DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090
June 9, 2017

REPLY TO
ATTENTION OF

Programs and Project Management Division

New York State Department of Environmental Conservation
Division of Environmental Remediation, Remedial Bureau B
c/o Mr. Kyle Forster
625 Broadway, 11th Floor
Albany, New York 12233-7016

RE: GROUNDWATER MONITORING PROGRAM REPORT FOR THE
DEFENSE NATIONAL STOCKPILE CENTER, SCOTIA, GLENVILLE, NEW YORK
[NYSDEC Site ID No. 447023]

Dear Mr. Forster:

Enclosed for the record is the *Groundwater Monitoring Program, 2017 Quarter One Status Report for Remedial Action at the Defense National Stockpile Center Scotia Depot, Glenville, New York*, dated May 2017.

The enclosed report includes analysis results from the groundwater sampling conducted in March, 2017.

The next sampling event will take place during the week of June 19, 2017.

Please contact me at (917) 790-8235 for anything further regarding this matter.

Sincerely,

Gregory J. Goepfert
Project Manager

Encl.

cc: Scotia Industrial Park, Inc. / Mr. David Ahl, w/ encl. (CD only)
Adirondack Beverages / Mr. Douglas Martin, w/encl. (CD only)
New York State Department of Health / Mr. Anthony Parretta, w/ encl. (CD only)
General Services Administration / Mr. David Baker, w/encl. (CD only)
USACE, Huntsville Center / Ms. Amy Doss, w/encl. (CD only)
USACE, New England District / Mr. Dean Brammer, w/encl. (hard copy & CD)
USACE, New York District / Mr. Tim Leonard, w/o encl.

GROUNDWATER MONITORING PROGRAM
2017 QUARTER ONE 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

AECOM Technical Services

May 2017

GROUNDWATER MONITORING PROGRAM
2017 QUARTER ONE STATUS REPORT

FOR

REMEDIAL ACTION AT
THE DEFENSE NATIONAL STOCKPILE CENTER SCOTIA DEPOT
GLENVILLE, NEW YORK

Prepared For:

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Contract No. W912DY-09-D-0059

Task Order No. 0010

May 2017

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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 first quarter of 2017 (January 1, 2017, through March 31, 2017). This report presents the results of the second 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. Installation of the PRB was completed in 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 Draft Final Engineering Report (FER) (AECOM, 2017a). A Site Layout Map is provided in Figure 1-2.

1.2.2 Pre-Design Groundwater Investigation – 2013

A pre-design investigation (PDI) was completed by Stone Environmental in 2013 to verify the location and dimensions of the TCE plume to better estimate the appropriate location and depth

of the PRB. The PDI was completed as a component of the ROD selected remedy to aid in the PRB design. The pre-design investigation included:

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

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

1.2.3 Baseline Groundwater Investigation

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

- Installation and development of four compliance well pairs (MW-28 to MW-35) and one additional monitoring well (MW-36) to confirm upgradient edge of groundwater plume
- Collection of 33 baseline groundwater samples
- Performance of a confirmatory ZVI bench scale test

- Performance of aquifer tests including slug testing and hydraulic pulse interference testing (HPIT)

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

1.3 PRB Design Summary

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

1.4 Remedial Action Implementation

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

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

The installation of the ZVI PRB was successfully completed in November of 2016. Details of the PRB construction activities of the PRB are provided in the Draft 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 to of the PRB. The four monitoring wells 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 well of the compliance monitoring wells showing the screened interval in relation to the PRB. Results from the groundwater monitoring program will be used to evaluate the effectiveness of the remedy at decreasing chlorinated VOC concentrations in groundwater and preventing the migration of contaminated groundwater off-site. The compliance well pairs, in addition to MW-24 (downgradient), MW-26 (downgradient), MW-15 (upgradient) and MW-16 (outside of plume), will be sampled quarterly for the first two years (eight quarters) then annually thereafter. The first quarterly sampling event was conducted in December 2016. Monitoring well locations are shown on Figure 1-2 and are described in Table 2-1 below.

Table 2-1: Location of Monitoring Wells

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

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

Deliverables for the groundwater monitoring program are specified in Section 7.0 of the Draft SMP.

2.1 Sample Collection Methods

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

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

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

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

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

- Drawdown: less than 0.3 ft drawdown during purging
- pH: ± 0.1 standard unit
- Specific Conductivity: ± 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 field forms with the field parameter readings for each monitoring well are included as Appendix A.

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 discharged on the ground in the vicinity of the well. This procedure was a deviation from USACE/GSA protocol and will be amended for all future sampling events. During future sampling events purge water will be containerized in 55-gallon drums and disposed of offsite. More detailed procedures for sample collection and handling and waste handling, are included in Appendix H of the Draft SMP (AECOM, 2017b). Appendix G of the Draft SMP includes the analytical QAPP for the site management activities. Appendix I of the Draft 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 (EPA SM 5310B), alkalinity (EPA 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 March 2017 sampling event and compares it to the December 2015 baseline sampling event and December 2016 elevation data. A potentiometric Site map indicating the overburden, groundwater elevation and direction of groundwater flow is included as Figure 3-1. The current potentiometric surface in relation to the PRB is shown in profile on Figure 2-1

The average hydraulic gradient at the Site in the vicinity of the PRB, estimated based on the March 2017 hydrogeologic conditions, was determined to be 0.0039 ft/ft. Based on the March 2017 hydraulic gradient of 0.0039 ft/ft and the range of hydraulic conductivities evaluated for the PRB design (15.66 ft/day to 193.8 ft/day) linear groundwater velocity at the Site could vary between approximately 0.06 ft/day and 0.75 ft/day. The range of estimated groundwater velocities based on the March 2017 Site conditions (0.06 ft/day-0.75 ft/day) is approximately within the lower end of the range of estimated groundwater velocities used for the PRB design (0.128 ft/day-2.83 ft/day).

3.2 Groundwater MNA Parameter Results

Results of groundwater MNA parameters obtained from March 2017 quarterly sampling event are presented in Table 3-2. MNA parameters were compared between compliance well pairs. In general conductivity values showed an increase between upgradient and downgradient wells. This was expected since the ZVI carrier fluid/guar contained salts and as the carrier gel was broken down the salt dissolved leading to an increase conductivity/salinity in the groundwater. The largest increase in conductivity was seenn in compliance monitoring well pair MW-35 to MW-34 located at the southern end of the PRB. This is expected because the southern portion of the PRB was completed first.

To date no significant changes have been observed in DO and ORP concentrations and measurements were variable with some well pairs showing an increase and some pairs showing a decrease. During future monitoring events a decrease in DO and ORP would be expected downgradient of the PRB indicating reducing conditions as the groundwater passes through the PRB. Furthermore, low DO and ORP values downgradient indicate that anaerobic conditions exist which promote anaerobic biodegradation that would be expected from the breakdown of the guar in the ZVI delivery fluid. The March 2017 groundwater results showed an increase in methane, ethane, and ethane in most downgradient compliance monitoring wells, particularly in MW-30, MW-32 and MW-34. The largest increase in methane and ethane was seen in compliance monitoring well pair MW-35 to MW-34 at the southern end of the PRB. Methane, ethane and ethene concentrations are expected to increase over time from the breakdown of the ZVI carrier fluids/guar. To date nitrate and sulfate levels have been variable since the 2015 baseline sampling event. Nitrate and sulfate concentrations are expected to decrease from upgradient to downgradient wells as this would further indicate that bioactivity is occurring.

3.3 Groundwater VOC results

The VOC results from March 2017 quarterly sampling event are presented in Table 3-2. In total, 12 groundwater samples were collected and analyzed. Figure 3-2 provides a summary of the groundwater VOC results 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 March 2017 sampling event results to the December 2015 baseline sampling event results. Full analytical reports are included in Appendix B.

The laboratory data was validated by an AECOM chemist and a full data usability summary report (DUSR) was prepared. The DUSR, included in Appendix C, indicated that all data points were usable and no data points were rejected.

A narrative summary of the results is presented below:

- Trichloroethene (TCE), the primary constituent of concern, was detected in 10 of the 12 wells sampled, nine of which were above the AWQS of 5 µg/L. Wells with detectable levels of TCE were MW-15, MW-24, MW-28, MW-29, MW-30, MW-31, MW-32, MW-33, MW-34, and MW-35. The concentration of TCE found in MW-24 was below the AWQS.

- No TCE was detected in samples from monitoring wells MW-16 and MW-26.Monitoring Well MW-16 is a plume bounding well located outside of the estimated area of the contamination plume.

- In general detected concentrations of TCE, as well as other chlorinated VOCs, for the March 2017 sampling event were consistent with previous groundwater sample results.

- Monitoring well MW-28 was the only downgradient member of a confirmation well pair to show a slight decrease in concentration of TCE. The sample from MW-28 was found to have a TCE concentration of 181 µg/L.

- Monitoring well MW-15, which is located upgradient of the PRB and is not a member of a confirmation well pair, showed a decrease in TCE concentration. The concentration of TCE decreased from 183 µg/L to 80.5 µg/L, which may be due to groundwater level variation.

4 SUMMARY AND CONCLUSIONS

The March 2017 groundwater monitoring event was the second quarterly groundwater sampling event at the Site since remedy implementation has been completed. Quarterly groundwater sampling will continue on the selected subset of monitoring wells listed in Table 2-1, and a Site-wide groundwater sampling event will occur annually during the second quarter. The next groundwater sampling event is scheduled for June 2017 and will include site wide groundwater sampling. Details regarding the groundwater sampling program for the Site are included in the Draft SMP (AECOM 2017b).

The laboratory results suggest that concentrations of dissolved VOCs in Site groundwater are currently similar to the baseline concentrations before installation of the ZVI PRB and no significant changes has been observed to date. The mixed MNA results indicate that the PRB and iron carrier fluidare affecting groundwater. Increased methane and ethane concentrations at downgradient monitoring wells indicate the presence of anaerobic conditions within the subsurface in the vicinity of the PRB. This indicates that the ZVI carrier fluid is continuing to be degraded in the subsurface. Increased TOC concentrations at the MW compliance pairs should facilitate downgradient changes in the local aquifer geochemistry which may help increase the reduction potential in the vicinity of the PRB.

Current Site groundwater flow conditions indicate that the on average the hydraulic gradient is consistent with the design, particularly in the southern and center sections of the PRB. The PRB was designed based on a hydraulic gradient of 0.004 ft/ft which is similar to the estimated hydraulic gradient of 0.0039 ft/ft measured in March 2017. There appears to be a seasonal variability in gradient which will be better understood as the quarterly monitoring continues. 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 it may take 1 to 2 years for groundwater to travel through the PRB to the downgradient compliance monitoring wells.

5 REFERENCES

AECOM, 2015. Remedial Design Investigation Work Plan for the Defense National Stockpile Center Scotia Depot, Town of Glenville, NY. November.

AECOM, 2016. Permeable Reactive Barrier Remedial Action Work Plan for the Defense National Stockpile Center Scotia Depot, Town of Glenville, NY. April.

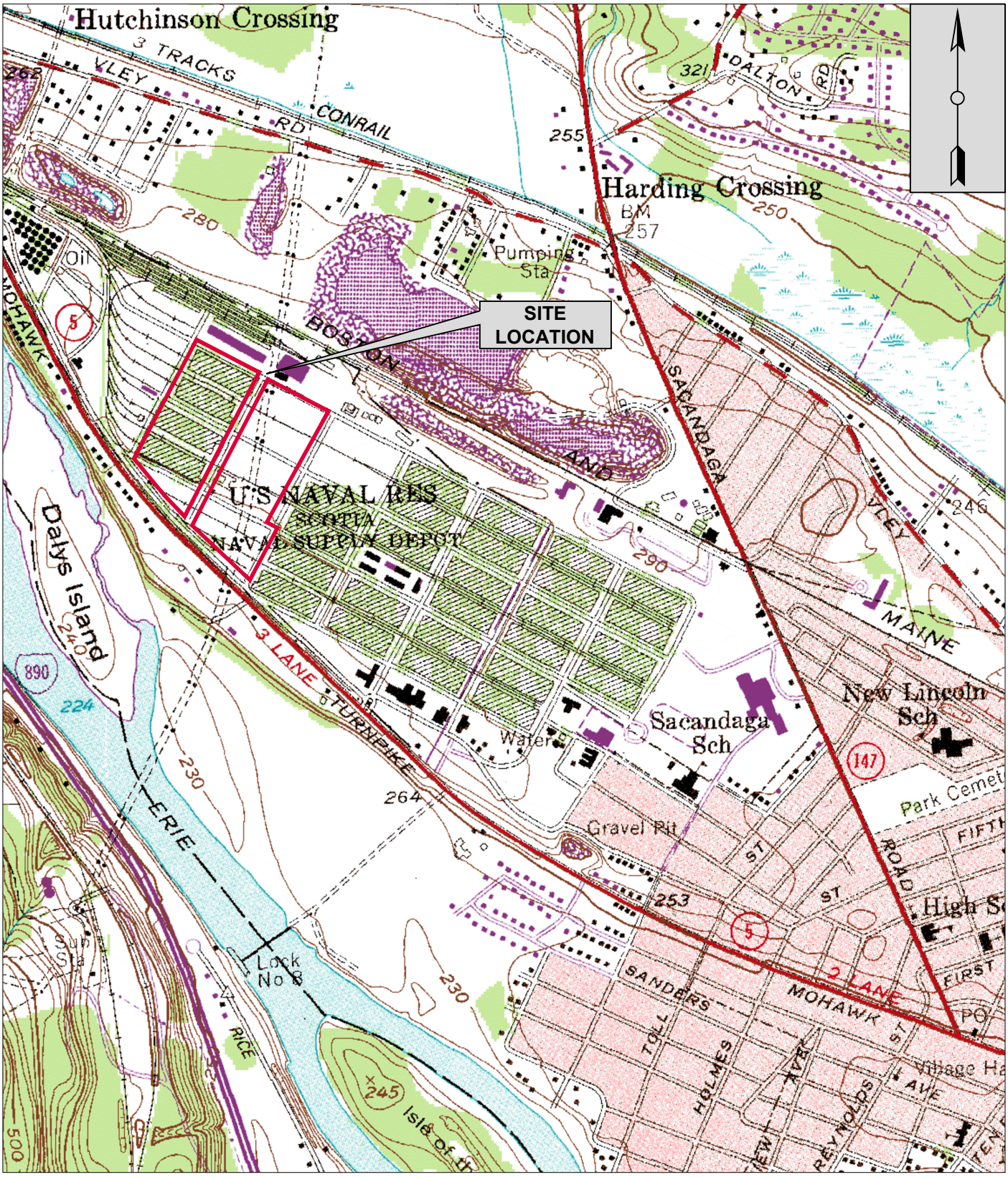
AECOM, 2017a. (Draft) Final Engineering Report for the Defense National Stockpile Center Scotia Depot, Town of Glenville, NY.

AECOM, 2017b. (Draft) Site Management Plan for the Defense National Stockpile Center Scotia Depot, Town of Glenville, NY.

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

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

FIGURES



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

0 2000' 4000'

2017 1st QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: May 2017

US ARMY Corps of Engineers

SITE LOCATION MAP

AECOM

Figure: 1-1

AECOM

Figure: 1-2

SITE LAYOUT MAP

1st STREET

3rd 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

TOWERS

250.0 FT. NATIONAL GRID POWER COMPANY EASEMENT

15.0 FT. (TYP.)

250.0 FT. (SHALLOW ZONE)

900.0 FT.

650.0 FT. (DEEP ZONE)

PROPERTY BOUNDARY (TYP.)

CONCRETE REMAINS

80.0'±

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

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 PLUME

400'
200'
0

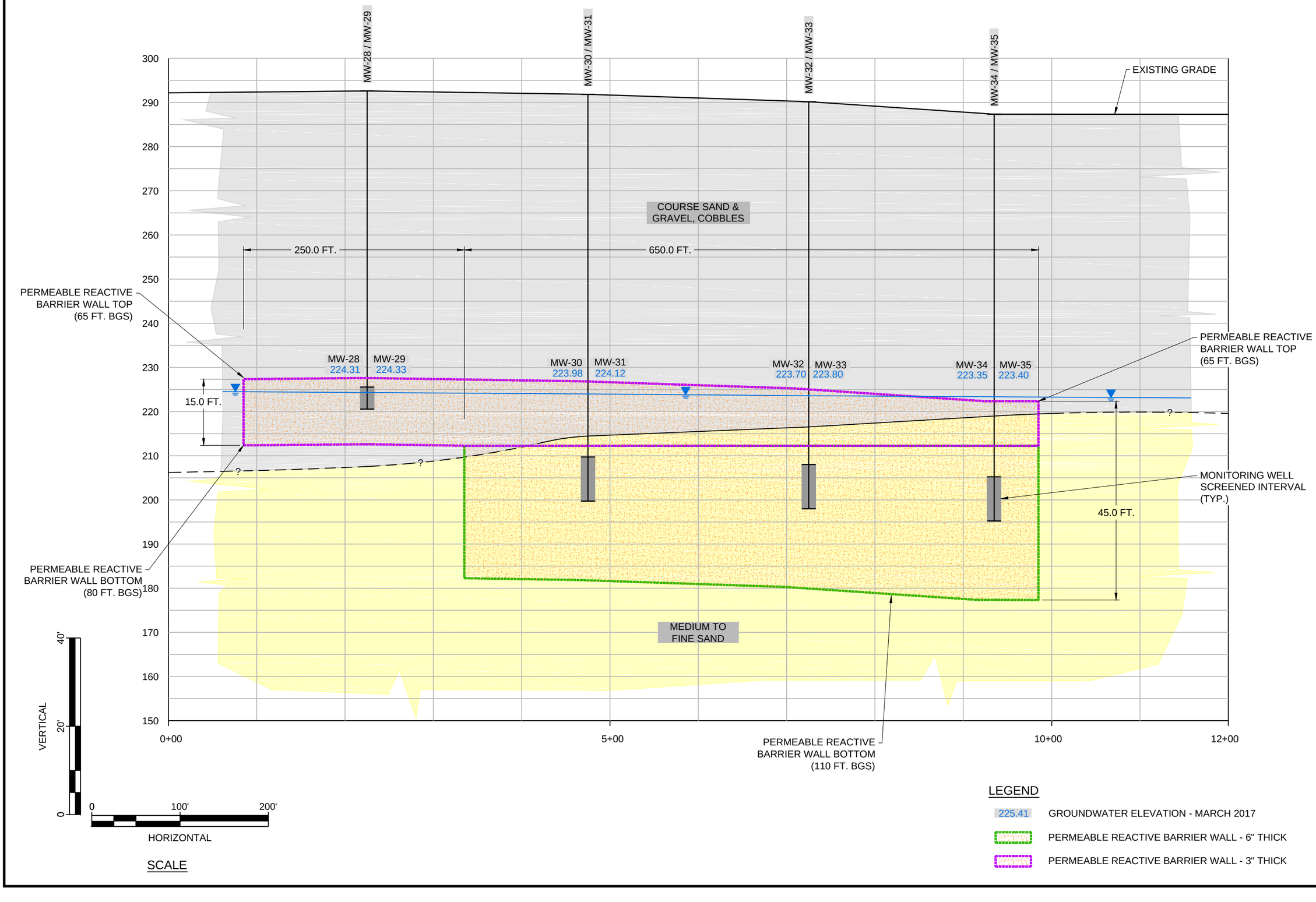
US ARMY Corps of Engineers

2017 1st QUARTER GROUNDWATER REPORT

DEFENSE NATIONAL STOCKPILE CENTER

SCOTIA DEPOT SITE - SCOTIA, NY

Project No.: 60440641 Date: May 2017



AECOM

Figure: 2-1

COMPLIANCE MONITORING WELLS AND PRB WALL PROFILE MARCH 2017

US ARMY Corps of Engineers

2017 1st QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE CENTER
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: May 2017

LEGEND

5 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 (MARCH 2017)

226 GROUNDWATER CONTOUR - 1 FT. (MARCH 2017) (DASHED WHERE INFERRED)

GENERAL GROUNDWATER DIRECTION

APPROXIMATE EXTENT OF PLUME

PMW-3
PMW-1
MW-23 228.40
PMW-2
1st STREET
MW-20 227.831
MW-19 227.13
MW-11 225.00
MW-21 225.97
MW-14 226.07
MW-17 225.99
MW-22 226.83
MW-36 226.26
250.0 FT. NATIONAL GRID POWER COMPANY EASEMENT
GEP-2 225.59
GEP-4 225.39
3rd STREET
MW-28 224.31
MW-29 224.33
MW-18 225.68
MW-15 225.32
MW-12
MW-8
GEP-1 224.43
GEP-3 225.26
MW-30 223.98
MW-31 224.12
MW-13 223.95
PROPERTY BOUNDARY (TYP.)
MW-24 223.60
MW-33 223.80
MW-32 223.70
MW-25 224.82
MW-B-3
MW-B-1
5th STREET
MW-26 222.60
MW-35 223.40
MW-34 223.35
MW-5 219.61
MW-9 219.78
MW-6 219.80
MW-27 219.65
MW-7 220.79
MW-16 221.95
BUILDING 201
BUILDING 202
BUILDING 203
BUILDING 204
BUILDING 403
BUILDING 404
BUILDING 405
BUILDING 406
AVENUE A
AVENUE B
AVENUE C
228
227
226
225
224
223
222
221
220
0
200'
400'

POTENTIOMETRIC SITE MAP
MARCH 2017

Figure: 3-1

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US ARMY Corps of Engineers

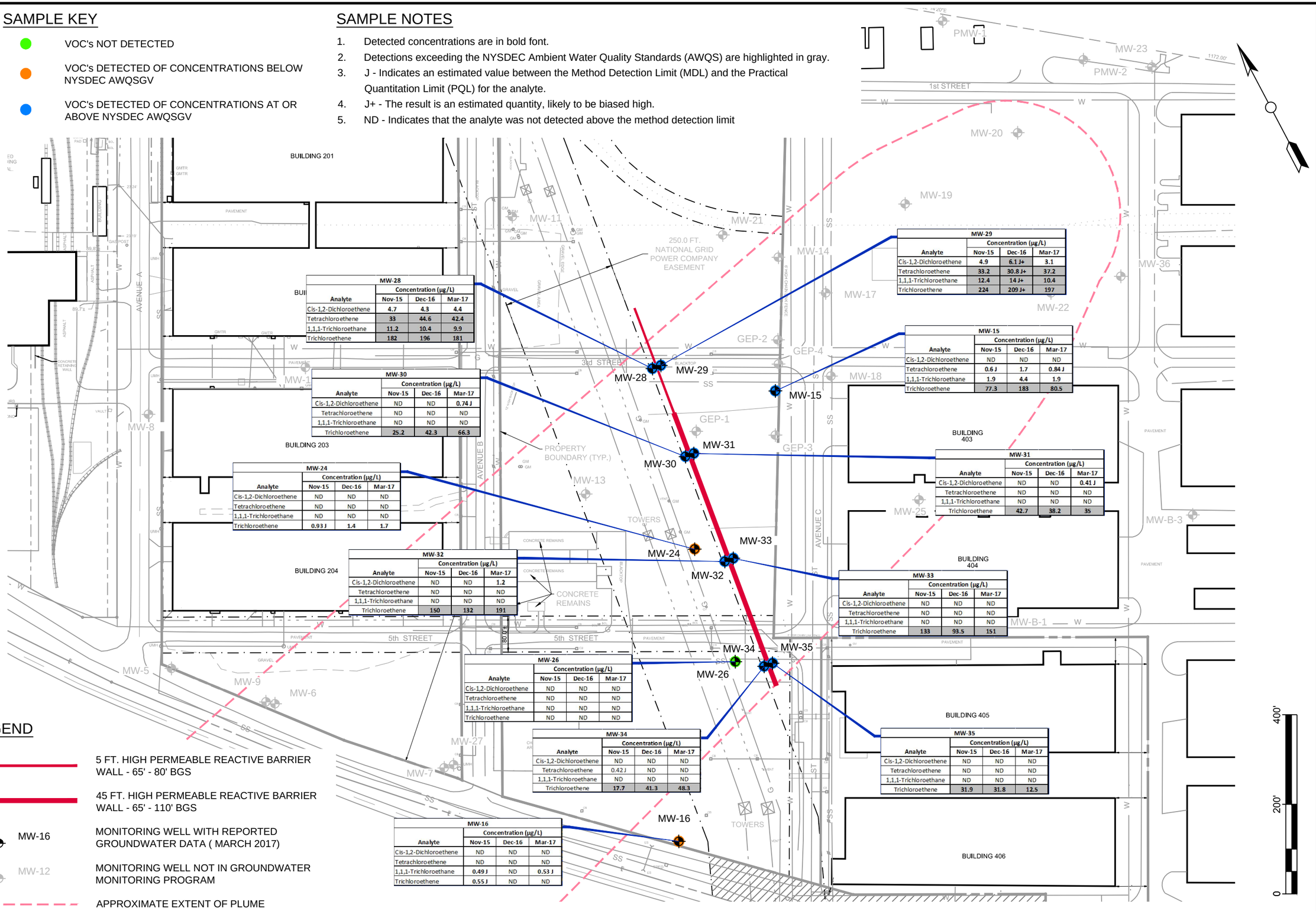
2017 1st QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE CENTER
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: May 2017

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.
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	Concentration (µg/L)		
Analyte	Nov-15	Dec-16	Mar-17
Cis-1,2-Dichloroethene	4.7	4.3	4.4
Tetrachloroethene	33	44.6	42.4
1,1,1-Trichloroethane	11.2	10.4	9.9
Trichloroethene	182	196	181

MW-29	Concentration (µg/L)		
Analyte	Nov-15	Dec-16	Mar-17
Cis-1,2-Dichloroethene	4.9	6.1 J+	3.1
Tetrachloroethene	33.2	30.8 J+	37.2
1,1,1-Trichloroethane	12.4	14 J+	10.4
Trichloroethene	224	209 J+	197

MW-30	Concentration (µg/L)		
Analyte	Nov-15	Dec-16	Mar-17
Cis-1,2-Dichloroethene	ND	ND	0.74 J
Tetrachloroethene	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND
Trichloroethene	25.2	42.3	66.3

MW-15	Concentration (µg/L)		
Analyte	Nov-15	Dec-16	Mar-17
Cis-1,2-Dichloroethene	ND	ND	ND
Tetrachloroethene	0.6 J	1.7	0.84 J
1,1,1-Trichloroethane	1.9	4.4	1.9
Trichloroethene	77.3	183	80.5

MW-24	Concentration (µg/L)		
Analyte	Nov-15	Dec-16	Mar-17
Cis-1,2-Dichloroethene	ND	ND	ND
Tetrachloroethene	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND
Trichloroethene	0.93 J	1.4	1.7

MW-31	Concentration (µg/L)		
Analyte	Nov-15	Dec-16	Mar-17
Cis-1,2-Dichloroethene	ND	ND	0.41 J
Tetrachloroethene	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND
Trichloroethene	42.7	38.2	35

MW-32	Concentration (µg/L)		
Analyte	Nov-15	Dec-16	Mar-17
Cis-1,2-Dichloroethene	ND	ND	1.2
Tetrachloroethene	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND
Trichloroethene	150	132	191

MW-33	Concentration (µg/L)		
Analyte	Nov-15	Dec-16	Mar-17
Cis-1,2-Dichloroethene	ND	ND	ND
Tetrachloroethene	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND
Trichloroethene	133	93.5	151

MW-26	Concentration (µg/L)		
Analyte	Nov-15	Dec-16	Mar-17
Cis-1,2-Dichloroethene	ND	ND	ND
Tetrachloroethene	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND
Trichloroethene	ND	ND	ND

MW-34	Concentration (µg/L)		
Analyte	Nov-15	Dec-16	Mar-17
Cis-1,2-Dichloroethene	ND	ND	ND
Tetrachloroethene	0.42 J	ND	ND
1,1,1-Trichloroethane	ND	ND	ND
Trichloroethene	17.7	41.3	48.3

MW-35	Concentration (µg/L)		
Analyte	Nov-15	Dec-16	Mar-17
Cis-1,2-Dichloroethene	ND	ND	ND
Tetrachloroethene	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND
Trichloroethene	31.9	31.8	12.5

MW-16	Concentration (µg/L)		
Analyte	Nov-15	Dec-16	Mar-17
Cis-1,2-Dichloroethene	ND	ND	ND
Tetrachloroethene	ND	ND	ND
1,1,1-Trichloroethane	0.49 J	ND	0.53 J
Trichloroethene	0.55 J	ND	ND

LEGEND

- 5 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 (MARCH 2017)
- MW-12 — MONITORING WELL NOT IN GROUNDWATER MONITORING PROGRAM
- APPROXIMATE EXTENT OF PLUME

0 200' 400'

AECOM

Figure: 3-2

GROUNDWATER RESULTS
MARCH 2017

US ARMY Corps of Engineers

2017 1st QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE CENTER
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: May 2017

TABLES

Table 2-1
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 anually	VOCs/MNA	65-80
MW-16	Outside Plume	Quarterly for 2 years then anually	VOCs/MNA	55-70
MW-24	Downgradient	Quarterly for 2 years then anually	VOCs/MNA	100-110
MW-26	Downgradient	Quarterly for 2 years then anually	VOCs/MNA	100-110
MW-28	Downgradient	Quarterly for 2 years then anually	VOCs/MNA	67-72
MW-29	Upgradient	Quarterly for 2 years then anually	VOCs/MNA	67-72
MW-30	Downgradient	Quarterly for 2 years then anually	VOCs/MNA	82-92
MW-31	Upgradient	Quarterly for 2 years then anually	VOCs/MNA	82-92
MW-32	Downgradient	Quarterly for 2 years then anually	VOCs/MNA	82-92
MW-33	Upgradient	Quarterly for 2 years then anually	VOCs/MNA	82-92
MW-34	Downgradient	Quarterly for 2 years then anually	VOCs/MNA	82-92
MW-35	Upgradient	Quarterly for 2 years then 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 2-1
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

Well IDs	Screened Interval (ft bgs)	Ground Surface Elevation	Reference Point Elev.	DTW (ft bgs)	DTW Elevation 2017	DTW Elevation 2016	DTW Elevation 2015
B-1	48-68	-	287.14	-	-	-	227.74
B-3	47.5-67.5	-	287.05	-	-	-	227.95
MW-4	63.8-73.8	289.58	291.74	-	-	-	225.74
MW-5	62.5-72.5	287.95	290.11	70.50	219.61	219.29	225.75
MW-6	58.5-68.5	286.28	288.58	68.78	219.80	219.80	225.86
MW-7	61-71	286.8	289.26	68.47	220.79	223.16	226.28
MW-9	110-120	285.98	288.33	68.55	219.78	219.75	225.83
MW-10	65-80	290.94	293.15	-	-	-	228.24
MW-11	65-80	295.73	295.12	70.12	225.00	225.91	227.7
MW-13	65-80	292.62	293.85	69.90	223.95	225.43	227.32
MW-14	65-80	-	296.2	70.13	226.07	226.56	228.08
MW-15	65-80	-	293.67	68.35	225.32	226.27	227.8
MW-16	55-70	-	288.33	66.38	221.95	225.38	226.39
MW-17	60-75	-	295.24	69.25	225.99	226.55	228.08
MW-18	60-75	-	295.24	69.56	225.68	226.46	227.94
MW-19	62-77	-	297.67	70.54	227.13	226.85	228.43
MW-20	63-78	-	301.55	73.72	227.83	227.01	228.71
MW-21	57-72	-	296.52	70.55	225.97	226.50	228.06
MW-22	63-78	-	298.91	72.08	226.83	226.73	228.29
MW-23	63-78	-	300.54	72.14	228.40	227.06	228.9
MW-24	90-100	290.24	292.45	68.85	223.60	225.30	226.79
MW-25	65-75	288.16	290.26	65.44	224.82	225.82	227.16
MW-26	100-110	287.23	286.45	63.85	222.60	224.75	226.06
MW-27	100-110	286.08	288.32	68.67	219.65	223.44	225.5
MW-28	67-72	292.55	292.25	67.94	224.31	225.41	227.07
MW-29	67-72	292.50	292.13	67.80	224.33	225.38	227.05
MW-30	82-92	291.76	291.63	67.65	223.98	225.35	226.98
MW-31	82-92	291.80	291.54	67.42	224.12	225.40	226.95
MW-32	82-92	290.12	289.75	66.05	223.70	225.45	226.86
MW-33	82-92	290.27	289.91	66.11	223.80	225.51	226.89
MW-34	82-92	287.30	287.05	63.70	223.35	225.48	226.73
MW-35	82-92	287.25	286.96	63.56	223.40	225.46	226.69
MW-36	70-80	292.61	292.36	66.10	226.26	226.12	227.8
GEP-1	59.6-74.6	-	294.98	70.55	224.43	-	227.36
GEP-2	60.6-75.6	-	296.02	70.43	225.59	226.38	227.9
GEP-3	59.6-74.6	-	292.97	67.71	225.26	226.31	227.81
GEP-4	60.15-75.15	-	295.62	70.23	225.39	226.22	227.73

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

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Non-paired Wells											
		MW-15			MW-16			MW-24			MW-26		
		11/9/2015	12/14/2016	3/22/2017	11/11/2015	12/12/2016	3/20/2017	11/10/2015	12/13/2016	3/21/2017	11/17/2015	12/13/2016	3/21/2017
		Upgradient			Outside Plume			Downgradient			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	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	**1.9**	**4.4**	**1.9**	**0.49 J**	0.75 U	**0.53 J**	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	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	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	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	0.75 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	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	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	0.75 U	0.75 U
Tetrachloroethene (PCE; PERC)	5	**0.6 J**	**1.7**	**0.84 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	**0.57 J**	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	0.75 U	0.75 U
Trichloroethene (TCE)	5	**77.3**	**183**	**80.5**	**0.55 J**	0.75 U	0.75 U	**0.93 J**	**1.4**	**1.7**	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	0.75 U	0.75 U
MNA Parameters													
Alkalinity, Total (as $CaCO_3$) (mg/L)	NS	**182**	**212**	**201**	**248**	**312**	**317**	**168**	**198**	**205**	**204**	**197**	**196**
Chloride (mg/L)	NS	**28.9**	**14.3**	**28.3**	**13.6**	**9.0**	**5.6**	**36.3**	**38.5**	**59.0**	**45.2**	**44.9**	**53.4**
Nitrate (mg/L)	NS	**0.58**	**0.56**	**0.90**	**1.6**	**1.6**	**2.1 J**	**0.9**	0.060 U	0.060 U	0.06 U	**0.040 J**	0.060 U
Sulfate (mg/L)	NS	**12.3**	**12.4**	**21.3**	**35.2**	**44.8**	**65.3**	**15.5**	**21.4**	**24.1**	**25.1**	**24.6**	**29.4**
Methane (µg/L)	NS	**0.19 J**	0.5 U	**0.21 J**	0.25 U	0.5 U	0.50 U	**0.82**	**1.6**	**1.7 J+**	**34.8**	**2.7**	**1.4 J+**
Ethane (µg/L)	NS	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	**0.34 J**	0.50 U	0.50 U	0.50 U	0.50 U	0.50 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	0.75 U	0.75 U	0.75 U	0.75 U
Total Organic Carbon (mg/L)	NS	**0.55 J**	**0.57 J**	**0.47 J**	**3.6**	**0.96 J**	**1.1**	**3.5**	**1.9**	**1.0 J**	**9.3**	**2.6**	**1.3 J**
Field Parameters													
Turbidity (NTU)	NS	11.1	7	15.7	8.01	14.8	7.71	9.33	13.9	16.3	68.3	21.8	31.9
ORP (MeV)	NS	91.4	54.6	-0.6	137.6	139.9	115.9	-80.2	-93.2	-111.3	-103.6	-28.9	-46.4
Conductivity (mS/cm)	NS	0.358	0.25	0.387	0.361	0.388	0.436	0.327	0.57	0.438	0.324	0.59	0.469
Dissolved Oxygen (mg/L)	NS	31.45	8.04	6.37	22.27	9.5	10.4	0.94	0.44	0.55	0	0.33	0.27
Groundwater Elevation (ft)	NS	227.80	226.27	225.32	226.39	225.38	221.95	226.79	225.30	223.60	226.06	224.75	222.60

Notes:
MNA - Monitored Natural Attenuation
NS - no standard
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).
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

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

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well Pair						Confirmation Well Pair					
		MW-28			MW-29			MW-30			MW-31		
		12/1/2015	12/14/2016	3/22/2017	12/1/2015	12/14/2016	3/22/2017	12/1/2015	12/13/2016	3/21/2017	12/1/2015	12/14/2016	3/22/2017
		Downgradient			Upgradient			Downgradient			Upgradient		
VOCs (µg/L)													
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	**11.2**	**10.4**	**9.9**	**12.4**	**14.0** J+	**10.4**	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	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	**0.46 J**	0.75 U	0.75 U	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	**1.0**	**0.77 J**	**0.88 J**	**0.97 J**	3.8 U	**0.45 J**	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	**0.53 J**	**0.43 J**	**0.53 J**	**0.68 J**	3.8 U	**0.55 J**	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	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	**0.61 J**	0.75 U	**0.62 J**	0.75 U	3.8 U	**0.63 J**	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	**4.7**	**4.3**	**4.4**	**4.9**	**6.1** J+	**3.1**	0.75 U	0.75 U	**0.74 J**	0.75 U	0.75 U	**0.41 J**
Tetrachloroethene (PCE; PERC)	5	**33**	**44.6**	**42.4**	**33.2**	**30.8** J+	**37.2**	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	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	**0.47 J**	**0.42 J**	0.75 U	3.8 U	**0.61 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	**182**	**196**	**181**	**224**	**209** J+	**197**	**25.2**	**42.3**	**66.3**	**42.7**	**38.2**	**35.0**
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters													
Alkalinity, Total (as $CaCO_3$) (mg/L)	NS	**352**	**316**	**295**	**327**	**301**	**258**	**143**	**319**	**210**	**178**	**222**	**381**
Chloride (mg/L)	NS	**22.1**	**32.4**	**25.7**	**28.2**	**28.4**	**21.3**	**38.4**	**182**	**136**	**41.9**	**56.6**	**98.5**
Nitrate (mg/L)	NS	0.06 U	**0.06 J**	**0.44**	**0.1 J**	**0.26**	**0.52**	0.06 U	0.060 U	0.06 U	0.06 U	0.06 U	**0.040 J**
Sulfate (mg/L)	NS	**22.4**	**20.9**	**21.6**	**29.2**	**24.9**	**20.1**	**35.9**	**2.9**	0.5 U	**26.3**	**10.9**	**2.6**
Methane (µg/L)	NS	**3.4**	**3.0**	**0.94**	**13.9**	**0.62**	**1.1**	**47.4**	**146**	**870**	**20.7**	**3.5**	**106**
Ethane (µg/L)	NS	0.50 U	**3.6**	**1.0**	**0.81 J**	0.50 U	0.5 U	**4.7**	**5.4**	**23.5**	**2.2**	**1.5**	**10.1**
Ethene (µg/L)	NS	0.75 U	**1.3 J**	**1.9**	**0.59 J**	0.75 U	0.75 U	**2.2**	**3.3**	**9.1**	**0.91 J**	**0.84 J**	**4.7**
Total Organic Carbon (mg/L)	NS	**1.9**	**2.3**	**0.81 J**	**2.3**	**1.4**	**0.91 J**	**2.2**	**225**	**139**	**2.1**	**43.9**	**257**
Field Parameters													
Turbidity (NTU)	NS	209	1.5	2.07	82.4	0.62	2.73	58.2	3.55	3.82	51.7	8.03	11.4
ORP (MeV)	NS	273.2	71.2	77.1	-25.1	60.9	46.1	-278.4	-166.3	-166.9	-319.7	-163.1	-201.5
Conductivity (mS/cm)	NS	0.324	0.366	0.52	0.325	0.354	0.424	0.21	1.41	0.74	0.243	0.348	0.85
Dissolved Oxygen (mg/L)	NS	6.75	3.94	5.2	4.29	6.17	9.26	3.7	0.29	0.17	1.29	0.28	0.22
Groundwater Elevation (ft)	NS	227.07	225.41	224.31	227.05	225.38	224.33	226.98	225.35	223.98	226.95	225.40	224.12

Notes:
MNA - Monitored Natural Attenuation
NS - no standard
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).
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

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

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well Pair						Confirmation Well Pair					
		MW-32			MW-33			MW-34			MW-35		
		11/30/2015	12/13/2016	3/21/2017	11/24/2015	12/14/2016	3/22/2017	11/24/2015	12/13/2016	3/21/2017	11/24/2015	12/15/2016	3/22/2017
		Downgradient			Upgradient			Downgradient			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	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	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	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	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	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	**0.40 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
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	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	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	**1.2**	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
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	**0.42 J**	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	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	0.75 U	0.75 U
Trichloroethene (TCE)	5	**150**	**132**	**191**	**133**	**93.5**	**151**	**17.7**	**41.3**	**48.3**	**31.9**	**31.8**	**12.5**
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	0.75 U	0.75 U
MNA Parameters													
Alkalinity, Total (as $CaCO_3$) (mg/L)	NS	**196**	**277**	**214**	**172**	**218**	**194**	**99**	**191**	**597**	**181**	**223**	**51**
Chloride (mg/L)	NS	**35.6**	**138**	**84.6**	**41.8**	**43.2**	**29.2**	**48.5**	**62.3**	**461**	**42.2**	**53.9**	**2.0**
Nitrate (mg/L)	NS	0.06 U	0.060 U	**0.02 J**	0.06 U	0.060 U	**0.32**	**0.56**	**0.060 J**	0.060 U	0.06 U	**0.040 J**	**0.14 J**
Sulfate (mg/L)	NS	**21.1**	**2.8**	**0.68 J**	**25.1**	**8.2**	**15.0**	**64.3**	**23.8**	**0.56 J**	**48.1**	**7.2**	**3.5**
Methane (µg/L)	NS	**6.8**	**16.5**	**309**	**64**	**3.4**	**9.2**	**14.5**	**1.2**	**1780**	**13.8**	**0.90**	**5.8**
Ethane (µg/L)	NS	**0.5 J**	**1.5**	**19.3**	**7**	**0.25 J**	0.50 U	**2.2**	0.50 U	**17.3**	**2.9**	0.50 U	0.50 U
Ethene (µg/L)	NS	0.75 U	**1.8**	**10.3**	**3.6**	**0.48 J**	0.75 U	**1.8**	0.75 U	**4.4**	**1.6**	0.75 U	**0.32 J**
Total Organic Carbon (mg/L)	NS	**2.6**	**133**	**98.0**	**8.1**	**30.9**	**2.1**	**5.9**	**12**	**631**	**7.7**	**18.3**	**1.4**
Field Parameters													
Turbidity (NTU)	NS	180	5.92	4.01	23.1	9.31	11.7	44.7	3.23	4.59	381	5.99	16.3
ORP (MeV)	NS	-234.2	-107.7	-140.7	-471.2	-126.8	-64.3	-185.4	-8.4	-144.0	-404	-167.9	-68.4
Conductivity (mS/cm)	NS	0.239	1.18	0.64	0.247	0.303	0.386	0.361	0.63	2.28	0.287	0.329	0.078
Dissolved Oxygen (mg/L)	NS	0.64	1.81	1.77	0.92	0.41	2.5	6.9	1.12	0.12	0.79	0.41	6.63
Groundwater Elevation (ft)	NS	226.86	225.45	223.70	226.89	225.51	223.80	226.73	225.48	223.35	226.69	225.46	223.40

Notes:
MNA - Monitored Natural Attenuation
NS - no standard
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).
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

APPENDICES

APPENDIX A: Groundwater Sample Collection Field Forms

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-15 Date: 3/22/2017

Samplers: Chris French & Ross McCredy

Sample Number: MW-15 032217 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	82.80	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	68.35	feet
4. C = Column of Water in Casing:	14.45	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	2.36	gal
6. D2 = Pump Setting Depth (ft):	75'	feet
7. C2 = Column of water in Pump/Tubing (ft):	-	feet
8. Tubing Volume = C2(0.005737088)	-	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 Plus and ~~Lamotte 2020 WE~~ Hach 2100 Q

Parameter	Units	Readings							
Time	24 hr	1454	1459	1504	1509	1514	1519	1524	1529
Water Level (0.33)	feet	68.26	68.27	68.25	68.24	68.24	68.24	68.24	68.24
Volume Purged	gal	0	0.3	0.6	0.9	1.2	1.5	1.8	2.1
Flow Rate	mL / min	220	220	220	220	215	210	210	210
Turbidity (+/- 10%)	NTU	179	283	235	114	39.9	17.2	16.1	15.7
Dissolved Oxygen (+/- 10%)	%	66.2	68.7	66.4	60.9	59.0	56.1	56.1	56.9
Dissolved Oxygen (+/- 10%)	mg/L	7.57	7.86	7.47	6.85	6.54	6.40	6.34	6.37
Eh / ORP (+/- 10)	MeV	-3.4	-4.6	-3.3	-2.1	-1.6	-1.2	-0.5	-0.6
Specific Conductivity	mS/cm[c]	0.514	0.506	0.516	0.528	0.537	0.541	0.539	0.539
Conductivity (+/- 3%)	mS/cm	0.363	0.362	0.369	0.378	0.384	0.385	0.385	0.387
pH (+/- 0.1)	pH unit	7.65	7.59	7.57	7.55	7.54	7.53	7.53	7.55
Temp (+/- 0.5)	C	9.6	10.0	10.1	10.1	10.1	~~10~~ 9.9	10.0	10.1
Color	Visual	cloudy	tan	tan	cloudy	milky	clear	clear	clear
Odor	Olfactory	none	none	none	none	none	none	None	None

Comments

Purge Start Time: 1449

Sample Time: 1529

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-16 Date: 3/20/2017

Samplers: Chris French & Ross McCredy

Sample Number: MW-16 032017 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	69.53	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	66.38	feet
4. C = Column of Water in Casing:	3.15	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	0.51	gal
6. D2 = Pump Setting Depth (ft):	68	feet
7. C2 = Column of water in Pump/Tubing (ft):	—	feet
8. Tubing Volume = C2(0.005737088)	—	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 Plus and ~~Lamotte 2020 WE~~ Hach 2100

Parameter	Units	Readings						
Time	24 hr	1424	1429	1434	1437	1444	1449	1454
Water Level (0.33)	feet	66.38	66.42	66.42	66.42	66.42	66.42	66.42
Volume Purged	gal	0	0.30	0.75	1.1	1.5	1.9	2.3
Flow Rate	mL / min	220	220	220	220	215	215	210
Turbidity (+/- 10%)	NTU	Limit	244	117	66.5	44.0	28.8	24.6
Dissolved Oxygen (+/- 10%)	%	99.4	94.6	105.5	93.7	93.7	93.5	93.9
Dissolved Oxygen (+/- 10%)	mg/L	10.71	10.47	11.54	10.22	10.23	10.30	10.34
Eh / ORP (+/- 10)	MeV	97.6	101.3	110.3	109.1	110.4	111.8	111.7
Specific Conductivity	mS/cm[c]	0.593 ~~0.436~~	0.594	0.016	0.596	0.596	0.593	0.594
Conductivity (+/- 3%)	mS/cm	0.436	0.436	0.030	0.490	0.438	0.434	0.435
pH (+/- 0.1)	pH unit	6.86	6.90	6.95	6.88	6.87	6.87	6.87
Temp (+/- 0.5)	C	11.1	11.1	11.0	11.2	11.1	11.0	10.9
Color	Visual	light Brown	L. Brown	Cloudy	Cloudy	Clear/Milky	clear	clear
Odor	Olfactory	none	None	None	none	none	none	none

Comments

Purge Start Time: 1418

Sample Time: 1524

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-16 Date: 3/20/2017

Samplers: Chris French & Ross McCredy

Sample Number: MW-16 032017 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	69.53	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	66.28	feet
4. C = Column of Water in Casing:	3.15	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	0.51	gal
6. D2 = Pump Setting Depth (ft):	68	feet
7. C2 = Column of water in Pump/Tubing (ft):	–	feet
8. Tubing Volume = C2(0.005737088)	–	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 Plus and ~~Lamotte 2020 WE~~ Hach 2100 Q

Parameter	Units	Readings					
Time	24 hr	1459	1504	1509	1514	1519	1524
Water Level (0.33)	feet	66.42	66.42	66.42	66.42	66.42	66.42
Volume Purged	gal	2.7	3.0	3.3	3.7	4.0	4.4
Flow Rate	mL / min	225	220	220	220	220	230
Turbidity (+/- 10%)	NTU	16.8	12.0	9.73	8.19	7.83	7.71
Dissolved Oxygen (+/- 10%)	%	94.4	93.6	93.4	92.5	93.3	93.6
Dissolved Oxygen (+/- 10%)	mg/L	10.35	10.34	10.52	10.26	10.34	10.40
Eh / ORP (+/- 10)	MeV	113.8	114.4	115.1	116.0	116.0	115.9
Specific Conductivity	mS/cm[c]	0.595	0.598	0.599	0.596	~~0.59~~ 0.600	0.598
Conductivity (+/- 3%)	mS/cm	0.434	0.436	0.434	0.433	0.436	0.436
pH (+/- 0.1)	pH unit	6.87	6.87	6.87	6.87	6.88	6.88
Temp (+/- 0.5)	C	10.8	10.8	10.7	10.7	10.7	10.8
Color	Visual	Clear	Clear	Clear	Clear	Clear	Clear
Odor	Olfactory	none	none	none	none	none	none

Comments

Purge Start Time: 1418

Sample Time: 1524

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-24 Date: 3/21/2017

Samplers: Chris French & Ross McCredy

Sample Number: MW-24 032117 QA/QC Collected? MS/MSD

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	103.35	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	68.85	feet
4. C = Column of Water in Casing:	34.5 ~~+21.5~~	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	5.62	gal
6. D2 = Pump Setting Depth (ft):	101.5	feet
7. C2 = Column of water in Pump/Tubing (ft):	—	feet
8. Tubing Volume = C2(0.005737088)	—	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 Plus and ~~Lamotte 2020 WE~~ Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	0945	0950	0955	1000	1005	1010	1015
Water Level (0.33)	feet	68.81	68.84	68.83	68.83	68.83	68.84	68.83
Volume Purged	gal	0.3	0.6	0.9	1.2	1.5	1.8	2.1
Flow Rate	mL / min	175	170	170	165	165	170	170
Turbidity (+/- 10%)	NTU	19.5	47.8	44.0	39.8	34.1	27.4	19.6
Dissolved Oxygen (+/- 10%)	%	87.8	3.0	2.5	2.6	2.7	3.4	~~3.8~~ 3.7
Dissolved Oxygen (+/- 10%)	mg/L	9.88	0.33	0.27	0.29	0.30	0.38	0.41
Eh / ORP (+/- 10)	MeV	-59.9	-83.6	-93.0	-98.7	-103.6	-105.2	-105.8
Specific Conductivity	mS/cm[c]	0.593	0.599	0.599	0.599	0.599	0.599	0.599
Conductivity (+/- 3%)	mS/cm	0.421	0.435	0.437	0.437	0.438	0.438	0.437
pH (+/- 0.1)	pH unit	7.91	7.85	7.85	7.85	7.84	7.84	7.84
Temp (+/- 0.5)	C	9.9	10.7	10.9	10.9	10.9	10.9	10.8
Color	Visual	clear	a milky	milky	milky	milky	clear	clear
Odor	Olfactory	very Slight org.	very Sl. Org.	none	none	none	none	none

Comments

Purge Start Time: 0942

Sample Time: 1035

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-24 Date: 3/21/2017

Samplers: Chris French & Ross McCredy

Sample Number: MW-24 032117 QA/QC Collected? MS/MSD

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	103.35	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	68.85	feet
4. C = Column of Water in Casing:	34.5	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	5.62	gal
6. D2 = Pump Setting Depth (ft):	101.5	feet
7. C2 = Column of water in Pump/Tubing (ft):	–	feet
8. Tubing Volume = C2(0.005737088)	–	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 Plus and ~~Lamotte 2020 WE~~ Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	1020	1025	1030	1035			
Water Level (0.33)	feet	68.83	68.83	68.83	68.83			
Volume Purged	gal	2.4	2.7	3.0	3.3			
Flow Rate	mL / min	170	170	170	175			
Turbidity (+/- 10%)	NTU	17.7	15.2	15.7	16.3			
Dissolved Oxygen (+/- 10%)	%	4.3	4.7	4.7 ~~0.49~~	4.9			
Dissolved Oxygen (+/- 10%)	mg/L	0.48	0.52	0.54	0.55			
Eh / ORP (+/- 10)	MeV	-107.1	-108.8	-110.1	-111.3			
Specific Conductivity	mS/cm^c	0.599	0.600	0.599	0.599			
Conductivity (+/- 3%)	mS/cm	0.437	0.438	0.437	0.438			
pH (+/- 0.1)	pH unit	7.84	7.83	7.83	7.83			
Temp (+/- 0.5)	C	10.7	10.9	10.8	10.8			
Color	Visual	clear	clear	clear	clear			
Odor	Olfactory	none	none	none	none			

Comments

Purge Start Time: 0942

Sample Time: 1035

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-26 Date: 3/21/2017

Samplers: Chris French & Ross McCredy

Sample Number: MW-26 032117 ~~032117~~ QA/QC Collected? Dup-1 032117

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	109.72	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	63.85	feet
4. C = Column of Water in Casing:	45.87	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	7.48	gal
6. D2 = Pump Setting Depth (ft):	105	feet
7. C2 = Column of water in Pump/Tubing (ft):	–	feet
8. Tubing Volume = C2(0.005737088)	–	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 Plus and ~~Lamotte 2020 WE~~ Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	0820	0825	0830	0835	0840	0845	0850
Water Level (0.33)	feet	63.92	63.91	63.92	63.92	63.91	63.92	63.92
Volume Purged	gal	0	0.3	0.6	1.0	1.4	1.8	2.3
Flow Rate	mL / min	200	200	205	200	200	210	210
Turbidity (+/- 10%)	NTU	42.1	154	84.5	61.5	37.4	31.8	27.4
Dissolved Oxygen (+/- 10%)	%	76.5	5.8	3.9	3.5	2.7	2.7	2.6
Dissolved Oxygen (+/- 10%)	mg/L	8.93	0.65	0.44	0.40	0.31	0.30	0.28
Eh / ORP (+/- 10)	MeV	171.3	47.5	6.1	-13.9	-20.4	-29.9	-34.0
Specific Conductivity	mS/cm^c	0.435	0.661	0.652	0.649	0.654	0654	0.653
Conductivity (+/- 3%)	mS/cm	0.298	0.467	0.463	0.461	0.462	0.465	0.464
pH (+/- 0.1)	pH unit	7.66	7.74	7.76	7.78	7.79	7.79	7.78
Temp (+/- 0.5)	C	8.8	9.7	9.8	9.8	9.7	9.9	9.9
Color	Visual	Milky	Cloudy	Milky	Milky	Milky	clear	clear
Odor	Olfactory	none	none	none	none	none	none	none

Comments

Purge Start Time: 0813

Sample Time: 0905

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-26 Date: 3/21/2017

Samplers: Chris French & Ross McCredy

Sample Number: MW-26 032117 QA/QC Collected? Dup-1 032117

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	109.72	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	63.85	feet
4. C = Column of Water in Casing:	45.87	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	7.48	gal
6. D2 = Pump Setting Depth (ft):	105	feet
7. C2 = Column of water in Pump/Tubing (ft):	-	feet
8. Tubing Volume = C2(0.005737088)	-	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 Plus and ~~Lamotte 2020 WE~~ Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	0855	0900	0905				
Water Level (0.33)	feet	63.92	63.92	63.92				
Volume Purged	gal	2.6	2.9	3.3				
Flow Rate	mL / min	205	200	200				
Turbidity (+/- 10%)	NTU	33.2	34.5	31.9				
Dissolved Oxygen (+/- 10%)	%	2.4	2.3	2.4				
Dissolved Oxygen (+/- 10%)	mg/L	0.27	0.26	0.27				
Eh / ORP (+/- 10)	MeV	-39.3	-42.3	-46.4				
Specific Conductivity	mS/cm[c]	0.654	0654	0.654				
Conductivity (+/- 3%)	mS/cm	0.466	0.464	0.469				
pH (+/- 0.1)	pH unit	7.80	7.80	7.80				
Temp (+/- 0.5)	C	10.0	9.8	10.0				
Color	Visual	Clear	Clear	Clear				
Odor	Olfactory	none	none	none				

Comments

Purge Start Time: 0813

Sample Time: 0905

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-28 Date: ~~3/21/2017~~ 3/22/17

Samplers: Chris French & Ross McCredy

Sample Number: MW-28 032217 ~~MW-28 032117~~ QA/QC Collected? No Dup-02 032217

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	71.80	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	67.94	feet
4. C = Column of Water in Casing:	3.86	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	0.63	gal
6. D2 = Pump Setting Depth (ft):	70	feet
7. C2 = Column of water in Pump/Tubing (ft):	–	feet
8. Tubing Volume = C2(0.005737088)	–	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 Plus and Hach 2100 Q ~~Lamotte 2020 WE~~

Parameter	Units	3/21/17	3/22/17	Readings				
Time	24 hr	1502	~~1507 0805~~	0813	0818	0823	0828	0833
Water Level (0.33)	feet	67.91	67.90	67.70	67.90	67.90	67.91	67.90
Volume Purged	gal	0	0	0.3	0.6	0.9	1.2	1.5
Flow Rate	mL / min	180	200	200	200	200	205	210
Turbidity (+/- 10%)	NTU	12.7	39.3	11.2	6.35	3.18	2.12	2.03
Dissolved Oxygen (+/- 10%)	%	49.6	45.0	45.7	44.6	46.4	47.0	46.9
Dissolved Oxygen (+/- 10%)	mg/L	5.42	5.21	5.26	5.17	5.32	5.35	5.38
Eh / ORP (+/- 10)	MeV	-24.1	135.4	103.0	92.6	87.7	83.9	82.0
Specific Conductivity	mS/cm[c]	0.76	0.75	0.75	0.74	0.74	0.74	0.74
Conductivity (+/- 3%)	mS/cm	0.56	0.52	0.51	0.52	0.52	0.52	0.52
pH (+/- 0.1)	pH unit	7.48	7.19	7.09	7.11	7.09	7.10	7.11
Temp (+/- 0.5)	C	11.6	8.8	8.7	9.2	9.5	9.1	9.1
Color	Visual	Clear	~~Cle~~ Milky	clear	Clear	Clear	clear	Clear
Odor	Olfactory	organic	organic	organic	none	none	none	none

Comments 3/21/17 3/22/17

Purge Start Time: 1458 0805

Sample Time: 0843

Pump failed at 1507. Bad O-ring. Well will be sampled tomorrow.

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-28 Date: 3/22/2017

Samplers: Chris French & Ross McCredy

Sample Number: MW-28 032217 QA/QC Collected? Dup-02 032217

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	71.80	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	67.94	feet
4. C = Column of Water in Casing:	3.86	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	0.63	gal
6. D2 = Pump Setting Depth (ft):	70	feet
7. C2 = Column of water in Pump/Tubing (ft):	-	feet
8. Tubing Volume = C2(0.005737088)	-	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 Plus and ~~Lamotte 2020 WE~~ Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	0838	0843					
Water Level (0.33)	feet	67.90	67.90					
Volume Purged	gal	1.8	2.1					
Flow Rate	mL / min	200	205					
Turbidity (+/- 10%)	NTU	1.99	2.07					
Dissolved Oxygen (+/- 10%)	%	45.6	45.2					
Dissolved Oxygen (+/- 10%)	mg/L	5.24	5.20					
Eh / ORP (+/- 10)	MeV	79.0	77.1					
Specific Conductivity	mS/cm[c]	0.74	0.74					
Conductivity (+/- 3%)	mS/cm	0.52	0.52					
pH (+/- 0.1)	pH unit	7.12	7.12					
Temp (+/- 0.5)	C	9.4	9.3					
Color	Visual	clear	clear					
Odor	Olfactory	none	none					

Comments

Purge Start Time: 0805

Sample Time: 0843

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-29 Date: 3/22/2017

Samplers: Chris French & Ross McCredy

Sample Number: MW-29 032217 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	70.36	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	67.80	feet
4. C = Column of Water in Casing:	2.56	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	0.42	gal
6. D2 = Pump Setting Depth (ft):	69.8	feet
7. C2 = Column of water in Pump/Tubing (ft):	-	feet
8. Tubing Volume = C2(0.005737088)	-	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 Plus and ~~Lamotte 2020 WE~~ Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	0920	0925	0930	0935	0940	0945	0950
Water Level (0.33)	feet	67.70	67.70	67.71	67.70	67.70	67.70	67.70
Volume Purged	gal	0	0.3	0.6	0.9	1.2	1.5	1.8
Flow Rate	mL / min	215	215	215	215	215	210	210
Turbidity (+/- 10%)	NTU	43.8	24.3	9.98	6.04	4.74	3.51	3.52
Dissolved Oxygen (+/- 10%)	%	86.4	76.7	76.8	76.9	77.2	69.6	77.5
Dissolved Oxygen (+/- 10%)	mg/L	9.07	8.77	8.71	8.71	8.90	8.15	8.92
Eh / ORP (+/- 10)	MeV	52.7	51.0	52.1	51.8	52.9	53.6	52.3
Specific Conductivity	mS/cm^c	0.277	0.331	0.386	0.423	0.456	0.474	0.499
Conductivity (+/- 3%)	mS/cm	0.196	0.227	0.276	~~0.304~~ 0.304	0.315	0.323	0.349
pH (+/- 0.1)	pH unit	7.81	7.71	7.64	7.58	7.55	7.52	7.51
Temp (+/- 0.5)	C	9.8	9.9	10.2	10.1	8.8	8.2	9.0
Color	Visual	milky	clear	clear	clear	clear	clear	clear
Odor	Olfactory	none	none	none	none	none	none	none

Comments

Purge Start Time: 0915

Sample Time: 1118

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-29 Date: 3/2/2017

Samplers: Chris French & Ross McCredy

Sample Number: MW-29 032217 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	70.36	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	67.80	feet
4. C = Column of Water in Casing:	2.56	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	0.42	gal
6. D2 = Pump Setting Depth (ft):	69.8	feet
7. C2 = Column of water in Pump/Tubing (ft):	–	feet
8. Tubing Volume = C2(0.005737088)	–	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 Plus and ~~Lamotte 2020 WE~~ Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	0955	1000	1005	1039	~~1044~~ 1053	1058	1103
Water Level (0.33)	feet	67.70	67.70	67.70	67.71	67.70	67.70	67.70
Volume Purged	gal	2.1	2.4	2.7	2.7	2.7	3.0	3.3
Flow Rate	mL / min	210	210	210	200	200	205	205
Turbidity (+/- 10%)	NTU	2.84	2.53	Pump	87.2	42.1	11.7	7.04
Dissolved Oxygen (+/- 10%)	%	77.9	77.3		122.7	82.1	81.6	81.4
Dissolved Oxygen (+/- 10%)	mg/L	9.05	8.94	Stopped	15.30	9.38	9.29	9.26
Eh / ORP (+/- 10)	MeV	53.4	53.0		52.8	47.2	49.1	45.2
Specific Conductivity	mS/cm^c	0.514	0.525	Working	0.576	0.598	0.573	0.576
Conductivity (+/- 3%)	mS/cm	0.354	0.363		0.372	~~0.420~~ 0.420	0.404	0.410
pH (+/- 0.1)	pH unit	7.49	7.49		7.74	7.56	7.51	7.48
Temp (+/- 0.5)	C	8.8	8.8		6.1	9.6	9.7	9.7
Color	Visual	Clear	Clear		cloudy	milky	clear	clear
Odor	Olfactory	none	none		none	none	none	none

Comments

Purge Start Time: 0925

Sample Time: 1118

1005 - Pump Stopped working. 1038 - pump working again.

1044 - pump Broke again.

1053 - Pump working again.

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-29 Date: 3/22/2017

Samplers: Chris French & Ross McCredy

Sample Number: MW-29 032217 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	70.36	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	67.80	feet
4. C = Column of Water in Casing:	2.56	feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	0.42	gal
6. D2 = Pump Setting Depth (ft):	69.8	feet
7. C2 = Column of water in Pump/Tubing (ft):	–	feet
8. Tubing Volume = C2(0.005737088)	–	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 Plus and ~~Lamotte 2020 WE~~ Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	1108	1113	1118				
Water Level (0.33)	feet	67.70	67.70	67.70				
Volume Purged	gal	3.6	3.9	4.2				
Flow Rate	mL / min	205	200	200				
Turbidity (+/- 10%)	NTU	2.91	2.99	2.73				
Dissolved Oxygen (+/- 10%)	%	80.7	80.4	80.8				
Dissolved Oxygen (+/- 10%)	mg/L	9.25	9.20	9.26				
Eh / ORP (+/- 10)	MeV	46.0	46.1	46.1				
Specific Conductivity	mS/cm^c	0.586	0.590	0.604				
Conductivity (+/- 3%)	mS/cm	0.413	0.420	0.424				
pH (+/- 0.1)	pH unit	7.45	7.43	7.43				
Temp (+/- 0.5)	C	9.6	9.7	9.8				
Color	Visual	clear	clear	clear				
Odor	Olfactory	none	none	none				

Comments

Purge Start Time: 0915

Sample Time: 1118

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-30 Date: 3/21 /2017

Samplers: Chris French & Ross McCredy

Sample Number: MW-30 032117 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	91.37	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	67.65	feet
4. C = Column of Water in Casing:	23.70	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	4.03	gal
6. D2 = Pump Setting Depth (ft):	87.0	feet
7. C2 = Column of water in Pump/Tubing (ft):	-	feet
8. Tubing Volume = C2(0.005737088)	-	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 Plus and ~~Lamotte 2020 WE~~ Hach 2100Q

Parameter	Units	Readings							
Time	24 hr	1348	1353	1358	1903	1908	1413	1418	1423
Water Level (0.33)	feet	67.70	~~67.85~~ 67.67	67.70	67.70	67.70	67.70	67.70	67.70
Volume Purged	gal	0	0.3	0.6	0.9	1.2	1.5	2.0	2.5
Flow Rate	mL / min	220	220	220	225	225	225	225	225
Turbidity (+/- 10%)	NTU	10.1	7.59	5.78	4.10	3.52	3.67	3.87	3.82
Dissolved Oxygen (+/- 10%)	%	12.2	2.1	2.1	1.5	1.5	1.7	1.6	1.5
Dissolved Oxygen (+/- 10%)	mg/L	1.32	0.25	0.23	0.17	0.16	0.19	0.18	0.17
Eh / ORP (+/- 10)	MeV	-145.0	-170.9	-152.1	-156.6	-158.6	-163.2	-165.9	-166.9
Specific Conductivity	mS/cm[c]	0.588	0.607	0.71	0.86	0.93	0.96	0.98	1.00
Conductivity (+/- 3%)	mS/cm	0.428	0.446	0.53	0.63	0.69	0.71	0.72	0.74
pH (+/- 0.1)	pH unit	7.84	7.85	7.74	7.65	7.62	7.61	7.61	7.60
Temp (+/- 0.5)	C	10.7	11.0	11.3	11.3	11.3	11.3	11.2	11.3
Color	Visual	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear
Odor	Olfactory	organic	organic	organic	organic	organic	organic	Organic	organic

Comments

Purge Start Time: 1345

Sample Time: 1423

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-31 Date: 3/22/2017

Samplers: Chris French & Ross McCredy

Sample Number: MW-31 032217 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	92.39	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	67.42	feet
4. C = Column of Water in Casing:	24.94	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	4.07	gal
6. D2 = Pump Setting Depth (ft):	87.3	feet
7. C2 = Column of water in Pump/Tubing (ft):	—	feet
8. Tubing Volume = C2(0.005737088)	—	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 Plus and ~~Lamotte 2020 WE~~ Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	1141	1146	1151	1156	1201	1206	1211
Water Level (0.33)	feet	67.46	67.45	67.45	67.45	67.45	67.45	67.45
Volume Purged	gal	0	0.35	0.7	1.0	1.3	1.7	2.1
Flow Rate	mL / min	210	210	210	210	215	215	220
Turbidity (+/- 10%)	NTU	12.3	15.3	13.7	12.5	11.8	11.5	11.4
Dissolved Oxygen (+/- 10%)	%	19.1	2.8	2.2	1.8	1.8	1.8	1.9
Dissolved Oxygen (+/- 10%)	mg/L	2.11	0.32	0.25	0.20	0.20	0.21	0.22
Eh / ORP (+/- 10)	MeV	-171.8	-194.4	-198.4	-201.3	-201.3	-201.9	-201.5
Specific Conductivity	mS/cm^c	1.12	1.18	1.23	1.24	1.24	1.22	1.19
Conductivity (+/- 3%)	mS/cm	0.77	0.83	0.87	0.88	0.87	0.86	0.85
pH (+/- 0.1)	pH unit	7.63	7.66	7.63	7.62	7.62	7.61	7.61
Temp (+/- 0.5)	C	8.6	9.5	9.3	9.7	9.4	9.6	9.8
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	sl. org.	organic	organic	organic	organic	organic	organic

Comments

Purge Start Time: 1129

Sample Time: 1211

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-32 Date: 3/21 /2017

Samplers: Chris French & Ross McCredy

Sample Number: MW-32 032117 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	91.60	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	66.05	feet
4. C = Column of Water in Casing:	25.55	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	4.16	gal
6. D2 = Pump Setting Depth (ft):	87'	feet
7. C2 = Column of water in Pump/Tubing (ft):	—	feet
8. Tubing Volume = C2(0.005737088)	—	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 Plus and ~~Lamotte 2020 WE~~ Hach 2100Q

Parameter	Units	Readings					
Time	24 hr	1250	1255	1300	1305	1310	1315
Water Level (0.33)	feet	65.45	65.45	65.45	65.45	65.45	65.45
Volume Purged	gal	0	0.5	1.0	1.5	2.0	2.5
Flow Rate	mL / min	220	220	220	220	220	225
Turbidity (+/- 10%)	NTU	11.6	~~220~~ 203	3.33	3.76	3.94	4.01
Dissolved Oxygen (+/- 10%)	%	9.8	~~3.8~~	9.3	15.1	16.0	18.0
Dissolved Oxygen (+/- 10%)	mg/L	1.16	~~0.40~~	1.04	1.90	~~1.76~~ 1.77	1.77
Eh / ORP (+/- 10)	MeV	-125.9	-143.5	-144.6	-140.4	-140.5	-140.7
Specific Conductivity	mS/cm^c	1.02	0.98	0.94	0.90	0.86	0.86
Conductivity (+/- 3%)	mS/cm	0.74	0.72	0.69	0.67	0.64	0.64
pH (+/- 0.1)	pH unit	7.52	7.55	7.54	7.54	7.54	7.54
Temp (+/- 0.5)	C	10.6	11.0	11.2	11.2	11.2	11.1
Color	Visual	Clear	Clear	Clear	Clear	Clear	Clear
Odor	Olfactory	None	None	None	None	None	none

Comments

Purge Start Time: 1245

Sample Time: 1315

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-33 Date: 3/22/2017

Samplers: Chris French & Ross McCredy

Sample Number: MW-33 032217 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	92.31	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	66.11	feet
4. C = Column of Water in Casing:	26.2	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	4.27	gal
6. D2 = Pump Setting Depth (ft):	87	feet
7. C2 = Column of water in Pump/Tubing (ft):	-	feet
8. Tubing Volume = C2(0.005737088)	-	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 Plus and ~~Lamotte 2020 WE~~ Hach 2100 Q

Parameter	Units	Readings							
Time	24 hr	1245	1250	1300	1300	1305	1310	1315	1320
Water Level (0.33)	feet	66.25	66.25	66.24	66.23	66.23	66.22	66.23	66.23
Volume Purged	gal	0	0.25	0.25	0.5	0.75	1.0	1.25	1.50
Flow Rate	mL / min	200	200	200	200	180	180	180	180
Turbidity (+/- 10%)	NTU	31.3	21.1	16.2	14.1	15.0	12.5	11.9	11.7
Dissolved Oxygen (+/- 10%)	%	93.3	56.2	28.4	23.7	21.7	21.1	21.5	21.6
Dissolved Oxygen (+/- 10%)	mg/L	11.19	6.13	3.36	2.74	2.49	2.44	2.47	2.50
Eh / ORP (+/- 10)	MeV	-65.8	-65.4	-56.3	-59.7	-62.5	-63.6	-64.5	-64.3
Specific Conductivity	mS/cm^c	0.546	0.561	0.543	0.551	0.550	0.552	0.552	0.556
Conductivity (+/- 3%)	mS/cm	0.370	0.379	0.369	0.383	0.385	0.388	0.385	0386
pH (+/- 0.1)	pH unit	7.75	7.74	7.60	7.59	7.58	7.58	7.57	7.58
Temp (+/- 0.5)	C	8.2	8.2	8.4	9.1	9.3	9.2	9.1	9.0
Color	Visual	milky	Clear	Clear	Clear	Clear	clear	clear	clear
Odor	Olfactory	sl. org.	sl. org.	none	none	none	None	None	None

Comments

Purge Start Time: 1240

Sample Time: 1320

1250 - Solenoid valve on pump stopped working. Pump taken apart to fix, purging stopped.

1300 - Solenoid valve unstuck

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-34 Date: 3/21/2017

Samplers: Chris French & Ross McCredy

Sample Number: MW-34 032117 QA/QC Collected? NO

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	88.08	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	63.70	feet
4. C = Column of Water in Casing:	24.38	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	4.14	gal
6. D2 = Pump Setting Depth (ft):	87.0	feet
7. C2 = Column of water in Pump/Tubing (ft):	–	feet
8. Tubing Volume = C2(0.005737088)	–	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 Plus and ~~Lamotte 2020 WE~~ Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	1120	1125	1130	1135	1140	1145	1150
Water Level (0.33)	feet	63.90	63.90	63.90	63.90	63.90	63.90	63.90
Volume Purged	gal	0	0.5	1.0	2.0	3.0	3.5	4.0
Flow Rate	mL / min	240	240	240	240	240	240	240
Turbidity (+/- 10%)	NTU	108	104	105	65.0	46.5	28.1	16.6
Dissolved Oxygen (+/- 10%)	%	17.9	1.9	1.7	1.3	1.3	2.0	1.6
Dissolved Oxygen (+/- 10%)	mg/L	2.24	0.22	0.18	0.14	0.14	0.22	0.18
Eh / ORP (+/- 10)	MeV	-97.7	-100.9	-84.8	-94.8	-118.3	-101.6	-106.8
Specific Conductivity	mS/cm[c]	2.92	3.46	3.46	3.37	3.31	3.27	3.27
Conductivity (+/- 3%)	mS/cm	2.87	2.52	2.53	2.49	2.42	2.40	2.37
pH (+/- 0.1)	pH unit	7.08	7.16	7.16	7.21	7.25	7.28	7.32
Temp (+/- 0.5)	C	9.8	11.0	11.0	11.1	11.2	11.1	11.0
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	None	Sl. organic	Sl. organic	Sl. org.	Sl. org	Sl. org	Sl. org

Comments

Purge Start Time: 1119

Sample Time: 1215

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-34 Date: 3/21/2017

Samplers: Chris French & Ross McCredy

Sample Number: MW-34 032117 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	88.08	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	63.70	feet
4. C = Column of Water in Casing:	24.38	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	4.14	gal
6. D2 = Pump Setting Depth (ft):	87	feet
7. C2 = Column of water in Pump/Tubing (ft):	-	feet
8. Tubing Volume = C2(0.005737088)	-	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 Plus and ~~Lamotte 2020 WE~~ Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	1155	1200	1205	1210	1215		
Water Level (0.33)	feet	63.90	63.90	63.90	63.90	63.90		
Volume Purged	gal	4.5	5.0	5.5	6.0	6.5		
Flow Rate	mL / min	235	290	240	250	295		
Turbidity (+/- 10%)	NTU	10.8	6.98	5.10	4.93	4.59		
Dissolved Oxygen (+/- 10%)	%	1.3	1.2	~~1.1~~	1.2	1.		
Dissolved Oxygen (+/- 10%)	mg/L	0.14	0.13	0.12	0.13	0.12		
Eh / ORP (+/- 10)	MeV	-139.0	-135.9	-149.6	-147.5	-94.0		
Specific Conductivity	mS/cm[c]	3.19	3.18	3.15	3.12	3.09		
Conductivity (+/- 3%)	mS/cm	~~2~~ 2.34	2.34	2.32	2.30	2.28		
pH (+/- 0.1)	pH unit	7.37	7.37	7.42	7.43	7.45		
Temp (+/- 0.5)	C	11.2	11.1	11.2	11.2	11.3		
Color	Visual	clear	clear	clear	clear	clear		
Odor	Olfactory	sl. org.	sl. org.	sl. org.	sl. org.	sl. org.		

Comments

Purge Start Time: 1119

Sample Time: 1215

* Three consecutive readings within range indicates stabilization of that parameter.

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641.9

Monitoring Well Number: MW-35 Date: 3/22/2017

Samplers: Chris French & Ross McCredy

Sample Number: MW-35 032217 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	92.20	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	63.56	feet
4. C = Column of Water in Casing:	28.64	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	4.67	gal
6. D2 = Pump Setting Depth (ft):	87.25	feet
7. C2 = Column of water in Pump/Tubing (ft):	–	feet
8. Tubing Volume = C2(0.005737088)	–	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 Plus and ~~Lamotte 2020 WE~~ Hach 2100 Q

Parameter	Units	Readings							
Time	24 hr	1355	1400	1405	1410	1415	1420	1425	1430
Water Level (0.33)	feet	63.50	63.50	63.50	63.50	63.50	63.50	63.50	63.50
Volume Purged	gal	0	0.25	0.50	0.75	1.00	1.25	1.50	1.75
Flow Rate	mL / min	230	230	230	230	230	230	230	230
Turbidity (+/- 10%)	NTU	38.0	27.9	20.9	19.4	18.5	17.8	16.9	16.3
Dissolved Oxygen (+/- 10%)	%	92.4	86.7	76.6	72.1	66.6	58.9	57.2	56.1
Dissolved Oxygen (+/- 10%)	mg/L	10.93	9.84	8.70	7.99	7.53	6.90	6.70	6.68
Eh / ORP (+/- 10)	MeV	-63.3	-72.2	-70.4	-67.6	-68.0	-67.7	-64.8	-68.4
Specific Conductivity	mS/cm[c]	0.080	0.079	0.087	0.092	0.097	0.101	0.103	0.109
Conductivity (+/- 3%)	mS/cm	0.051	0.056	0.062	0.065	0.068	0.072	0.071	0.078
pH (+/- 0.1)	pH unit	8.67	8.80	8.79	8.77	8.80	8.79	8.79	8.79
Temp (+/- 0.5)	C	5.1	9.6	9.9	9.8	9.7	9.8	9.7	9.8
Color	Visual	milky	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	none	None	None	None	None	None	None	None

Comments

Purge Start Time: 1350

Sample Time: 1430

* Three consecutive readings within range indicates stabilization of that parameter.

APPENDIX B: Laboratory Reports

ALS Environmental

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

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

March 29, 2017

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

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO**	Workorder:	**2216212**
Purchase Order:	**60440641.11**	Workorder ID:	**ASN017|Scotia Navy Depot**

Dear Ms. Lurie:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, March 21, 2017.

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. Vicki A. Forney (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. John Santacroce , Mr. Scott Underhill

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

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

ALS Environmental

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

SAMPLE SUMMARY

Workorder: 2216212 ASN017|Scotia Navy Depot

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2216212001	MW-16 032017	Ground Water	3/20/2017 15:24	3/21/2017 09:15	Collected by Client

ALS Environmental

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

SAMPLE SUMMARY

Workorder: 2216212 ASN017|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 incurbator and the "Analyzed" value is the date/time out the incubator.

Standard Acronyms/Flags

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

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

ANALYTICAL RESULTS

Workorder: 2216212 ASN017|Scotia Navy Depot

Lab ID: **2216212001** Date Collected: 3/20/2017 15:24 Matrix: Ground Water

Sample ID: **MW-16 032017** Date Received: 3/21/2017 09:15

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			3/23/17 14:35	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:35	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:35	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:35	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:35	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:35	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:35	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:35	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:35	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:35	TMP	A
1,1,1-Trichloroethane	0.53J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:35	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:35	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:35	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:35	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	103		%	81 - 118			SW846 8260C			3/23/17 14:35	TMP	A
4-Bromofluorobenzene (S)	107		%	85 - 114			SW846 8260C			3/23/17 14:35	TMP	A
Dibromofluoromethane (S)	97		%	80 - 119			SW846 8260C			3/23/17 14:35	TMP	A
Toluene-d8 (S)	94.7		%	89 - 112			SW846 8260C			3/23/17 14:35	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			3/23/17 01:13	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			3/23/17 01:13	EGO	C
Methane	0.32J	J	ug/L	0.50	0.25	0.13	RSK 175			3/23/17 01:13	EGO	C
WET CHEMISTRY												
Alkalinity, Total	317	3	mg/L	5	5	0.8	S2320B-97			3/22/17 02:00	MSA	H
Chloride	5.6		mg/L	2.0	0.50	0.16	EPA 300.0			3/23/17 05:11	CHW	G
Nitrate-N	2.1	2	mg/L	0.20	0.060	0.020	EPA 300.0			3/23/17 05:11	CHW	G
Sulfate	65.3		mg/L	2.0	0.50	0.20	EPA 300.0			3/23/17 05:11	CHW	G
Total Organic Carbon (TOC)	1.1		mg/L	1.0	0.50	0.18	S5310B-00			3/27/17 10:46	PAG	E

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2216212001	2	MW-16 032017	EPA 300.0	Nitrate-N
Analyte was analyzed past the 48 hour holding time.				
2216212001	3	MW-16 032017	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

ALS Environmental

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

QUALITY CONTROL DATA

Workorder: 2216212 ASN017|Scotia Navy Depot

QC Batch: SVGC/44864 **Analysis Method:** RSK 175

QC Batch Method: RSK 175

Associated Lab Samples: 2216212001

METHOD BLANK: 2505665

Parameter	Blank Result	Units	Reporting Limit
Ethane	0.50U	ug/L	1.0
Ethene	0.75U	ug/L	1.5
Methane	0.40J	ug/L	0.50

SAMPLE DUPLICATE: 2505666 ORIGINAL: 2216645002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	.21	ug/L	.19	10	20
Ethene	.24	ug/L	.23	4.26	20
Methane	1.69	ug/L	1.53	9.94	20

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

QUALITY CONTROL DATA

Workorder: 2216212 ASN017|Scotia Navy Depot

QC Batch: VOMS/42801 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 2216212001

METHOD BLANK: 2505913

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)	95.7	%	81 - 118
4-Bromofluorobenzene (S)	99.2	%	85 - 114
Dibromofluoromethane (S)	89.2	%	80 - 119
Toluene-d8 (S)	89.2	%	89 - 112

LABORATORY CONTROL SAMPLE: 2505914

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	115	ug/L	20	23.0	72 - 136
1,1-Dichloroethane	109	ug/L	20	21.8	77 - 125
1,2-Dichloroethane	103	ug/L	20	20.5	73 - 128
1,1-Dichloroethene	116	ug/L	20	23.1	71 - 131
cis-1,2-Dichloroethene	106	ug/L	20	21.1	78 - 123
trans-1,2-Dichloroethene	115	ug/L	20	23.0	75 - 124
1,1,1,2-Tetrachloroethane	106	ug/L	20	21.2	78 - 124
1,1,2,2-Tetrachloroethane	103	ug/L	20	20.5	71 - 121
Tetrachloroethene	105	ug/L	20	21.1	74 - 129
Toluene	109	ug/L	20	21.8	80 - 121
1,1,1-Trichloroethane	109	ug/L	20	21.9	74 - 131
1,1,2-Trichloroethane	101	ug/L	20	20.3	80 - 119
Trichloroethene	103	ug/L	20	20.6	79 - 123

QUALITY CONTROL DATA

Workorder: 2216212 ASN017|Scotia Navy Depot

Vinyl Chloride	95.2	ug/L	20	19.0	58 - 137
1,2-Dichloroethane-d4 (S)	98.7	%			81 - 118
4-Bromofluorobenzene (S)	107	%			85 - 114
Dibromofluoromethane (S)	99	%			80 - 119
Toluene-d8 (S)	94.5	%			89 - 112

MATRIX SPIKE: 2506015 DUPLICATE: 2506016 ORIGINAL: 2216645002

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

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Carbon Tetrachloride	0	ug/L	20	24.3892	24.5434	122	123	72 - 136	.63	30
1,1-Dichloroethane	0	ug/L	20	22.7862	23.523	114	118	77 - 125	3.18	30
1,2-Dichloroethane	0	ug/L	20	21.0479	21.3626	105	107	73 - 128	1.48	30
1,1-Dichloroethene	0	ug/L	20	23.7919	25.1521	119	126	71 - 131	5.56	30
cis-1,2-Dichloroethene	0	ug/L	20	21.7929	22.3545	109	112	78 - 123	2.54	30
trans-1,2-Dichloroethene	0	ug/L	20	24.0919	24.755	120	124	75 - 124	2.72	30
1,1,1,2-Tetrachloroethane	0	ug/L	20	20.6832	21.576	103	108	78 - 124	4.23	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	20.6064	21.5252	103	108	71 - 121	4.36	30
Tetrachloroethene	0	ug/L	20	20.9329	22.0605	105	110	74 - 129	5.25	30
Toluene	0	ug/L	20	21.646	22.9202	108	115	80 - 121	5.72	30
1,1,1-Trichloroethane	0	ug/L	20	23.3225	24.1847	117	121	74 - 131	3.63	30
1,1,2-Trichloroethane	0	ug/L	20	19.8033	21.1152	99	106	80 - 119	6.41	30
Trichloroethene	1.68681	ug/L	20	23.5951	24.0331	110	112	79 - 123	1.84	30
Vinyl Chloride	0	ug/L	20	20.5787	21.0985	103	105	58 - 137	2.49	30
1,2-Dichloroethane-d4 (S)	100	%				100	95.6	81 - 118		
4-Bromofluorobenzene (S)	103	%				103	107	85 - 114		
Dibromofluoromethane (S)	97.9	%				97.9	101	80 - 119		
Toluene-d8 (S)	90.6	%				90.6	94.1	89 - 112		

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QUALITY CONTROL DATA

Workorder: 2216212 ASN017|Scotia Navy Depot

QC Batch: WETC/184633 **Analysis Method:** S2320B-97

QC Batch Method: S2320B-97

Associated Lab Samples: 2216212001

METHOD BLANK: 2504869

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	0.9J	mg/L	5

SAMPLE DUPLICATE: 2504874 ORIGINAL: 2216088002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	58.97691	mg/L	61.81926	4.71	20

METHOD BLANK: 2504877

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

SAMPLE DUPLICATE: 2504878 ORIGINAL: 2216212001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	316.5162	mg/L	308.13721	2.68	20

METHOD BLANK: 2504881

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

METHOD BLANK: 2504885

Parameter	Blank Result	Units	Reporting Limit

QUALITY CONTROL DATA

Workorder: 2216212 ASN017|Scotia Navy Depot

Alkalinity, Total	1J	mg/L	5

SAMPLE DUPLICATE: 2504886 ORIGINAL: 2216387003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	137.43733	mg/L	140.74956	2.38	20

METHOD BLANK: 2504942

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	0.9J	mg/L	5

SAMPLE DUPLICATE: 2504943 ORIGINAL: 2216449010

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	165.80394	mg/L	156.15445	5.99	20

METHOD BLANK: 2505047

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

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QUALITY CONTROL DATA

Workorder: 2216212 ASN017|Scotia Navy Depot

QC Batch: WETC/184698 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 2216212001

METHOD BLANK: 2505687

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

LABORATORY CONTROL SAMPLE: 2505689

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	108	mg/L	20	21.6	87 - 111
Nitrate-N	109	mg/L	2.5	2.7	88 - 111
Sulfate	109	mg/L	20	21.8	87 - 112

MATRIX SPIKE: 2505691 DUPLICATE: 2505692 ORIGINAL: 2216645002

****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	59.02	mg/L	40	105.52	98.56	116*	98.8	87 - 111	6.82	15
Nitrate-N	0	mg/L	5	5.82	5.76	116*	115*	88 - 111	1.04	15
Sulfate	24.06	mg/L	40	66.36	64.48	106	101	87 - 112	2.87	15

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QUALITY CONTROL DATA

Workorder: 2216212 ASN017|Scotia Navy Depot

QC Batch: WETC/184875 **Analysis Method:** S5310B-00

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 2216212001

METHOD BLANK: 2507920

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

LABORATORY CONTROL SAMPLE: 2507921

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	98.1	mg/L	1	0.98J	85 - 115

MATRIX SPIKE: 2507922 DUPLICATE: 2507923 ORIGINAL: 2216279001

****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)	.109	mg/L	6	6.371	6.402	104	105	85 - 115	.49	20

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2216212 ASN017|Scotia Navy Depot

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2216212001	MW-16 032017			S2320B-97	WETC/184633
2216212001	MW-16 032017			RSK 175	SVGC/44864
2216212001	MW-16 032017			EPA 300.0	WETC/184698
2216212001	MW-16 032017			SW846 8260C	VOMS/42801
2216212001	MW-16 032017			S5310B-00	WETC/184875

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

ALS Environmental

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAGE ___

2216212

Project Name: Scotia Navy Depot	Project Number: 60440641.9
Project Manager: John Santacroce	Report CC: John Santacroce
Company/Address: AECOM, 40 British American Blvd, Latham, NY 12110	
Phone #: 518-951-2200	Email: John.Santacroce@aecom.com
Sampler's Signature: Chris French	Sampler's Printed Name: Chris French

ANALYSIS REQUESTED (Include Method Number and Container Preservative)

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	8260C	RSK 175	TOC	Alkalinity	Cl, SO4, NO3	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	REMARKS/ ALTERNATE DESCRIPTION
PRESERVATIVE						1	1	1	0	0			
MW-16 032017		3/20/17	1524	GW	8	X 3	X 2	X 2	X 1	X 1			
Trip Blank (NOT rec'd JLS 3/21)		–	–	AQ	2	X							

Chris French (initialed, lines struck) — AF 3/21/17

Preservative Key: 0. NONE 1. HCL 2. HNO_3 3. H_2SO_4 4. NaOH 5. Zn. Acetate 6. MeOH 7. $NaHSO_4$ 8. Other ______

SPECIAL INSTRUCTIONS/COMMENTS: Metals

See QAPP

	Y	N	Initials
Custody Seals Present?		✓	JLS
(if present) Seals Intact?			
Received on Ice?	✓		
COC/Lbls Complete	✓		
Cont in Good Cond?		✓ (circled)	
Correct Containers?	✓		
Correct Samp Vol?	✓		
Correct Preservation?	✓		
Headspace/Volatiles?		✓	

Cooler Temp: 1 °C

Cooler #:

Therm ID: TH 318

Ship Carrier: FedEx (circled) UPS DHL

Tracking #: 643083100129

TRIP BLANKS NOT Rec'd. We did rec. 2 empty VIALS But they are not labeled. TB JLS 3/21/17

TURNAROUND REQUIREMENTS
RUSH (SURCHARGES APPLY)
___ 1 day ___ 2 day ___ 3 day
___ 4 day ___ 5 day
Standard
REQUESTED REPORT DATE: Standard

REPORT REQUIREMENTS
___ I. Results Only See QAPP
___ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
___ III. Results + QC and Calibration Summaries
___ IV. Data Validation Report with Raw Data
See QAPP
Edata X Yes ___ No

INVOICE INFORMATION
PO # 60440641
BILL TO: John Santacroce
AECOM
40 British American Blvd
Latham, NY 12110

STATE WHERE SAMPLES WERE COLLECTED: New York

	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	Chris French	Brian McGuirk	Brian McGuirk	Brian McGuirk		Jessica Smith
Printed Name	Chris French	BRIAN MCGUIRK	BRIAN MCGUIRK	BRIAN MCGUIRK		JESSICA SMITH
Firm	AECOM	ALS	ALS	ALS		ALS
Date/Time	3/20/17 1535	3/20/17 1535	3/20/17 1720	3/20/17 1900		3/21/17 0915

Distribution: White - Lab Copy; Yellow - Return to Originator

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March 31, 2017

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

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO**	Workorder:	**2216645**
Purchase Order:	**60440641.11**	Workorder ID:	**ASN018|Scotia Navy Depot**

Dear Ms. Lurie:

Enclosed are the analytical results for samples received by the laboratory on Wednesday, March 22, 2017.

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. Vicki A. Forney (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. John Santacroce , Mr. Scott Underhill

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

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

ALS Environmental

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SAMPLE SUMMARY

Workorder: 2216645 ASN018|Scotia Navy Depot

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2216645001	MW-26 032117	Ground Water	3/21/2017 09:05	3/22/2017 08:56	Collected by Client
2216645002	MW-24 032117	Ground Water	3/21/2017 10:35	3/22/2017 08:56	Collected by Client
2216645003	MW-32 032117	Ground Water	3/21/2017 13:15	3/22/2017 08:56	Collected by Client
2216645004	MW-34 032117	Ground Water	3/21/2017 12:15	3/22/2017 08:56	Collected by Client
2216645005	DUP-01 032117	Ground Water	3/21/2017 00:00	3/22/2017 08:56	Collected by Client
2216645006	Trip Blank	Ground Water	3/22/2017 08:56	3/22/2017 08:56	Collected by Client
2216645007	MW-30 032117	Ground Water	3/21/2017 14:23	3/22/2017 08:56	Collected by Client

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SAMPLE SUMMARY

Workorder: 2216645 ASN018|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 incurbator and the "Analyzed" value is the date/time out the incubator.

Standard Acronyms/Flags

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

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ANALYTICAL RESULTS

Workorder: 2216645 ASN018|Scotia Navy Depot

Lab ID: **2216645001** Date Collected: 3/21/2017 09:05 Matrix: Ground Water

Sample ID: **MW-26 032117** Date Received: 3/22/2017 08:56

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			3/23/17 14:57	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:57	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:57	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:57	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:57	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:57	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:57	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:57	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:57	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:57	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:57	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:57	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:57	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 14:57	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	81 - 118			SW846 8260C			3/23/17 14:57	TMP	A
4-Bromofluorobenzene (S)	109		%	85 - 114			SW846 8260C			3/23/17 14:57	TMP	A
Dibromofluoromethane (S)	98.5		%	80 - 119			SW846 8260C			3/23/17 14:57	TMP	A
Toluene-d8 (S)	95.8		%	89 - 112			SW846 8260C			3/23/17 14:57	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			3/23/17 01:28	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			3/23/17 01:28	EGO	C
Methane	1.4		ug/L	0.50	0.25	0.13	RSK 175			3/23/17 01:28	EGO	C
WET CHEMISTRY												
Alkalinity, Total	196	1	mg/L	5	5	0.8	S2320B-97			3/23/17 04:33	MSA	H
Chloride	53.4		mg/L	2.0	0.50	0.16	EPA 300.0			3/23/17 05:25	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			3/23/17 05:25	CHW	G
Sulfate	29.4		mg/L	2.0	0.50	0.20	EPA 300.0			3/23/17 05:25	CHW	G
Total Organic Carbon (TOC)	1.3J	J	mg/L	2.0	1.0	0.37	S5310B-00			3/27/17 14:28	PAG	E

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

ANALYTICAL RESULTS

Workorder: 2216645 ASN018|Scotia Navy Depot

Lab ID: **2216645002** Date Collected: 3/21/2017 10:35 Matrix: Ground Water

Sample ID: **MW-24 032117** Date Received: 3/22/2017 08:56

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			3/23/17 15:19	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:19	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:19	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:19	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:19	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:19	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:19	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:19	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:19	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:19	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:19	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:19	TMP	A
Trichloroethene	1.7		ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:19	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:19	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	81 - 118			SW846 8260C			3/23/17 15:19	TMP	A
4-Bromofluorobenzene (S)	107		%	85 - 114			SW846 8260C			3/23/17 15:19	TMP	A
Dibromofluoromethane (S)	98.6		%	80 - 119			SW846 8260C			3/23/17 15:19	TMP	A
Toluene-d8 (S)	95.2		%	89 - 112			SW846 8260C			3/23/17 15:19	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			3/23/17 01:45	EGO	G
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			3/23/17 01:45	EGO	G
Methane	1.7		ug/L	0.50	0.25	0.13	RSK 175			3/23/17 01:45	EGO	G
WET CHEMISTRY												
Alkalinity, Total	205	1	mg/L	5	5	0.8	S2320B-97			3/23/17 02:22	MSA	V
Chloride	59.0		mg/L	2.0	0.50	0.16	EPA 300.0			3/23/17 05:39	CHW	S
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			3/23/17 05:39	CHW	S
Sulfate	24.1		mg/L	2.0	0.50	0.20	EPA 300.0			3/23/17 05:39	CHW	S
Total Organic Carbon (TOC)	1.0J	J	mg/L	2.0	1.0	0.37	S5310B-00			3/27/17 14:28	PAG	M

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

ANALYTICAL RESULTS

Workorder: 2216645 ASN018|Scotia Navy Depot

Lab ID: **2216645003** Date Collected: 3/21/2017 13:15 Matrix: Ground Water

Sample ID: **MW-32 032117** Date Received: 3/22/2017 08:56

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			3/23/17 15:40	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:40	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:40	TMP	A
1,1-Dichloroethene	0.40J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:40	TMP	A
cis-1,2-Dichloroethene	1.2		ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:40	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:40	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:40	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:40	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:40	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:40	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:40	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:40	TMP	A
Trichloroethene	191		ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:40	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 15:40	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118			SW846 8260C			3/23/17 15:40	TMP	A
4-Bromofluorobenzene (S)	110		%	85 - 114			SW846 8260C			3/23/17 15:40	TMP	A
Dibromofluoromethane (S)	98.6		%	80 - 119			SW846 8260C			3/23/17 15:40	TMP	A
Toluene-d8 (S)	96.7		%	89 - 112			SW846 8260C			3/23/17 15:40	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	19.3		ug/L	1.0	0.50	0.25	RSK 175			3/23/17 02:17	EGO	C
Ethene	10.3		ug/L	1.5	0.75	0.31	RSK 175			3/23/17 02:17	EGO	C
Methane	309		ug/L	0.50	0.25	0.13	RSK 175			3/23/17 02:17	EGO	C
WET CHEMISTRY												
Alkalinity, Total	214	1	mg/L	5	5	0.8	S2320B-97			3/23/17 04:44	MSA	H
Chloride	84.6		mg/L	2.0	0.50	0.16	EPA 300.0			3/23/17 06:21	CHW	G
Nitrate-N	0.020J	J	mg/L	0.20	0.060	0.020	EPA 300.0			3/23/17 06:21	CHW	G
Sulfate	0.68J	J	mg/L	2.0	0.50	0.20	EPA 300.0			3/23/17 06:21	CHW	G
Total Organic Carbon (TOC)	98.0		mg/L	50.0	25.0	9.2	S5310B-00			3/29/17 11:31	PAG	E

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

ANALYTICAL RESULTS

Workorder: 2216645 ASN018|Scotia Navy Depot

Lab ID: **2216645004** Date Collected: 3/21/2017 12:15 Matrix: Ground Water

Sample ID: **MW-34 032117** Date Received: 3/22/2017 08:56

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			3/23/17 16:02	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:02	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:02	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:02	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:02	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:02	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:02	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:02	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:02	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:02	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:02	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:02	TMP	A
Trichloroethene	48.3		ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:02	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:02	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	81 - 118			SW846 8260C			3/23/17 16:02	TMP	A
4-Bromofluorobenzene (S)	110		%	85 - 114			SW846 8260C			3/23/17 16:02	TMP	A
Dibromofluoromethane (S)	100		%	80 - 119			SW846 8260C			3/23/17 16:02	TMP	A
Toluene-d8 (S)	94		%	89 - 112			SW846 8260C			3/23/17 16:02	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	17.3		ug/L	1.0	0.50	0.25	RSK 175			3/23/17 02:34	EGO	C
Ethene	4.4		ug/L	1.5	0.75	0.31	RSK 175			3/23/17 02:34	EGO	C
Methane	1780		ug/L	0.50	0.25	0.13	RSK 175			3/23/17 02:34	EGO	C
WET CHEMISTRY												
Alkalinity, Total	597	1	mg/L	5	5	0.8	S2320B-97			3/23/17 04:57	MSA	H
Chloride	461		mg/L	10.0	2.5	0.80	EPA 300.0			3/30/17 05:11	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			3/23/17 06:35	CHW	G
Sulfate	0.56J	J	mg/L	2.0	0.50	0.20	EPA 300.0			3/23/17 06:35	CHW	G
Total Organic Carbon (TOC)	631		mg/L	100	50.0	18.4	S5310B-00			3/29/17 11:31	PAG	E

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

ANALYTICAL RESULTS

Workorder: 2216645 ASN018|Scotia Navy Depot

Lab ID: **2216645005** Date Collected: 3/21/2017 00:00 Matrix: Ground Water

Sample ID: **DUP-01 032117** Date Received: 3/22/2017 08:56

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			3/23/17 16:24	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:24	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:24	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:24	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:24	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:24	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:24	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:24	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:24	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:24	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:24	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:24	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:24	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:24	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	103		%	81 - 118			SW846 8260C			3/23/17 16:24	TMP	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C			3/23/17 16:24	TMP	A
Dibromofluoromethane (S)	99.4		%	80 - 119			SW846 8260C			3/23/17 16:24	TMP	A
Toluene-d8 (S)	94.7		%	89 - 112			SW846 8260C			3/23/17 16:24	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			3/23/17 02:50	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			3/23/17 02:50	EGO	C
Methane	1.3		ug/L	0.50	0.25	0.13	RSK 175			3/23/17 02:50	EGO	C
WET CHEMISTRY												
Alkalinity, Total	206	1	mg/L	5	5	0.8	S2320B-97			3/23/17 05:08	MSA	H
Chloride	52.6		mg/L	2.0	0.50	0.16	EPA 300.0			3/23/17 06:49	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			3/23/17 06:49	CHW	G
Sulfate	29.1		mg/L	2.0	0.50	0.20	EPA 300.0			3/23/17 06:49	CHW	G
Total Organic Carbon (TOC)	1.1J	J	mg/L	2.0	1.0	0.37	S5310B-00			3/29/17 11:31	PAG	E

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ANALYTICAL RESULTS

Workorder: 2216645 ASN018|Scotia Navy Depot

Lab ID: **2216645006** Date Collected: 3/22/2017 08:56 Matrix: Ground Water

Sample ID: **Trip Blank** Date Received: 3/22/2017 08:56

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		3/23/17 13:07	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	99.3		%	81 - 118	SW846 8260C		3/23/17 13:07	TMP	A
4-Bromofluorobenzene (S)	110		%	85 - 114	SW846 8260C		3/23/17 13:07	TMP	A
Dibromofluoromethane (S)	95.7		%	80 - 119	SW846 8260C		3/23/17 13:07	TMP	A
Toluene-d8 (S)	95.2		%	89 - 112	SW846 8260C		3/23/17 13:07	TMP	A

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2216645 ASN018|Scotia Navy Depot

Lab ID: **2216645007** Date Collected: 3/21/2017 14:23 Matrix: Ground Water

Sample ID: **MW-30 032117** Date Received: 3/22/2017 08:56

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			3/23/17 16:46	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:46	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:46	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:46	TMP	A
cis-1,2-Dichloroethene	0.74J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:46	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:46	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:46	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:46	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:46	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:46	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:46	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:46	TMP	A
Trichloroethene	66.3		ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:46	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/23/17 16:46	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	106		%	81 - 118			SW846 8260C			3/23/17 16:46	TMP	A
4-Bromofluorobenzene (S)	109		%	85 - 114			SW846 8260C			3/23/17 16:46	TMP	A
Dibromofluoromethane (S)	100		%	80 - 119			SW846 8260C			3/23/17 16:46	TMP	A
Toluene-d8 (S)	96.3		%	89 - 112			SW846 8260C			3/23/17 16:46	TMP	A
LIGHT HYDROCARBON GASES												
Ethane	23.5		ug/L	1.0	0.50	0.25	RSK 175			3/23/17 03:06	EGO	C
Ethene	9.1		ug/L	1.5	0.75	0.31	RSK 175			3/23/17 03:06	EGO	C
Methane	870		ug/L	0.50	0.25	0.13	RSK 175			3/23/17 03:06	EGO	C
WET CHEMISTRY												
Alkalinity, Total	210	1	mg/L	5	5	0.8	S2320B-97			3/23/17 05:18	MSA	H
Chloride	136		mg/L	2.0	0.50	0.16	EPA 300.0			3/23/17 07:03	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			3/23/17 07:03	CHW	G
Sulfate	0.50U	U	mg/L	2.0	0.50	0.20	EPA 300.0			3/23/17 07:03	CHW	G
Total Organic Carbon (TOC)	139		mg/L	50.0	25.0	9.2	S5310B-00			3/29/17 11:31	PAG	E

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2216645001	1	MW-26 032117	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2216645002	1	MW-24 032117	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2216645003	1	MW-32 032117	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2216645004	1	MW-34 032117	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2216645005	1	DUP-01 032117	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2216645007	1	MW-30 032117	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

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QUALITY CONTROL DATA

Workorder: 2216645 ASN018|Scotia Navy Depot

QC Batch: SVGC/44864 **Analysis Method:** RSK 175

QC Batch Method: RSK 175

Associated Lab Samples: 2216645001, 2216645002, 2216645003, 2216645004, 2216645005, 2216645007

METHOD BLANK: 2505665

Parameter	Blank Result	Units	Reporting Limit
Ethane	0.50U	ug/L	1.0
Ethene	0.75U	ug/L	1.5
Methane	0.40J	ug/L	0.50

SAMPLE DUPLICATE: 2505666 ORIGINAL: 2216645002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	.21	ug/L	.19	10	20
Ethene	.24	ug/L	.23	4.26	20
Methane	1.69	ug/L	1.53	9.94	20

QUALITY CONTROL DATA

Workorder: 2216645 ASN018|Scotia Navy Depot

QC Batch: VOMS/42801 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 2216645001, 2216645002, 2216645003, 2216645004, 2216645005, 2216645006, 2216645007

METHOD BLANK: 2505913

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)	95.7	%	81 - 118
4-Bromofluorobenzene (S)	99.2	%	85 - 114
Dibromofluoromethane (S)	89.2	%	80 - 119
Toluene-d8 (S)	89.2	%	89 - 112

LABORATORY CONTROL SAMPLE: 2505914

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	115	ug/L	20	23.0	72 - 136
1,1-Dichloroethane	109	ug/L	20	21.8	77 - 125
1,2-Dichloroethane	103	ug/L	20	20.5	73 - 128
1,1-Dichloroethene	116	ug/L	20	23.1	71 - 131
cis-1,2-Dichloroethene	106	ug/L	20	21.1	78 - 123
trans-1,2-Dichloroethene	115	ug/L	20	23.0	75 - 124
1,1,1,2-Tetrachloroethane	106	ug/L	20	21.2	78 - 124
1,1,2,2-Tetrachloroethane	103	ug/L	20	20.5	71 - 121
Tetrachloroethene	105	ug/L	20	21.1	74 - 129
Toluene	109	ug/L	20	21.8	80 - 121
1,1,1-Trichloroethane	109	ug/L	20	21.9	74 - 131
1,1,2-Trichloroethane	101	ug/L	20	20.3	80 - 119
Trichloroethene	103	ug/L	20	20.6	79 - 123

QUALITY CONTROL DATA

Workorder: 2216645 ASN018|Scotia Navy Depot

Vinyl Chloride	95.2	ug/L	20	19.0	58 - 137
1,2-Dichloroethane-d4 (S)	98.7	%			81 - 118
4-Bromofluorobenzene (S)	107	%			85 - 114
Dibromofluoromethane (S)	99	%			80 - 119
Toluene-d8 (S)	94.5	%			89 - 112

MATRIX SPIKE: 2506015 DUPLICATE: 2506016 ORIGINAL: 2216645002

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

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Carbon Tetrachloride	0	ug/L	20	24.3892	24.5434	122	123	72 - 136	.63	30
1,1-Dichloroethane	0	ug/L	20	22.7862	23.523	114	118	77 - 125	3.18	30
1,2-Dichloroethane	0	ug/L	20	21.0479	21.3626	105	107	73 - 128	1.48	30
1,1-Dichloroethene	0	ug/L	20	23.7919	25.1521	119	126	71 - 131	5.56	30
cis-1,2-Dichloroethene	0	ug/L	20	21.7929	22.3545	109	112	78 - 123	2.54	30
trans-1,2-Dichloroethene	0	ug/L	20	24.0919	24.755	120	124	75 - 124	2.72	30
1,1,1,2-Tetrachloroethane	0	ug/L	20	20.6832	21.576	103	108	78 - 124	4.23	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	20.6064	21.5252	103	108	71 - 121	4.36	30
Tetrachloroethene	0	ug/L	20	20.9329	22.0605	105	110	74 - 129	5.25	30
Toluene	0	ug/L	20	21.646	22.9202	108	115	80 - 121	5.72	30
1,1,1-Trichloroethane	0	ug/L	20	23.3225	24.1847	117	121	74 - 131	3.63	30
1,1,2-Trichloroethane	0	ug/L	20	19.8033	21.1152	99	106	80 - 119	6.41	30
Trichloroethene	1.68681	ug/L	20	23.5951	24.0331	110	112	79 - 123	1.84	30
Vinyl Chloride	0	ug/L	20	20.5787	21.0985	103	105	58 - 137	2.49	30
1,2-Dichloroethane-d4 (S)	100	%				100	95.6	81 - 118		
4-Bromofluorobenzene (S)	103	%				103	107	85 - 114		
Dibromofluoromethane (S)	97.9	%				97.9	101	80 - 119		
Toluene-d8 (S)	90.6	%				90.6	94.1	89 - 112		

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QUALITY CONTROL DATA

Workorder: 2216645 ASN018|Scotia Navy Depot

QC Batch: WETC/184694 **Analysis Method:** S2320B-97

QC Batch Method: S2320B-97

Associated Lab Samples: 2216645001, 2216645002, 2216645003, 2216645004, 2216645005, 2216645007

METHOD BLANK: 2505575

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

SAMPLE DUPLICATE: 2505580 ORIGINAL: 2216645002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	204.90637	mg/L	192.57541	6.2	20

METHOD BLANK: 2505583

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

SAMPLE DUPLICATE: 2505584 ORIGINAL: 2216505007

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	97.26776	mg/L	97.80231	.55	20

METHOD BLANK: 2505587

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	0.8J	mg/L	5

SAMPLE DUPLICATE: 2505588 ORIGINAL: 2216659001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD

QUALITY CONTROL DATA

Workorder: 2216645 ASN018|Scotia Navy Depot

Alkalinity, Total	105.71528	mg/L	102.91753	2.68	20

METHOD BLANK: 2505591

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

SAMPLE DUPLICATE: 2505592 ORIGINAL: 2216662003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	23.41205	mg/L	22.16128	5.49	20

METHOD BLANK: 2506531

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

SAMPLE DUPLICATE: 2505595 ORIGINAL: 2216662013

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	33.30704	mg/L	35.2999	5.81	20

METHOD BLANK: 2505598

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

SAMPLE DUPLICATE: 2505599 ORIGINAL: 2216663007

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	40.47271	mg/L	39.67828	1.98	20

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QUALITY CONTROL DATA

Workorder: 2216645 ASN018|Scotia Navy Depot

METHOD BLANK: 2505727

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

SAMPLE DUPLICATE: 2505728 ORIGINAL: 2216811002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	573.68536	mg/L	537.43781	6.52	20

METHOD BLANK: 2505731

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

SAMPLE DUPLICATE: 2505732 ORIGINAL: 2216831002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	110.36606	mg/L	105.7785	4.24	20

METHOD BLANK: 2505868

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

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QUALITY CONTROL DATA

Workorder: 2216645 ASN018|Scotia Navy Depot

QC Batch: WETC/184698 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 2216645001, 2216645002, 2216645003, 2216645004, 2216645005, 2216645007

METHOD BLANK: 2505687

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

LABORATORY CONTROL SAMPLE: 2505689

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	108	mg/L	20	21.6	87 - 111
Nitrate-N	109	mg/L	2.5	2.7	88 - 111
Sulfate	109	mg/L	20	21.8	87 - 112

MATRIX SPIKE: 2505691 DUPLICATE: 2505692 ORIGINAL: 2216645002

****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	59.02	mg/L	40	105.52	98.56	116*	98.8	87 - 111	6.82	15
Nitrate-N	0	mg/L	5	5.82	5.76	116*	115*	88 - 111	1.04	15
Sulfate	24.06	mg/L	40	66.36	64.48	106	101	87 - 112	2.87	15

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QUALITY CONTROL DATA

Workorder: 2216645 ASN018|Scotia Navy Depot

QC Batch: WETC/184894 **Analysis Method:** S5310B-00

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 2216645001, 2216645002, 2216645003, 2216645004, 2216645005, 2216645007

METHOD BLANK: 2508090

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

LABORATORY CONTROL SAMPLE: 2508091

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	100	mg/L	1	1.0	85 - 115

MATRIX SPIKE: 2508092 DUPLICATE: 2508093 ORIGINAL: 2216645002

****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)	1.006	mg/L	12	14.306	13.798	111	107	85 - 115	3.62	20

MATRIX SPIKE: 2508098 DUPLICATE: 2508099 ORIGINAL: 2216837005

****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)	1.997	mg/L	6	8.018	8.13	100	102	85 - 115	1.39	20

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QUALITY CONTROL DATA

Workorder: 2216645 ASN018|Scotia Navy Depot

QC Batch: WETC/184994 **Analysis Method:** S5310B-00

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 2216645003, 2216645004, 2216645005, 2216645007

METHOD BLANK: 2509351

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

LABORATORY CONTROL SAMPLE: 2509352

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	97.4	mg/L	1	0.97J	85 - 115

MATRIX SPIKE: 2509353 DUPLICATE: 2509354 ORIGINAL: 2216645003

****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)	98	mg/L	300	402.3	402.35	101	101	85 - 115	.01	20

MATRIX SPIKE: 2509355 DUPLICATE: 2509356 ORIGINAL: 2217269006

****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)	17.825	mg/L	150	169.9	172.375	101	103	85 - 115	1.45	20

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QUALITY CONTROL DATA

Workorder: 2216645 ASN018|Scotia Navy Depot

QC Batch: WETC/185028 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 2216645004

METHOD BLANK: 2509810

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.080J	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2509812

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	101	mg/L	20	20.2	87 - 111
Nitrate-N	97.6	mg/L	2.5	2.4	88 - 111
Sulfate	97	mg/L	20	19.4	87 - 112

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2216645 ASN018|Scotia Navy Depot

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2216645001	MW-26 032117			S2320B-97	WETC/184694
2216645002	MW-24 032117			S2320B-97	WETC/184694
2216645003	MW-32 032117			S2320B-97	WETC/184694
2216645004	MW-34 032117			S2320B-97	WETC/184694
2216645005	DUP-01 032117			S2320B-97	WETC/184694
2216645007	MW-30 032117			S2320B-97	WETC/184694
2216645001	MW-26 032117			RSK 175	SVGC/44864
2216645002	MW-24 032117			RSK 175	SVGC/44864
2216645003	MW-32 032117			RSK 175	SVGC/44864
2216645004	MW-34 032117			RSK 175	SVGC/44864
2216645005	DUP-01 032117			RSK 175	SVGC/44864
2216645007	MW-30 032117			RSK 175	SVGC/44864
2216645001	MW-26 032117			EPA 300.0	WETC/184698
2216645002	MW-24 032117			EPA 300.0	WETC/184698
2216645003	MW-32 032117			EPA 300.0	WETC/184698
2216645004	MW-34 032117			EPA 300.0	WETC/184698
2216645005	DUP-01 032117			EPA 300.0	WETC/184698
2216645007	MW-30 032117			EPA 300.0	WETC/184698
2216645001	MW-26 032117			SW846 8260C	VOMS/42801
2216645002	MW-24 032117			SW846 8260C	VOMS/42801
2216645003	MW-32 032117			SW846 8260C	VOMS/42801
2216645004	MW-34 032117			SW846 8260C	VOMS/42801
2216645005	DUP-01 032117			SW846 8260C	VOMS/42801
2216645006	Trip Blank			SW846 8260C	VOMS/42801
2216645007	MW-30 032117			SW846 8260C	VOMS/42801
2216645001	MW-26 032117			S5310B-00	WETC/184894
2216645002	MW-24 032117			S5310B-00	WETC/184894

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2216645 ASN018|Scotia Navy Depot

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2216645003	MW-32 032117			S5310B-00	WETC/184994
2216645004	MW-34 032117			S5310B-00	WETC/184994
2216645005	DUP-01 032117			S5310B-00	WETC/184994
2216645007	MW-30 032117			S5310B-00	WETC/184994
2216645004	MW-34 032117			EPA 300.0	WETC/185028

ALS Environmental

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAG

* 2 2 1 6 6 4 5 *

Project Name: Scotia Navy Depot	Project Number: 60440641.9
Project Manager: John Santacroce	Report CC: John.Santacroce@
Company/Address: AECOM 40 British American Blvd Latham, NY 12110	
Phone #: (518) 951-2200	Email: John.Santacroce@aecom.com
Sampler's Signature:	Sampler's Printed Name: Chris French

ANALYSIS REQUESTED (Include Method Number and

PRESERVATIVE: 1 | 1 | 1 | 0 | 0

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	8260 C	RSK 175	TOC	Alkalinity	Cl SO4 NO3	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)
MW-26 032117		3/21/17	0905	GW	8	X	X	X	X	X		
MW-24 032117 MS/MSD			1035		24	X	X	X	X	X		
MW-32 032117			1315		8	X	X	X	X	X		
MW-34 032117			1215		8	X	X	X	X	X		
DUP-01 032117			-		8	X	X	X	X	X		
MW-30 032117			1423		8	X	X	X	X	X		
TRIP BLANK		-	-	-	2	X						

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

REMARKS/ ALTERNATE DESCRIPTION

Extra Volume collected for MS/MSD

AF 3/22/17

	Y	N	Initials	Cooler Temp:
Custody Seals Present?			AF	°C
(if present) Seals Intact?				Cooler #:
Received on Ice?				
COC/Lbls Complete				Therm ID: TTB16
Cont in Good Cond?				
Correct Containers?				Ship Carrier:
Correct Samp Vol?				FedEx UPS
Correct Preservation?				DHL
Headspace/Volatiles?				

Tracking #: 647065100140

SPECIAL INSTRUCTIONS/COMMENTS
Metals

See QAPP ☒

TURNAROUND REQUIREMENTS
___ RUSH (SURCHARGES APPLY)
___ 1 day ___ 2 day ___ 3 day
___ 4 day ___ 5 day
Standard
REQUESTED REPORT DATE
Standard

REPORT REQUIREMENTS
___ I. Results Only See QAPP
___ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
___ III. Results + QC and Calibration Summaries
___ IV. Data Validation Report with Raw Data
See QAPP
Edata X Yes ___ No

INVOICE INFORMATION
PO # 60440641
BILL TO: John Santacroce
AECOM
40 British American Blvd
Latham, NY 12110

STATE WHERE SAMPLES WERE COLLECTED: New York

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature:	Signature: Brian McGuirk	Signature: BRIAN McGUIRK	Signature:	Signature	Signature
Printed Name:	Printed Name: BRIAN McGUIRK	Printed Name: Brian McGuirk	Printed Name:	Printed Name	Printed Name
Firm: AECOM	Firm: AES	Firm: AES	Firm: AES	Firm	Firm
Date/Time: 3/21/17 1330	Date/Time: 3/21/17 1530	Date/Time: 3/21/17 1700	Date/Time: 3/22/17 0856	Date/Time	Date/Time

Distribution: White - Lab Copy; Yellow - Return to Originator

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March 31, 2017

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

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO**	Workorder:	**2217086**
Purchase Order:	**60440641.11**	Workorder ID:	**ASN019|Scotia Navy Depot**

Dear Ms. Lurie:

Enclosed are the analytical results for samples received by the laboratory on Thursday, March 23, 2017.

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. Vicki A. Forney (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. John Santacroce , Mr. Scott Underhill

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

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

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SAMPLE SUMMARY

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2217086001	MW-28 032217	Ground Water	3/22/2017 08:43	3/23/2017 08:40	Collected by Client
2217086002	MW-29 032217	Ground Water	3/22/2017 11:18	3/23/2017 08:40	Collected by Client
2217086003	MW-31 032217	Ground Water	3/22/2017 12:11	3/23/2017 08:40	Collected by Client
2217086004	MW-33 032217	Ground Water	3/22/2017 13:20	3/23/2017 08:40	Collected by Client
2217086005	MW-35 032217	Ground Water	3/22/2017 14:30	3/23/2017 08:40	Collected by Client
2217086006	MW-15 032217	Ground Water	3/22/2017 15:29	3/23/2017 08:40	Collected by Client
2217086007	DUP-02 032217	Ground Water	3/22/2017 00:00	3/23/2017 08:40	Collected by Client
2217086008	Trip Blank	Ground Water	3/23/2017 08:40	3/23/2017 08:40	Collected by Client

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SAMPLE SUMMARY

Workorder: 2217086 ASN019|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 incurbator and the "Analyzed" value is the date/time out the incubator.

Standard Acronyms/Flags

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

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ANALYTICAL RESULTS

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID: **2217086001** Date Collected: 3/22/2017 08:43 Matrix: Ground Water

Sample ID: **MW-28 032217** Date Received: 3/23/2017 08:40

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.62J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
1,1-Dichloroethane	0.88J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
1,1-Dichloroethene	0.53J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
cis-1,2-Dichloroethene	4.4		ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
trans-1,2-Dichloroethene	0.42J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
Tetrachloroethene	42.4		ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
1,1,1-Trichloroethane	9.9		ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
Trichloroethene	181		ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	92.9		%	81 - 118			SW846 8260C		3/29/17 17:58	DD	A
4-Bromofluorobenzene (S)	101		%	85 - 114			SW846 8260C		3/29/17 17:58	DD	A
Dibromofluoromethane (S)	83.8		%	80 - 119			SW846 8260C		3/29/17 17:58	DD	A
Toluene-d8 (S)	90.5		%	89 - 112			SW846 8260C		3/29/17 17:58	DD	A
LIGHT HYDROCARBON GASES											
Ethane	1.0		ug/L	1.0	0.50	0.25	RSK 175		3/24/17 02:28	EGO	C
Ethene	1.9		ug/L	1.5	0.75	0.31	RSK 175		3/24/17 02:28	EGO	C
Methane	0.94	1	ug/L	0.50	0.25	0.13	RSK 175		3/24/17 02:28	EGO	C
WET CHEMISTRY											
Alkalinity, Total	295	2	mg/L	5	5	0.8	S2320B-97		3/24/17 09:20	MSA	H
Chloride	25.7		mg/L	2.0	0.50	0.16	EPA 300.0		3/24/17 04:51	CHW	G
Nitrate-N	0.44		mg/L	0.20	0.060	0.020	EPA 300.0		3/24/17 04:51	CHW	G
Sulfate	21.6		mg/L	2.0	0.50	0.20	EPA 300.0		3/24/17 04:51	CHW	G
Total Organic Carbon (TOC)	0.81J	J	mg/L	1.0	0.50	0.18	S5310B-00		3/29/17 11:31	PAG	E

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID: **2217086002** Date Collected: 3/22/2017 11:18 Matrix: Ground Water

Sample ID: **MW-29 032217** Date Received: 3/23/2017 08:40

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.63J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
1,1-Dichloroethane	0.45J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
1,1-Dichloroethene	0.55J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
cis-1,2-Dichloroethene	3.1		ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
trans-1,2-Dichloroethene	0.61J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
Tetrachloroethene	37.2		ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
1,1,1-Trichloroethane	10.4		ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
Trichloroethene	197		ug/L	5.0	3.8	1.7	SW846 8260C		3/30/17 15:14	DD	D
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118			SW846 8260C		3/30/17 15:14	DD	D
1,2-Dichloroethane-d4 (S)	93		%	81 - 118			SW846 8260C		3/29/17 18:20	DD	A
4-Bromofluorobenzene (S)	99.4		%	85 - 114			SW846 8260C		3/30/17 15:14	DD	D
4-Bromofluorobenzene (S)	101		%	85 - 114			SW846 8260C		3/29/17 18:20	DD	A
Dibromofluoromethane (S)	93.6		%	80 - 119			SW846 8260C		3/30/17 15:14	DD	D
Dibromofluoromethane (S)	85.5		%	80 - 119			SW846 8260C		3/29/17 18:20	DD	A
Toluene-d8 (S)	98.1		%	89 - 112			SW846 8260C		3/30/17 15:14	DD	D
Toluene-d8 (S)	91.2		%	89 - 112			SW846 8260C		3/29/17 18:20	DD	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		3/24/17 02:59	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		3/24/17 02:59	EGO	C
Methane	1.1		ug/L	0.50	0.25	0.13	RSK 175		3/24/17 02:59	EGO	C
WET CHEMISTRY											
Alkalinity, Total	258	1	mg/L	5	5	0.8	S2320B-97		3/24/17 09:31	MSA	H
Chloride	21.3		mg/L	2.0	0.50	0.16	EPA 300.0		3/24/17 05:05	CHW	G
Nitrate-N	0.52		mg/L	0.20	0.060	0.020	EPA 300.0		3/24/17 05:05	CHW	G
Sulfate	20.1		mg/L	2.0	0.50	0.20	EPA 300.0		3/24/17 05:05	CHW	G
Total Organic Carbon (TOC)	0.91J	J	mg/L	1.0	0.50	0.18	S5310B-00		3/29/17 11:31	PAG	E

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ANALYTICAL RESULTS

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID: **2217086002** Date Collected: 3/22/2017 11:18 Matrix: Ground Water

Sample ID: **MW-29 032217** Date Received: 3/23/2017 08:40

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

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

ALS Environmental

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

ANALYTICAL RESULTS

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID: **2217086003** Date Collected: 3/22/2017 12:11 Matrix: Ground Water

Sample ID: **MW-31 032217** Date Received: 3/23/2017 08:40

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			3/29/17 16:52	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 16:52	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 16:52	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 16:52	DD	A
cis-1,2-Dichloroethene	0.41J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 16:52	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 16:52	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 16:52	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 16:52	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 16:52	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 16:52	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 16:52	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 16:52	DD	A
Trichloroethene	35.0		ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 16:52	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 16:52	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	91.8		%	81 - 118			SW846 8260C			3/29/17 16:52	DD	A
4-Bromofluorobenzene (S)	100		%	85 - 114			SW846 8260C			3/29/17 16:52	DD	A
Dibromofluoromethane (S)	81.6		%	80 - 119			SW846 8260C			3/29/17 16:52	DD	A
Toluene-d8 (S)	90.7		%	89 - 112			SW846 8260C			3/29/17 16:52	DD	A
LIGHT HYDROCARBON GASES												
Ethane	10.1		ug/L	1.0	0.50	0.25	RSK 175			3/24/17 03:34	EGO	C
Ethene	4.7		ug/L	1.5	0.75	0.31	RSK 175			3/24/17 03:34	EGO	C
Methane	106		ug/L	0.50	0.25	0.13	RSK 175			3/24/17 03:34	EGO	C
WET CHEMISTRY												
Alkalinity, Total	381	1	mg/L	5	5	0.8	S2320B-97			3/24/17 09:43	MSA	H
Chloride	98.5		mg/L	2.0	0.50	0.16	EPA 300.0			3/24/17 05:19	CHW	G
Nitrate-N	0.040J	J	mg/L	0.20	0.060	0.020	EPA 300.0			3/24/17 05:19	CHW	G
Sulfate	2.6		mg/L	2.0	0.50	0.20	EPA 300.0			3/24/17 05:19	CHW	G
Total Organic Carbon (TOC)	257		mg/L	50.0	25.0	9.2	S5310B-00			3/31/17 20:15	PAG	E

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

ANALYTICAL RESULTS

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID: **2217086004** Date Collected: 3/22/2017 13:20 Matrix: Ground Water

Sample ID: **MW-33 032217** Date Received: 3/23/2017 08:40

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		3/29/17 17:36	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:36	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:36	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:36	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:36	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:36	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:36	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:36	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:36	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:36	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:36	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:36	DD	A
Trichloroethene	151		ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:36	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:36	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	91.8		%	81 - 118			SW846 8260C		3/29/17 17:36	DD	A
4-Bromofluorobenzene (S)	98.8		%	85 - 114			SW846 8260C		3/29/17 17:36	DD	A
Dibromofluoromethane (S)	83.2		%	80 - 119			SW846 8260C		3/29/17 17:36	DD	A
Toluene-d8 (S)	89.5		%	89 - 112			SW846 8260C		3/29/17 17:36	DD	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		3/24/17 03:54	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		3/24/17 03:54	EGO	C
Methane	9.2		ug/L	0.50	0.25	0.13	RSK 175		3/24/17 03:54	EGO	C
WET CHEMISTRY											
Alkalinity, Total	194	1	mg/L	5	5	0.8	S2320B-97		3/24/17 09:55	MSA	H
Chloride	29.2		mg/L	2.0	0.50	0.16	EPA 300.0		3/24/17 05:33	CHW	G
Nitrate-N	0.32		mg/L	0.20	0.060	0.020	EPA 300.0		3/24/17 05:33	CHW	G
Sulfate	15.0		mg/L	2.0	0.50	0.20	EPA 300.0		3/24/17 05:33	CHW	G
Total Organic Carbon (TOC)	2.1		mg/L	1.0	0.50	0.18	S5310B-00		3/29/17 11:31	PAG	E

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

ANALYTICAL RESULTS

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID: **2217086005** Date Collected: 3/22/2017 14:30 Matrix: Ground Water

Sample ID: **MW-35 032217** Date Received: 3/23/2017 08:40

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			3/29/17 17:14	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:14	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:14	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:14	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:14	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:14	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:14	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:14	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:14	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:14	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:14	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:14	DD	A
Trichloroethene	12.5		ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:14	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:14	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	93		%	81 - 118			SW846 8260C			3/29/17 17:14	DD	A
4-Bromofluorobenzene (S)	100		%	85 - 114			SW846 8260C			3/29/17 17:14	DD	A
Dibromofluoromethane (S)	83.9		%	80 - 119			SW846 8260C			3/29/17 17:14	DD	A
Toluene-d8 (S)	91		%	89 - 112			SW846 8260C			3/29/17 17:14	DD	A
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			3/24/17 04:10	EGO	C
Ethene	0.32J	J	ug/L	1.5	0.75	0.31	RSK 175			3/24/17 04:10	EGO	C
Methane	5.8		ug/L	0.50	0.25	0.13	RSK 175			3/24/17 04:10	EGO	C
WET CHEMISTRY												
Alkalinity, Total	51	1	mg/L	5	5	0.8	S2320B-97			3/24/17 10:04	MSA	H
Chloride	2.0		mg/L	2.0	0.50	0.16	EPA 300.0			3/24/17 05:47	CHW	G
Nitrate-N	0.14J	J	mg/L	0.20	0.060	0.020	EPA 300.0			3/24/17 05:47	CHW	G
Sulfate	3.5		mg/L	2.0	0.50	0.20	EPA 300.0			3/24/17 05:47	CHW	G
Total Organic Carbon (TOC)	1.4		mg/L	1.0	0.50	0.18	S5310B-00			3/29/17 11:31	PAG	E

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

ANALYTICAL RESULTS

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID: **2217086006** Date Collected: 3/22/2017 15:29 Matrix: Ground Water

Sample ID: **MW-15 032217** Date Received: 3/23/2017 08:40

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			3/30/17 19:15	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:15	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:15	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:15	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:15	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:15	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:15	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:15	DD	A
Tetrachloroethene	0.84J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:15	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:15	DD	A
1,1,1-Trichloroethane	1.9		ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:15	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:15	DD	A
Trichloroethene	80.5		ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:15	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:15	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	111		%	81 - 118			SW846 8260C			3/30/17 19:15	DD	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C			3/30/17 19:15	DD	A
Dibromofluoromethane (S)	96.5		%	80 - 119			SW846 8260C			3/30/17 19:15	DD	A
Toluene-d8 (S)	99.8		%	89 - 112			SW846 8260C			3/30/17 19:15	DD	A
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			3/24/17 04:26	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			3/24/17 04:26	EGO	C
Methane	0.21J	J	ug/L	0.50	0.25	0.13	RSK 175			3/24/17 04:26	EGO	C
WET CHEMISTRY												
Alkalinity, Total	201	1	mg/L	5	5	0.8	S2320B-97			3/24/17 10:15	MSA	H
Chloride	28.3		mg/L	2.0	0.50	0.16	EPA 300.0			3/24/17 06:01	CHW	G
Nitrate-N	0.90		mg/L	0.20	0.060	0.020	EPA 300.0			3/24/17 06:01	CHW	G
Sulfate	21.3		mg/L	2.0	0.50	0.20	EPA 300.0			3/24/17 06:01	CHW	G
Total Organic Carbon (TOC)	0.47J	J	mg/L	1.0	0.50	0.18	S5310B-00			3/29/17 11:31	PAG	E

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ANALYTICAL RESULTS

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID: **2217086007** Date Collected: 3/22/2017 00:00 Matrix: Ground Water

Sample ID: **DUP-02 032217** Date Received: 3/23/2017 08:40

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.64J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:37	DD	A
1,1-Dichloroethane	0.90J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:37	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:37	DD	A
1,1-Dichloroethene	0.54J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:37	DD	A
cis-1,2-Dichloroethene	4.4		ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:37	DD	A
trans-1,2-Dichloroethene	0.43J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:37	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:37	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:37	DD	A
Tetrachloroethene	43.3		ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:37	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:37	DD	A
1,1,1-Trichloroethane	10.4		ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:37	DD	A
1,1,2-Trichloroethane	0.33J	J	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:37	DD	A
Trichloroethene	188		ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:37	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 19:37	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	109		%	81 - 118			SW846 8260C			3/30/17 19:37	DD	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C			3/30/17 19:37	DD	A
Dibromofluoromethane (S)	96.4		%	80 - 119			SW846 8260C			3/30/17 19:37	DD	A
Toluene-d8 (S)	98.7		%	89 - 112			SW846 8260C			3/30/17 19:37	DD	A
LIGHT HYDROCARBON GASES												
Ethane	1.0		ug/L	1.0	0.50	0.25	RSK 175			3/24/17 04:42	EGO	C
Ethene	1.9		ug/L	1.5	0.75	0.31	RSK 175			3/24/17 04:42	EGO	C
Methane	0.80		ug/L	0.50	0.25	0.13	RSK 175			3/24/17 04:42	EGO	C
WET CHEMISTRY												
Alkalinity, Total	309	1	mg/L	5	5	0.8	S2320B-97			3/24/17 10:26	MSA	H
Chloride	26.2		mg/L	2.0	0.50	0.16	EPA 300.0			3/24/17 06:15	CHW	G
Nitrate-N	0.48		mg/L	0.20	0.060	0.020	EPA 300.0			3/24/17 06:15	CHW	G
Sulfate	22.1		mg/L	2.0	0.50	0.20	EPA 300.0			3/24/17 06:15	CHW	G
Total Organic Carbon (TOC)	0.68J	J	mg/L	1.0	0.50	0.18	S5310B-00			3/29/17 11:31	PAG	E

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ANALYTICAL RESULTS

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID: **2217086008** Date Collected: 3/23/2017 08:40 Matrix: Ground Water

Sample ID: **Trip Blank** Date Received: 3/23/2017 08:40

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			3/30/17 14:09	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 14:09	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 14:09	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 14:09	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 14:09	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 14:09	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 14:09	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 14:09	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 14:09	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 14:09	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 14:09	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 14:09	DD	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 14:09	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/30/17 14:09	DD	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	81 - 118	SW846 8260C			3/30/17 14:09	DD	A
4-Bromofluorobenzene (S)	101		%	85 - 114	SW846 8260C			3/30/17 14:09	DD	A
Dibromofluoromethane (S)	91.8		%	80 - 119	SW846 8260C			3/30/17 14:09	DD	A
Toluene-d8 (S)	95.9		%	89 - 112	SW846 8260C			3/30/17 14:09	DD	A

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2217086001	1	MW-28 032217	RSK 175	Methane
The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper control limit is 20.				
2217086001	2	MW-28 032217	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2217086002	1	MW-29 032217	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2217086003	1	MW-31 032217	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2217086004	1	MW-33 032217	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2217086005	1	MW-35 032217	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2217086006	1	MW-15 032217	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2217086007	1	DUP-02 032217	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

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QUALITY CONTROL DATA

Workorder: 2217086 ASN019|Scotia Navy Depot

QC Batch: SVGC/44871 **Analysis Method:** RSK 175

QC Batch Method: RSK 175

Associated Lab Samples: 2217086001, 2217086002, 2217086003, 2217086004, 2217086005, 2217086006, 2217086007

METHOD BLANK: 2506383

Parameter	Blank Result	Units	Reporting Limit
Ethane	0.50U	ug/L	1.0
Ethene	0.75U	ug/L	1.5
Methane	0.21J	ug/L	0.50

SAMPLE DUPLICATE: 2506384 ORIGINAL: 2217086001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	1.04	ug/L	1	3.92	20
Ethene	1.88	ug/L	1.78	5.46	20
Methane	.94	ug/L	.74	23.8*	20

QUALITY CONTROL DATA

Workorder: 2217086 ASN019|Scotia Navy Depot

QC Batch: VOMS/42857 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 2217086001, 2217086002, 2217086003, 2217086004, 2217086005

METHOD BLANK: 2509129

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)	100	%	81 - 118
4-Bromofluorobenzene (S)	114	%	85 - 114
Dibromofluoromethane (S)	89.4	%	80 - 119
Toluene-d8 (S)	101	%	89 - 112

LABORATORY CONTROL SAMPLE: 2509130

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	93.5	ug/L	20	18.7	72 - 136
1,1-Dichloroethane	97.3	ug/L	20	19.5	77 - 125
1,2-Dichloroethane	95	ug/L	20	19.0	73 - 128
1,1-Dichloroethene	98.7	ug/L	20	19.7	71 - 131
cis-1,2-Dichloroethene	94.4	ug/L	20	18.9	78 - 123
trans-1,2-Dichloroethene	99.6	ug/L	20	19.9	75 - 124
1,1,1,2-Tetrachloroethane	99.2	ug/L	20	19.8	78 - 124
1,1,2,2-Tetrachloroethane	98.5	ug/L	20	19.7	71 - 121
Tetrachloroethene	93	ug/L	20	18.6	74 - 129
Toluene	99.2	ug/L	20	19.8	80 - 121
1,1,1-Trichloroethane	96.6	ug/L	20	19.3	74 - 131
1,1,2-Trichloroethane	97.3	ug/L	20	19.5	80 - 119
Trichloroethene	90.2	ug/L	20	18.0	79 - 123

QUALITY CONTROL DATA

Workorder: 2217086 ASN019|Scotia Navy Depot

Vinyl Chloride	92.4	ug/L	20	18.5	58 - 137
1,2-Dichloroethane-d4 (S)	95.3	%			81 - 118
4-Bromofluorobenzene (S)	108	%			85 - 114
Dibromofluoromethane (S)	89.9	%			80 - 119
Toluene-d8 (S)	96.6	%			89 - 112

MATRIX SPIKE: 2509228 DUPLICATE: 2509229 ORIGINAL: 2217435008

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

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Carbon Tetrachloride	0	ug/L	20	21.5774	21.4284	108	107	72 - 136	.69	30
1,1-Dichloroethane	0	ug/L	20	21.096	20.9823	105	105	77 - 125	.54	30
1,2-Dichloroethane	0	ug/L	20	19.3063	19.3352	96.5	96.7	73 - 128	.15	30
1,1-Dichloroethene	0	ug/L	20	22.2823	21.9991	111	110	71 - 131	1.28	30
cis-1,2-Dichloroethene	0	ug/L	20	20.1599	20.0752	101	100	78 - 123	.42	30
trans-1,2-Dichloroethene	0	ug/L	20	22.0784	21.403	110	107	75 - 124	3.11	30
1,1,1,2-Tetrachloroethane	0	ug/L	20	20.6746	20.4871	103	102	78 - 124	.91	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	20.0003	19.8853	100	99.4	71 - 121	.58	30
Tetrachloroethene	0	ug/L	20	20.1002	20.8728	101	104	74 - 129	3.77	30
Toluene	0	ug/L	20	21.1359	21.0631	106	105	80 - 121	.35	30
1,1,1-Trichloroethane	0	ug/L	20	21.5818	22.1486	108	111	74 - 131	2.59	30
1,1,2-Trichloroethane	0	ug/L	20	19.6812	19.8774	98.4	99.4	80 - 119	.99	30
Trichloroethene	0	ug/L	20	20.3387	20.1898	102	101	79 - 123	.73	30
Vinyl Chloride	0	ug/L	20	21.0637	20.6692	105	103	58 - 137	1.89	30
1,2-Dichloroethane-d4 (S)	84.5	%				84.5	89	81 - 118		
4-Bromofluorobenzene (S)	99.6	%				99.6	97.3	85 - 114		
Dibromofluoromethane (S)	85.7	%				85.7	84.6	80 - 119		
Toluene-d8 (S)	88.1	%				88.1*	89.1	89 - 112		

QUALITY CONTROL DATA

Workorder: 2217086 ASN019|Scotia Navy Depot

QC Batch: VOMS/42865 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 2217086002, 2217086006, 2217086007, 2217086008

METHOD BLANK: 2509653

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)	102	%	81 - 118
4-Bromofluorobenzene (S)	104	%	85 - 114
Dibromofluoromethane (S)	89.6	%	80 - 119
Toluene-d8 (S)	97.3	%	89 - 112

LABORATORY CONTROL SAMPLE: 2509654

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	99.3	ug/L	20	19.9	72 - 136
1,1-Dichloroethane	100	ug/L	20	20.1	77 - 125
1,2-Dichloroethane	95.5	ug/L	20	19.1	73 - 128
1,1-Dichloroethene	104	ug/L	20	20.7	71 - 131
cis-1,2-Dichloroethene	97	ug/L	20	19.4	78 - 123
trans-1,2-Dichloroethene	104	ug/L	20	20.8	75 - 124
1,1,1,2-Tetrachloroethane	100	ug/L	20	20.1	78 - 124
1,1,2,2-Tetrachloroethane	98.8	ug/L	20	19.8	71 - 121
Tetrachloroethene	97.6	ug/L	20	19.5	74 - 129
Toluene	102	ug/L	20	20.5	80 - 121
1,1,1-Trichloroethane	105	ug/L	20	21.1	74 - 131
1,1,2-Trichloroethane	96.4	ug/L	20	19.3	80 - 119
Trichloroethene	97.4	ug/L	20	19.5	79 - 123

QUALITY CONTROL DATA

Workorder: 2217086 ASN019|Scotia Navy Depot

Vinyl Chloride	100	ug/L	20	20.0	58 - 137
1,2-Dichloroethane-d4 (S)	98.2	%			81 - 118
4-Bromofluorobenzene (S)	102	%			85 - 114
Dibromofluoromethane (S)	91.9	%			80 - 119
Toluene-d8 (S)	95	%			89 - 112

MATRIX SPIKE: 2509655 DUPLICATE: 2509656 ORIGINAL: 2217086006

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

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Carbon Tetrachloride	0	ug/L	20	21.6519	21.6855	108	108	72 - 136	.16	30
1,1-Dichloroethane	0	ug/L	20	21.5994	21.3656	108	107	77 - 125	1.09	30
1,2-Dichloroethane	0	ug/L	20	20.2172	19.9151	101	99.6	73 - 128	1.51	30
1,1-Dichloroethene	0	ug/L	20	22.868	22.1809	114	111	71 - 131	3.05	30
cis-1,2-Dichloroethene	0	ug/L	20	20.672	20.3647	103	102	78 - 123	1.5	30
trans-1,2-Dichloroethene	0	ug/L	20	22.6824	21.9347	113	110	75 - 124	3.35	30
1,1,1,2-Tetrachloroethane	0	ug/L	20	20.7347	20.3712	104	102	78 - 124	1.77	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	19.2308	18.2249	96.2	91.1	71 - 121	5.37	30
Tetrachloroethene	.84236	ug/L	20	21.804	21.103	105	101	74 - 129	3.27	30
Toluene	0	ug/L	20	21.3159	20.7037	107	104	80 - 121	2.91	30
1,1,1-Trichloroethane	1.92038	ug/L	20	24.4662	24.6304	113	114	74 - 131	.67	30
1,1,2-Trichloroethane	0	ug/L	20	19.5477	18.7846	97.7	93.9	80 - 119	3.98	30
Trichloroethene	80.5114	ug/L	20	98.5991	96.7034	NC	NC	79 - 123	1.94	30
Vinyl Chloride	0	ug/L	20	20.5706	20.0486	103	100	58 - 137	2.57	30
1,2-Dichloroethane-d4 (S)	97.2	%				97.2	94.9	81 - 118		
4-Bromofluorobenzene (S)	99.6	%				99.6	99.5	85 - 114		
Dibromofluoromethane (S)	95.3	%				95.3	95.6	80 - 119		
Toluene-d8 (S)	95	%				95	94	89 - 112		

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QUALITY CONTROL DATA

Workorder: 2217086 ASN019|Scotia Navy Depot

QC Batch: WETC/184756 **Analysis Method:** S2320B-97

QC Batch Method: S2320B-97

Associated Lab Samples: 2217086001, 2217086002, 2217086003, 2217086004, 2217086005, 2217086006, 2217086007

METHOD BLANK: 2506308

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

SAMPLE DUPLICATE: 2506313 ORIGINAL: 2216877001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	192.78046	mg/L	196.23071	1.77	20

METHOD BLANK: 2506316

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

SAMPLE DUPLICATE: 2506317 ORIGINAL: 2216916004

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	535.67853	mg/L	523.15076	2.37	20

METHOD BLANK: 2506320

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

SAMPLE DUPLICATE: 2506321 ORIGINAL: 2216917009

Parameter	Original Result	Units	DUP Result	RPD	Max RPD

QUALITY CONTROL DATA

Workorder: 2217086 ASN019|Scotia Navy Depot

Alkalinity, Total	51.97328	mg/L	50.35659	3.16	20

METHOD BLANK: 2506324

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	0.9J	mg/L	5

SAMPLE DUPLICATE: 2506325 ORIGINAL: 2216925002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	16.5881	mg/L	17.96963	8	20

METHOD BLANK: 2506328

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	0.9J	mg/L	5

SAMPLE DUPLICATE: 2506329 ORIGINAL: 2217121001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	478.53033	mg/L	507.96805	5.97	20

METHOD BLANK: 2506332

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

SAMPLE DUPLICATE: 2506333 ORIGINAL: 2217192004

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	408.45517	mg/L	389.93192	4.64	20

QUALITY CONTROL DATA

Workorder: 2217086 ASN019|Scotia Navy Depot

METHOD BLANK: 2506485

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

SAMPLE DUPLICATE: 2506486 ORIGINAL: 2217207003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	82.72683	mg/L	86.25069	4.17	20

METHOD BLANK: 2506489

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

METHOD BLANK: 2506493

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

SAMPLE DUPLICATE: 2506494 ORIGINAL: 2217253007

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	129.53949	mg/L	128.67282	.67	20

METHOD BLANK: 2506497

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

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QUALITY CONTROL DATA

Workorder: 2217086 ASN019|Scotia Navy Depot

SAMPLE DUPLICATE: 2506498 ORIGINAL: 2217275004

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	13.45301	mg/L	14.11369	4.79	20

METHOD BLANK: 2506501

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

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

QUALITY CONTROL DATA

Workorder: 2217086 ASN019|Scotia Navy Depot

QC Batch: WETC/184762 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 2217086001, 2217086002, 2217086003, 2217086004, 2217086005, 2217086006, 2217086007

METHOD BLANK: 2506448

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.080J	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 2506450

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	102	mg/L	20	20.4	87 - 111
Nitrate-N	103	mg/L	2.5	2.6	88 - 111
Sulfate	103	mg/L	20	20.6	87 - 112

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

QUALITY CONTROL DATA

Workorder: 2217086 ASN019|Scotia Navy Depot

QC Batch: WETC/184984 **Analysis Method:** S5310B-00

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 2217086001, 2217086002, 2217086003, 2217086004, 2217086005, 2217086006, 2217086007

METHOD BLANK: 2509211

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

LABORATORY CONTROL SAMPLE: 2509212

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	97.4	mg/L	1	0.97J	85 - 115

MATRIX SPIKE: 2509213 DUPLICATE: 2509214 ORIGINAL: 2216918004

****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)	.013	mg/L	6	6.275	6.257	104	104	85 - 115	.29	20

MATRIX SPIKE: 2509215 DUPLICATE: 2509216 ORIGINAL: 2217086006

****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)	.466	mg/L	6	6.471	6.493	100	100	85 - 115	.34	20

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

QUALITY CONTROL DATA

Workorder: 2217086 ASN019|Scotia Navy Depot

QC Batch: WETC/185079 **Analysis Method:** S5310B-00

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 2217086003

METHOD BLANK: 2510438

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

LABORATORY CONTROL SAMPLE: 2510439

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	97.4	mg/L	1	0.97J	85 - 115

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2217086001	MW-28 032217			S2320B-97	WETC/184756
2217086002	MW-29 032217			S2320B-97	WETC/184756
2217086003	MW-31 032217			S2320B-97	WETC/184756
2217086004	MW-33 032217			S2320B-97	WETC/184756
2217086005	MW-35 032217			S2320B-97	WETC/184756
2217086006	MW-15 032217			S2320B-97	WETC/184756
2217086007	DUP-02 032217			S2320B-97	WETC/184756
2217086001	MW-28 032217			RSK 175	SVGC/44871
2217086002	MW-29 032217			RSK 175	SVGC/44871
2217086003	MW-31 032217			RSK 175	SVGC/44871
2217086004	MW-33 032217			RSK 175	SVGC/44871
2217086005	MW-35 032217			RSK 175	SVGC/44871
2217086006	MW-15 032217			RSK 175	SVGC/44871
2217086007	DUP-02 032217			RSK 175	SVGC/44871
2217086001	MW-28 032217			EPA 300.0	WETC/184762
2217086002	MW-29 032217			EPA 300.0	WETC/184762
2217086003	MW-31 032217			EPA 300.0	WETC/184762
2217086004	MW-33 032217			EPA 300.0	WETC/184762
2217086005	MW-35 032217			EPA 300.0	WETC/184762
2217086006	MW-15 032217			EPA 300.0	WETC/184762
2217086007	DUP-02 032217			EPA 300.0	WETC/184762
2217086001	MW-28 032217			SW846 8260C	VOMS/42857
2217086002	MW-29 032217			SW846 8260C	VOMS/42857
2217086003	MW-31 032217			SW846 8260C	VOMS/42857
2217086004	MW-33 032217			SW846 8260C	VOMS/42857
2217086005	MW-35 032217			SW846 8260C	VOMS/42857
2217086001	MW-28 032217			S5310B-00	WETC/184984
2217086002	MW-29 032217			S5310B-00	WETC/184984

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2217086004	MW-33 032217			S5310B-00	WETC/184984
2217086005	MW-35 032217			S5310B-00	WETC/184984
2217086006	MW-15 032217			S5310B-00	WETC/184984
2217086007	DUP-02 032217			S5310B-00	WETC/184984
2217086002	MW-29 032217			SW846 8260C	VOMS/42865
2217086006	MW-15 032217			SW846 8260C	VOMS/42865
2217086007	DUP-02 032217			SW846 8260C	VOMS/42865
2217086008	Trip Blank			SW846 8260C	VOMS/42865
2217086003	MW-31 032217			S5310B-00	WETC/185079

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CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAGE

* 2 2 1 7 0 8 6 *

Project Name: Scotia Navy Depot
Project Number: 60440641.9
Project Manager: John Santacroce
Report CC: John Santacroce
Company/Address: AECOM
40 British American Blvd
Latham, NY 12110
Phone #: (518) 951-2200
Email: John.Santacroce@aecom.com
Sampler's Signature: Chris French
Sampler's Printed Name: Chris French

ANALYSIS REQUESTED (Include Method Number and C...

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	8260 C (Preservative 1)	RSK 175 (Preservative 1)	TOC (Preservative 1)	Alkalinity (Preservative 0)	Cl, SO4, NO3 (Preservative 0)	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)
MW-28 032217		3/22/17	0843	GW	8	X	X	X	X	X		
MW-29 032217		↓	1118	↓	8	↓	↓	↓	↓	↓		
MW-31 032217		↓	1211	↓	8	↓	↓	↓	↓	↓		
MW-33 032217		↓	1320	↓	8	↓	↓	↓	↓	↓		
MW-35 032217		↓	1430	↓	8	↓	↓	↓	↓	↓		
MW-15 032217		↓	1529	↓	8	↓	↓	↓	↓	↓		
Dup-02 032217		↓	–	↓	8	↓	↓	↓	↓	↓		Duplicate Sample
Trip Blank		–	–	AQ	2	↓						

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH

	Y	N	Initials
Custody Seals Present?	✓		AW
(if present) Seals Intact?	✓		
Received on Ice?	✓		
COC/Lbls Complete	✓		
Cont in Good Cond?	✓		
Correct Containers?	✓		
Correct Samp Vol?	✓		
Correct Preservation?	✓		
Headspace/Volatiles?			↓

Cooler Temp: 0 °C
Cooler #:
Therm ID: 318
Ship Carrier: FedEx UPS DHL
Tracking #: 6470 8310 0162

SPECIAL INSTRUCTIONS/COMMENTS
Metals

AT 3/23/17

See QAPP ☒

STATE WHERE SAMPLES WERE COLLECTED: New York

TURNAROUND REQUIREMENTS
___ RUSH (SURCHARGES APPLY)
___ 1 day ___ 2 day ___ 3 day
___ 4 day ___ 5 day
Standard
REQUESTED REPORT DATE: Standard

REPORT REQUIREMENTS
___ I. Results Only See QAPP
___ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
___ III. Results + QC and Calibration Summaries
___ IV. Data Validation Report with Raw Data See QAPP
Edata X Yes ___ No

INVOICE INFORMATION
PO #: 60440641
BILL TO: John Santacroce
AECOM
40 British American Blvd
Latham, NY 12110

	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	Chris French	D. Ayers	D. Ayers	AW 3-23-17 0840		
Printed Name	Chris French	DINA AYERS	DINA AYERS			
Firm	AECOM	ALS	ALS	ALS		
Date/Time	3/22/17 1610	3/22/17 1610	3/22/17 1700	3/23/17 0840		

Distribution: White - Lab Copy; Yellow - Return to Originator

AECOM

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

Prepared by:
AECOM
Pittsburgh, PA
60440641-9
April 2017

April 24, 2017

Data Usability Summary Report
Defense National Stockpile Center
Scotia Depot
Glenville, New York
Groundwater Sampling Event
March 2016
Final

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

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AECOM
Pittsburgh, PA
60440641-9
April 2017

April 24, 2017

Data Usability Summary Report
Defense National Stockpile Center
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April 2016
Final

Prepared By
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Reviewed By
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AECOM
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Atlanta, GA 30309

Contents

List of Attachments

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, from March 20, 2017 through March 22, 2017. 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, 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 by USEPA SW-846 Method 8260B
- Methane, Ethane and Ethene by RSK -175
- Chloride, Nitrate as N and Sulfate by EPA Method 300.0
- Alkalinity by Standard Methods 2320B
- Total Organic Carbon by Standard Methods 5310B

The trip blanks were analyzed for VOCs only. Sample MW-24-032217 was designated in the field to be processed as the quality control sample. That is, as the MS/MSD. No equipment blank was collected for this round of samples. 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	Date Sampled	Work Order Number	SDG Number
MW-16-032017	2216212001	Groundwater	3/20/2017	2216212	ASN017
MW-26-032117	2216645001	Groundwater	3/21/2017	2216645	ASN018
MW-24-032117	2216645002	Groundwater	3/21/2017	2216645	ASN018
MW-32 032117	2216645003	Groundwater	3/21/2017	2216645	ASN018
MW-34-032117	2216645004	Groundwater	3/21/2017	2216645	ASN018
DUP-1-032117 [MW-26]	2216645005	Groundwater (QC)	3/21/2017	2216645	ASN018
Trip Blank	2216645006	Aqueous (QC)	—	2216645	ASN018
MW-30-032117	2216645007	Groundwater	3/21/2017	2216645	ASN018
MW-28-032217	2217086001	Groundwater	3/22/2017	2217086	ASN019
MW-29-032217	2217086002	Groundwater	3/22/2017	2217086	ASN019
MW-31-032217	2217086003	Groundwater	3/22/2017	2217086	ASN019
MW-33-032217	2217086004	Groundwater	3/22/2017	2217086	ASN019
MW-35-032217	2217086005	Groundwater	3/22/2017	2217086	ASN019
MW-15-032217	2217086006	Groundwater	3/22/2017	2217086	ASN019
DUP-2-032217 [MW-28]	2217086007	Groundwater (QC)	3/22/2017	2217086	ASN019
Trip Blank	2217086008	Aqueous (QC)	—	2217086	ASN019

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.

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 Attachment A of this report. The data qualifier summaries are attached as Attachment 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 Attachment 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
- Equipment Blanks
- Surrogates
- Matrix Spike/Matrix Spike Duplicate (MS/MSD)
- Internal Standards
- Quantitation Limits
- Laboratory Control Standards
- Data package / EDD consistency

Work Order 2216212 (SDG ASN017)

No trip blank was submitted with this SDG.

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

Work Order 2216645 (SDG ASN018)

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

Work Order 2217086 (SDG ASN019)

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 Standards
- Data package / EDD consistency

Work Order 2216212 (SDG ASN017)

Laboratory Method Blank (p. 1525): Methane was detected in method blank 2505665 (03/23/17) at a concentration greater than the limit of quantitation (LOQ). The result for methane in associated sample MW-16-032017 was less than the LOQ and was qualified as non-detect (U) at the LOQ.

Work Order 2216645 (SDG ASN018)

Laboratory Method Blank (p. 1921): Methane was detected in method blank 2505665 (03/23/17) at a concentration greater than the LOQ. The positive results for methane in associated samples MW-26-032117, MW-24-032117 and DUP-01-032117 were greater than the LOQ, but less than five times the blank level and were qualified (J+), as estimated concentrations, biased high because of ambient contamination. All other associated methane results were greater than five times the blank level and did not require qualification.

Work Order 2217086 (SDG ASN019)

Laboratory Duplicates (p. 2108): A laboratory duplicate analysis was performed on sample MW-28-032217. The RPD between the original and laboratory duplicate results was greater than the maximum quality control limit of 20%. The original and duplicate results for methane were less than two times the LOQ and the difference between the results was less than the LOQ. Variation of this magnitude is acceptable. No data qualification was required.

3.0 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
- Field Duplicate
- Laboratory Control Standards
- Data package / EDD consistency

Work Order 2216212 (SDG ASN017)

Holding Time (pp.1589-1590): Sample MW-16-032017 was analyzed one day beyond the 48-hour holding time for nitrate. The positive result for nitrate in sample MW-16-032017 was qualified (J) as an estimated concentration because the holding time was exceeded.

Laboratory Method Blank (p. 1549): Chloride was detected in method blank 2505926 (03/23/17) at a concentration greater than the LOD, but less than the LOQ. The result for chloride in associated sample MW-16-032017 was greater than the LOQ and greater than ten times the blank level. No data qualification was required.

Work Order 2216645 (SDG ASN018)

Continuing Calibration Blanks (p. 1950): Chloride was detected in the continuing calibration blanks: 2505926 (03/23/17), 2509810 (03/30/17) and 2510221 (03/30/17) at concentrations greater than the LOD, but less than the LOQ. All samples in this SDG were affected. The results for chloride were greater than the LOQ and greater than ten times the blank levels. No data qualification was required.

Matrix Spike Recoveries (p. 1949): The MW-24-032117 MS recovery for nitrate and the MW-24-032117 MS and MSD recoveries for chloride were greater than the ALS upper advisory limit of 111%, but were within the data validation limits of 75-125%. Based on professional judgement, no data qualification was necessary.

Work Order 2217086 (SDG ASN019)

Continuing Calibration Blanks (p. 2130): Chloride was detected in the continuing calibration blanks: 2506448 (03/24/17) and 2506921 (03/24/17) at concentrations greater than the LOD, but less than the

LOQ. All samples in this SDG were affected. The results for chloride were greater than the LOQ and greater than ten times the blank levels. No data qualification was required.

4.0 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
- Field Duplicate
- Laboratory Control Standards
- Data package / EDD consistency

Work Order 2216212 (SDG ASN017)

Laboratory Method Blank (p. 1534): Method blanks 2504869, 2504877 and 2504881,associated with sample MW-16-032017, were contaminated at concentrations greater than the LOD but less than the LOQ. The associated sample result was greater than ten times the highest blank contamination level. No data qualification was required.

Work Order 2216645 (SDG ASN018)

Laboratory Method Blank (p. 1936): Method blank 2505587 (03/23/17), associated with samples MW-26-032117, MW-24-032117, MW-32-032117, MW-34-032117, MW-30-032117 and DUP-01-032117, was contaminated at a concentration greater than the LOD but less than the LOQ. The associated sample results were greater than ten times the highest blank contamination level. No data qualification was required.

Work Order 2217086 (SDG ASN019)

Laboratory Method Blank (p. 2117): Method blanks 2506308 and 2506328, associated with samples MW-28-032217, MW-29-032217, MW-31-032217, MW-33-032217, MW-35-032217, MW-15-032217 and DUP-02-032217, were contaminated at concentrations greater than the LOD but less than the LOQ. The associated sample results were greater than ten times the highest blank contamination level. No data qualification was required.

5.0 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
- Field Duplicate
- Laboratory Control Standards
- Data package / EDD consistency

Work Order 2216212 (SDG ASN017)

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

Work Order 2216645 (SDG ASN018)

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

Work Order 2217086 (SDG ASN019)

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

6.0 Field Duplicate Comparison

Field duplicate samples were collected at groundwater wells MW-26 and MW-28. See Tables 2A and 2B below for the calculated RPDs for all 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 reporting limit. If one of the results is non-detect or less than two times the reporting limit, and the duplicate is greater than two times the reporting limit, the difference between the parent and field duplicate results must be less than or equal to two times the reporting limit.

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 reporting limit. 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 reporting limit.

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
<±2LOQ: The difference between the primary and field duplicate results was less than two times the LOQ for results less than two times the LOQ. Variation of this magnitude is acceptable.
µg/L: micrograms per liter (ppb) and mg/L: milligrams per liter (ppm)

Table 2A – Field Duplicate Precision

Parameter	Units	MW-26-032117	DUP-01-032117	RPD (%)	Qual
Methane	µg/L	1.4	1.3	7.4	None
Alkalinity, total	mg/L	196	206	5.0	None
Chloride	mg/L	53.4	52.6	1.5	None
Sulfate	mg/L	29.4	29.1	1.0	None
Total Organic Carbon	mg/L	1.3 J	1.1 J	17	None

Table 2B – Field Duplicate Precision

Parameter	Units	MW-28-032217	DUP-02-032217	RPD (%)	Qual
Carbon tetrachloride	µg/L	0.62 J	0.64 J	3.2	None
1,1-Dichloroethane	µg/L	0.88 J	0.90 J	2.2	None
1,1-Dichloroethene	µg/L	0.53 J	0.54 J	1.9	None
cis-1,2-Dichloroethene	µg/L	4.4	4.4	0	None
trans-1,2-Dichloroethene	µg/L	0.42 J	0.43 J	2.3	None
Tetrachloroethene	µg/L	42.4	43.3	2.1	None
1,1,1-Trichloroethane	µg/L	9.9	10.4	4.9	None
1,1,2-Trichloroethane	µg/L	0.75 U	0.33 J	NC	<±2LOQ, None
Trichloroethene	µg/L	181	188	3.8	None
Methane	µg/L	0.94	0.80	16	None
Ethane	µg/L	1.0	1.0	0	None
Ethene	µg/L	1.9	1.9	0	None
Alkalinity, total	mg/L	295	309	4.6	None
Chloride	mg/L	25.7	26.6	3.4	None
Nitrate	mg/L	0.44	0.48	8.7	None
Sulfate	mg/L	21.6	22.1	2.3	None
Total Organic Carbon	mg/L	0.81 J	0.68 J	17	None

The RPDs between the original and field duplicates were all within the advisory limits of 0-30%. Field sampling/laboratory precision and sample homogeneity were acceptable. No data qualifications were required.

7.0 Notes

Positive organic and inorganic results less than the LOQ, but greater than the LOD were qualified (J), as estimated concentrations, due to increased uncertainty near the detection limit. The (J) qualifiers were maintained in the data validation.

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.

Attachment 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.

Attachment B

Data Qualification Summaries

ALS Environmental

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

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

ANALYTICAL RESULTS

Workorder: 2216212 ASN017|Scotia Navy Depot

Lab ID: **2216212001** Date Collected: 3/20/2017 15:24 Matrix: Ground Water

Sample ID: **MW-16 032017** Date Received: 3/21/2017 09:15

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		3/23/17 14:35	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:35	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:35	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:35	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:35	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:35	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:35	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:35	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:35	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:35	TMP	A
1,1,1-Trichloroethane	0.53J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:35	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:35	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:35	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:35	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	103		%	81 - 118			SW846 8260C		3/23/17 14:35	TMP	A
4-Bromofluorobenzene (S)	107		%	85 - 114			SW846 8260C		3/23/17 14:35	TMP	A
Dibromofluoromethane (S)	97		%	80 - 119			SW846 8260C		3/23/17 14:35	TMP	A
Toluene-d8 (S)	94.7		%	89 - 112			SW846 8260C		3/23/17 14:35	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		3/23/17 01:13	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		3/23/17 01:13	EGO	C
Methane 0.50 U	~~0.32J~~	~~J~~	ug/L	0.50	0.25	0.13	RSK 175		3/23/17 01:13	EGO	C
WET CHEMISTRY											
Alkalinity, Total	317	~~3~~	mg/L	5	5	0.8	S2320B-97		3/22/17 02:00	MSA	H
Chloride	5.6		mg/L	2.0	0.50	0.16	EPA 300.0		3/23/17 05:11	CHW	G
Nitrate-N	2.1	J ~~2~~	mg/L	0.20	0.060	0.020	EPA 300.0		3/23/17 05:11	CHW	G
Sulfate	65.3		mg/L	2.0	0.50	0.20	EPA 300.0		3/23/17 05:11	CHW	G
Total Organic Carbon (TOC)	1.1		mg/L	1.0	0.50	0.18	S5310B-00		3/27/17 10:46	PAG	E

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

ANALYTICAL RESULTS

Workorder: 2216645 ASN018|Scotia Navy Depot

Lab ID: **2216645001** Date Collected: 3/21/2017 09:05 Matrix: Ground Water

Sample ID: **MW-26 032117** Date Received: 3/22/2017 08:56

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		3/23/17 14:57	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:57	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:57	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:57	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:57	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:57	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:57	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:57	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:57	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:57	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:57	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:57	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:57	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 14:57	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	81 - 118			SW846 8260C		3/23/17 14:57	TMP	A
4-Bromofluorobenzene (S)	109		%	85 - 114			SW846 8260C		3/23/17 14:57	TMP	A
Dibromofluoromethane (S)	98.5		%	80 - 119			SW846 8260C		3/23/17 14:57	TMP	A
Toluene-d8 (S)	95.8		%	89 - 112			SW846 8260C		3/23/17 14:57	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		3/23/17 01:28	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		3/23/17 01:28	EGO	C
Methane	1.4	J+	ug/L	0.50	0.25	0.13	RSK 175		3/23/17 01:28	EGO	C
WET CHEMISTRY											
Alkalinity, Total	196	+	mg/L	5	5	0.8	S2320B-97		3/23/17 04:33	MSA	H
Chloride	53.4		mg/L	2.0	0.50	0.16	EPA 300.0		3/23/17 05:25	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		3/23/17 05:25	CHW	G
Sulfate	29.4		mg/L	2.0	0.50	0.20	EPA 300.0		3/23/17 05:25	CHW	G
Total Organic Carbon (TOC)	1.3J	J	mg/L	2.0	1.0	0.37	S5310B-00		3/27/17 14:28	PAG	E

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

ANALYTICAL RESULTS

Workorder: 2216645 ASN018|Scotia Navy Depot

Lab ID: **2216645002** Date Collected: 3/21/2017 10:35 Matrix: Ground Water

Sample ID: **MW-24 032117** Date Received: 3/22/2017 08:56

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		3/23/17 15:19	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:19	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:19	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:19	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:19	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:19	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:19	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:19	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:19	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:19	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:19	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:19	TMP	A
Trichloroethene	1.7		ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:19	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:19	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	81 - 118			SW846 8260C		3/23/17 15:19	TMP	A
4-Bromofluorobenzene (S)	107		%	85 - 114			SW846 8260C		3/23/17 15:19	TMP	A
Dibromofluoromethane (S)	98.6		%	80 - 119			SW846 8260C		3/23/17 15:19	TMP	A
Toluene-d8 (S)	95.2		%	89 - 112			SW846 8260C		3/23/17 15:19	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		3/23/17 01:45	EGO	G
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		3/23/17 01:45	EGO	G
Methane	1.7	J+	ug/L	0.50	0.25	0.13	RSK 175		3/23/17 01:45	EGO	G
WET CHEMISTRY											
Alkalinity, Total	205	J+	mg/L	5	5	0.8	S2320B-97		3/23/17 02:22	MSA	V
Chloride	59.0		mg/L	2.0	0.50	0.16	EPA 300.0		3/23/17 05:39	CHW	S
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		3/23/17 05:39	CHW	S
Sulfate	24.1		mg/L	2.0	0.50	0.20	EPA 300.0		3/23/17 05:39	CHW	S
Total Organic Carbon (TOC)	1.0J	J	mg/L	2.0	1.0	0.37	S5310B-00		3/27/17 14:28	PAG	M

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

ANALYTICAL RESULTS

Workorder: 2216645 ASN018|Scotia Navy Depot

Lab ID: **2216645003** Date Collected: 3/21/2017 13:15 Matrix: Ground Water

Sample ID: **MW-32 032117** Date Received: 3/22/2017 08:56

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		3/23/17 15:40	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:40	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:40	TMP	A
1,1-Dichloroethene	0.40J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:40	TMP	A
cis-1,2-Dichloroethene	1.2		ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:40	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:40	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:40	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:40	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:40	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:40	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:40	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:40	TMP	A
Trichloroethene	191		ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:40	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 15:40	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118			SW846 8260C		3/23/17 15:40	TMP	A
4-Bromofluorobenzene (S)	110		%	85 - 114			SW846 8260C		3/23/17 15:40	TMP	A
Dibromofluoromethane (S)	98.6		%	80 - 119			SW846 8260C		3/23/17 15:40	TMP	A
Toluene-d8 (S)	96.7		%	89 - 112			SW846 8260C		3/23/17 15:40	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	19.3		ug/L	1.0	0.50	0.25	RSK 175		3/23/17 02:17	EGO	C
Ethene	10.3		ug/L	1.5	0.75	0.31	RSK 175		3/23/17 02:17	EGO	C
Methane	309		ug/L	0.50	0.25	0.13	RSK 175		3/23/17 02:17	EGO	C
WET CHEMISTRY											
Alkalinity, Total	214	+	mg/L	5	5	0.8	S2320B-97		3/23/17 04:44	MSA	H
Chloride	84.6		mg/L	2.0	0.50	0.16	EPA 300.0		3/23/17 06:21	CHW	G
Nitrate-N	0.020J	J	mg/L	0.20	0.060	0.020	EPA 300.0		3/23/17 06:21	CHW	G
Sulfate	0.68J	J	mg/L	2.0	0.50	0.20	EPA 300.0		3/23/17 06:21	CHW	G
Total Organic Carbon (TOC)	98.0		mg/L	50.0	25.0	9.2	S5310B-00		3/29/17 11:31	PAG	E

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

ANALYTICAL RESULTS

Workorder: 2216645 ASN018|Scotia Navy Depot

Lab ID: **2216645004** Date Collected: 3/21/2017 12:15 Matrix: Ground Water

Sample ID: **MW-34 032117** Date Received: 3/22/2017 08:56

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		3/23/17 16:02	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:02	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:02	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:02	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:02	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:02	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:02	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:02	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:02	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:02	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:02	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:02	TMP	A
Trichloroethene	48.3		ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:02	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:02	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	81 - 118			SW846 8260C		3/23/17 16:02	TMP	A
4-Bromofluorobenzene (S)	110		%	85 - 114			SW846 8260C		3/23/17 16:02	TMP	A
Dibromofluoromethane (S)	100		%	80 - 119			SW846 8260C		3/23/17 16:02	TMP	A
Toluene-d8 (S)	94		%	89 - 112			SW846 8260C		3/23/17 16:02	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	17.3		ug/L	1.0	0.50	0.25	RSK 175		3/23/17 02:34	EGO	C
Ethene	4.4		ug/L	1.5	0.75	0.31	RSK 175		3/23/17 02:34	EGO	C
Methane	1780		ug/L	0.50	0.25	0.13	RSK 175		3/23/17 02:34	EGO	C
WET CHEMISTRY											
Alkalinity, Total	597	+	mg/L	5	5	0.8	S2320B-97		3/23/17 04:57	MSA	H
Chloride	461		mg/L	10.0	2.5	0.80	EPA 300.0		3/30/17 05:11	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		3/23/17 06:35	CHW	G
Sulfate	0.56J	J	mg/L	2.0	0.50	0.20	EPA 300.0		3/23/17 06:35	CHW	G
Total Organic Carbon (TOC)	631		mg/L	100	50.0	18.4	S5310B-00		3/29/17 11:31	PAG	E

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

ANALYTICAL RESULTS

Workorder: 2216645 ASN018|Scotia Navy Depot

Lab ID: **2216645005** Date Collected: 3/21/2017 00:00 Matrix: Ground Water

Sample ID: **DUP-01 032117** Date Received: 3/22/2017 08:56

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		3/23/17 16:24	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:24	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:24	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:24	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:24	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:24	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:24	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:24	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:24	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:24	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:24	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:24	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:24	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:24	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	103		%	81 - 118			SW846 8260C		3/23/17 16:24	TMP	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C		3/23/17 16:24	TMP	A
Dibromofluoromethane (S)	99.4		%	80 - 119			SW846 8260C		3/23/17 16:24	TMP	A
Toluene-d8 (S)	94.7		%	89 - 112			SW846 8260C		3/23/17 16:24	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		3/23/17 02:50	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		3/23/17 02:50	EGO	C
Methane	1.3	J+	ug/L	0.50	0.25	0.13	RSK 175		3/23/17 02:50	EGO	C
WET CHEMISTRY											
Alkalinity, Total	206	J+	mg/L	5	5	0.8	S2320B-97		3/23/17 05:08	MSA	H
Chloride	52.6		mg/L	2.0	0.50	0.16	EPA 300.0		3/23/17 06:49	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		3/23/17 06:49	CHW	G
Sulfate	29.1		mg/L	2.0	0.50	0.20	EPA 300.0		3/23/17 06:49	CHW	G
Total Organic Carbon (TOC)	1.1J	J	mg/L	2.0	1.0	0.37	S5310B-00		3/29/17 11:31	PAG	E

Vicki Forney

Mrs. Vicki A. Forney
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State Certifications: DE ID 11, MA PA0102, MD 128, VA 460157, WV 343

ANALYTICAL RESULTS

Workorder: 2216645 ASN018|Scotia Navy Depot

Lab ID: **2216645006** Date Collected: 3/22/2017 08:56 Matrix: Ground Water

Sample ID: **Trip Blank** Date Received: 3/22/2017 08:56

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		3/23/17 13:07	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 13:07	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	99.3		%	81 - 118	SW846 8260C		3/23/17 13:07	TMP	A
4-Bromofluorobenzene (S)	110		%	85 - 114	SW846 8260C		3/23/17 13:07	TMP	A
Dibromofluoromethane (S)	95.7		%	80 - 119	SW846 8260C		3/23/17 13:07	TMP	A
Toluene-d8 (S)	95.2		%	89 - 112	SW846 8260C		3/23/17 13:07	TMP	A

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ANALYTICAL RESULTS

Workorder: 2216645 ASN018|Scotia Navy Depot

Lab ID: **2216645007** Date Collected: 3/21/2017 14:23 Matrix: Ground Water

Sample ID: **MW-30 032117** Date Received: 3/22/2017 08:56

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		3/23/17 16:46	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:46	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:46	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:46	TMP	A
cis-1,2-Dichloroethene	0.74J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:46	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:46	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:46	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:46	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:46	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:46	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:46	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:46	TMP	A
Trichloroethene	66.3		ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:46	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/23/17 16:46	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	106		%	81 - 118			SW846 8260C		3/23/17 16:46	TMP	A
4-Bromofluorobenzene (S)	109		%	85 - 114			SW846 8260C		3/23/17 16:46	TMP	A
Dibromofluoromethane (S)	100		%	80 - 119			SW846 8260C		3/23/17 16:46	TMP	A
Toluene-d8 (S)	96.3		%	89 - 112			SW846 8260C		3/23/17 16:46	TMP	A
LIGHT HYDROCARBON GASES											
Ethane	23.5		ug/L	1.0	0.50	0.25	RSK 175		3/23/17 03:06	EGO	C
Ethene	9.1		ug/L	1.5	0.75	0.31	RSK 175		3/23/17 03:06	EGO	C
Methane	870		ug/L	0.50	0.25	0.13	RSK 175		3/23/17 03:06	EGO	C
WET CHEMISTRY											
Alkalinity, Total	210	J	mg/L	5	5	0.8	S2320B-97		3/23/17 05:18	MSA	H
Chloride	136		mg/L	2.0	0.50	0.16	EPA 300.0		3/23/17 07:03	CHW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		3/23/17 07:03	CHW	G
Sulfate	0.50U	U	mg/L	2.0	0.50	0.20	EPA 300.0		3/23/17 07:03	CHW	G
Total Organic Carbon (TOC)	139		mg/L	50.0	25.0	9.2	S5310B-00		3/29/17 11:31	PAG	E

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ANALYTICAL RESULTS

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID: **2217086001** Date Collected: 3/22/2017 08:43 Matrix: Ground Water

Sample ID: **MW-28 032217** Date Received: 3/23/2017 08:40

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.62J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
1,1-Dichloroethane	0.88J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
1,1-Dichloroethene	0.53J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
cis-1,2-Dichloroethene	4.4		ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
trans-1,2-Dichloroethene	0.42J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
Tetrachloroethene	42.4		ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
1,1,1-Trichloroethane	9.9		ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
Trichloroethene	181		ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:58	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	92.9		%	81 - 118			SW846 8260C		3/29/17 17:58	DD	A
4-Bromofluorobenzene (S)	101		%	85 - 114			SW846 8260C		3/29/17 17:58	DD	A
Dibromofluoromethane (S)	83.8		%	80 - 119			SW846 8260C		3/29/17 17:58	DD	A
Toluene-d8 (S)	90.5		%	89 - 112			SW846 8260C		3/29/17 17:58	DD	A
LIGHT HYDROCARBON GASES											
Ethane	1.0		ug/L	1.0	0.50	0.25	RSK 175		3/24/17 02:28	EGO	C
Ethene	1.9		ug/L	1.5	0.75	0.31	RSK 175		3/24/17 02:28	EGO	C
Methane	0.94	~~1~~	ug/L	0.50	0.25	0.13	RSK 175		3/24/17 02:28	EGO	C
WET CHEMISTRY											
Alkalinity, Total	295	~~2~~	mg/L	5	5	0.8	S2320B-97		3/24/17 09:20	MSA	H
Chloride	25.7		mg/L	2.0	0.50	0.16	EPA 300.0		3/24/17 04:51	CHW	G
Nitrate-N	0.44		mg/L	0.20	0.060	0.020	EPA 300.0		3/24/17 04:51	CHW	G
Sulfate	21.6		mg/L	2.0	0.50	0.20	EPA 300.0		3/24/17 04:51	CHW	G
Total Organic Carbon (TOC)	0.81J	J	mg/L	1.0	0.50	0.18	S5310B-00		3/29/17 11:31	PAG	E

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ANALYTICAL RESULTS

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID: **2217086002** Date Collected: 3/22/2017 11:18 Matrix: Ground Water

Sample ID: **MW-29 032217** Date Received: 3/23/2017 08:40

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.63J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
1,1-Dichloroethane	0.45J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
1,1-Dichloroethene	0.55J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
cis-1,2-Dichloroethene	3.1		ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
trans-1,2-Dichloroethene	0.61J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
Tetrachloroethene	37.2		ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
1,1,1-Trichloroethane	10.4		ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
Trichloroethene	197		ug/L	5.0	3.8	1.7	SW846 8260C		3/30/17 15:14	DD	D
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 18:20	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118			SW846 8260C		3/30/17 15:14	DD	D
1,2-Dichloroethane-d4 (S)	93		%	81 - 118			SW846 8260C		3/29/17 18:20	DD	A
4-Bromofluorobenzene (S)	99.4		%	85 - 114			SW846 8260C		3/30/17 15:14	DD	D
4-Bromofluorobenzene (S)	101		%	85 - 114			SW846 8260C		3/29/17 18:20	DD	A
Dibromofluoromethane (S)	93.6		%	80 - 119			SW846 8260C		3/30/17 15:14	DD	D
Dibromofluoromethane (S)	85.5		%	80 - 119			SW846 8260C		3/29/17 18:20	DD	A
Toluene-d8 (S)	98.1		%	89 - 112			SW846 8260C		3/30/17 15:14	DD	D
Toluene-d8 (S)	91.2		%	89 - 112			SW846 8260C		3/29/17 18:20	DD	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		3/24/17 02:59	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		3/24/17 02:59	EGO	C
Methane	1.1		ug/L	0.50	0.25	0.13	RSK 175		3/24/17 02:59	EGO	C
WET CHEMISTRY											
Alkalinity, Total	258	+-	mg/L	5	5	0.8	S2320B-97		3/24/17 09:31	MSA	H
Chloride	21.3		mg/L	2.0	0.50	0.16	EPA 300.0		3/24/17 05:05	CHW	G
Nitrate-N	0.52		mg/L	0.20	0.060	0.020	EPA 300.0		3/24/17 05:05	CHW	G
Sulfate	20.1		mg/L	2.0	0.50	0.20	EPA 300.0		3/24/17 05:05	CHW	G
Total Organic Carbon (TOC)	0.91J	J	mg/L	1.0	0.50	0.18	S5310B-00		3/29/17 11:31	PAG	E

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ANALYTICAL RESULTS

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID: **2217086003** Date Collected: 3/22/2017 12:11 Matrix: Ground Water

Sample ID: **MW-31 032217** Date Received: 3/23/2017 08:40

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		3/29/17 16:52	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 16:52	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 16:52	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 16:52	DD	A
cis-1,2-Dichloroethene	0.41J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 16:52	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 16:52	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 16:52	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 16:52	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 16:52	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 16:52	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 16:52	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 16:52	DD	A
Trichloroethene	35.0		ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 16:52	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 16:52	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	91.8		%	81 - 118			SW846 8260C		3/29/17 16:52	DD	A
4-Bromofluorobenzene (S)	100		%	85 - 114			SW846 8260C		3/29/17 16:52	DD	A
Dibromofluoromethane (S)	81.6		%	80 - 119			SW846 8260C		3/29/17 16:52	DD	A
Toluene-d8 (S)	90.7		%	89 - 112			SW846 8260C		3/29/17 16:52	DD	A
LIGHT HYDROCARBON GASES											
Ethane	10.1		ug/L	1.0	0.50	0.25	RSK 175		3/24/17 03:34	EGO	C
Ethene	4.7		ug/L	1.5	0.75	0.31	RSK 175		3/24/17 03:34	EGO	C
Methane	106		ug/L	0.50	0.25	0.13	RSK 175		3/24/17 03:34	EGO	C
WET CHEMISTRY											
Alkalinity, Total	381	+	mg/L	5	5	0.8	S2320B-97		3/24/17 09:43	MSA	H
Chloride	98.5		mg/L	2.0	0.50	0.16	EPA 300.0		3/24/17 05:19	CHW	G
Nitrate-N	0.040J	J	mg/L	0.20	0.060	0.020	EPA 300.0		3/24/17 05:19	CHW	G
Sulfate	2.6		mg/L	2.0	0.50	0.20	EPA 300.0		3/24/17 05:19	CHW	G
Total Organic Carbon (TOC)	257		mg/L	50.0	25.0	9.2	S5310B-00		3/31/17 20:15	PAG	E

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

ANALYTICAL RESULTS

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID: **2217086004** Date Collected: 3/22/2017 13:20 Matrix: Ground Water

Sample ID: **MW-33 032217** Date Received: 3/23/2017 08:40

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			3/29/17 17:36	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:36	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:36	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:36	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:36	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:36	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:36	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:36	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:36	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:36	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:36	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:36	DD	A
Trichloroethene	151		ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:36	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			3/29/17 17:36	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	91.8		%	81 - 118			SW846 8260C			3/29/17 17:36	DD	A
4-Bromofluorobenzene (S)	98.8		%	85 - 114			SW846 8260C			3/29/17 17:36	DD	A
Dibromofluoromethane (S)	83.2		%	80 - 119			SW846 8260C			3/29/17 17:36	DD	A
Toluene-d8 (S)	89.5		%	89 - 112			SW846 8260C			3/29/17 17:36	DD	A
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			3/24/17 03:54	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			3/24/17 03:54	EGO	C
Methane	9.2		ug/L	0.50	0.25	0.13	RSK 175			3/24/17 03:54	EGO	C
WET CHEMISTRY												
Alkalinity, Total	194	+	mg/L	5	5	0.8	S2320B-97			3/24/17 09:55	MSA	H
Chloride	29.2		mg/L	2.0	0.50	0.16	EPA 300.0			3/24/17 05:33	CHW	G
Nitrate-N	0.32		mg/L	0.20	0.060	0.020	EPA 300.0			3/24/17 05:33	CHW	G
Sulfate	15.0		mg/L	2.0	0.50	0.20	EPA 300.0			3/24/17 05:33	CHW	G
Total Organic Carbon (TOC)	2.1		mg/L	1.0	0.50	0.18	S5310B-00			3/29/17 11:31	PAG	E

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

ANALYTICAL RESULTS

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID: **2217086005** Date Collected: 3/22/2017 14:30 Matrix: Ground Water

Sample ID: **MW-35 032217** Date Received: 3/23/2017 08:40

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		3/29/17 17:14	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:14	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:14	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:14	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:14	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:14	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:14	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:14	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:14	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:14	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:14	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:14	DD	A
Trichloroethene	12.5		ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:14	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/29/17 17:14	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	93		%	81 - 118			SW846 8260C		3/29/17 17:14	DD	A
4-Bromofluorobenzene (S)	100		%	85 - 114			SW846 8260C		3/29/17 17:14	DD	A
Dibromofluoromethane (S)	83.9		%	80 - 119			SW846 8260C		3/29/17 17:14	DD	A
Toluene-d8 (S)	91		%	89 - 112			SW846 8260C		3/29/17 17:14	DD	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		3/24/17 04:10	EGO	C
Ethene	0.32J	J	ug/L	1.5	0.75	0.31	RSK 175		3/24/17 04:10	EGO	C
Methane	5.8		ug/L	0.50	0.25	0.13	RSK 175		3/24/17 04:10	EGO	C
WET CHEMISTRY											
Alkalinity, Total	51	+	mg/L	5	5	0.8	S2320B-97		3/24/17 10:04	MSA	H
Chloride	2.0		mg/L	2.0	0.50	0.16	EPA 300.0		3/24/17 05:47	CHW	G
Nitrate-N	0.14J	J	mg/L	0.20	0.060	0.020	EPA 300.0		3/24/17 05:47	CHW	G
Sulfate	3.5		mg/L	2.0	0.50	0.20	EPA 300.0		3/24/17 05:47	CHW	G
Total Organic Carbon (TOC)	1.4		mg/L	1.0	0.50	0.18	S5310B-00		3/29/17 11:31	PAG	E

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

ANALYTICAL RESULTS

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID: **2217086006** Date Collected: 3/22/2017 15:29 Matrix: Ground Water

Sample ID: **MW-15 032217** Date Received: 3/23/2017 08:40

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		3/30/17 19:15	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:15	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:15	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:15	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:15	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:15	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:15	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:15	DD	A
Tetrachloroethene	0.84J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:15	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:15	DD	A
1,1,1-Trichloroethane	1.9		ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:15	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:15	DD	A
Trichloroethene	80.5		ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:15	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:15	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	111		%	81 - 118			SW846 8260C		3/30/17 19:15	DD	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C		3/30/17 19:15	DD	A
Dibromofluoromethane (S)	96.5		%	80 - 119			SW846 8260C		3/30/17 19:15	DD	A
Toluene-d8 (S)	99.8		%	89 - 112			SW846 8260C		3/30/17 19:15	DD	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		3/24/17 04:26	EGO	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		3/24/17 04:26	EGO	C
Methane	0.21J	J	ug/L	0.50	0.25	0.13	RSK 175		3/24/17 04:26	EGO	C
WET CHEMISTRY											
Alkalinity, Total	201	+-	mg/L	5	5	0.8	S2320B-97		3/24/17 10:15	MSA	H
Chloride	28.3		mg/L	2.0	0.50	0.16	EPA 300.0		3/24/17 06:01	CHW	G
Nitrate-N	0.90		mg/L	0.20	0.060	0.020	EPA 300.0		3/24/17 06:01	CHW	G
Sulfate	21.3		mg/L	2.0	0.50	0.20	EPA 300.0		3/24/17 06:01	CHW	G
Total Organic Carbon (TOC)	0.47J	J	mg/L	1.0	0.50	0.18	S5310B-00		3/29/17 11:31	PAG	E

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

ANALYTICAL RESULTS

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID: **2217086007** Date Collected: 3/22/2017 00:00 Matrix: Ground Water

Sample ID: **DUP-02 032217** Date Received: 3/23/2017 08:40

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.64J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:37	DD	A
1,1-Dichloroethane	0.90J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:37	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:37	DD	A
1,1-Dichloroethene	0.54J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:37	DD	A
cis-1,2-Dichloroethene	4.4		ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:37	DD	A
trans-1,2-Dichloroethene	0.43J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:37	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:37	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:37	DD	A
Tetrachloroethene	43.3		ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:37	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:37	DD	A
1,1,1-Trichloroethane	10.4		ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:37	DD	A
1,1,2-Trichloroethane	0.33J	J	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:37	DD	A
Trichloroethene	188		ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:37	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 19:37	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	109		%	81 - 118			SW846 8260C		3/30/17 19:37	DD	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C		3/30/17 19:37	DD	A
Dibromofluoromethane (S)	96.4		%	80 - 119			SW846 8260C		3/30/17 19:37	DD	A
Toluene-d8 (S)	98.7		%	89 - 112			SW846 8260C		3/30/17 19:37	DD	A
LIGHT HYDROCARBON GASES											
Ethane	1.0		ug/L	1.0	0.50	0.25	RSK 175		3/24/17 04:42	EGO	C
Ethene	1.9		ug/L	1.5	0.75	0.31	RSK 175		3/24/17 04:42	EGO	C
Methane	0.80		ug/L	0.50	0.25	0.13	RSK 175		3/24/17 04:42	EGO	C
WET CHEMISTRY											
Alkalinity, Total	309	+-	mg/L	5	5	0.8	S2320B-97		3/24/17 10:26	MSA	H
Chloride	26.2		mg/L	2.0	0.50	0.16	EPA 300.0		3/24/17 06:15	CHW	G
Nitrate-N	0.48		mg/L	0.20	0.060	0.020	EPA 300.0		3/24/17 06:15	CHW	G
Sulfate	22.1		mg/L	2.0	0.50	0.20	EPA 300.0		3/24/17 06:15	CHW	G
Total Organic Carbon (TOC)	0.68J	J	mg/L	1.0	0.50	0.18	S5310B-00		3/29/17 11:31	PAG	E

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ANALYTICAL RESULTS

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID: **2217086008** Date Collected: 3/23/2017 08:40 Matrix: Ground Water

Sample ID: **Trip Blank** Date Received: 3/23/2017 08:40

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		3/30/17 14:09	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 14:09	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 14:09	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 14:09	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 14:09	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 14:09	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 14:09	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 14:09	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 14:09	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 14:09	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 14:09	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 14:09	DD	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 14:09	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		3/30/17 14:09	DD	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	81 - 118	SW846 8260C		3/30/17 14:09	DD	A
4-Bromofluorobenzene (S)	101		%	85 - 114	SW846 8260C		3/30/17 14:09	DD	A
Dibromofluoromethane (S)	91.8		%	80 - 119	SW846 8260C		3/30/17 14:09	DD	A
Toluene-d8 (S)	95.9		%	89 - 112	SW846 8260C		3/30/17 14:09	DD	A

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

Attachment C

Support Documentation

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

ALS Environmental

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAGE ___

* 2 2 1 6 2 1 2 *

Project Name: Scotia Navy Depot	Project Number: 60440641.9
Project Manager: John Santacroce	Report CC: John Santacroce
Company/Address: AECOM 40 British American Blvd Latham, NY 12110	
Phone #: 518-951-2200	Email: John.Santacroce@aecom.com
Sampler's Signature: Chris French	Sampler's Printed Name: Chris French

ANALYSIS REQUESTED (Include Method Number and Container Preservative)

PRESERVATIVE: 1 1 1 0 0

NUMBER OF CONTAINERS: 8 2 2 2 1 1

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other ____

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	REMARKS/ ALTERNATE DESCRIPTION
MW-16 032017		3/20/17	1524	GW	
Trip Blank (Not rec'd JLS 3/21		-	-	AQ	

Custody Seals Present? JLS
(if present) Seals Intact?
Received on ice?
COC/Labels Complete
Cont in Good Cond? ✓
Correct Containers?
Correct Samp Vol?
Correct Preservation?
Headspace/Volatiles?
Tracking #: 647283100129

Y N Initials Cooler Temp: ___ °C
Cooler #:
Therm ID: TH318
Ship Carrier: FedEx UPS DHL

TRIP BLANKS NOT Rec'd. We did rec. 2 empty VIALS But they are not labeled

SPECIAL INST: Metals

See QAPP

TURNAROUND REQUIREMENTS
___ RUSH (SURCHARGES APPLY)
___ 1 day ___ 2 day ___ 3 day
___ 4 day ___ 5 day
Standard
REQUESTED REPORT DATE
Standard

REPORT REQUIREMENTS
___ I. Results Only See QAPP
___ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
___ III. Results + QC and Calibration Summaries
___ IV. Data Validation Report with Raw Data
See QAPP
Edata X Yes ___ No

INVOICE INFORMATION
PO # 60440641
BILL TO: John Santacroce
AECOM
40 British American Blvd
Latham, NY 12110

STATE WHERE SAMPLES WERE COLLECTED: New York TB JLS 3/21/17

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature: Chris French	Signature: Brian McMullen	Signature: Brian McMullen	Signature: Brian McMullen	Signature	Signature: Jessica Smith
Printed Name: Chris French	Printed Name: BRIAN McMULLEN	Printed Name: BRIAN McMULLEN	Printed Name: BRIAN McMULLEN	Printed Name	Printed Name: JLS
Firm: AECOM	Firm: ALS	Firm: ALS	Firm: ALS	Firm	Firm: ALS
Date/Time: 3/20/17 1535	Date/Time: 3/20/17 1535	Date/Time: 3/20/17 1720	Date/Time: 3/21/17 0900	Date/Time	Date/Time: 3/21/17 0915

Distribution: White - Lab Copy; Yellow - Return to Originator

ALS Environmental

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

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

SAMPLE SUMMARY

Workorder: 2216212 ASN017|Scotia Navy Depot

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2216212001	MW-16 032017	Ground Water	3/20/2017 15:24	3/21/2017 09:15	Collected by Client

ALS Environmental

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

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

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2216212001	2	MW-16 032017	EPA 300.0	Nitrate-N
Analyte was analyzed past the 48 hour holding time.				
2216212001	3	MW-16 032017	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

AECOM - Latham, NY
ALS-Middletown
Case Narrative
ASN-017 (2216212)

Sample Management

This report contains the results of the analysis of one (1) ground water sample collected on March 20, 2107. 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 March 21, 2017. 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. One (1) water sample was 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).

Continuing Calibration Verification. Samples were analyzed immediately following the initial calibration.

Blanks. Target analytes were not detected in the method blanks

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

- In 2502786 LCS, Dibromofluoromethane was recovered below 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. One (1) water sample was submitted for the analysis of light hydrocarbon gases by Method RSK-175. The samples were analyzed within the method specified holding time of fourteen days.

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

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

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

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

- Methane was detected at 0.40 µg/L.

Anions by EPA 300.0

Sample handling. One (1) aqueous sample was analyzed for chloride, nitrate, and sulfate by EPA Method 300.0. The sample was analyzed within the method recommended holding time for each analyte.

Calibration. Initial calibrations, identified as Method A (high range) and Method L (low range), were properly established. All calibration verification standards were recovered within the QC limits.

Blanks. Initial and continuing blanks were analyzed with the samples. No analyte was detected above ½ the reporting limits in the blanks.

Laboratory Control Samples. Laboratory control samples, identified as 2505689 and SSL, were analyzed initially and every 20 samples. Recoveries were within the QC limits.

Total Alkalinity by SM 2320B

Sample handling. One (1) aqueous sample was analyzed for total alkalinity by Standard Method 2320B. The sample was analyzed within the 14-day holding time established for the method.

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

Calibration. The standards were recovered within the alkalinity QC limits.

Duplicate. A duplicate analysis, identified as 2504878, was performed on sample 2216212001 (MW-16 032017). The relative percent difference between the results was within the QC limit.

Total Organic Carbon by SM 5310B

Sample handling. One (1) aqueous sample was analyzed for total organic carbon by Standard Method 5310B. The sample was analyzed within the 28-day holding time established for the method.

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

Blanks. Method blanks were analyzed with the samples. Total organic carbon was not detected above ½ the reporting limit in the blanks.

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.
2505665

Lab Name: ALSI Contract:

Lab Code: PA-010 Case No.: SAS No.: SDG No.: ASN017

Matrix: (soil/water) WATER Lab Sample ID: 2505665

Sample wt/vol: _____ (g/mL) ML Lab File ID: MCNA003

Level: (low/med) LOW Date Received: 03/23/17

% Moisture: not dec. _____ Date Analyzed: 03/23/17

GC Column: PORAPAK Q ID: 2.00 (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	0.40	
74-85-1	ETHENE	0.75	U
74-84-0	ETHANE	0.50	U

Form 4B
Inorganic Blank Summary

Analysis Method: S2320B-97
Instrument: AUTOT

SDG No.: ASN017

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2504869	Alkalinity, Total	MB	QC-Water	03/21/2017 23:14	0.9	J	mg/L
2504877	Alkalinity, Total	MB	QC-Water	03/22/2017 01:36	2	J	mg/L
2504881	Alkalinity, Total	MB	QC-Water	03/22/2017 03:29	2	J	mg/L

(1) The following qualifiers are used:

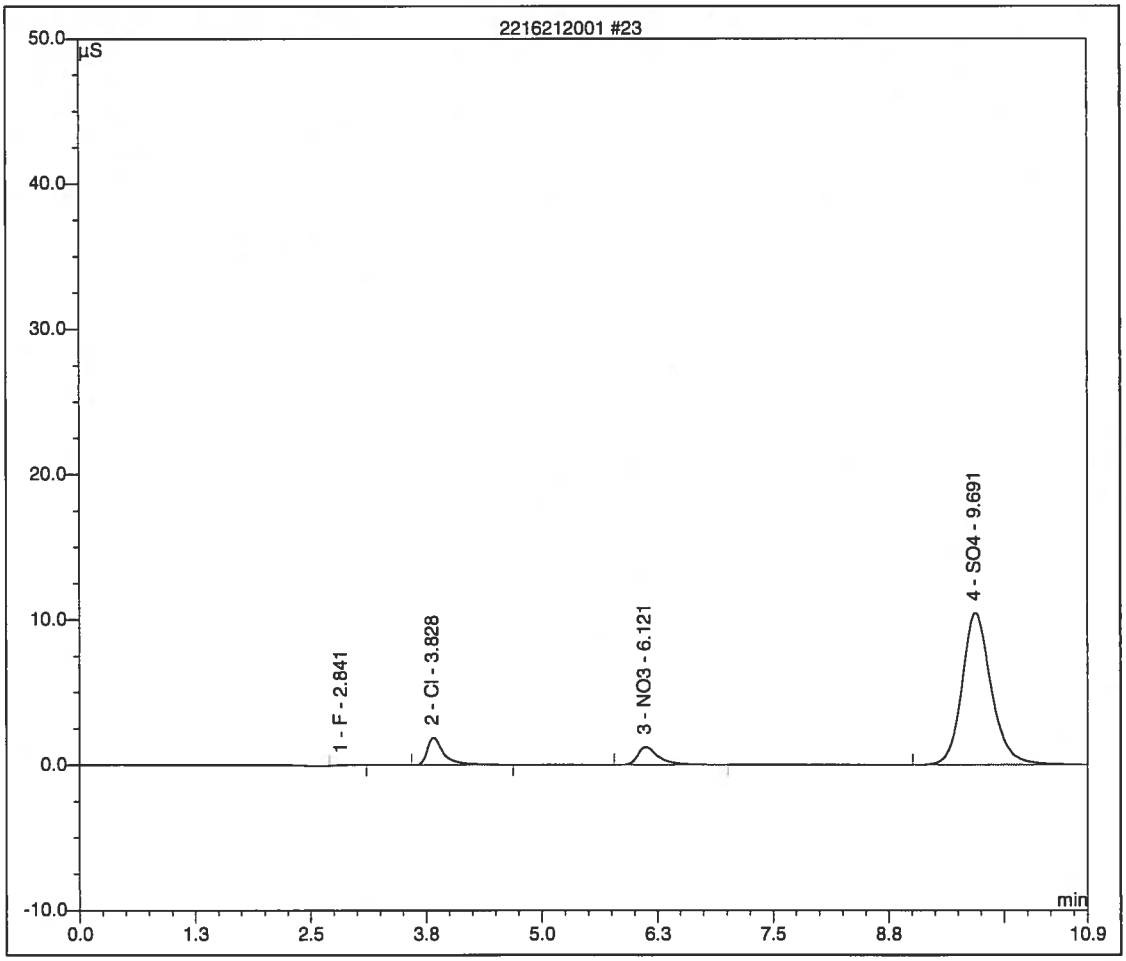
U: The analyte concentration is less than the reporting limit listed
J: The analyte concentration is less than the reporting limit but greater than the method detection limit

Comments:

Peak Integration Report

Sample Name:	**2216212001**	*Dilution:*	**2**
Sample Type:	**SAMPLE**	*Analyst:*	**CHW**
Program:	**300_0**	*Queue:*	**WETC**
Inj. Date/Time:	**03/23/17 05:11**	*Batch:*	**184698**
Instrument:	**IC-5**	*Comment:*	
Sequence1:	**032317**	*InitialCal:*	**031617**
Sequence2:		*Method:*	**A5_031617**

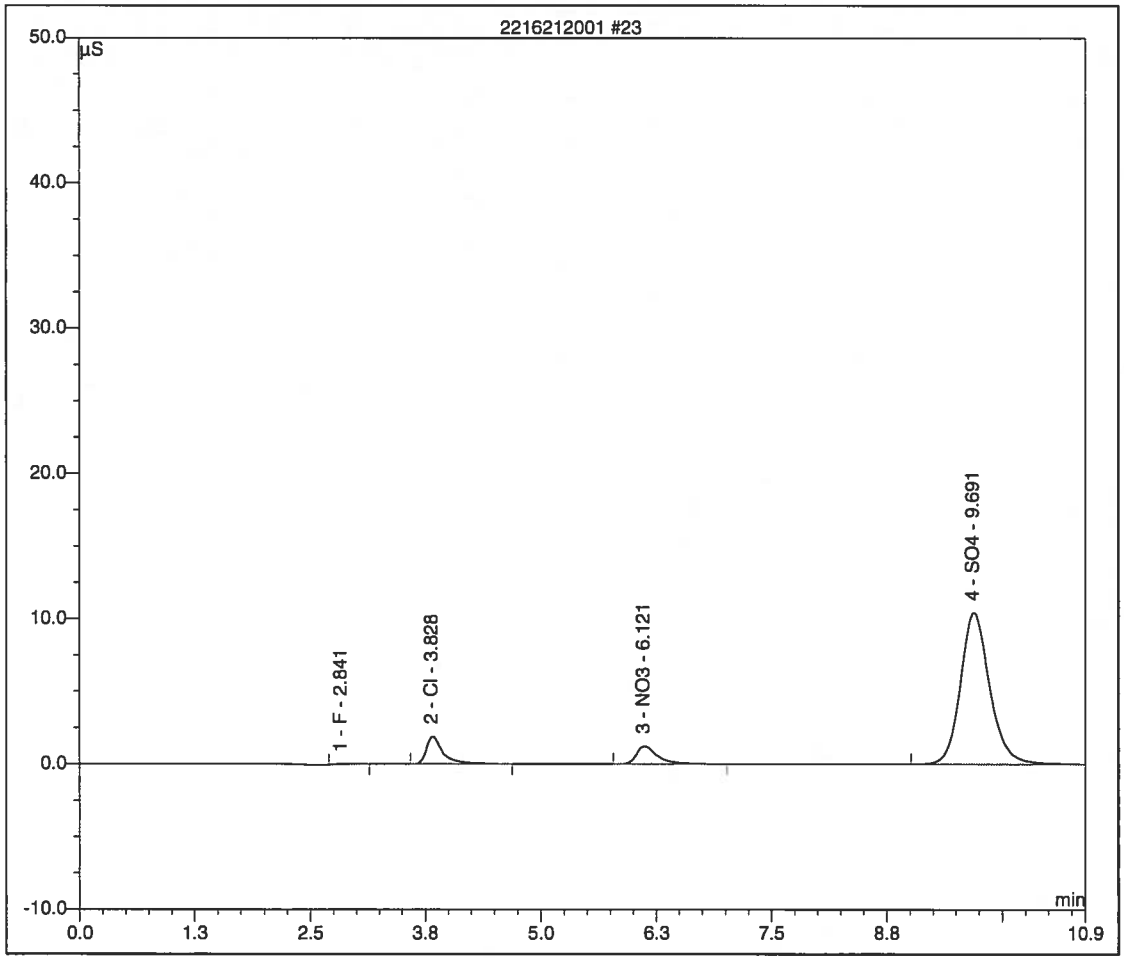
No.	Time min	Peak Name	Area µS*min	Height µS	Amount
1	2.84	F	0.007	0.042	0.03
2	3.83	Cl	0.401	1.896	5.87
n.a.	n.a.	NO2	n.a.	n.a.	n.a.
n.a.	n.a.	Br	n.a.	n.a.	n.a.
3	6.12	NO3	0.327	1.235	1.15
4	9.69	SO4	3.828	10.425	32.67
		TOTAL:	4.56	13.60	39.74



Peak Integration Report

Sample Name:	**2216212001**	*Dilution:*	**2**
Sample Type:	**SAMPLE**	*Analyst:*	**CHW**
Program:	**300_0**	*Queue:*	**WETC**
Inj. Date/Time:	**03/23/17 05:11**	*Batch:*	**184698**
Instrument:	**IC-5**	*Comment:*	
Sequence1:	**032317**	*InitialCal:*	**031617**
Sequence2:		*Method:*	**L5_031617**

No.	Time min	Peak Name	Area µS*min	Height µS	Amount
1	2.84	F	0.008	0.043	0.04
2	3.83	Cl	0.401	1.896	2.80
n.a.	n.a.	NO2	n.a.	n.a.	n.a.
n.a.	n.a.	Br	n.a.	n.a.	n.a.
3	6.12	NO3	0.327	1.235	1.03
4	9.69	SO4	3.828	10.425	37.78
		TOTAL:	4.56	13.60	41.64



Form 4B
Inorganic Blank Summary

Analysis Method: EPA 300.0
Instrument: IC-5

SDG No.: ASN017

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2505687	Chloride	MB	QC-Water	03/23/2017 03:35	0.25	U	mg/L
2505687	Nitrate-N	MB	QC-Water	03/23/2017 03:35	0.030	U	mg/L
2505687	Sulfate	MB	QC-Water	03/23/2017 03:35	0.25	U	mg/L
2505926	Chloride	MB	QC-Water	03/23/2017 07:59	0.1	J	mg/L
2505926	Nitrate-N	MB	QC-Water	03/23/2017 07:59	0.10	U	mg/L
2505926	Sulfate	MB	QC-Water	03/23/2017 07:59	1.0	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:

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

ALS Environmental

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAG

* 2 2 1 6 6 4 5 *

Project Name: Scotia Navy Depot	Project Number: 60440641.7
Project Manager: John Santacroce	Report CC: John.Santacroce@
Company/Address: AECOM	
40 British American Blvd	
Latham, NY 12110	
Phone #: (518) 951-2200	Email: John.Santacroce@aecom.com
Sampler's Signature:	Sampler's Printed Name: Chris French

ANALYSIS REQUESTED (Include Method Number and

PRESERVATIVE	1	1	1	0	0												
NUMBER OF CONTAINERS	8260 VOC	RSK 175	TOC	Alkalinity	Cl, SO4, NO3	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)										REMARKS/ ALTERNATE DESCRIPTION
CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX													
MW-26 032117		3/21/17	0905	GW	8	X	X	X	X	X							
MW-24 032117 MS MSD			1035		24	X	X	X	X	X							Extra Volume collected for MS/MSD
MW-32 032117			1315		8	X	X	X	X	X							
MW-34 032117			1215		8	X	X	X	X	X							
DUP-01 032117			-		8	X	X	X	X	X							
MW-30 032117			1423		8	X	X	X	X	X							
TRIP BLANK		-	-	-	2	X											

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

	Y	N	Initials	Cooler Temp:
Custody Seals Present?			AF	°C
(if present) Seals Intact?				Cooler #:
Received on Ice?				
COC/Lbls Complete				Therm ID:
Cont in Good Cond?				IR18
Correct Containers?				Ship Carrier:
Correct Samp Vol?				(FedEx) UPS
Correct Preservation?				DHL ____
Headspace/Volatiles?				

Tracking #: 640863100140

AF 3/22/17

SPECIAL INSTRUCTIONS/COMMENTS
Metals

See QAPP ☒

TURNAROUND REQUIREMENTS
____ RUSH (SURCHARGES APPLY)
____ 1 day ____ 2 day ____ 3 day
____ 4 day ____ 5 day
Standard
REQUESTED REPORT DATE
Standard

REPORT REQUIREMENTS
____ I. Results Only See QAPP
____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
____ III. Results + QC and Calibration Summaries
____ IV. Data Validation Report with Raw Data
See QAPP
Edata X Yes ____ No

INVOICE INFORMATION
PO # 60440641
Bill To: John Santacroce
AECOM
40 British American Blvd
Latham, NY 12110

STATE WHERE SAMPLES WERE COLLECTED: New York

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	Signature: Brian McHugh	Signature: Brian McHugh	Signature	Signature	Signature
Printed Name	Printed Name: BRIAN McHUGH	Printed Name: Brian McHugh	Printed Name	Printed Name	Printed Name
Firm	Firm: AES	Firm: AES	Firm	Firm	Firm
Date/Time: 3/21/17 1330	Date/Time: 3/21/17 1530	Date/Time: 3/21/17 1700	Date/Time: 3/22/17 0856	Date/Time	Date/Time

Distribution: White - Lab Copy; Yellow - Return to Originator

ALS Environmental

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

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

SAMPLE SUMMARY

Workorder: 2216645 ASN018|Scotia Navy Depot

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2216645001	MW-26 032117	Ground Water	3/21/2017 09:05	3/22/2017 08:56	Collected by Client
2216645002	MW-24 032117	Ground Water	3/21/2017 10:35	3/22/2017 08:56	Collected by Client
2216645003	MW-32 032117	Ground Water	3/21/2017 13:15	3/22/2017 08:56	Collected by Client
2216645004	MW-34 032117	Ground Water	3/21/2017 12:15	3/22/2017 08:56	Collected by Client
2216645005	DUP-01 032117	Ground Water	3/21/2017 00:00	3/22/2017 08:56	Collected by Client
2216645006	Trip Blank	Ground Water	3/22/2017 08:56	3/22/2017 08:56	Collected by Client
2216645007	MW-30 032117	Ground Water	3/21/2017 14:23	3/22/2017 08:56	Collected by Client

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2216645001	1	MW-26 032117	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2216645002	1	MW-24 032117	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2216645003	1	MW-32 032117	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2216645004	1	MW-34 032117	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2216645005	1	DUP-01 032117	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2216645007	1	MW-30 032117	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

AECOM - Latham, NY
ALS-Middletown
Case Narrative
ASN-017 (2216645)

Sample Management

This report contains the results of the analysis of seven (7) ground water samples collected on March 21-22, 2017. 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 March 22, 2017. 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. Seven (7) 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).

Continuing Calibration Verification. Samples were analyzed immediately following the initial calibration.

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

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

- In 2502786 LCS, Dibromofluoromethane was recovered below control limits.

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

Matrix Spikes. A matrix spike and matrix spike duplicate, identified as 2506015 and 2506016, was prepared from project sample MW-30 032117 (2216645007). Results for precision and accuracy were within control limits.

Internal Standards. Internal standard results met method criteria

Light Hydrocarbon Gases by RSK-175

Sample Handling. Six (6) 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:

- Methane was detected at 0.40 µg/L.

Duplicate Samples. A duplicate sample, identified as 2505666, was prepared from project sample MW-24 032117 (2216645002). No target analytes were detected; except as follows:

- Methane was detected at 1.7 µg/L in the sample and at 1.5 µg/L in the duplicate sample with a %RPD of 13%.

Anions by EPA 300.0

Sample handling. Seven (7) aqueous samples were analyzed for chloride, nitrate-N, 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. All calibration verification standards were recovered within the QC limits.

Blanks. Initial and continuing blanks were analyzed with the samples. No analyte was detected above ½ the reporting limits in the blanks.

Laboratory Control Samples. Laboratory control samples, identified as 2505689 and SSL, were analyzed initially and every 20 samples. Recoveries were within the QC limits.

Laboratory control samples, identified as 2509812 and SSL, were analyzed initially and every 20 samples. Recoveries were within the QC limits.

Spikes. Matrix spike and matrix spike duplicate analyses, identified as 2505691 and 2505692, were performed on sample 2216645002 (MW-24 032117). The spike recoveries for chloride and nitrate-N were not within the QC limit for the method and was not commented appropriately in LIMs. The spike recoveries for sulfate was within the QC limit for the method. Relative percent difference for all analytes were within the QC limit.

Total Alkalinity by SM 2320B

Sample handling. Seven (7) aqueous samples were analyzed for total alkalinity by Standard Method 2320B. The samples were analyzed within the 14-day holding time established for the method.

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

Calibration. The standards were recovered within the alkalinity QC limits.

Duplicate. A duplicate analysis, identified as 2505580, was performed on sample 2216645002 (MW-24 032117). The relative percent difference between the results was within the QC limit.

Total Organic Carbon by SM 5310B

Sample handling. Seven (7) aqueous samples were analyzed for total organic carbon by Standard Method 5310B. The samples were analyzed within the 28-day holding time established for the method.

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

Blanks. Method blanks were analyzed with the samples. Total organic carbon was not detected above ½ the reporting limit in the blanks.

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.
2505665

Lab Name: ALSI Contract:

Lab Code: PA-010 Case No.: SAS No.: SDG No.: ASN018

Matrix: (soil/water) WATER Lab Sample ID: 2505665

Sample wt/vol: _____ (g/mL) ML Lab File ID: MCNA003

Level: (low/med) LOW Date Received: 03/23/17

% Moisture: not dec. _____ Date Analyzed: 03/23/17

GC Column: PORAPAK Q ID: 2.00 (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	0.40	
74-85-1	ETHENE	0.75	U
74-84-0	ETHANE	0.50	U

FORM I VOA

Sample Description

MW-24 032117

Form 3A

Matrix Spike and Matrix Spike Duplicate Recovery Summary

Analysis Method: EPA 300.0
Matrix (soil/water): Ground Water

SDG No.: ASN018
Units: mg/L
Lab Sample ID: 2216645002
Lab MS Sample ID: 2505691
Lab MSD Sample ID: 2505692

Analyte	Spike Added	Sample Concentration	MS Concentration	MS Recovery (%)	(1)	Acceptable Limits (%)
Chloride	40	59.0	106	116	*	87 - 111
Nitrate-N	5	0.0	5.8	116	*	88 - 111
Sulfate	40	24.1	66.4	106		87 - 112

Analyte	Spike Added	MSD Concentration	MSD Recovery (%)	(1)	Acceptable Limits (%)	RPD (%)	(1)	Acc. Lim. (%)
Chloride	40	98.6	98.8		87 - 111	6.82		15
Nitrate-N	5	5.8	115	*	88 - 111	1.04		15
Sulfate	40	64.5	101		87 - 112	2.87		15

(1) The following qualifiers are used:

* : Values outside of acceptable limits
D : Spikes diluted out

Comments:

Form 4B
Inorganic Blank Summary

Analysis Method: EPA 300.0
Instrument: IC-5

SDG No.: ASN018

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2505687	Chloride	MB	QC-Water	03/23/2017 03:35	0.25	U	mg/L
2505687	Nitrate-N	MB	QC-Water	03/23/2017 03:35	0.030	U	mg/L
2505687	Sulfate	MB	QC-Water	03/23/2017 03:35	0.25	U	mg/L
2505926	Chloride	MB	QC-Water	03/23/2017 07:59	0.1	J	mg/L
2505926	Nitrate-N	MB	QC-Water	03/23/2017 07:59	0.10	U	mg/L
2505926	Sulfate	MB	QC-Water	03/23/2017 07:59	1.0	U	mg/L
2509810	Chloride	MB	QC-Water	03/30/2017 03:38	0.08	J	mg/L
2509810	Nitrate-N	MB	QC-Water	03/30/2017 03:38	0.030	U	mg/L
2509810	Sulfate	MB	QC-Water	03/30/2017 03:38	0.25	U	mg/L
2510221	Chloride	MB	QC-Water	03/30/2017 07:52	0.11	J	mg/L
2510221	Nitrate-N	MB	QC-Water	03/30/2017 07:52	0.10	U	mg/L
2510221	Sulfate	MB	QC-Water	03/30/2017 07:52	1.0	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:

Form 4B
Inorganic Blank Summary

Analysis Method: S2320B-97
Instrument: AUTOT

SDG No.: ASN018

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2505575	Alkalinity, Total	MB	QC-Water	03/23/2017 01:36	5	U	mg/L
2505583	Alkalinity, Total	MB	QC-Water	03/23/2017 03:54	5	U	mg/L
2505587	Alkalinity, Total	MB	QC-Water	03/23/2017 05:57	0.8	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:

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

ALS Environmental

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAGE

* 2 2 1 7 0 8 6 *

Project Name: Scotia Navy Depot	Project Number: 60440641.9
Project Manager: John Santacroce	Report CC: John Santacroce
Company/Address: AECOM 40 British American Blvd Latham, NY 12110	
Phone #: (518) 951-2200	Email: John.Santacroce@aecom.com
Sampler's Signature: Chris French	Sampler's Printed Name: Chris French

ANALYSIS REQUESTED (Include Method Number and C

PRESERVATIVE: 1 1 1 0 0

NUMBER OF CONTAINERS | 8260 C | RSK 175 | TOC | Alkalinity | Cl, SO4, NO3 | METALS, TOTAL (List in comments below) | METALS, DISSOLVED (List in comments below)

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	#	8260 C	RSK 175	TOC	Alkalinity	Cl, SO4, NO3	METALS, TOTAL	METALS, DISSOLVED
MW-28 032217		3/22/17	0843	GW	8	X	X	X	X	X		
MW-29 032217			1118		8							
MW-31 032217			1211		8							
MW-33 032217			1320		8							
MW-35 032217			1430		8							
MW-15 032217			1529		8							
Dup-02 032217			—		8							
Trip Blank		—	—	AQ	2							

Duplicate Sample

	Y	N	Initials	Cooler Temp:
Custody Seals Present?				°C
(if present) Seals Intact?	✓			
Received on Ice?	✓		AW	0
COC/Lbls Complete	✓			
Cont in Good Cond?	✓			Cooler #:
Correct Containers?	✓			
Correct Samp Vol?	✓			
Correct Preservation?	✓			Therm.ID: 318
Headspace/Volatiles?			✓	

Ship Carrier: FedEx UPS DHL

Tracking #: 6470 8310 0162

SPECIAL INSTRUCTIONS/COMMENTS
Metals

AT 3/23/17

See QAPP ☒

STATE WHERE SAMPLES WERE COLLECTED: New York

TURNAROUND REQUIREMENTS
RUSH (SURCHARGES APPLY)
1 day 2 day 3 day
4 day 5 day
Standard
REQUESTED REPORT DATE
Standard

REPORT REQUIREMENTS
I. Results Only See QAPP
II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
III. Results + QC and Calibration Summaries
IV. Data Validation Report with Raw Data
See QAPP
Edata X Yes No

INVOICE INFORMATION
PO # 60440641
BILL TO: John Santacroce
AECOM
40 British American Blvd
Latham, NY 12110

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature: Chris French	Signature: D. Ayers	Signature: D. Ayers	Signature: 3-23-17 0850	Signature	Signature
Printed Name: Chris French	Printed Name: DINA AYERS	Printed Name: DINA AYERS	Printed Name	Printed Name	Printed Name
Firm: AECOM	Firm: ALS	Firm: ALS	Firm: ALS	Firm	Firm
Date/Time: 3/22/17 1610	Date/Time: 3/22/17 1610	Date/Time: 3/22/17 1700	Date/Time: 3/23/17 0850	Date/Time	Date/Time

Distribution: White - Lab Copy; Yellow - Return to Originator

ALS Environmental

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

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

SAMPLE SUMMARY

Workorder: 2217086 ASN019|Scotia Navy Depot

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2217086001	MW-28 032217	Ground Water	3/22/2017 08:43	3/23/2017 08:40	Collected by Client
2217086002	MW-29 032217	Ground Water	3/22/2017 11:18	3/23/2017 08:40	Collected by Client
2217086003	MW-31 032217	Ground Water	3/22/2017 12:11	3/23/2017 08:40	Collected by Client
2217086004	MW-33 032217	Ground Water	3/22/2017 13:20	3/23/2017 08:40	Collected by Client
2217086005	MW-35 032217	Ground Water	3/22/2017 14:30	3/23/2017 08:40	Collected by Client
2217086006	MW-15 032217	Ground Water	3/22/2017 15:29	3/23/2017 08:40	Collected by Client
2217086007	DUP-02 032217	Ground Water	3/22/2017 00:00	3/23/2017 08:40	Collected by Client
2217086008	Trip Blank	Ground Water	3/23/2017 08:40	3/23/2017 08:40	Collected by Client

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2217086001	1	MW-28 032217	RSK 175	Methane
The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper control limit is 20.				
2217086001	2	MW-28 032217	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2217086002	1	MW-29 032217	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2217086003	1	MW-31 032217	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2217086004	1	MW-33 032217	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2217086005	1	MW-35 032217	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2217086006	1	MW-15 032217	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2217086007	1	DUP-02 032217	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

AECOM - Latham, NY
ALS-Middletown
Case Narrative
ASN-019 (2217086)

Sample Management

This report contains the results of the analysis of eight (8) ground water samples collected on March 22-23, 2017. 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 March 23, 2017. 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. Eight (8) 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).

Continuing Calibration Verification. Samples were analyzed immediately following the initial calibration.

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

Surrogates. Recoveries were within control limits.

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

Matrix Spikes. A matrix spike and matrix spike duplicate, identified as 2509655 and 2509656, was prepared from project sample MW-15 032217 (2217086006). Results for precision and accuracy were within control limits.

Internal Standards. Internal standard results met method criteria

Light Hydrocarbon Gases by RSK-175

Sample Handling. Seven (7) water samples were submitted for the analysis of light hydrocarbon gases by Method RSK-175. The samples were analyzed within the method specified holding time of fourteen days.

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

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

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

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

Duplicate Samples. A duplicate sample, identified as 2506384, was prepared from project sample MW-28 032217 (2217086001). Target analytes were detected as follows:

- Methane was detected at 0.94 µg/L in the sample and at 0.74 µg/L in the duplicate sample with a %RPD of 24%.
- Ethene was detected at 1.9 µg/L in the sample and at 1.8 µg/L in the duplicate sample with a %RPD of 5%.
- Ethane was detected at 1.0 µg/L in the sample and at 1.0 µg/L in the duplicate sample with a %RPD of 0%.

Anions by EPA 300.0

Sample handling. Seven (7) aqueous samples were analyzed for chloride, nitrate-N, 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. All calibration verification standards were recovered within the QC limits.

Blanks. Initial and continuing blanks were analyzed with the samples. No analyte was detected above ½ the reporting limits in the blanks.

Laboratory Control Samples. Laboratory control samples, identified as 2506450 and SSL, were analyzed initially and every 20 samples. Recoveries were within the QC limits.

Total Alkalinity by SM 2320B

Sample handling. Seven (7) aqueous samples were analyzed for total alkalinity by Standard Method 2320B. The samples were analyzed within the 14-day holding time established for the method.

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

Calibration. The standards were recovered within the alkalinity QC limits.

Total Organic Carbon by SM 5310B

Sample handling. Seven (7) aqueous samples were analyzed for total organic carbon by Standard Method 5310B. The samples were analyzed within the 28-day holding time established for the method.

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

Blanks. Method blanks were analyzed with the samples. Total organic carbon was not detected above ½ the reporting limit in the blanks.

Spikes. A matrix spike and matrix spike duplicate analysis, identified as 2509215 and 2509216, were performed on sample 2217086006 (MW-15 032217). The recoveries were within the QC limit. The RPD between the spikes was below the QC limit.

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.
MW-28 03
2217 DUP

Lab Name: ALSI Contract:

Lab Code: PA-010 Case No.: SAS No.: SDG No.: ASN019

Matrix: (soil/water) WATER Lab Sample ID: 2506384

Sample wt/vol: _____ (g/mL) ML Lab File ID: MCOA014

Level: (low/med) LOW Date Received: 03/23/17

% Moisture: not dec. _____ Date Analyzed: 03/24/17

GC Column: PORAPAK Q ID: 2.00 (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	0.74	
74-85-1	ETHENE	1.8	
74-84-0	ETHANE	1.0	

FORM I VOA

Form 4B
Inorganic Blank Summary

Analysis Method: EPA 300.0
Instrument: IC-5

SDG No.: ASN019

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2506448	Chloride	MB	QC-Water	03/24/2017 03:12	0.08	J	mg/L
2506448	Nitrate-N	MB	QC-Water	03/24/2017 03:12	0.030	U	mg/L
2506448	Sulfate	MB	QC-Water	03/24/2017 03:12	0.25	U	mg/L
2506921	Chloride	MB	QC-Water	03/24/2017 07:38	0.11	J	mg/L
2506921	Nitrate-N	MB	QC-Water	03/24/2017 07:38	0.10	U	mg/L
2506921	Sulfate	MB	QC-Water	03/24/2017 07:38	1.0	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:

Form 4B
Inorganic Blank Summary

Analysis Method: S2320B-97
Instrument: AUTOT

SDG No.: ASN019

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2506308	Alkalinity, Total	MB	QC-Water	03/23/2017 22:03	5	U	mg/L
2506324	Alkalinity, Total	MB	QC-Water	03/24/2017 08:37	0.9	J	mg/L
2506328	Alkalinity, Total	MB	QC-Water	03/24/2017 11:02	0.9	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:

Form 4B
Inorganic Blank Summary

Analysis Method: S2320B-97
Instrument: AUTOT

SDG No.: ASN019

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2506308	Alkalinity, Total	MB	QC-Water	03/23/2017 22:03	5	U	mg/L
2506324	Alkalinity, Total	MB	QC-Water	03/24/2017 08:37	0.9	J	mg/L
2506328	Alkalinity, Total	MB	QC-Water	03/24/2017 11:02	0.9	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: