER / ALS COURIER			6 [illegible]	12/18	1057
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ] other

EDDs Required? [ ] If yes, format type:

DOD Criteria Required?

SDWA Forms? ⇨ yes [ ] yes [ ] yes [ ] yes [ ]

State Samples Collected In? MD [ ] NJ [ ] NY [ ] PA [ ]

Other

ALS FIELD SERVICES
[ ] Pickup
[ ] Labor
[ ] Composite Sampling
[ ] Rental Equipment
[ ] Other:

* G=Grab; C=Composite

**Matrix: Al=Air; DW=Drinking Water; GW=Groundwater; OI=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, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

Rev 01-2013

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: AECOM Work Order #: 3007109 Initials: WS Date: 12/2018

1. Were airbills / tracking numbers present and recorded? Tracking number: 7845 2942 4080	NONE	YES	NO
2. Are Custody Seals on shipping containers intact?	NONE	YES	NO
3. Are Custody Seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present?		YES	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
5a. Does the COC contain sample locations?		YES	NO
5b. Does the COC contain date and time of sample collection for all samples?		YES	NO
5c. Does the COC contain sample collectors name?		YES	NO
5d. Does the COC note the type(s) of preservation for all bottles?		YES	NO
5e. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab?		YES	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		YES	NO
8. Are all samples within holding times for the requested analyses?		YES	NO
9. Were all sample containers received intact and headspace free when required? (not broken or leaking, frozen, etc.)		YES	NO
10. Did we received trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES	NO
11. Were the samples received on ice?		YES	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	NO
13. Are the samples reportable? If yes, fill out Reportable Drinking Water questions below.		YES	NO
13a. Did the client provide a PWS ID#?	N/A	YES	NO
13b. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13c. Did the client provide the sample location ID/Description?	N/A	YES	NO
13d. Did the client provide the sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #:
Temperature (°C): 2.3
Thermometer ID: 407

COMMENTS (Required for all NO responses above and any sample non-conformance):

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

January 8, 2019

Gerlinde Wolf
AECOM
40 British American Blvd
Latham, NY 12110

RE: **60440641-16 / Scotia Frm Navy**

Pace Workorder: 29102

Dear Gerlinde Wolf:

Enclosed are the analytical results for sample(s) received by the laboratory on Monday, December 24, 2018. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Emma Louis 01/08/2019
Emma.Louis@pacelabs.com

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.
Please email PAESfeedback@pacelabs.com.

Total Number of Pages 21

CERTIFICATE OF ANALYSIS

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water
Accreditor:	West Virginia Department of Environmental Protection, Division of Water and Waste Management
Accreditation ID:	395
Scope:	Non-Potable Water
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	State of Virginia
Accreditation ID:	460201
Scope:	Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

SAMPLE SUMMARY

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID	Sample ID	Matrix	Date Collected	Date Received
291020001	MW-30	Bubble Strip	12/19/2018 15:00	12/24/2018 09:28
291020002	MW-31	Bubble Strip	12/19/2018 15:30	12/24/2018 09:28
291020003	MW-34	Bubble Strip	12/20/2018 09:30	12/24/2018 09:28
291020004	MW-35	Bubble Strip	12/20/2018 11:00	12/24/2018 09:28
291020005	MW-28	Bubble Strip	12/20/2018 12:45	12/24/2018 09:28
291020006	MW-29	Bubble Strip	12/20/2018 13:40	12/24/2018 09:28
291020007	MW-15	Bubble Strip	12/20/2018 14:35	12/24/2018 09:28
291020008	MW-24	Bubble Strip	12/20/2018 16:00	12/24/2018 09:28
291020009	MW-32	Bubble Strip	12/21/2018 11:00	12/24/2018 09:28
291020010	MW-33	Bubble Strip	12/21/2018 11:05	12/24/2018 09:28

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ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020001** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip

Sample ID: **MW-30** Date Collected: 12/19/2018 15:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**36**	nM	1.0	0.65	1	12/29/2018 06:20	TD	n

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ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020002** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip

Sample ID: **MW-31** Date Collected: 12/19/2018 15:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**1.9**	nM	1.0	0.65	1	12/29/2018 06:35	TD	n

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ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020003** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip

Sample ID: **MW-34** Date Collected: 12/20/2018 09:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**3.1**	nM	1.0	0.65	1	12/29/2018 06:48	TD	n

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ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020004** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip

Sample ID: **MW-35** Date Collected: 12/20/2018 11:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**2.1**	nM	1.0	0.65	1	12/29/2018 07:01	TD	n

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ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020005** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip

Sample ID: **MW-28** Date Collected: 12/20/2018 12:45

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**3.7**	nM	1.0	0.65	1	12/29/2018 07:13	TD	n

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ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020006** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip

Sample ID: **MW-29** Date Collected: 12/20/2018 13:40

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**2.0**	nM	1.0	0.65	1	1/2/2019 05:43	TD	n

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ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020007** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip

Sample ID: **MW-15** Date Collected: 12/20/2018 14:35

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**2.4**	nM	1.0	0.65	1	1/2/2019 05:55	TD	n

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ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020008** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip

Sample ID: **MW-24** Date Collected: 12/20/2018 16:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**3.4**	nM	1.0	0.65	1	1/2/2019 06:08	TD	n

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ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020009** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip

Sample ID: **MW-32** Date Collected: 12/21/2018 11:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**2.2**	nM	1.0	0.65	1	1/2/2019 06:20	TD	n

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Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020010** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip

Sample ID: **MW-33** Date Collected: 12/21/2018 11:05

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**2.1**	nM	1.0	0.65	1	1/2/2019 06:32	TD	n

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Phone: (412) 826-5245
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ANALYTICAL RESULTS QUALIFIERS

Workorder: 29102 60440641-16 / Scotia Frm Navy

DEFINITIONS/QUALIFIERS

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.

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QUALITY CONTROL DATA

Workorder: 29102 60440641-16 / Scotia Frm Navy

QC Batch: DISG/7305 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 291020001, 291020002, 291020003, 291020004, 291020005

METHOD BLANK: 59238

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Hydrogen	nM	<1.0	1.0	n

LABORATORY CONTROL SAMPLE & LCSD: 59239 59240

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK										
Hydrogen	nM	24	23	24	96	99	80-120	3	20	n

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Fax: (412) 826-3433

QUALITY CONTROL DATA

Workorder: 29102 60440641-16 / Scotia Frm Navy

QC Batch: DISG/7310 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 291020006, 291020007, 291020008, 291020009, 291020010

METHOD BLANK: 59264

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Hydrogen	nM	<1.0	1.0	n

LABORATORY CONTROL SAMPLE & LCSD: 59265 59266

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK										
Hydrogen	nM	24	26	26	109	109	80-120	0.54	20	n

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Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA QUALIFIERS

Workorder: 29102 60440641-16 / Scotia Frm Navy

QUALITY CONTROL PARAMETER QUALIFIERS

n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.

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Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
291020001	MW-30			AM20GAX	DISG/7305
291020002	MW-31			AM20GAX	DISG/7305
291020003	MW-34			AM20GAX	DISG/7305
291020004	MW-35			AM20GAX	DISG/7305
291020005	MW-28			AM20GAX	DISG/7305
291020006	MW-29			AM20GAX	DISG/7310
291020007	MW-15			AM20GAX	DISG/7310
291020008	MW-24			AM20GAX	DISG/7310
291020009	MW-32			AM20GAX	DISG/7310
291020010	MW-33			AM20GAX	DISG/7310

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www.pacelabs.com

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412-826-5245

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

013600

Section A Required Client Information:

Company: AECOM
Address: 40 British Am. Blvd. Latham, NY 12110
Email To: Gerlinde.Wolf@aecom.com
Phone: 518 951 2370 Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Gerlinde Wolf
Copy To: Dan Servetas
Purchase Order No.:
Project Name: Scotia Former Navy Depot
Project Number: 60440641-16

Section C Invoice Information:

Attention: Dan Servetas
Company Name: AECOM
Address: 40 British Am Latham
Pace Quote Reference: #28154
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER
UST RCRA OTHER

Site Location STATE:

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	TSP	BAK	Zinc Acetate & NaOH	Other	Analysis Test Y/N: Dissolved Hydrogen	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-30	AR	G	12/19	1500				1									X		
2	MW-31	"	"	12/19	1530				1									"		
3	MW-34	"	"	12/20	0930				1									"		
4	MW-35	"	"	12/20	1100				1									"		
5	MW-28	"	"	12/20	1245				1									"		
6	MW-29	"	"	12/20	1340				1									"		
7	MW-15	"	"	12/20	1435				1									"		
8	MW-24	"	"	12/20	1600				1									"		
9	MW-32	"	"	12/21	1100				1									"		
10	MW-33	"	"	12/21	1105				1									"		
11																				
12																				

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	AECOM	12/24/18	1030	RWelon PAES	12/24/18	0945	

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

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Pittsburgh, PA 15238
412-826-5245

29102

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

013600

Section A
Required Client Information:

Company:	AECOM
Address:	40 British Am. Blvd. Latham, NY 12110
Email To:	Gerlinde.Wolf@aecom.com
Phone:	518 951 2370
Fax:	
Requested Due Date/TAT:	

Section B
Required Project Information:

Report To:	Gerlinde Wolf
Copy To:	Dan Servetas
Purchase Order No.:	
Project Name:	Scotia Former Navy Depot
Project Number:	60440641-16

Section C
Invoice Information:

Attention:	Dan Servetas
Company Name:	AECOM
Address:	40 British Am Latham
Pace Quote Reference:	#28154
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER
UST RCRA OTHER _____

Site Location
STATE: _____

Requested Analysis Filtered (Y/N)

Section D
Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes
MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	TSP	BAK	Zinc Acetate & NaOH	Other	Analysis Test: Dissolved Hydrogen	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-30	AR	G	12/19	1500				1									X		
2	MW-31			12/19	1530				1											
3	MW-34			12/20	0930				1											
4	MW-35			12/20	1100				1											
5	MW-28			12/20	1245				1											
6	MW-29			12/20	1340				1											
7	MW-15			12/20	1435				1											
8	MW-24			12/20	1600				1											
9	MW-32			12/21	1100				1											
10	MW-33			12/21	1105				1											
11																				
12																				

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
				RWelch PAES	12/24/20	0915	

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER:

DATE Signed (MM/DD/YY):

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Cooler Receipt Form

Client Name: AECOM Project: Scotia Frm Navy Dept Lab Work Order: 29102

A. **Shipping/Container Information** (circle appropriate response)

Courier: (FedEx) UPS USPS Client Other:_____ Air bill Present: (Yes) No

Tracking Number: 811300894584 RW

Custody Seal on Cooler/Box Present: (Yes) No Seals Intact: (Yes) No

Cooler/Box Packing Material: (Bubble Wrap) Absorbent Foam Other:_____

Type of Ice: Wet Blue (None) Ice Intact: Yes Melted

Cooler Temperature: NA Radiation Screened: Yes (No) Chain of Custody Present: (Yes) No

Comments:_____

B. **Laboratory Assignment/Log-in** (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out		✓		
Chain of Custody relinquished		✓		
Sampler Name & Signature on COC		✓		
Containers intact	✓			
Were samples in separate bags	✓			
Sample container labels match COC Sample name/date and time collected	✓			
Sufficient volume provided	✓			
PAES containers used	✓			
Are containers properly preserved for the requested testing? (as labeled)			✓	
If an unknown preservation state, were containers checked? Exception: VOA's coliform			✓	If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			✓	
Headspace present?			✓	

Comments:_____

Cooler contents examined/received by: RW Date: 12-24-18

Project Manager Review: NL Date: 12/24/18

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
60440641-16
January 2019

January 4, 2019

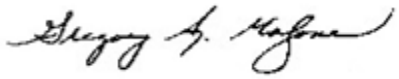
Data Usability Summary Report
Defense National Stockpile Center
Scotia Depot
Glenville, New York
Groundwater Sampling Event
December 2018
Final

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

Prepared by:
AECOM
Pittsburgh, PA
60440641-16
January 2019

January 4, 2019

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



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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 December 18-20, 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 three 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 were submitted to Pace Analytical Energy Services LLC (PACE), 220 William Pitt Way, Pittsburgh, PA 15238 for analysis.

The trip blanks and equipment blank were analyzed for VOCs only. Sample MW-15-122018 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-16-121818	3007109001	Groundwater		12/18/2018	3007109	ASN043
MW-26-121818	3007109002	Groundwater		12/18/2018	3007109	ASN043
MW-32-121918	3006960001	Groundwater		12/19/2018	3006960	ASL007
MW-33-121918	3006960002	Groundwater		12/19/2018	3006960	ASL007
MW-30-121918	3006960003	Groundwater		12/19/2018	3006960	ASL007
MW-31-121918	3006960004	Groundwater		12/19/2018	3006960	ASL007
DUP-121918	3006960005	Groundwater (QC)	MW-33-121918	12/19/2018	3006960	ASL007
TRIP BLANK-121918	3006960006	Aqueous (QC)	trip blank	12/19/2018	3006960	ASL007
MW-34-122018	3007296001	Groundwater		12/20/2018	3007296	ASN044
MW-35-122018	3007296002	Groundwater	MS/MSD	12/20/2018	3007296	ASN044
MW-28-122018	3007296003	Groundwater		12/20/2018	3007296	ASN044

Field ID	ALS ID	Matrix	Field QC	Date Sampled	WO Number	SDG Number
MW-29-122018	3007296004	Groundwater		12/20/2018	3007296	ASN044
MW-15-122018	3007296005	Groundwater		12/20/2018	3007296	ASN044
MW-24-122018	3007296006	Groundwater		12/20/2018	3007296	ASN044
Trip Blank-122018	3007296007	Aqueous (QC)	trip blank	12/20/2018	3007296	ASN044
Equipment Blank-122018	3007296008	Aqueous (QC)	equipment blank	12/20/2018	3007296	ASN044

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 three 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 3007109 (SDG ASN043)

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

Work Order 3006960 (SDG ASL007)

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

Work Order 3007296 (SDG ASN044)

No data quality issues were noted. 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 three 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 3007109 (SDG ASN043)

Method Blanks (p. 1520): The method blank associated with quality control batch SVGC/51557 had a methane result 6.2 µg/L. Samples MW-26-121816 and MW-16-121818 were affected. The methane result for associated sample MW-26-121816 was positive and less than five times the blank level and was qualified "J+," as an estimated concentration, biased high because of laboratory contamination. Non-detect results were not qualified on this basis.

Work Order 3006960 (SDG ASL007)

Method Blanks (p. 1878): The method blank associated with quality control batch SVGC/51557 had a methane result 6.2 µg/L. Samples MW-32-121918, MW-33-121918, MW-30-121918, MW-31-121918 and DUP-121918 were affected. The methane results for associated samples MW-33-121918 and DUP-121918 were positive and less than five times the blank level and were qualified "J+," as estimated concentrations, biased high because of laboratory contamination. The methane results for all other associated samples were greater than five times the blank level and did not require qualification.

Work Order 3007296 (SDG ASN044)

Method Blanks (p. 2458): The method blank associated with quality control batch SVGC/51573 had a methane result 7.0 µg/L. All samples were affected. The methane results for associated samples MW-15-122018, MW-28-122018 and MW-29-122018 were less than the LOQ and were qualified "U," as undetected at the LOQ because of lab contamination. The methane result for sample MW-35-122018 was positive and less than five times the blank level and was qualified "J+," as an estimated concentration, biased high because of laboratory contamination. The associated

methane results for samples MW-34-122018 and MW-24-122018 were greater than five times the blank level and did not require qualification.

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 three 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 3007109 (SDG ASN043)

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

Work Order 3006960 (SDG ASL007)

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

Work Order 3007296 (SDG ASN044)

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 three 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 3007109 (SDG ASN043)

Holding Time (pp 1702-1703): The nitrate analyses for samples MW-16-121818 and MW-26-121818 were performed one day beyond the USEPA-recommended 48-hour holding time. The nitrate results for samples MW-16-121818 and MW-26-121818 were positive and were qualified "J," as estimated concentrations, because the holding time was exceeded.

Work Order 3006960 (SDG ASL007)

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

Work Order 3007296 (SDG ASN044)

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 three 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 3007109 (SDG ASN043)

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

Work Order 3006960 (SDG ASL007)

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

Work Order 3007296 (SDG ASN044)

No data quality issues were noted. 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 three 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 3007109 (SDG ASN043)

Calibration Blanks (p. 1708): TOC was detected in the December 27, 2018 initial and continuing calibration blanks on TOC3 at concentrations estimated to be less than the LOQ. Samples MW-16-121818 and MW-26-121818 were affected. The positive TOC result for sample MW-16-122018 was greater than the LOQ and less than ten times the associated blank level and was qualified "J+," as an estimated concentration, biased high because of laboratory contamination. Sample MW-26-122018 TOC result was greater than ten times the highest associated blank level and did not require qualification.

Work Order 3006960 (SDG ASL007)

Calibration Blanks (p. 2129): TOC was detected in the December 27, 2018 initial and continuing calibration blanks on TOC3 at concentrations estimated to be less than the LOQ. Samples MW-32-121918, MW-33-121918, MW-30-121918, MW-31-121918 and DUP-121918 were affected. The TOC results for associated samples MW-33-121918, DUP-121918 and MW-31-121918 were positive and less than five times the blank level and were qualified "J/J+," as estimated concentrations, biased high because of laboratory contamination. The TOC results for all other associated samples were greater than ten times the highest blank level and did not require qualification.

Work Order 3007296 (SDG ASN044)

Calibration Blanks (p. 2129): TOC was detected in the December 28, 2018 continuing calibration blanks on TOC3 at concentrations estimated to be less than the LOQ. All samples were affected. The TOC results for associated samples MW-15-122018, MW-34-122018, MW-35-122018, MW-28-122018 and MW-29-122018 were greater than the LOQ and less than ten times the blank level and were qualified "J+," as estimated concentrations, biased high because of lab contamination. The

associated TOC result for sample MW-24-122018 was greater than ten times the associated blank level and did not require qualification.

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 29102

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 ≤ 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 ≤ 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
Qual: Qualification required
µg/L: micrograms per liter (ppb) and mg/L: milligrams per liter (ppm)

Table 2 – Field Duplicate Precision

Parameter	Units	MW-33-121918	DUP-121918	RPD (%)	Qual
Trichloroethene	µg/L	159	155	2.5	None
Methane	µg/L	10.3	9.4	9.1	None
Iron, Total	mg/L	0.071	0.066 J	7.3	None
Alkalinity, total	mg/L	211	209	1.0	None
Chloride	mg/L	23.9	24.2	1.3	None
Nitrate	mg/L	0.44	0.46	4.4	None
Sulfate	mg/L	12.1	12.4	2.4	None
Total Organic Carbon	mg/L	1.1	0.84 J	27	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

ALS Environmental

301 Fulling Mill Road - 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: PJ LA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

Lab ID: **3007109001** Date Collected: 12/18/2018 11:30 Matrix: Ground Water
Sample ID: **MW-16 121818** Date Received: 12/20/2018 10:57

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		12/28/18 15:35	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:35	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:35	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:35	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:35	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:35	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:35	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:35	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:35	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:35	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:35	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:35	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:35	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:35	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	113		%	81 - 118			SW846 8260C		12/28/18 15:35	TMP	A
4-Bromofluorobenzene (S)	106		%	85 - 114			SW846 8260C		12/28/18 15:35	TMP	A
Dibromofluoromethane (S)	105		%	80 - 119			SW846 8260C		12/28/18 15:35	TMP	A
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C		12/28/18 15:35	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175		12/27/18 10:07	CHS	C
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175		12/27/18 10:07	CHS	C
Methane	1.5U	U	ug/L	1.5	1.5	0.34	RSK 175		12/27/18 10:07	CHS	C
WET CHEMISTRY											
Alkalinity, Total	321	2	mg/L	5	5	0.8	SM2320B-2011		12/25/18 02:17	MSA	H
Chloride	2.8		mg/L	2.0	0.50	0.16	EPA 300.0		12/21/18 06:26	CHW	G
Nitrate-N	0.88	J	mg/L	0.20	0.060	0.020	EPA 300.0		12/21/18 06:26	CHW	G
Sulfate	46.0		mg/L	2.0	0.50	0.20	EPA 300.0		12/21/18 06:26	CHW	G
Total Organic Carbon (TOC)	1.5	J+	mg/L	1.0	0.50	0.18	SM5310B-2011		12/27/18 18:35	PAG	E

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

Lab ID: **3007109002** Date Collected: 12/18/2018 15:25 Matrix: Ground Water
Sample ID: **MW-26 121818** Date Received: 12/20/2018 10:57

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		12/28/18 15:58	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:58	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:58	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:58	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:58	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:58	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:58	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:58	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:58	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:58	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:58	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:58	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:58	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 15:58	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	111		%	81 - 118			SW846 8260C		12/28/18 15:58	TMP	A
4-Bromofluorobenzene (S)	104		%	85 - 114			SW846 8260C		12/28/18 15:58	TMP	A
Dibromofluoromethane (S)	103		%	80 - 119			SW846 8260C		12/28/18 15:58	TMP	A
Toluene-d8 (S)	103		%	89 - 112			SW846 8260C		12/28/18 15:58	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175		12/27/18 10:25	CHS	C
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175		12/27/18 10:25	CHS	C
Methane	19.7	J*	ug/L	1.5	1.5	0.34	RSK 175		12/27/18 10:25	CHS	C
WET CHEMISTRY											
Alkalinity, Total	179	Z	mg/L	5	5	0.8	SM2320B-2011		12/25/18 02:27	MSA	H
Chloride	48.3		mg/L	2.0	0.50	0.16	EPA 300.0		12/21/18 06:39	CHW	G
Nitrate-N	0.060J	J	mg/L	0.20	0.060	0.020	EPA 300.0		12/21/18 06:39	CHW	G
Sulfate	22.4		mg/L	2.0	0.50	0.20	EPA 300.0		12/21/18 06:39	CHW	G
Total Organic Carbon (TOC)	2.2		mg/L	1.0	0.50	0.18	SM5310B-2011		12/27/18 18:35	PAG	E
METALS											
Iron, Total	0.23		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18 AHI	12/28/18 18:00	SRT	J1
Iron, Dissolved	0.029J	J	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18 SRT	12/31/18 09:37	SRT	K

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ANALYTICAL RESULTS

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

Lab ID:	**3007109002**	Date Collected:	12/18/2018 15:25	Matrix:	Ground Water
Sample ID:	**MW-26 121818**	Date Received:	12/20/2018 10:57		

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

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3006960 ANL007|60440641

Lab ID: **3006960001** Date Collected: 12/19/2018 10:30 Matrix: Ground Water
Sample ID: **MW-32 121918** Date Received: 12/20/2018 10:57

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		12/21/18 12:05	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:05	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:05	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:05	TMP	A
cis-1,2-Dichloroethene	0.85J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:05	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:05	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:05	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:05	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:05	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:05	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:05	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:05	TMP	A
Trichloroethene	87.1		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:05	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:05	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	96.1		%	81 - 118			SW846 8260C		12/21/18 12:05	TMP	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C		12/21/18 12:05	TMP	A
Dibromofluoromethane (S)	90.3		%	80 - 119			SW846 8260C		12/21/18 12:05	TMP	A
Toluene-d8 (S)	97.6		%	89 - 112			SW846 8260C		12/21/18 12:05	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	12.0		ug/L	3.3	3.3	0.23	RSK 175		12/27/18 08:31	CHS	H
Ethene	1.5J	J	ug/L	2.4	2.4	0.40	RSK 175		12/27/18 08:31	CHS	H
Methane	407		ug/L	30.0	30.0	6.8	RSK 175		12/27/18 10:41	CHS	H
WET CHEMISTRY											
Alkalinity, Total	158		mg/L	5	5	0.8	SM2320B-2011		12/21/18 10:23	MSA	F
Chloride	24.5		mg/L	2.0	0.50	0.16	EPA 300.0		12/21/18 05:21	CHW	E
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		12/21/18 05:21	CHW	E
Sulfate	6.0		mg/L	2.0	0.50	0.20	EPA 300.0		12/21/18 05:21	CHW	E
Total Organic Carbon (TOC)	2.4		mg/L	1.0	0.50	0.18	SM5310B-2011		12/27/18 13:59	PAG	C
METALS											
Iron, Total	1.0		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18 AHI	12/28/18 17:42	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18 SRT	12/31/18 09:19	SRT	K

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ANALYTICAL RESULTS

Workorder: 3006960 ANL007|60440641

Lab ID: **3006960002** Date Collected: 12/19/2018 13:10 Matrix: Ground Water
Sample ID: **MW-33 121918** Date Received: 12/20/2018 10:57

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		12/21/18 12:28	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:28	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:28	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:28	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:28	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:28	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:28	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:28	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:28	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:28	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:28	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:28	TMP	A
Trichloroethene	159		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:28	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:28	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	98.2		%	81 - 118			SW846 8260C		12/21/18 12:28	TMP	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C		12/21/18 12:28	TMP	A
Dibromofluoromethane (S)	91.3		%	80 - 119			SW846 8260C		12/21/18 12:28	TMP	A
Toluene-d8 (S)	96		%	89 - 112			SW846 8260C		12/21/18 12:28	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175		12/27/18 09:03	CHS	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175		12/27/18 09:03	CHS	H
Methane	10.3	J+	ug/L	1.5	1.5	0.34	RSK 175		12/27/18 09:03	CHS	H
WET CHEMISTRY											
Alkalinity, Total	211		mg/L	5	5	0.8	SM2320B-2011		12/21/18 10:34	MSA	F
Chloride	23.9		mg/L	2.0	0.50	0.16	EPA 300.0		12/21/18 05:34	CHW	E
Nitrate-N	0.44		mg/L	0.20	0.060	0.020	EPA 300.0		12/21/18 05:34	CHW	E
Sulfate	12.1		mg/L	2.0	0.50	0.20	EPA 300.0		12/21/18 05:34	CHW	E
Total Organic Carbon (TOC)	1.1	J+	mg/L	1.0	0.50	0.18	SM5310B-2011		12/27/18 18:35	PAG	C
METALS											
Iron, Total	0.071		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18 AHI	12/28/18 17:46	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18 SRT	12/31/18 09:22	SRT	K

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ANALYTICAL RESULTS

Workorder: 3006960 ANL007|60440641

Lab ID: **3006960003** Date Collected: 12/19/2018 14:40 Matrix: Ground Water

Sample ID: **MW-30 121918** Date Received: 12/20/2018 10:57

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		12/21/18 12:51	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:51	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:51	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:51	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:51	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:51	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:51	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:51	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:51	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:51	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:51	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:51	TMP	A
Trichloroethene	7.3		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:51	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 12:51	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	97.8		%	81 - 118			SW846 8260C		12/21/18 12:51	TMP	A
4-Bromofluorobenzene (S)	104		%	85 - 114			SW846 8260C		12/21/18 12:51	TMP	A
Dibromofluoromethane (S)	90.4		%	80 - 119			SW846 8260C		12/21/18 12:51	TMP	A
Toluene-d8 (S)	96.4		%	89 - 112			SW846 8260C		12/21/18 12:51	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	46.4		ug/L	3.3	3.3	0.23	RSK 175		12/27/18 09:19	CHS	H
Ethene	2.8		ug/L	2.4	2.4	0.40	RSK 175		12/27/18 09:19	CHS	H
Methane	3790		ug/L	150	150	34.0	RSK 175		12/27/18 11:16	CHS	H
WET CHEMISTRY											
Alkalinity, Total	51		mg/L	5	5	0.8	SM2320B-2011		12/21/18 11:34	MSA	F
Chloride	39.2		mg/L	2.0	0.50	0.16	EPA 300.0		12/21/18 05:47	CHW	E
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		12/21/18 05:47	CHW	E
Sulfate	0.76J	J	mg/L	2.0	0.50	0.20	EPA 300.0		12/21/18 05:47	CHW	E
Total Organic Carbon (TOC)	12.1		mg/L	2.0	1.0	0.37	SM5310B-2011		12/27/18 18:35	PAG	C
METALS											
Iron, Total	0.087		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18 AHI	12/28/18 17:49	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18 SRT	12/31/18 09:26	SRT	K

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ANALYTICAL RESULTS

Workorder: 3006960 ANL007|60440641

Lab ID: **3006960004** Date Collected: 12/19/2018 15:55 Matrix: Ground Water

Sample ID: **MW-31 121918** Date Received: 12/20/2018 10:57

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		12/21/18 13:13	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 13:13	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 13:13	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 13:13	TMP	A
cis-1,2-Dichloroethene	0.37J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 13:13	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 13:13	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 13:13	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 13:13	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 13:13	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 13:13	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 13:13	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 13:13	TMP	A
Trichloroethene	19.1		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 13:13	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 13:13	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	99.1		%	81 - 118			SW846 8260C		12/21/18 13:13	TMP	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C		12/21/18 13:13	TMP	A
Dibromofluoromethane (S)	92.5		%	80 - 119			SW846 8260C		12/21/18 13:13	TMP	A
Toluene-d8 (S)	97.5		%	89 - 112			SW846 8260C		12/21/18 13:13	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	4.3		ug/L	3.3	3.3	0.23	RSK 175		12/27/18 09:34	CHS	H
Ethene	1.3J	J	ug/L	2.4	2.4	0.40	RSK 175		12/27/18 09:34	CHS	H
Methane	126		ug/L	7.5	7.5	1.7	RSK 175		12/27/18 11:32	CHS	H
WET CHEMISTRY											
Alkalinity, Total	172		mg/L	5	5	0.8	SM2320B-2011		12/21/18 11:45	MSA	F
Chloride	34.6		mg/L	2.0	0.50	0.16	EPA 300.0		12/21/18 06:00	CHW	E
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		12/21/18 06:00	CHW	E
Sulfate	7.1		mg/L	2.0	0.50	0.20	EPA 300.0		12/21/18 06:00	CHW	E
Total Organic Carbon (TOC)	1.1	J+	mg/L	1.0	0.50	0.18	SM5310B-2011		12/27/18 18:35	PAG	C
METALS											
Iron, Total	0.87		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18 AHI	12/28/18 17:53	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18 SRT	12/31/18 09:30	SRT	K

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ANALYTICAL RESULTS

Workorder: 3006960 ANL007|60440641

Lab ID: **3006960005** Date Collected: 12/19/2018 00:00 Matrix: Ground Water

Sample ID: **DUP** Date Received: 12/20/2018 10:57

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			12/21/18 13:36	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
Trichloroethene	155		ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/18 13:36	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	98.3		%	81 - 118			SW846 8260C			12/21/18 13:36	TMP	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C			12/21/18 13:36	TMP	A
Dibromofluoromethane (S)	92.2		%	80 - 119			SW846 8260C			12/21/18 13:36	TMP	A
Toluene-d8 (S)	96.6		%	89 - 112			SW846 8260C			12/21/18 13:36	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175			12/27/18 09:52	CHS	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175			12/27/18 09:52	CHS	H
Methane	9.4	J+	ug/L	1.5	1.5	0.34	RSK 175			12/27/18 09:52	CHS	H
WET CHEMISTRY												
Alkalinity, Total	209		mg/L	5	5	0.8	SM2320B-2011			12/21/18 11:55	MSA	F
Chloride	24.2		mg/L	2.0	0.50	0.16	EPA 300.0			12/21/18 06:13	CHW	E
Nitrate-N	0.46		mg/L	0.20	0.060	0.020	EPA 300.0			12/21/18 06:13	CHW	E
Sulfate	12.4		mg/L	2.0	0.50	0.20	EPA 300.0			12/21/18 06:13	CHW	E
Total Organic Carbon (TOC)	0.84J	J	mg/L	1.0	0.50	0.18	SM5310B-2011			12/27/18 18:35	PAG	C
METALS												
Iron, Total	0.066J	J	mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18	AHI	12/28/18 17:57	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18	SRT	12/31/18 09:34	SRT	K

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ANALYTICAL RESULTS

Workorder: 3006960 ANL007|60440641

Lab ID: **3006960006** Date Collected: 12/19/2018 16:00 Matrix: Ground Water

Sample ID: **TRIP BLANK 121918** Date Received: 12/20/2018 10:57

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		12/21/18 11:43	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 11:43	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 11:43	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 11:43	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 11:43	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 11:43	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 11:43	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 11:43	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 11:43	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 11:43	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 11:43	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 11:43	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 11:43	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/18 11:43	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	96.1		%	81 - 118	SW846 8260C		12/21/18 11:43	TMP	A
4-Bromofluorobenzene (S)	102		%	85 - 114	SW846 8260C		12/21/18 11:43	TMP	A
Dibromofluoromethane (S)	92		%	80 - 119	SW846 8260C		12/21/18 11:43	TMP	A
Toluene-d8 (S)	97.1		%	89 - 112	SW846 8260C		12/21/18 11:43	TMP	A

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296001** Date Collected: 12/20/2018 08:50 Matrix: Ground Water

Sample ID: **MW-34 122018** Date Received: 12/21/2018 11:33

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			12/28/18 16:20	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
Trichloroethene	10.6		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:20	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	113		%	81 - 118			SW846 8260C			12/28/18 16:20	TMP	A
4-Bromofluorobenzene (S)	104		%	85 - 114			SW846 8260C			12/28/18 16:20	TMP	A
Dibromofluoromethane (S)	103		%	80 - 119			SW846 8260C			12/28/18 16:20	TMP	A
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C			12/28/18 16:20	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	4.0		ug/L	3.3	3.3	0.23	RSK 175			12/28/18 07:58	CHS	C
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175			12/28/18 07:58	CHS	C
Methane	737		ug/L	30.0	30.0	6.8	RSK 175			12/28/18 10:00	CHS	C
WET CHEMISTRY												
Alkalinity, Total	162	J+	mg/L	5	5	0.8	SM2320B-2011			12/22/18 10:16	MBW	H
Chloride	12.6		mg/L	2.0	0.50	0.16	EPA 300.0			12/22/18 05:12	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			12/22/18 05:12	CHW	G
Sulfate	3.3		mg/L	2.0	0.50	0.20	EPA 300.0			12/22/18 05:12	CHW	G
Total Organic Carbon (TOC)	3.2	J+	mg/L	1.0	0.50	0.18	SM5310B-2011			12/29/18 00:07	PAG	E
METALS												
Iron, Total	0.068		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18	AHI	12/28/18 18:04	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18	SRT	12/31/18 09:41	SRT	K

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296002** Date Collected: 12/20/2018 10:25 Matrix: Ground Water

Sample ID: **MW-35 122018** Date Received: 12/21/2018 11:33

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			12/28/18 16:43	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
Trichloroethene	38.1		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 16:43	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	111		%	81 - 118			SW846 8260C			12/28/18 16:43	TMP	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C			12/28/18 16:43	TMP	A
Dibromofluoromethane (S)	104		%	80 - 119			SW846 8260C			12/28/18 16:43	TMP	A
Toluene-d8 (S)	102		%	89 - 112			SW846 8260C			12/28/18 16:43	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175			12/28/18 08:31	CHS	G
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175			12/28/18 08:31	CHS	G
Methane	12.3	J+	ug/L	1.5	1.5	0.34	RSK 175			12/28/18 08:31	CHS	G
WET CHEMISTRY												
Alkalinity, Total	195		mg/L	5	5	0.8	SM2320B-2011			12/22/18 10:37	MBW	V
Chloride	24.4		mg/L	2.0	0.50	0.16	EPA 300.0			12/22/18 05:25	CHW	S
Nitrate-N	0.58		mg/L	0.20	0.060	0.020	EPA 300.0			12/22/18 05:25	CHW	S
Sulfate	9.7		mg/L	2.0	0.50	0.20	EPA 300.0			12/22/18 05:25	CHW	S
Total Organic Carbon (TOC)	1.1J	J	mg/L	2.0	1.0	0.37	SM5310B-2011			12/29/18 00:07	PAG	M
METALS												
Iron, Total	0.12		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18	AHI	12/28/18 18:15	SRT	Z1
Iron, Dissolved	0.093		mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18	SRT	12/31/18 09:56	SRT	c

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296003** Date Collected: 12/20/2018 12:15 Matrix: Ground Water

Sample ID: **MW-28 122018** Date Received: 12/21/2018 11:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.42J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 19:44	TMP	A
1,1-Dichloroethane	1.2		ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 19:44	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 19:44	TMP	A
1,1-Dichloroethene	0.42J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 19:44	TMP	A
cis-1,2-Dichloroethene	4.7		ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 19:44	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 19:44	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 19:44	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 19:44	TMP	A
Tetrachloroethene	34.7		ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 19:44	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 19:44	TMP	A
1,1,1-Trichloroethane	9.8		ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 19:44	TMP	A
1,1,2-Trichloroethane	0.34J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 19:44	TMP	A
Trichloroethene	195		ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 19:44	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 19:44	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	111		%	81 - 118			SW846 8260C		12/28/18 19:44	TMP	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C		12/28/18 19:44	TMP	A
Dibromofluoromethane (S)	103		%	80 - 119			SW846 8260C		12/28/18 19:44	TMP	A
Toluene-d8 (S)	102		%	89 - 112			SW846 8260C		12/28/18 19:44	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175		12/28/18 08:50	CHS	C
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175		12/28/18 08:50	CHS	C
Methane	1.5U ~~0.80J~~	~~J~~	ug/L	1.5	1.5	0.34	RSK 175		12/28/18 08:50	CHS	C
WET CHEMISTRY											
Alkalinity, Total	342		mg/L	5	5	0.8	SM2320B-2011		12/22/18 10:49	MBW	H
Chloride	25.4		mg/L	2.0	0.50	0.16	EPA 300.0		12/22/18 06:04	CHW	G
Nitrate-N	0.16J	J	mg/L	0.20	0.060	0.020	EPA 300.0		12/22/18 06:04	CHW	G
Sulfate	13.1		mg/L	2.0	0.50	0.20	EPA 300.0		12/22/18 06:04	CHW	G
Total Organic Carbon (TOC)	2.1	J+	mg/L	1.0	0.50	0.18	SM5310B-2011		12/29/18 00:07	PAG	E
METALS											
Iron, Total	0.024J	J	mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18 AHI	12/28/18 18:26	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18 SRT	12/31/18 09:45	SRT	K

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296004** Date Collected: 12/20/2018 13:10 Matrix: Ground Water

Sample ID: **MW-29 122018** Date Received: 12/21/2018 11:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.67J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
1,1-Dichloroethane	1.0J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
1,1-Dichloroethene	0.46J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
cis-1,2-Dichloroethene	4.1		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
trans-1,2-Dichloroethene	0.40J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
Tetrachloroethene	30.8		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
1,1,1-Trichloroethane	9.3		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
1,1,2-Trichloroethane	0.36J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
Trichloroethene	218		ug/L	5.0	3.8	1.7	SW846 8260C			12/28/18 18:59	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 20:06	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	110		%	81 - 118			SW846 8260C			12/28/18 20:06	TMP	A
1,2-Dichloroethane-d4 (S)	112		%	81 - 118			SW846 8260C			12/28/18 18:59	TMP	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C			12/28/18 18:59	TMP	A
4-Bromofluorobenzene (S)	104		%	85 - 114			SW846 8260C			12/28/18 20:06	TMP	A
Dibromofluoromethane (S)	103		%	80 - 119			SW846 8260C			12/28/18 18:59	TMP	A
Dibromofluoromethane (S)	103		%	80 - 119			SW846 8260C			12/28/18 20:06	TMP	A
Toluene-d8 (S)	102		%	89 - 112			SW846 8260C			12/28/18 20:06	TMP	A
Toluene-d8 (S)	102		%	89 - 112			SW846 8260C			12/28/18 18:59	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175			12/28/18 09:06	CHS	C
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175			12/28/18 09:06	CHS	C
Methane 1.5U	~~0.45J~~	~~J~~	ug/L	1.5	1.5	0.34	RSK 175			12/28/18 09:06	CHS	C
WET CHEMISTRY												
Alkalinity, Total	380		mg/L	5	5	0.8	SM2320B-2011			12/22/18 11:00	MBW	H
Chloride	28.8		mg/L	2.0	0.50	0.16	EPA 300.0			12/22/18 06:18	CHW	G
Nitrate-N	0.50		mg/L	0.20	0.060	0.020	EPA 300.0			12/22/18 06:18	CHW	G
Sulfate	21.0		mg/L	2.0	0.50	0.20	EPA 300.0			12/22/18 06:18	CHW	G
Total Organic Carbon (TOC)	1.7	J+	mg/L	1.0	0.50	0.18	SM5310B-2011			12/29/18 00:07	PAG	E
METALS												
Iron, Total	0.14		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18	AHI	12/28/18 18:30	SRT	J1

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296004** Date Collected: 12/20/2018 13:10 Matrix: Ground Water

Sample ID: **MW-29 122018** Date Received: 12/21/2018 11:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18	SRT	12/31/18 10:07	SRT	K

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296005** Date Collected: 12/20/2018 14:10 Matrix: Ground Water

Sample ID: **MW-15 122018** Date Received: 12/21/2018 11:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.48J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 17:05	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 17:05	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 17:05	TMP	A
1,1-Dichloroethene	0.51J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 17:05	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 17:05	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 17:05	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 17:05	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 17:05	TMP	A
Tetrachloroethene	1.4		ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 17:05	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 17:05	TMP	A
1,1,1-Trichloroethane	6.9		ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 17:05	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 17:05	TMP	A
Trichloroethene	193		ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 17:05	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 17:05	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	110		%	81 - 118			SW846 8260C		12/28/18 17:05	TMP	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C		12/28/18 17:05	TMP	A
Dibromofluoromethane (S)	103		%	80 - 119			SW846 8260C		12/28/18 17:05	TMP	A
Toluene-d8 (S)	101		%	89 - 112			SW846 8260C		12/28/18 17:05	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	3.3U	U	ug/L	3.3	3.3	0.23	RSK 175		12/28/18 09:26	CHS	C
Ethene	2.4U	U	ug/L	2.4	2.4	0.40	RSK 175		12/28/18 09:26	CHS	C
Methane 1.5U	~~0.70J~~	~~J~~	ug/L	1.5	1.5	0.34	RSK 175		12/28/18 09:26	CHS	C
WET CHEMISTRY											
Alkalinity, Total	224	1	mg/L	5	5	0.8	SM2320B-2011		12/22/18 11:11	MBW	H
Chloride	37.1		mg/L	2.0	0.50	0.16	EPA 300.0		12/22/18 06:31	CHW	G
Nitrate-N	0.70		mg/L	0.20	0.060	0.020	EPA 300.0		12/22/18 06:31	CHW	G
Sulfate	11.3		mg/L	2.0	0.50	0.20	EPA 300.0		12/22/18 06:31	CHW	G
Total Organic Carbon (TOC)	1.0 J+		mg/L	1.0	0.50	0.18	SM5310B-2011		12/29/18 00:07	PAG	E
METALS											
Iron, Total	0.26		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18 AHI	12/28/18 18:33	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18 SRT	12/31/18 10:10	SRT	K

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296006** Date Collected: 12/20/2018 15:20 Matrix: Ground Water

Sample ID: **MW-24 122018** Date Received: 12/21/2018 11:33

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			12/31/18 12:13	TMP	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
1,1-Dichloroethene	0.55J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
cis-1,2-Dichloroethene	6.1		ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
Trichloroethene	1.3		ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/31/18 12:13	TMP	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	108		%	81 - 118			SW846 8260C			12/31/18 12:13	TMP	B
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C			12/31/18 12:13	TMP	B
Dibromofluoromethane (S)	103		%	80 - 119			SW846 8260C			12/31/18 12:13	TMP	B
Toluene-d8 (S)	102		%	89 - 112			SW846 8260C			12/31/18 12:13	TMP	B
LIGHT HYDROCARBON GASES												
Ethane	11.2		ug/L	3.3	3.3	0.23	RSK 175			12/28/18 09:44	CHS	C
Ethene	9.7		ug/L	2.4	2.4	0.40	RSK 175			12/28/18 09:44	CHS	C
Methane	102		ug/L	3.0	3.0	0.68	RSK 175			12/28/18 10:34	CHS	C
WET CHEMISTRY												
Alkalinity, Total	185		mg/L	5	5	0.8	SM2320B-2011			12/22/18 11:22	MBW	H
Chloride	32.6		mg/L	2.0	0.50	0.16	EPA 300.0			12/22/18 06:44	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			12/22/18 06:44	CHW	G
Sulfate	2.7		mg/L	2.0	0.50	0.20	EPA 300.0			12/22/18 06:44	CHW	G
Total Organic Carbon (TOC)	4.0		mg/L	1.0	0.50	0.18	SM5310B-2011			12/31/18 17:45	PAG	E
METALS												
Iron, Total	1.4		mg/L	0.067	0.045	0.022	SW846 6010C	12/27/18	AHI	12/28/18 18:37	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/28/18	SRT	12/31/18 10:14	SRT	K

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296007** Date Collected: 12/20/2018 15:25 Matrix: Ground Water
Sample ID: **Trip Blank 122018** Date Received: 12/21/2018 11:33

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			12/28/18 14:05	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/18 14:05	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	110		%	81 - 118	SW846 8260C			12/28/18 14:05	TMP	A
4-Bromofluorobenzene (S)	105		%	85 - 114	SW846 8260C			12/28/18 14:05	TMP	A
Dibromofluoromethane (S)	103		%	80 - 119	SW846 8260C			12/28/18 14:05	TMP	A
Toluene-d8 (S)	102		%	89 - 112	SW846 8260C			12/28/18 14:05	TMP	A

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ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID: **3007296008** Date Collected: 12/20/2018 15:27 Matrix: Ground Water

Sample ID: **Equipment Blank** Date Received: 12/21/2018 11:33

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		12/28/18 14:27	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 14:27	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 14:27	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 14:27	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 14:27	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 14:27	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 14:27	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 14:27	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 14:27	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 14:27	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 14:27	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 14:27	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 14:27	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/18 14:27	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	109		%	81 - 118	SW846 8260C		12/28/18 14:27	TMP	A
4-Bromofluorobenzene (S)	103		%	85 - 114	SW846 8260C		12/28/18 14:27	TMP	A
Dibromofluoromethane (S)	101		%	80 - 119	SW846 8260C		12/28/18 14:27	TMP	A
Toluene-d8 (S)	102		%	89 - 112	SW846 8260C		12/28/18 14:27	TMP	A

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ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020001** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip
Sample ID: **MW-30** Date Collected: 12/19/2018 15:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**36**	nM	1.0	0.65	1	12/29/2018 06:20	TD	n

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020002** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip
Sample ID: **MW-31** Date Collected: 12/19/2018 15:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**1.9**	nM	1.0	0.65	1	12/29/2018 06:35	TD	n

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020003** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip
Sample ID: **MW-34** Date Collected: 12/20/2018 09:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**3.1**	nM	1.0	0.65	1	12/29/2018 06:48	TD	n

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020004** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip
Sample ID: **MW-35** Date Collected: 12/20/2018 11:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**2.1**	nM	1.0	0.65	1	12/29/2018 07:01	TD	n

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020005** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip
Sample ID: **MW-28** Date Collected: 12/20/2018 12:45

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**3.7**	nM	1.0	0.65	1	12/29/2018 07:13	TD	n

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020006** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip
Sample ID: **MW-29** Date Collected: 12/20/2018 13:40

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**2.0**	nM	1.0	0.65	1	1/2/2019 05:43	TD	n

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020007** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip
Sample ID: **MW-15** Date Collected: 12/20/2018 14:35

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**2.4**	nM	1.0	0.65	1	1/2/2019 05:55	TD	n

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020008** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip
Sample ID: **MW-24** Date Collected: 12/20/2018 16:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**3.4**	nM	1.0	0.65	1	1/2/2019 06:08	TD	n

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020009** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip
Sample ID: **MW-32** Date Collected: 12/21/2018 11:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**2.2**	nM	1.0	0.65	1	1/2/2019 06:20	TD	n

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID: **291020010** Date Received: 12/24/2018 09:28 Matrix: Bubble Strip
Sample ID: **MW-33** Date Collected: 12/21/2018 11:05

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**2.1**	nM	1.0	0.65	1	1/2/2019 06:32	TD	n

Appendix C

Support Documentation

ALS Environmental

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
Courier:
Tracking #:

* 3 0 0 7 1 0 9 *

Co. Name: AECOM
Contact (Report to): Gerlinde Wolf
Phone: 518-977-2370
Address: 40 British American Blvd Latham, NY 12110
Bill to (if different than Report to):
PO#:
Project Name/#: 60440641
ALS Quote #:
TAT: [x] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.
Date Required:
Approved By:
Email? [x] Y gerlinde.wolf@aecom.com
Fax? Y N

						8260C	RSK175	Total Fe	Diss Fe	Alkalinity	Cl-, NO3-, SO4	TOC		
***Container Type						CG	CG	PL	PL	PL	PL	AG		
***Container Size						40	40ml	8oz	8oz	8oz	8oz	250ml		
***Preservative						HCl	HCl	HNO3	—	—	—	HCl		
Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	Enter Number of Containers Per Analysis								
1 MW-16 121818		12/18/18	11:30	G	GW	3	3	X	X	1	1	3		
2 MW-26 121818		12/18/18	15:25	G	GW	3	3	1	1	1	1	3		
3														
4														
5														
6														
7														
8														

ANALYSES/METHOD REQUESTED

Performed by: / INITIAL HERE
Cooler Temp:
Therm. ID:
No. of Coolers:
Notes:

Correct containers? Y N
Correct sample volume? Y N
Correct preservation? Y N
Headspace/Volatiles? Y N
Circle appropriate Y or N.
Custody seals Present? Y N
(if present) Seals Intact? Y N
Received on ice? Y N
COC/Labels complete/accurate? Y N
Container in good condition? Y N

SAMPLED BY (Please Print): Alexandra Golden
Project Comments:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Alexandra Golden / AECOM	12/18/18	3:00	2 Brian McGuire	12/18/18	3:00
3 Brian McGuire	12/18/18	1700	4 COMMON COURIER / ALS COURIER		
5 COMMON COURIER / ALS COURIER			6 [signature]	12/19/18	1051
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ]
EDDs Required? [ ] If yes, format type:
SDWA Forms? yes / yes / yes / yes / Other
State Samples Collected In? MD / NJ / NY / PA
DOD Criteria Required?

ALS FIELD SERVICES
[ ] Pickup [ ] Labor [ ] Composite Sampling [ ] Rental Equipment [ ] Other:

* G=Grab; C=Composite
**Matrix: Al=Air; DW=Drinking Water; GW=Groundwater; OI=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, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY
Rev 01-2013

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: AECOM Work Order #: 300 7109 Initials: WS Date: 12-2018

1. Were airbills / tracking numbers present and recorded? Tracking number: 7845 2942 4087	NONE	(YES)	NO
2. Are Custody Seals on shipping containers intact?	NONE	(YES)	NO
3. Are Custody Seals on sample containers intact?	NONE	(YES)	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken or leaking, frozen, etc.)		(YES)	NO
10. Did we received trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		(YES)	NO
13. Are the samples reportable? If yes, fill out Reportable Drinking Water questions below.		YES	(NO)
13a. Did the client provide a PWS ID#?	(N/A)	YES	NO
13b. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13c. Did the client provide the sample location ID/Description?	(N/A)	YES	NO
13d. Did the client provide the sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #: 1
Temperature (°C): 2.3
Thermometer ID: 407

COMMENTS (Required for all NO responses above and any sample non-conformance):

ALS Environmental

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NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113, WA C999, MD 128, VA 460157, WV DW 9961-C, WV 343

SAMPLE SUMMARY

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3007109001	MW-16 121818	Ground Water	12/18/2018 11:30	12/20/2018 10:57	Collected by Client
3007109002	MW-26 121818	Ground Water	12/18/2018 15:25	12/20/2018 10:57	Collected by Client

AECOM - Latham, NY
ALS-Middletown
Case Narrative
ASN-043 (3007109)

Sample Management

This report contains the results of the analysis of two (2) ground water samples collected on December 18, 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 December 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. 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.

Surrogates. Recoveries were within 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. Two (2) 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; except as follows:

- In 2867832 MB, methane was detected at 6.2 µg/L.

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

Total Alkalinity by SM 2320B

Sample handling. Two (2) ground water 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.

Anions by EPA 300.0

Sample handling. Two (2) ground water samples were analyzed for chloride, nitrate, and sulfate by EPA Method 300.0. The samples were analyzed within the method recommended holding time for chloride and sulfate. The nitrate analysis was performed outside of the 48-hour holding time.

Calibration. Initial calibrations, identified as Method A (high range) and Method L (low range), were properly established for instruments IC5 on 12/13/2018. 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 2865483 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 Carbon by SM 5310B

Sample handling. Two (2) ground water samples were analyzed for total carbon by Standard Method 5310B. The preserved samples were analyzed within the 28-day holding time established for the method.

Calibration. A four-point curve was properly established on the day of analysis. An initial calibration verification standard of 1.0 was analyzed and recovered within the QC limits of 85-115%. Continuing calibration verification standards of 5.0 and 8.0 mg/L were analyzed throughout the run. The recoveries were within the QC limits of 90-110%.

Blanks. Method blanks were analyzed with the samples. Total carbon was not detected above the reporting limit in the blanks.

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

ALS Environmental

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJ LA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3007109 ASN043|2015-SCOTIA NAVY DEPOT

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3007109001	1	MW-16 121818	EPA 300.0	Nitrate-N
Analyte was analyzed past the 48 hour holding time.				
3007109001	2	MW-16 121818	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3007109002	1	MW-26 121818	EPA 300.0	Nitrate-N
Analyte was analyzed past the 48 hour holding time.				
3007109002	2	MW-26 121818	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

2867832(MB)

Lab Name: ALS Global Contract: SVGC

Lab Code: VOA Case No.: SAS No.: SDG No.: ASN-043

Matrix (soil/water): WATER Lab Sample ID: 2867832

Sample wt/vol: 0.30 (g/mL) ML Lab File ID: MLRA003.D

Level (low/med): Low Date Received: 12/27/18

% Moisture: not dec. 100.0 Date Analyzed: 12/27/18

GC Column: PORPAK Q ID: 2.0 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-82-8	METHANE	6.2	
74-85-1	ETHENE	2.4	U
74-84-0	ETHANE	3.3	U

Form 4B
Inorganic Blank Summary

Analysis Method: EPA 300.0
Instrument: IC-5

SDG No.: ASN043

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2865481	Chloride	MB	QC-Water	12/21/2018 03:49	0.14	J	mg/L
2865481	Nitrate-N	MB	QC-Water	12/21/2018 03:49	0.030	U	mg/L
2865481	Sulfate	MB	QC-Water	12/21/2018 03:49	0.25	U	mg/L
2865486	Chloride	MB	QC-Water	12/21/2018 07:57	0.18	J	mg/L
2865486	Nitrate-N	MB	QC-Water	12/21/2018 07:57	0.030	U	mg/L
2865486	Sulfate	MB	QC-Water	12/21/2018 07:57	0.25	U	mg/L
Chloride results >> 10 times the blank levels. Not used to qualify data							
					GAM 01/29/19		

(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.: ASN043

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2866856	Alkalinity, Total	MB	QC-Water	12/25/2018 00:17	1	J	mg/L
Alkalinity results >> 10 times the blank level. Not used to qualify data							
					conn 01/24/19.		

(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: SM5310B-2011
Instrument: TOC3

SDG No.: ASN043

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2868142	Total Organic Carbon (TOC)	MB	QC-Water	12/27/2018 18:35	0.5	U	mg/L
ICB1	Total Organic Carbon (TOC)	ICB	QC-Water	12/27/2018 18:35	0.189	J	mg/L
CCB6	Total Organic Carbon (TOC)	CCB	QC-Water	12/27/2018 18:35	0.190	J	mg/L
CCB7	Total Organic Carbon (TOC)	CCB	QC-Water	12/27/2018 18:35	0.203	J	mg/L

(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:

ALS Environmental
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

Courier:

Tracking #: 7843 6143 7462

3006960

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/#: 60440641

ALS Quote #:

TAT: [x] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.

Data Required:

Approved By:

Email? [x] Y gerlinde.wolf@aecom.com

Fax? [ ] Y No.:

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	8260 C	RSK 175	TOC	Alkalinity	Cl, NO3, SO4	Total Fe	Diss. Fe
1 MW-32 121918		12/19/18	1030	G	GW	2	2	2	1	1	1	1
2 MW-33 121918			1310			2	2	2	1	1	1	1
3 MW-30 121918			1440			2	2	2	1	1	1	1
4 MW-31 121918			1555			2	2	2	1	1	1	1
5 DUP			—			2	2	2	1	1	1	1
6 Trip blank 121918	trip blank		1600			2						
7												
8												

***Container Type: C C AV P P P P
***Container Size: 40 40 40 250 250 250 250
***Preservative: HCl HCl HCl — — HNO3 —

ANALYSES/METHOD REQUESTED

Enter Number of Containers Per Analysis

(completed by Sample Receiving)

Performed by: NTW MDE

Cooler Temp: 2.8

Therm. ID: 403

No. of Coolers:

Notes:

	Correct containers?	Correct sample volume?	Correct preservation?	Headspace/Volatiles?	Circle appropriate Y or N.
N	N	N	N	N	
Y	Y	Y	Y	Y	

	Custody seals Present?	(if present) Seals intact?	Received on Ice?	COC/Labels complete/accurate?	Container in good condition?
N	N	N	N	N	
Y	Y	Y	Y	Y	

SAMPLED BY (Please Print): Alexandra Golden

Project Comments: send results to email listed above

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Alexandra Golden	12/19/18	1605	2 Brian McGuire	12/19/18	1605
3 Brian McGuire	12/19/18	1700	4 COMMON COURIER / ALS COURIER		
5 COMMON COURIER / ALS COURIER			6	12/20/18	1057
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ] other:

EDDs Required? [ ] If yes, format type:

SDWA Forms? ⇨ yes [ ] yes [ ] yes [ ] yes [ ]

State Samples Collected In? MD [ ] NJ [ ] NY [ ] PA [ ]

Other

DOD Criteria Required?

ALS FIELD SERVICES: [ ] Pickup [ ] Labor [ ] Composite Sampling [ ] Rental Equipment [ ] Other:

* G=Grab; C=Composite

**Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Rev 01-2013

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: AECOM Work Order #: 30069660 Initials: LD Date: 12/28/18

1. Were airbills / tracking numbers present and recorded?	NONE	(YES)	NO
Tracking number: 7845 6143 7462			
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken or leaking; frozen, etc.)		(YES)	NO
10. Did we received trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	(YES)	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		(YES)	NO
13. Are the samples reportable? If yes, fill out Reportable Drinking Water questions below...		YES	(NO)
13a. Did the client provide a PWS ID#?	(N/A)	YES	NO
13b. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13c. Did the client provide the sample location ID/Description?	(N/A)	YES	NO
13d. Did the client provide the sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #:
Temperature (°C): 2.8
Thermometer ID: 403

COMMENTS (Required for all NO responses above and any sample non-conformance):

ALS Environmental

301 Fulling Mill Road - 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: PJ LA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3006960 ANL007|60440641

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3006960001	MW-32 121918	Ground Water	12/19/2018 10:30	12/20/2018 10:57	Collected by Client
3006960002	MW-33 121918	Ground Water	12/19/2018 13:10	12/20/2018 10:57	Collected by Client
3006960003	MW-30 121918	Ground Water	12/19/2018 14:40	12/20/2018 10:57	Collected by Client
3006960004	MW-31 121918	Ground Water	12/19/2018 15:55	12/20/2018 10:57	Collected by Client
3006960005	DUP	Ground Water	12/19/2018 00:00	12/20/2018 10:57	Collected by Client
3006960006	TRIP BLANK 121918	Ground Water	12/19/2018 16:00	12/20/2018 10:57	Collected by Client

AECOM - Latham, NY
ALS-Middletown
Case Narrative
ANL-007 (3006960)

Sample Management

This report contains the results of the analysis of six (6) ground water samples collected on December 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 December 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. Six (6) water samples were analyzed by SW-846 Method 8260 for volatile organic compounds. The extraction and analysis were performed within 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).

Continuing Calibration Verification. Continuing calibrations were properly analyzed and met method criteria for all target analytes.

Blanks. Target analytes were not detected in the blank.

Surrogates. All surrogates were recovered within control limits.

Laboratory control samples. Target analytes were recovered within control limits,

Internal Standards. All internal standard results met method criteria.

Light Hydrocarbon Gases by RSK-175

Sample Handling. Five (5) 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; except as follows:

- In 2867832 MB, methane was detected at 6.2 µg/L.

Duplicate Samples. A duplicate sample, identified as 2867833, from project sample MW-32- 121918 (3006960001). Target analytes were detected as follows:

- Methane was E-flagged in the sample and in the duplicate sample.
- Ethane was detected at 12.0 µg/L in the sample and at 12.7J µg/L in the duplicate sample.

A 2ND duplicate sample, identified as 2867833, from project sample MW-32- 121918 (3006960001, DL20). Target analytes were detected as follows:

- Methane was detected at 407 µg/L. in the sample and 461 µg/L in the duplicate sample.

Total Metals by SW-846 Method 6010C

Sample handling. Five (5) 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 was not prepared from the sample in this deliverable group..

Dissolved Metals by EPA Method 6010C

Sample handling. Five (5) 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

Total Alkalinity by SM 2320B

Sample handling. Five (5) ground water 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.

Anions by EPA 300.0

Sample handling. Five (5) ground water samples were analyzed for chloride, nitrate, 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 instruments IC5 on 12/13/2018. 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 2865483 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 Carbon by SM 5310B

Sample handling. Five (5) ground water samples were analyzed for total carbon by Standard Method 5310B. The preserved samples were analyzed within the 28-day holding time established for the method.

Calibration. A four-point curve was properly established on the day of analysis. An initial calibration verification standard of 1.0 was analyzed and recovered within the QC limits of 85-115%. Continuing calibration verification standards of 5.0 and 8.0 mg/L were analyzed throughout the run. The recoveries were within the QC limits of 90-110%.

Blanks. Method blanks were analyzed with the samples. Total carbon was not detected above the reporting limit in the blanks.

Matrix Spikes. A matrix spike and spike duplicate analysis identified as 2867427 and 2867428 was performed on sample 3006960001 (MW-32 121918). The recovery was within the method limit of 85-115%.

A matrix spike and spike duplicate analysis identified as 2868144 and 2868145 was performed on sample 3006960004 (MW-31 121918). The recovery was within the method limit of 85-115%.

ALS Environmental

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NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: PJ LA 74618
State Certifications: FL E871113, WA C999, MD 128, VA 460157, WV DW 9961-C, WV 343

ANALYTICAL RESULTS

Workorder: 3006960 ANL007|60440641

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3006960001	1	MW-32 121918	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3006960002	1	MW-33 121918	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3006960003	1	MW-30 121918	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3006960004	1	MW-31 121918	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3006960005	1	DUP	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

2867832(MB)

Lab Name: ALS Global Contract: SVGC

Lab Code: VOA Case No.: SAS No.: SDG No.: ANL-007

Matrix (soil/water): WATER Lab Sample ID: 2867832

Sample wt/vol: 0.30 (g/mL) ML Lab File ID: MLRA003.D

Level (low/med): Low Date Received: 12/27/18

% Moisture: not dec. 100.0 Date Analyzed: 12/27/18

GC Column: PORPAK Q ID: 2.0 (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
74-82-8	METHANE	6.2	
74-85-1	ETHENE	2.4	U
74-84-0	ETHANE	3.3	U

Form 4B
Inorganic Blank Summary

Analysis Method: EPA 300.0
Instrument: IC-5

SDG No.: ANL007

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2865481	Chloride	MB	QC-Water	12/21/2018 03:49	0.14	J	mg/L
2865481	Nitrate-N	MB	QC-Water	12/21/2018 03:49	0.030	U	mg/L
2865481	Sulfate	MB	QC-Water	12/21/2018 03:49	0.25	U	mg/L
2865486	Chloride	MB	QC-Water	12/21/2018 07:57	0.18	J	mg/L
2865486	Nitrate-N	MB	QC-Water	12/21/2018 07:57	0.030	U	mg/L
2865486	Sulfate	MB	QC-Water	12/21/2018 07:57	0.25	U	mg/L

Chloride results >> ten times the associated blank level. Not used to qualify data. GAM 01/29/19

(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.: ANL007

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2865396	Alkalinity, Total	MB	QC-Water	12/21/2018 01:01	2	J	mg/L
2865412	Alkalinity, Total	MB	QC-Water	12/21/2018 08:37	4	J	mg/L
2865416	Alkalinity, Total	MB	QC-Water	12/21/2018 11:00	2	J	mg/L
2865420	Alkalinity, Total	MB	QC-Water	12/21/2018 13:23	3	J	mg/L
Associated alkalinity results >> ten times the blank level. Not used to qualify data. am 1/29/19							

(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: SM5310B-2011
Instrument: TOC3

SDG No.: ANL007

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
ICB1	Total Organic Carbon (TOC)	ICB	QC-Water	12/27/2018 13:59	0.189	J	mg/L
2867425	Total Organic Carbon (TOC)	MB	QC-Water	12/27/2018 13:59	1.0	U	mg/L
CCB5	Total Organic Carbon (TOC)	CCB	QC-Water	12/27/2018 13:59	0.170	J	mg/L
2868142	Total Organic Carbon (TOC)	MB	QC-Water	12/27/2018 18:35	1.0	U	mg/L
CCB6	Total Organic Carbon (TOC)	CCB	QC-Water	12/27/2018 18:35	0.190	J	mg/L
CCB7	Total Organic Carbon (TOC)	CCB	QC-Water	12/27/2018 18:35	0.203	J	mg/L

(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:

ALS Environmental
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

Courier:

Tracking #:

3007109

Co. Name: AECOM

Contact (Report to): Gerlinde Wolf Phone: 518-917-2370

Address: 40 British American Blvd Latham, NY 12110

Bill to (if different than Report to): PO#:

Project Name/#: 60441064 1 ALS Quote #:

TAT: [✓] Normal-Standard TAT is 10-12 business days. Date Required:
[ ] Rush-Subject to ALS approval and surcharges. Approved By:

Email? [✓] Y gerlinde.wolf@aecom.com
Fax? [ ] Y No:

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	8260c	RSK 175	Total Fe	Diss. Fe	Alkalinity	Cl, NO3, SO4	TOC						
Container Type						CG	CG	PL	PL	PL	PL	AG						
***Container Size**						40	40ml	8oz	8oz	8oz	8oz	40ml						
*** Preservative**						HCl	HCl	HNO3	—	—	—	HCl						
						ANALYSES/METHOD REQUESTED												
						Enter Number of Containers Per Analysis												
1 MW-16 121818		12/18/18	11:30	G	GW	3	3	X	X	1	1	3						
2 MW-26 121818		12/18/18	15:25	G	GW	3	3	1	1	1	1	3						
3																		
4																		
5																		
6																		
7																		
8																		

Preserved In: METAL HERE

Cooler Temp:

Therm. ID:

No. of Coolers:

Notes:

Correct containers?	Correct sample volume?	Correct preservation?	Headspace/Volatiles?	Circle appropriate Y or N.
N / Y	N / Y	N / Y	N / Y	
Custody seals Present?	(If present) Seals Intact?	Received on Ice?	COC/Labels complete/accurate?	Container in good condition?
Y / N	Y / N	Y / N	Y / N	Y / N

SAMPLED BY (Please Print): Alexandra Golden

Project Comments:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Alexandra Golden / AECOM	12/18/18	3:00	2 [illegible]	12/18/18	3:00
3 [illegible]	12/18	17:00	4 COMMON COURIER / ALS COURIER		
5 COMMON COURIER / ALS COURIER			6 [illegible]	12/18	1851
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ] csv [ ] If yes, format type:

EDDs Required?

SDWA Forms? yes

State Samples Collected In? MD NJ NY PA Other

DOD Criteria Required?

ALS FIELD SERVICES: [ ] Pickup [ ] Labor [ ] Composite Sampling [ ] Rental Equipment [ ] Other:

* G=Grab; C=Composite

**Matrix: Al=Air; DW=Drinking Water; GW=Groundwater; O=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Rev 01-2013

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: JACOBS Work Order #: 3007109 Initials: WS Date: 12-28-18

1. Were airbills / tracking numbers present and recorded? Tracking number: 7845 2942 4087	NONE	YES	NO
2. Are Custody Seals on shipping containers intact?	NONE	YES	NO
3. Are Custody Seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present?		YES	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
5a. Does the COC contain sample locations?		YES	NO
5b. Does the COC contain date and time of sample collection for all samples?		YES	NO
5c. Does the COC contain sample collectors name?		YES	NO
5d. Does the COC note the type(s) of preservation for all bottles?		YES	NO
5e. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab?		YES	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		YES	NO
8. Are all samples within holding times for the requested analyses?		YES	NO
9. Were all sample containers received intact and headspace free when required? (not broken or leaking, frozen, etc.)		YES	NO
10. Did we received trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES	NO
11. Were the samples received on ice?		YES	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	NO
13. Are the samples reportable? If yes, fill out Reportable Drinking Water questions below.		YES	NO
13a. Did the client provide a PWS ID#?	N/A	YES	NO
13b. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13c. Did the client provide the sample location ID/Description?	N/A	YES	NO
13d. Did the client provide the sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #: 1
Temperature (°C): 2.3
Thermometer ID: 407

COMMENTS (Required for all NO responses above and any sample non-conformance):

ALS Environmental

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJ LA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3007296001	MW-34 122018	Ground Water	12/20/2018 08:50	12/21/2018 11:33	Collected by Client
3007296002	MW-35 122018	Ground Water	12/20/2018 10:25	12/21/2018 11:33	Collected by Client
3007296003	MW-28 122018	Ground Water	12/20/2018 12:15	12/21/2018 11:33	Collected by Client
3007296004	MW-29 122018	Ground Water	12/20/2018 13:10	12/21/2018 11:33	Collected by Client
3007296005	MW-15 122018	Ground Water	12/20/2018 14:10	12/21/2018 11:33	Collected by Client
3007296006	MW-24 122018	Ground Water	12/20/2018 15:20	12/21/2018 11:33	Collected by Client
3007296007	Trip Blank 122018	Ground Water	12/20/2018 15:25	12/21/2018 11:33	Collected by Client
3007296008	Equipment Blank	Ground Water	12/20/2018 15:27	12/21/2018 11:33	Collected by Client

AECOM - Latham, NY
ALS-Middletown
Case Narrative
ASN-043 (3007109)

Sample Management

This report contains the results of the analysis of two (2) ground water samples collected on December 18, 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 December 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. 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.

Surrogates. Recoveries were within 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. Two (2) 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; except as follows:

- In 2867832 MB, methane was detected at 6.2 µg/L.

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

Total Alkalinity by SM 2320B

Sample handling. Two (2) ground water 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.

Anions by EPA 300.0

Sample handling. Two (2) ground water samples were analyzed for chloride, nitrate, and sulfate by EPA Method 300.0. The samples were analyzed within the method recommended holding time for chloride and sulfate. The nitrate analysis was performed outside of the 48-hour holding time.

Calibration. Initial calibrations, identified as Method A (high range) and Method L (low range), were properly established for instruments IC5 on 12/13/2018. 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 2865483 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 Carbon by SM 5310B

Sample handling. Two (2) ground water samples were analyzed for total carbon by Standard Method 5310B. The preserved samples were analyzed within the 28-day holding time established for the method.

Calibration. A four-point curve was properly established on the day of analysis. An initial calibration verification standard of 1.0 was analyzed and recovered within the QC limits of 85-115%. Continuing calibration verification standards of 5.0 and 8.0 mg/L were analyzed throughout the run. The recoveries were within the QC limits of 90-110%.

Blanks. Method blanks were analyzed with the samples. Total carbon was not detected above the reporting limit in the blanks.

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

ALS Environmental

301 Fulling Mill Road - 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: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3007296 ASN044|2015-SCOTIA NAVY DEPOT

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3007296001	1	MW-34 122018	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3007296002	1	MW-35 122018	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3007296003	1	MW-28 122018	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3007296004	1	MW-29 122018	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3007296005	1	MW-15 122018	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3007296006	4	MW-24 122018	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

2868723(MB)

Lab Name: ALS Global Contract: SVGC

Lab Code: VOA Case No.: SAS No.: SDG No.: ASN-044

Matrix (soil/water): WATER Lab Sample ID: 2868723

Sample wt/vol: 0.30 (g/mL) ML Lab File ID: MLSA003.D

Level (low/med): Low Date Received: 12/28/18

% Moisture: not dec. 100.0 Date Analyzed: 12/28/18

GC Column: PORPAK Q ID: 2.0 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-82-8	METHANE	7.0	
74-85-1	ETHENE	2.4	U
74-84-0	ETHANE	3.3	U

Form 4B
Inorganic Blank Summary

Analysis Method: SM2320B-2011
Instrument: AUTOT

SDG No.: ASN044

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2866186	Alkalinity, Total	MB	QC-Water	12/22/2018 04:49	3	J	mg/L
2866198	Alkalinity, Total	MB	QC-Water	12/22/2018 09:55	3	J	mg/L
2866202	Alkalinity, Total	MB	QC-Water	12/22/2018 11:58	3	J	mg/L
All Alkalinity results were >> 10 times the blank level(s). Not used to qualify data.							
						cm	01/29/19

(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: EPA 300.0
Instrument: IC-7

SDG No.: ASN044

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2866165	Chloride	MB	QC-Water	12/22/2018 03:40	0.15	J	mg/L
2866165	Nitrate-N	MB	QC-Water	12/22/2018 03:40	0.030	U	mg/L
2866165	Sulfate	MB	QC-Water	12/22/2018 03:40	0.25	U	mg/L
2866172	Chloride	MB	QC-Water	12/22/2018 07:50	0.15	J	mg/L
2866172	Nitrate-N	MB	QC-Water	12/22/2018 07:50	0.030	U	mg/L
2866172	Sulfate	MB	QC-Water	12/22/2018 07:50	0.25	U	mg/L

Chloride results were >> ~~two~~ to times the associated blank level. Not used to qualify data.

amn 01/24/19.

(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: SM5310B-2011
Instrument: TOC

SDG No.: ASN044

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2869055	Total Organic Carbon (TOC)	MB	QC-Water	12/28/2018 18:31	0.5	U	mg/L
CCB2	Total Organic Carbon (TOC)	CCB	QC-Water	12/28/2018 18:31	0.353	J	mg/L
2869061	Total Organic Carbon (TOC)	MB	QC-Water	12/31/2018 17:45	0.5	U	mg/L
CCB1	Total Organic Carbon (TOC)	CCB	QC-Water	12/31/2018 17:45	0.015	J	mg/L
CCB2	Total Organic Carbon (TOC)	CCB	QC-Water	12/31/2018 17:45	0.012	U	mg/L

(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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www.pacelabs.com

220 William Pitt Way
Pittsburgh, PA 15238
412-826-5245

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

013600

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: AECOM	Report To: Gerlinde Wolff	Attention: Dan Servetas
Address: 40 British Am. Blvd. Latham, NY 12110	Copy To: Dan Servetas	Company Name: AECOM
		Address: 40 British Am Latham
Email To: Gerlinde.Wolff@aecom.com	Purchase Order No.:	Pace Quote Reference: #28154
Phone: 518 951 2370 Fax:	Project Name: Scotia Former Navy Depot	Pace Project Manager:
Requested Due Date/TAT:	Project Number: 60440641-16	Pace Profile #:

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER

UST RCRA OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE)

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	TSP	BAK	Zinc Acetate & NaOH	Other	Analysis Test Y/N	Analysis Test: Dissolved Hydrogen	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-30	AR	G	12/19	1500				1									X	X		
2	MW-31			12/19	1530				1												
3	MW-34			12/20	0930				1												
4	MW-35			12/20	1100				1												
5	MW-28			12/20	1245				1												
6	MW-29			12/20	1340				1												
7	MW-15			12/20	1435				1												
8	MW-24			12/20	1600				1												
9	MW-32			12/21	1100				1												
10	MW-33	↓	↓	12/21	1105				1									↓			
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	AECOM	12/24/18	1030	RWelon PAES	12/24/18	0935	

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

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29102

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

013600

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: AECOM	Report To: Gerlinde Wolff	Attention: Dan Servetas
Address: 40 British Am Blvd. Latham, NY 12110	Copy To: Dan Servetas	Company Name: AECOM
		Address: 40 British Am Latham
Email To: Gerlinde.Wolff@aecom.com	Purchase Order No.:	Pace Quote Reference: #28154
Phone: 518 951 2370 Fax:	Project Name: Scotia Former Navy Depot	Pace Project Manager:
Requested Due Date/TAT:	Project Number: 60440641-16	Pace Profile #:

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER

UST RCRA OTHER _____

Site Location STATE: _____

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	TSP	BAK	Zinc Acetate & NaOH	Other	Analysis Test Y/N: Dissolved Hydrogen	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-30	AR	G	12/19	1500				1									X		
2	MW-31	"	"	12/19	1530				1									"		
3	MW-34	"	"	12/20	0930				1									"		
4	MW-35	"	"	12/20	1100				1									"		
5	MW-28	"	"	12/20	1245				1									"		
6	MW-29	"	"	12/20	1340				1									"		
7	MW-15	"	"	12/20	1435				1									"		
8	MW-24	"	"	12/20	1600				1									"		
9	MW-32	"	"	12/21	1100				1									"		
10	MW-33	↓	↓	12/21	1105				1									✓		
11																				
12																				

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
				RWelch PAES	12/24/18	0915	

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Cooler Receipt Form

Client Name: AECOM Project: Seneca Army Navy Depot Lab Work Order: 29102

A. Shipping/Container Information (circle appropriate response)

Courier: (FedEx) UPS USPS Client Other:________ Air bill Present: (Yes) No

Tracking Number: 8113 0089 4584

Custody Seal on Cooler/Box Present: (Yes) ~~No~~ RW Seals Intact: (Yes) No

Cooler/Box Packing Material: (Bubble Wrap) Absorbent Foam Other:________

Type of Ice: Wet Blue (None) Ice Intact: Yes Melted

Cooler Temperature: NA Radiation Screened: Yes (No) Chain of Custody Present: (Yes) No

Comments:________

B. Laboratory Assignment/Log-in (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out		✓		
Chain of Custody relinquished		✓		
Sampler Name & Signature on COC		✓		
Containers intact	✓			
Were samples in separate bags	✓			
Sample container labels match COC Sample name/date and time collected	✓			
Sufficient volume provided	✓			
PAES containers used	✓			
Are containers properly preserved for the requested testing? (as labeled)			✓	
If an unknown preservation state, were containers checked? Exception: VOA's coliform			✓	If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			✓	
Headspace present?			✓	

Comments:________

Cooler contents examined/received by: RW Date: 12-24-18

Project Manager Review: [signature] Date: 12-24-18

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

SAMPLE SUMMARY

Workorder: 29102 60440641-16 / Scotia Frm Navy

Lab ID	Sample ID	Matrix	Date Collected	Date Received
291020001	MW-30	Bubble Strip	12/19/2018 15:00	12/24/2018 09:28
291020002	MW-31	Bubble Strip	12/19/2018 15:30	12/24/2018 09:28
291020003	MW-34	Bubble Strip	12/20/2018 09:30	12/24/2018 09:28
291020004	MW-35	Bubble Strip	12/20/2018 11:00	12/24/2018 09:28
291020005	MW-28	Bubble Strip	12/20/2018 12:45	12/24/2018 09:28
291020006	MW-29	Bubble Strip	12/20/2018 13:40	12/24/2018 09:28
291020007	MW-15	Bubble Strip	12/20/2018 14:35	12/24/2018 09:28
291020008	MW-24	Bubble Strip	12/20/2018 16:00	12/24/2018 09:28
291020009	MW-32	Bubble Strip	12/21/2018 11:00	12/24/2018 09:28
291020010	MW-33	Bubble Strip	12/21/2018 11:05	12/24/2018 09:28

APPENDIX F: Groundwater Concentration Trend Plots

Figure F-1 MW Pair 28/29

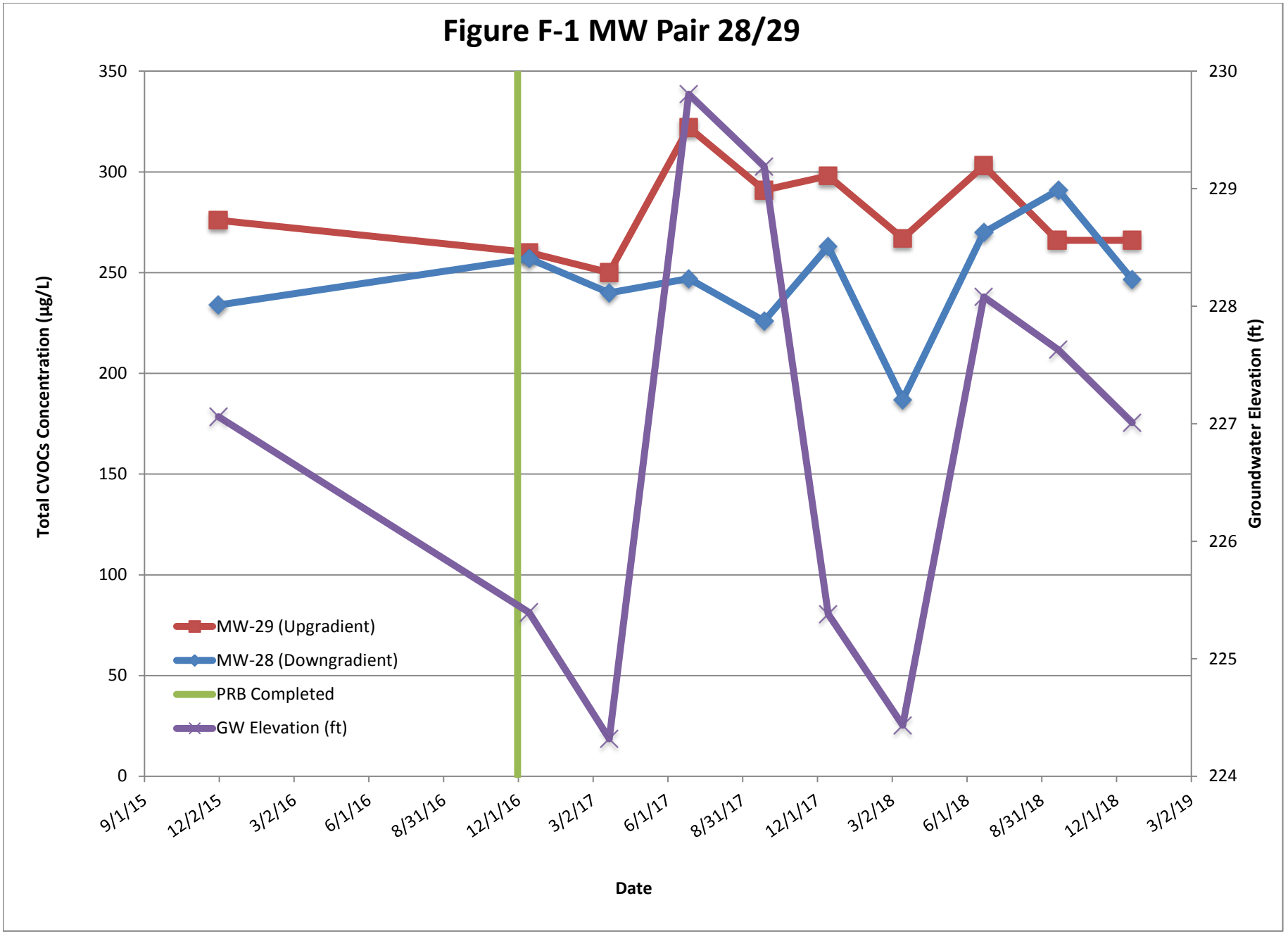

Figure F-2 MW Pair 30/31

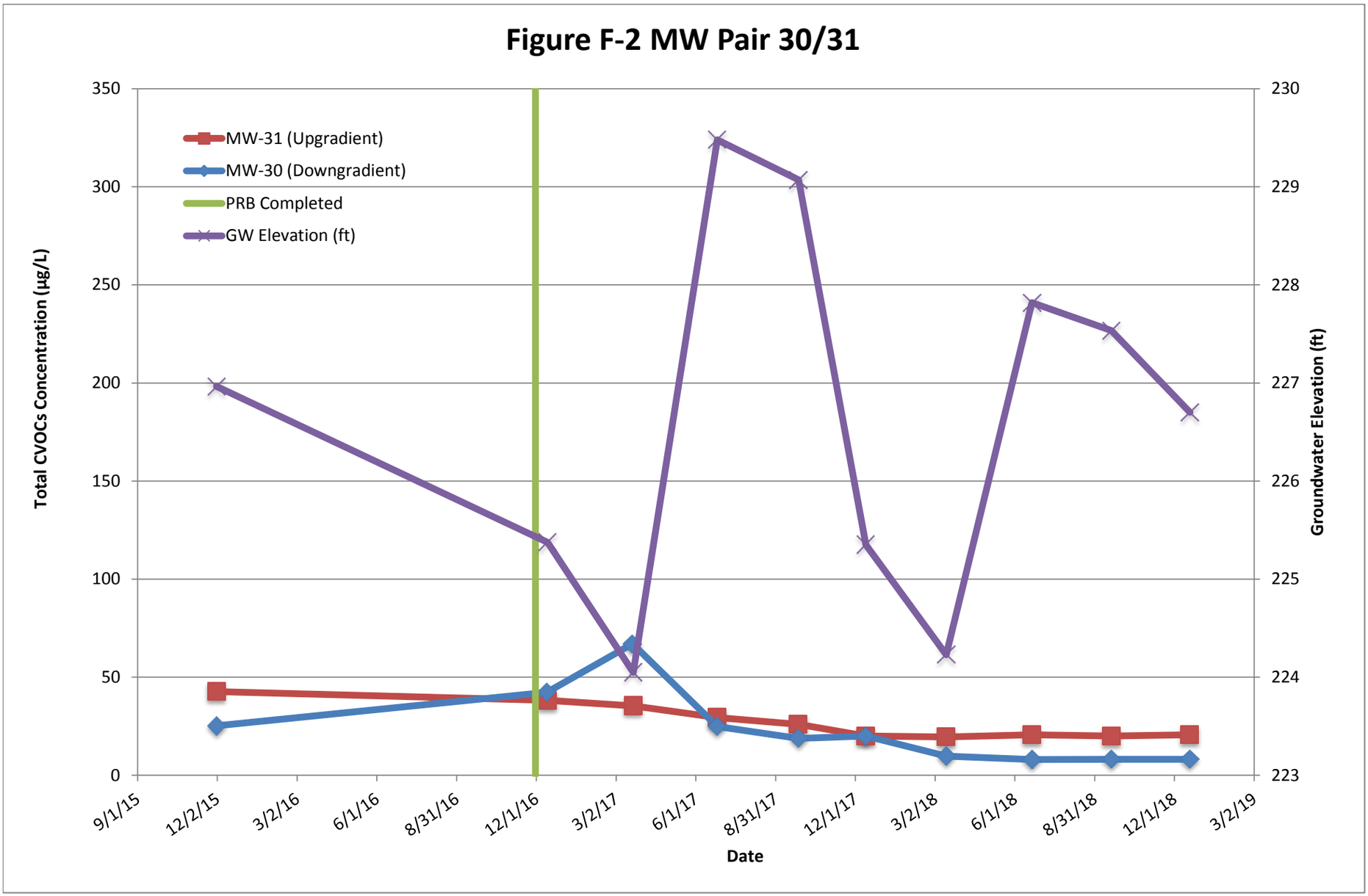

Figure F-3 MW Pair 32/33

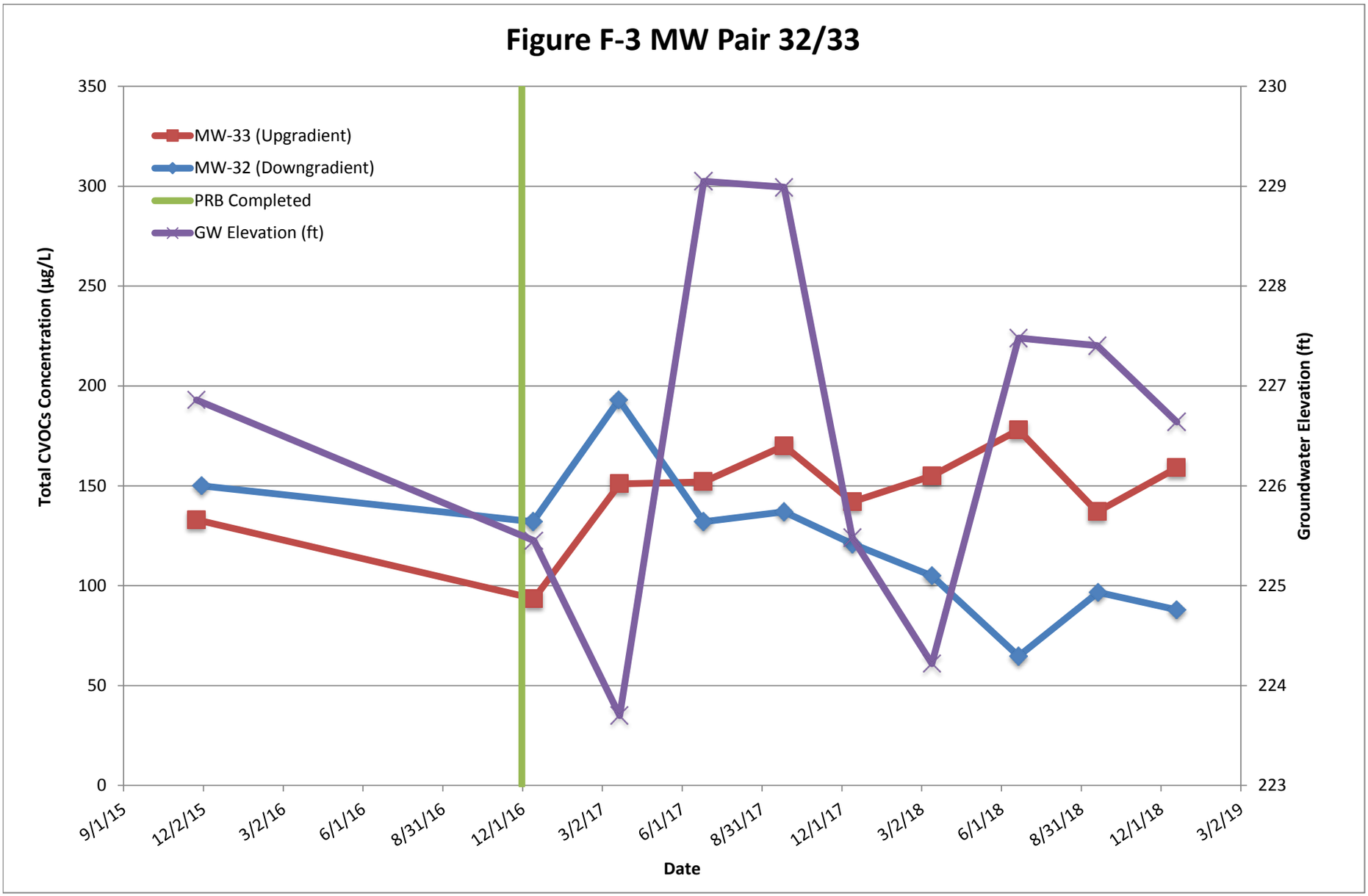

Figure F-4 MW Pair 34/35