2016 OU2 GROUNDWATER INVESTIGATION RE131D1, RE131D2, RE131D3 (VPB165) INSTALLATION REPORT

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP)
SITE 1 OU2
BETHPAGE, NY

Prepared for:

Department of the Navy
Naval Facilities Engineering Command, Atlantic
9324 Virginia Avenue
Building Z-144
Norfolk, Virginia 23511

August 2016

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INSTALLATION REPORT

NWIRP BETHPAGE
SITE 1 OU2
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Department of the Navy
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9324 Virginia Avenue
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Norfolk, Virginia 23511

Prepared by:

Resolution Consultants
A Joint Venture of AECOM & EnSafe
1500 Wells Fargo Building
440 Monticello Avenue
Norfolk, Virginia 23510

Contract Number: N62470-11-D-8013
CTO WE15

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Brian Caldwell

Brian Caldwell
Contract Task Order Manager

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List of Acronyms and Abbreviations

AOC	Area of Concern
bgs	below ground surface
COR	Continuously Operating Reference
EPA	Environmental Protection Agency, United States
ft	feet
GOCO	Government-Owned Contractor-Operated
GPS	Global Positioning System
IDW	Investigation Derived Waste
IR	Installation Restoration
Katahdin	Katahdin Analytical Services
NAD	North American Datum
NAVD	North American Vertical Datum
NAVFAC	Naval Facilities Engineering Command
NG	Northrop Grumman
NTU	nephelometric turbidity units
NWIRP	Naval Weapons Industrial Reserve Plant
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
OU	Operable Unit
PCBs	Polychlorinated Biphenyls
POTW	Publicly Owned Treatment Works
PPE	Personal Protective Equipment
PVC	Polyvinylchloride
SAP	Sampling and Analysis Plan
SVOC	Semivolatile Organic Compounds
TCE	Trichloroethene
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TOC	Total Organic Carbon
UFP	United Federal Programs
US	United States
VOC	Volatile Organic Compounds
VPB	Vertical Profile Boring

1.0 PROJECT BACKGROUND

Resolution Consultants has prepared this Data Summary Report for the Naval Facilities Engineering Command (NAVFAC), Mid-Atlantic under contract task order WE15 Contract N62470-11-D-8013. This report describes the installation of three monitoring wells and one initial groundwater monitoring event (specifically at the Vertical Profile Boring [VPB] 165 location) in 2016 for the Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage Operable Unit (OU) 2 Site 1 offsite plume. NWIRP Bethpage is located in east-central Nassau County, Long Island, New York, approximately 30 miles east of New York City (Figure 1).

1.1 Scope and Objectives

This report provides information on the installation of RE131D1, RE131D2 and RE131D3. The purpose of this investigation was to ascertain contaminant levels and depths, and the western extent of the offsite plume north of Hempstead Turnpike and west of North Wantagh Avenue. The locations of RE131D1, RE131D2 and RE131D3, as well as other VPBs and monitoring well locations are shown in Figure 2.

The field investigation included completing three monitoring wells, well development, soil/groundwater analysis, groundwater grab samples, and surveying. Field tasks were conducted in 2016 in accordance with the *United Federal Programs Sampling and Analysis Plan (UFP SAP)*, Bethpage, New York (Resolution, 2013a). In addition, the work adhered to the following UFP SAP Addendums: *Groundwater Sampling Using Low Stress (Low Flow) Purging and Sampling Protocol* (Resolution Consultants, 2013b) and *Installation of Vertical Profile Borings and Monitoring Wells* (Resolution Consultants, 2013c).

Documentation of these activities is included in Appendix A of this report.

1.2 Site History

NWIRP Bethpage is in the Hamlet of Bethpage, Town of Oyster Bay, New York. Since its inception in 1941, the plant's primary mission was the research, prototyping, testing, design, engineering, fabrication, and primary assembly of military aircraft. The facilities at NWIRP included four plants used for assembly and prototype testing, a group of quality control laboratories, two warehouse complexes (north and south), a salvage storage area, water recharge basins, the Industrial Wastewater Treatment Plant, and several smaller support buildings.

The Navy's property originally totaled 109.5 acres and was formerly a Government-Owned Contractor-Operated (GOCO) facility that was operated by Northrop Grumman (NG) until September 1998. Prior to 2002, the NWIRP property was bordered on the north, west, and south by current or former NG facilities, and on the east by a residential neighborhood. By March 2008, approximately 100 acres of NWIRP property were transferred to Nassau County in three separate actions. The remaining 9 acres and access easements were retained by the Navy to continue remedial efforts at Installation Restoration (IR) Site 1 – Former Drum Marshalling Area and Site 4 – Former Underground Storage Tanks (Area of Concern [AOC] 22). A parcel of land connecting the two sites was also retained. Currently, the 9-acre parcel of NWIRP is bordered on the east by the residential neighborhood and on the north, south, and west by Steel Equities; however, a small portion is still owned by Nassau County. Access to the NWIRP is from South Oyster Bay Road.

1.3 Geology and Hydrogeology

Overburden at the site consists of well over 1,000 feet (ft) of unconsolidated deposits overlying crystalline bedrock of the Hartland Formation. Overburden is divided into four geologic units: the upper Pleistocene deposits, the Magothy Formation, the clay member of the Raritan Formation ("Raritan Clay") and the Lloyd Sand member of the Raritan Formation ("Lloyd Sand") (Geraghty and Miller, 1994).

The upper Pleistocene ranges in thickness from approximately 50 to 100 ft and consists of till and outwash deposits of medium to coarse sand and gravel with lenses of fine sand, silt and clay (Smolensky and Feldman, 1990); these deposits form the Upper Glacial Aquifer. Directly underlying this unit is the Magothy Formation with a thickness of 650 to 900 ft and lower extent of 700 to 1,000 ft below ground surface (bgs), as observed at the former NWIRP and extending southeast to areas south of Southern State Parkway. Locally at the RE131 locations, the bottom of the Magothy (top of the Raritan Clay) is encountered at approximately 893 feet bgs. The Magothy is characterized by fine to medium sands and silts interbedded with zones of clays, silty sands and sandy clays. Sand and gravel lenses are found in some areas between depths of 600 and 880 ft bgs; these deposits form the main producing zones of the Magothy Aquifer.

Investigations performed by the Navy since 2012 indicate that the bottom of the Magothy (top of the Raritan Clay) can extend to depths of 700 to greater than 1,000 ft bgs. The top of the Raritan Clay deepens to the south-southeast, as evidenced by clay depths of 1,000 ft bgs (or more) in borings installed offsite. The Raritan Clay Unit is of continental origin and consists of clay, silty clay, clayey silt, and fine silty sand. This member acts as a confining layer over the Lloyd Sand Unit. The Lloyd Sand Unit is also of continental origin, having been deposited in a large fresh water lacustrine

environment. The material consists of fine to coarse-grained sands, gravel, inter-bedded clay, and silty sand. These deposits form the Lloyd Aquifer.

The Upper Glacial Aquifer and the Magothy Aquifer comprise the aquifers of interest at the NWIRP. Regionally, these formations are generally considered to form a common, interconnected aquifer as the coarse nature of each unit near their contact and the lack of any regionally confining clay unit allows for the unrestricted flow of groundwater between the formations.

The Magothy Aquifer is the major source of public water in Nassau County. The most productive water bearing zones are the discontinuous lenses of sand and gravel that occur within the siltier matrix. The major water-bearing zones are coarse sand and gravel lenses located in the lower portion of the Magothy. The Magothy Aquifer is commonly regarded to function overall as an unconfined aquifer at shallow depths and a confined aquifer at deeper depths. The drilling program at the NWIRP has revealed that clay zones beneath the facility are common but laterally discontinuous. No confining clay units of facility-wide extent have been encountered. This is also the case for borings installed offsite.

Groundwater is encountered at a depth of approximately 50 ft bgs at the facility. Historically, because of pumping and recharge at the facility, groundwater depths have been measured to range from 40 to 60 ft bgs. The groundwater flow in the area is to the south-southeast.

2.0 FIELD PROGRAM

Three monitoring wells were installed in the vicinity of VPB165 between January 2016 and March 2016. Field investigation activities consisted of drilling, well installation, well development, sampling, soil/groundwater analysis, and surveying. Drilling during this investigation was performed by Delta Well and Pump Company of Ronkonkoma, New York. A description of these tasks is provided below.

2.1 Drilling and Well Construction

Monitoring wells RE131D1, RE131D2 and RE131D3 were installed using mud rotary drilling techniques (Figure 2). Depths of monitoring wells RE131D1, RE131D2 and RE131D3 were 455 ft, 595 ft and 685 ft respectively. Well construction details are summarized in Table 1. Boring logs with lithologic descriptions of the well screen interval are included in the Appendix A. *2015-2016 OU2 Groundwater Investigation VPB165* (Resolution Consultants, 2016) documents the installation of this VPB including detailed lithologic descriptions, continuous gamma plot and multiple Volatile Organic Compounds (VOC) sample results over the entire boring length.

Prior to installing each monitoring well, the results of the groundwater samples, the geophysical logs, lithology and field data from the vertical profile borings were analyzed. Screen intervals were determined based on this analysis: intervals with the highest VOC concentrations as measured in the hydropunch samples, and coincident intervals with the highest apparent permeability based on the gamma logs. During the monitoring well installation, split spoon samples were collected every 5 ft in the screen interval. One soil sample per monitoring well was analyzed for Total Organic Carbon (TOC) via United States (US) Environmental Protection Agency (EPA) series SW-846 method 9060A by Katahdin Analytical Services (Katahdin). Data validation of TOC data was performed by Resolution Consultants. Data validation packages and analytical data tables are included in Appendix A.

Wells were constructed of 4-inch diameter, Schedule 80, National Sanitation Foundation-approved polyvinylchloride (PVC) riser pipe and .010-slot well screen. Wells were completed at the surface with a 12-inch diameter steel curb box. Well risers were set below grade and fit with lockable J plugs. Detailed monitoring well construction diagrams are included in Appendix A.

2.2 Well Development

Following installation, all monitoring wells were developed to evacuate silts and other fine-grained materials and to establish the filter pack to promote a hydraulic connection between the well and

the surrounding aquifer. Well development was not initiated until at least 24 hours after well installation.

Monitoring well screens were developed using a combination of air lifting, manual surging, and pumping with a submersible pump. Turbidity was monitored during development to determine stabilization. In compliance with New York State Department of Environmental Conservation (NYSDEC) policy, wells were developed until turbidity was less than 50 nephelometric turbidity units (NTUs) if possible. Table 2 summarizes total pumped volume from air and pump development and final turbidity. Well development logs are included in Appendix A.

2.3 Sampling

Following development, wells were allowed to stabilize for at least 2 weeks prior to groundwater sampling in accordance with low flow sampling procedures. Wells were purged using a bladder pump with a drop tube intake placed at the approximate midpoint of the screened interval. The following water quality parameters were continuously measured: water temperature, pH, conductivity, oxidation-reduction potential, dissolved oxygen and turbidity. Groundwater analytical samples were collected when water quality parameters stabilized. Samples were analyzed for VOCs via method 8260C and 1,4-dioxane via Method 8270D SIM by Katahdin. All development and purge water was managed as investigation derived waste (IDW). Groundwater sample logs and data validation packages are included in Appendix A.

Monitoring wells RE131D1, RE131D2 and RE131D3 were sampled by Resolution Consultants on April 21, 2016. Analytical results and stabilized field parameters for these data are summarized in Table 3 and 4, respectively. Data validation is documented in Appendix A. These monitoring wells will be included in quarterly sampling as part of the Navy's ongoing Environmental Restoration Program.

2.4 Decontamination and Investigation Derived Waste (IDW)

Resolution Consultants utilized dedicated and disposable sampling equipment when possible to avoid the potential for cross-contamination of samples. The sampling equipment included dedicated plastic scoops, disposable Teflon or polyethylene tubing, disposable gloves, and laboratory supplied sample bottles. Hand held equipment and split spoons were decontaminated using Luminox and water wash, a potable water rinse, followed by a distilled water rinse. Water was collected in 5-gallon pails or 55-gallon drums. Non dedicated sampling equipment was decontaminated as outlined in the UFP SAP Addendum - *Groundwater Sampling Using Low Stress (Low Flow) Purging and Sampling Protocol* (Resolution Consultants, 2013b).

As part of the IDW management practices and in accordance with the SAP, the investigation waste (consisting of soil cuttings, drilling muds, IDW fluids, and personal protective equipment [PPE]) generated during the groundwater monitoring well installation and sampling was containerized and staged at NWIRP Bethpage.

IDW solids were containerized in roll offs. Representative samples from each roll off were submitted to Katahdin for analysis of:

- Target Compound List (TCL) VOCs
- TCL Semi-volatile Organic Compounds (SVOCs)
- Toxicity Characteristic Leaching Procedure (TCLP) Metals
- Polychlorinated Biphenyls (PCBs)
- Total petroleum hydrocarbons
- Corrosivity
- Ignitability
- Reactive Cyanide
- Reactive Sulfide
- Paint Filter

IDW fluid generated during well development and purging was containerized in frac tanks and stored at NWIRP Bethpage for characterization and ultimate disposal to the Publicly Owned Treatment Works (POTW), in accordance with the facilities existing discharge permit. A representative water sample was collected from each frac tank and submitted to Katahdin for analysis of VOCs via Method SW 624, pH via Method SW 9040B, PCBs via Method 8082 and Total Metals via Method SW 846. All analytical criteria were met for disposal of water.

2.5 Surveying

A survey of the monitoring well locations was conducted at the end of fieldwork by C. T. Male, Inc., of Latham, NY, under the direct supervision of Resolution Consultants. The locations were tied into the existing base map developed for this investigation. The survey elevation is referenced to the North American Vertical Datum (NAVD) 1988 and has a vertical accuracy of 0.01 foot. Vertical control is based on observations of the Continuously Operating Reference (COR) Stations Queens and Central Islip. The horizontal location is referenced to the North American Datum (NAD) 1983 (2011) NY. Long Island Zone 3104 and has an accuracy of 0.1 foot. Local horizontal and vertical

control is based on Global Positioning System (GPS) observations using the NYSNet Real Time Network.

A table of survey data (latitude/longitude, northing/easting, elevations of ground, rim and PVC) and a survey map is included in Appendix A.

3.0 REFERENCES

Geraghty and Miller, Inc., 1994. *Remedial Investigation Report, Grumman Aerospace Corporation, Bethpage, New York*. Revised September 1994.

Resolution Consultants, 2013a. *United Federal Programs Sampling and Analysis Plan*, *Site OU-2 Offsite Trichloroethene (TCE) Groundwater Plume Investigation, Bethpage, New York*. April 2013.

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Resolution Consultants, 2013c. UFP SAP Addendum*, Installation of Vertical Profile Borings and Monitoring Wells.* December 2013.

Resolution Consultants, 2016. *2015-2016 OU2 Groundwater Investigation VPB165, Bethpage, NY.* June 2016.

Smolensky, D., and Feldman, S., 1990. *Geohydrology of the Bethpage-Hicksville-Levittown Area, Long Island, New York, U.S*. Geological Survey Water-Resourced Investigations Report 88-4135, 25 pp.

Tables

TABLE 1
MONITORING WELL CONSTRUCTION SUMMARY
2016 OU2 GROUNDWATER INVESTIGATION
NWIRP BETHPAGE, NY

MONITORING WELL	WELL COMPLETION DATE	GROUND ELEVATION (MSL)	PVC ELEVATION (INNER CASING) (MSL)	WELL DEPTH (ft bgs)	CASING DEPTH (ft bgs)	SCREEN INTERVAL (ft bgs)	SUMP DEPTH INTERVAL (ft bgs)	BORING DEPTH (ft bgs)
RE131D1	2/19/2016	86.33	85.94	455	54	430 - 450	450 - 455	467
RE131D2	2/3/2016	86.25	85.72	595	54	565 - 590	590 - 595	607
RE131D3	3/7/2016	86.22	85.90	685	53	660 - 680	680 - 685	697

MSL - mean sea level

ft bgs - feet below ground surface

TABLE 2
MONITORING WELL DEVELOPMENT SUMMARY
2016 OU2 GROUNDWATER INVESTIGATION
NWIRP BETHPAGE, NY

MONITORING WELL	AIR DEVELOPMENT		PUMP DEVELOPMENT			APPROX. TOTAL DEVELOPMENT VOLUME (GAL)	FINAL TURBIDITY (NTUs)
	DATE	APPROX. VOLUME (GAL)	DATE	FINAL PUMP DEPTH (FT BGS)	APPROX. VOLUME (GAL)		
RE131D1	3/22/2016	5,000	3/25/2016	430-450	6,000	11,000	1.34
RE131D2	3/21/16, 3/22/16	5,500	3/24/2016	565-590	6,000	11,500	7.02
RE131D3	3/23/2016	5,500	3/28/2016	660-680	4,100	9,600	1.07

GAL - gallon
FT BGS - feet below ground surface
NTUs - Nephelometric Turbidity Units

TABLE 3. ANALYTICAL DATA SUMMARY
2016 OU2 GROUNDWATER INVESTIGATION
NWIRP BETHPAGE, NY

Location	NYSDEC Groundwater Guidance or Standard Value (Note 1)	RE131D1	RE131D1	RE131D2	RE131D3
Sample Date		4/21/2016	4/21/2016	4/21/2016	4/21/2016
Sample ID		RE131D1-GW-042116	DUPLICATE-042116	RE131D2-GW-042116	RE131D3-GW-042116
Sample type code		N	FD	N	N
VOC 8260C (ug/L)					
1,1,1-TRICHLOROETHANE	5	<0.50 U	<0.50 U	<0.50 U	<0.50 U
1,1,2,2-TETRACHLOROETHANE	5	<0.50 U	<0.50 U	<0.50 U	<0.50 U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	5	**4.4**	**4.2**	<1.0 U	**91**
1,1,2-TRICHLOROETHANE	1	<0.50 U	<0.50 U	<0.50 U	<0.50 U
1,1-DICHLOROETHANE	5	<0.50 U	<0.50 U	<0.50 U	<0.50 U
1,1-DICHLOROETHENE	5	**0.71 J**	**0.56 J**	<0.50 U	**0.54 J**
1,2,4-TRICHLOROBENZENE	5	<0.50 U	<0.50 U	<0.50 U	<0.50 U
1,2-DIBROMO-3-CHLOROPROPANE	0.04	***<0.75 U***	***<0.75 U***	***<0.75 U***	***<0.75 U***
1,2-DIBROMOETHANE	NL	<0.50 U	<0.50 U	<0.50 U	<0.50 U
1,2-DICHLOROBENZENE	3	<0.50 U	<0.50 U	<0.50 U	<0.50 U
1,2-DICHLOROETHANE	5	<0.50 U	<0.50 U	<0.50 U	<0.50 U
1,2-DICHLOROETHENE, TOTAL	5	**4.1**	**3.4**	**3.8**	**0.24 J**
1,2-DICHLOROPROPANE	1	<0.50 U	<0.50 U	<0.50 U	<0.50 U
1,3-DICHLOROBENZENE	3	<0.50 U	<0.50 U	<0.50 U	<0.50 U
1,4-DICHLOROBENZENE	3	<0.50 U	<0.50 U	<0.50 U	<0.50 U
1,4-DIOXANE (Method 8270D_SIM)	NL	**8.7**	**10**	**8.2**	**1.1**
2-BUTANONE	50	<2.5 U	<2.5 U	<2.5 U	<2.5 U
2-HEXANONE	50	<2.5 U	<2.5 U	<2.5 U	<2.5 U
4-METHYL-2-PENTANONE	NL	<2.5 U	<2.5 U	<2.5 U	<2.5 U
ACETONE	50	<2.5 UJ	<2.5 UJ	<2.5 UJ	<2.5 UJ
BENZENE	1	<0.50 U	<0.50 U	<0.50 U	<0.50 U
BROMODICHLOROMETHANE	50	<0.50 U	<0.50 U	<0.50 U	<0.50 U
BROMOFORM	50	<0.50 U	<0.50 U	<0.50 U	<0.50 U
BROMOMETHANE	5	<1.0 U	<1.0 U	<1.0 U	<1.0 U
CARBON DISULFIDE	60	<0.50 U	<0.50 U	<0.50 U	<0.50 U
CARBON TETRACHLORIDE	5	<0.50 U	<0.50 U	<0.50 U	<0.50 U
CHLOROBENZENE	5	<0.50 U	<0.50 U	<0.50 U	<0.50 U
CHLOROETHANE	5	<1.0 U	<1.0 U	<1.0 U	<1.0 U
CHLOROFORM	7	**3.5**	**3.5**	<0.50 U	<0.50 U
CHLOROMETHANE	5	<1.0 U	<1.0 U	<1.0 U	<1.0 U
CIS-1,2-DICHLOROETHENE	5	**4.1**	**3.4**	**3.8**	**0.24 J**
CIS-1,3-DICHLOROPROPENE	0.4	***<0.50 U***	***<0.50 U***	***<0.50 U***	***<0.50 U***
CYCLOHEXANE	NL	<0.50 U	<0.50 U	<0.50 U	<0.50 U
DIBROMOCHLOROMETHANE	5	<0.50 U	<0.50 U	<0.50 U	<0.50 U
DICHLORODIFLUOROMETHANE	5	<1.0 UJ	<1.0 UJ	<1.0 UJ	<1.0 UJ
ETHYLBENZENE	5	<0.50 U	<0.50 U	<0.50 U	<0.50 U
ISOPROPYLBENZENE	5	<0.50 U	<0.50 U	<0.50 U	<0.50 U
M- AND P-XYLENE	NL	<1.0 U	<1.0 U	<1.0 U	<1.0 U
METHYL ACETATE	NL	<0.75 U	<0.75 U	<0.75 U	<0.75 U
METHYL CYCLOHEXANE	NL	<0.50 U	<0.50 U	<0.50 U	<0.50 U
METHYL TERT-BUTYL ETHER	10	<0.50 U	<0.50 U	<0.50 U	<0.50 U
METHYLENE CHLORIDE	5	<2.5 U	<2.5 U	<2.5 U	<2.5 U
O-XYLENE	NL	<0.50 U	<0.50 U	<0.50 U	<0.50 U
STYRENE	5	<0.50 U	<0.50 U	<0.50 U	<0.50 U
TETRACHLOROETHENE	5	**7.6**	**6.5**	**6.0**	**1.5**
TOLUENE	5	<0.50 U	<0.50 U	<0.50 U	<0.50 U
TRANS-1,2-DICHLOROETHENE	5	<0.50 U	<0.50 U	<0.50 U	<0.50 U
TRANS-1,3-DICHLOROPROPENE	0.4	***<0.50 U***	***<0.50 U***	***<0.50 U***	***<0.50 U***
TRICHLOROETHENE	5	**88**	**79**	**41**	**3.8**
TRICHLOROFLUOROMETHANE	5	<1.0 U	<1.0 U	<1.0 U	<1.0 U
VINYL CHLORIDE	2	<1.0 U	<1.0 U	<1.0 U	<1.0 U
XYLENES, TOTAL	5	<1.5 U	<1.5 U	<1.5 U	<1.5 U

Notes:

1 New York State Department of Environmental Conservation Division of Water Technical and Operation Guidance series (6 NYCRR 700-706, Part 703.5 summarized in TOGS 1.1.1)
Ambient water quality standards and groundwater effluent limitations, class GA; NL = Not Listed

Bold = Detected; ***Bold and Italics*** =Not detected exceeds NYS Groundwater Standards or guidance value

Yellow highlighted values exceed Groundwater Standards or guidance value

Sample type codes: N - normal environmental sample, FD - field duplicate

U = Nondetected result. The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte.

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

M = the matrix spike or matrix spike duplicate did not meet recovery or precision requirements.

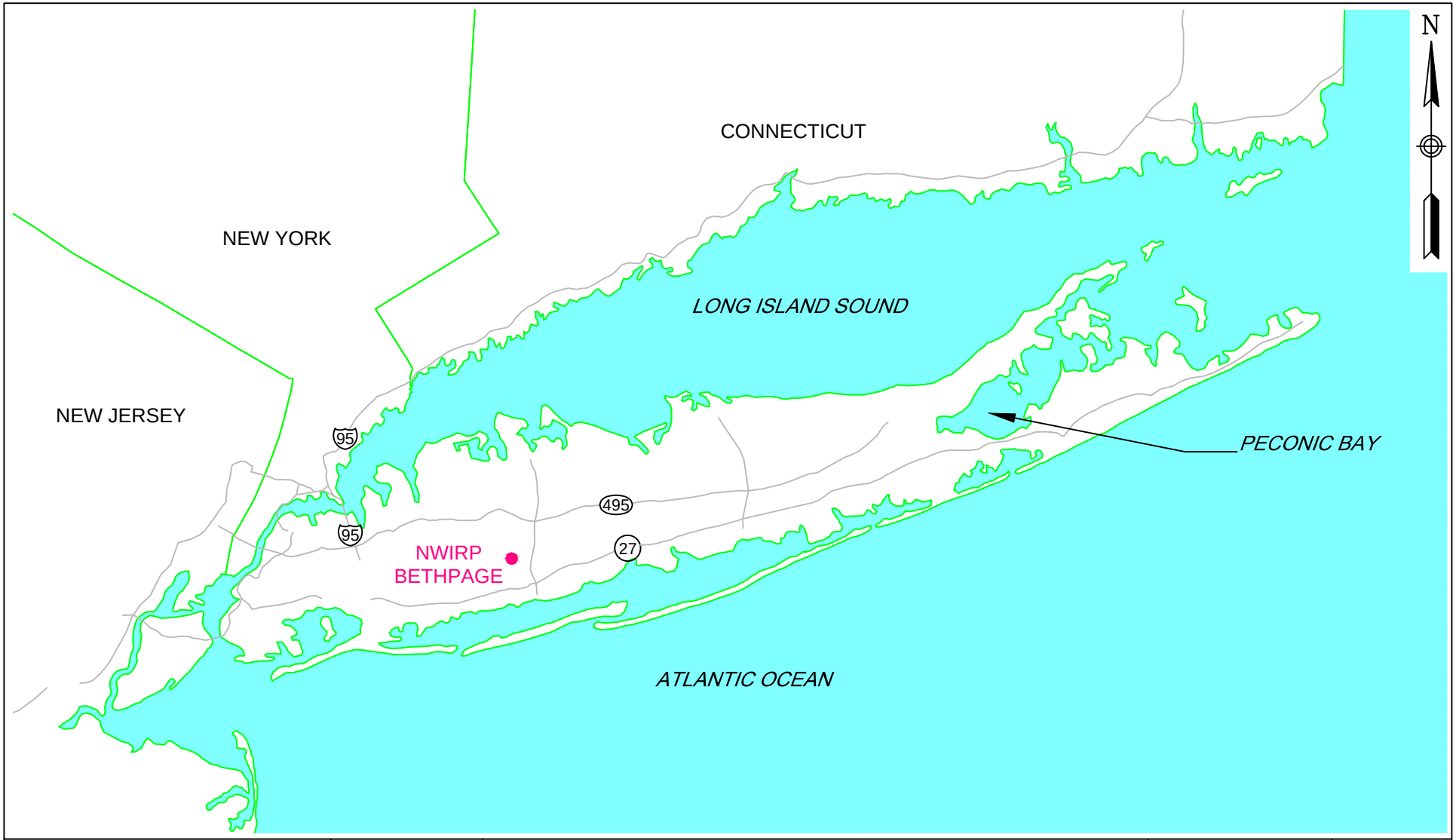
TABLE 4
STABILIZED FIELD PARAMETERS
2016 OU2 GROUNDWATER INVESTIGATION
NWIRP BETHPAGE, NY

Well	Date	Temperature (°C)	pH	Specific Conductance (µS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to water (ft bgs)	Flow rate (ml/min)
RE131D1	4/21/2016	15.98	5.50	0.134	2.72	248.5	23.1	76.62	500
RE131D2	4/21/2016	14.87	5.53	84	4.86	163.2	118	37.32	700
RE131D3	4/21/2016	17.12	5.03	0.042	6.29	304.4	2.59	37.74	350

°C - degrees Celsius
µS/cm - Microsiemens per Centimeter
mg/L - milligrams per liter
mV - Millivolts
NTU - Nephelometric Turbidity Unit
ft bgs - feet below ground surface
ml/min - mililiters per minute

Figures

112G00622\0510\112G00622CM01.DWG 08/02/10 MKB



0 15 30

SCALE IN MILES

NAVFAC

GENERAL LOCATION MAP
NWIRP BETHPAGE
BETHPAGE, NEW YORK

CONTRACT NUMBER	CTO NUMBER
N62470-11-D-8013	WE15
APPROVED BY --	DATE --
APPROVED BY --	DATE --
FIGURE NO. 1	REV 0

F:\Projects\Navy\Bethpage WXE0817.0 Deliverables\7.2 CADD\GIS_files\Bethpage\MAP DOCS\MXD\MISC\Location Maps\F2 RE131 2016 07 13 R1.mxd

Former Naval Weapons Industrial Reserve Plant

Former Northrop Grumman Site

RE131D1
RE131D2
RE131D3

Inset: RE131D1, RE131D2, and RE131D3 Location

RE131D1
RE131D2
RE131D3

0 375 750 Feet

0 750 1,500 3,000 Feet

Legend

- Monitoring Well
- Vertical Profile Boring
- Vertical Profile Boring - Proposed
- Water Supply Well
- Extraction Well

RE131D1, RE131D2, AND RE131D3 LOCATION MAP
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK

CONTRACT NUMBER	CTO NUMBER
N62470-11-D8013	WE15
APPROVED BY: PS	DATE: 7/13/2016
APPROVED BY: —	DATE: —
FIGURE NO.: 2	REV: 0

Appendices

Appendix A

RE131D1, RE131D2, RE131D3

Section 1

Boring Logs

Resolution Consultants

Boring Log

BORING #: **RE131D1**
Sheet 1 of 2

Client: Department of the Navy, Naval Facilities Engineering Command, Mid-Atlantic		**Logged By:** V. Varricchio
Location: Oriole & Cardinal Rd, Levittown, NY		**Drilling Company:** Delta Well & Pump
Project #: 60240739	**Ground Elevation (msl):** 86.33	**Well Screen Interval (ft):** 430-450
Start Date: 2/10/2016	**Drilling Method:** Auger (0-50' bgs) Mud Rotary (>50' bgs)	**Water Level (ft):**
Finish Date: 2/19/2016	**Northing:** 204367.45 **Easting:** 1123114.27	**Total Depth (ft):** 467.0

DEPTH (ft)	PID (ppm)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION	Well Completion	Well Construction
0					0-433 ft bgs: See VPB 165 for Descriptions		10" Diameter Steel Casing
50							
100							Bentonite Grout
150							
200							
250							
300							4" Diameter Schedule 80 PVC Riser
350							

Resolution Consultants

Boring Log

BORING #: **RE131D1**
Sheet 2 of 2

Client: Department of the Navy, Naval Facilities Engineering Command, Mid-Atlantic		**Logged By:** V. Varricchio
Location: Oriole & Cardinal Rd, Levittown, NY		**Drilling Company:** Delta Well & Pump
Project #: 60240739	**Ground Elevation (msl):** 86.33	**Well Screen Interval (ft):** 430-450
Start Date: 2/10/2016	**Drilling Method:** Auger (0-50' bgs) Mud Rotary (>50' bgs)	**Water Level (ft):**
Finish Date: 2/19/2016	**Northing:** 204367.45 **Easting:** 1123114.27	**Total Depth (ft):** 467.0

DEPTH (ft)	PID (ppm)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION	Well Completion	Well Construction
370					0-433 ft bgs: See VPB 165 for Descriptions *(continued)*		4" Diameter Schedule 80 PVC Riser *(continued)*
372							
374							
376							
378							
380							
382							
384							
386							
388							
390							
392							
394							
396							
398							#00 Filter Sand
400							
402							
404							
406							
408							
410							
412							
414							
416							
418							#1 Filter Sand
420							
422							
424							
426							
428							
430							
432							
434	0.0		SP		Light gray (10YR 7/2) poorly graded fine SAND		
436							
438	0.0		SP-SM		Light gray (10YR 7/2) poorly graded fine SAND, few Silt		
440							4" Diameter Schedule 80 PVC, 10 Slot Well Screen (430-450 ft bgs)
442							
444	0.0		SM		Light gray (10YR 7/1) poorly graded fine SAND, little Silt		
446							
448	0.0		SP		Light gray (10YR 7/2) poorly graded fine SAND, trace Silt		
450							Sump
452							
454							
456							
458							
460							#1 Sand to Bottom
462							
464							
466							
					End of boring at 467.0 ft. bgs.		

Resolution Consultants

Boring Log

BORING #: **RE131D2**
Sheet 1 of 2

Client: Department of the Navy, Naval Facilities Engineering Command, Mid-Atlantic		**Logged By:** V. Varricchio
Location: Oriole & Cardinal Rd, Levittown, NY		**Drilling Company:** Delta Well & Pump
Project #: 60240739	**Ground Elevation (msl):** 86.25	**Well Screen Interval (ft):** **5**65-590
Start Date: 1/26/2016	**Drilling Method:** Auger (0-50' bgs) Mud Rotary (>50' bgs)	**Water Level (ft):**
Finish Date: 2/3/2016	**Northing:** 204359.42 **Easting:** 1123099.42	**Total Depth (ft):** 607.0

DEPTH (ft)	PID (ppm)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION	Well Completion	Well Construction
0					0-568 ft bgs: See VPB 165 for Descriptions		10" Diameter Steel Casing
50							
100							
150							
200							Bentonite Grout
250							
300							
350							
400							
450							4" Diameter Schedule 80 PVC Riser

Resolution Consultants

Boring Log

BORING #: **RE131D2**
Sheet 2 of 2

Client: Department of the Navy, Naval Facilities Engineering Command, Mid-Atlantic		**Logged By:** V. Varricchio
Location: Oriole & Cardinal Rd, Levittown, NY		**Drilling Company:** Delta Well & Pump
Project #: 60240739	**Ground Elevation (msl):** 86.25	**Well Screen Interval (ft):** 565-590
Start Date: 1/26/2016	**Drilling Method:** Auger (0-50' bgs) Mud Rotary (>50' bgs)	**Water Level (ft):**
Finish Date: 2/3/2016	**Northing:** 204359.42 **Easting:** 1123099.42	**Total Depth (ft):** 607.0

DEPTH (ft)	PID (ppm)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION	Well Completion	Well Construction
490–606					0-568 ft bgs: See VPB 165 for Descriptions *(continued)*		4" Diameter Schedule 80 PVC Riser *(continued)*
							#00 Filter Sand
							#1 Filter Sand
568–570	0.0		SW		Very pale brown (10YR 8/5), well graded fine to medium SAND, trace Silt		
572–576	0.0		SP		Pale brown (2.5Y 7/4), poorly graded medium SAND		
578–582	0.0		SP		Light gray (10YR 7/1), poorly graded fine SAND		4" Diameter Schedule 80 PVC, 10 Slot Well Screen (565-590 ft bgs)
584–586	0.0				No Recovery		
588–590	0.0		SW		Light gray (10YR 7/1), well graded fine to medium SAND		
							Sump
							#1 Sand to Bottom
					End of boring at 607.0 ft. bgs.		

Resolution Consultants

Boring Log

BORING #: **RE131D3**
Sheet 1 of 2

Client: Department of the Navy, Naval Facilities Engineering Command, Mid-Atlantic		**Logged By:** V. Varricchio
Location: Oriole & Cardinal Rd, Levittown, NY		**Drilling Company:** Delta Well & Pump
Project #: 60240739	**Ground Elevation (msl):** 86.22	**Well Screen Interval (ft):** 660-680
Start Date: 2/25/2016	**Drilling Method:** Auger (0-50' bgs) Mud Rotary (>50' bgs)	**Water Level (ft):**
Finish Date: 3/7/2016	**Northing:** 204350.99 **Easting:** 1123115.19	**Total Depth (ft):** 697.0

DEPTH (ft)	PID (ppm)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION	Well Completion	Well Construction
0					0-663 ft bgs: See VPB 165 for Descriptions		10" Diameter Steel Casing
50							
100							
150							
200							Bentonite Grout
250							
300							
350							
400							
450							
500							4" Diameter Schedule 80 PVC Riser
550							

Resolution Consultants

Boring Log

BORING #: **RE131D3**
Sheet 2 of 2

Client: Department of the Navy, Naval Facilities Engineering Command, Mid-Atlantic		**Logged By:** V. Varricchio
Location: Oriole & Cardinal Rd, Levittown, NY		**Drilling Company:** Delta Well & Pump
Project #: 60240739	**Ground Elevation (msl):** 86.22	**Well Screen Interval (ft):** 660-680
Start Date: 2/25/2016	**Drilling Method:** Auger (0-50' bgs) Mud Rotary (>50' bgs)	**Water Level (ft):**
Finish Date: 3/7/2016	**Northing:** 204350.99 **Easting:** 1123115.19	**Total Depth (ft):** 697.0

DEPTH (ft)	PID (ppm)	Formation	USCS	GRAPHIC LOG	MATERIAL DESCRIPTION	Well Completion	Well Construction
598					0-663 ft bgs: See VPB 165 for Descriptions *(continued)*		4" Diameter Schedule 80 PVC Riser *(continued)*
600							
602							
604							
606							
608							
610							
612							
614							
616							
618							
620							
622							
624							
626							#00 Filter Sand
628							
630							
632							
634							
636							
638							
640							
642							
644							
646							
648							#1 Filter Sand
650							
652							
654							
656							
658							
660							
662							
664	0.0		SP		White (10YR 8/1), poorly graded fine SAND		
666							
668	0.0		GW		Light Gray (10YR 7/2), well graded fine to coarse subangular GRAVEL with some well graded medium to coarse subangular Sand		4" Diameter Schedule 80 PVC, 10 Slot Well Screen (660-680 ft bgs)
670							
672							
674	0.0		SM		Light gray (10YR 7/1), poorly graded fine SAND with some Silt		
676							
678	0.0		SM		Light gray (10YR 7/2) SILT with little fine Sand		
680							
682							Sump
684							
686							
688							
690							#1 Sand to Bottom
692							
694							
696							
					End of boring at 697.0 ft. bgs.		

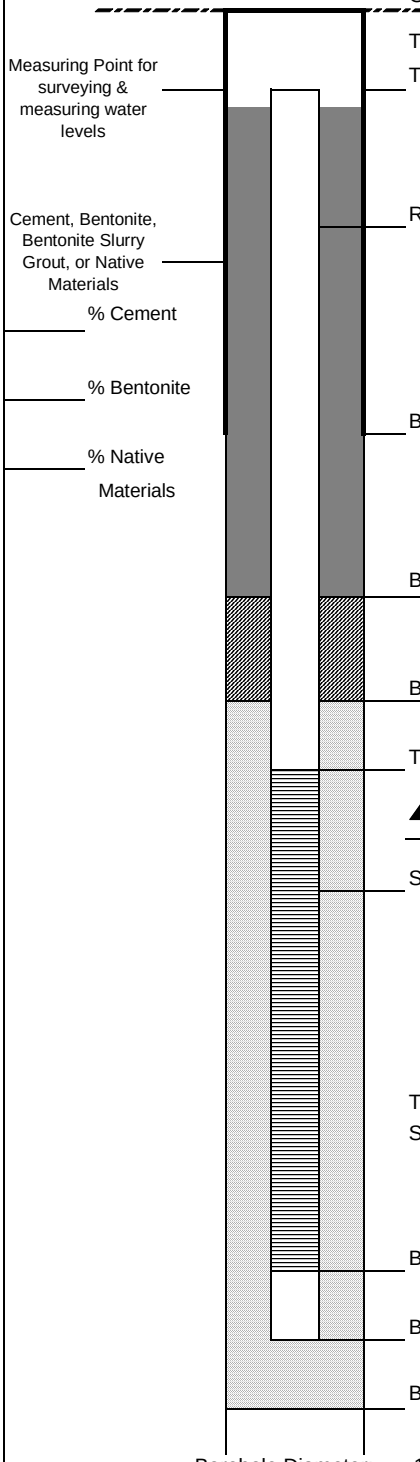
Section 2

Monitoring Well Construction Logs

RESOLUTION CONSULTANTS	Client: NAVFAC	Project Number: 60266526	***WELL ID: RE131D1***
	Site Location: NWIRP BETHPAGE, NY		
	Well Location: Oriole & Cardinal Rd, Levittown, NY		Date Installed: 2/10/2016 - 2/19/2016 *
	Method: MUD ROTARY		Inspector: V. Varricchio
	Coords: Northing: 204367.45 Easting: 1123114.27		Contractor: DELTA WELL & PUMP

MONITORING WELL CONSTRUCTION DETAIL

* Casing installed with Auger rig 1/18/16 - 1/19/16



	Depth from G.S. (feet)	Elevation(feet) Datum
Ground Surface (G.S.)	0.00	86.33
Top of 12 inch diameter Steel Curb Box		
Top of Riser Pipe fit with locking j-plug	0.39	85.94
Riser Pipe:		
Length: 430		
Inside Diameter (ID): 4 inch		
Type of Material: PVC		
Bottom of 10 inch diameter Steel Surface Casing	54	32.3
Bottom of Bentonite Grout	390	-303.7
Bottom of #00 Filter Sand/Top of #1 Filter Sand	405	-318.7
Top of Screen	430	-343.7
▲ Stabilized Water Level		
Screen:		
Length: 20		
Inside Diameter (ID): 4 inch		
Slot Size: 10		
Type of Material: PVC		
Type/Size of Sand: #1		
Sand Pack Thickness: 62		
Bottom of Screen	450	-363.7
Bottom of Sump:	455	-368.7
Bottom of Borehole	467	-380.7

Borehole Diameter: 10 inch

Approved: _____ Signature _____ Date

Describe Measuring Point: Ground Surface

RESOLUTION CONSULTANTS	Client: NAVFAC	Project Number: 60266526	***WELL ID: RE131D2***
	Site Location: NWIRP BETHPAGE, NY		
	Well Location: Oriole & Cardinal Rd, Levittown, NY		Date Installed: 1/26/2016 - 2/3/2016 *
	Method: MUD ROTARY		Inspector: V Varricchio
	Coords: Northing: 204359.42	Easting: 1123099.42	Contractor: DELTA WELL & PUMP

MONITORING WELL CONSTRUCTION DETAIL

* Casing installed with Auger rig 1/14/16 - 1/15/16

		Depth from G.S. (feet)	Elevation(feet) Datum
Ground Surface (G.S.)		0.00	86.25
Top of 12 inch diameter Steel Curb Box			
Top of Riser Pipe fit with locking j-plug		0.53	85.72
Riser Pipe:			
Length	565		
Inside Diameter (ID)	4 inch		
Type of Material	PVC		
Bottom of 10 inch diameter Steel Surface Casing		54	32.3
Bottom of Bentonite Grout		510	-423.8
Bottom of #00 Filter Sand/Top of #1 Filter Sand		530	-443.8
Top of Screen		565	-478.8
▲ Stabilized Water Level			
Screen:			
Length	25		
Inside Diameter (ID)	4 inch		
Slot Size	10		
Type of Material	PVC		
Type/Size of Sand	#1		
Sand Pack Thickness	77		
Bottom of Screen		590	-503.8
Bottom of Sump:		595	-508.8
Bottom of Borehole		607	-520.8

Borehole Diameter: 10 inch

Approved:

Describe Measuring Point:

Ground Surface

Signature

Date

RESOLUTION CONSULTANTS	Client: NAVFAC	Project Number: 60266526	***WELL ID: RE131D3***
	Site Location: NWIRP BETHPAGE, NY		
	Well Location: Oriole & Cardinal Rd, Levittown, NY		Date Installed: 2/25/2016 - 3/7/2016 *
	Method: MUD ROTARY		Inspector: V. Varricchio
	Coords: Northing: 204350.99	Easting: 1123115.19	Contractor: DELTA WELL & PUMP

MONITORING WELL CONSTRUCTION DETAIL

* Casing installed with Auger rig 2/22/16 - 2/23/16

	Depth from G.S. (feet)	Elevation(feet) Datum
Ground Surface (G.S.)	0.00	86.22
Top of 12 inch diameter Steel Curb Box		
Top of Riser Pipe fit with locking j-plug	0.32	85.90
Riser Pipe:		
Length: 660		
Inside Diameter (ID): 4 inch		
Type of Material: PVC		
Bottom of 10 inch diameter Steel Surface Casing	53	33.2
Bottom of Bentonite Grout	618	-531.8
Bottom of #00 Filter Sand/Top of #1 Filter Sand	635	-548.8
Top of Screen	660	-573.8
▲ Stabilized Water Level		
Screen:		
Length: 20		
Inside Diameter (ID): 4 inch		
Slot Size: 10		
Type of Material: PVC		
Type/Size of Sand: #1		
Sand Pack Thickness: 62		
Bottom of Screen	680	-593.8
Bottom of Sump:	685	-598.8
Bottom of Borehole	697	-610.8

Borehole Diameter: 10 inch

Approved:

Describe Measuring Point:

Ground Surface

Signature

Date

Section 3

Groundwater Sample Log Sheets

Well ID: RE13101

Low Flow Ground Water Sample Collection Record

Client: NWIRP - Bethpage Date: 4-21-16 Time: Start 1230 am/pm
Project No: 60266526 Finish 1530 am/pm
Site Location:
Weather Conds: Sunny 70 Collector(s):

1. WATER LEVEL DATA: (measured from Top of Casing)

a. Total Well Length 455 c. Length of Water Column 418.47 (a-b)

Casing Diameter/Material 4" pvc

b. Water Table Depth 36.53 d. Calculated System Volume (see back)

2. WELL PURGE DATA

a. Purge Method: Low Flow

b. Acceptance Criteria defined (see workplan)

- Temperature	3%	-D.O.	10%
- pH	± 1.0 unit	- ORP	± 10mV
- Sp. Cond.	3%	- Drawdown	< 0.3'

c. Field Testing Equipment used: Make YSI Model MPS 556 Serial Number U65715X
Horiba

Time (24hr)	Volume Removed (Liters)	Temp. (°C)	pH	Spec. Cond. (µS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Drawdown (feet)	Color/Odor
1300								500		OH
1315		16.57	5.22	0.141	6.26	260.9		500		
1320		16.45	5.39	0.131	5.62	262.1	32.8	500	36.60	clear
1325		16.45	5.42	0.134	5.74	260.1	13.3	500	36.60	clear
1330		16.28	5.41	0.133	4.26	259.7	14.1	500	36.60	"
1345	5 gal	16.10	5.45	0.132	3.54	253.3	17.8	500	36.60	"
1350		16.12	5.47	0.133	3.41	253.7	20.2	500	36.60	"

(continued on back)

d. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☒	☐	☐
Has required turbidity been reached	☒	☐	☐
Have parameters stabilized	☒	☐	☐

If no or N/A - Explain below.

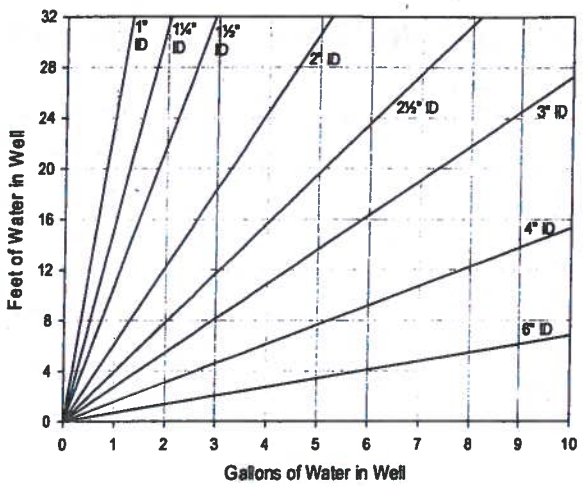
3. SAMPLE COLLECTION: Method: Bladder pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis Req.	Time
RE13101-GW-042116	1L	2	—	1,4 Dioxane	1430
RE13101-GW-042116	40mL	3	HCl	VOCs	1430
DUPLICATE COLLECTED HERE					1530

Comments Pump hit bottom

Signature Date 4/21/16

Purge Volume Calculation



Volume / Linear Ft. of Pipe		
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

1 screen volume

15 ft = 37.1 L / 9.8 G
20 ft = 49.6 L / 13.1 G
25 ft = 61.7 L / 16.3 G

Well ID: RE131D1

(continued from front)

Time (24 hr)	Volume Removed (Liters)	Temp (°C)	pH	Spec. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
1355		16.23	5.48	0.134	3.23	252.5	16.9	500	36.60	clear / none
1400		16.23	5.49	0.134	3.44	252.5	18.7	500	36.60	"
1405	10 gal	16.22	5.50	0.134	7.20	251.7	17.4	500	36.60	"
1410		16.05	5.50	0.135	3.00	250.8	19.1	500	36.60	"
1415		15.90	5.51	0.134	2.89	249.3	22.2	500	36.60	"
1420		15.85	5.51	0.133	2.85	247.3	22.0	500	36.61	"
1425	13.5 gal	15.98	5.50	0.134	2.72	248.5	23.1	500	36.62	"

Well ID: RE1310 2

Low Flow Ground Water Sample Collection Record

Client: NWIRP - Bethpage Date: 4-21-16 Time: Start 1230 am/pm
Project No: 60266526 Finish 1530 am/pm
Site Location: Municipal Parking lot
Weather Conds: Sunny, 70° Collector(s): FB

1. WATER LEVEL DATA: (measured from Top of Casing)

a. Total Well Length 580 c. Length of Water Column _____ (a-b)

b. Water Table Depth 37.17 d. Calculated System Volume (see back) _____

Casing Diameter/Material 4" PVC

2. WELL PURGE DATA

a. Purge Method: Low flow

b. Acceptance Criteria defined (see workplan)

- Temperature	3%	-D.O.	10%
- pH	± 1.0 unit	- ORP	± 10mV
- Sp. Cond.	3%	- Drawdown	< 0.3'

c. Field Testing Equipment used:

Make	Model	Serial Number
YSI	556	6424410

Time (24hr)	Volume Removed (Liters)	Temp. (°C)	pH	Spec. Cond. (µS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Drawdown (feet)	Color/Odor
1320	Start purge.								37.22	
1325	~~5.5~~	15.50	5.34	75	9.80	180.5	23.9	600	37.27	Clear
1330	-	15.22	5.16	74	8.92	178.9	-	700	37.24	Clear.
1335	-	15.20	5.03	74	8.62	182.7	10.6	700	37.27	
1340	-	15.20	5.46	81	~~7~~ 8.89	167.6	-	-	-	Clear
1345	5 Gal	15.02	5.40	80	7.07	174.8	142	700	37.30	
1350	-	15.02	5.40	80	6.83	176.4	184	700	37.27	

(continued on back)

d. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☑	☐	☐
Has required turbidity been reached	☑	☐	☐
Have parameters stabilized	☑	☐	☐

If no or N/A - Explain below.

_____

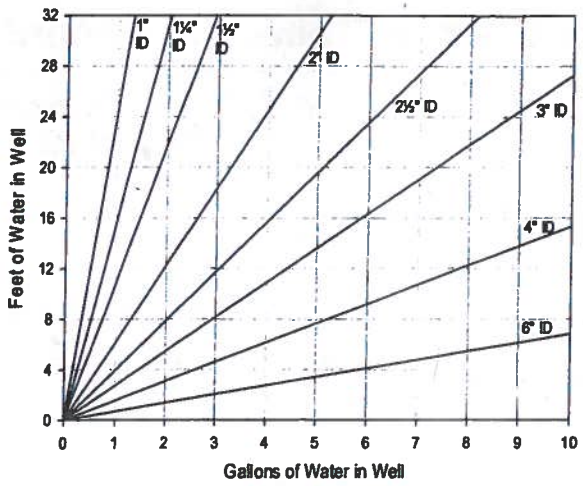
3. SAMPLE COLLECTION: Method: _____

Sample ID	Container Type	No. of Containers	Preservation	Analysis Req.	Time
~~FD~~					1450
RE1310 2-GW-042116	VOA	(3)	HCl	VOC	
RE1310 2-GW-042116	1L Amber	(2)	-	1,4-Dioxane	

Comments 25' Screen

Signature Farrell Bell Date 4/21/16

Purge Volume Calculation



Volume / Linear Ft. of Pipe		
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

1 screen volume

15 ft = 37.1 L / 9.8 G
20 ft = 49.6 L / 13.1 G
25 ft = 61.7 L / 16.3 G

Well ID:

(continued from front)

Time (24 hr)	Volume Removed (Liters)	Temp (°C)	pH	Spec. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
1400	—	14.97	5.42	81	6.35	176.6	—	700	37.30	Cloudy
1405	10 Gal	14.96	5.43	82	6.32	176.8	176	700	37.29	
1410	—	14.92	5.44	81	6.24	176.8	170	700	37.30	
1415	-	14.87	5.46	82	5.80	176.0	—	700	37.30	
1420	-	14.88	5.48	82	5.62	175.3	158	700	—	
1425	-	14.90	5.49	84	5.44	174.4	146	700	37.27	
1430		14.92	5.32	84	5.20	169.8	133	700	37.31	
1435	15 Gal	14.93	5.52	84	5.52	168.2	128	700	37.30	
1440	—	14.92	5.53	84	~~5.55~~ 4.25	165.8	—	700	—	
1445	17 Gal	14.87	5.53	84	4.86	163.2	118	700	37.32	
1450	Sample Time									

Well ID: RE13103

Low Flow Ground Water Sample Collection Record

Client: NWIRP - Bethpage Date: 4-21-16 Time: Start 1230 am/pm
Project No: 60266526 Finish 1530 am/pm
Site Location: Municipal Parking lot
Weather Conds: Sunny 70° Collector(s): _____

1. WATER LEVEL DATA: (measured from Top of Casing)

a. Total Well Length 675 c. Length of Water Column _____ (a-b)

Casing Diameter/Material: 4-inch PVC 20ft

b. Water Table Depth 37.62 d. Calculated System Volume (see back) 13 l gal

2. WELL PURGE DATA

a. Purge Method: _____

b. Acceptance Criteria defined (see workplan)

- Temperature	3%	-D.O.	10%
- pH	± 1.0 unit	- ORP	± 10mV
- Sp. Cond.	3%	- Drawdown	< 0.3'

c. Field Testing Equipment used:

	Make	Model	Serial Number
	YSI	556	11832538
	Hanna	98703	11639840

Time (24hr)	Volume Removed (Liters)	Temp. (°C)	pH	Spec. Cond. (µS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Drawdown (feet)	Color/Odor
1250								400		OH
1300		17.78	5.41	0.053	7.38	280.8			37.65	
1315		18.16	5.22	0.051	6.52	291.2				
1320		18.52	5.34	0.051	6.36	284.7			37.67	
1325		19.01	5.54	0.051	6.33	281.0	46.6			
1330		19.76	5.30	0.050	6.62	287.5		400	37.69	
1335		17.95	5.23	0.048	6.52	289.5				

(continued on back)

d. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☒	☐
Has required turbidity been reached	☑	☐	☐
Have parameters stabilized	☑	☐	☐

If no or N/A - Explain below.

2 hour purge limit, could not get flow rate above 350 ml/min

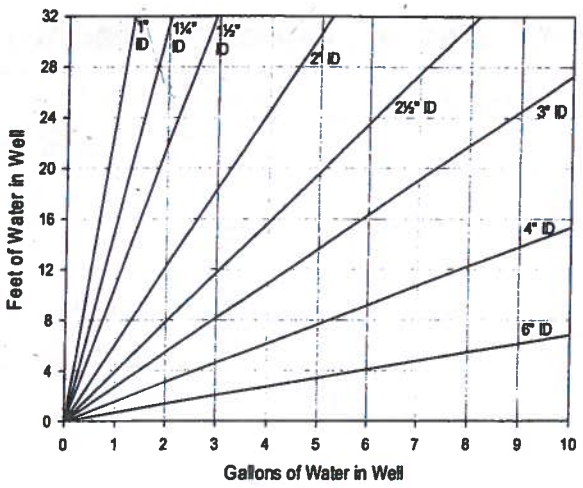
3. SAMPLE COLLECTION: Method: _____

Sample ID	Container Type	No. of Containers	Preservation	Analysis Req.	Time
RE13103-GW-042116	40ml	3	HCl	VOCs	1500
	1 liter amber	2	none	1,4 Dioxane	1500

Comments _____

Signature Paul Kauth Date 4/21/16

Purge Volume Calculation



Volume / Linear Ft. of Pipe		
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

1 screen volume

15 ft = 37.1 L / 9.8 G
20 ft = 49.6 L / 13.1 G
25 ft = 61.7 L / 16.3 G

Well ID: RE13103 1250 1450

(continued from front)

Time (24 hr)	Volume Removed (Liters)	Temp (°C)	pH	Spec. Cond. (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Depth to water (ft)	Color/Odor
1340		17.91	5.17	0.046	6.48	289.6	56.4	400	37.72	
1345		17.81	5.11	0.045	6.42	293.0	30.3		37.71	
1350		17.73	5.10	0.044	6.39	294.8	12.8			
1355	5gal	17.72	5.07	0.044	6.33	295.7	12.7		37.73	
1400		17.82	5.07	0.043	6.33	297.6	8.02			
1405		17.89	5.05	0.043	6.30	299.7	6.17	~~400~~	37.74	
1410		17.74	5.04	0.043	6.30	300.0	5.13	350		
1415		17.42	5.03	0.043	6.39	304.9	6.15		37.72	
1420		17.37	5.08	0.043	6.14	300.4	5.70	350		
1425		17.56	5.09	0.043	6.13	299.5	4.41		37.73	
1430		17.73	5.07	0.043	6.12	299.6	4.09			
1435		17.84	5.08	0.043	6.07	300.1	7.61			
1440		17.77	5.05	0.043	6.08	302.5	3.23	350	37.73	
1445	10gal	17.69	5.04	0.043	6.12	302.9	2.62			
1450		17.33	5.03	0.042	6.27	305.2	3.10			
1455	11gal	17.12	5.03	0.042	6.29	304.4	2.59	350	37.74	
1500										Sample

Section 4

Analytical Data Validation

DATA VALIDATION REPORT

Project:	Regional Groundwater Investigation — NWIRP Bethpage	
Laboratory:	Katahdin Analytical	
Sample Delivery Group:	SJ2726	
Analyses/Method:	Volatile Organic Compounds by U.S. EPA SW-846 Method 8260C 1,4-Dioxane by U.S. EPA SW-846 Method 8270D via Selective Ion Monitoring (SIM)	
Validation Level:	3	
Project Number:	0888812477.SA.DV	
Prepared by:	Dana Miller/Resolution Consultants	Completed on: 05/31/2016
Reviewed by:	Tina Cantwell/Resolution Consultants	File Name: SJ2726_8260C_8270D

SUMMARY

This report summarizes data review findings for samples listed below, collected by Resolution Consultants from the Regional Groundwater Investigation — NWIRP Bethpage Site on 21 April 2016 in accordance with the following Sampling and Analysis Plans:

- *Sampling and Analysis Plan, Bethpage, New York.* (Resolution Consultants, April 2013).
- *UFP SAP Addendum, Installation of Vertical Profile Borings and Monitoring Wells, Operable Unit 2, NWIRP Bethpage, New York.* (Resolution Consultants, November 2013).
- *UFP SAP Addendum, Inclusion of Additional Target Analytes for Volatile Organics Analyses, NWIRP Bethpage OU2, Bethpage, New York*. (Resolution Consultants, August 2014).

Sample ID	Matrix/Sample Type	Analysis
DUPLICATE-042116	Duplicate of RE131D1-GW-042116	8260C, 8270D_SIM
FB03-042116	Field Blank	8260C, 8270D_SIM
RE126D1-GW-042116	Groundwater	8260C, 8270D_SIM
RE126D2-GW-042116	Groundwater	8260C, 8270D_SIM
RE126D3-GW-042116	Groundwater	8260C, 8270D_SIM
RE131D1-GW-042116	Groundwater	8260C, 8270D_SIM
RE131D2-GW-042116	Groundwater	8260C, 8270D_SIM
RE131D3-GW-042116	Groundwater	8260C, 8270D_SIM
TRIP BLANK 042116	Trip Blank	8260C

Data validation activities were conducted using the following guidance documents: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846, specifically Method 8260C, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry* (United States Environmental Protection Agency [U.S. EPA] 2006), *SW-846 Method 8270D, Semi volatile Organic Compounds by Gas Chromatograph/Mass Spectrometry* (U.S. EPA 2007), *U.S. Environmental Protection Agency Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (U.S. EPA, June 2008), and *Department of Defense Quality Systems Manual for Environmental Laboratories*, Version 4.2 (October 2010). In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements, and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

✓	Data completeness (chain-of-custody) / sample integrity
✓	Holding times and sample preservation
✓	Gas chromatography/Mass spectrometer performance checks
✗	Initial calibration (ICAL) / initial calibration verification (ICV) / continuing calibration verification (CCV)
✗	Laboratory blanks / trip blanks / field blanks
✓	Surrogate spike recoveries
✗	Matrix spike and/or matrix spike duplicate results
✓	Laboratory control sample / laboratory control sample duplicate results
✓	Field duplicates
✓	Internal standards
✓	Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Acceptable data parameters for which all criteria were met and no qualification was performed, and non-conformance or other issues that were noted during validation, but did not result in qualification of data are not discussed further. The symbol (*X*) indicates that a QC non-conformance resulted in the qualification of data. Any QC non-conformance that resulted in the qualification of data is discussed below.

RESULTS

Initial Calibration / Initial Calibration Verification / Continuing Calibration Verification

The ICAL is evaluated to ensure that the instrument was capable of producing acceptable quantitative data prior to the analysis of environmental samples. The ICV is evaluated to assess the accuracy of the ICAL standards. The CCV is evaluated to determine whether the instrument was within acceptable calibration throughout the period in which samples were analyzed.

Calibration data were reviewed for conformance with the QC acceptance criteria to ensure that:

- The ICAL percent relative standard deviation, correlation coefficient/coefficient of determination, and/or response factor method acceptance criteria were met
- The ICV standard percent recovery acceptance criteria were met
- The CCV method percent difference or percent drift and response factor acceptance criteria were met
- The retention time method acceptance criteria were met

Data qualification to the analytes associated with the specific ICAL was as follows:

ICAL Linearity Non-conformance:

Criteria	Actions	
	Detected Results	Non-detected Results
%RSD >15% and quantitation based on mean response factor	J	UJ

Notes:

%RSD = Relative standard deviation
J = Estimated
UJ = Undetected and estimated

Data qualification to the analytes associated with the specific ICV was as follows:

ICV Recovery Non-conformance:

Criteria	Actions	
	Detected Results	Non-detected Results
Recovery >120%	J	UJ
Recovery < 80%	J	UJ

Notes:
J = Estimated
UJ = Undetected and estimated

Data qualification to the analytes associated with the specific CCV was as follows:

CCV Linearity Non-conformance:

Criteria	Actions	
	Detected Results	Non-detected Results
%Difference or %Drift > 20%	J	UJ

Notes:
J = Estimated
UJ = Undetected and estimated

ICV non-conformances are summarized in Attachment A in Table A-1.

Laboratory Blanks / Trip Blanks / Field Blanks

Blanks are assessed to determine the existence and magnitude of contamination of contamination problems and measure of the representativeness of the analytical process. Laboratory blanks were analyzed with samples to assess contamination imparted by sample preparation and/or analysis. Trip blanks and field blanks help determine how much, if any, contamination was introduced in the field and laboratory activities. All results associated with a particular blank were evaluated to determine whether there was an inherent variability in the data, or if a problem was an isolated occurrence that did not affect the data. Samples were flagged in accordance with *Functional Guidelines* (shown below) where detections were not believed to be site-related.

Blank Non-conformance Charts:

For common lab contaminants (methylene chloride, acetone, 2-butanone):			
Blank type	**Blank result**	**Sample result**	**Action for samples**
Method, Storage, Trip, Field, or Equipment	Detects	Not detected	No qualification
	≤ 2x LOQ	< 2x LOQ	Report sample LOQ value with a U
		≥ 2x LOQ and ≤ 4x the LOQ	Report the sample result with a U**
		≥ 4x the LOQ	No qualifications
	> 2x LOQ	< LOD	Report sample LOD value with a U**
		≥ LOD and < 2x LOQ	Report sample LOQ value with a U
		≥ 2x LOQ and < blank contamination	Report the blank result with a U or reject the sample result as unusable R
		≥ 2x LOQ and ≥ blank contamination	If the result is ≤2x blank result, report the sample result U.** If the result is > 2x blank result, no qualification is required.**
****Based on Resolution Consultants professional judgment**			

Notes:

LOQ	=	Limit of quantitation
LOD	=	Limit of detection
U	=	Undetected
R	=	Rejected

Lab blank, trip blank, and field blank non-conformances are summarized in Attachment A in Table A-2.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results

MS/MSDs are generated to provide information about the effect of each sample matrix on the sample preparation and the measurement methodology. MS/MSD percent recoveries (%Rs) assess the effect of the sample matrix on the accuracy of the analytical results and %Rs above the laboratory control limit could indicate a potential high result bias while %Rs below QC limits could indicate a potential low result bias. The relative percent differences (RPDs) between the MS and MSD results are evaluated to assess sample precision. The MS/MSD %Rs and RPDs were reviewed for conformance with the QC acceptance criteria. Data qualification to the analytes associated with the specific MS/MSD non-conformances were as follows:

MS/MSD Non-conformances Chart:

Criteria	Action	
	Detected Compounds	Non-detected Compounds
%R>Upper Limit	J	No qualification
20% ≤ %R < Lower Limit	J	UJ
%R <20%	J	Rejected

Notes:

%R	=	Percent recovery
RPD	=	Relative percent difference
J	=	Estimated
UJ	=	Undetected and estimated

MS/MSD non-conformances are summarized in Attachment A in Table A-3.

Qualifications Actions

The data were reviewed independently from the laboratory to assess data quality. All analytes detected at concentrations less than the limit of quantitation but greater than the method detection limit were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation. Data not qualified during data review are considered usable by the project. Any sample that was analyzed at a dilution because of high concentrations of target or non-target analytes was checked to confirm that the results and/or sample-specific limit of quantitation and limit of detections were adjusted accordingly by the laboratory. The remaining results qualified as estimated may be high or low, but the data are usable for their intended purpose, according to U.S. EPA and Department

of Defense guidelines. Final data review qualifiers used to describe results and how they should be interpreted by the end data user are provided in Attachment B and Attachment C. Attachment D provides final results after data review.

ATTACHMENTS

Attachment A: Non-Conformance Summary Tables
Attachment B: Qualifier Codes and Explanations
Attachment C: Reason Codes and Explanations
Attachment D: Final Results after Data Review

Attachment A
Non-Conformance Summary Table

Table A-1
Initial Calibration Verification Non-Conformance

Analyte	ICV ID	%R	Limit	Associated Samples	Lab ID	Qualifier
DICHLORODIFLUOROMETHANE	P5447A	73.49	80-120	RE126D1-GW-042116	SJ2726-2	Non-detects: UJ
DICHLORODIFLUOROMETHANE	P5447A	73.49	80-120	RE126D2-GW-042116	SJ2726-3	Non-detects: UJ
DICHLORODIFLUOROMETHANE	P5447A	73.49	80-120	FB03-042116	SJ2726-5	Non-detects: UJ
DICHLORODIFLUOROMETHANE	P5447A	73.49	80-120	RE131D1-GW-042116	SJ2726-6	Non-detects: UJ
DICHLORODIFLUOROMETHANE	P5447A	73.49	80-120	RE131D2-GW-042116	SJ2726-7	Non-detects: UJ
ACETONE	P5447A	128.63	80-120	RE126D1-GW-042116	SJ2726-2	Non-detects: UJ
ACETONE	P5447A	128.63	80-120	RE126D2-GW-042116	SJ2726-3	Non-detects: UJ
ACETONE	P5447A	128.63	80-120	FB03-042116	SJ2726-5	Detects: J
ACETONE	P5447A	128.63	80-120	RE131D1-GW-042116	SJ2726-6	Detects: J
ACETONE	P5447A	128.63	80-120	RE131D2-GW-042116	SJ2726-7	Non-detects: UJ
DICHLORODIFLUOROMETHANE	T7138A	78.07	80-120	TRIP BLANK 042116	SJ2726-1	Non-detects: UJ
DICHLORODIFLUOROMETHANE	T7138A	78.07	80-120	DUPLICATE-042116	SJ2726-9	Non-detects: UJ
DICHLORODIFLUOROMETHANE	T7138A	78.07	80-120	RE126D3-GW-042116	SJ2726-4RA	Non-detects: UJ
DICHLORODIFLUOROMETHANE	T7138A	78.07	80-120	RE131D3-GW-042116	SJ2726-8RA	Non-detects: UJ
ACETONE	T7138A	152.32	80-120	TRIP BLANK 042116	SJ2726-1	Detects: J
ACETONE	T7138A	152.32	80-120	DUPLICATE-042116	SJ2726-9	Non-detect: UJ
ACETONE	T7138A	152.32	80-120	RE126D3-GW-042116	SJ2726-4RA	Non-detects: UJ
ACETONE	T7138A	152.32	80-120	RE131D3-GW-042116	SJ2726-8RA	Non-detects: UJ

Notes:
ICV ID = Initial calibration verification identification
%R = Percent recovery
UJ = Qualified non-detect and estimated
J = Detected analytes qualified estimated

Table A-2
Blank Non-Conformance

Blank ID	Analyte	Blank Result (UG_L)	LOQ	Detected Associated Sample	Qualifier
WG182433-9	METHYLENE CHLORIDE	1.9	5.0	FB03-042116	UJ
FB03-042116	ACETONE	6.0	5.0	DUPLICATE-042116	UJ
FB03-042116	ACETONE	6.0	5.0	RE126D1-GW-042116	UJ
FB03-042116	ACETONE	6.0	5.0	RE126D2-GW-042116	UJ
FB03-042116	ACETONE	6.0	5.0	RE126D3-GW-042116	UJ
FB03-042116	ACETONE	6.0	5.0	RE131D2-GW-042116	UJ
FB03-042116	ACETONE	6.0	5.0	RE131D3-GW-042116	UJ
TRIP BLANK 042116	ACETONE	7.6	5.0	DUPLICATE-042116	UJ
TRIP BLANK 042116	ACETONE	7.6	5.0	RE126D1-GW-042116	UJ
TRIP BLANK 042116	ACETONE	7.6	5.0	RE126D2-GW-042116	UJ
TRIP BLANK 042116	ACETONE	7.6	5.0	RE126D3-GW-042116	UJ
TRIP BLANK 042116	ACETONE	7.6	5.0	RE131D2-GW-042116	UJ
TRIP BLANK 042116	ACETONE	7.6	5.0	RE131D3-GW-042116	UJ

Notes:
UG_L = Micrograms per liter
LOQ = Limit of quantitation
UJ = Analyte qualified as non-detect and estimated due to blank contamination.

Table A-3
Matrix Spike / Matrix Spike Duplicate Non-Conformance

Spiked Sample	Analyte	Sample Result (UG_L)	Spike Added	MS %R	MSD %R	%R Limits	Qualifier
RE126D2-GW-042116	1,4-DIOXANE	3.7	2.10	68.9	**106***	10 – 90	J
RE126D2-GW-042116	CARBON TETRACHLORIDE	< 0.50	50.0	66.6	**61.2***	65 - 140	UJ

Notes:

UG_L = Micrograms per liter
MS = Matrix spike
MSD = Matrix spike duplicate
%R = Percent recovery
Bold* = Percent recovery not within control limit
J = Detected analyte in associated sample qualified as estimated because the MSD %R is greater than the control limit.
UJ = Analyte in associated sample qualified non-detect and estimated “UJ” because the MSD %R is lower than the control limit.

Attachment B
Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual quantitation limit necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

Attachment C
Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
bm	Missing blank information
bt	Trip blank contamination
c	Calibration issue
cr	Chromatographic resolution
d	Reporting limit raised due to chromatographic interference
dt	Dissolved result > total over limit
e	Ether interference
ej	Above calibration range; result estimated.
f	Presumed contamination from FB or ER.
fd	Field duplicate RPDs
h	Holding times
hs	Headspace greater than 6mm in all sample vials
i	Internal standard areas
ii	Injection internal standard area or retention time exceedance
it	Instrument tune
k	Estimated maximum possible concentrations (EMPC)
l	LCS recoveries
lc	Labeled compound recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
mc	Deviation from the method
md	MS/MSD RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
p-h	Uncertainty near detection limit (< Reporting Limit), historical reason code applied.
pe	Post Extraction Spike
q	Quantitation issue
r	Dual column RPD
rt	SIM ions not within + 2 seconds
s	Surrogate recovery
sp	Sample preparation issue
su	Evidence of ion suppression
t	Temperature Preservation Issue
x	Low % solids
y	Serial dilution results
z	ICS results

Attachment D
Final Results after Data Review

SJ2726
Final Results after Data Review
NWIRP Bethpage OU 2 Regional Groundwater Investigation

		Sample Delivery Group		SJ2726		
		Lab ID		SJ2726-1		
		Sample ID		TRIP BLANK 042116		
		Sample Date		4/21/2016		
		Sample Type		Trip Blank		
Method	**Analyte**	**CAS No**	**Units**	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG_L	0.5	U	
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	U	
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	U	
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.5	U	
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	1	U	
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	U	
8260C	2-BUTANONE	78-93-3	UG_L	2.5	U	
8260C	2-HEXANONE	591-78-6	UG_L	2.5	U	
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	U	
8260C	ACETONE	67-64-1	UG_L	7.6	J	c
8260C	BENZENE	71-43-2	UG_L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U	
8260C	BROMOFORM	75-25-2	UG_L	0.5	U	
8260C	BROMOMETHANE	74-83-9	UG_L	1	U	
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	U	
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	0.5	U	
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	U	
8260C	CHLOROETHANE	75-00-3	UG_L	1	U	
8260C	CHLOROFORM	67-66-3	UG_L	0.5	U	
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	0.5	U	
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	UJ	c
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	
8260C	STYRENE	100-42-5	UG_L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5	U	
8260C	TOLUENE	108-88-3	UG_L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG_L	0.5	U	
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	NA		

Notes:

UG_L = Micrograms per liter
NA = Not applicable
Qual = Final qualifiers (See Attachment B)
RC = Reason codes (See Attachment C)

SJ2726
Final Results after Data Review
NWIRP Bethpage OU 2 Regional Groundwater Investigation

		Sample Delivery Group		SJ2726		
		Lab ID		SJ2726-2		
		Sample ID		RE126D1-GW-042116		
		Sample Date		4/21/2016		
		Sample Type		Groundwater		
Method	**Analyte**	**CAS No**	**Units**	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG_L	0.5	U	
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	U	
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	U	
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.5	U	
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	1	U	
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	U	
8260C	2-BUTANONE	78-93-3	UG_L	2.5	U	
8260C	2-HEXANONE	591-78-6	UG_L	2.5	U	
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	U	
8260C	ACETONE	67-64-1	UG_L	2.5	UJ	bf,bt,c
8260C	BENZENE	71-43-2	UG_L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U	
8260C	BROMOFORM	75-25-2	UG_L	0.5	U	
8260C	BROMOMETHANE	74-83-9	UG_L	1	U	
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	U	
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	0.5	U	
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	U	
8260C	CHLOROETHANE	75-00-3	UG_L	1	U	
8260C	CHLOROFORM	67-66-3	UG_L	0.5	U	
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	0.5	U	
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	UJ	c
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	
8260C	STYRENE	100-42-5	UG_L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG_L	3.6		
8260C	TOLUENE	108-88-3	UG_L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG_L	33		
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	4.8		

Notes:

UG_L = Micrograms per liter
NA = Not applicable
Qual = Final qualifiers (See Attachment B)
RC = Reason codes (See Attachment C)

SJ2726
Final Results after Data Review
NWIRP Bethpage OU 2 Regional Groundwater Investigation

		Sample Delivery Group		SJ2726		
		Lab ID		SJ2726-3		
		Sample ID		RE126D2-GW-042116		
		Sample Date		4/21/2016		
		Sample Type		Groundwater		
Method	**Analyte**	**CAS No**	**Units**	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG_L	0.9	J	
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.38	J	
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	2		
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.5	U	
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	2.2		
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	U	
8260C	2-BUTANONE	78-93-3	UG_L	2.5	U	
8260C	2-HEXANONE	591-78-6	UG_L	2.5	U	
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	U	
8260C	ACETONE	67-64-1	UG_L	2.5	UJ	bf,bt,c
8260C	BENZENE	71-43-2	UG_L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U	
8260C	BROMOFORM	75-25-2	UG_L	0.5	U	
8260C	BROMOMETHANE	74-83-9	UG_L	1	U	
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	U	
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	0.5	UJ	m
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	U	
8260C	CHLOROETHANE	75-00-3	UG_L	1	U	
8260C	CHLOROFORM	67-66-3	UG_L	0.5	U	
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	2.2		
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	UJ	c
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	
8260C	STYRENE	100-42-5	UG_L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG_L	3.4		
8260C	TOLUENE	108-88-3	UG_L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG_L	500		
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	3.7	J	m

Notes:

UG_L = Micrograms per liter
NA = Not applicable
Qual = Final qualifiers (See Attachment B)
RC = Reason codes (See Attachment C)

SJ2726
Final Results after Data Review
NWIRP Bethpage OU 2 Regional Groundwater Investigation

		Sample Delivery Group		SJ2726		
		Lab ID		SJ2726-4RA		
		Sample ID		RE126D3-GW-042116		
		Sample Date		4/21/2016		
		Sample Type		Groundwater		
Method	**Analyte**	**CAS No**	**Units**	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG_L	0.84	J	
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	U	
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	U	
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.38	J	
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	1	U	
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	U	
8260C	2-BUTANONE	78-93-3	UG_L	2.5	U	
8260C	2-HEXANONE	591-78-6	UG_L	2.5	U	
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	U	
8260C	ACETONE	67-64-1	UG_L	2.5	UJ	bf,bt,c
8260C	BENZENE	71-43-2	UG_L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U	
8260C	BROMOFORM	75-25-2	UG_L	0.5	U	
8260C	BROMOMETHANE	74-83-9	UG_L	1	U	
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	U	
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	0.5	U	
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	U	
8260C	CHLOROETHANE	75-00-3	UG_L	1	U	
8260C	CHLOROFORM	67-66-3	UG_L	0.5	U	
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	0.5	U	
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	UJ	c
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	
8260C	STYRENE	100-42-5	UG_L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG_L	2.8		
8260C	TOLUENE	108-88-3	UG_L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG_L	4.6		
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	1.6		

Notes:

UG_L = Micrograms per liter
NA = Not applicable
Qual = Final qualifiers (See Attachment B)
RC = Reason codes (See Attachment C)

SJ2726
Final Results after Data Review
NWIRP Bethpage OU 2 Regional Groundwater Investigation

		Sample Delivery Group		SJ2726		
		Lab ID		SJ2726-5		
		Sample ID		FB03-042116		
		Sample Date		4/21/2016		
		Sample Type		Field Blank		
Method	**Analyte**	**CAS No**	**Units**	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG_L	0.5	U	
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	U	
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	U	
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.5	U	
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	1	U	
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	U	
8260C	2-BUTANONE	78-93-3	UG_L	2.5	U	
8260C	2-HEXANONE	591-78-6	UG_L	2.5	U	
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	U	
8260C	ACETONE	67-64-1	UG_L	6	J	c
8260C	BENZENE	71-43-2	UG_L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U	
8260C	BROMOFORM	75-25-2	UG_L	0.5	U	
8260C	BROMOMETHANE	74-83-9	UG_L	1	U	
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	U	
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	0.5	U	
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	U	
8260C	CHLOROETHANE	75-00-3	UG_L	1	U	
8260C	CHLOROFORM	67-66-3	UG_L	0.5	U	
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	0.5	U	
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	UJ	c
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	UJ	bl
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	
8260C	STYRENE	100-42-5	UG_L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG_L	0.5	U	
8260C	TOLUENE	108-88-3	UG_L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG_L	0.5	U	
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	0.2		

Notes:

UG_L = Micrograms per liter
NA = Not applicable
Qual = Final qualifiers (See Attachment B)
RC = Reason codes (See Attachment C)

SJ2726
Final Results after Data Review
NWIRP Bethpage OU 2 Regional Groundwater Investigation

		Sample Delivery Group		SJ2726		
		Lab ID		SJ2726-6		
		Sample ID		RE131D1-GW-042116		
		Sample Date		4/21/2016		
		Sample Type		Groundwater		
Method	**Analyte**	**CAS No**	**Units**	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG_L	4.4		
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	U	
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	U	
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.71	J	
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	4.1		
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	U	
8260C	2-BUTANONE	78-93-3	UG_L	2.5	U	
8260C	2-HEXANONE	591-78-6	UG_L	2.5	U	
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	U	
8260C	ACETONE	67-64-1	UG_L	2.5	UJ	c
8260C	BENZENE	71-43-2	UG_L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U	
8260C	BROMOFORM	75-25-2	UG_L	0.5	U	
8260C	BROMOMETHANE	74-83-9	UG_L	1	U	
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	U	
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	0.5	U	
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	U	
8260C	CHLOROETHANE	75-00-3	UG_L	1	U	
8260C	CHLOROFORM	67-66-3	UG_L	3.5		
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	4.1		
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	UJ	c
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	
8260C	STYRENE	100-42-5	UG_L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG_L	7.6		
8260C	TOLUENE	108-88-3	UG_L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG_L	88		
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	8.7		

Notes:

UG_L = Micrograms per liter
NA = Not applicable
Qual = Final qualifiers (See Attachment B)
RC = Reason codes (See Attachment C)

SJ2726
Final Results after Data Review
NWIRP Bethpage OU 2 Regional Groundwater Investigation

		Sample Delivery Group		SJ2726		
		Lab ID		SJ2726-7		
		Sample ID		RE131D2-GW-042116		
		Sample Date		4/21/2016		
		Sample Type		Groundwater		
Method	**Analyte**	**CAS No**	**Units**	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG_L	1	U	
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	U	
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	U	
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.5	U	
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	3.8		
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	U	
8260C	2-BUTANONE	78-93-3	UG_L	2.5	U	
8260C	2-HEXANONE	591-78-6	UG_L	2.5	U	
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	U	
8260C	ACETONE	67-64-1	UG_L	2.5	UJ	bf,bt,c
8260C	BENZENE	71-43-2	UG_L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U	
8260C	BROMOFORM	75-25-2	UG_L	0.5	U	
8260C	BROMOMETHANE	74-83-9	UG_L	1	U	
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	U	
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	0.5	U	
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	U	
8260C	CHLOROETHANE	75-00-3	UG_L	1	U	
8260C	CHLOROFORM	67-66-3	UG_L	0.5	U	
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	3.8		
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	UJ	c
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	
8260C	STYRENE	100-42-5	UG_L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG_L	6		
8260C	TOLUENE	108-88-3	UG_L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG_L	41		
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	8.2		

Notes:

UG_L = Micrograms per liter
NA = Not applicable
Qual = Final qualifiers (See Attachment B)
RC = Reason codes (See Attachment C)

SJ2726
Final Results after Data Review
NWIRP Bethpage OU 2 Regional Groundwater Investigation

		Sample Delivery Group		SJ2726		
		Lab ID		SJ2726-8RA		
		Sample ID		RE131D3-GW-042116		
		Sample Date		4/21/2016		
		Sample Type		Groundwater		
Method	**Analyte**	**CAS No**	**Units**	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG_L	91		
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	U	
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	U	
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.54	J	
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	0.24	J	
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	U	
8260C	2-BUTANONE	78-93-3	UG_L	2.5	U	
8260C	2-HEXANONE	591-78-6	UG_L	2.5	U	
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	U	
8260C	ACETONE	67-64-1	UG_L	2.5	UJ	bf,bt,c
8260C	BENZENE	71-43-2	UG_L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U	
8260C	BROMOFORM	75-25-2	UG_L	0.5	U	
8260C	BROMOMETHANE	74-83-9	UG_L	1	U	
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	U	
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	0.5	U	
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	U	
8260C	CHLOROETHANE	75-00-3	UG_L	1	U	
8260C	CHLOROFORM	67-66-3	UG_L	0.5	U	
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	0.24	J	
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	UJ	c
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	
8260C	STYRENE	100-42-5	UG_L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG_L	1.5		
8260C	TOLUENE	108-88-3	UG_L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG_L	3.8		
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	1.1		

Notes:

UG_L = Micrograms per liter
NA = Not applicable
Qual = Final qualifiers (See Attachment B)
RC = Reason codes (See Attachment C)

SJ2726
Final Results after Data Review
NWIRP Bethpage OU 2 Regional Groundwater Investigation

		Sample Delivery Group		SJ2726		
		Lab ID		SJ2726-9		
		Sample ID		DUPLICATE-042116		
		Sample Date		4/21/2016		
		Sample Type		Field Duplicate		
Method	**Analyte**	**CAS No**	**Units**	Result	Qual	RC
8260C	1,1,1-TRICHLOROETHANE	71-55-6	UG_L	0.5	U	
8260C	1,1,2,2-TETRACHLOROETHANE	79-34-5	UG_L	0.5	U	
8260C	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	UG_L	4.2		
8260C	1,1,2-TRICHLOROETHANE	79-00-5	UG_L	0.5	U	
8260C	1,1-DICHLOROETHANE	75-34-3	UG_L	0.5	U	
8260C	1,1-DICHLOROETHENE	75-35-4	UG_L	0.56	J	
8260C	1,2,4-TRICHLOROBENZENE	120-82-1	UG_L	0.5	U	
8260C	1,2-DIBROMO-3-CHLOROPROPANE	96-12-8	UG_L	0.75	U	
8260C	1,2-DIBROMOETHANE	106-93-4	UG_L	0.5	U	
8260C	1,2-DICHLOROBENZENE	95-50-1	UG_L	0.5	U	
8260C	1,2-DICHLOROETHANE	107-06-2	UG_L	0.5	U	
8260C	1,2-DICHLOROETHENE, TOTAL	540-59-0	UG_L	3.4		
8260C	1,2-DICHLOROPROPANE	78-87-5	UG_L	0.5	U	
8260C	1,3-DICHLOROBENZENE	541-73-1	UG_L	0.5	U	
8260C	1,4-DICHLOROBENZENE	106-46-7	UG_L	0.5	U	
8260C	2-BUTANONE	78-93-3	UG_L	2.5	U	
8260C	2-HEXANONE	591-78-6	UG_L	2.5	U	
8260C	4-METHYL-2-PENTANONE	108-10-1	UG_L	2.5	U	
8260C	ACETONE	67-64-1	UG_L	2.5	UJ	bf,bt,c
8260C	BENZENE	71-43-2	UG_L	0.5	U	
8260C	BROMODICHLOROMETHANE	75-27-4	UG_L	0.5	U	
8260C	BROMOFORM	75-25-2	UG_L	0.5	U	
8260C	BROMOMETHANE	74-83-9	UG_L	1	U	
8260C	CARBON DISULFIDE	75-15-0	UG_L	0.5	U	
8260C	CARBON TETRACHLORIDE	56-23-5	UG_L	0.5	U	
8260C	CHLOROBENZENE	108-90-7	UG_L	0.5	U	
8260C	CHLOROETHANE	75-00-3	UG_L	1	U	
8260C	CHLOROFORM	67-66-3	UG_L	3.5		
8260C	CHLOROMETHANE	74-87-3	UG_L	1	U	
8260C	CIS-1,2-DICHLOROETHENE	156-59-2	UG_L	3.4		
8260C	CIS-1,3-DICHLOROPROPENE	10061-01-5	UG_L	0.5	U	
8260C	CYCLOHEXANE	110-82-7	UG_L	0.5	U	
8260C	DIBROMOCHLOROMETHANE	124-48-1	UG_L	0.5	U	
8260C	DICHLORODIFLUOROMETHANE	75-71-8	UG_L	1	UJ	c
8260C	ETHYLBENZENE	100-41-4	UG_L	0.5	U	
8260C	ISOPROPYLBENZENE	98-82-8	UG_L	0.5	U	
8260C	M- AND P-XYLENE	108-38-3/106-42	UG_L	1	U	
8260C	METHYL ACETATE	79-20-9	UG_L	0.75	U	
8260C	METHYL CYCLOHEXANE	108-87-2	UG_L	0.5	U	
8260C	METHYL TERT-BUTYL ETHER	1634-04-4	UG_L	0.5	U	
8260C	METHYLENE CHLORIDE	75-09-2	UG_L	2.5	U	
8260C	O-XYLENE	95-47-6	UG_L	0.5	U	
8260C	STYRENE	100-42-5	UG_L	0.5	U	
8260C	TETRACHLOROETHENE	127-18-4	UG_L	6.5		
8260C	TOLUENE	108-88-3	UG_L	0.5	U	
8260C	TRANS-1,2-DICHLOROETHENE	156-60-5	UG_L	0.5	U	
8260C	TRANS-1,3-DICHLOROPROPENE	10061-02-6	UG_L	0.5	U	
8260C	TRICHLOROETHENE	79-01-6	UG_L	79		
8260C	TRICHLOROFLUOROMETHANE	75-69-4	UG_L	1	U	
8260C	VINYL CHLORIDE	75-01-4	UG_L	1	U	
8260C	XYLENES, TOTAL	1330-20-7	UG_L	1.5	U	
8270D_SIM	1,4-DIOXANE	123-91-1	UG_L	10		

Notes:

UG_L = Micrograms per liter
NA = Not applicable
Qual = Final qualifiers (See Attachment B)
RC = Reason codes (See Attachment C)

DATA VALIDATION REPORT

Project:	Regional Groundwater Investigation — NWIRP Bethpage	
Laboratory:	Katahdin Analytical	
Sample Delivery Groups:	SJ0752	
Analyses/Method:	Total Organic Carbon (TOC) by U.S. EPA SW-846 Method 9060A and Standard Method 5310B for Total Organic Carbon by High-Temperature Combustion	
Validation Level:	2	
Project Number:	0888812477.SA.DV	
Prepared by:	Dana Miller/Resolution Consultants	Completed on: 03/04/2016
Reviewed by:	Tina Cantwell/Resolution Consultants	File Name: SJ0691_ 9060A_5310B

SUMMARY

This report summarizes data review findings for samples listed below, collected by Resolution Consultants from the Regional Groundwater Investigation — NWIRP Bethpage site on 29 January 2016 in accordance with the following Sampling and Analysis Plans:

- *Sampling and Analysis Plan, Bethpage, New York.* (Resolution Consultants April 2013).
- *UFP SAP Addendum, Installation of Vertical Profile Borings and Monitoring Wells, Operable Unit 2, NWIRP Bethpage, New York.* (Resolution Consultants November 2013).
- *UFP SAP Addendum, Inclusion of Additional Target Analytes for Volatile Organics Analyses, NWIRP Bethpage OU2, Bethpage, New York*. (Resolution Consultants August 2014).

Sample ID	Lab ID	Matrix/Sample Type	Analysis
RE131D2-SOIL-012916-568-570	SJ0752-1	Soil	9060A, 2540G
RE131D2-EB-012916	SJ0752-2	Equipment Blank	5310B

Data validation activities were conducted using the following guidance documents: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846, specifically Method 9060A, Total Organic Carbon* (U.S. EPA, 1996), *Method SM5310B, Total Organic Carbon by High-Temperature Combustion, U.S. Environmental Protection Agency (U.S. EPA) Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (NFG, January 2010, and Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2 (October 2010). In

the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

✓	Data completeness (chain-of-custody)/sample integrity
✓	Holding times and sample preservation
NA	Gas chromatography/Mass spectrometer performance checks
NA	Initial calibration/continuing calibration verification
✓	Laboratory blanks/equipment blanks/field blanks/trip blanks
NA	Surrogate spike recoveries
NA	Matrix spike and/or matrix spike duplicate results
✓	Laboratory control sample / laboratory control sample duplicate results
NA	Field duplicates
NA	Internal standards
✓	Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Acceptable data parameters for which all criteria were met and no qualification was performed, and non-conformance or other issues that were noted during validation, but did not result in qualification of data are not discussed further.

Qualifications Actions

The data was reviewed independently from the laboratory to assess data quality. TOC was detected in the equipment blank but professional judgement was used not to qualify the associated sample as undetected. All analytes detected at concentrations less than the limit of quantitation but greater than the method detection limit were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation. No results were qualified during this review and are considered usable by the project for their intended purpose, according to U.S. Environmental Protection Agency and Department of Defense guidelines. Attachment A, Table A-1 provides final results after data review.

ATTACHMENTS

Attachment A: Table A-1, Final Results after Data Review

Attachment A
Final Results after Data Review

Table A-1
Final Results after Data Review
Regional Groundwater Investigation NWIRP Bethpage

			Sample Delivery Group	SJ0752	SJ0752
			Lab ID	SJ0752-1	SJ0752-2
			Sample ID	RE131D2-SOIL-012916-568-570	RE131D2-EB-012916
			Sample Date	1/29/2016	1/29/2016
			Sample Type	Soil	Equipment Blank
Method	**Analyte**	**CAS No**	**Units**	Result	Result
2540G	TOTAL SOLIDS	-29	PCT	88	NA
5310B	TOTAL ORGANIC CARBON	-28	MG_L	NA	0.15 J
9060A	TOTAL ORGANIC CARBON	-28	UG_G	240 J	NA

Notes:

ID = Identification
PCT = Percent
MG_L = Milligrams per liter
UG_G = Micrograms per gram
NA = Not analyzed
J = Estimated value – value was below the limit of quantitation.

DATA VALIDATION REPORT

Project:	Regional Groundwater Investigation — NWIRP Bethpage	
Laboratory:	Katahdin Analytical	
Sample Delivery Groups:	SJ1198	
Analyses/Method:	Total Organic Carbon (TOC) by U.S. EPA SW-846 Method 9060A and Standard Method 5310B for Total Organic Carbon by High-Temperature Combustion	
Validation Level:	2	
Project Number:	0888812477.SA.DV	
Prepared by:	Dana Miller/Resolution Consultants	Completed on: 03/30/2016
Reviewed by:	Tina Cantwell/Resolution Consultants	File Name: SJ1198_ 9060A_5310B

SUMMARY

This report summarizes data review findings for samples listed below, collected by Resolution Consultants from the Regional Groundwater Investigation — NWIRP Bethpage site on 16 February 2016 in accordance with the following Sampling and Analysis Plans:

- *Sampling and Analysis Plan, Bethpage, New York.* (Resolution Consultants April 2013).
- *UFP SAP Addendum, Installation of Vertical Profile Borings and Monitoring Wells, Operable Unit 2, NWIRP Bethpage, New York.* (Resolution Consultants November 2013).
- *UFP SAP Addendum, Inclusion of Additional Target Analytes for Volatile Organics Analyses, NWIRP Bethpage OU2, Bethpage, New York*. (Resolution Consultants August 2014).

Sample ID	Lab ID	Matrix/Sample Type	Analysis
RE131D1-SOIL-021616-433-435	SJ1198-1	Soil	9060A, 2540G
RE131D1-EB-021616	SJ1198-2	Equipment Blank	5310B

Data validation activities were conducted using the following guidance documents: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846, specifically Method 9060A, Total Organic Carbon* (U.S. EPA, 1996), *Method SM5310B, Total Organic Carbon by High-Temperature Combustion, U.S. Environmental Protection Agency (U.S. EPA) Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (NFG, January 2010, and Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2 (October 2010). In

the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

✓	Data completeness (chain-of-custody)/sample integrity
✓	Holding times and sample preservation
NA	Gas chromatography/Mass spectrometer performance checks
NA	Initial calibration/continuing calibration verification
✓	Laboratory blanks/equipment blanks/field blanks/trip blanks
NA	Surrogate spike recoveries
NA	Matrix spike and/or matrix spike duplicate results
✓	Laboratory control sample / laboratory control sample duplicate results
NA	Field duplicates
NA	Internal standards
✓	Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Acceptable data parameters for which all criteria were met and no qualification was performed, and non-conformance or other issues that were noted during validation, but did not result in qualification of data are not discussed further.

Qualifications Actions

The data was reviewed independently from the laboratory to assess data quality. TOC was detected in the equipment blank but professional judgement was used not to qualify the associated sample as undetected. All analytes detected at concentrations less than the limit of quantitation but greater than the method detection limit were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation. No results were qualified during this review and are considered usable by the project for their intended purpose, according to U.S. Environmental Protection Agency and Department of Defense guidelines. Attachment A, Table A-1 provides final results after data review.

ATTACHMENTS

Attachment A: Table A-1, Final Results after Data Review

Attachment A
Final Results after Data Review

Table A-1
Final Results after Data Review
Regional Groundwater Investigation NWIRP Bethpage

			Sample Delivery Group	SJ1198	SJ1198
			Lab ID	SJ1198-1	SJ1198-2
			Sample ID	RE131D1-SOIL-021616-433-435	RE131D1-EB-021616
			Sample Date	2/16/2016	2/16/2016
			Sample Type	Soil	Equipment Blank
Method	**Analyte**	**CAS No**	**Units**	Result	Result
2540G	TOTAL SOLIDS	-29	PCT	84	NA
5310B	TOTAL ORGANIC CARBON	-28	MG_L	NA	0.22 J
9060A	TOTAL ORGANIC CARBON	-28	UG_G	510	NA

Notes:

ID = Identification
PCT = Percent
MG_L = Milligrams per liter
UG_G = Micrograms per gram
NA = Not analyzed
J = Estimated value – value was below the limit of quantitation.

DATA VALIDATION REPORT

Project:	Regional Groundwater Investigation — NWIRP Bethpage	
Laboratory:	Katahdin Analytical	
Sample Delivery Groups:	SJ1554	
Analyses/Method:	Total Organic Carbon (TOC) by U.S. EPA SW-846 Method 9060A and Standard Method 5310B for Total Organic Carbon by High-Temperature Combustion	
Validation Level:	2	
Project Number:	0888812477.SA.DV	
Prepared by:	Dana Miller/Resolution Consultants	Completed on: 04/26/2016
Reviewed by:	Tina Cantwell/Resolution Consultants	File Name: SJ1554_ 9060A_5310B

SUMMARY

This report summarizes data review findings for samples listed below, collected by Resolution Consultants from the Regional Groundwater Investigation — NWIRP Bethpage site on 2 March 2016 in accordance with the following Sampling and Analysis Plans:

- *Sampling and Analysis Plan, Bethpage, New York.* (Resolution Consultants April 2013).
- *UFP SAP Addendum, Installation of Vertical Profile Borings and Monitoring Wells, Operable Unit 2, NWIRP Bethpage, New York.* (Resolution Consultants November 2013).
- *UFP SAP Addendum, Inclusion of Additional Target Analytes for Volatile Organics Analyses, NWIRP Bethpage OU2, Bethpage, New York*. (Resolution Consultants August 2014).

Sample ID	Lab ID	Matrix/Sample Type	Analysis
RE131D3-SOIL-030216-663-665	SJ1554-1	Soil	9060A, 2540G
RE131D3-EB-030216	SJ1554-2	Equipment Blank	5310B

Data validation activities were conducted using the following guidance documents: *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846, specifically Method 9060A, Total Organic Carbon* (U.S. EPA, 1996), *Method SM5310B, Total Organic Carbon by High-Temperature Combustion, U.S. Environmental Protection Agency (U.S. EPA) Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (NFG, January 2010, and Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2 (October 2010). In

the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

✓	Data completeness (chain-of-custody)/sample integrity
✓	Holding times and sample preservation
NA	Gas chromatography/Mass spectrometer performance checks
NA	Initial calibration/continuing calibration verification
✗	Laboratory blanks/equipment blanks
NA	Surrogate spike recoveries
✓	Matrix spike and/or matrix spike duplicate results
✓	Laboratory control sample / laboratory control sample duplicate results
NA	Field duplicates
NA	Internal standards
✓	Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Acceptable data parameters for which all criteria were met and no qualification was performed, and non-conformance or other issues that were noted during validation, but did not result in qualification of data are not discussed further. The symbol (✗) indicates that a QC non-conformance resulted in the qualification of data. Any QC non-conformance that resulted in the qualification of data is discussed below.

Laboratory Blanks/Equipment Blanks

Laboratory blanks and equipment blanks were analyzed with samples to assess contamination imparted by sample preparation and/or analysis. All results associated with a particular blank were evaluated to determine whether there was an inherent variability in the data, or if a problem was an isolated occurrence that did not affect the data. Samples were flagged in accordance with *Functional Guidelines* (shown below) where detections were not believed to be site-related.

Blank Non-conformance Charts:

For common lab contaminants (methylene chloride, acetone, 2-butanone):			
Blank type	**Blank result**	**Sample result**	**Action for samples**
Method, Storage, Trip, Field, or Equipment	Detects	Not detected	No qualification
	≤ 2x LOQ	< 2x LOQ	Report sample LOQ value with a U
		≥ 2x LOQ and ≤ 4x the LOQ	Report the sample result with a U**
		≥ 4x the LOQ	No qualifications
	> 2x LOQ	< LOD	Report sample LOD value with a U**
		≥ LOD and < 2x LOQ	Report sample LOQ value with a U
		≥ 2x LOQ and < blank contamination	Report the blank result with a U or reject the sample result as unusable R
		≥ 2x LOQ and ≥ blank contamination	If the result is ≤2x blank result, report the sample result U.** If the result is > 2x blank result, no qualification is required.**
****Based on Resolution Consultants professional judgment**			

For all other compounds:			
Blank type	**Blank result**	**Sample result**	**Action for samples**
Method, Storage, Trip, Field, or Equipment	Detects	Not detected	No qualification
	< 2x LOQ	< 2x LOQ	Report sample LOQ value with a U
		≥ 2x LOQ	Use professional judgment
	> 2x LOQ	< 2x LOQ	Report sample LOQ value with a U
		≥ 2x LOQ and < blank contamination	Report the blank result with a U or reject the sample result as unusable R
		≥ 2x LOQ and ≥ blank contamination	If the result is ≤2x blank result, report the sample result U. If the result is > 2x blank result, no qualification is required.
	= 2x LOQ	< 2x LOQ	Report sample LOQ value with a U
		≥ 2x LOQ	Use professional judgment
	Gross contamination	Detects	Qualify results as unusable R

Notes:

LOQ	=	Limit of quantitation
LOD	=	Limit of detection
U	=	Undetected
R	=	Rejected

TOC was detected in the equipment blank but professional judgement was used not to qualify the associated sample as undetected. Lab blank non-conformances are summarized in Attachment A in Table A-1.

Qualifications Actions

The data was reviewed independently from the laboratory to assess data quality. One sample was qualified as non-detect and estimated due to lab blank contamination. All analytes detected at concentrations less than the limit of quantitation but greater than the method detection limit were qualified by the laboratory as estimated (J). This "J" qualifier was retained during data validation. Data not qualified during data review are considered usable by the project for their intended purpose, according to U.S. EPA and Department of Defense guidelines. Final results after data review are provided in Attachment B.

ATTACHMENTS

Attachment A: Non-Conformance Summary Table

Attachment B: Table B-1, Final Results after Data Review

Attachment A
Non-Conformance Summary Table

Table A-1
Lab Blank Non-Conformance

Blank	Batches	Method	Analyte	Blank Result (MG_L)	LOQ	Associated Samples	Detected Associated Sample Result (MG_L)	LOQ	Qualifier
WG180357-1	WG180357	5310B	TOTAL ORGANIC CARBON	0.13	1.0	RE131D3-EB-030216	0.17	1.0	UJ

Notes:

MG_L = Milligrams per liter
LOQ = Limit of quantitation
UJ = The analyte was found in a sample at a concentration less than five times the blank concentration and qualified non-detect and estimated.

Attachment B
Final Results after Data Review

Table B-1
Final Results after Data Review
Regional Groundwater Investigation NWIRP Bethpage

			Sample Delivery Group	SJ1554			SJ1554		
			Lab ID	SJ1554-1			SJ1554-2		
			Sample ID	RE131D3-SOIL-030216-663-665			RE131D3-EB-030216		
			Sample Date	3/2/2016			3/2/2016		
			Sample Type	Soil			Equipment Blank		
Method	**Analyte**	**CAS No**	**Units**	Result	Qual	RC	Result	Qual	RC
2540G	TOTAL SOLIDS	-29	PCT	85			NA		
5310B	TOTAL ORGANIC CARBON	-28	MG_L	NA			0.5	UJ	bl
9060A	TOTAL ORGANIC CARBON	-28	UG_G	220	J		NA		

Notes:

ID = Identification
Qual = Final interpreted qualifier
RC = Validator reason code (See definition below)
PCT = Percent
MG_L = Milligrams per liter
UG_G = Micrograms per gram
NA = Not analyzed
UJ = Non-detect and estimated value
J = Estimated value; the reported value is greater than or equal to the laboratory method limit but less than the quantitation limit.

Reason Code

bl = Flagged non-detect and estimated due to lab blank contamination.

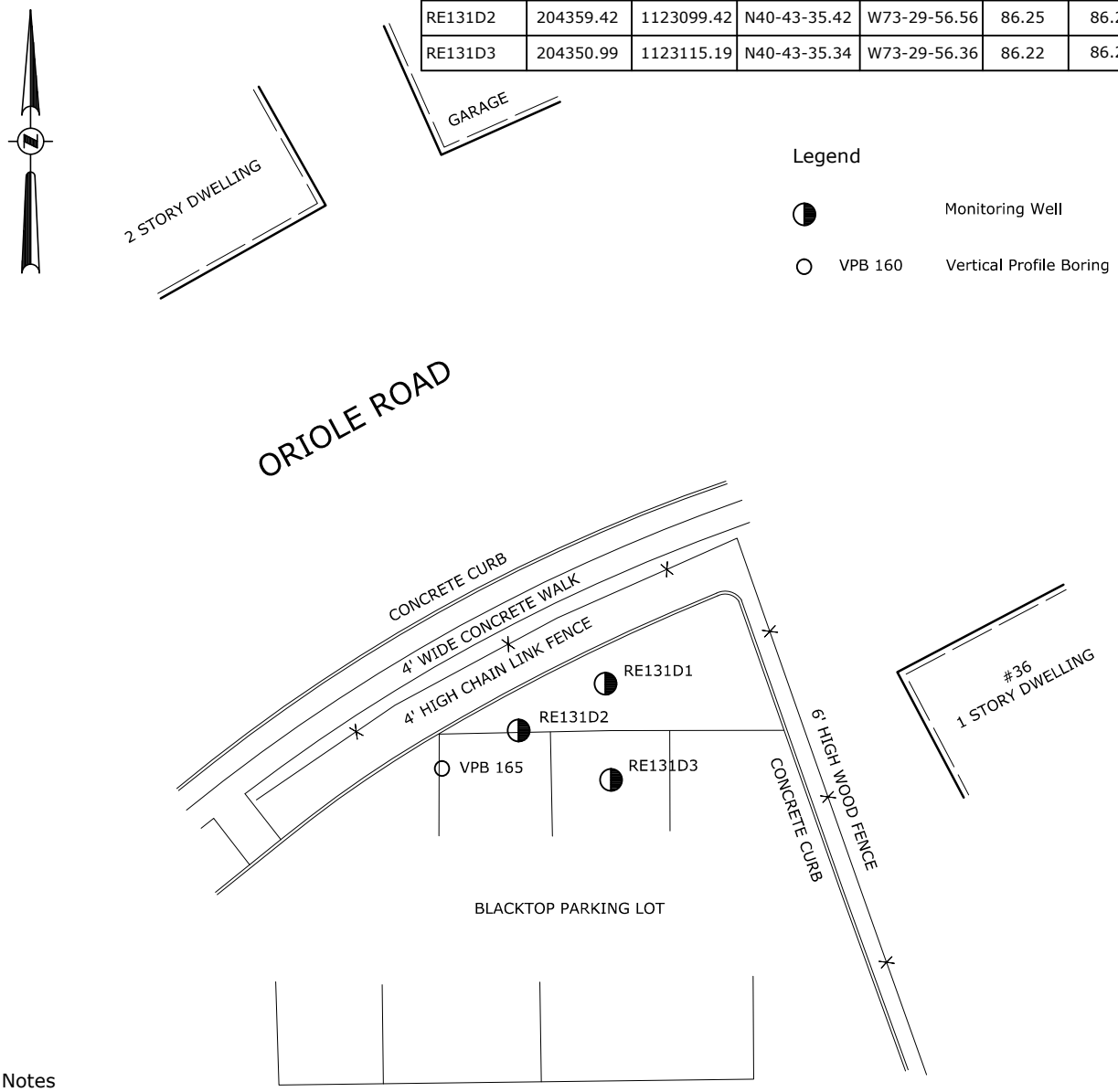
Section 5

Survey

NONE :XREFS

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DOCUMENT IS A VIOLATION OF SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

Description	Northing	Easting	Latitude	Longitude	Ground	Rim	PVC
VPB 165	204352.95	1123086.29	N40-43-35.36	W73-29-56.73	86.26	NA	NA
RE131D1	204367.45	1123114.27	N40-43-35.50	W73-29-56.37	86.33	86.33	85.94
RE131D2	204359.42	1123099.42	N40-43-35.42	W73-29-56.56	86.25	86.25	85.72
RE131D3	204350.99	1123115.19	N40-43-35.34	W73-29-56.36	86.22	86.22	85.90



Map Notes

1. Information shown hereon was compiled from an actual field survey conducted on April 26, 2016.
2. North orientation is Grid North based on the New York State Plane Coordinate System, Long Island Zone, NAD 83(2011) epoch 2010.00 as obtained from GPS observations.
3. Vertical datum shown hereon is NAVD 88(Geoid12A) as obtained from RTK GPS observations using the Queens CORS as a base station.

BAR SCALE
30 0 15 30 60
1 inch = 30 ft.

DWG NO.16-328

Date	RECORD OF WORK	Appr.

Drafter: LMK | Checker: JFC

Appr. by: JFC | Proj. No. 14.4121

VERTICAL PROFILE BORING 165 SURVEY LOCATION
36 ORIOLE ROAD

TOWN OF HEMPSTEAD | NASSAU COUNTY, NEW YORK

C.T. MALE ASSOCIATES
Engineering, Surveying, Architecture & Landscape Architecture, D.P.C.
50 CENTURY HILL DRIVE, LATHAM, NY 12110
518.786.7400 * FAX 518.786.7299

SCALE: 1"=30' | DATE: APRIL 26, 2016

CAD DWG. FILE NAME: K:\Projects\144121\Survey\Drawings and Maps\VPB 165.dwg