TETRA TECH

NOR-02532

November 22, 2019

Mr. Jason Pelton
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau A, 12th Floor
625 Broadway
Albany, New York 12233-7015

Reference: CLEAN Contract No. N6247016D9008
Contract Task Order WE13

Subject: Final Letter Work Plan for 2019-2020 Quarterly Groundwater Sampling Events
Operable Unit 2 (OU2) – Offsite Groundwater Monitoring Program
Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage, New York

Dear Mr. Pelton:

On behalf of the Department of the Navy, Tetra Tech is submitting the subject document to the New York State Department of Environmental Conservation (NYSDEC) for the Department's records. NYSDEC comments on the September 2019 Letter Work Plan were addressed and incorporated into the Final Work Plan.

If you have any questions please contact Mr. Brian Murray, NAVFAC MIDLANT, at brian.s.murray@navy.mil or (757) 341-0491.

Sincerely

Ernie Wu for DDB

David D. Brayack, P.E.
Project Manager

Enclosures: Final Letter Work Plan for 2019-2020 Quarterly Groundwater Sampling Events
Operable Unit 2 – Offsite Groundwater Monitoring Program
Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage, New York

Distribution:
NYSDEC, Don Hesler
NAVFAC MIDLANT, Brian Murray
Project File

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FINAL LETTER WORK PLAN FOR 2019-2020 QUARTERLY GROUNDWATER SAMPLING EVENTS OPERABLE UNIT 2 – OFFSITE GROUNDWATER MONITORING PROGRAM NAVAL WEAPONS INDUSTRIAL RESERVE PLANT, BETHPAGE, NEW YORK

Introduction

The Department of Navy (Navy) is conducting a groundwater investigation in the vicinity of the former Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage in Nassau County, New York (Figure 1) to further delineate and assess migration of the Operable Unit (OU) 2 regional volatile organic compound (VOC) groundwater plume. The purpose of this work plan is to provide an update to the network of groundwater monitoring wells to be sampled during the quarterly monitoring events.

The location of groundwater monitoring wells to be sampled are presented on Figure 2. Table 1 lists the wells to be sampled and summarizes the sampling program. Groundwater samples will be analyzed for VOCs via analytical method SW846 8260B and 1,4-dioxane via analytical method SW846 8270D SIM. There are additional monitoring wells in the area that are being sampled under separate monitoring programs by other parties.

It is anticipated, that further refinements of the groundwater monitoring program will be developed based on detailed review of analytical data. These refinements may include adjustment to the network of wells in the monitoring program and sampling frequency.

This letter work plan was prepared by Tetra Tech, Inc. (Tetra Tech) under the Naval Facilities Engineering Command Atlantic Comprehensive Long-Term Environmental Action Navy under Contract Number N62470-16-D-9008 Task Order WE13.

Groundwater Sampling

Groundwater samples will be collected from 56 monitoring wells as provided in Figure 2 and Table 1. The wells will be sampled using low flow sampling procedures and follow general requirements outlined in Tetra Tech Standard Operating Procedure (SOP) SA-1.1, Groundwater Sample Acquisition and Onsite Water Quality Testing.

A down-hole pump with high-density polyethylene (HDPE) tubing will be used for groundwater sample purging and collection activities. A meter with a continuous flow-through cell will be used to collect water quality measurements. Turbidity measurements will be made using a separate field turbidity meter specifically designated to measure turbidity only.

In order to properly purge the water in the 3/8” inner diameter (ID) downhole tubing, a minimum of one gallon per 100 feet of tubing will be removed prior to sampling. If 1/2” ID tubing is used, a minimum 1.6 gallons per 100 feet of tubing will be removed prior to sampling. Sampling will be conducted after three consecutive readings (groundwater purged from the well screen interval), taken at 5- to 10-minute intervals, are within the following limits:

- pH ±0.2 standard units
- Specific conductance ±10 percent

- Temperature ±10 percent
- Turbidity less than 50 nephelometric turbidity units (NTUs)
- Dissolved oxygen ±10 percent

If the above conditions are not satisfied after 1 hour of purging groundwater from the well screen interval, purging will be considered complete and sampling will begin.

Immediately following sample collection, all groundwater samples will be placed in an ice-filled cooler. These samples will also be preserved on ice during shipment to the laboratory. Samples will be shipped to the laboratory using either overnight courier service or laboratory sample pickup service. All samples will be shipped under Chain-of-Custody (CoC) documentation.

Synoptic groundwater elevations will be measured in monitoring well locations provided in Figure 2 and Table 2. These data will be used to generate a groundwater potentiometric contour map and provide information on groundwater flow and patterns. Water-level measurements will be completed on the same day, and no sooner than 24 hours after a significant precipitation event to minimize the precipitation effects on the data. Water level measurements will be recorded to the nearest 0.01 foot and referenced to a top of casing notch or north side of the well casing (if a notch is absent). The measurement instrument will be decontaminated prior to conducting the measurement and between each monitoring well.

Field documentation will be performed in accordance with Tetra Tech SOP SA-6.3 Field Documentation. Documentation of groundwater purging and sampling of each well will be recorded on individual log sheets. Data from the synoptic round of groundwater level measurements will be recorded on a field log sheet. A summary of all field activities will be properly recorded in a logbook.

Quality Control Samples

Quality assurance and quality control samples will be collected for groundwater samples. Duplicate samples will be collected at 10 percent (1 per 10 samples). Matrix spike and matrix spike duplicate (MS/MSD) samples (i.e., triple volume) will be collected at a rate of 5 percent (1 per 20 samples). MS/MSDs will receive the same sample ID as the respective parent samples, and the triple volume will be noted in the field log book and on CoC form. A VOC trip blank will accommodate each sample cooler containing samples analyzed for VOCs. During each sampling event, a rinsate blank sample(s) will be collected from decontaminated, non-dedicated field sampling equipment (e.g., sampling pump). Rinsate blank sample(s) will be analyzed for VOC and 1,4-dioxane.

Field Decontamination Procedures and Investigation Derived Waste Management

All non-dedicated groundwater sampling equipment will be decontaminated between use at each monitoring well. An alconox/deionized water solution will be circulated through the pump to ensure the internal components have been decontaminated. The external components of the equipment will be scrubbed with an Alconox/deionized water solution then rinsed with clean deionized water. Investigation derived waste (IDW) generated during this program will include decontamination fluids and purge water (groundwater). All IDW will be containerized,

characterized, and temporarily stored at a central staging area located on the former NWIRP property. It is anticipated all IDW will be non-hazardous. Based on the results of the waste characterization, the waste will be discharged via the local industrial wastewater discharge permit or transported offsite and appropriately disposed by the IDW subcontractor.

Field equipment decontamination procedures and IDW generated during this investigation will follow procedures outlined in Tetra Tech Standard Operating Procedure (SOP) SA-7.1 Decontamination of Field Equipment and Management of Investigation Derived Waste (Tetra Tech, 2016) and United States Environmental Protection Agency (EPA) Guide to Management of Investigation-Derived Wastes (OSWER, 1992).

Analytical and Data Validation

Chemical analyses will be performed by a fixed-based analytical laboratory accredited by the Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP) and New York State Department of Health ELAP.

All groundwater analytical data undergo full data validation in accordance with EPA data validation guidelines. Validated analytical data will be provided as it becomes available.

Project Reports

A data summary report will be developed summarizing field activities and validated analytical results. Figures and tables will be used to present the analytical data. The report will include log sheets and CoC forms documenting the collection of groundwater samples. The data validation summary letters will also be included in the report.

In addition, the Navy will provide the New York State Department of Environmental Conservation (NYSDEC) with validated analytical data from each groundwater sampling event. The data will be provided as an EQuIS data deliverable.

REFERENECS

Office of Solid Waste and Emergency Response (OSWER), 1992. Guide to Management of Investigation-Derived Wastes, April.

Tetra Tech, 2016. Standard Operating Procedure SA-1.1 Groundwater Sample Acquisition and Onsite Water Quality Testing, July.

Tetra Tech, 2016. Standard Operating Procedure SA-7.1 Decontamination of Field Equipment and Management of Investigation Derived Waste, July.

Tetra Tech, 2017. Standard Operating Procedure SA-3.3 Field Documentation, September.

TABLES

TABLE 1 - SAMPLING PROGRAM
OU2 GROUNDWATER MONITORING PROGRAM
NWIRP BETHPAGE

OU 2 Groundwater Monitoring Program Investigation 2019-2020 Sampling Chemtech 284 Sheffield St. Mountainside, NJ 07092 Direct Phone: (908) 728-3147				Analysis Group		VOCs	1,4-Dioxane
				Preparation and Analytical Method		SW846 8260B	SW846 8270D SIM
				Data Package Turnaround Time		21 Calendar day	21 Calendar day
				Container Type/ Volume Required		3 – 40mL Volatile Organic Analytes (VOA) Vials	2 – 1 L amber glass
				Preservatives		HCl to pH <2; Cool to ≤ 6 °C; no headspace	Cool to ≤6 °C
				Holding Time (Preparation/ Analysis)		14 days to analysis	7 days to extraction 40 days to analysis
Site	Matrix	Station ID	Sample ID [1]	Depth Sampling Interval (feet bgs)			
				Top Screen	Bottom Screen		
OU 2	GW	RE103D1	RE103D1-MMDDYYYY	625	640	X	X
OU 2	GW	RE103D2	RE103D2-MMDDYYYY	653	673	X	X
OU 2	GW	RE103D3	RE103D3-MMDDYYYY	715	730	X	X
OU 2	GW	RE104D1	RE104D1-MMDDYYYY	350	370	X	X
OU 2	GW	RE104D2	RE104D2-MMDDYYYY	710	730	X	X
OU 2	GW	RE104D3	RE104D3-MMDDYYYY	760	780	X	X
OU 2	GW	RE105D1	RE105D1-MMDDYYYY	530	550	X	X
OU 2	GW	RE105D2	RE105D2-MMDDYYYY	730	750	X	X
OU 2	GW	RE108D1	RE108D1-MMDDYYYY	530	550	X	X
OU 2	GW	RE108D2	RE108D2-MMDDYYYY	630	650	X	X
OU 2	GW	RE109D1	RE109D1-MMDDYYYY	515	535	X	X
OU 2	GW	RE109D2	RE109D2-MMDDYYYY	550	570	X	X
OU 2	GW	RE109D3	RE109D3-MMDDYYYY	580	600	X	X
OU 2	GW	RE117D1	RE117D1-MMDDYYYY	730	755	X	X
OU 2	GW	RE117D2	RE117D2-MMDDYYYY	780	805	X	X
OU 2	GW	RE120D1	RE120D1-MMDDYYYY	630	650	X	X
OU 2	GW	RE120D2	RE120D2-MMDDYYYY	690	710	X	X
OU 2	GW	RE120D3	RE120D3-MMDDYYYY	740	760	X	X
OU 2	GW	RE122D1	RE122D1-MMDDYYYY	520	540	X	X
OU 2	GW	RE122D2	RE122D2-MMDDYYYY	590	610	X	X
OU 2	GW	RE122D3	RE122D3-MMDDYYYY	715	735	X	X
OU 2	GW	RE123D1	RE123D1-MMDDYYYY	480	500	X	X
OU 2	GW	RE123D2	RE123D2-MMDDYYYY	635	655	X	X
OU 2	GW	RE123D3	RE123D3-MMDDYYYY	815	835	X	X
OU 2	GW	RE125D1	RE125D1-MMDDYYYY	320	340	X	X
OU 2	GW	RE125D2	RE125D2-MMDDYYYY	580	600	X	X
OU 2	GW	RE125D3	RE125D3-MMDDYYYY	670	690	X	X
OU 2	GW	RE126D1	RE126D1-MMDDYYYY	500	520	X	X
OU 2	GW	RE126D2	RE126D2-MMDDYYYY	555	575	X	X
OU 2	GW	RE126D3	RE126D3-MMDDYYYY	640	660	X	X
OU 2	GW	RE131D1	RE131D1-MMDDYYYY	430	450	X	X
OU 2	GW	RE131D2	RE131D2-MMDDYYYY	565	590	X	X
OU 2	GW	RE131D3	RE131D3-MMDDYYYY	660	680	X	X
OU 2	GW	RE132D1[3]	RE132D1-MMDDYYYY[3]	220	240	X	X
OU 2	GW	RE132D2[3]	RE132D2-MMDDYYYY[3]	330	350	X	X
OU 2	GW	RE132D3[3]	RE132D3-MMDDYYYY[3]	500	520	X	X
OU 2	GW	RE132D4[3]	RE132D4-MMDDYYYY[3]	560	580	X	X

TABLE 1 - SAMPLING PROGRAM
OU2 GROUNDWATER MONITORING PROGRAM
NWIRP BETHPAGE
PAGE 2 OF 2

OU 2 Groundwater Monitoring Program Investigation
2019-2020 Sampling

Chemtech
284 Sheffield St.
Mountainside, NJ 07092
Direct Phone: (908) 728-3147

Site	Matrix	Station ID	Sample ID (1)	Analysis Group		VOCs	1,4-Dioxane
				Preparation and Analytical Method		SW846 8260B	SW846 8270D SIM
				Data Package Turnaround Time		21 Calendar day	21 Calendar day
				Container Type/ Volume Required		3 – 40mL Volatile Organic Analytes (VOA) Vials	2 – 1 L amber glass
				Preservatives		HCl to pH <2; Cool to ≤ 6 °C; no headspace	Cool to ≤6 °C
				Holding Time (Preparation/ Analysis)		14 days to analysis	7 days to extraction 40 days to analysis
				Depth Sampling Interval (feet bgs)			
				Top Screen	Bottom Screen		
OU 2	GW	RE132D5(3)	RE132D5-MMDDYYYY(3)	610	630	X	X
OU 2	GW	RE132D6(3)	RE132D6-MMDDYYYY(3)	685	705	X	X
OU 2	GW	RE132D7(3)	RE132D7-MMDDYYYY(3)	743	758	X	X
OU 2	GW	RE134D1(3)	RE134D1-MMDDYYYY(3)	325	345	X	X
OU 2	GW	RE134D2(3)	RE134D2-MMDDYYYY(3)	510	530	X	X
OU 2	GW	RE134D3(3)	RE134D3-MMDDYYYY(3)	600	620	X	X
OU 2	GW	RE134D4(3)	RE134D4-MMDDYYYY(3)	665	685	X	X
OU 2	GW	RE135D1(3)	RE135D1-MMDDYYYY(3)	410	430	X	X
OU 2	GW	RE135D2(3)	RE135D2-MMDDYYYY(3)	545	565	X	X
OU 2	GW	RE135D3(3)	RE135D3-MMDDYYYY(3)	640	660	X	X
OU 2	GW	RE139D1(3)	RE139D1-MMDDYYYY(3)	650	670	X	X
OU 2	GW	RE139D2 (2)(3)	RE139D2-MMDDYYYY (2)(3)	740	760	X	X
OU 2	GW	MW201D(3)	MW201D-MMDDYYYY(3)	335	350	X	X
OU 2	GW	MW201D1(3)	MW201D1-MMDDYYYY(3)	480	500	X	X
OU 2	GW	MW202D(3)	MW202D-MMDDYYYY(3)	335	350	X	X
OU 2	GW	MW202D1(3)	MW202D1-MMDDYYYY(3)	425	440	X	X
OU 2	GW	TT101D	TT101D-MMDDYYYY	325	345	X	X
OU 2	GW	TT101D1	TT101D1-MMDDYYYY	570	590	X	X
OU 2	GW	TT101D2	TT101D2-MMDDYYYY	740	760	X	X
					Total Field Samples:	**56**	**56**
Field Duplicate		BP-DUP01-MMDDYYY	Quantity:	6 (1 per 10 field samples)		X	X
MS/MSD		same as parent sample	Quantity:	3 (1 pair per 20 field samples)		X	X
Equipment Blank		EB01-MMDDYYYY	Quantity:	2 (1 per week sampling)		X	X
Trip Blank		TB01-MMDDYYYY	Quantity:	(1 per cooler containing VOCs)		X	N/A
Field Blank		FB01-MMDDYYYY	Quantity:	2 (1 per week)		X	X
				Total Number Samples to the Lab:		**68 + trip blanks**	**68**

(1) MMDDYYYY is the two-digit month, two digit day, and four digit year that the sample is collected. As an example, if RE103D1 is sampled on September 10, 2019, the sample nomenclature would be RE103D1-09102019.

(2) RE139D2 is also known as BPOW-3-5

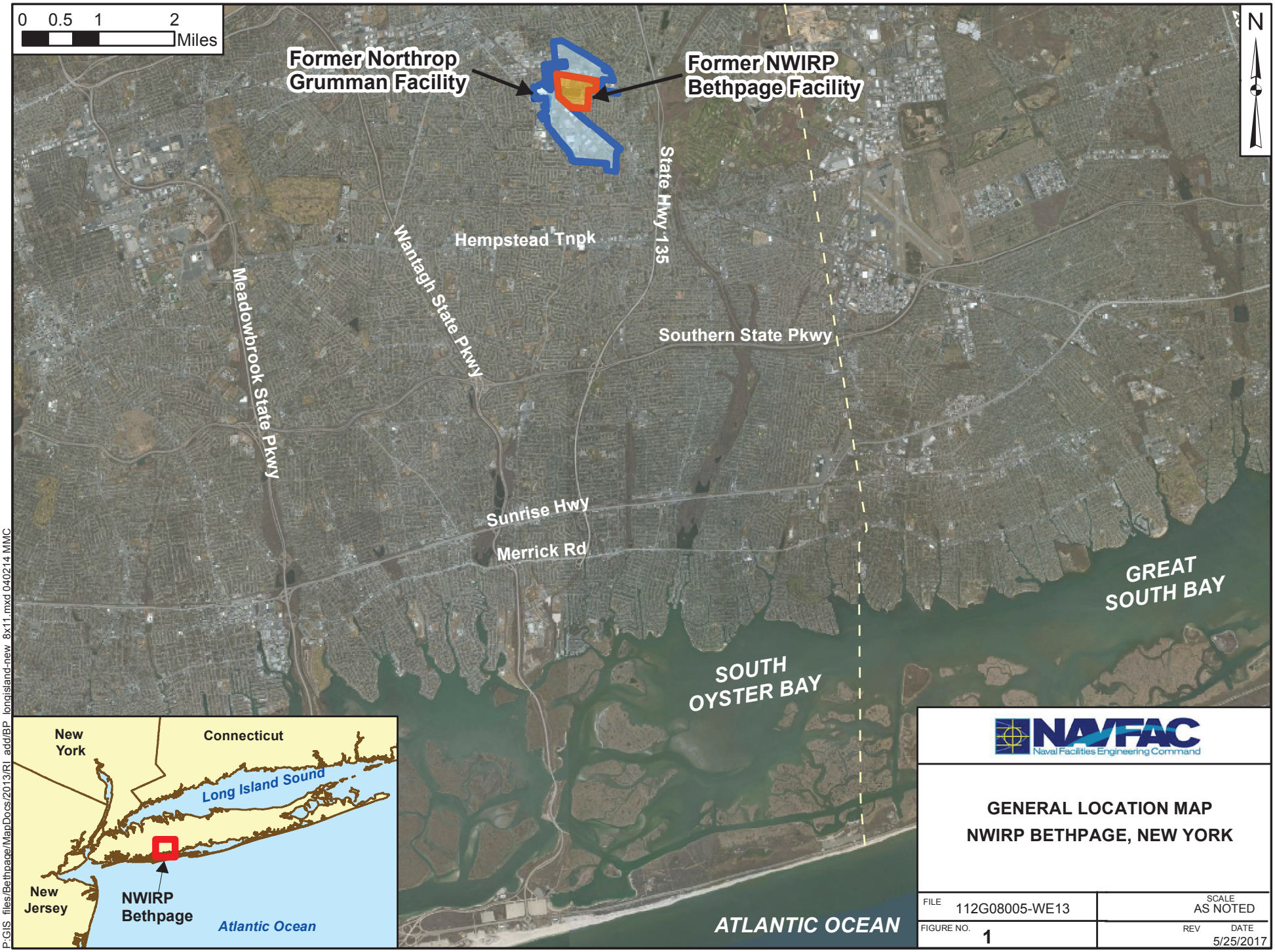
(3) Monitoring wells added to the quarterly sampling program as of September 2019.

TABLE 2 - WATER LEVEL MONITORING WELLS
OU2 GROUNDWATER MONITORING PROGRAM
NWIRP BETHPAGE

Well
GM-75D2
RE103D1
RE103D2
RE103D3
RE104D1
RE104D2
RE104D3
RE105D1
RE105D2
RE108D1
RE108D2
RE109D1
RE109D2
RE109D3
RE116D1
RE117D1
RE117D2
RE120D1
RE120D2
RE120D3
RE122D1
RE122D2
RE122D3
RE123D1
RE123D2
RE123D3
RE125D1
RE125D2
RE125D3
RE126D1
RE126D2
RE126D3
RE131D1
RE131D2
RE131D3

Well
RE132D1
RE132D2
RE132D3
RE132D4
RE132D5
RE132D6
RE132D7
RE134D1
RE134D2
RE134D3
RE134D4
RE135D1
RE135D2
RE135D3
RE139D1
RE139D2
RE137
RW1-MW1
RW1-MW2
RW1-MW3
RW2-MW1
RW3-MW1
RW3-MW2
RW3-MW3
RW3-MW4
TT-101D
TT-101D1
TT-101D2
MW201D
MW201D1
MW202D
MW202D1

FIGURES



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NAVFAC
Naval Facilities Engineering Command

GENERAL LOCATION MAP
NWIRP BETHPAGE, NEW YORK

FILE	SCALE
112G08005-WE13	AS NOTED
FIGURE NO. 1	REV / DATE 5/25/2017

N

Former Northrop Grumman Facility

Former NWIRP Bethpage Facility

Hempstead Tpke

Hicksville Rd

Southern State Pkwy

MW202D
MW202D1

MW201D
MW201D1

RE123D1
RE123D2
RE123D3

RE107D1
GM-75D2
RE107D2

RE126D1
RE126D2
RE126D3

RE109D1
RE109D2
RE109D3

RE122D1
RE122D2
RE122D3

RE108D1
RE108D2

RE104D1
RE104D2
RE104D3

RW3-MW3
RW3-MW4
RW3-MW1
RW3-MW2

RE103D1
RE103D2
RE103D3

RE134D1
RE134D2
RE134D3
RE134D4

RW1-MW3
RW1-MW1
RW1-MW2

RW2-MW1

RE105D1
RE105D2

RE125D1
RE125D2
RE125D3

RE120D1
RE120D2
RE120D3

RE131D1
RE131D2
RE131D3

RE135D1
RE135D2
RE135D3

RE137

TT-101D
TT-101D1
TT-101D2

RE132D1
RE132D2
RE132D3
RE132D4
RE132D5
RE132D6
RE132D7

VPB-150
RE116

RE139D2
RE139D1

RE117D1
RE117D2

Legend

- Monitoring Well - Other
- Vertical Profile Boring
- Extraction Well
- Water Supply Well
- Monitoring Wells to be sampled
- Monitoring Wells for water levels only
- 1997 Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage Property
- 1997 Northrop Grumman Property

0 500 1,000 2,000 Feet

Note:
Wells outlined on this figure are for water level measurements and/or groundwater sampling

NAVFAC Naval Facilities Engineering Command

MONITORING WELL LOCATIONS
2019-2020 OU2 GROUNDWATER MONITORING PROGRAM
NWIRP BETHPAGE, NEW YORK

FILE	SCALE
112G08005-WE13	AS NOTED
FIGURE NO. 2	REV DATE 8/30/2019

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