FINAL

GROUNDWATER MONITORING PROGRAM
2016 FOURTH QUARTER 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

April 2017

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Contract No. W912DY-09-D-0059

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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 United States General Services Administration (GSA) to document the groundwater monitoring activities performed at the Former Scotia Navy Depot (FSND) (Site) for the fourth quarter of 2016 (October 1, 2016 through December 31, 2016). This report presents the results of the first 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 Groundwater Investigations – 2015

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 up-gradient 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 up gradient 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 wall. 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. 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 Wall
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. 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 currier during the sample collection timeframe. Standard COC 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 Hydrogeological Results

The groundwater elevations for the Site were determined based on the initial depth to groundwater measurements that were taken prior to sample collection. Table 3-1 shows the groundwater elevation data for the December 2016 sampling event and compares it to the December 2015 baseline sampling event elevation data. A potentiometric Site map indicating the overburden groundwater flow conditions, groundwater elevation and direction of groundwater flow is included as Figure 3-1.

The average hydraulic gradient at the Site in the vicinity of the PRB wall, estimated based on the December 2016 hydrogeological conditions, was determined to be 0.0025 ft/ft. Based on the December 2016 hydraulic gradient of 0.0025 ft/ft and the range of hydraulic conductivities evaluated for the PRB design (15.66 ft/day to 193.8 ft/day) groundwater velocity at the Site could vary between approximately 0.04 ft/day and 0.5 ft/day. The range of estimated groundwater velocities based on the December 2016 Site conditions (0.04 ft/day-0.5 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 December 2016 quarterly sampling event are presented in Table 3-2. MNA parameters were compared between compliance well pairs.. Chlorides and conductivity values showed an increase between upgradient and downgradient wells. This was expected since the ZVI carrier fluid/guar contained salt and as the carrier gel was broken down the salt dissolved leading to an increase conductivity/salinity in the groundwater.

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. To date nitrate and sulfate levels have shown variable results since the baseline sampling event. Nitrate and sulfate concentrations are expected to decrease from upgradient to downgradient wells as this would indicate that bioactivity is occurring at the Site. The December 2015 groundwater results showed an increase in methane, ethane and ethane in most compliance well pairs particularly in the MW-32 and MW-30 pair. Methane, ethane and ethene are expected to show increased concentrations, indicating signs of subsurface biological activity and breakdown of the ZVI carrier fluids/guar.

3.3 Groundwater VOC results

The VOC results from December 2016 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 (TOG S) 1.1.1 (NYSDEC, 1998) and compares the December 2016 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 contaminant of concern, was detected in 10 of the 12 wells sampled, nine of which were above the AGWQS 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. MW-16 is a plume bounding monitoring well located outside of the estimated area of the contamination plume.

- Concentrations of TCE increased in wells MW-28, MW-30 and MW-34 between the November/December 2015 baseline sampling event, and the December of 2016 Quarterly monitoring event. These wells are all immediately downgradient of the PRB and are all members of PRB confirmation well pairs.

- MW-32 was the only downgradient member of a confirmation well pair to show a slight decrease in concentration of TCE. The sample from MW-32 was found to have a TCE concentration of 132 µg/L which is less than the baseline sampling concentration of 150 µg/L.

- Concentrations of TCE decreased in wells MW-29, MW-31, MW-33 and MW-35 between the November/December 2015 baseline sampling event, and the December of 2016 quarterly monitoring event. These wells are all immediately upgradient of the PRB and are all members of PRB confirmation well pairs.

- Upgradient confirmation wells, MW-31 and MW-35, did not show significant changes in TCE concentrations. MW-31 decreased from 42.7 µg/L to 38.2 µg/L and MW-35 decreased from 31.9 µg/L to 31.8 µg/L.

- Well MW-15, which is located upgradient of the PRB and is not a member of a confirmation well pair, showed an increase in TCE concentration. The concentration of TCE increased from 77.3 µg/L to 183 µg/L, which may be due to groundwater level variation.

4 SUMMARY AND CONCLUSIONS

The 2016 December groundwater monitoring event was the first 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. Details regarding the groundwater sampling program for the Site are given 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. This result is not unexpected due to the fact that the PRB installation was completed approximately two weeks before the collection of these samples. The mixed MNA results indicate that the PRB wall is affecting groundwater but subsurface conditions have not equilibrated from the disturbance caused by the PRB installation that the ZVI carrier fluids could be affecting groundwater chemistry. 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 wall.

Current Site conditions indicate a low or flat hydraulic gradient, and therefore a low groundwater velocity may be present in the vicinity of the PRB wall. The PRB wall was designed based on a hydraulic gradient of 0.004 ft/ft which is approximately 2 times more than the estimated hydraulic gradient of 0.0025 ft/ft in December 2016. 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 take1-2 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.

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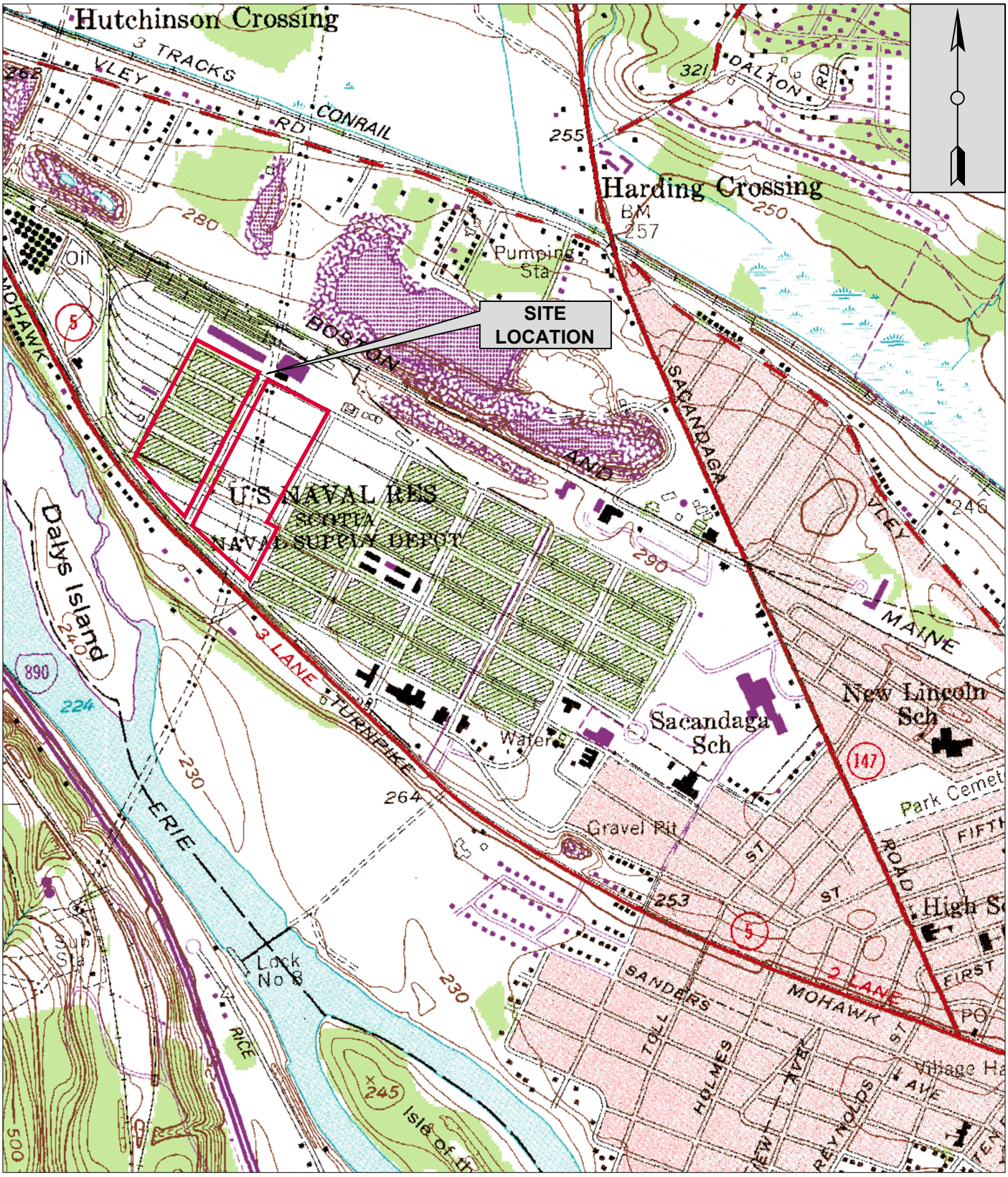
Stone Environmental, 2013. Final Pre-Design Investigation Report, Defense Nation Stockpile Center Scotia Depot Site, Town of Glenville, NY, December.

FIGURES



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

0 2000' 4000'

2016 4th QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: March 2017

US ARMY Corps of Engineers

SITE LOCATION MAP

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Figure: 1-1

AECOM

Figure: 1-2

SITE LAYOUT MAP

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'±

TOWERS

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

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

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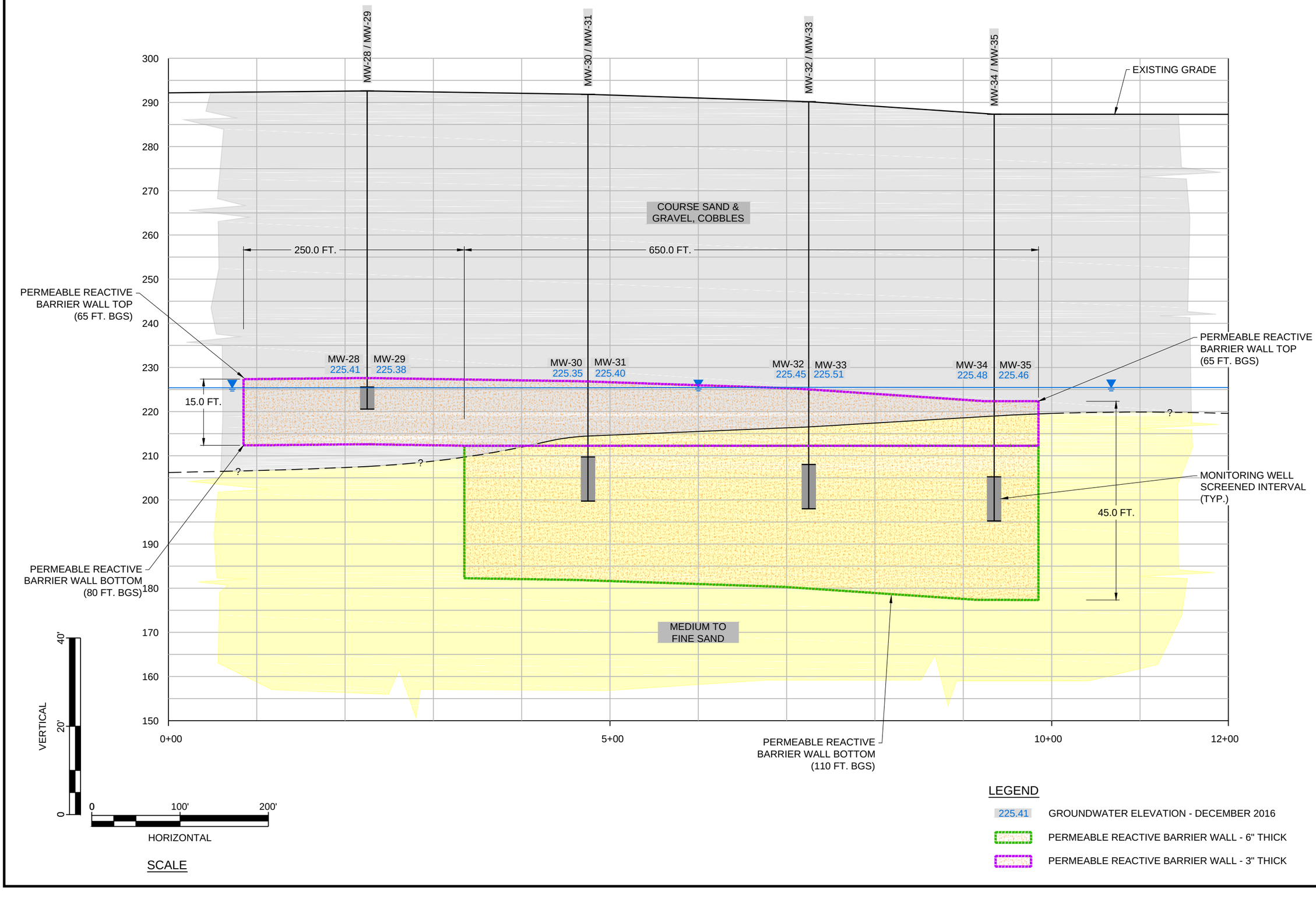
2016 4th QUARTER GROUNDWATER REPORT

DEFENSE NATIONAL STOCKPILE CENTER

SCOTIA DEPOT SITE - SCOTIA, NY

Project No.: 60440641 Date: MARCH 2017



AECOM

Figure: 2-1

COMPLIANCE MONITORING WELLS
AND PRB WALL PROFILE
DECEMBER 2016

US ARMY Corps of Engineers

2016 4th QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE CENTER
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: April 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 (DEC 2015)
- 226 — GROUNDWATER CONTOUR - 1 FT. (DEC 2016) (DASHED WHERE INFERRED)
- GENERAL GROUNDWATER DIRECTION
- APPROXIMATE EXTENT OF PLUME

PMW-3
PMW-1
MW-23 227.06
PMW-2
1st STREET
MW-20 227.01
227
MW-19 226.85
MW-11
MW-21 226.50
250.0 FT. NATIONAL GRID POWER COMPANY EASEMENT
MW-14 226.56
MW-17 226.55
MW-22 226.73
MW-36 226.12
BUILDING 201
BUILDING 202
BUILDING 203
BUILDING 204
AVENUE A
AVENUE B
AVENUE C
3rd STREET
5th STREET
GEP-2 226.38
GEP-4 226.22
MW-28 225.41
MW-29 225.38
MW-18 226.46
MW-15 226.27
GEP-1
GEP-3 226.31
MW-30 225.32
MW-31 225.40
MW-12
MW-8
MW-13 225.43
PROPERTY BOUNDARY (TYP.)
MW-24 225.30
MW-33 225.51
MW-32 225.45
MW-25 225.82
MW-B-3
MW-B-1
MW-35 225.46
MW-26 224.75
MW-34 225.48
MW-5 219.29
MW-9 219.75
MW-6 219.80
MW-27 223.44
MW-7 223.16
MW-16 225.38
BUILDING 403
BUILDING 404
BUILDING 405
BUILDING 406
CONCRETE REMAINS
TOWERS
CHAIN LINK FENCE
220
221
222
223
224
225
226
0
200'
400'

POTENTIOMETRIC SITE MAP
DECEMBER 2016

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Figure: 3-1

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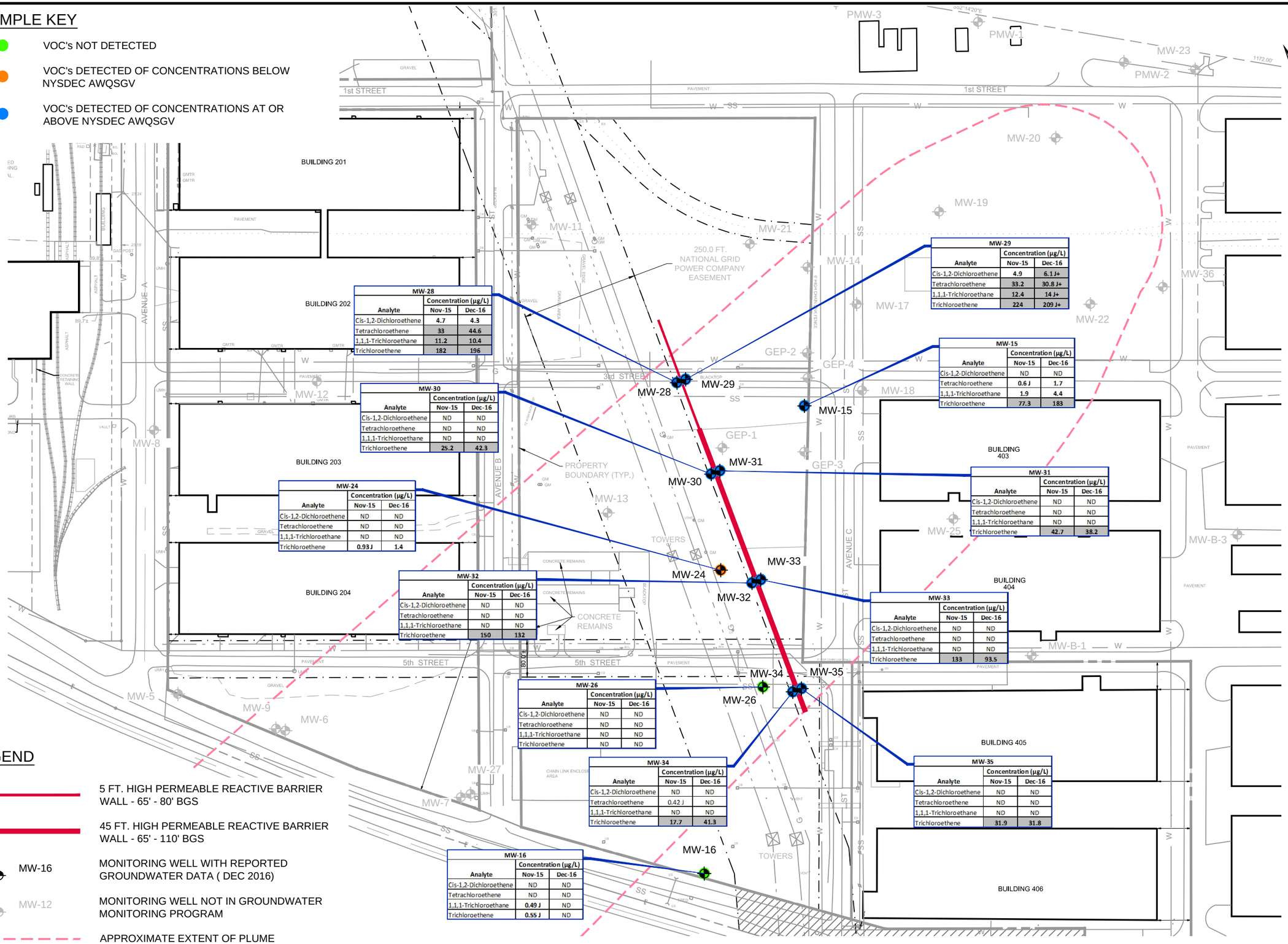
2016 4th QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE CENTER
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: MARCH 2017

SAMPLE KEY

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



MW-28	Concentration (µg/L)	
Analyte	Nov-15	Dec-16
Cis-1,2-Dichloroethene	4.7	4.3
Tetrachloroethene	33	44.6
1,1,1-Trichloroethane	11.2	10.4
Trichloroethene	182	196

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

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

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

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

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

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

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

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

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

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

MW-16	Concentration (µg/L)	
Analyte	Nov-15	Dec-16
Cis-1,2-Dichloroethene	ND	ND
Tetrachloroethene	ND	ND
1,1,1-Trichloroethane	0.49 J	ND
Trichloroethene	0.55 J	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 (DEC 2016)
- MW-12 — MONITORING WELL NOT IN GROUNDWATER MONITORING PROGRAM
- APPROXIMATE EXTENT OF PLUME

0 200' 400'

AECOM

Figure: 3-2

GROUNDWATER RESULTS
DECEMBER 2016

US ARMY Corps of Engineers

2016 4th QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE CENTER
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: MARCH 2017

TABLES

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

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 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	70.82	219.29	225.75
MW-6	58.5-68.5	286.28	288.58	68.78	219.8	225.86
MW-7	61-71	286.8	289.26	66.1	223.16	226.28
MW-9	110-120	285.98	288.33	68.58	219.75	225.83
MW-10	65-80	290.94	293.15	-	-	228.24
MW-11	65-80	295.73	295.12	69.21	225.91	227.7
MW-13	65-80	292.62	293.85	68.42	225.43	227.32
MW-14	65-80	-	296.2	69.64	226.56	228.08
MW-15	65-80	-	293.67	67.4	226.27	227.8
MW-16	55-70	-	288.33	62.95	225.38	226.39
MW-17	60-75	-	295.24	68.69	226.55	228.08
MW-18	60-75	-	295.24	68.78	226.46	227.94
MW-19	62-77	-	297.67	70.82	226.85	228.43
MW-20	63-78	-	301.55	74.54	227.01	228.71
MW-21	57-72	-	296.52	70.02	226.5	228.06
MW-22	63-78	-	298.91	72.18	226.73	228.29
MW-23	63-78	-	300.54	73.48	227.06	228.9
MW-24	90-100	290.24	292.45	67.15	225.3	226.79
MW-25	65-75	288.16	290.26	64.44	225.82	227.16
MW-26	100-110	287.23	286.45	61.7	224.75	226.06
MW-27	100-110	286.08	288.32	64.88	223.44	225.5
MW-28	67-72	292.55	292.25	66.84	225.41	227.07
MW-29	67-72	292.50	292.13	66.75	225.38	227.05
MW-30	82-92	291.76	291.63	66.28	225.35	226.98
MW-31	82-92	291.80	291.54	66.14	225.4	226.95
MW-32	82-92	290.12	289.75	64.3	225.45	226.86
MW-33	82-92	290.27	289.91	64.4	225.51	226.89
MW-34	82-92	287.30	287.05	61.57	225.48	226.73
MW-35	82-92	287.25	286.96	61.5	225.46	226.69
MW-36	70-80	292.61	292.36	66.24	226.12	227.8
GEP-1	59.6-74.6	-	294.98	-	-	227.36
GEP-2	60.6-75.6	-	296.02	69.64	226.38	227.9
GEP-3	59.6-74.6	-	292.97	66.66	226.31	227.81
GEP-4	60.15-75.15	-	295.62	69.4	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	MW-15		MW-16		MW-24		MW-26		Confirmation Well pairs: MW-28		MW-29	
		11/9/2015	12/14/2016	11/11/2015	12/12/2016	11/10/2015	12/13/2016	11/17/2015	12/13/2016	12/1/2015	12/14/2016	12/1/2015	12/14/2016
		Upgradient		Outside Plume		Downgradient		Downgradient		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	3.8 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	**1.9**	**4.4**	**0.49 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	**11.2**	**10.4**	**12.4**	**14.0** J+
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	3.8 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	**0.46 J**	0.75 U	0.75 U	3.8 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	**1**	**0.77 J**	**0.97 J**	3.8 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	**0.53 J**	**0.43 J**	**0.68 J**	3.8 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	3.8 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	**0.61 J**	0.75 U	0.75 U	3.8 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	**4.7**	**4.3**	**4.9**	**6.1** J+
Tetrachloroethene (PCE; PERC)	5	**0.6 J**	**1.7**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	**33**	**44.6**	**33.2**	**30.8** J+
Toluene	5	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	0.75 U	0.75 U	3.8 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	**0.47 J**	0.75 U	3.8 U
Trichloroethene (TCE)	5	**77.3**	**183**	**0.55 J**	0.75 U	**0.93 J**	**1.4**	0.75 U	0.75 U	**182**	**196**	**224**	**209** J+
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	3.8 U
MNA Parameters													
Alkalinity, Total (as $CaCO_3$) (mg/L)	NS	**182**	**212**	**248**	**312**	**168**	**198**	**204**	**197**	**352**	**316**	**327**	**301**
Chloride (mg/L)	NS	**28.9**	**14.3**	**13.6**	**9.0**	**36.3**	**38.5**	**45.2**	**44.9**	**22.1**	**32.4**	**28.2**	**28.4**
Nitrate (mg/L)	NS	**0.58**	**0.56**	**1.6**	**1.6**	**0.9**	0.060 U	0.06 U	**0.040 J**	0.06 U	**0.06 J**	**0.1 J**	**0.26**
Sulfate (mg/L)	NS	**12.3**	**12.4**	**35.2**	**44.8**	**15.5**	**21.4**	**25.1**	**24.6**	**22.4**	**20.9**	**29.2**	**24.9**
Methane (µg/L)	NS	**0.19 J**	0.5 U	0.25 U	0.5 U	**0.82**	**1.6**	**34.8**	**2.7**	**3.4**	**3.0**	**13.9**	**0.62**
Ethane (µg/L)	NS	0.5 U	0.50 U	0.5 U	0.50 U	**0.34 J**	0.50 U	0.5 U	0.50 U	0.5 U	**3.6**	**0.81 J**	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	**1.3 J**	**0.59 J**	0.75 U
Total Organic Carbon (mg/L)	NS	**0.55 J**	**0.57 J**	**3.6**	**0.96 J**	**3.5**	**1.9**	**9.3**	**2.6**	**1.9**	**2.3**	**2.3**	**1.4**
Field Parameters													
Turbidity (NTU)	NS	11.1	7	8.01	14.8	9.33	13.9	68.3	21.8	209	1.5	82.4	0.62
ORP (MeV)	NS	91.4	54.6	137.6	139.9	-80.2	-93.2	-103.6	-28.9	273.2	71.2	-25.1	60.9
Conductivity (mS/cm)	NS	0.358	0.25	0.361	0.388	0.327	0.57	0.324	0.59	0.324	0.366	0.325	0.354
Dissolved Oxygen (mg/L)	NS	31.45	8.04	22.27	9.5	0.94	0.44	0	0.33	6.75	3.94	4.29	6.17
Groundwater Elevation (ft)	NS	227.8	226.27	226.39	225.38	226.79	225.3	226.06	224.75	227.07	225.41	227.05	225.38

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).

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

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well pairs				Confirmation Well pairs				Confirmation Well pairs			
		MW-30		MW-31		MW-32		MW-33		MW-34		MW-35	
		12/1/2015	12/13/2016	12/1/2015	12/14/2016	11/30/2015	12/13/2016	11/24/2015	12/14/2016	11/24/2015	12/13/2016	11/24/2015	12/15/2016
		Downgradient		Upgradient		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	0.75 U	0.75 U	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	0.75 U	0.75 U	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
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	**25.2**	**42.3**	**42.7**	**38.2**	**150**	**132**	**133**	**93.5**	**17.7**	**41.3**	**31.9**	**31.8**
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	**143**	**319**	**178**	**222**	**196**	**277**	**172**	**218**	**99**	**191**	**181**	**223**
Chloride (mg/L)	NS	**38.4**	**182**	**41.9**	**56.6**	**35.6**	**138**	**41.8**	**43.2**	**48.5**	**62.3**	**42.2**	**53.9**
Nitrate (mg/L)	NS	0.06 U	0.060 U	0.06 U	0.06 U	0.06 U	0.060 U	0.06 U	0.060 U	**0.56**	**0.060 J**	0.06 U	**0.040 J**
Sulfate (mg/L)	NS	**35.9**	**2.9**	**26.3**	**10.9**	**21.1**	**2.8**	**25.1**	**8.2**	**64.3**	**23.8**	**48.1**	**7.2**
Methane (µg/L)	NS	**47.4**	**146**	**20.7**	**3.5**	**6.8**	**16.5**	**64**	**3.4**	**14.5**	**1.2**	**13.8**	**0.90**
Ethane (µg/L)	NS	**4.7**	**5.4**	**2.2**	**1.5**	**0.5 J**	**1.5**	**7**	**0.25 J**	**2.2**	0.50 U	**2.9**	0.50 U
Ethene (µg/L)	NS	**2.2**	**3.3**	**0.91 J**	**0.84 J**	0.75 U	**1.8**	**3.6**	**0.48 J**	**1.8**	0.75 U	**1.6**	0.75 U
Total Organic Carbon (mg/L)	NS	**2.2**	**225**	**2.1**	**43.9**	**2.6**	**133**	**8.1**	**30.9**	**5.9**	**12**	**7.7**	**18.3**
Field Parameters													
Turbidity (NTU)	NS	58.2	3.55	51.7	8.03	180	5.92	23.1	9.31	44.7	3.23	381	5.99
ORP (MeV)	NS	-278.4	-166.3	-319.7	-163.1	-234.2	-107.7	-471.2	-126.8	-185.4	-8.4	-404	-167.9
Conductivity (mS/cm)	NS	0.21	1.41	0.243	0.348	0.239	1.18	0.247	0.303	0.361	0.63	0.287	0.329
Dissolved Oxygen (mg/L)	NS	3.7	0.29	1.29	0.28	0.64	1.81	0.92	0.41	6.9	1.12	0.79	0.41
Groundwater Elevation (ft)	NS	226.98	225.35	226.95	225.4	226.86	225.45	226.89	225.51	226.73	225.48	226.69	225.46

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).

APPENDICES

APPENDIX A: Groundwater Sample Collection Field Forms

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641

Monitoring Well Number: MW-15 Date: 12/14/2016

Samplers: Chris French & Ross McCredy & Curtis Taylor

Sample Number: MW-15 121416 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	81.60	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	67.40	feet
4. C = Column of Water in Casing:	14.2	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	2.31	gal
6. D2 = Pump Setting Depth (ft):	73	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 / Hach 4106 Q

Parameter	Units	Readings						
Time	24 hr	920	925	930	935	940	945	950
Water Level (0.33)	feet	67.49	67.49	67.49	67.49	67.48	67.48	67.48
Volume Purged	gal	0	0.2	0.5	0.70	0.90	1.2	1.5
Flow Rate	mL / min	305	305	305	305	305	305	305
Turbidity (+/- 10%)	NTU	76.9	106	79.8	32.4	18.1	11.9	9.22
Dissolved Oxygen (+/- 10%)	%	80.6	78.4	75.3	72.6	71.8	71.3	72.5
Dissolved Oxygen (+/- 10%)	mg/L	9.44	8.92	8.54	8.28	8.12	8.06	8.16
Eh / ORP (+/- 10)	MeV	44.2	37.3	42.4	49.7	49.3	49.4	50.0
Specific Conductivity	mS/cm[c]	327.4	333.5	343.0	352.5	351.0	351.1	351.9
Conductivity (+/- 3%)	mS/cm	0.222	0.236	0.244	0.249	0.250	0.250	0.231
pH (+/- 0.1)	pH unit	7.48	7.47	7.42	7.33	7.34	7.36	7.35
Temp (+/- 0.5)	C	8.3	9.8	9.9	9.7	9.9	10.0	10.0
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	No	No	No	No	No	No	No

Comments

Purge Start Time: 915

Sample Time: 1005

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

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641

Monitoring Well Number: MW-15 Date: 12/14/2016

Samplers: Chris French & Ross McCredy & Curtis Taylor

Sample Number: MW-15 121416 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	81.60	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	67.40	feet
4. C = Column of Water in Casing:	14.2	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	2.31	gal
6. D2 = Pump Setting Depth (ft):	73	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 / Hach 2100 Q

Parameter	Units	Readings						
Time	24 hr	955	1000	1005				
Water Level (0.33)	feet	67.48	67.49	67.49				
Volume Purged	gal	2.3	2.8	3.2				
Flow Rate	mL / min	305	305	305				
Turbidity (+/- 10%)	NTU	7.83	7.10	7.00				
Dissolved Oxygen (+/- 10%)	%	72.3	72.5	71.4				
Dissolved Oxygen (+/- 10%)	mg/L	8.11	8.07	8.04				
Eh / ORP (+/- 10)	MeV	49.6	51.9	54.6				
Specific Conductivity	mS/cm[c]	349.5	350.0	349.1				
Conductivity (+/- 3%)	mS/cm	0.254	0.251	0.250				
pH (+/- 0.1)	pH unit	7.34	7.35	7.31				
Temp (+/- 0.5)	C	10.4	10.3	10.2				
Color	Visual	clear	clear	clear				
Odor	Olfactory	No	No	No				

Comments

Purge Start Time: 955

Sample Time: 1005

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

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641

Monitoring Well Number: MW-16 Date: 12/12/2016

Samplers: Chris French & Ross McCredy & Curtis Taylor

Sample Number: MW-16 121216 QA/QC Collected? ____

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	69.40	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	62.95	feet
4. C = Column of Water in Casing:	6.45	feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	1.05	gal
6. D2 = Pump Setting Depth (ft):	66	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 / Hach 2100 Q

Parameter	Units	Readings						
Time	24 hr	1403	1408	1413	1418	1423		
Water Level (0.33)	feet	62.92	62.95	62.95	62.95	62.93		
Volume Purged	gal	0	0.15	0.30	0.45	0.60		
Flow Rate	mL / min	150	150	150	150	150		
Turbidity (+/- 10%)	NTU	17.7	19.1	16.3	15.1	14.8		
Dissolved Oxygen (+/- 10%)	%	86.8	85.9	85.4	85.5	86.1		
Dissolved Oxygen (+/- 10%)	mg/L	9.64	9.52	9.48	9.42	9.50		
Eh / ORP (+/- 10)	MeV	154.1	160.9	137.4	143.0	139.9		
Specific Conductivity	mS/cm[c]	543.2	537.0	534.8	535.0	534.3		
Conductivity (+/- 3%)	mS/cm	0.392	0.390	0.387	0.389	0.388		
pH (+/- 0.1)	pH unit	7.21	7.15	7.20	7.24	7.27		
Temp (+/- 0.5)	C	10.2	10.7	10.6	10.7	10.7		
Color	Visual	clear	clear	clear	clear	clear		
Odor	Olfactory	None	None	None	None	None		

Comments

Purge Start Time: 1400

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

Monitoring Well Number: MW-24 Date: 12/13/2016

Samplers: Chris French & Ross McCredy & Curtis Taylor

Sample Number: MW-24 121516 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	103.30	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	67.15	feet
4. C = Column of Water in Casing:	36.15	feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	5.96	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 / Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	1320	1325	1330	1335	1340	1345	1350
Water Level (0.33)	feet	67.25	67.25	67.25	67.25	67.25	67.25	67.25
Volume Purged	gal	0	0.20	0.40	0.55	0.65	0.86	1.00
Flow Rate	mL / min	195	195	195	195	195	195	195
Turbidity (+/- 10%)	NTU	8.47	46.8	43.0	40.0	30.6	27.4	21.9
Dissolved Oxygen (+/- 10%)	%	30.0	4.6	3.8	3.8	3.9	4.5	4.3
Dissolved Oxygen (+/- 10%)	mg/L	3.40	0.52	0.42	0.42	0.42	0.50	0.48
Eh / ORP (+/- 10)	MeV	-61.5	-80.2	-87.4	-92.0	-94.0	-93.0	-94.7
Specific Conductivity	mS/cm[c]	773	774	774	776	776	775	776
Conductivity (+/- 3%)	mS/cm	0.56	0.56	0.56	0.56	0.57	0.57	0.56
pH (+/- 0.1)	pH unit	7.12	7.25	7.24	7.23	7.24	7.21	7.22
Temp (+/- 0.5)	C	10.3	10.6	10.8	10.8	10.8	10.8	10.8
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	sulfur	sulfur	sulfur	No	No	No	No

Comments

Purge Start Time: 1315

Sample Time:

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

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641

Monitoring Well Number: MW-24 Date: 12/12/2016

Samplers: Chris French & Ross McCredy & Curtis Taylor

Sample Number: MW-24 121216 QA/QC Collected? no

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	103.30	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	67.15	feet
4. C = Column of Water in Casing:	36.15	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	5.96	gal
6. D2 = Pump Setting Depth (ft):	~~105~~ 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 _____

Parameter	Units	Readings						
Time	24 hr	1355	1400	1405	1410	1415		
Water Level (0.33)	feet	67.25	67.23	67.25	67.25	67.25		
Volume Purged	gal	1.20	1.80	2.2	2.5	2.75		
Flow Rate	mL / min	195	195	195	195	195		
Turbidity (+/- 10%)	NTU	20.3	16.9	14.9	14.4	13.9		
Dissolved Oxygen (+/- 10%)	%	4.2	4.3	4.1	4.0	4.0		
Dissolved Oxygen (+/- 10%)	mg/L	0.47	0.48	0.46	0.45	0.44		
Eh / ORP (+/- 10)	MeV	-93	-95.7	-94.4	-93.9	-93.2		
Specific Conductivity	mS/cm^c	776	777	777	777	777		
Conductivity (+/- 3%)	mS/cm	0.56	0.57	0.57	0.57	0.57		
pH (+/- 0.1)	pH unit	7.20	7.23	7.23	7.22	7.22		
Temp (+/- 0.5)	C	10.6	10.8	10.8	10.8	10.8		
Color	Visual	clear	clear	clear	clear	clear		
Odor	Olfactory	No	No	No	No	No		

Comments

Purge Start Time: 1315

Sample Time: 1415

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

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641

Monitoring Well Number: MW-26 Date: 12/13/2016

Samplers: Chris French & Ross McCredy & Curtis Taylor

Sample Number: MW-26 121316 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	110.41	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	61.70	feet
4. C = Column of Water in Casing:	48.71	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	7.94	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 / Hach 2100 Q

Parameter	Units	Readings						
Time	24 hr	0949	0954	0959	1004	1009	1014	1019
Water Level (0.33)	feet	61.71	61.74	61.76	61.69	61.69	61.71	61.69
Volume Purged	gal	0.30	0.59	0.88	1.18	1.48	1.77	2.07
Flow Rate	mL / min	223	223	223	223	223	223	223
Turbidity (+/- 10%)	NTU	183	139	87.1	65.8	63.7	52.3	41.4
Dissolved Oxygen (+/- 10%)	%	16.2	7.1	8.2	6.1	5.1	4.3	4.1
Dissolved Oxygen (+/- 10%)	mg/L	1.86	0.79	0.94	0.69	0.57	0.47	0.46
Eh / ORP (+/- 10)	MeV	27.2	6.6	-0.3	-1.2	-7.5	-6.8	-9.3
Specific Conductivity	mS/cm[c]	603.2	630.9	706	740	761	769	777
Conductivity (+/- 3%)	mS/cm	0.438	0.472	0.51	0.54	0.56	0.56	0.57
pH (+/- 0.1)	pH unit	7.29	7.32	7.26	7.19	7.23	7.19	7.17
Temp (+/- 0.5)	C	10.7	10.7	10.8	10.7	10.8	10.6	10.7
Color	Visual	Clear	Clear	Clear	Clear	Clear	Clear	Clear
Odor	Olfactory	none	none	none	none	none	none	none

Comments

Purge Start Time: 930

Sample Time: 1054

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

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641

Monitoring Well Number: MW-26 Date: 12/13/2016

Samplers: Chris French & Ross McCredy & Curtis Taylor

Sample Number: MW-26 121316 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	110.41	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	61.70	feet
4. C = Column of Water in Casing:	48.71	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	7.94	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/Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	1024	1029	1034	1039	1044	1049	1054
Water Level (0.33)	feet	61.70	61.69	61.71	61.69	61.70	61.69	61.69
Volume Purged	gal	2.36	2.67	2.95	3.25	3.54	3.84	4.18
Flow Rate	mL / min	223	223	223	223	223	223	223
Turbidity (+/- 10%)	NTU	38.0	31.8	30.4	25.4	23.9	22.7	21.8
Dissolved Oxygen (+/- 10%)	%	4.4	4.3	4.4	4.7	3.9	3.4	2.9
Dissolved Oxygen (+/- 10%)	mg/L	0.47	0.47	0.49	0.52	0.43	0.36	0.33
Eh / ORP (+/- 10)	MeV	-15.2	-14.8	-14.5	-20.1	-22.9	-25.4	-28.9
Specific Conductivity	mS/cm^c	788	792	799	803	809	812	814
Conductivity (+/- 3%)	mS/cm	0.57	0.58	0.58	0.59	0.59	0.59	0.59
pH (+/- 0.1)	pH unit	7.23	7.19	7.22	7.19	7.20	7.22	7.22
Temp (+/- 0.5)	C	10.8	10.7	10.9	10.8	10.8	10.9	10.9
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	none	none	none	none	none	none	none

Comments 920

Purge Start Time:

Sample Time: 1054

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

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641

Monitoring Well Number: MW-28 Date: 12/14/2016

Samplers: Chris French & Ross McCredy & Curtis Taylor

Sample Number: MW-28 121416 QA/QC Collected? NO

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	71.70	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	66.84	feet
4. C = Column of Water in Casing:	4.86	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	0.79	gal
6. D2 = Pump Setting Depth (ft):	69.50	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 / Hach 2100 Q

Parameter	Units	Readings						
Time	24 hr	805	810	815	820	825	830	835
Water Level (0.33)	feet	67.01	67.12	67.03	67.03	67.03	67.03	67.03
Volume Purged	gal	0	0.1	0.6	1.0	1.2	1.7	2.0
Flow Rate	mL / min	55	300	300	300	300	300	300
Turbidity (+/- 10%)	NTU	9.52	8.14	6.83	6.09	2.86	1.61	1.50
Dissolved Oxygen (+/- 10%)	%	86.7	48.6	40.9	35.5	35.5	34.7	34.6
Dissolved Oxygen (+/- 10%)	mg/L	11.39	5.54	4.70	4.06	4.03	3.96	2.94
Eh / ORP (+/- 10)	MeV	111.5	104.8	85.2	79.3	78.7	71.4	71.2
Specific Conductivity	mS/cm[c]	524.0	492.1	515.9	520.1	520.1	519.8	520.2
Conductivity (+/- 3%)	mS/cm	0.326	0.341	0.361	0.365	0.365	0.366	0.366
pH (+/- 0.1)	pH unit	6.70	6.75	7.00	7.01	7.00	7.03	7.03
Temp (+/- 0.5)	C	5.4	8.4	9.3	9.3	9.4	9.5	9.5
Color	Visual	clear	clear	clear	clear	Clear	clear	clear
Odor	Olfactory	NO	NO	NO	NO	NO	NO	NO

Comments

Purge Start Time: 800

Sample Time: 835

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

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641

Monitoring Well Number: MW-29 Date: 12/14/2016

Samplers: Chris French & Ross McCredy & Curtis Taylor

Sample Number: MW-29 121416 QA/QC Collected? NO

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	71.00	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	66.75	feet
4. C = Column of Water in Casing:	4.25	feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	6.69	gal
6. D2 = Pump Setting Depth (ft):	69.5	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 / Hach 2100Q

Parameter	Units	Readings					
Time	24 hr	1055	1100	1105	1110	1115	1120
Water Level (0.33)	feet	66.91	66.90	66.90	66.90	66.91	66.91
Volume Purged	gal	0	0.2	0.4	0.6	0.8	1.0
Flow Rate	mL / min	295	295	295	295	295	295
Turbidity (+/- 10%)	NTU	5.39	2.85	1.48	0.65	0.70	0.62
Dissolved Oxygen (+/- 10%)	%	65.3	59.0	56.9	56.7	55.7	55.1
Dissolved Oxygen (+/- 10%)	mg/L	7.50	6.60	6.36	6.38	6.24	6.17
Eh / ORP (+/- 10)	MeV	46.5	57.1	58.6	59.5	57.9	60.9
Specific Conductivity	mS/cm[c]	454.2	483.1	488.9	489.5	491.5	492.1
Conductivity (+/- 3%)	mS/cm	0.321	0.348	0.351	0.354	0.355	0.354
pH (+/- 0.1)	pH unit	7.14	7.00	7.02	7.00	7.06	7.02
Temp (+/- 0.5)	C	8.6	10.4	10.2	10.5	10.5	10.3
Color	Visual	clear	clear	clear	clear	clear	clear
Odor	Olfactory	NO	NO	NO	NO	NO	NO

Comments

Purge Start Time: 1050

Sample Time: 1120

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

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641

Monitoring Well Number: MW-30 Date: 12/13/2016

Samplers: Chris French & Ross McCredy & Curtis Taylor

Sample Number: MW-30 121316 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	91.10	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	64.30	feet
4. C = Column of Water in Casing:	26.8	feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	4.37	gal
6. D2 = Pump Setting Depth (ft):	86.5	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 / Hach 2100 Q

Parameter	Units	Readings						
Time	24 hr	1441	1446	1451	1456	1501	1506	1511
Water Level (0.33)	feet	66.50	66.50	66.50	66.50	66.50	66.50	66.51
Volume Purged	gal	0.38	0.75	1.13	1.51	1.89	2.26	2.64
Flow Rate	mL / min	286	286	286	286	286	286	286
Turbidity (+/- 10%)	NTU	8.58	4.5	4.28	3.89	3.48	3.61	3.55
Dissolved Oxygen (+/- 10%)	%	12.4	8.5	3.8	2.8	2.4	2.4	2.7
Dissolved Oxygen (+/- 10%)	mg/L	1.35	0.91	0.43	0.31	0.26	0.26	0.29
Eh / ORP (+/- 10)	MeV	-139.6	-167.2	-172.2	-172.7	-169.6	-167.9	-166.3
Specific Conductivity	mS/cm^c	2071	1975	1908	1880	1875	1886	1904
Conductivity (+/- 3%)	mS/cm	1.33	1.46	1.41	1.39	1.38	1.39	1.41
pH (+/- 0.1)	pH unit	6.78	6.85	6.85	6.86	6.83	6.82	6.83
Temp (+/- 0.5)	C	11.0	11.4	11.4	11.4	11.3	11.4	11.3
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	slight organic	none	none	none	none	none	none

Comments

Purge Start Time: 1436

Sample Time: 1511

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

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641

Monitoring Well Number: MW-31 Date: 12/14/2016

Samplers: Chris French & Ross McCredy & Curtis Taylor

Sample Number: MW-31 121416 QA/QC Collected? —

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):	66.14	feet
4. C = Column of Water in Casing:	25.46	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	4.15	gal
6. D2 = Pump Setting Depth (ft):	87.5	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 / Hach 2100 Q

Parameter	Units	Readings						
Time	24 hr	1242	1247	1252	1257	1302	1307	1312
Water Level (0.33)	feet	66.4	66.35	66.35	66.35	66.35	66.37	66.37
Volume Purged	gal	0	0.1	0.2	0.3	0.5	0.7	1.2
Flow Rate	mL / min	100	100	100	100	340	340	340
Turbidity (+/- 10%)	NTU	13.0	10.7	15.0	17.1	22.8	17.0	14.7
Dissolved Oxygen (+/- 10%)	%	78.5	19.0	6.2	4.7	5.5	4.1	2.6
Dissolved Oxygen (+/- 10%)	mg/L	9.60	1.63	0.71	0.54	0.59	0.45	0.30
Eh / ORP (+/- 10)	MeV	20.1	-87.9	-109.8	-113.6	-133.1	-150.1	-156.8
Specific Conductivity	mS/cm[c]	403.2	450.4	4.58	4.54	4.56	4.69	4.72
Conductivity (+/- 3%)	mS/cm	0.265	0.312	0.320	0.316	0.331	0.340	0.344
pH (+/- 0.1)	pH unit	7.27	7.11	7.18	7.18	7.22	7.21	7.21
Temp (+/- 0.5)	C	6.9	9.0	9.4	8.9	10.5	10.4	10.6
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	NO	no	no	NO	No	NO	No

Comments

Purge Start Time: 1240

Sample Time: 1332

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

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641

Monitoring Well Number: MW-31 121416 Date: 12/14/2016

Samplers: Chris French & Ross McCredy & Curtis Taylor

Sample Number: MW-31 QA/QC Collected? N?

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):	66.14	feet
4. C = Column of Water in Casing:	25.46	feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	4.15	gal
6. D2 = Pump Setting Depth (ft):	87.5	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 / Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	1317	1322	1327	1732			
Water Level (0.33)	feet	66.37	66.38	66.39	66.39			
Volume Purged	gal	2.0	2.5	3.0	3.5			
Flow Rate	mL / min	340	340	340	340			
Turbidity (+/- 10%)	NTU	11.0	9.46	8.43	8.03			
Dissolved Oxygen (+/- 10%)	%	2.8	2.8	2.7	2.6			
Dissolved Oxygen (+/- 10%)	mg/L	0.32	0.31	0.28	0.28			
Eh / ORP (+/- 10)	MeV	-160.9	-159.6	-162.1	-163.1			
Specific Conductivity	mS/cm[c]	4.72	4.75	4.76	4.75			
Conductivity (+/- 3%)	mS/cm	0.344	0.344	0.347	0.348			
pH (+/- 0.1)	pH unit	7.21	7.15	7.19	7.20			
Temp (+/- 0.5)	C	10.9	10.7	10.7	10.7			
Color	Visual	clear	clear	clear	clear			
Odor	Olfactory	NO	NO	NO	NO			

Comments

Purge Start Time: 1246

Sample Time: 1352

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

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641

Monitoring Well Number: MW-32 Date: 12/13/2016

Samplers: Chris French & Ross McCredy & Curtis Taylor

Sample Number: MW-32 QA/QC Collected? Dup-1 121316

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	91.41	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	64.30	feet
4. C = Column of Water in Casing:	27.11	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	4.42	gal
6. D2 = Pump Setting Depth (ft):	85.5	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 / 2100Q Hach

Parameter	Units	Readings					
Time	24 hr	1130	1135	1140	1145	1148	1150
Water Level (0.33)	feet	64.15	64.17	64.18	64.18	64.18	64.18
Volume Purged	gal	0	0.2	0.3	0.62	0.80	1.30
Flow Rate	mL / min	150	150	150	150	150	150
Turbidity (+/- 10%)	NTU	15.0	4.74	4.76	5.29	5.68	5.92
Dissolved Oxygen (+/- 10%)	%	29.5	6.6	13.6	15.0	16.2	16.8
Dissolved Oxygen (+/- 10%)	mg/L	3.32	0.64	1.50	1.62	1.70	1.81
Eh / ORP (+/- 10)	MeV	-70.2	-130.8	-121.7	-118.0	-114.0	-107.7
Specific Conductivity	mS/cm^c	1487	1631	1581	1575	1572	1580
Conductivity (+/- 3%)	mS/cm	1.10	1.22	1.18	1.18	1.18	1.18
pH (+/- 0.1)	pH unit	6.47	6.71	6.70	6.71	6.71	6.69
Temp (+/- 0.5)	C	11.4	11.8	11.7	11.8	11.8	11.7
Color	Visual	clear	clear	clear	clear	clear	clear
Odor	Olfactory	NO	NO Sulfur	Sulfur	Sulfur	Sulfur	Sulfur

Comments

Purge Start Time: 1120

Sample Time: 1150

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

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641

Monitoring Well Number: MW-33 Date: 12/4/2016

Samplers: Chris French & Ross McCredy & Curtis Taylor

Sample Number: MW-33 12416 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	92.12	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	64.46	feet
4. C = Column of Water in Casing:	27.72	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	4.52	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 / Hach 2100 Q

Parameter	Units	Readings						
Time	24 hr	1425	1430	1439	1440	1445	1450	1455
Water Level (0.33)	feet	64.62	64.62	64.62	64.62	64.62	64.61	64.61
Volume Purged	gal	0	0.2	0.4	0.6	1.0	1.5	1.8
Flow Rate	mL / min	240	240	240	290	290	290	290
Turbidity (+/- 10%)	NTU	17.6	12.6	14.6	13.3	10.5	9.84	9.31
Dissolved Oxygen (+/- 10%)	%	35.6	16.4	14.8	4.6	3.8	3.7	3.7
Dissolved Oxygen (+/- 10%)	mg/L	4.63	1.90	1.58	0.52	0.43	0.42	0.41
Eh / ORP (+/- 10)	MeV	-48.0	-99.2	-111.5	-114.1	-122.1	-125.0	-126.8
Specific Conductivity	mS/cm^c	396.6	419.1	417.3	419.5	423.6	424.2	425.9
Conductivity (+/- 3%)	mS/cm	0.240	0.296	0.299	0.298	0.303	0.303	0.303
pH (+/- 0.1)	pH unit	7.34	7.21	7.23	7.25	7.25	7.22	7.18
Temp (+/- 0.5)	C	9.6	9.8	10.1	9.9	10.1	10.1	10.1
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	None	None	Sl. org.	Sl. Organic	None	None	None

Comments

Purge Start Time: 1420

Sample Time: 1458

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

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641

Monitoring Well Number: MW-34 Date: 12/13/2016

Samplers: Chris French & Ross McCredy & Curtis Taylor

Sample Number: MW-34 121316 QA/QC Collected? MS/MSD

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	88.02	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	61.57	feet
4. C = Column of Water in Casing:	26.45	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	4.31	gal
6. D2 = Pump Setting Depth (ft):	86	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 / Hach 2100 Q

Parameter	Units	Readings						
Time	24 hr	0809	0814	0819	0824	0829	0834	0839
Water Level (0.33)	feet	61.73	61.74	61.74	61.75	61.75	61.75	61.75
Volume Purged	gal	0.66	1.04	1.41	1.78	2.15	2.52	2.89
Flow Rate	mL / min	280	280	280	280	280	280	280
Turbidity (+/- 10%)	NTU	~~36.5~~	22.4	12.5	7.41	6.45	4.78	3.85
Dissolved Oxygen (+/- 10%)	%	60.3	32.0	23.1	17.2	15.0	16.0	12.7
Dissolved Oxygen (+/- 10%)	mg/L	6.27	3.45	2.50	1.87	1.64	1.72	1.39
Eh / ORP (+/- 10)	MeV	113.9	91.4	69.5	43.5	30.0	19.0	6.4
Specific Conductivity	mS/cm^c	795	799	804	812	816	824	835
Conductivity (+/- 3%)	mS/cm	0.59	0.59	0.59	0.60	0.60	0.61	0.62
pH (+/- 0.1)	pH unit	6.91	6.94	6.98	7.03	7.06	6.98	7.09
Temp (+/- 0.5)	C	11.3	11.4	11.3	11.3	11.3	11.3	11.3
Color	Visual	Clear	clear	clear	clear	Clear	Clear	clear
Odor	Olfactory	none	none	none	none	none	none	none

Comments

Purge Start Time: 800

Sample Time: 849

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

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641

Monitoring Well Number: MW-34 Date: 12/13/2016

Samplers: Chris French & Ross McCredy & Curtis Taylor

Sample Number: MW-34 121316 QA/QC Collected? MS/MSD

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	88.02	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	61.57	feet
4. C = Column of Water in Casing:	26.45	feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$	4.31	gal
6. D2 = Pump Setting Depth (ft):	86	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 / Hach 2100 Q

Parameter	Units	Readings						
Time	24 hr	0844	0849					
Water Level (0.33)	feet	61.75	61.76					
Volume Purged	gal	3.26	3.63					
Flow Rate	mL / min	280	280					
Turbidity (+/- 10%)	NTU	3.08	3.23					
Dissolved Oxygen (+/- 10%)	%	11.2	10.3					
Dissolved Oxygen (+/- 10%)	mg/L	1.21	1.12					
Eh / ORP (+/- 10)	MeV	1.0	-8.4					
Specific Conductivity	mS/cm[c]	847	857					
Conductivity (+/- 3%)	mS/cm	0.62	0.63					
pH (+/- 0.1)	pH unit	7.11	7.14					
Temp (+/- 0.5)	C	11.2	11.3					
Color	Visual	Clear	Clear					
Odor	Olfactory	none	none					

Comments

Purge Start Time: 800

Sample Time: 849

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

Monitoring Well Purging/Sampling Form

Project Name and Number: Scotia Navy Depot 60440641

Monitoring Well Number: MW-35 Date: 12/15/2016

Samplers: Chris French & Ross McCredy & Curtis Taylor

Sample Number: MW-35 121516 QA/QC Collected? DUP-2 121516

Purging / Sampling Method: Bladder Pump/Low Flow

1. L = Total Well Depth:	92.11	feet
2. D = Riser Diameter (I.D.):	0.17	feet
3. W = Static Depth to Water (TOC):	61.50	feet
4. C = Column of Water in Casing:	30.61	feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)	4.99	gal
6. D2 = Pump Setting Depth (ft):	87.5	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 XSI Tproplus / Hach 2100Q

Parameter	Units	Readings						
Time	24 hr	0837	842	847	852	857	902	907
Water Level (0.33)	feet	61.80	61.86	61.80	61.80	61.80	61.80	61.80
Volume Purged	gal	0	0.1	0.2	0.3	0.50	0.80	1.2
Flow Rate	mL / min	315	315	315	315	315	315	315
Turbidity (+/- 10%)	NTU	13.3	8.77	8.92	5.40	6.10	6.45	5.99
Dissolved Oxygen (+/- 10%)	%	24.6	6.9	4.3	4.0	3.8	3.6	3.4
Dissolved Oxygen (+/- 10%)	mg/L	2.96	0.69	0.49	0.46	0.41	0.42	0.41
Eh / ORP (+/- 10)	MeV	-42.9	-153.2	-165.5	-169.7	-168.6	-169.0	-167.9
Specific Conductivity	mS/cm[c]	455.5	454.5	457.9	460.7	464.8	466.0	465.6
Conductivity (+/- 3%)	mS/cm	0.308	0.316	0.321	0.325	0.328	0.326	0.329
pH (+/- 0.1)	pH unit	6.67	7.10	7.13	7.15	7.09	7.10	7.09
Temp (+/- 0.5)	C	8.2	8.8	9.3	9.6	9.8	9.7	9.7
Color	Visual	Clear	Clear	Clear	clear	Clear	clear	Clear
Odor	Olfactory	None	None	Sl. org	Sl. org	Sl. org	Sl. org	Sl. org

Comments

Purge Start Time: 820

Sample Time: 907

* 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

December 22, 2016

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

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO**	Workorder:	**2195241**
Purchase Order:	**60440641.11**	Workorder ID:	**ASN013|Scotia Navy 60490641.11**

Dear Ms. Lurie:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, December 13, 2016.

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

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: 2195241 ASN013|Scotia Navy 60490641.11

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2195241001	MW-16 121216	Ground Water	12/12/2016 14:23	12/13/2016 09:21	Collected by Client
2195241002	Trip Blank	Ground Water	12/13/2016 09:21	12/13/2016 09:21	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

SAMPLE SUMMARY

Workorder: 2195241 ASN013|Scotia Navy 60490641.11

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: 2195241 ASN013|Scotia Navy 60490641.11

Lab ID: **2195241001** Date Collected: 12/12/2016 14:23 Matrix: Ground Water

Sample ID: **MW-16 121216** Date Received: 12/13/2016 09:21

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:48	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:48	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:48	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:48	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:48	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:48	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:48	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:48	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:48	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:48	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:48	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:48	DD	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:48	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:48	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	100		%	81 - 118			SW846 8260C			12/21/16 15:48	DD	A
4-Bromofluorobenzene (S)	95.3		%	85 - 114			SW846 8260C			12/21/16 15:48	DD	A
Dibromofluoromethane (S)	94.4		%	80 - 119			SW846 8260C			12/21/16 15:48	DD	A
Toluene-d8 (S)	95.9		%	89 - 112			SW846 8260C			12/21/16 15:48	DD	A
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			12/16/16 06:54	KJH	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			12/16/16 06:54	KJH	C
Methane	0.14J	J1	ug/L	0.50	0.25	0.13	RSK 175			12/16/16 06:54	KJH	C
WET CHEMISTRY												
Alkalinity, Total	312	2	mg/L	5	5	0.8	S2320B-97			12/14/16 14:16	MSA	F
Chloride	9.0		mg/L	2.0	0.50	0.16	EPA 300.0			12/14/16 04:59	MBW	G
Nitrate-N	1.6		mg/L	0.20	0.060	0.020	EPA 300.0			12/14/16 04:59	MBW	G
Sulfate	44.8		mg/L	2.0	0.50	0.20	EPA 300.0			12/14/16 04:59	MBW	G
Total Organic Carbon (TOC)	0.96J	J	mg/L	1.0	0.50	0.18	S5310B-00			12/14/16 10:56	PAG	E

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2195241 ASN013|Scotia Navy 60490641.11

Lab ID: **2195241002** Date Collected: 12/13/2016 09:21 Matrix: Ground Water

Sample ID: **Trip Blank** Date Received: 12/13/2016 09:21

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 13:59	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 13:59	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 13:59	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 13:59	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 13:59	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 13:59	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 13:59	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 13:59	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 13:59	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 13:59	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 13:59	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 13:59	DD	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 13:59	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 13:59	DD	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	97.8		%	81 - 118	SW846 8260C			12/21/16 13:59	DD	A
4-Bromofluorobenzene (S)	97.4		%	85 - 114	SW846 8260C			12/21/16 13:59	DD	A
Dibromofluoromethane (S)	89		%	80 - 119	SW846 8260C			12/21/16 13:59	DD	A
Toluene-d8 (S)	96.3		%	89 - 112	SW846 8260C			12/21/16 13:59	DD	A

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2195241001	1	MW-16 121216	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 40 and the upper control limit is 20.				
2195241001	2	MW-16 121216	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: 2195241 ASN013|Scotia Navy 60490641.11

QC Batch: SVGC/43897 **Analysis Method:** RSK 175

QC Batch Method: RSK 175

Associated Lab Samples: 2195241001

METHOD BLANK: 2456158

Parameter	Blank Result	Units	Reporting Limit
Ethane	0.50U	ug/L	1.0
Ethene	0.75U	ug/L	1.5
Methane	0.20J	ug/L	0.50

SAMPLE DUPLICATE: 2456159 ORIGINAL: 2195241001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	0	NC	20
Ethene	0	ug/L	0	NC	20
Methane	.14	ug/L	.21	40*	20

SAMPLE DUPLICATE: 2456160 ORIGINAL: 2196114005

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	.25	ug/L	.27	7.69	20
Ethene	.48	ug/L	.48	0	20
Methane	3.36	ug/L	3.5	4.08	20

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QUALITY CONTROL DATA

Workorder: 2195241 ASN013|Scotia Navy 60490641.11

QC Batch: VOMS/41894 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 2195241001, 2195241002

METHOD BLANK: 2458809

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)	95.6	%	81 - 118
4-Bromofluorobenzene (S)	98.3	%	85 - 114
Dibromofluoromethane (S)	118	%	80 - 119
Toluene-d8 (S)	95	%	89 - 112

LABORATORY CONTROL SAMPLE: 2458810

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	99.6	ug/L	20	19.9	72 - 136
1,1-Dichloroethane	97	ug/L	20	19.4	77 - 125
1,2-Dichloroethane	89.9	ug/L	20	18.0	73 - 128
1,1-Dichloroethene	110	ug/L	20	22.0	71 - 131
cis-1,2-Dichloroethene	94.3	ug/L	20	18.9	78 - 123
trans-1,2-Dichloroethene	102	ug/L	20	20.3	75 - 124
1,1,1,2-Tetrachloroethane	99.5	ug/L	20	19.9	78 - 124
1,1,2,2-Tetrachloroethane	91.7	ug/L	20	18.3	71 - 121
Tetrachloroethene	119	ug/L	20	23.7	74 - 129
Toluene	101	ug/L	20	20.2	80 - 121
1,1,1-Trichloroethane	99.8	ug/L	20	20.0	74 - 131
1,1,2-Trichloroethane	88.7	ug/L	20	17.7	80 - 119
Trichloroethene	105	ug/L	20	21.1	79 - 123

QUALITY CONTROL DATA

Workorder: 2195241 ASN013|Scotia Navy 60490641.11

Vinyl Chloride	89.2	ug/L	20	17.8	58 - 137
1,2-Dichloroethane-d4 (S)	93.7	%			81 - 118
4-Bromofluorobenzene (S)	95.4	%			85 - 114
Dibromofluoromethane (S)	91.2	%			80 - 119
Toluene-d8 (S)	93.7	%			89 - 112

MATRIX SPIKE: 2459004 DUPLICATE: 2459005 ORIGINAL: 2195623001

****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	21.2948	20.8678	106	104	72 - 136	2.03	30
1,1-Dichloroethane	0	ug/L	20	20.5125	20.1669	103	101	77 - 125	1.7	30
1,2-Dichloroethane	0	ug/L	20	18.8889	18.6143	94.4	93.1	73 - 128	1.46	30
1,1-Dichloroethene	0	ug/L	20	23.5659	23.1211	118	116	71 - 131	1.91	30
cis-1,2-Dichloroethene	0	ug/L	20	19.6638	19.3142	98.3	96.6	78 - 123	1.79	30
trans-1,2-Dichloroethene	0	ug/L	20	20.6812	20.9307	103	105	75 - 124	1.2	30
1,1,1,2-Tetrachloroethane	0	ug/L	20	19.7643	19.3982	98.8	97	78 - 124	1.87	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	19.1817	18.8277	95.9	94.1	71 - 121	1.86	30
Tetrachloroethene	0	ug/L	20	22.8753	22.0083	114	110	74 - 129	3.86	30
Toluene	0	ug/L	20	20.2489	19.6685	101	98.3	80 - 121	2.91	30
1,1,1-Trichloroethane	0	ug/L	20	21.0018	20.5801	105	103	74 - 131	2.03	30
1,1,2-Trichloroethane	0	ug/L	20	18.0699	17.5185	90.3	87.6	80 - 119	3.1	30
Trichloroethene	41.3154	ug/L	20	62.1095	60.3602	104	95.2	79 - 123	2.86	30
Vinyl Chloride	0	ug/L	20	18.9048	19.061	94.5	95.3	58 - 137	.82	30
1,2-Dichloroethane-d4 (S)	95.8	%				95.8	96.4	81 - 118		
4-Bromofluorobenzene (S)	92.6	%				92.6	93.7	85 - 114		
Dibromofluoromethane (S)	93.1	%				93.1	93	80 - 119		
Toluene-d8 (S)	89.1	%				89.1	90.4	89 - 112		

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QUALITY CONTROL DATA

Workorder: 2195241 ASN013|Scotia Navy 60490641.11

QC Batch: WETC/180286 **Analysis Method:** S2320B-97

QC Batch Method: S2320B-97

Associated Lab Samples: 2195241001

METHOD BLANK: 2454307

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

SAMPLE DUPLICATE: 2454312 ORIGINAL: 2195000001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	68.77727	mg/L	69.28632	.74	20

METHOD BLANK: 2454315

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

SAMPLE DUPLICATE: 2454316 ORIGINAL: 2195000005

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	22.41242	mg/L	20.79313	7.5	20

METHOD BLANK: 2454319

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

SAMPLE DUPLICATE: 2454320 ORIGINAL: 2195070003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD

QUALITY CONTROL DATA

Workorder: 2195241 ASN013|Scotia Navy 60490641.11

Alkalinity, Total	110.0922	mg/L	115.22224	4.55	20

METHOD BLANK: 2454323

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

SAMPLE DUPLICATE: 2454324 ORIGINAL: 2195071006

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	317.3295	mg/L	324.42059	2.21	20

METHOD BLANK: 2454327

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

SAMPLE DUPLICATE: 2454328 ORIGINAL: 2195107001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	148.21938	mg/L	147.6646	.37	20

METHOD BLANK: 2454331

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

SAMPLE DUPLICATE: 2454332 ORIGINAL: 2195125001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	453.11383	mg/L	432.85306	4.57	20

QUALITY CONTROL DATA

Workorder: 2195241 ASN013|Scotia Navy 60490641.11

METHOD BLANK: 2454335

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

SAMPLE DUPLICATE: 2454336 ORIGINAL: 2195244001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	112.28918	mg/L	109.64995	2.38	20

METHOD BLANK: 2454339

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

SAMPLE DUPLICATE: 2454436 ORIGINAL: 2195243001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	53.0799	mg/L	52.14878	1.77	20

METHOD BLANK: 2454343

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

SAMPLE DUPLICATE: 2454344 ORIGINAL: 2195331001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	371.26544	mg/L	335.41486	10.1	20

QUALITY CONTROL DATA

Workorder: 2195241 ASN013|Scotia Navy 60490641.11

METHOD BLANK: 2454347

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

SAMPLE DUPLICATE: 2454348 ORIGINAL: 2195331005

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	432.12787	mg/L	427.74744	1.02	20

METHOD BLANK: 2454351

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

SAMPLE DUPLICATE: 2454352 ORIGINAL: 2195332002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	113.76702	mg/L	101.32238	11.6	20

METHOD BLANK: 2454439

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

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QUALITY CONTROL DATA

Workorder: 2195241 ASN013|Scotia Navy 60490641.11

QC Batch: WETC/180293 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 2195241001

METHOD BLANK: 2454429

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: 2454431

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	102	mg/L	20	20.5	87 - 111
Nitrate-N	101	mg/L	2.5	2.5	88 - 111
Sulfate	103	mg/L	20	20.5	87 - 112

LABORATORY CONTROL SAMPLE: 2454433

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	115	mg/L	1	1.1	75 - 175
Nitrate-N	110	mg/L	.1	0.11	67 - 167
Sulfate	108	mg/L	1	1.1	61 - 161

METHOD BLANK: 2454435

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

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QUALITY CONTROL DATA

Workorder: 2195241 ASN013|Scotia Navy 60490641.11

QC Batch: WETC/180327 **Analysis Method:** S5310B-00

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 2195241001

METHOD BLANK: 2454974

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

LABORATORY CONTROL SAMPLE: 2454975

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	96.3	mg/L	1	0.96J	85 - 115

MATRIX SPIKE: 2454978 DUPLICATE: 2454979 ORIGINAL: 2195483001

****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)	.193	mg/L	6	6.305	6.316	102	102	85 - 115	.17	20

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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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2195241 ASN013|Scotia Navy 60490641.11

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2195241001	MW-16 121216			S2320B-97	WETC/180286
2195241001	MW-16 121216			EPA 300.0	WETC/180293
2195241001	MW-16 121216			S5310B-00	WETC/180327
2195241001	MW-16 121216			RSK 175	SVGC/43897
2195241001	MW-16 121216			SW846 8260C	VOMS/41894
2195241002	Trip Blank			SW846 8260C	VOMS/41894

eurofins | Spectrum Analytical

CHAIN OF CUSTODY RECORD

Page 1 of 1

Sl

☒ Standard TA

☐ Rush TAT -

2195241

All TATs subject to laboratory approval
Min. 24-hr notification needed for rushes
Samples disposed after 60 days unless otherwise instructed.

Report To: AECOM / John Santacroce
40 British American Blvd
Latham, NY 12110

Telephone #:

Project Mgr: John Santacroce

Invoice To: John Santacroce

P.O No.: Quote #:

Project No: 60490691.11

Site Name: Seatin Navy Depot

Location: Seatin State: NY

Sampler(s): C. French, R. McCredy, C. Taylor

F=Field Filtered 1=$Na_2S_2O_3$ 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid
7=CH_3OH 8=$NaHSO_4$ 9=Deionized Water 10=H_3PO_4 11= 12=

DW=Dinking Water GW=Groundwater SW=Surface Water WW=Waste Water
O=Oil SO=Soil SL=Sludge A=Indoor/Ambient Air SG=Soil Gas
X1= X2= X3=

G= Grab C=Compsite

Lab ID:	Sample ID:	Date:	Time:	Type	Matrix	# of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic
	MW-16 121216	12/12/16	1423	G	GW	6			2
	Trip Blank	12/12/16	—	-	-	2			

List Preservative Code below:

8260C	TOC	RSK 175	Cl, SO4, NO3	Alkalinity			
2	2	2	/	/			
X	X	X	X	X			
X							

Check if chlorinated: ☐

QA/QC Reporting Notes:
* additional charges may appply

MA DEP MCP CAM Report? ☐ Yes ☐ No
CT DPH RCP Report? ☐ Yes ☐ No
☐ Standard ☐ No QC ☐ DQA*
☐ ASP A* ☐ ASP B*
☐ NJ Reduced* ☐ NJ Full*
☐ Tier II* ☐ Tier IV*
☒ Other: Kr QAPP
State-specific reporting standards:

	Y	N	n/a
Custody Seals Present?			/
(if present) Seals Intact?			
Received on Ice?	/		
COC/Labels Complete	/		
Cont in Good Cond?	/		
Correct Containers?	/		
Correct Samp Vol?	/		
Correct Preservation?	/		
Headspace/Volatiles?			/

Initials: CF

Cooler Temp: 2 °C

Cooler #:

Therm ID: TH-36

Ship Carrier: FedEx UPS DHL

Tracking #: 4470 8309 8360

Relinquished by:	Received by:	Date:	Time:
Chris French	Brian McGuirk	12/12/16	1530
Brian McGuirk		12/12/16	4:10PM
Fedex		12/13/16	0921

Temp °C: Observed / Correction Factor / Corrected / IR ID #

☐ EDD format: PER QAPP

☒ E-mail to: John.Santacroce@aecom.com

Condition upon receipt: Custody Seals: ☐ Present ☐ Intact ☐ Broken

☐ Ambient ☐ Iced ☐ Refrigerated ☐ DI VOA Frozen ☐ Soil Jar Frozen

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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

December 27, 2016

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

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO**	Workorder:	**2195623**
Purchase Order:	**60440641.11**	Workorder ID:	**ASN014|Scotia Navy Depot 60440**

Dear Ms. Lurie:

Enclosed are the analytical results for samples received by the laboratory on Wednesday, December 14, 2016.

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: 2195623 ASN014|Scotia Navy Depot 60440

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2195623001	MW-34 121316	Ground Water	12/13/2016 08:49	12/14/2016 09:09	Collected by Client
2195623002	MW-26 121316	Ground Water	12/13/2016 10:54	12/14/2016 09:09	Collected by Client
2195623003	MW-32 121316	Ground Water	12/13/2016 11:50	12/14/2016 09:09	Collected by Client
2195623004	MW-24 121316	Ground Water	12/13/2016 14:15	12/14/2016 09:09	Collected by Client
2195623005	MW-30 121316	Ground Water	12/13/2016 15:11	12/14/2016 09:09	Collected by Client
2195623006	DUP-1 121316	Ground Water	12/13/2016 00:00	12/14/2016 09:09	Collected by Client
2195623007	Trip Blank	Ground Water	12/14/2016 09:09	12/14/2016 09:09	Collected by Client

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SAMPLE SUMMARY

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

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: 2195623 ASN014|Scotia Navy Depot 60440

Lab ID: **2195623001** Date Collected: 12/13/2016 08:49 Matrix: Ground Water

Sample ID: **MW-34 121316** Date Received: 12/14/2016 09:09

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:26	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:26	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:26	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:26	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:26	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:26	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:26	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:26	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:26	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:26	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:26	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:26	DD	A
Trichloroethene	41.3		ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:26	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 15:26	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118			SW846 8260C			12/21/16 15:26	DD	A
4-Bromofluorobenzene (S)	96.8		%	85 - 114			SW846 8260C			12/21/16 15:26	DD	A
Dibromofluoromethane (S)	95.6		%	80 - 119			SW846 8260C			12/21/16 15:26	DD	A
Toluene-d8 (S)	96.4		%	89 - 112			SW846 8260C			12/21/16 15:26	DD	A
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			12/16/16 07:45	KJH	G
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			12/16/16 07:45	KJH	G
Methane	1.2		ug/L	0.50	0.25	0.13	RSK 175			12/16/16 07:45	KJH	G
WET CHEMISTRY												
Alkalinity, Total	191	1	mg/L	5	5	0.8	S2320B-97			12/15/16 08:53	MSA	V
Chloride	62.3		mg/L	2.0	0.50	0.16	EPA 300.0			12/15/16 06:28	MBW	S
Nitrate-N	0.060J	J	mg/L	0.20	0.060	0.020	EPA 300.0			12/15/16 06:28	MBW	S
Sulfate	23.8		mg/L	2.0	0.50	0.20	EPA 300.0			12/15/16 06:28	MBW	S
Total Organic Carbon (TOC)	12.0		mg/L	5.0	2.5	0.92	S5310B-00			12/19/16 10:23	PAG	M

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

Lab ID: **2195623002** Date Collected: 12/13/2016 10:54 Matrix: Ground Water

Sample ID: **MW-26 121316** Date Received: 12/14/2016 09:09

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118			SW846 8260C		12/21/16 16:10	DD	A
4-Bromofluorobenzene (S)	94.8		%	85 - 114			SW846 8260C		12/21/16 16:10	DD	A
Dibromofluoromethane (S)	94.2		%	80 - 119			SW846 8260C		12/21/16 16:10	DD	A
Toluene-d8 (S)	94.1		%	89 - 112			SW846 8260C		12/21/16 16:10	DD	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		12/16/16 08:15	KJH	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		12/16/16 08:15	KJH	C
Methane	2.7		ug/L	0.50	0.25	0.13	RSK 175		12/16/16 08:15	KJH	C
WET CHEMISTRY											
Alkalinity, Total	197	1	mg/L	5	5	0.8	S2320B-97		12/15/16 09:59	MSA	H
Chloride	44.9		mg/L	2.0	0.50	0.16	EPA 300.0		12/15/16 05:11	MBW	G
Nitrate-N	0.040J	J	mg/L	0.20	0.060	0.020	EPA 300.0		12/15/16 05:11	MBW	G
Sulfate	24.6		mg/L	2.0	0.50	0.20	EPA 300.0		12/15/16 05:11	MBW	G
Total Organic Carbon (TOC)	2.6		mg/L	1.0	0.50	0.18	S5310B-00		12/19/16 10:23	PAG	E

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: 2195623 ASN014|Scotia Navy Depot 60440

Lab ID: **2195623003** Date Collected: 12/13/2016 11:50 Matrix: Ground Water

Sample ID: **MW-32 121316** Date Received: 12/14/2016 09:09

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
Trichloroethene	132		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	99		%	81 - 118			SW846 8260C		12/21/16 16:32	DD	A
4-Bromofluorobenzene (S)	100		%	85 - 114			SW846 8260C		12/21/16 16:32	DD	A
Dibromofluoromethane (S)	94.5		%	80 - 119			SW846 8260C		12/21/16 16:32	DD	A
Toluene-d8 (S)	95.6		%	89 - 112			SW846 8260C		12/21/16 16:32	DD	A
LIGHT HYDROCARBON GASES											
Ethane	1.5		ug/L	1.0	0.50	0.25	RSK 175		12/16/16 08:32	KJH	C
Ethene	1.8		ug/L	1.5	0.75	0.31	RSK 175		12/16/16 08:32	KJH	C
Methane	16.5		ug/L	0.50	0.25	0.13	RSK 175		12/16/16 08:32	KJH	C
WET CHEMISTRY											
Alkalinity, Total	277	1	mg/L	5	5	0.8	S2320B-97		12/15/16 10:10	MSA	H
Chloride	138		mg/L	2.0	0.50	0.16	EPA 300.0		12/15/16 05:26	MBW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		12/15/16 05:26	MBW	G
Sulfate	2.8		mg/L	2.0	0.50	0.20	EPA 300.0		12/15/16 05:26	MBW	G
Total Organic Carbon (TOC)	133		mg/L	25.0	12.5	4.6	S5310B-00		12/19/16 10:23	PAG	E

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

Lab ID: **2195623004** Date Collected: 12/13/2016 14:15 Matrix: Ground Water

Sample ID: **MW-24 121316** Date Received: 12/14/2016 09:09

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 16:54	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 16:54	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 16:54	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 16:54	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 16:54	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 16:54	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 16:54	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 16:54	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 16:54	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 16:54	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 16:54	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 16:54	DD	A
Trichloroethene	1.4		ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 16:54	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 16:54	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	81 - 118			SW846 8260C			12/21/16 16:54	DD	A
4-Bromofluorobenzene (S)	94.7		%	85 - 114			SW846 8260C			12/21/16 16:54	DD	A
Dibromofluoromethane (S)	95.4		%	80 - 119			SW846 8260C			12/21/16 16:54	DD	A
Toluene-d8 (S)	93.2		%	89 - 112			SW846 8260C			12/21/16 16:54	DD	A
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			12/16/16 08:48	KJH	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			12/16/16 08:48	KJH	C
Methane	1.6		ug/L	0.50	0.25	0.13	RSK 175			12/16/16 08:48	KJH	C
WET CHEMISTRY												
Alkalinity, Total	198	1	mg/L	5	5	0.8	S2320B-97			12/15/16 10:57	MSA	H
Chloride	38.5		mg/L	2.0	0.50	0.16	EPA 300.0			12/15/16 05:42	MBW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			12/15/16 05:42	MBW	G
Sulfate	21.4		mg/L	2.0	0.50	0.20	EPA 300.0			12/15/16 05:42	MBW	G
Total Organic Carbon (TOC)	1.9		mg/L	1.0	0.50	0.18	S5310B-00			12/19/16 10:23	PAG	E

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ANALYTICAL RESULTS

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

Lab ID: **2195623005** Date Collected: 12/13/2016 15:11 Matrix: Ground Water

Sample ID: **MW-30 121316** Date Received: 12/14/2016 09:09

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
Trichloroethene	42.3		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118			SW846 8260C		12/21/16 15:04	DD	A
4-Bromofluorobenzene (S)	97.2		%	85 - 114			SW846 8260C		12/21/16 15:04	DD	A
Dibromofluoromethane (S)	91.1		%	80 - 119			SW846 8260C		12/21/16 15:04	DD	A
Toluene-d8 (S)	95.7		%	89 - 112			SW846 8260C		12/21/16 15:04	DD	A
LIGHT HYDROCARBON GASES											
Ethane	5.4		ug/L	1.0	0.50	0.25	RSK 175		12/16/16 09:04	KJH	C
Ethene	3.3		ug/L	1.5	0.75	0.31	RSK 175		12/16/16 09:04	KJH	C
Methane	146		ug/L	0.50	0.25	0.13	RSK 175		12/16/16 09:04	KJH	C
WET CHEMISTRY											
Alkalinity, Total	319	1	mg/L	5	5	0.8	S2320B-97		12/15/16 11:08	MSA	H
Chloride	182		mg/L	2.0	0.50	0.16	EPA 300.0		12/15/16 05:57	MBW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		12/15/16 05:57	MBW	G
Sulfate	2.9		mg/L	2.0	0.50	0.20	EPA 300.0		12/15/16 05:57	MBW	G
Total Organic Carbon (TOC)	225		mg/L	50.0	25.0	9.2	S5310B-00		12/19/16 10:23	PAG	E

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ANALYTICAL RESULTS

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

Lab ID: **2195623006** Date Collected: 12/13/2016 00:00 Matrix: Ground Water

Sample ID: **DUP-1 121316** Date Received: 12/14/2016 09:09

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 17:16	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 17:16	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 17:16	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 17:16	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 17:16	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 17:16	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 17:16	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 17:16	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 17:16	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 17:16	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 17:16	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 17:16	DD	A
Trichloroethene	133		ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 17:16	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 17:16	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	81 - 118			SW846 8260C			12/21/16 17:16	DD	A
4-Bromofluorobenzene (S)	97.7		%	85 - 114			SW846 8260C			12/21/16 17:16	DD	A
Dibromofluoromethane (S)	96.4		%	80 - 119			SW846 8260C			12/21/16 17:16	DD	A
Toluene-d8 (S)	96.2		%	89 - 112			SW846 8260C			12/21/16 17:16	DD	A
LIGHT HYDROCARBON GASES												
Ethane	1.5		ug/L	1.0	0.50	0.25	RSK 175			12/16/16 07:28	KJH	C
Ethene	1.8		ug/L	1.5	0.75	0.31	RSK 175			12/16/16 07:28	KJH	C
Methane	15.0		ug/L	0.50	0.25	0.13	RSK 175			12/16/16 07:28	KJH	C
WET CHEMISTRY												
Alkalinity, Total	278	1	mg/L	5	5	0.8	S2320B-97			12/15/16 11:18	MSA	H
Chloride	150		mg/L	2.0	0.50	0.16	EPA 300.0			12/15/16 06:13	MBW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			12/15/16 06:13	MBW	G
Sulfate	2.9		mg/L	2.0	0.50	0.20	EPA 300.0			12/15/16 06:13	MBW	G
Total Organic Carbon (TOC)	131		mg/L	25.0	12.5	4.6	S5310B-00			12/19/16 10:23	PAG	E

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ANALYTICAL RESULTS

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

Lab ID: **2195623007** Date Collected: 12/14/2016 09:09 Matrix: Ground Water

Sample ID: **Trip Blank** Date Received: 12/14/2016 09:09

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 14:20	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 14:20	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 14:20	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 14:20	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 14:20	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 14:20	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 14:20	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 14:20	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 14:20	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 14:20	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 14:20	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 14:20	DD	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 14:20	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/21/16 14:20	DD	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	99		%	81 - 118	SW846 8260C			12/21/16 14:20	DD	A
4-Bromofluorobenzene (S)	95.8		%	85 - 114	SW846 8260C			12/21/16 14:20	DD	A
Dibromofluoromethane (S)	90.9		%	80 - 119	SW846 8260C			12/21/16 14:20	DD	A
Toluene-d8 (S)	95.2		%	89 - 112	SW846 8260C			12/21/16 14:20	DD	A

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PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2195623001	1	MW-34 121316	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2195623002	1	MW-26 121316	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2195623003	1	MW-32 121316	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2195623004	1	MW-24 121316	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2195623005	1	MW-30 121316	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2195623006	1	DUP-1 121316	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: 2195623 ASN014|Scotia Navy Depot 60440

QC Batch: SVGC/43897 **Analysis Method:** RSK 175

QC Batch Method: RSK 175

Associated Lab Samples: 2195623001, 2195623002, 2195623003, 2195623004, 2195623005, 2195623006

METHOD BLANK: 2456158

Parameter	Blank Result	Units	Reporting Limit
Ethane	0.50U	ug/L	1.0
Ethene	0.75U	ug/L	1.5
Methane	0.20J	ug/L	0.50

SAMPLE DUPLICATE: 2456159 ORIGINAL: 2195241001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	0	NC	20
Ethene	0	ug/L	0	NC	20
Methane	.14	ug/L	.21	40*	20

SAMPLE DUPLICATE: 2456160 ORIGINAL: 2196114005

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	.25	ug/L	.27	7.69	20
Ethene	.48	ug/L	.48	0	20
Methane	3.36	ug/L	3.5	4.08	20

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QUALITY CONTROL DATA

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

QC Batch: VOMS/41894 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 2195623001, 2195623002, 2195623003, 2195623004, 2195623005, 2195623006, 2195623007

METHOD BLANK: 2458809

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)	95.6	%	81 - 118
4-Bromofluorobenzene (S)	98.3	%	85 - 114
Dibromofluoromethane (S)	118	%	80 - 119
Toluene-d8 (S)	95	%	89 - 112

LABORATORY CONTROL SAMPLE: 2458810

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	99.6	ug/L	20	19.9	72 - 136
1,1-Dichloroethane	97	ug/L	20	19.4	77 - 125
1,2-Dichloroethane	89.9	ug/L	20	18.0	73 - 128
1,1-Dichloroethene	110	ug/L	20	22.0	71 - 131
cis-1,2-Dichloroethene	94.3	ug/L	20	18.9	78 - 123
trans-1,2-Dichloroethene	102	ug/L	20	20.3	75 - 124
1,1,1,2-Tetrachloroethane	99.5	ug/L	20	19.9	78 - 124
1,1,2,2-Tetrachloroethane	91.7	ug/L	20	18.3	71 - 121
Tetrachloroethene	119	ug/L	20	23.7	74 - 129
Toluene	101	ug/L	20	20.2	80 - 121
1,1,1-Trichloroethane	99.8	ug/L	20	20.0	74 - 131
1,1,2-Trichloroethane	88.7	ug/L	20	17.7	80 - 119
Trichloroethene	105	ug/L	20	21.1	79 - 123

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QUALITY CONTROL DATA

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

Vinyl Chloride	89.2	ug/L	20	17.8	58 - 137
1,2-Dichloroethane-d4 (S)	93.7	%			81 - 118
4-Bromofluorobenzene (S)	95.4	%			85 - 114
Dibromofluoromethane (S)	91.2	%			80 - 119
Toluene-d8 (S)	93.7	%			89 - 112

MATRIX SPIKE: 2459004 DUPLICATE: 2459005 ORIGINAL: 2195623001

****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	21.2948	20.8678	106	104	72 - 136	2.03	30
1,1-Dichloroethane	0	ug/L	20	20.5125	20.1669	103	101	77 - 125	1.7	30
1,2-Dichloroethane	0	ug/L	20	18.8889	18.6143	94.4	93.1	73 - 128	1.46	30
1,1-Dichloroethene	0	ug/L	20	23.5659	23.1211	118	116	71 - 131	1.91	30
cis-1,2-Dichloroethene	0	ug/L	20	19.6638	19.3142	98.3	96.6	78 - 123	1.79	30
trans-1,2-Dichloroethene	0	ug/L	20	20.6812	20.9307	103	105	75 - 124	1.2	30
1,1,1,2-Tetrachloroethane	0	ug/L	20	19.7643	19.3982	98.8	97	78 - 124	1.87	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	19.1817	18.8277	95.9	94.1	71 - 121	1.86	30
Tetrachloroethene	0	ug/L	20	22.8753	22.0083	114	110	74 - 129	3.86	30
Toluene	0	ug/L	20	20.2489	19.6685	101	98.3	80 - 121	2.91	30
1,1,1-Trichloroethane	0	ug/L	20	21.0018	20.5801	105	103	74 - 131	2.03	30
1,1,2-Trichloroethane	0	ug/L	20	18.0699	17.5185	90.3	87.6	80 - 119	3.1	30
Trichloroethene	41.3154	ug/L	20	62.1095	60.3602	104	95.2	79 - 123	2.86	30
Vinyl Chloride	0	ug/L	20	18.9048	19.061	94.5	95.3	58 - 137	.82	30
1,2-Dichloroethane-d4 (S)	95.8	%				95.8	96.4	81 - 118		
4-Bromofluorobenzene (S)	92.6	%				92.6	93.7	85 - 114		
Dibromofluoromethane (S)	93.1	%				93.1	93	80 - 119		
Toluene-d8 (S)	89.1	%				89.1	90.4	89 - 112		

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

QUALITY CONTROL DATA

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

QC Batch: WETC/180374 **Analysis Method:** S2320B-97

QC Batch Method: S2320B-97

Associated Lab Samples: 2195623001, 2195623002, 2195623003, 2195623004, 2195623005, 2195623006

METHOD BLANK: 2455281

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

SAMPLE DUPLICATE: 2455286 ORIGINAL: 2195407001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	126.23075	mg/L	128.3443	1.66	20

METHOD BLANK: 2455289

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

SAMPLE DUPLICATE: 2455391 ORIGINAL: 2195441001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	53.94825	mg/L	49.16405	9.28	20

METHOD BLANK: 2455292

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

SAMPLE DUPLICATE: 2455293 ORIGINAL: 2195623001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD

QUALITY CONTROL DATA

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

Alkalinity, Total	190.58337	mg/L	188.21579	1.25	20

METHOD BLANK: 2455296

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

SAMPLE DUPLICATE: 2455297 ORIGINAL: 2195623004

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	198.12714	mg/L	200.67105	1.28	20

METHOD BLANK: 2455300

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

SAMPLE DUPLICATE: 2455301 ORIGINAL: 2195729002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	122.08543	mg/L	121.15656	.76	20

METHOD BLANK: 2455304

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

SAMPLE DUPLICATE: 2455305 ORIGINAL: 2195808001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	217.80974	mg/L	217.33879	.22	20

QUALITY CONTROL DATA

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

METHOD BLANK: 2455377

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

SAMPLE DUPLICATE: 2455378 ORIGINAL: 2195896001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	211.29691	mg/L	199.9447	5.52	20

METHOD BLANK: 2455381

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

SAMPLE DUPLICATE: 2455382 ORIGINAL: 2195912005

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	287.29807	mg/L	296.31662	3.09	20

METHOD BLANK: 2455385

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

SAMPLE DUPLICATE: 2455386 ORIGINAL: 2195920002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	0	mg/L	0	NC	20

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QUALITY CONTROL DATA

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

METHOD BLANK: 2455389

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

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QUALITY CONTROL DATA

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

QC Batch: WETC/180375 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 2195623001, 2195623002, 2195623003, 2195623004, 2195623005, 2195623006

METHOD BLANK: 2455306

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: 2455308

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	104	mg/L	20	20.7	87 - 111
Nitrate-N	103	mg/L	2.5	2.6	88 - 111
Sulfate	104	mg/L	20	20.8	87 - 112

MATRIX SPIKE: 2455310 DUPLICATE: 2455311 ORIGINAL: 2195623001

****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	62.26	mg/L	40	106.28	107.64	110	113*	87 - 111	1.27	15
Nitrate-N	.06	mg/L	5	5.48	5.54	108	110	88 - 111	1.09	15
Sulfate	23.8	mg/L	40	60.78	61.56	92.5	94.4	87 - 112	1.28	15

METHOD BLANK: 2455313

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

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QUALITY CONTROL DATA

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

QC Batch: WETC/180400 **Analysis Method:** S5310B-00

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 2195623001, 2195623002, 2195623003, 2195623004, 2195623005, 2195623006

METHOD BLANK: 2455733

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

LABORATORY CONTROL SAMPLE: 2455734

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	103	mg/L	1	1.0	85 - 115

MATRIX SPIKE: 2455735 DUPLICATE: 2455736 ORIGINAL: 2195950002

****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)	5.787	mg/L	6	11.11	10.846	88.7	84.3*	85 - 115	2.4	20

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QUALITY CONTROL DATA

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

QC Batch: WETC/180623 **Analysis Method:** S5310B-00

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 2195623001, 2195623003, 2195623005, 2195623006

METHOD BLANK: 2458238

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

LABORATORY CONTROL SAMPLE: 2458239

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	103	mg/L	1	1.0	85 - 115

MATRIX SPIKE: 2458240 DUPLICATE: 2458241 ORIGINAL: 2195623001

****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)	12	mg/L	30	40.3	39.9	94.3	93	85 - 115	1	20

MATRIX SPIKE: 2458242 DUPLICATE: 2458243 ORIGINAL: 2196832003

****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)	4.297	mg/L	6	9.911	9.764	93.6	91.1	85 - 115	1.49	20

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2195623001	MW-34 121316			S2320B-97	WETC/180374
2195623002	MW-26 121316			S2320B-97	WETC/180374
2195623003	MW-32 121316			S2320B-97	WETC/180374
2195623004	MW-24 121316			S2320B-97	WETC/180374
2195623005	MW-30 121316			S2320B-97	WETC/180374
2195623006	DUP-1 121316			S2320B-97	WETC/180374
2195623001	MW-34 121316			EPA 300.0	WETC/180375
2195623002	MW-26 121316			EPA 300.0	WETC/180375
2195623003	MW-32 121316			EPA 300.0	WETC/180375
2195623004	MW-24 121316			EPA 300.0	WETC/180375
2195623005	MW-30 121316			EPA 300.0	WETC/180375
2195623006	DUP-1 121316			EPA 300.0	WETC/180375
2195623002	MW-26 121316			S5310B-00	WETC/180400
2195623004	MW-24 121316			S5310B-00	WETC/180400
2195623001	MW-34 121316			RSK 175	SVGC/43897
2195623002	MW-26 121316			RSK 175	SVGC/43897
2195623003	MW-32 121316			RSK 175	SVGC/43897
2195623004	MW-24 121316			RSK 175	SVGC/43897
2195623005	MW-30 121316			RSK 175	SVGC/43897
2195623006	DUP-1 121316			RSK 175	SVGC/43897
2195623001	MW-34 121316			S5310B-00	WETC/180623
2195623003	MW-32 121316			S5310B-00	WETC/180623
2195623005	MW-30 121316			S5310B-00	WETC/180623
2195623006	DUP-1 121316			S5310B-00	WETC/180623
2195623001	MW-34 121316			SW846 8260C	VOMS/41894
2195623002	MW-26 121316			SW846 8260C	VOMS/41894

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2195623003	MW-32 121316			SW846 8260C	VOMS/41894
2195623004	MW-24 121316			SW846 8260C	VOMS/41894
2195623005	MW-30 121316			SW846 8260C	VOMS/41894
2195623006	DUP-1 121316			SW846 8260C	VOMS/41894
2195623007	Trip Blank			SW846 8260C	VOMS/41894

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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 1 9 5 6 2 3 *

Project Name: Scolia Navy Depot	Project Number: 6044064
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: [signature]	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 (Preservative 1)	RSK 175 (Preservative 1)	TOC (Preservative 1)	Alkalinity (Preservative 0)	Cl, SO4, NO3 (Preservative 0)	REMARKS/ ALTERNATE DESCRIPTION
MW-34 121316		12/13/16	0849	GW	24	X	X	X	X	X	Extra Volume collected for MS/MSD
MW-26 121316		12/13/16	1054	↓	8	↓	↓	↓	↓	↓	
MW-32 121316		↓	1150	↓	↓	↓	↓	↓	↓	↓	
MW-24 121316		↓	1415	↓	↓	↓	↓	↓	↓	↓	
MW-30 121316		↓	1511	↓	↓	↓	↓	↓	↓	↓	
Dup-1 121316		↓	–	↓	↓	↓	↓	↓	↓	↓	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 7. $NaHSO_4$ 8. Other ____

Cooler receipt label: Custody Seals Present? (if present) Seals Intact? Received on ice? COC/Labs Complete Cont in Good Cond? Correct Containers? Correct Samp Vol? Correct Preservation? Headspace/Volatiles? Tracking #: 8309 9382 6420 Cooler Temp / Cooler #: / Therm ID: TH-318 / Ship Carrier: FedEx UPS DHL

SPECIAL INSTRUCTIONS/COMMENTS
Metals

AT 12/14/16

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 #: 6044064.11
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	[signature]	Brian McGuirk	Brian McGuirk	[signature]		
Printed Name	Chris French	Brian McGuirk	Brian McGuirk			
Firm	AECOM	ALS	ALS			
Date/Time	12/13/16 1530	12/13/16 1530	12/13/16 1700	12-14-16 0909		

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

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December 29, 2016

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

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO**	Workorder:	**2196114**
Purchase Order:	**60440641.11**	Workorder ID:	**ASN015|2015-SCOTIA NAVY-PO6044**

Dear Ms. Lurie:

Enclosed are the analytical results for samples received by the laboratory on Thursday, December 15, 2016.

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: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2196114001	MW-28 121416	Ground Water	12/14/2016 08:35	12/15/2016 09:16	Collected by Client
2196114002	MW-15 121416	Ground Water	12/14/2016 10:05	12/15/2016 09:16	Collected by Client
2196114003	MW-29 121416	Ground Water	12/14/2016 11:20	12/15/2016 09:16	Collected by Client
2196114004	MW-31 121416	Ground Water	12/14/2016 13:32	12/15/2016 09:16	Collected by Client
2196114005	MW-33 121416	Ground Water	12/14/2016 14:55	12/15/2016 09:16	Collected by Client
2196114006	Trip Blank	Ground Water	12/15/2016 09:16	12/15/2016 09:16	Collected by Client

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SAMPLE SUMMARY

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

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: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Lab ID: **2196114001** Date Collected: 12/14/2016 08:35 Matrix: Ground Water

Sample ID: **MW-28 121416** Date Received: 12/15/2016 09:16

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
1,1-Dichloroethane	0.77J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
1,1-Dichloroethene	0.43J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
cis-1,2-Dichloroethene	4.3		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
trans-1,2-Dichloroethene	0.47J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
Tetrachloroethene	44.6		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
1,1,1-Trichloroethane	10.4		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
Trichloroethene	196		ug/L	5.0	3.8	1.7	SW846 8260C		12/28/16 20:38	DD	C
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	81 - 118			SW846 8260C		12/21/16 17:37	DD	A
1,2-Dichloroethane-d4 (S)	114		%	81 - 118			SW846 8260C		12/28/16 20:38	DD	C
4-Bromofluorobenzene (S)	104		%	85 - 114			SW846 8260C		12/28/16 20:38	DD	C
4-Bromofluorobenzene (S)	95.3		%	85 - 114			SW846 8260C		12/21/16 17:37	DD	A
Dibromofluoromethane (S)	97.5		%	80 - 119			SW846 8260C		12/21/16 17:37	DD	A
Dibromofluoromethane (S)	93		%	80 - 119			SW846 8260C		12/28/16 20:38	DD	C
Toluene-d8 (S)	95.2		%	89 - 112			SW846 8260C		12/21/16 17:37	DD	A
Toluene-d8 (S)	103		%	89 - 112			SW846 8260C		12/28/16 20:38	DD	C
LIGHT HYDROCARBON GASES											
Ethane	3.6		ug/L	1.0	0.50	0.25	RSK 175		12/16/16 09:21	KJH	C
Ethene	1.3J	J	ug/L	1.5	0.75	0.31	RSK 175		12/16/16 09:21	KJH	C
Methane	3.0		ug/L	0.50	0.25	0.13	RSK 175		12/16/16 09:21	KJH	C
WET CHEMISTRY											
Alkalinity, Total	316	1	mg/L	5	5	0.8	S2320B-97		12/16/16 06:09	MSA	H
Chloride	32.4		mg/L	2.0	0.50	0.16	EPA 300.0		12/16/16 05:16	MBW	G
Nitrate-N	0.060J	J	mg/L	0.20	0.060	0.020	EPA 300.0		12/16/16 05:16	MBW	G
Sulfate	20.9		mg/L	2.0	0.50	0.20	EPA 300.0		12/16/16 05:16	MBW	G
Total Organic Carbon (TOC)	2.3		mg/L	1.0	0.50	0.18	S5310B-00		12/19/16 10:23	PAG	E

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ANALYTICAL RESULTS

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Lab ID: **2196114001** Date Collected: 12/14/2016 08:35 Matrix: Ground Water

Sample ID: **MW-28 121416** Date Received: 12/15/2016 09:16

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

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ANALYTICAL RESULTS

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Lab ID: **2196114002** Date Collected: 12/14/2016 10:05 Matrix: Ground Water

Sample ID: **MW-15 121416** Date Received: 12/15/2016 09:16

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
1,1-Dichloroethene	0.44J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
Tetrachloroethene	1.7		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
1,1,1-Trichloroethane	4.4		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
Trichloroethene	183		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118			SW846 8260C		12/21/16 17:59	DD	A
4-Bromofluorobenzene (S)	98.4		%	85 - 114			SW846 8260C		12/21/16 17:59	DD	A
Dibromofluoromethane (S)	97.1		%	80 - 119			SW846 8260C		12/21/16 17:59	DD	A
Toluene-d8 (S)	95.3		%	89 - 112			SW846 8260C		12/21/16 17:59	DD	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		12/16/16 09:37	KJH	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		12/16/16 09:37	KJH	C
Methane	0.21J	J	ug/L	0.50	0.25	0.13	RSK 175		12/16/16 09:37	KJH	C
WET CHEMISTRY											
Alkalinity, Total	212	1	mg/L	5	5	0.8	S2320B-97		12/16/16 06:24	MSA	H
Chloride	14.3		mg/L	2.0	0.50	0.16	EPA 300.0		12/16/16 05:32	MBW	G
Nitrate-N	0.56		mg/L	0.20	0.060	0.020	EPA 300.0		12/16/16 05:32	MBW	G
Sulfate	12.4		mg/L	2.0	0.50	0.20	EPA 300.0		12/16/16 05:32	MBW	G
Total Organic Carbon (TOC)	0.57J	J	mg/L	1.0	0.50	0.18	S5310B-00		12/19/16 10:23	PAG	E

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ANALYTICAL RESULTS

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Lab ID: **2196114003** Date Collected: 12/14/2016 11:20 Matrix: Ground Water

Sample ID: **MW-29 121416** Date Received: 12/15/2016 09:16

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C			12/28/16 21:01	DD	A
1,1-Dichloroethane	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C			12/28/16 21:01	DD	A
1,2-Dichloroethane	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C			12/28/16 21:01	DD	A
1,1-Dichloroethene	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C			12/28/16 21:01	DD	A
cis-1,2-Dichloroethene	6.1		ug/L	5.0	3.8	1.7	SW846 8260C			12/28/16 21:01	DD	A
trans-1,2-Dichloroethene	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C			12/28/16 21:01	DD	A
1,1,1,2-Tetrachloroethane	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C			12/28/16 21:01	DD	A
1,1,2,2-Tetrachloroethane	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C			12/28/16 21:01	DD	A
Tetrachloroethene	30.8		ug/L	5.0	3.8	1.7	SW846 8260C			12/28/16 21:01	DD	A
Toluene	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C			12/28/16 21:01	DD	A
1,1,1-Trichloroethane	14.0		ug/L	5.0	3.8	1.7	SW846 8260C			12/28/16 21:01	DD	A
1,1,2-Trichloroethane	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C			12/28/16 21:01	DD	A
Trichloroethene	209		ug/L	5.0	3.8	1.7	SW846 8260C			12/28/16 21:01	DD	A
Vinyl Chloride	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C			12/28/16 21:01	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	111		%	81 - 118			SW846 8260C			12/28/16 21:01	DD	A
4-Bromofluorobenzene (S)	108		%	85 - 114			SW846 8260C			12/28/16 21:01	DD	A
Dibromofluoromethane (S)	151	3	%	80 - 119			SW846 8260C			12/28/16 21:01	DD	A
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C			12/28/16 21:01	DD	A
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			12/16/16 09:52	KJH	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			12/16/16 09:52	KJH	C
Methane	0.62		ug/L	0.50	0.25	0.13	RSK 175			12/16/16 09:52	KJH	C
WET CHEMISTRY												
Alkalinity, Total	301	2	mg/L	5	5	0.8	S2320B-97			12/16/16 06:35	MSA	H
Chloride	28.4		mg/L	2.0	0.50	0.16	EPA 300.0			12/16/16 05:47	MBW	G
Nitrate-N	0.26		mg/L	0.20	0.060	0.020	EPA 300.0			12/16/16 05:47	MBW	G
Sulfate	24.9		mg/L	2.0	0.50	0.20	EPA 300.0			12/16/16 05:47	MBW	G
Total Organic Carbon (TOC)	1.4		mg/L	1.0	0.50	0.18	S5310B-00			12/19/16 10:23	PAG	E

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ANALYTICAL RESULTS

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Lab ID: **2196114004** Date Collected: 12/14/2016 13:32 Matrix: Ground Water

Sample ID: **MW-31 121416** Date Received: 12/15/2016 09:16

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:22	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:22	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:22	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:22	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:22	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:22	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:22	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:22	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:22	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:22	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:22	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:22	DD	A
Trichloroethene	38.2		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:22	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:22	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	112		%	81 - 118			SW846 8260C			12/28/16 21:22	DD	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C			12/28/16 21:22	DD	A
Dibromofluoromethane (S)	90.6		%	80 - 119			SW846 8260C			12/28/16 21:22	DD	A
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C			12/28/16 21:22	DD	A
LIGHT HYDROCARBON GASES												
Ethane	1.5		ug/L	1.0	0.50	0.25	RSK 175			12/16/16 10:25	KJH	C
Ethene	0.84J	J	ug/L	1.5	0.75	0.31	RSK 175			12/16/16 10:25	KJH	C
Methane	3.5		ug/L	0.50	0.25	0.13	RSK 175			12/16/16 10:25	KJH	C
WET CHEMISTRY												
Alkalinity, Total	222	1	mg/L	5	5	0.8	S2320B-97			12/16/16 06:45	MSA	H
Chloride	56.6		mg/L	2.0	0.50	0.16	EPA 300.0			12/16/16 06:03	MBW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			12/16/16 06:03	MBW	G
Sulfate	10.9		mg/L	2.0	0.50	0.20	EPA 300.0			12/16/16 06:03	MBW	G
Total Organic Carbon (TOC)	43.9		mg/L	10.0	5.0	1.8	S5310B-00			12/21/16 11:30	PAG	E

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ANALYTICAL RESULTS

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Lab ID: **2196114005** Date Collected: 12/14/2016 14:55 Matrix: Ground Water

Sample ID: **MW-33 121416** Date Received: 12/15/2016 09:16

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:44	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:44	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:44	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:44	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:44	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:44	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:44	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:44	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:44	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:44	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:44	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:44	DD	A
Trichloroethene	93.5		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:44	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 21:44	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	115		%	81 - 118			SW846 8260C			12/28/16 21:44	DD	A
4-Bromofluorobenzene (S)	108		%	85 - 114			SW846 8260C			12/28/16 21:44	DD	A
Dibromofluoromethane (S)	95.7		%	80 - 119			SW846 8260C			12/28/16 21:44	DD	A
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C			12/28/16 21:44	DD	A
LIGHT HYDROCARBON GASES												
Ethane	0.25J	J	ug/L	1.0	0.50	0.25	RSK 175			12/16/16 10:41	KJH	C
Ethene	0.48J	J	ug/L	1.5	0.75	0.31	RSK 175			12/16/16 10:41	KJH	C
Methane	3.4		ug/L	0.50	0.25	0.13	RSK 175			12/16/16 10:41	KJH	C
WET CHEMISTRY												
Alkalinity, Total	218	1	mg/L	5	5	0.8	S2320B-97			12/16/16 06:55	MSA	H
Chloride	43.2		mg/L	2.0	0.50	0.16	EPA 300.0			12/16/16 06:18	MBW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			12/16/16 06:18	MBW	G
Sulfate	8.2		mg/L	2.0	0.50	0.20	EPA 300.0			12/16/16 06:18	MBW	G
Total Organic Carbon (TOC)	30.9		mg/L	10.0	5.0	1.8	S5310B-00			12/21/16 11:30	PAG	E

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Lab ID: **2196114006** Date Collected: 12/15/2016 09:16 Matrix: Ground Water

Sample ID: **Trip Blank** Date Received: 12/15/2016 09:16

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 20:16	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 20:16	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 20:16	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 20:16	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 20:16	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 20:16	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 20:16	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 20:16	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 20:16	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 20:16	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 20:16	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 20:16	DD	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 20:16	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 20:16	DD	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	113		%	81 - 118	SW846 8260C			12/28/16 20:16	DD	A
4-Bromofluorobenzene (S)	107		%	85 - 114	SW846 8260C			12/28/16 20:16	DD	A
Dibromofluoromethane (S)	92		%	80 - 119	SW846 8260C			12/28/16 20:16	DD	A
Toluene-d8 (S)	103		%	89 - 112	SW846 8260C			12/28/16 20:16	DD	A

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Mrs. Vicki A. Forney
Project Coordinator

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2196114001	1	MW-28 121416	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2196114002	1	MW-15 121416	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2196114003	2	MW-29 121416	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2196114003	3	MW-29 121416	SW846 8260C	Dibromofluoromethane
The surrogate Dibromofluoromethane for method SW846 8260C was outside of control limits. The % Recovery was reported as 151 and the control limits were 80 to 119. This result was reported at a dilution of 5.				
2196114004	1	MW-31 121416	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2196114005	1	MW-33 121416	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: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

QC Batch: SVGC/43897 **Analysis Method:** RSK 175

QC Batch Method: RSK 175

Associated Lab Samples: 2196114001, 2196114002, 2196114003, 2196114004, 2196114005

METHOD BLANK: 2456158

Parameter	Blank Result	Units	Reporting Limit
Ethane	0.50U	ug/L	1.0
Ethene	0.75U	ug/L	1.5
Methane	0.20J	ug/L	0.50

SAMPLE DUPLICATE: 2456159 ORIGINAL: 2195241001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	0	NC	20
Ethene	0	ug/L	0	NC	20
Methane	.14	ug/L	.21	40*	20

SAMPLE DUPLICATE: 2456160 ORIGINAL: 2196114005

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	.25	ug/L	.27	7.69	20
Ethene	.48	ug/L	.48	0	20
Methane	3.36	ug/L	3.5	4.08	20

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QUALITY CONTROL DATA

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

QC Batch: VOMS/41894 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 2196114001, 2196114002

METHOD BLANK: 2458809

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)	95.6	%	81 - 118
4-Bromofluorobenzene (S)	98.3	%	85 - 114
Dibromofluoromethane (S)	118	%	80 - 119
Toluene-d8 (S)	95	%	89 - 112

LABORATORY CONTROL SAMPLE: 2458810

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	99.6	ug/L	20	19.9	72 - 136
1,1-Dichloroethane	97	ug/L	20	19.4	77 - 125
1,2-Dichloroethane	89.9	ug/L	20	18.0	73 - 128
1,1-Dichloroethene	110	ug/L	20	22.0	71 - 131
cis-1,2-Dichloroethene	94.3	ug/L	20	18.9	78 - 123
trans-1,2-Dichloroethene	102	ug/L	20	20.3	75 - 124
1,1,1,2-Tetrachloroethane	99.5	ug/L	20	19.9	78 - 124
1,1,2,2-Tetrachloroethane	91.7	ug/L	20	18.3	71 - 121
Tetrachloroethene	119	ug/L	20	23.7	74 - 129
Toluene	101	ug/L	20	20.2	80 - 121
1,1,1-Trichloroethane	99.8	ug/L	20	20.0	74 - 131
1,1,2-Trichloroethane	88.7	ug/L	20	17.7	80 - 119
Trichloroethene	105	ug/L	20	21.1	79 - 123

QUALITY CONTROL DATA

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Vinyl Chloride	89.2	ug/L	20	17.8	58 - 137
1,2-Dichloroethane-d4 (S)	93.7	%			81 - 118
4-Bromofluorobenzene (S)	95.4	%			85 - 114
Dibromofluoromethane (S)	91.2	%			80 - 119
Toluene-d8 (S)	93.7	%			89 - 112

MATRIX SPIKE: 2459004 DUPLICATE: 2459005 ORIGINAL: 2195623001

****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	21.2948	20.8678	106	104	72 - 136	2.03	30
1,1-Dichloroethane	0	ug/L	20	20.5125	20.1669	103	101	77 - 125	1.7	30
1,2-Dichloroethane	0	ug/L	20	18.8889	18.6143	94.4	93.1	73 - 128	1.46	30
1,1-Dichloroethene	0	ug/L	20	23.5659	23.1211	118	116	71 - 131	1.91	30
cis-1,2-Dichloroethene	0	ug/L	20	19.6638	19.3142	98.3	96.6	78 - 123	1.79	30
trans-1,2-Dichloroethene	0	ug/L	20	20.6812	20.9307	103	105	75 - 124	1.2	30
1,1,1,2-Tetrachloroethane	0	ug/L	20	19.7643	19.3982	98.8	97	78 - 124	1.87	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	19.1817	18.8277	95.9	94.1	71 - 121	1.86	30
Tetrachloroethene	0	ug/L	20	22.8753	22.0083	114	110	74 - 129	3.86	30
Toluene	0	ug/L	20	20.2489	19.6685	101	98.3	80 - 121	2.91	30
1,1,1-Trichloroethane	0	ug/L	20	21.0018	20.5801	105	103	74 - 131	2.03	30
1,1,2-Trichloroethane	0	ug/L	20	18.0699	17.5185	90.3	87.6	80 - 119	3.1	30
Trichloroethene	41.3154	ug/L	20	62.1095	60.3602	104	95.2	79 - 123	2.86	30
Vinyl Chloride	0	ug/L	20	18.9048	19.061	94.5	95.3	58 - 137	.82	30
1,2-Dichloroethane-d4 (S)	95.8	%				95.8	96.4	81 - 118		
4-Bromofluorobenzene (S)	92.6	%				92.6	93.7	85 - 114		
Dibromofluoromethane (S)	93.1	%				93.1	93	80 - 119		
Toluene-d8 (S)	89.1	%				89.1	90.4	89 - 112		

QUALITY CONTROL DATA

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

QC Batch: VOMS/41953 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 2196114001, 2196114003, 2196114004, 2196114005, 2196114006

METHOD BLANK: 2461659

Parameter	Blank Result	Units	Reporting Limit
Carbon Tetrachloride	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	110	%	81 - 118
4-Bromofluorobenzene (S)	107	%	85 - 114
Dibromofluoromethane (S)	91.1	%	80 - 119
Toluene-d8 (S)	104	%	89 - 112

LABORATORY CONTROL SAMPLE: 2461660

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	116	ug/L	20	23.2	72 - 136
1,1-Dichloroethane	109	ug/L	20	21.9	77 - 125
1,2-Dichloroethane	107	ug/L	20	21.5	73 - 128
1,1-Dichloroethene	133*	ug/L	20	26.5	71 - 131
cis-1,2-Dichloroethene	107	ug/L	20	21.4	78 - 123
trans-1,2-Dichloroethene	122	ug/L	20	24.5	75 - 124
1,1,1,2-Tetrachloroethane	114	ug/L	20	22.7	78 - 124
1,1,2,2-Tetrachloroethane	108	ug/L	20	21.7	71 - 121
Tetrachloroethene	112	ug/L	20	22.4	74 - 129
Toluene	118	ug/L	20	23.5	80 - 121
1,1,1-Trichloroethane	114	ug/L	20	22.8	74 - 131
1,1,2-Trichloroethane	109	ug/L	20	21.7	80 - 119
Trichloroethene	112	ug/L	20	22.3	79 - 123

QUALITY CONTROL DATA

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Vinyl Chloride	96.7	ug/L	20	19.3	58 - 137
1,2-Dichloroethane-d4 (S)	107	%			81 - 118
4-Bromofluorobenzene (S)	105	%			85 - 114
Dibromofluoromethane (S)	91.7	%			80 - 119
Toluene-d8 (S)	103	%			89 - 112

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QUALITY CONTROL DATA

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

QC Batch: WETC/180428 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 2196114001, 2196114002, 2196114003, 2196114004, 2196114005

METHOD BLANK: 2456016

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: 2456018

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	104	mg/L	20	20.8	87 - 111
Nitrate-N	103	mg/L	2.5	2.6	88 - 111
Sulfate	105	mg/L	20	20.9	87 - 112

METHOD BLANK: 2456025

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

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QUALITY CONTROL DATA

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

QC Batch: WETC/180433 **Analysis Method:** S2320B-97

QC Batch Method: S2320B-97

Associated Lab Samples: 2196114001, 2196114002, 2196114003, 2196114004, 2196114005

METHOD BLANK: 2456059

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

SAMPLE DUPLICATE: 2456064 ORIGINAL: 2195966001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	94.43452	mg/L	99.1573	4.88	20

METHOD BLANK: 2456067

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

SAMPLE DUPLICATE: 2456068 ORIGINAL: 2196114001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	316.07867	mg/L	309.03873	2.25	20

METHOD BLANK: 2456071

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

SAMPLE DUPLICATE: 2456072 ORIGINAL: 2196145001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD

QUALITY CONTROL DATA

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Alkalinity, Total	264.32217	mg/L	257.86462	2.47	20

METHOD BLANK: 2456075

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

SAMPLE DUPLICATE: 2456076 ORIGINAL: 2196171001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	14.98288	mg/L	13.59898	9.68	20

METHOD BLANK: 2456079

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

SAMPLE DUPLICATE: 2456080 ORIGINAL: 2196213001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	172.34834	mg/L	171.28119	.62	20

METHOD BLANK: 2456176

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

SAMPLE DUPLICATE: 2456177 ORIGINAL: 2196248001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	204.6218	mg/L	195.62924	4.49	20

QUALITY CONTROL DATA

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

METHOD BLANK: 2456180

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

SAMPLE DUPLICATE: 2456638 ORIGINAL: 2196293001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	36.38869	mg/L	35.12141	3.54	20

METHOD BLANK: 2456641

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

SAMPLE DUPLICATE: 2456642 ORIGINAL: 2196293011

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	12.54202	mg/L	12.68995	1.17	20

METHOD BLANK: 2456645

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

SAMPLE DUPLICATE: 2456646 ORIGINAL: 2196473002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	222.57646	mg/L	224.45787	.84	20

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QUALITY CONTROL DATA

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

METHOD BLANK: 2456649

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

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QUALITY CONTROL DATA

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

QC Batch: WETC/180547 **Analysis Method:** S5310B-00

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 2196114001, 2196114002, 2196114003, 2196114004, 2196114005

METHOD BLANK: 2457396

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

LABORATORY CONTROL SAMPLE: 2457397

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	103	mg/L	1	1.0	85 - 115

MATRIX SPIKE: 2457398 DUPLICATE: 2457399 ORIGINAL: 2196580002

****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)	1.87	mg/L	6	7.875	7.81	100	99	85 - 115	.83	20

MATRIX SPIKE: 2457400 DUPLICATE: 2457401 ORIGINAL: 2196171003

****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)	1.256	mg/L	6	7.238	7.242	99.7	99.8	85 - 115	.06	20

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QUALITY CONTROL DATA

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

QC Batch: WETC/180697 **Analysis Method:** S5310B-00

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 2196114004, 2196114005

METHOD BLANK: 2459159

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

LABORATORY CONTROL SAMPLE: 2459160

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	107	mg/L	1	1.1	85 - 115

MATRIX SPIKE: 2459161 DUPLICATE: 2459162 ORIGINAL: 2196114005

****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)	30.88	mg/L	60	88.1	88.51	95.4	96.1	85 - 115	.46	20

MATRIX SPIKE: 2459163 DUPLICATE: 2459164 ORIGINAL: 2196607002

****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)	1.362	mg/L	6	7.514	7.504	103	102	85 - 115	.13	20

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

QUALITY CONTROL DATA QUALIFIERS

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

QUALITY CONTROL PARAMETER QUALIFIERS

Lab ID	#	Sample Type	Analytical Method	Analyte
2461660	1	Lab Control Standard	SW846 8260C	1,1-Dichloroethene

The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,1-Dichloroethene. The % Recovery was reported as 133 and the control limits were 71 to 131.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2196114001	MW-28 121416			EPA 300.0	WETC/180428
2196114002	MW-15 121416			EPA 300.0	WETC/180428
2196114003	MW-29 121416			EPA 300.0	WETC/180428
2196114004	MW-31 121416			EPA 300.0	WETC/180428
2196114005	MW-33 121416			EPA 300.0	WETC/180428
2196114001	MW-28 121416			S2320B-97	WETC/180433
2196114002	MW-15 121416			S2320B-97	WETC/180433
2196114003	MW-29 121416			S2320B-97	WETC/180433
2196114004	MW-31 121416			S2320B-97	WETC/180433
2196114005	MW-33 121416			S2320B-97	WETC/180433
2196114001	MW-28 121416			RSK 175	SVGC/43897
2196114002	MW-15 121416			RSK 175	SVGC/43897
2196114003	MW-29 121416			RSK 175	SVGC/43897
2196114004	MW-31 121416			RSK 175	SVGC/43897
2196114005	MW-33 121416			RSK 175	SVGC/43897
2196114001	MW-28 121416			S5310B-00	WETC/180547
2196114002	MW-15 121416			S5310B-00	WETC/180547
2196114003	MW-29 121416			S5310B-00	WETC/180547
2196114001	MW-28 121416			SW846 8260C	VOMS/41894
2196114002	MW-15 121416			SW846 8260C	VOMS/41894
2196114004	MW-31 121416			S5310B-00	WETC/180697
2196114005	MW-33 121416			S5310B-00	WETC/180697
2196114001	MW-28 121416			SW846 8260C	VOMS/41953
2196114003	MW-29 121416			SW846 8260C	VOMS/41953
2196114004	MW-31 121416			SW846 8260C	VOMS/41953

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2196114005	MW-33 121416			SW846 8260C	VOMS/41953
2196114006	Trip Blank			SW846 8260C	VOMS/41953

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)

* 2 1 9 6 1 1 4 *

Project Name: Scotia Navy Depot	Project Number: 60440641
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: [signature]	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 (Pres. 2/1)	RSK 175 (Pres. 1)	TOC (Pres. 1)	Alkalinity (Pres. 0)	Cl, SO4, NO3 (Pres. 0)	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	REMARKS/ ALTERNATE DESCRIPTION
MW-28 121416		12/14/16	0835	GW	8	X	X	X	X	X			
MW-15 121416		↓	1005	↓	↓	↓	↓	↓	↓	↓			
MW-29 121416		↓	1120	↓	↓	↓	↓	↓	↓	↓			
MW-31 121416		↓	1332	↓	↓	↓	↓	↓	↓	↓			
MW-33 121416		↓	1455	↓	↓	↓	↓	↓	↓	↓			
Trip Blank		–	–	AQ	2	↓							

(Printed column options: GC/MS VOAs 8260 • 624 • OLP; GC/MS SVOAs 8270 • 625; GC VOAs 8021 • BTEX; PESTICIDES 8081 • 608; PCBs 8082 • 608)

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 ____

Cooler Temp °C: 3 | Cooler #: | Therm ID: 352 | Ship Carrier: UPS / FedEx (circled) / DHL

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

Tracking #: 6470 8309 9408

SPECIAL INSTRUCTIONS/COMMENTS
Metals

12/15/16
1237

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 #: 60440641.11
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	[signature]	Brian McGuirk	Brian McGuirk	Jessica Smith		
Printed Name	Chris French	Brian McGuirk	Brian McGuirk	ALS		
Firm	AECOM	ALS	ALS	12/15/16 0916		
Date/Time	12/14/16 1525	12/14/16 1525	12/14/16 1700			

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

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December 29, 2016

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

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO**	Workorder:	**2196473**
Purchase Order:	**60440641.11**	Workorder ID:	**ASN016|2015-SCOTIA NAVY DEPOT-**

Dear Ms. Lurie:

Enclosed are the analytical results for samples received by the laboratory on Friday, December 16, 2016.

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: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2196473001	EB-1 121516	Ground Water	12/15/2016 07:55	12/16/2016 09:26	Collected by Client
2196473002	MW-35 121516	Ground Water	12/15/2016 09:07	12/16/2016 09:26	Collected by Client
2196473003	DUP-2 121516	Ground Water	12/15/2016 00:00	12/16/2016 09:26	Collected by Client
2196473004	Trip Blank	Ground Water	12/16/2016 09:26	12/16/2016 09:26	Collected by Client

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SAMPLE SUMMARY

Workorder: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the 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: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

Lab ID: **2196473001** Date Collected: 12/15/2016 07:55 Matrix: Ground Water

Sample ID: **EB-1 121516** Date Received: 12/16/2016 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 19:33	DD	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 19:33	DD	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 19:33	DD	B
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 19:33	DD	B
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 19:33	DD	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 19:33	DD	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 19:33	DD	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 19:33	DD	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 19:33	DD	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 19:33	DD	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 19:33	DD	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 19:33	DD	B
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 19:33	DD	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 19:33	DD	B

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	110		%	81 - 118	SW846 8260C			12/28/16 19:33	DD	B
4-Bromofluorobenzene (S)	106		%	85 - 114	SW846 8260C			12/28/16 19:33	DD	B
Dibromofluoromethane (S)	90.3		%	80 - 119	SW846 8260C			12/28/16 19:33	DD	B
Toluene-d8 (S)	104		%	89 - 112	SW846 8260C			12/28/16 19:33	DD	B

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

Lab ID: **2196473002** Date Collected: 12/15/2016 09:07 Matrix: Ground Water

Sample ID: **MW-35 121516** Date Received: 12/16/2016 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
Trichloroethene	31.8		ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	113		%	81 - 118			SW846 8260C		12/28/16 22:28	DD	H
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C		12/28/16 22:28	DD	H
Dibromofluoromethane (S)	93		%	80 - 119			SW846 8260C		12/28/16 22:28	DD	H
Toluene-d8 (S)	102		%	89 - 112			SW846 8260C		12/28/16 22:28	DD	H
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		12/20/16 09:09	KJH	A
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		12/20/16 09:09	KJH	A
Methane	0.90		ug/L	0.50	0.25	0.13	RSK 175		12/20/16 09:09	KJH	A
WET CHEMISTRY											
Alkalinity, Total	223	1	mg/L	5	5	0.8	S2320B-97		12/17/16 01:42	MSA	F
Chloride	53.9		mg/L	2.0	0.50	0.16	EPA 300.0		12/17/16 06:10	MBW	E
Nitrate-N	0.040J	J	mg/L	0.20	0.060	0.020	EPA 300.0		12/17/16 06:10	MBW	E
Sulfate	7.2		mg/L	2.0	0.50	0.20	EPA 300.0		12/17/16 06:10	MBW	E
Total Organic Carbon (TOC)	18.3		mg/L	5.0	2.5	0.92	S5310B-00		12/21/16 11:30	PAG	C

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

Lab ID: **2196473003** Date Collected: 12/15/2016 00:00 Matrix: Ground Water

Sample ID: **DUP-2 121516** Date Received: 12/16/2016 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 22:06	DD	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 22:06	DD	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 22:06	DD	B
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 22:06	DD	B
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 22:06	DD	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 22:06	DD	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 22:06	DD	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 22:06	DD	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 22:06	DD	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 22:06	DD	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 22:06	DD	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 22:06	DD	B
Trichloroethene	30.3		ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 22:06	DD	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/28/16 22:06	DD	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	81 - 118			SW846 8260C			12/28/16 22:06	DD	B
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C			12/28/16 22:06	DD	B
Dibromofluoromethane (S)	90.7		%	80 - 119			SW846 8260C			12/28/16 22:06	DD	B
Toluene-d8 (S)	174	2	%	89 - 112			SW846 8260C			12/28/16 22:06	DD	B
LIGHT HYDROCARBON GASES												
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175			12/20/16 08:53	KJH	A
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175			12/20/16 08:53	KJH	A
Methane	1.3		ug/L	0.50	0.25	0.13	RSK 175			12/20/16 08:53	KJH	A
WET CHEMISTRY												
Alkalinity, Total	226	1	mg/L	5	5	0.8	S2320B-97			12/17/16 01:54	MSA	F
Chloride	53.2		mg/L	2.0	0.50	0.16	EPA 300.0			12/17/16 06:26	MBW	E
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			12/17/16 06:26	MBW	E
Sulfate	6.5		mg/L	2.0	0.50	0.20	EPA 300.0			12/17/16 06:26	MBW	E
Total Organic Carbon (TOC)	18.6		mg/L	5.0	2.5	0.92	S5310B-00			12/21/16 11:30	PAG	C

Vicki Forney

Mrs. Vicki A. Forney
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ANALYTICAL RESULTS

Workorder: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

Lab ID: **2196473004** Date Collected: 12/16/2016 09:26 Matrix: Ground Water

Sample ID: **Trip Blank** Date Received: 12/16/2016 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	109		%	81 - 118	SW846 8260C		12/28/16 19:54	DD	I
4-Bromofluorobenzene (S)	106		%	85 - 114	SW846 8260C		12/28/16 19:54	DD	I
Dibromofluoromethane (S)	90.5		%	80 - 119	SW846 8260C		12/28/16 19:54	DD	I
Toluene-d8 (S)	103		%	89 - 112	SW846 8260C		12/28/16 19:54	DD	I

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PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2196473002	1	MW-35 121516	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2196473003	1	DUP-2 121516	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2196473003	2	DUP-2 121516	SW846 8260C	Toluene-d8
The surrogate Toluene-d8 for method SW846 8260C was outside of control limits. The % Recovery was reported as 174 and the control limits were 89 to 112. This result was reported at a dilution of 1.				

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QUALITY CONTROL DATA

Workorder: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

QC Batch: SVGC/43924 **Analysis Method:** RSK 175

QC Batch Method: RSK 175

Associated Lab Samples: 2196473002, 2196473003

METHOD BLANK: 2457899

Parameter	Blank Result	Units	Reporting Limit
Ethane	0.50U	ug/L	1.0
Ethene	0.75U	ug/L	1.5
Methane	0.25J	ug/L	0.50

SAMPLE DUPLICATE: 2457900 ORIGINAL: 2196473002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Ethane	0	ug/L	0	NC	20
Ethene	0	ug/L	0	NC	20
Methane	.9	ug/L	1.26	33.3*	20

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QUALITY CONTROL DATA

Workorder: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

QC Batch: VOMS/41953 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 2196473001, 2196473002, 2196473003, 2196473004

METHOD BLANK: 2461659

Parameter	Blank Result	Units	Reporting Limit
Carbon Tetrachloride	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	110	%	81 - 118
4-Bromofluorobenzene (S)	107	%	85 - 114
Dibromofluoromethane (S)	91.1	%	80 - 119
Toluene-d8 (S)	104	%	89 - 112

LABORATORY CONTROL SAMPLE: 2461660

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	116	ug/L	20	23.2	72 - 136
1,1-Dichloroethane	109	ug/L	20	21.9	77 - 125
1,2-Dichloroethane	107	ug/L	20	21.5	73 - 128
1,1-Dichloroethene	133*	ug/L	20	26.5	71 - 131
cis-1,2-Dichloroethene	107	ug/L	20	21.4	78 - 123
trans-1,2-Dichloroethene	122	ug/L	20	24.5	75 - 124
1,1,1,2-Tetrachloroethane	114	ug/L	20	22.7	78 - 124
1,1,2,2-Tetrachloroethane	108	ug/L	20	21.7	71 - 121
Tetrachloroethene	112	ug/L	20	22.4	74 - 129
Toluene	118	ug/L	20	23.5	80 - 121
1,1,1-Trichloroethane	114	ug/L	20	22.8	74 - 131
1,1,2-Trichloroethane	109	ug/L	20	21.7	80 - 119
Trichloroethene	112	ug/L	20	22.3	79 - 123

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QUALITY CONTROL DATA

Workorder: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

Vinyl Chloride	96.7	ug/L	20	19.3	58 - 137
1,2-Dichloroethane-d4 (S)	107	%			81 - 118
4-Bromofluorobenzene (S)	105	%			85 - 114
Dibromofluoromethane (S)	91.7	%			80 - 119
Toluene-d8 (S)	103	%			89 - 112

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QUALITY CONTROL DATA

Workorder: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/180433 **Analysis Method:** S2320B-97

QC Batch Method: S2320B-97

Associated Lab Samples: 2196473002, 2196473003

METHOD BLANK: 2456059

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

SAMPLE DUPLICATE: 2456064 ORIGINAL: 2195966001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	94.43452	mg/L	99.1573	4.88	20

METHOD BLANK: 2456067

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

SAMPLE DUPLICATE: 2456068 ORIGINAL: 2196114001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	316.07867	mg/L	309.03873	2.25	20

METHOD BLANK: 2456071

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

SAMPLE DUPLICATE: 2456072 ORIGINAL: 2196145001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD

QUALITY CONTROL DATA

Workorder: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

Alkalinity, Total	264.32217	mg/L	257.86462	2.47	20

METHOD BLANK: 2456075

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

SAMPLE DUPLICATE: 2456076 ORIGINAL: 2196171001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	14.98288	mg/L	13.59898	9.68	20

METHOD BLANK: 2456079

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

SAMPLE DUPLICATE: 2456080 ORIGINAL: 2196213001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	172.34834	mg/L	171.28119	.62	20

METHOD BLANK: 2456176

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

SAMPLE DUPLICATE: 2456177 ORIGINAL: 2196248001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	204.6218	mg/L	195.62924	4.49	20

QUALITY CONTROL DATA

Workorder: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

METHOD BLANK: 2456180

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

SAMPLE DUPLICATE: 2456638 ORIGINAL: 2196293001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	36.38869	mg/L	35.12141	3.54	20

METHOD BLANK: 2456641

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

SAMPLE DUPLICATE: 2456642 ORIGINAL: 2196293011

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	12.54202	mg/L	12.68995	1.17	20

METHOD BLANK: 2456645

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

SAMPLE DUPLICATE: 2456646 ORIGINAL: 2196473002

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	222.57646	mg/L	224.45787	.84	20

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QUALITY CONTROL DATA

Workorder: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

METHOD BLANK: 2456649

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

QUALITY CONTROL DATA

Workorder: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/180491 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 2196473002, 2196473003

METHOD BLANK: 2456738

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: 2456740

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	104	mg/L	20	20.8	87 - 111
Nitrate-N	104	mg/L	2.5	2.6	88 - 111
Sulfate	104	mg/L	20	20.9	87 - 112

METHOD BLANK: 2456743

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

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QUALITY CONTROL DATA

Workorder: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/180697 **Analysis Method:** S5310B-00

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 2196473002, 2196473003

METHOD BLANK: 2459159

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

LABORATORY CONTROL SAMPLE: 2459160

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	107	mg/L	1	1.1	85 - 115

MATRIX SPIKE: 2459161 DUPLICATE: 2459162 ORIGINAL: 2196114005

****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)	30.88	mg/L	60	88.1	88.51	95.4	96.1	85 - 115	.46	20

MATRIX SPIKE: 2459163 DUPLICATE: 2459164 ORIGINAL: 2196607002

****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)	1.362	mg/L	6	7.514	7.504	103	102	85 - 115	.13	20

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QUALITY CONTROL DATA QUALIFIERS

Workorder: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

QUALITY CONTROL PARAMETER QUALIFIERS

Lab ID	#	Sample Type	Analytical Method	Analyte
2461660	1	Lab Control Standard	SW846 8260C	1,1-Dichloroethene

The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,1-Dichloroethene. The % Recovery was reported as 133 and the control limits were 71 to 131.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2196473002	MW-35 121516			S2320B-97	WETC/180433
2196473003	DUP-2 121516			S2320B-97	WETC/180433
2196473002	MW-35 121516			EPA 300.0	WETC/180491
2196473003	DUP-2 121516			EPA 300.0	WETC/180491
2196473002	MW-35 121516			RSK 175	SVGC/43924
2196473003	DUP-2 121516			RSK 175	SVGC/43924
2196473002	MW-35 121516			S5310B-00	WETC/180697
2196473003	DUP-2 121516			S5310B-00	WETC/180697
2196473001	EB-1 121516			SW846 8260C	VOMS/41953
2196473002	MW-35 121516			SW846 8260C	VOMS/41953
2196473003	DUP-2 121516			SW846 8260C	VOMS/41953
2196473004	Trip Blank			SW846 8260C	VOMS/41953

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CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

33468

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

* 2 1 9 6 4 7 3 *

Project Name: Scotia Navy Depot	Project Number: 60440641
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 G

PRESERVATIVE: 1 1 1 0 0

NUMBER OF CONTAINERS | 8260C | RSK175 | 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
7. $NaHSO_4$
8. Other _____

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	8260C	RSK175	TOC	Alkalinity	Cl, SO4, NO3	METALS, TOTAL	METALS, DISSOLVED	REMARKS/ ALTERNATE DESCRIPTION
EB-1 121516		12/15/16	0755	~~GW~~ AQ	3	X							Equipment Blank
MW-25 121516			0907	GW	8	X	X	X	X	X			
Dup-2 121516		↓	—	GW	8	X	X	X	X	X			Duplicate Sample
Trip Blank		—	—	AQ	2	X							

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

Cooler Temp: 2 °C
Cooler #:
Therm ID: TH-352
Ship Carrier: FedEx UPS DHL
Tracking #: 6470 8309 9419

SPECIAL INSTRUCTIONS/C
Metals

See QAPP ☒

TURNAROUND REQUIREMENTS
_____ RUSH (SURCHARGES APPLY)
Standard
_____ 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 # 60440641.11
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: CB/TH	Signature:	Signature:	Signature:	Signature:	Signature:
Printed Name: Chris Taylor	Printed Name: DINA AVERS	Printed Name: DINA AVERS	Printed Name:	Printed Name:	Printed Name:
Firm: AECOM	Firm: ALS	Firm: ALS	Firm:	Firm:	Firm:
Date/Time: 12/15/16 1320	Date/Time: 12/15/16 1320	Date/Time: 12/15/16 1600	Date/Time: 12-16-16 0926	Date/Time:	Date/Time:

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

APPENDIX C: AECOM Data Usability Summary Report (DUSR)

AECOM

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

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

January 24, 2017

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

Prepared for:
U.S. Army Corps of Engineers
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Data Usability Summary Report
Defense National Stockpile Center
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December 2016
Final

Prepared By
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Contents

List of Appendices

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 December 12, 2016 through December 16, 2016. 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 four deliverables. Each laboratory deliverable is identified by both a laboratory work order number and sample delivery group (SDG) number.

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

- Volatile Organic Compounds by USEPA SW-846 Method 8260B
- Methane, Ethane and Ethene by RSK -175
- Chloride, Nitrate as N and Sulfate by Method EPA Method 300.0
- Alkalinity by Standard Methods 2320B
- Total Organic Carbon by Standard Methods 5310B

The trip blanks and the equipment blank were analyzed for VOCs only. 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 No.	SDG Number
MW-16-121216	2195241001	Groundwater	12/12/2016	2195241	ASN013
Trip Blank-121216	2195241002	Aqueous (QC)	12/12/2016	2195241	ASN013
MW-34-121316	2195623001	Groundwater	12/13/2016	2195623	ASN014
MW-26-121316	2195623002	Groundwater	12/13/2016	2195623	ASN014
MW-32-121316	2195623003	Groundwater	12/13/2016	2195623	ASN014
MW-24-121316	2195623004	Groundwater	12/13/2016	2195623	ASN014
MW-30-121316	2195623005	Groundwater	12/13/2016	2195623	ASN014
DUP-1-121316 [MW-32]	2195623006	Groundwater (QC)	12/13/2016	2195623	ASN014
Trip Blank-121416	2195623007	Aqueous (QC)	12/14/2016	2195623	ASN014
MW-28-121416	2196114001	Groundwater	12/14/2016	2196114	ASN015
MW-15-121416	2196114002	Groundwater	12/14/2016	2196114	ASN015
MW-29-121416	2196114003	Groundwater	12/14/2016	2196114	ASN015
MW-31-121416	2196114004	Groundwater	12/14/2016	2196114	ASN015
MW-33-121416	2196114005	Groundwater	12/14/2016	2196114	ASN015
Trip Blank-121516	2196114006	Aqueous (QC)	12/15/2016	2196114	ASN015
EB-1-121516	2196473001	Aqueous (QC)	12/15/2016	2196473	ASN016
MW-35-121516	2196473002	Groundwater	12/15/2016	2196473	ASN016
DUP-2-121516 [MW-35]	2196473003	Groundwater (QC)	12/15/2016	2196473	ASN016
Trip Blank-121616	2196473004	Aqueous (QC)	12/16/2016	2196473	ASN016

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 Appendix A of this report. The data qualifier summaries are attached as Appendix B of this report.

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

1.0 Volatile Organic Compounds

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

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

Work Order 2195241 (SDG ASN013)

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

Work Order 2195623 (SDG ASN014)

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

Work Order 2196114 (SDG ASN015)

Calibrations (p.2022-2024): The 1,1-dichloroethene recovery for the 12/28/16 initial calibration verification standard on instrument MS03 was greater than the upper quality control limit. The 1,1-dichloroethene results for associated samples Trip Blank , MW-28-121416, MW-29-121416, MW-31-121416 and MW-33-121416 were non-detect. No data qualification was required in response to the high instrument bias.

Laboratory Control Sample Recovery (p. 26): The 1,1-dichloroethene recovery for LCS 2461660 was greater than the upper quality control limit. The 1,1-dichloroethene results for associated samples Trip Blank , MW-28-121416, MW-29-121416, MW-31-121416 and MW-33-121416 were non-detect. No data qualification was required in response to the high method bias.

Surrogate Recoveries (p. 24): The dibromofluoromethane surrogate recovery for sample MW-29-121416 was greater than the upper quality control limit. The positive cis-1,2-dichloroethene, tetrachloroethene, 1,1,1-trichloroethane and trichloroethene results were qualified "J+," as estimated concentrations, because of high method bias and/or matrix effects. Non-detect results were not qualified on this basis.

Work Order 2196473 (SDG ASN016)

Calibrations (p.972-974): The 1,1-dichloroethene recovery for the 12/28/16 initial calibration verification standard on instrument MS03 was greater than the upper quality control limit. The 1,1-dichloroethene results for associated samples Trip Blank , EB-1-121516, MW-29-121416, MW-35-121516 and DUP-2-121516 were non-detect. No data qualification was required in response to the high instrument bias.

Laboratory Control Sample Recovery (p. 21): The 1,1-dichloroethene recovery for LCS 2461660 was greater than the upper quality control limit. The 1,1-dichloroethene results for associated samples Trip Blank , EB-1-121516, MW-29-121416, MW-35-121516 and DUP-2-121516 were non-detect. No data qualification was required in response to the high method bias.

Surrogate Recoveries (p. 20): The toluene-d8 surrogate recovery for sample DUP-2-121516 was greater than the upper quality control limit. The positive trichloroethene result was qualified "J+," as an estimated concentration, because of high method bias and/or matrix effects. Non-detect results were not qualified on this basis.

2.0 Methane, Ethane, Ethene

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

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

Work Order 2195241 (SDG ASN013)

Laboratory Method Blank (p. 1262): Methane was detected in method blank 2456158 (12/16/16) at a concentration greater than the LOD but less than the LOQ. The results for methane in associated samples MW-16-121216 and MW-16-121216 DUP were less than the LOQ and were qualified as non-detect (U) at the LOQ.

Laboratory Duplicates (pp. 1196, 1268): A laboratory duplicate analysis was performed on sample MW-16-121216 in this SDG. The results for methane, ethane and ethene were non-detect in both analyses; no qualifications were required.

Work Order 2195623 (SDG ASN014)

Laboratory Method Blank (p. 1647): Methane was detected in method blank 2456158 (12/16/16) at a concentration greater than the LOD but less than the LOQ. The results for methane in associated samples MW-34-121316, MW-26-121316, MW-32-121316, MW-24-121316, MW-30-121316 and DUP-1-121316 were greater than the LOQ, no qualification was required.

Work Order 2196114 (SDG ASN015)

Laboratory Method Blank (p. 2542): Methane was detected in method blank 2456158 (12/16/16) at a concentration greater than the LOD but less than the LOQ. The results for methane in associated samples MW-28-121416, MW-29-121416, MW-31-121416 and MW-33-121416 were greater than the LOQ, no qualification was required. The result for methane in associated sample MW-15-121416 was less than the LOQ and was qualified as non-detect (U) at the LOQ.

Laboratory Duplicates (pp. 2471, 2548): A laboratory duplicate analysis was performed on sample MW-33-121416 in this SDG. The RPDs between the original ad duplicate results for methane, ethane and ethene were less than the maximum quality control limit of 20%. No qualifications were required.

Work Order 2196473 (SDG ASN016)

Laboratory Method Blank (p. 1325): Methane was detected in method blank 2457899 (12/20/16) at a concentration greater than the LOQ. The results for methane in associated samples MW-35-121516 and DUP-2-121516 were greater than the LOQ and greater than the blank contamination level. No qualification was required.

Laboratory Duplicates (pp. 1254, 1331): A laboratory duplicate analysis was performed on sample MW-35-121516 in this SDG. The results for ethane and ethene were non-detect in both analyses; no qualifications were required. The original and duplicate results for methane were less than five times the LOQ and the difference between the results was less than the LOQ. No qualifications were 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 four laboratory reports. Analytical results for these anions were reviewed for the following measurement performance indicators:

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

Work Order 2195241 (SDG ASN013)

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

Work Order 2195623 (SDG ASN014)

Matrix Spike Recoveries (p.1670): MS/MSD analyses were performed on sample MW-31-121316. The MSD recovery for chloride was greater than the upper ALS advisory limit of 111%, at 113%. The recovery of 113% was within the data validation limits of 75-125%. No data qualifications were required.

Work Order 2196114 (SDG ASN015)

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

Work Order 2196473 (SDG ASN016)

No data quality issues were noted. 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 four laboratory reports. Analytical results for alkalinity were reviewed for the following measurement performance indicators:

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

Work Order 2195241 (SDG ASN013)

Laboratory Method Blank (p. 1278): Method blanks 2454307, 2454331 and 2454335 associated with sample MW-16-121216 were contaminated at concentrations greater than the LOD but less than the LOQ. The associated sample result was greater than the LOQ, and greater than the highest blank contamination level. No qualification was required.

Work Order 2195623 (SDG ASN014)

Laboratory Method Blank (p. 1657): Method blanks 2455292, 2455296 and 2455300 associated with samples MW-34-121316, MW-26-121316, MW-32-121316, MW-24-121316, MW-30-121316 and DUP-1-121316 were contaminated at concentrations greater than the LOD but less than the LOQ. The associated sample results were greater than the LOQ, and greater than the highest blank contamination level. No qualification was required.

Work Order 2196114 (SDG ASN015)

Laboratory Method Blank (p. 2558): Method blanks 2456067 and 2456071 associated with samples MW-28-121416, MW-15-121416, MW-29-121416, MW-31-121416 and MW-33-121416 were contaminated at concentrations greater than the LOD but less than the LOQ. The associated sample results were greater than the LOQ, and greater than the highest blank contamination level. No qualification was required.

Work Order 2196473 (SDG ASN016)

Laboratory Method Blank (p. 1340): Method blank 2456645 associated with samples MW-35-121516 and DUP-2-121516 was contaminated at a concentration greater than the LOD but less than the

LOQ. The associated sample results were greater than the LOQ, and greater than the highest blank contamination level. No 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 four laboratory reports. Analytical results for TOC were reviewed for the following measurement performance indicators:

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

Work Order 2195241 (SDG ASN013)

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

Work Order 2195623 (SDG ASN014)

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

Work Order 2196114 (SDG ASN015)

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

Work Order 2196473 (SDG ASN016)

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-32 and MW-35. 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 table.

RPD: Relative percent difference
Qual: Qualification required;
<±LOQ: The difference between the primary and field duplicate results was less than the LOQ for results less than five 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-32-121316	DUP-1-121316	RPD (%)	Qual
Trichloroethene	µg/L	132	133	0.75	None
Ethane	µg/L	1.5	1.5	0	None
Ethene	µg/L	1.8	1.8	0	None
Methane	µg/L	16.5	15.0	9.5	None
Alkalinity, total	mg/L	277	278	0.36	None
Chloride	mg/L	138	150	8.3	None
Sulfate	mg/L	2.8	2.9	3.5	None
Total Organic Carbon	mg/L	133	131	1.5	None

Table 2B – Field Duplicate Precision

Parameter	Units	MW-35-121516	DUP-2-121516	RPD (%)	Qual
Trichloroethene	µg/L	31.8	30.3	4.8	None
Methane	µg/L	0.90	1.3	36	<±LOQ, None
Alkalinity, total	mg/L	223	226	1.3	None
Chloride	mg/L	53.9	53.2	1.3	None
Sulfate	mg/L	7.2	6.5	10	None
Total Organic Carbon	mg/L	18.3	18.6	1.6	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.

Appendix A

Glossary of Data Qualifier Codes

Glossary of Data Qualifier Codes

U The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ The analyte was analyzed for, but was not detected. The reported quantitation limit is approximated and may be inaccurate or imprecise.

J The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.

J+ The result is an estimated quantity, likely to be biased high. The associated numerical value is the approximate concentration of the analyte in the sample.

J- The result is an estimated quantity, likely to be biased low. The associated numerical value is the approximate concentration of the analyte in the sample.

R The data are unusable. The sample results are rejected due to serious deficiencies in the ability to meet quality control criteria. The presence or absence of the analyte cannot be verified.

N (Organics) The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.

NJ (Organics) The analysis indicates the presence of an analyte that has been tentatively identified and the associated numerical value represents its approximate concentration.

Appendix B

Data Qualification Summaries

ALS Environmental

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: 2195241 ASN013|Scotia Navy 60490641.11

Lab ID: **2195241001** Date Collected: 12/12/2016 14:23 Matrix: Ground Water

Sample ID: **MW-16 121216** Date Received: 12/13/2016 09:21

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:48	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:48	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:48	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:48	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:48	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:48	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:48	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:48	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:48	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:48	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:48	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:48	DD	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:48	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:48	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	100		%	81 - 118			SW846 8260C		12/21/16 15:48	DD	A
4-Bromofluorobenzene (S)	95.3		%	85 - 114			SW846 8260C		12/21/16 15:48	DD	A
Dibromofluoromethane (S)	94.4		%	80 - 119			SW846 8260C		12/21/16 15:48	DD	A
Toluene-d8 (S)	95.9		%	89 - 112			SW846 8260C		12/21/16 15:48	DD	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		12/16/16 06:54	KJH	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		12/16/16 06:54	KJH	C
Methane 0.50U	~~0.14J~~	~~J1~~	ug/L	0.50	0.25	0.13	RSK 175		12/16/16 06:54	KJH	C
WET CHEMISTRY											
Alkalinity, Total	312	~~2~~	mg/L	5	5	0.8	S2320B-97		12/14/16 14:16	MSA	F
Chloride	9.0		mg/L	2.0	0.50	0.16	EPA 300.0		12/14/16 04:59	MBW	G
Nitrate-N	1.6		mg/L	0.20	0.060	0.020	EPA 300.0		12/14/16 04:59	MBW	G
Sulfate	44.8		mg/L	2.0	0.50	0.20	EPA 300.0		12/14/16 04:59	MBW	G
Total Organic Carbon (TOC)	0.96J	J	mg/L	1.0	0.50	0.18	S5310B-00		12/14/16 10:56	PAG	E

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

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: 2195241 ASN013|Scotia Navy 60490641.11

Lab ID: **2195241002** Date Collected: 12/13/2016 09:21 Matrix: Ground Water

Sample ID: **Trip Blank** Date Received: 12/13/2016 09:21

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 13:59	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 13:59	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 13:59	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 13:59	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 13:59	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 13:59	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 13:59	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 13:59	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 13:59	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 13:59	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 13:59	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 13:59	DD	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 13:59	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 13:59	DD	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	97.8		%	81 - 118	SW846 8260C		12/21/16 13:59	DD	A
4-Bromofluorobenzene (S)	97.4		%	85 - 114	SW846 8260C		12/21/16 13:59	DD	A
Dibromofluoromethane (S)	89		%	80 - 119	SW846 8260C		12/21/16 13:59	DD	A
Toluene-d8 (S)	96.3		%	89 - 112	SW846 8260C		12/21/16 13:59	DD	A

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

ANALYTICAL RESULTS

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

Lab ID: **2195623001** Date Collected: 12/13/2016 08:49 Matrix: Ground Water

Sample ID: **MW-34 121316** Date Received: 12/14/2016 09:09

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:26	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:26	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:26	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:26	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:26	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:26	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:26	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:26	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:26	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:26	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:26	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:26	DD	A
Trichloroethene	41.3		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:26	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:26	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118			SW846 8260C		12/21/16 15:26	DD	A
4-Bromofluorobenzene (S)	96.8		%	85 - 114			SW846 8260C		12/21/16 15:26	DD	A
Dibromofluoromethane (S)	95.6		%	80 - 119			SW846 8260C		12/21/16 15:26	DD	A
Toluene-d8 (S)	96.4		%	89 - 112			SW846 8260C		12/21/16 15:26	DD	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		12/16/16 07:45	KJH	G
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		12/16/16 07:45	KJH	G
Methane	1.2		ug/L	0.50	0.25	0.13	RSK 175		12/16/16 07:45	KJH	G
WET CHEMISTRY											
Alkalinity, Total	191	J-	mg/L	5	5	0.8	S2320B-97		12/15/16 08:53	MSA	V
Chloride	62.3		mg/L	2.0	0.50	0.16	EPA 300.0		12/15/16 06:28	MBW	S
Nitrate-N	0.060J	J	mg/L	0.20	0.060	0.020	EPA 300.0		12/15/16 06:28	MBW	S
Sulfate	23.8		mg/L	2.0	0.50	0.20	EPA 300.0		12/15/16 06:28	MBW	S
Total Organic Carbon (TOC)	12.0		mg/L	5.0	2.5	0.92	S5310B-00		12/19/16 10:23	PAG	M

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

ANALYTICAL RESULTS

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

Lab ID: **2195623002** Date Collected: 12/13/2016 10:54 Matrix: Ground Water

Sample ID: **MW-26 121316** Date Received: 12/14/2016 09:09

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:10	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118			SW846 8260C		12/21/16 16:10	DD	A
4-Bromofluorobenzene (S)	94.8		%	85 - 114			SW846 8260C		12/21/16 16:10	DD	A
Dibromofluoromethane (S)	94.2		%	80 - 119			SW846 8260C		12/21/16 16:10	DD	A
Toluene-d8 (S)	94.1		%	89 - 112			SW846 8260C		12/21/16 16:10	DD	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		12/16/16 08:15	KJH	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		12/16/16 08:15	KJH	C
Methane	2.7		ug/L	0.50	0.25	0.13	RSK 175		12/16/16 08:15	KJH	C
WET CHEMISTRY											
Alkalinity, Total	197	+	mg/L	5	5	0.8	S2320B-97		12/15/16 09:59	MSA	H
Chloride	44.9		mg/L	2.0	0.50	0.16	EPA 300.0		12/15/16 05:11	MBW	G
Nitrate-N	0.040J	J	mg/L	0.20	0.060	0.020	EPA 300.0		12/15/16 05:11	MBW	G
Sulfate	24.6		mg/L	2.0	0.50	0.20	EPA 300.0		12/15/16 05:11	MBW	G
Total Organic Carbon (TOC)	2.6		mg/L	1.0	0.50	0.18	S5310B-00		12/19/16 10:23	PAG	E

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

ANALYTICAL RESULTS

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

Lab ID: **2195623003** Date Collected: 12/13/2016 11:50 Matrix: Ground Water

Sample ID: **MW-32 121316** Date Received: 12/14/2016 09:09

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
Trichloroethene	132		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:32	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	99		%	81 - 118			SW846 8260C		12/21/16 16:32	DD	A
4-Bromofluorobenzene (S)	100		%	85 - 114			SW846 8260C		12/21/16 16:32	DD	A
Dibromofluoromethane (S)	94.5		%	80 - 119			SW846 8260C		12/21/16 16:32	DD	A
Toluene-d8 (S)	95.6		%	89 - 112			SW846 8260C		12/21/16 16:32	DD	A
LIGHT HYDROCARBON GASES											
Ethane	1.5		ug/L	1.0	0.50	0.25	RSK 175		12/16/16 08:32	KJH	C
Ethene	1.8		ug/L	1.5	0.75	0.31	RSK 175		12/16/16 08:32	KJH	C
Methane	16.5		ug/L	0.50	0.25	0.13	RSK 175		12/16/16 08:32	KJH	C
WET CHEMISTRY											
Alkalinity, Total	277	+-	mg/L	5	5	0.8	S2320B-97		12/15/16 10:10	MSA	H
Chloride	138		mg/L	2.0	0.50	0.16	EPA 300.0		12/15/16 05:26	MBW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		12/15/16 05:26	MBW	G
Sulfate	2.8		mg/L	2.0	0.50	0.20	EPA 300.0		12/15/16 05:26	MBW	G
Total Organic Carbon (TOC)	133		mg/L	25.0	12.5	4.6	S5310B-00		12/19/16 10:23	PAG	E

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

ANALYTICAL RESULTS

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

Lab ID: **2195623004** Date Collected: 12/13/2016 14:15 Matrix: Ground Water

Sample ID: **MW-24 121316** Date Received: 12/14/2016 09:09

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:54	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:54	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:54	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:54	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:54	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:54	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:54	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:54	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:54	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:54	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:54	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:54	DD	A
Trichloroethene	1.4		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:54	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 16:54	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	81 - 118			SW846 8260C		12/21/16 16:54	DD	A
4-Bromofluorobenzene (S)	94.7		%	85 - 114			SW846 8260C		12/21/16 16:54	DD	A
Dibromofluoromethane (S)	95.4		%	80 - 119			SW846 8260C		12/21/16 16:54	DD	A
Toluene-d8 (S)	93.2		%	89 - 112			SW846 8260C		12/21/16 16:54	DD	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		12/16/16 08:48	KJH	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		12/16/16 08:48	KJH	C
Methane	1.6		ug/L	0.50	0.25	0.13	RSK 175		12/16/16 08:48	KJH	C
WET CHEMISTRY											
Alkalinity, Total	198	-H-	mg/L	5	5	0.8	S2320B-97		12/15/16 10:57	MSA	H
Chloride	38.5		mg/L	2.0	0.50	0.16	EPA 300.0		12/15/16 05:42	MBW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		12/15/16 05:42	MBW	G
Sulfate	21.4		mg/L	2.0	0.50	0.20	EPA 300.0		12/15/16 05:42	MBW	G
Total Organic Carbon (TOC)	1.9		mg/L	1.0	0.50	0.18	S5310B-00		12/19/16 10:23	PAG	E

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ANALYTICAL RESULTS

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

Lab ID: **2195623005** Date Collected: 12/13/2016 15:11 Matrix: Ground Water

Sample ID: **MW-30 121316** Date Received: 12/14/2016 09:09

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
Trichloroethene	42.3		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 15:04	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118			SW846 8260C		12/21/16 15:04	DD	A
4-Bromofluorobenzene (S)	97.2		%	85 - 114			SW846 8260C		12/21/16 15:04	DD	A
Dibromofluoromethane (S)	91.1		%	80 - 119			SW846 8260C		12/21/16 15:04	DD	A
Toluene-d8 (S)	95.7		%	89 - 112			SW846 8260C		12/21/16 15:04	DD	A
LIGHT HYDROCARBON GASES											
Ethane	5.4		ug/L	1.0	0.50	0.25	RSK 175		12/16/16 09:04	KJH	C
Ethene	3.3		ug/L	1.5	0.75	0.31	RSK 175		12/16/16 09:04	KJH	C
Methane	146		ug/L	0.50	0.25	0.13	RSK 175		12/16/16 09:04	KJH	C
WET CHEMISTRY											
Alkalinity, Total	319	J-	mg/L	5	5	0.8	S2320B-97		12/15/16 11:08	MSA	H
Chloride	182		mg/L	2.0	0.50	0.16	EPA 300.0		12/15/16 05:57	MBW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		12/15/16 05:57	MBW	G
Sulfate	2.9		mg/L	2.0	0.50	0.20	EPA 300.0		12/15/16 05:57	MBW	G
Total Organic Carbon (TOC)	225		mg/L	50.0	25.0	9.2	S5310B-00		12/19/16 10:23	PAG	E

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

ANALYTICAL RESULTS

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

Lab ID: **2195623006** Date Collected: 12/13/2016 00:00 Matrix: Ground Water

Sample ID: **DUP-1 121316** Date Received: 12/14/2016 09:09

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:16	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:16	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:16	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:16	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:16	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:16	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:16	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:16	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:16	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:16	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:16	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:16	DD	A
Trichloroethene	133		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:16	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:16	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	81 - 118			SW846 8260C		12/21/16 17:16	DD	A
4-Bromofluorobenzene (S)	97.7		%	85 - 114			SW846 8260C		12/21/16 17:16	DD	A
Dibromofluoromethane (S)	96.4		%	80 - 119			SW846 8260C		12/21/16 17:16	DD	A
Toluene-d8 (S)	96.2		%	89 - 112			SW846 8260C		12/21/16 17:16	DD	A
LIGHT HYDROCARBON GASES											
Ethane	1.5		ug/L	1.0	0.50	0.25	RSK 175		12/16/16 07:28	KJH	C
Ethene	1.8		ug/L	1.5	0.75	0.31	RSK 175		12/16/16 07:28	KJH	C
Methane	15.0		ug/L	0.50	0.25	0.13	RSK 175		12/16/16 07:28	KJH	C
WET CHEMISTRY											
Alkalinity, Total	278	J+	mg/L	5	5	0.8	S2320B-97		12/15/16 11:18	MSA	H
Chloride	150		mg/L	2.0	0.50	0.16	EPA 300.0		12/15/16 06:13	MBW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		12/15/16 06:13	MBW	G
Sulfate	2.9		mg/L	2.0	0.50	0.20	EPA 300.0		12/15/16 06:13	MBW	G
Total Organic Carbon (TOC)	131		mg/L	25.0	12.5	4.6	S5310B-00		12/19/16 10:23	PAG	E

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ANALYTICAL RESULTS

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

Lab ID: **2195623007** Date Collected: 12/14/2016 09:09 Matrix: Ground Water

Sample ID: **Trip Blank** Date Received: 12/14/2016 09:09

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 14:20	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 14:20	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 14:20	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 14:20	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 14:20	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 14:20	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 14:20	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 14:20	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 14:20	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 14:20	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 14:20	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 14:20	DD	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 14:20	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 14:20	DD	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	99		%	81 - 118	SW846 8260C		12/21/16 14:20	DD	A
4-Bromofluorobenzene (S)	95.8		%	85 - 114	SW846 8260C		12/21/16 14:20	DD	A
Dibromofluoromethane (S)	90.9		%	80 - 119	SW846 8260C		12/21/16 14:20	DD	A
Toluene-d8 (S)	95.2		%	89 - 112	SW846 8260C		12/21/16 14:20	DD	A

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ANALYTICAL RESULTS

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Lab ID: **2196114001** Date Collected: 12/14/2016 08:35 Matrix: Ground Water

Sample ID: **MW-28 121416** Date Received: 12/15/2016 09:16

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
1,1-Dichloroethane	0.77J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
1,1-Dichloroethene	0.43J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
cis-1,2-Dichloroethene	4.3		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
trans-1,2-Dichloroethene	0.47J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
Tetrachloroethene	44.6		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
1,1,1-Trichloroethane	10.4		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
Trichloroethene	196		ug/L	5.0	3.8	1.7	SW846 8260C		12/28/16 20:38	DD	C
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:37	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	81 - 118			SW846 8260C		12/21/16 17:37	DD	A
1,2-Dichloroethane-d4 (S)	114		%	81 - 118			SW846 8260C		12/28/16 20:38	DD	C
4-Bromofluorobenzene (S)	104		%	85 - 114			SW846 8260C		12/28/16 20:38	DD	C
4-Bromofluorobenzene (S)	95.3		%	85 - 114			SW846 8260C		12/21/16 17:37	DD	A
Dibromofluoromethane (S)	97.5		%	80 - 119			SW846 8260C		12/21/16 17:37	DD	A
Dibromofluoromethane (S)	93		%	80 - 119			SW846 8260C		12/28/16 20:38	DD	C
Toluene-d8 (S)	95.2		%	89 - 112			SW846 8260C		12/21/16 17:37	DD	A
Toluene-d8 (S)	103		%	89 - 112			SW846 8260C		12/28/16 20:38	DD	C
LIGHT HYDROCARBON GASES											
Ethane	3.6		ug/L	1.0	0.50	0.25	RSK 175		12/16/16 09:21	KJH	C
Ethene	1.3J	J	ug/L	1.5	0.75	0.31	RSK 175		12/16/16 09:21	KJH	C
Methane	3.0		ug/L	0.50	0.25	0.13	RSK 175		12/16/16 09:21	KJH	C
WET CHEMISTRY											
Alkalinity, Total	316	J-	mg/L	5	5	0.8	S2320B-97		12/16/16 06:09	MSA	H
Chloride	32.4		mg/L	2.0	0.50	0.16	EPA 300.0		12/16/16 05:16	MBW	G
Nitrate-N	0.060J	J	mg/L	0.20	0.060	0.020	EPA 300.0		12/16/16 05:16	MBW	G
Sulfate	20.9		mg/L	2.0	0.50	0.20	EPA 300.0		12/16/16 05:16	MBW	G
Total Organic Carbon (TOC)	2.3		mg/L	1.0	0.50	0.18	S5310B-00		12/19/16 10:23	PAG	E

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ANALYTICAL RESULTS

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Lab ID: **2196114001** Date Collected: 12/14/2016 08:35 Matrix: Ground Water

Sample ID: **MW-28 121416** Date Received: 12/15/2016 09:16

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

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ANALYTICAL RESULTS

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Lab ID: **2196114002** Date Collected: 12/14/2016 10:05 Matrix: Ground Water

Sample ID: **MW-15 121416** Date Received: 12/15/2016 09:16

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
1,1-Dichloroethene	0.44J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
Tetrachloroethene	1.7		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
1,1,1-Trichloroethane	4.4		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
Trichloroethene	183		ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/21/16 17:59	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118			SW846 8260C		12/21/16 17:59	DD	A
4-Bromofluorobenzene (S)	98.4		%	85 - 114			SW846 8260C		12/21/16 17:59	DD	A
Dibromofluoromethane (S)	97.1		%	80 - 119			SW846 8260C		12/21/16 17:59	DD	A
Toluene-d8 (S)	95.3		%	89 - 112			SW846 8260C		12/21/16 17:59	DD	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		12/16/16 09:37	KJH	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		12/16/16 09:37	KJH	C
Methane 0.50U	~~0.21J~~	~~J~~	ug/L	0.50	0.25	0.13	RSK 175		12/16/16 09:37	KJH	C
WET CHEMISTRY											
Alkalinity, Total	212	~~J~~	mg/L	5	5	0.8	S2320B-97		12/16/16 06:24	MSA	H
Chloride	14.3		mg/L	2.0	0.50	0.16	EPA 300.0		12/16/16 05:32	MBW	G
Nitrate-N	0.56		mg/L	0.20	0.060	0.020	EPA 300.0		12/16/16 05:32	MBW	G
Sulfate	12.4		mg/L	2.0	0.50	0.20	EPA 300.0		12/16/16 05:32	MBW	G
Total Organic Carbon (TOC)	0.57J	J	mg/L	1.0	0.50	0.18	S5310B-00		12/19/16 10:23	PAG	E

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ANALYTICAL RESULTS

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Lab ID: **2196114003** Date Collected: 12/14/2016 11:20 Matrix: Ground Water

Sample ID: **MW-29 121416** Date Received: 12/15/2016 09:16

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C		12/28/16 21:01	DD	A
1,1-Dichloroethane	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C		12/28/16 21:01	DD	A
1,2-Dichloroethane	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C		12/28/16 21:01	DD	A
1,1-Dichloroethene	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C		12/28/16 21:01	DD	A
cis-1,2-Dichloroethene	6.1	J+	ug/L	5.0	3.8	1.7	SW846 8260C		12/28/16 21:01	DD	A
trans-1,2-Dichloroethene	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C		12/28/16 21:01	DD	A
1,1,1,2-Tetrachloroethane	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C		12/28/16 21:01	DD	A
1,1,2,2-Tetrachloroethane	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C		12/28/16 21:01	DD	A
Tetrachloroethene	30.8	J+	ug/L	5.0	3.8	1.7	SW846 8260C		12/28/16 21:01	DD	A
Toluene	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C		12/28/16 21:01	DD	A
1,1,1-Trichloroethane	14.0	J+	ug/L	5.0	3.8	1.7	SW846 8260C		12/28/16 21:01	DD	A
1,1,2-Trichloroethane	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C		12/28/16 21:01	DD	A
Trichloroethene	209	J+	ug/L	5.0	3.8	1.7	SW846 8260C		12/28/16 21:01	DD	A
Vinyl Chloride	3.8U	U	ug/L	5.0	3.8	1.7	SW846 8260C		12/28/16 21:01	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	111		%	81 - 118			SW846 8260C		12/28/16 21:01	DD	A
4-Bromofluorobenzene (S)	108		%	85 - 114			SW846 8260C		12/28/16 21:01	DD	A
Dibromofluoromethane (S)	151	~~J+~~	%	80 - 119			SW846 8260C		12/28/16 21:01	DD	A
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C		12/28/16 21:01	DD	A
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		12/16/16 09:52	KJH	C
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		12/16/16 09:52	KJH	C
Methane	0.62		ug/L	0.50	0.25	0.13	RSK 175		12/16/16 09:52	KJH	C
WET CHEMISTRY											
Alkalinity, Total	301	~~J+~~	mg/L	5	5	0.8	S2320B-97		12/16/16 06:35	MSA	H
Chloride	28.4		mg/L	2.0	0.50	0.16	EPA 300.0		12/16/16 05:47	MBW	G
Nitrate-N	0.26		mg/L	0.20	0.060	0.020	EPA 300.0		12/16/16 05:47	MBW	G
Sulfate	24.9		mg/L	2.0	0.50	0.20	EPA 300.0		12/16/16 05:47	MBW	G
Total Organic Carbon (TOC)	1.4		mg/L	1.0	0.50	0.18	S5310B-00		12/19/16 10:23	PAG	E

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ANALYTICAL RESULTS

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Lab ID: **2196114004** Date Collected: 12/14/2016 13:32 Matrix: Ground Water

Sample ID: **MW-31 121416** Date Received: 12/15/2016 09:16

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:22	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:22	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:22	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:22	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:22	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:22	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:22	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:22	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:22	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:22	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:22	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:22	DD	A
Trichloroethene	38.2		ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:22	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:22	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	112		%	81 - 118			SW846 8260C		12/28/16 21:22	DD	A
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C		12/28/16 21:22	DD	A
Dibromofluoromethane (S)	90.6		%	80 - 119			SW846 8260C		12/28/16 21:22	DD	A
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C		12/28/16 21:22	DD	A
LIGHT HYDROCARBON GASES											
Ethane	1.5		ug/L	1.0	0.50	0.25	RSK 175		12/16/16 10:25	KJH	C
Ethene	0.84J	J	ug/L	1.5	0.75	0.31	RSK 175		12/16/16 10:25	KJH	C
Methane	3.5		ug/L	0.50	0.25	0.13	RSK 175		12/16/16 10:25	KJH	C
WET CHEMISTRY											
Alkalinity, Total	222	~~J~~	mg/L	5	5	0.8	S2320B-97		12/16/16 06:45	MSA	H
Chloride	56.6		mg/L	2.0	0.50	0.16	EPA 300.0		12/16/16 06:03	MBW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		12/16/16 06:03	MBW	G
Sulfate	10.9		mg/L	2.0	0.50	0.20	EPA 300.0		12/16/16 06:03	MBW	G
Total Organic Carbon (TOC)	43.9		mg/L	10.0	5.0	1.8	S5310B-00		12/21/16 11:30	PAG	E

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ANALYTICAL RESULTS

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Lab ID: **2196114005** Date Collected: 12/14/2016 14:55 Matrix: Ground Water

Sample ID: **MW-33 121416** Date Received: 12/15/2016 09:16

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:44	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:44	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:44	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:44	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:44	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:44	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:44	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:44	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:44	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:44	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:44	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:44	DD	A
Trichloroethene	93.5		ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:44	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 21:44	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	115		%	81 - 118			SW846 8260C		12/28/16 21:44	DD	A
4-Bromofluorobenzene (S)	108		%	85 - 114			SW846 8260C		12/28/16 21:44	DD	A
Dibromofluoromethane (S)	95.7		%	80 - 119			SW846 8260C		12/28/16 21:44	DD	A
Toluene-d8 (S)	104		%	89 - 112			SW846 8260C		12/28/16 21:44	DD	A
LIGHT HYDROCARBON GASES											
Ethane	0.25J	J	ug/L	1.0	0.50	0.25	RSK 175		12/16/16 10:41	KJH	C
Ethene	0.48J	J	ug/L	1.5	0.75	0.31	RSK 175		12/16/16 10:41	KJH	C
Methane	3.4		ug/L	0.50	0.25	0.13	RSK 175		12/16/16 10:41	KJH	C
WET CHEMISTRY											
Alkalinity, Total	218	H	mg/L	5	5	0.8	S2320B-97		12/16/16 06:55	MSA	H
Chloride	43.2		mg/L	2.0	0.50	0.16	EPA 300.0		12/16/16 06:18	MBW	G
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		12/16/16 06:18	MBW	G
Sulfate	8.2		mg/L	2.0	0.50	0.20	EPA 300.0		12/16/16 06:18	MBW	G
Total Organic Carbon (TOC)	30.9		mg/L	10.0	5.0	1.8	S5310B-00		12/21/16 11:30	PAG	E

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ANALYTICAL RESULTS

Workorder: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Lab ID: **2196114006** Date Collected: 12/15/2016 09:16 Matrix: Ground Water

Sample ID: **Trip Blank** Date Received: 12/15/2016 09:16

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 20:16	DD	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 20:16	DD	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 20:16	DD	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 20:16	DD	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 20:16	DD	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 20:16	DD	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 20:16	DD	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 20:16	DD	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 20:16	DD	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 20:16	DD	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 20:16	DD	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 20:16	DD	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 20:16	DD	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 20:16	DD	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	113		%	81 - 118	SW846 8260C		12/28/16 20:16	DD	A
4-Bromofluorobenzene (S)	107		%	85 - 114	SW846 8260C		12/28/16 20:16	DD	A
Dibromofluoromethane (S)	92		%	80 - 119	SW846 8260C		12/28/16 20:16	DD	A
Toluene-d8 (S)	103		%	89 - 112	SW846 8260C		12/28/16 20:16	DD	A

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ANALYTICAL RESULTS

Workorder: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

Lab ID: **2196473001** Date Collected: 12/15/2016 07:55 Matrix: Ground Water

Sample ID: **EB-1 121516** Date Received: 12/16/2016 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:33	DD	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:33	DD	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:33	DD	B
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:33	DD	B
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:33	DD	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:33	DD	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:33	DD	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:33	DD	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:33	DD	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:33	DD	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:33	DD	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:33	DD	B
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:33	DD	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:33	DD	B

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	110		%	81 - 118	SW846 8260C		12/28/16 19:33	DD	B
4-Bromofluorobenzene (S)	106		%	85 - 114	SW846 8260C		12/28/16 19:33	DD	B
Dibromofluoromethane (S)	90.3		%	80 - 119	SW846 8260C		12/28/16 19:33	DD	B
Toluene-d8 (S)	104		%	89 - 112	SW846 8260C		12/28/16 19:33	DD	B

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ANALYTICAL RESULTS

Workorder: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

Lab ID: **2196473002** Date Collected: 12/15/2016 09:07 Matrix: Ground Water

Sample ID: **MW-35 121516** Date Received: 12/16/2016 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
Trichloroethene	31.8		ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:28	DD	H
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	113		%	81 - 118			SW846 8260C		12/28/16 22:28	DD	H
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C		12/28/16 22:28	DD	H
Dibromofluoromethane (S)	93		%	80 - 119			SW846 8260C		12/28/16 22:28	DD	H
Toluene-d8 (S)	102		%	89 - 112			SW846 8260C		12/28/16 22:28	DD	H
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		12/20/16 09:09	KJH	A
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		12/20/16 09:09	KJH	A
Methane	0.90		ug/L	0.50	0.25	0.13	RSK 175		12/20/16 09:09	KJH	A
WET CHEMISTRY											
Alkalinity, Total	223	J+	mg/L	5	5	0.8	S2320B-97		12/17/16 01:42	MSA	F
Chloride	53.9		mg/L	2.0	0.50	0.16	EPA 300.0		12/17/16 06:10	MBW	E
Nitrate-N	0.040J	J	mg/L	0.20	0.060	0.020	EPA 300.0		12/17/16 06:10	MBW	E
Sulfate	7.2		mg/L	2.0	0.50	0.20	EPA 300.0		12/17/16 06:10	MBW	E
Total Organic Carbon (TOC)	18.3		mg/L	5.0	2.5	0.92	S5310B-00		12/21/16 11:30	PAG	C

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

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: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

Lab ID: **2196473003** Date Collected: 12/15/2016 00:00 Matrix: Ground Water

Sample ID: **DUP-2 121516** Date Received: 12/16/2016 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:06	DD	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:06	DD	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:06	DD	B
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:06	DD	B
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:06	DD	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:06	DD	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:06	DD	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:06	DD	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:06	DD	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:06	DD	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:06	DD	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:06	DD	B
Trichloroethene	30.3	J+	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:06	DD	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 22:06	DD	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	81 - 118			SW846 8260C		12/28/16 22:06	DD	B
4-Bromofluorobenzene (S)	105		%	85 - 114			SW846 8260C		12/28/16 22:06	DD	B
Dibromofluoromethane (S)	90.7		%	80 - 119			SW846 8260C		12/28/16 22:06	DD	B
Toluene-d8 (S)	174	~~2~~	%	89 - 112			SW846 8260C		12/28/16 22:06	DD	B
LIGHT HYDROCARBON GASES											
Ethane	0.50U	U	ug/L	1.0	0.50	0.25	RSK 175		12/20/16 08:53	KJH	A
Ethene	0.75U	U	ug/L	1.5	0.75	0.31	RSK 175		12/20/16 08:53	KJH	A
Methane	1.3		ug/L	0.50	0.25	0.13	RSK 175		12/20/16 08:53	KJH	A
WET CHEMISTRY											
Alkalinity, Total	226	~~1~~	mg/L	5	5	0.8	S2320B-97		12/17/16 01:54	MSA	F
Chloride	53.2		mg/L	2.0	0.50	0.16	EPA 300.0		12/17/16 06:26	MBW	E
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		12/17/16 06:26	MBW	E
Sulfate	6.5		mg/L	2.0	0.50	0.20	EPA 300.0		12/17/16 06:26	MBW	E
Total Organic Carbon (TOC)	18.6		mg/L	5.0	2.5	0.92	S5310B-00		12/21/16 11:30	PAG	C

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: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

Lab ID: **2196473004** Date Collected: 12/16/2016 09:26 Matrix: Ground Water

Sample ID: **Trip Blank** Date Received: 12/16/2016 09:26

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/28/16 19:54	DD	I

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	109		%	81 - 118	SW846 8260C		12/28/16 19:54	DD	I
4-Bromofluorobenzene (S)	106		%	85 - 114	SW846 8260C		12/28/16 19:54	DD	I
Dibromofluoromethane (S)	90.5		%	80 - 119	SW846 8260C		12/28/16 19:54	DD	I
Toluene-d8 (S)	103		%	89 - 112	SW846 8260C		12/28/16 19:54	DD	I

Vicki Forney

Mrs. Vicki A. Forney
Project Coordinator

Appendix C

Support Documentation

eurofins | Spectrum Analytical

CHAIN OF CUSTODY RECORD

Page 1 of 1

2195241

Standard TAT
Rush TAT -

All TATs subject to laboratory approval
Min. 24-hr notification needed for rushes
Samples disposed after 60 days unless otherwise instructed.

Report To: AECOM / John Santacroce
40 British American Blvd
Latham NY 12110

Telephone #:
Project Mgr: John Santacroce

Invoice To: John Santacroce

P.O No.: Quote #:

Project No: 60490691.11
Site Name: Scotia Navy Depot
Location: Scotia State: NY
Sampler(s): C. French, R. McCredy, C. Taylor

F=Field Filtered 1=$Na_2S_2O_3$ 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid
7=CH3OH 8=$NaHSO_4$ 9=Deionized Water 10=H_3PO_4 11= 12=

DW=Dinking Water GW=Groundwater SW=Surface Water WW=Waste Water
O=Oil SO=Soil SL=Sludge A=Indoor/Ambient Air SG=Soil Gas
X1= X2= X3=

G= Grab C=Compsite

Lab ID:	Sample ID:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analysis: 8260C	TOC	RSK 175	Cl, SO4, NO3	Alkalinity	Check if chlorinated
	MW-16 121216	12/12/16	1423	G	GW	6			2	X	X	X	X	X	☐
	Trip Blank	12/12/16	—	-	-	2				X					

List Preservative Code below: 2 2 2 / /

QA/QC Reporting Notes:
* additional charges may appply
MA DEP MCP CAM Report? ☐ Yes ☐ No
CT DPH RCP Report? ☐ Yes ☐ No
☐ Standard ☐ No QC ☐ DQA*
☐ ASP A* ☐ ASP B*
☐ NJ Reduced* ☐ NJ Full*
☐ Tier II* ☐ Tier IV*
☒ Other: Br QAPP
State-specific reporting standards:

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

Cooler Temp: 2 °C
Cooler #:
Therm ID: TH-36
Ship Carrier: FedEx UPS DHL
Tracking #: 1Z 70 8309 9360

Relinquished by:	Received by:	Date:	Time:	Temp °C
Chris French	Brian McGuirk	12/12/16	1530	Observed
Brian McGuirk		12/12/16	4:10PM	Correction Factor
FedEx		12/13/16	0921	Corrected
				IR ID #

☐ EDD format: PER QAPP
☒ E-mail to: John.Santacroce@aecom.com

Condition upon receipt: Custody Seals: ☐ Present ☐ Intact ☐ Broken
☐ Ambient ☐ Iced ☐ Refrigerated ☐ DI VOA Frozen ☐ Soil Jar Frozen

Sample shipping address: 11 Almgren Drive • Agawam, MA 01001 • 413-789-9018 • www.EurofinsUS.com/Spectrum

Rev. Sep 2015

ALS Environmental

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

SAMPLE SUMMARY

Workorder: 2195241 ASN013|Scotia Navy 60490641.11

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2195241001	MW-16 121216	Ground Water	12/12/2016 14:23	12/13/2016 09:21	Collected by Client
2195241002	Trip Blank	Ground Water	12/13/2016 09:21	12/13/2016 09:21	Collected by Client

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

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2195241001	1	MW-16 121216	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 40 and the upper control limit is 20.				
2195241001	2	MW-16 121216	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

Sample Receipt

Samples arrived at ALS via courier on December 13, 2016. Upon receipt, the samples were inspected and compared to the Chain of Custody. Sample temperature was documented on the enclosed Chain of Custody. Samples were received intact and properly preserved, unless noted on the enclosed Certificate of Analysis and/or Chain of Custody.

Manual Integrations

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

Volatile Organics by SW-846 Method 8260

Sample Handling. Two (2) water samples were analyzed by SW-846 Method 8260 for volatile organic compounds. All analyses were performed within the holding time.

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

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 sample.

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 0.20J µg/L.

Duplicate Samples. A duplicate sample, identified as 2456159, was prepared from project sample MW-16 121216 (2195241001). Target analytes were detected as follows:

- Methane was detected at 0.14J µg/L in the sample and at 0.21J µg/L in the duplicate sample with a %RPD of 40%.

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 ½ the reporting limit in the blanks.

Calibration. The autotitrator was pH calibrated on the day of analysis. Total alkalinity and pH standards were analyzed initially and throughout the analysis. The standards were recovered within the alkalinity QC limits.

Anions by EPA 300.0

Sample handling. One (1) aqueous sample was analyzed for chloride, nitrate-N, 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. Initial and continuing 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 2454431 and SSL, were analyzed initially and every 20 samples. Recoveries were within the QC limits.

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.

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)

PAGE ___

* 2 1 9 5 6 2 3 *

Project Name: Seneca Army Depot
Project Number: 60440641
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: [signature]
Sampler's Printed Name: Chris French

ANALYSIS REQUESTED (Include Method Number and Container Preservative)

Preservative: 1 | 1 | 1 | 0 | 0

Analyses: 8260C; RSK 175; TOC; Alkalinity; Cl, SO4, NO3; METALS, TOTAL (List in comments below); METALS, DISSOLVED (List in comments below)

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	REMARKS/ ALTERNATE DESCRIPTION
MW-34 121316		12/13/16	0849	GW	24	X	X	X	X	X	Extra volume collected for MS/MSD
MW-26 121316		12/13/16	1054	↓	8	↓	↓	↓	↓	↓	
MW-32 121316		↓	1150	↓	↓	↓	↓	↓	↓	↓	
MW-24 121316		↓	1415	↓	↓	↓	↓	↓	↓	↓	
MW-50 121316		↓	1511	↓	↓	↓	↓	↓	↓	↓	
Dup-1 121316		↓	–	↓	↓	↓	↓	↓	↓	↓	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
7. $NaHSO_4$
8. Other ___

Lab sticker: Custody Seals Present? (if present) Seals Intact? Received on ice? COC/Labs Complete? Cont in Good Cond? Correct Containers? Correct Samp Vol? Correct Preservation? Headspace/Volatiles? Lab Cooler Temp; Cooler #; Therm ID 11-318; Ship Carrier: FedEx UPS DHL; Tracking #: 6420 8309 93828

SPECIAL INSTRUCTIONS/COMMENTS
Metals

See QAPP ☒

AT 12/14/16

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 #: 60440641.11
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	[signature]	[signature]	[signature]	[signature]		
Printed Name	Chris French	Brian McGuirk	Brian McGuirk			
Firm	AECOM	ALS	ALS			
Date/Time	12/13/16 1530	12/13/16 1530	12/13/16 1700	12-14-16 0909		

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

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

SAMPLE SUMMARY

Workorder: 2195623 ASN014|Scotia Navy Depot 60440

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2195623001	MW-34 121316	Ground Water	12/13/2016 08:49	12/14/2016 09:09	Collected by Client
2195623002	MW-26 121316	Ground Water	12/13/2016 10:54	12/14/2016 09:09	Collected by Client
2195623003	MW-32 121316	Ground Water	12/13/2016 11:50	12/14/2016 09:09	Collected by Client
2195623004	MW-24 121316	Ground Water	12/13/2016 14:15	12/14/2016 09:09	Collected by Client
2195623005	MW-30 121316	Ground Water	12/13/2016 15:11	12/14/2016 09:09	Collected by Client
2195623006	DUP-1 121316	Ground Water	12/13/2016 00:00	12/14/2016 09:09	Collected by Client
2195623007	Trip Blank	Ground Water	12/14/2016 09:09	12/14/2016 09:09	Collected by Client

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

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2195623001	1	MW-34 121316	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2195623002	1	MW-26 121316	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2195623003	1	MW-32 121316	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2195623004	1	MW-24 121316	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2195623005	1	MW-30 121316	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2195623006	1	DUP-1 121316	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

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)

* 2 1 9 6 1 1 4 *

Project Name: Scotia Navy Depot	Project Number: 6044 0641
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: [signature]	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	8260 C (Pres. 2)	RSK 175 (Pres. 1)	TOC (Pres. 1)	Alkalinity (Pres. 0)	Cl, SO4, NO3 (Pres. 0)	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)
MW-28 121416		12/14/16	0835	GW	8	X	X	X	X	X		
MW-15 121416		↓	1005	↓	↓	↓	↓	↓	↓	↓		
MW-29 121416		↓	1120	↓	↓	↓	↓	↓	↓	↓		
MW-31 121416		↓	1332	↓	↓	↓	↓	↓	↓	↓		
MW-33 121416		↓	1455	↓	↓	↓	↓	↓	↓	↓		
Trip Blank		–	–	AQ	2	↓						

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

Cooler Temp °C: 3 | Cooler #: | Therm ID: 332 | Ship Carrier: FedEx (circled) / UPS / DHL

Initials: [initials]

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

Tracking #: 6420 8309 9408

SPECIAL INSTRUCTIONS/COMMENTS
Metals

△ 12/15/14 1737

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 #: 60440641.11
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	[signature]	Brian McGuirk	Brian McGuirk	[signature]		
Printed Name	Chris French	Brian McGuirk	Brian McGuirk	Jessica Smith		
Firm	AECOM	ALS	ALS	ALS		
Date/Time	12/14/16 1525	12/14/16 1525	12/14/16 1700	12/15/16 0916		

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: 2196114 ASN015|2015-SCOTIA NAVY-PO6044

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2196114001	MW-28 121416	Ground Water	12/14/2016 08:35	12/15/2016 09:16	Collected by Client
2196114002	MW-15 121416	Ground Water	12/14/2016 10:05	12/15/2016 09:16	Collected by Client
2196114003	MW-29 121416	Ground Water	12/14/2016 11:20	12/15/2016 09:16	Collected by Client
2196114004	MW-31 121416	Ground Water	12/14/2016 13:32	12/15/2016 09:16	Collected by Client
2196114005	MW-33 121416	Ground Water	12/14/2016 14:55	12/15/2016 09:16	Collected by Client
2196114006	Trip Blank	Ground Water	12/15/2016 09:16	12/15/2016 09:16	Collected by Client

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2196114001	1	MW-28 121416	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2196114002	1	MW-15 121416	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2196114003	2	MW-29 121416	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2196114003	3	MW-29 121416	SW846 8260C	Dibromofluoromethane
The surrogate Dibromofluoromethane for method SW846 8260C was outside of control limits. The % Recovery was reported as 151 and the control limits were 80 to 119. This result was reported at a dilution of 5.				
2196114004	1	MW-31 121416	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2196114005	1	MW-33 121416	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

ALS Environmental

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

33468

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

* 2 1 9 6 4 7 3 *

Project Name: Scotia Navy Depot	Project Number: 60440641
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 G

PRESERVATIVE: 1 1 1 0 0

NUMBER OF CONTAINERS

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	8260C	RSK175	TOC	Alkalinity	Cl, SO4, NO3	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	REMARKS/ ALTERNATE DESCRIPTION
EB-1 121516		12/15/16	0755	GW (AQ)	3	X							Equipment Blank
MW-25 121516		↓	0907	GW	8	X	X	X	X	X			
Dup-2 121516		↓	—	GW	8	X	X	X	X	X			Duplicate Sample
Trip Blank		—	—	AQ	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 ____

Chris French

	Y	N	Initials	Cooler Temp
Custody Seals Present?	✓			2 °C
(if present) Seals Intact?	✓			Cooler #:
Received on Ice?	✓			
COC/Labs Complete	✓			Therm ID: TT-352
Cont in Good Cond?	✓			
Correct Containers?	✓			Ship Carrier:
Correct Samp Vol?	✓			FedEx UPS
Correct Preservation?	✓			DHL ____
Headspace/Volatiles?				

Tracking # 6470 8309 9419

SPECIAL INSTRUCTIONS/CO
Metals

See QAPP ☒

TURNAROUND REQUIREMENTS
____ RUSH (SURCHARGES APPLY)
Standard
____ 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 # 60440641.11
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:	Signature:	Signature:	Signature:	Signature:
Printed Name: Curtis Taylor	Printed Name: DINA AVERS	Printed Name: DINA AVERS	Printed Name:	Printed Name:	Printed Name:
Firm: AECOM	Firm: ALS	Firm: ALS	Firm:	Firm:	Firm:
Date/Time: 12/15/16 1320	Date/Time: 12/15/16 1320	Date/Time: 12/15/16 1600	Date/Time: 12-16-16 0926	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: 2196473 ASN016|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2196473001	EB-1 121516	Ground Water	12/15/2016 07:55	12/16/2016 09:26	Collected by Client
2196473002	MW-35 121516	Ground Water	12/15/2016 09:07	12/16/2016 09:26	Collected by Client
2196473003	DUP-2 121516	Ground Water	12/15/2016 00:00	12/16/2016 09:26	Collected by Client
2196473004	Trip Blank	Ground Water	12/16/2016 09:26	12/16/2016 09:26	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
2196473002	1	MW-35 121516	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2196473003	1	DUP-2 121516	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2196473003	2	DUP-2 121516	SW846 8260C	Toluene-d8
The surrogate Toluene-d8 for method SW846 8260C was outside of control limits. The % Recovery was reported as 174 and the control limits were 89 to 112. This result was reported at a dilution of 1.				

ALS Environmental Services

RECOVERY REPORT

Client Name:
Sample Matrix: LIQUID
Lab Smp Id: 1801 ICV.
Level: LOW
Data Type: MS DATA
SpikeList File: DODENDCCV.spk
Sublist File: DODall.sub
Method File: \\ALMDTWS014\TargetData\Chem2\ms03.i\03_2016\3161228.b\3-8260b0
Misc Info:

Client SDG: 3161228.b
Fraction: VOA
Operator: DD
SampleType: LCS
Quant Type: ISTD

SPIKE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
1 Dichlorodifluorome	50.0000	49.1772	98.35	50-150
2 Chloromethane	50.0000	50.8327	101.67	50-150
3 Vinyl Chloride	50.0000	52.0958	104.19	50-150
4 Bromomethane	50.0000	43.0051	86.01	50-150
5 Chloroethane	50.0000	52.2534	104.51	50-150
6 Pentane	50.0000	90.1847	180.37*	50-150
7 Trichlorofluoromet	50.0000	47.8618	95.72	50-150
8 Dichlorofluorometh	50.0000	56.3707	112.74	50-150
9 Ethyl Ether	50.0000	55.6289	111.26	50-150
10 1,1-Dichloroethene	50.0000	84.2012	168.40*	50-150
11 Freon 113	50.0000	84.5793	169.16*	50-150
12 Carbon Disulfide	50.0000	78.7280	157.46*	50-150
13 Iodomethane	50.0000	65.5824	131.16	50-150
14 Acrolein	500.000	583.171	116.63	50-150
15 Isopropyl Alcohol	250.000	326.928	130.77	50-150
16 3-Chloro-1-propene	50.0000	58.1070	116.21	50-150
17 Methylene Chloride	50.0000	56.0647	112.13	50-150
18 Acetone	250.000	303.206	121.28	50-150
19 Methyl acetate	50.0000	59.5011	119.00	50-150
20 trans-1,2-Dichloro	50.0000	59.4159	118.83	50-150
21 Hexane	50.0000	68.0806	136.16	50-150
22 Methyl t-Butyl Eth	50.0000	57.8853	115.77	50-150
23 tert.- Butyl Alcoh	250.000	303.059	121.22	50-150
24 Acetonitrile	250.000	266.174	106.47	50-150
25 Diisopropyl ether	50.0000	58.4675	116.94	50-150
26 Chloroprene	50.0000	59.4814	118.96	50-150
27 1,1-Dichloroethane	50.0000	54.9015	109.80	50-150
28 Acrylonitrile	250.000	290.097	116.04	50-150
30 n-Propanol	500.000	543.634	108.73	50-150
29 Ethyl tert-butyl e	50.0000	51.0522	102.10	50-150
31 Vinyl acetate	50.0000	48.7817	97.56	50-150
32 cis-1,2-Dichloroet	50.0000	54.3508	108.70	50-150
33 2,2-Dichloropropan	50.0000	45.6802	91.36	50-150
34 Bromochloromethane	50.0000	51.4525	102.91	50-150
35 Cyclohexane	50.0000	63.3210	126.64	50-150
36 Chloroform	50.0000	56.4999	113.00	50-150
37 Ethyl acetate	50.0000	59.4575	118.92	50-150
38 Methyl acrylate	50.0000	59.7566	119.51	50-150
39 Carbon Tetrachlori	50.0000	58.3601	116.72	50-150
40 Tetrahydrofuran	250.000	279.610	111.84	50-150

SPIKE	COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
42	1,1,1-Trichloroeth	50.0000	56.1119	112.22	50-150
43	2-Butanone	250.000	286.050	114.42	50-150
44	1,1-Dichloropropen	50.0000	57.8011	115.60	50-150
45	1-Chlorobutane	50.0000	58.4318	116.86	50-150
46	Heptane	50.0000	63.9507	127.90	50-150
47	Benzene	50.0000	54.8958	109.79	50-150
48	Propionitrile	250.000	290.982	116.39	50-150
49	Methacrylonitrile	50.0000	57.3964	114.79	50-150
50	tert-amyl methyl E	50.0000	50.1015	100.20	50-150
54	Isobutyl alcohol	500.000	494.994	99.00	50-150
52	1,2-Dichloroethane	50.0000	52.7758	105.55	50-150
53	tert-Amyl Alcohol	250.000	225.037	90.01	50-150
56	Diisobutylene	50.0000	63.2712	126.54	50-150
57	Trichloroethene	50.0000	56.9535	113.91	50-150
58	Methyl cyclohexane	50.0000	62.2290	124.46	50-150
59	tert-Amyl Ethyleth	50.0000	49.0589	98.12	50-150
60	Dibromomethane	50.0000	51.6197	103.24	50-150
61	1,2-Dichloropropan	50.0000	56.9382	113.88	50-150
62	Bromodichlorometha	50.0000	57.0242	114.05	50-150
63	Methyl methacrylat	50.0000	51.5770	103.15	50-150
64	1,4-Dioxane	1250.00	1671.08	133.69	50-150
65	2-Chloroethylvinyl	50.0000	46.6201	93.24	50-150
66	cis-1,3-Dichloropr	50.0000	48.9384	97.88	50-150
67	Octane	50.0000	41.7738	83.55	50-150
69	Toluene	50.0000	58.0550	116.11	50-150
70	Chloroacetonitrile	250.000	250.603	100.24	50-150
71	2-Nitropropane	250.000	247.242	98.90	50-150
72	1,1-Dichloro-2-pro	250.000	240.908	96.36	50-150
73	4-Methyl-2-Pentano	250.000	278.358	111.34	50-150
74	Tetrachloroethene	50.0000	53.2641	106.53	50-150
75	trans-1,3-Dichloro	50.0000	48.9697	97.94	50-150
76	Ethyl methacrylate	50.0000	50.3196	100.64	50-150
77	1,1,2-Trichloroeth	50.0000	53.7827	107.57	50-150
78	Chlorodibromometha	50.0000	46.6139	93.23	50-150
80	1,2-Dibromoethane	50.0000	55.0186	110.04	50-150
81	2-Hexanone	250.000	271.344	108.54	50-150
82	1-Chlorohexane	50.0000	53.4417	106.88	50-150
79	1,3-Dichloropropan	50.0000	53.7116	107.42	50-150
84	Chlorobenzene	50.0000	52.5580	105.12	50-150
85	Ethylbenzene	50.0000	58.3873	116.77	50-150
86	1,1,1,2-Tetrachlor	50.0000	55.9982	112.00	50-150
87	mp-Xylene	100.000	119.337	119.34	50-150
88	o-Xylene	50.0000	53.3510	106.70	50-150
89	Styrene	50.0000	56.6260	113.25	50-150
90	Bromoform	50.0000	42.1541	84.31	50-150
91	Isopropylbenzene	50.0000	60.0949	120.19	50-150
93	Bromobenzene	50.0000	57.1384	114.28	50-150
94	n-Propylbenzene	50.0000	59.5712	119.14	50-150
95	1,1,2,2-Tetrachlor	50.0000	56.4020	112.80	50-150
96	o-Chlorotoluene	50.0000	62.3929	124.79	50-150
M 100	1,2-Dichloroethene	100.000	113.767	113.77	50-150
97	1,3,5-Trimethylben	50.0000	61.2703	122.54	50-150
98	1,2,3-Trichloropro	50.0000	52.1488	104.30	50-150
99	trans-1,4-Dichloro	50.0000	37.0273	74.05	50-150

SPIKE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
101 p-Chlorotoluene	50.0000	61.5598	123.12	50-150
102 tert-Butylbenzene	50.0000	59.0998	118.20	50-150
103 Pentachloroethane	50.0000	57.6449	115.29	50-150
104 1,2,4-Trimethylben	50.0000	60.1270	120.25	50-150
105 sec-Butylbenzene	50.0000	61.4122	122.82	50-150
106 p-Isopropyltoluene	50.0000	58.3729	116.75	50-150
107 1,3-Dichlorobenzen	50.0000	56.2353	112.47	50-150
109 1,4-Dichlorobenzen	50.0000	53.7289	107.46	50-150
110 Benzyl Chloride	50.0000	30.6269	61.25	50-150
111 n-Butylbenzene	50.0000	55.4096	110.82	50-150
112 Hexachloroethane	50.0000	58.1471	116.29	50-150
113 1,2-Dichlorobenzen	50.0000	56.2892	112.58	50-150
114 1,2-Dibromo-3-chlo	50.0000	47.6395	95.28	50-150
115 Nitrobenzene	500.000	221.535	44.31*	50-150
116 Hexachlorobutadien	50.0000	41.8963	83.79	50-150
117 1,2,4-Trichloroben	50.0000	49.1052	98.21	50-150
118 Naphthalene	50.0000	49.9160	99.83	50-150
M 120 1,3-Dichloropropen	100.000	97.9081	97.91	50-150
119 1,2,3-Trichloroben	50.0000	51.4294	102.86	50-150
M 121 TOTAL XYLENES	150.000	172.688	115.13	50-150

SURROGATE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
$ 41 Dibromofluorometha	50.0000	50.7566	101.51	80-119
$ 51 1,2-Dichloroethane	50.0000	53.5892	107.18	81-118
$ 68 Toluene-d8	50.0000	54.2211	108.44	89-112
$ 92 4-Bromofluorobenze	50.0000	53.0499	106.10	85-114

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: ASN-015

Laboratory Control Spike - Sample No: 2461660

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
Carbon Tetrachloride	20		23.2	116	(72-136)
1,1-Dichloroethane	20		21.9	109	(77-125)
1,2-Dichloroethane	20		21.5	107	(73-128)
1,1-Dichloroethene	20		26.5	133*	(71-131)
cis-1,2-Dichloroethene	20		21.4	107	(78-123)
trans-1,2-Dichloroethen	20		24.5	122	(75-124)
1,1,1,2-Tetrachloroetha	20		22.7	114	(78-124)
1,1,2,2-Tetrachloroetha	20		21.7	108	(71-121)
Tetrachloroethene	20		22.4	112	(74-129)
Toluene	20		23.5	118	(80-121)
1,1,1-Trichloroethane	20		22.8	114	(74-131)
1,1,2-Trichloroethane	20		21.7	109	(80-119)
Trichloroethene	20		22.3	112	(79-123)
Vinyl Chloride	20		19.3	96.7	(58-137)

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

RPD: 0 out of 0 outside limits

Spike Recovery: 1 out of 14 outside limits

Comments:

4A

VOLATILE METHOD BLANK SUMMARY

SAMPLE NO.

2461659

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG NO.: ASN-015

Lab File ID: 316122813.D Lab Sample ID: 2461659

Date Analyzed: 12/28/2016 Time Analyzed: 18:27

GC Column: RTXVRX ID: 0.25 (mm) Heated Purge: (Y/N) N

Instrument ID: ms03.i

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
2461660(LCS)	2461660	316122814A.D	18:49
Trip Blank	2196114006	316122818.D	20:16
MW-28 121416	2196114001	316122819.D	20:38
MW-29 121416	2196114003	316122820.D	21:01
MW-31 121416	2196114004	316122821.D	21:22
MW-33 121416	2196114005	316122822.D	21:44

COMMENTS:

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA CASE No.: SAS No.: SDG NO.: ASN-015

	Sample NO.	SMC1 (BFB) #	SMC2 (DBFM)	SMC3 (DCE) #	SMC4 (TOL) #	TOT OUT
05	2461659(MB)	107	91.1	110	104	0
06	2461660(LCS)	105	91.7	107	103	0
07	Trip Blank	107	92.0	113	103	0
08	MW-28 121416	104	93.0	114	103	0
09	MW-29 121416	108	151 *	111	104	1
10	MW-31 121416	105	90.6	112	104	0
11	MW-33 121416	108	95.7	115	104	0

	QC LIMITS
SMC1 (BFB) = 4-Bromofluorobenzene	(85-114)
SMC2 (DBFM) = Dibromofluoromethane	(80-119)
SMC3 (DCE) = 1,2-Dichloroethane-d4	(81-118)
SMC4 (TOL) = Toluene-d8	(89-112)

Column to be used to flag recovery values
* Values outside of contract required QC Limits
D Surrogate Diluted Out

ALS Environmental Services

RECOVERY REPORT

Client Name:
Client SDG: 3161228.b
Sample Matrix: LIQUID
Fraction: VOA
Lab Smp Id: 1801
Level: LOW
Operator: DD
Data Type: MS DATA
SampleType: LCS
SpikeList File: DODENDCCV.spk
Quant Type: ISTD
Sublist File: DODall.sub
Method File: \\ALMDTWS014\TargetData\Chem2\ms03.i\03_2016\3161228.b\3-8260b0
Misc Info:

SPIKE	COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
1	Dichlorodifluorome	50.0000	49.1772	98.35	50-150
2	Chloromethane	50.0000	50.8327	101.67	50-150
3	Vinyl Chloride	50.0000	52.0958	104.19	50-150
4	Bromomethane	50.0000	43.0051	86.01	50-150
5	Chloroethane	50.0000	52.2534	104.51	50-150
6	Pentane	50.0000	90.1847	180.37*	50-150
7	Trichlorofluoromet	50.0000	47.8618	95.72	50-150
8	Dichlorofluorometh	50.0000	56.3707	112.74	50-150
9	Ethyl Ether	50.0000	55.6289	111.26	50-150
10	1,1-Dichloroethene	50.0000	84.2012	168.40*	50-150
11	Freon 113	50.0000	84.5793	169.16*	50-150
12	Carbon Disulfide	50.0000	78.7280	157.46*	50-150
13	Iodomethane	50.0000	65.5824	131.16	50-150
14	Acrolein	500.000	583.171	116.63	50-150
15	Isopropyl Alcohol	250.000	326.928	130.77	50-150
16	3-Chloro-1-propene	50.0000	58.1070	116.21	50-150
17	Methylene Chloride	50.0000	56.0647	112.13	50-150
18	Acetone	250.000	303.206	121.28	50-150
19	Methyl acetate	50.0000	59.5011	119.00	50-150
20	trans-1,2-Dichloro	50.0000	59.4159	118.83	50-150
21	Hexane	50.0000	68.0806	136.16	50-150
22	Methyl t-Butyl Eth	50.0000	57.8853	115.77	50-150
23	tert.- Butyl Alcoh	250.000	303.059	121.22	50-150
24	Acetonitrile	250.000	266.174	106.47	50-150
25	Diisopropyl ether	50.0000	58.4675	116.94	50-150
26	Chloroprene	50.0000	59.4814	118.96	50-150
27	1,1-Dichloroethane	50.0000	54.9015	109.80	50-150
28	Acrylonitrile	250.000	290.097	116.04	50-150
30	n-Propanol	500.000	543.634	108.73	50-150
29	Ethyl tert-butyl e	50.0000	51.0522	102.10	50-150
31	Vinyl acetate	50.0000	48.7817	97.56	50-150
32	cis-1,2-Dichloroet	50.0000	54.3508	108.70	50-150
33	2,2-Dichloropropan	50.0000	45.6802	91.36	50-150
34	Bromochloromethane	50.0000	51.4525	102.91	50-150
35	Cyclohexane	50.0000	63.3210	126.64	50-150
36	Chloroform	50.0000	56.4999	113.00	50-150
37	Ethyl acetate	50.0000	59.4575	118.92	50-150
38	Methyl acrylate	50.0000	59.7566	119.51	50-150
39	Carbon Tetrachlori	50.0000	58.3601	116.72	50-150
40	Tetrahydrofuran	250.000	279.610	111.84	50-150

SPIKE	COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
42	1,1,1-Trichloroeth	50.0000	56.1119	112.22	50-150
43	2-Butanone	250.000	286.050	114.42	50-150
44	1,1-Dichloropropen	50.0000	57.8011	115.60	50-150
45	1-Chlorobutane	50.0000	58.4318	116.86	50-150
46	Heptane	50.0000	63.9507	127.90	50-150
47	Benzene	50.0000	54.8958	109.79	50-150
48	Propionitrile	250.000	290.982	116.39	50-150
49	Methacrylonitrile	50.0000	57.3964	114.79	50-150
50	tert-amyl methyl E	50.0000	50.1015	100.20	50-150
54	Isobutyl alcohol	500.000	494.994	99.00	50-150
52	1,2-Dichloroethane	50.0000	52.7758	105.55	50-150
53	tert-Amyl Alcohol	250.000	225.037	90.01	50-150
56	Diisobutylene	50.0000	63.2712	126.54	50-150
57	Trichloroethene	50.0000	56.9535	113.91	50-150
58	Methyl cyclohexane	50.0000	62.2290	124.46	50-150
59	tert-Amyl Ethyleth	50.0000	49.0589	98.12	50-150
60	Dibromomethane	50.0000	51.6197	103.24	50-150
61	1,2-Dichloropropan	50.0000	56.9382	113.88	50-150
62	Bromodichlorometha	50.0000	57.0242	114.05	50-150
63	Methyl methacrylat	50.0000	51.5770	103.15	50-150
64	1,4-Dioxane	1250.00	1671.08	133.69	50-150
65	2-Chloroethylvinyl	50.0000	46.6201	93.24	50-150
66	cis-1,3-Dichloropr	50.0000	48.9384	97.88	50-150
67	Octane	50.0000	41.7738	83.55	50-150
69	Toluene	50.0000	58.0550	116.11	50-150
70	Chloroacetonitrile	250.000	250.603	100.24	50-150
71	2-Nitropropane	250.000	247.242	98.90	50-150
72	1,1-Dichloro-2-pro	250.000	240.908	96.36	50-150
73	4-Methyl-2-Pentano	250.000	278.358	111.34	50-150
74	Tetrachloroethene	50.0000	53.2641	106.53	50-150
75	trans-1,3-Dichloro	50.0000	48.9697	97.94	50-150
76	Ethyl methacrylate	50.0000	50.3196	100.64	50-150
77	1,1,2-Trichloroeth	50.0000	53.7827	107.57	50-150
78	Chlorodibromometha	50.0000	46.6139	93.23	50-150
80	1,2-Dibromoethane	50.0000	55.0186	110.04	50-150
81	2-Hexanone	250.000	271.344	108.54	50-150
82	1-Chlorohexane	50.0000	53.4417	106.88	50-150
79	1,3-Dichloropropan	50.0000	53.7116	107.42	50-150
84	Chlorobenzene	50.0000	52.5580	105.12	50-150
85	Ethylbenzene	50.0000	58.3873	116.77	50-150
86	1,1,1,2-Tetrachlor	50.0000	55.9982	112.00	50-150
87	mp-Xylene	100.000	119.337	119.34	50-150
88	o-Xylene	50.0000	53.3510	106.70	50-150
89	Styrene	50.0000	56.6260	113.25	50-150
90	Bromoform	50.0000	42.1541	84.31	50-150
91	Isopropylbenzene	50.0000	60.0949	120.19	50-150
93	Bromobenzene	50.0000	57.1384	114.28	50-150
94	n-Propylbenzene	50.0000	59.5712	119.14	50-150
95	1,1,2,2-Tetrachlor	50.0000	56.4020	112.80	50-150
96	o-Chlorotoluene	50.0000	62.3929	124.79	50-150
M 100	1,2-Dichloroethene	100.000	113.767	113.77	50-150
97	1,3,5-Trimethylben	50.0000	61.2703	122.54	50-150
98	1,2,3-Trichloropro	50.0000	52.1488	104.30	50-150
99	trans-1,4-Dichloro	50.0000	37.0273	74.05	50-150

SPIKE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
101 p-Chlorotoluene	50.0000	61.5598	123.12	50-150
102 tert-Butylbenzene	50.0000	59.0998	118.20	50-150
103 Pentachloroethane	50.0000	57.6449	115.29	50-150
104 1,2,4-Trimethylben	50.0000	60.1270	120.25	50-150
105 sec-Butylbenzene	50.0000	61.4122	122.82	50-150
106 p-Isopropyltoluene	50.0000	58.3729	116.75	50-150
107 1,3-Dichlorobenzen	50.0000	56.2353	112.47	50-150
109 1,4-Dichlorobenzen	50.0000	53.7289	107.46	50-150
110 Benzyl Chloride	50.0000	30.6269	61.25	50-150
111 n-Butylbenzene	50.0000	55.4096	110.82	50-150
112 Hexachloroethane	50.0000	58.1471	116.29	50-150
113 1,2-Dichlorobenzen	50.0000	56.2892	112.58	50-150
114 1,2-Dibromo-3-chlo	50.0000	47.6395	95.28	50-150
115 Nitrobenzene	500.000	221.535	44.31*	50-150
116 Hexachlorobutadien	50.0000	41.8963	83.79	50-150
117 1,2,4-Trichloroben	50.0000	49.1052	98.21	50-150
118 Naphthalene	50.0000	49.9160	99.83	50-150
M 120 1,3-Dichloropropen	100.000	97.9081	97.91	50-150
119 1,2,3-Trichloroben	50.0000	51.4294	102.86	50-150
M 121 TOTAL XYLENES	150.000	172.688	115.13	50-150

SURROGATE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
$ 41 Dibromofluorometha	50.0000	50.7566	101.51	80-119
$ 51 1,2-Dichloroethane	50.0000	53.5892	107.18	81-118
$ 68 Toluene-d8	50.0000	54.2211	108.44	89-112
$ 92 4-Bromofluorobenze	50.0000	53.0499	106.10	85-114

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: ASN-016

Laboratory Control Spike - Sample No: 2461660

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
Carbon Tetrachloride	20		23.2	116	(72-136)
1,1-Dichloroethane	20		21.9	109	(77-125)
1,2-Dichloroethane	20		21.5	107	(73-128)
1,1-Dichloroethene	20		26.5	133*	(71-131)
cis-1,2-Dichloroethene	20		21.4	107	(78-123)
trans-1,2-Dichloroethen	20		24.5	122	(75-124)
1,1,1,2-Tetrachloroetha	20		22.7	114	(78-124)
1,1,2,2-Tetrachloroetha	20		21.7	108	(71-121)
Tetrachloroethene	20		22.4	112	(74-129)
Toluene	20		23.5	118	(80-121)
1,1,1-Trichloroethane	20		22.8	114	(74-131)
1,1,2-Trichloroethane	20		21.7	109	(80-119)
Trichloroethene	20		22.3	112	(79-123)
Vinyl Chloride	20		19.3	96.7	(58-137)

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

RPD: 0 out of 0 outside limits

Spike Recovery: 1 out of 14 outside limits

Comments:

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA CASE No.: SAS No.: SDG NO.: ASN-016

	Sample NO.	SMC1 (BFB) #	SMC2 (DBFM)	SMC3 (DCE) #	SMC4 (TOL) #	TOT OUT
01	2461659(MB)	107	91.1	110	104	0
02	2461660(LCS)	105	91.7	107	103	0
03	EB-1 121516	106	90.3	110	104	0
04	Trip Blank	106	90.5	109	103	0
05	DUP-2 121516	105	90.7	102	174 *	1
06	MW-35 121516	103	93.0	113	102	0

	QC LIMITS
SMC1 (BFB) = 4-Bromofluorobenzene	(85-114)
SMC2 (DBFM) = Dibromofluoromethane	(80-119)
SMC3 (DCE) = 1,2-Dichloroethane-d4	(81-118)
SMC4 (TOL) = Toluene-d8	(89-112)

Column to be used to flag recovery values
* Values outside of contract required QC Limits
D Surrogate Diluted Out

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.
2456158

Lab Name: ALSI Contract:

Lab Code: PA-010 Case No.: SAS No.: SDG No.: ASN013

Matrix: (soil/water) WATER Lab Sample ID: 2456158

Sample wt/vol: _____ (g/mL) ML Lab File ID: MLGA003

Level: (low/med) LOW Date Received: 12/16/16

% Moisture: not dec. _____ Date Analyzed: 12/16/16

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	0.20	J
74-85-1	ETHENE	0.75	U
74-84-0	ETHANE	0.50	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.
2456158

Lab Name: ALSI Contract:

Lab Code: PA-010 Case No.: SAS No.: SDG No.: ASN014

Matrix: (soil/water) WATER Lab Sample ID: 2456158

Sample wt/vol: _____ (g/mL) ML Lab File ID: MLGA003

Level: (low/med) LOW Date Received: 12/16/16

% Moisture: not dec. _____ Date Analyzed: 12/16/16

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	0.20	J
74-85-1	ETHENE	0.75	U
74-84-0	ETHANE	0.50	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.
2456158

Lab Name: ALSI Contract:

Lab Code: PA-010 Case No.: SAS No.: SDG No.: ASN015

Matrix: (soil/water) WATER Lab Sample ID: 2456158

Sample wt/vol: _____ (g/mL) ML Lab File ID: MLGA003

Level: (low/med) LOW Date Received: 12/16/16

% Moisture: not dec. _____ Date Analyzed: 12/16/16

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	0.20	J
74-85-1	ETHENE	0.75	U
74-84-0	ETHANE	0.50	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.
2457899

Lab Name: ALSI Contract:

Lab Code: PA-010 Case No.: SAS No.: SDG No.: ASN016

Matrix: (soil/water) WATER Lab Sample ID: 2457899

Sample wt/vol: _____ (g/mL) ML Lab File ID: MLKA003

Level: (low/med) LOW Date Received: 12/20/16

% Moisture: not dec. _____ Date Analyzed: 12/20/16

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	0.25	
74-85-1	ETHENE	0.75	U
74-84-0	ETHANE	0.50	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.
MW-16 12
1216 DUP

Lab Name: ALSI Contract:

Lab Code: PA-010 Case No.: SAS No.: SDG No.: ASN013

Matrix: (soil/water) WATER Lab Sample ID: 2456159

Sample wt/vol: _____ (g/mL) ML Lab File ID: MLGA005

Level: (low/med) LOW Date Received: 12/13/16

% Moisture: not dec. _____ Date Analyzed: 12/16/16

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	0.50U ~~0.21~~	~~J~~
74-85-1	ETHENE	0.75	U
74-84-0	ETHANE	0.50	U

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.
MW-33 12
1416 DUP

Lab Name: ALSI Contract:

Lab Code: PA-010 Case No.: SAS No.: SDG No.: ASN015

Matrix: (soil/water) WATER Lab Sample ID: 2456160

Sample wt/vol: _____ (g/mL) ML Lab File ID: MLGA018

Level: (low/med) LOW Date Received: 12/15/16

% Moisture: not dec. _____ Date Analyzed: 12/16/16

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		RPD
74-82-8	METHANE	3.5		3.4	2.9
74-85-1	ETHENE	0.48	J	0.48J	∅
74-84-0	ETHANE	0.27	J	0.25J	7.7

FORM I VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.
MW-35 12
1516 DUP

Lab Name: ALSI Contract:

Lab Code: PA-010 Case No.: SAS No.: SDG No.: ASN016

Matrix: (soil/water) WATER Lab Sample ID: 2457900

Sample wt/vol: _____ (g/mL) ML Lab File ID: MLKA012

Level: (low/med) LOW Date Received: 12/16/16

% Moisture: not dec. _____ Date Analyzed: 12/20/16

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		RPD	
74-82-8	METHANE	1.3		0.90	36	< ± LOD
74-85-1	ETHENE	0.75	U	U	—	
74-84-0	ETHANE	0.50	U	U	—	

FORM I VOA

Sample Description

MW-34 121316

Form 3A

Matrix Spike and Matrix Spike Duplicate Recovery Summary

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

SDG No.: ASN014
Units: mg/L
Lab Sample ID: 2195623001
Lab MS Sample ID: 2455310
Lab MSD Sample ID: 2455311

Analyte	Spike Added	Sample Concentration	MS Concentration	MS Recovery (%)	(1)	Acceptable Limits (%)
Chloride	40	62.3	106	110		87 - 111
Nitrate-N	5	0.060	5.5	108		88 - 111
Sulfate	40	23.8	60.8	92.5		87 - 112

Analyte	Spike Added	MSD Concentration	MSD Recovery (%)	(1)	Acceptable Limits (%)	RPD (%)	(1)	Acc. Lim. (%)
Chloride	40	108	113	*	87 - 111	1.27		15
Nitrate-N	5	5.5	110		88 - 111	1.09		15
Sulfate	40	61.6	94.4		87 - 112	1.28		15

(1) The following qualifiers are used:

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

Comments:

Form 4B
Inorganic Blank Summary

Analysis Method: S2320B-97
Instrument: AUTOT

SDG No.: ASN013

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2454307	Alkalinity, Total	MB	QC-Water	12/14/2016 03:05	0.9	J	mg/L
2454331	Alkalinity, Total	MB	QC-Water	12/14/2016 12:49	1	J	mg/L
2454335	Alkalinity, Total	MB	QC-Water	12/14/2016 15:01	1	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.: ASN014

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2455281	Alkalinity, Total	MB	QC-Water	12/15/2016 02:57	5	U	mg/L
2455292	Alkalinity, Total	MB	QC-Water	12/15/2016 08:31	1	J	mg/L
2455296	Alkalinity, Total	MB	QC-Water	12/15/2016 10:34	1	J	mg/L
2455300	Alkalinity, Total	MB	QC-Water	12/15/2016 12:52	1	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.: ASN015

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2456059	Alkalinity, Total	MB	QC-Water	12/16/2016 03:22	5	U	mg/L
2456067	Alkalinity, Total	MB	QC-Water	12/16/2016 05:47	1	J	mg/L
2456071	Alkalinity, Total	MB	QC-Water	12/16/2016 08:07	1	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.: ASN016

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
2456059	Alkalinity, Total	MB	QC-Water	12/16/2016 03:22	5	U	mg/L
2456645	Alkalinity, Total	MB	QC-Water	12/17/2016 01:19	1	J	mg/L
2456649	Alkalinity, Total	MB	QC-Water	12/17/2016 03:02	5	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: