# ABBREVIATED WORK PLAN – DECEMBER 2013 OUTPOST MONITORING WELL REHABILITATION (BPOW 4-1 and BPOW 4-2) PRE-DESIGN FIELD INVESTIGATION, OPERABLE UNIT 2 GROUNDWATER NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP), BETHPAGE, NEW YORK

Revision No: 0

*Revision Date: 12/3/2013* 

This abbreviated work plan addendum has been prepared for the Mid-Atlantic Division of the Naval Facilities Engineering Command (NAVFAC) pursuant to Contract Task Order (CTO) WE15, issued under Comprehensive Long-term Environmental Action Navy (CLEAN) contract number N62470-11-D-8013. This abbreviated work plan addresses activities to be conducted at the Naval Weapons Industrial Reserve Plant (NWIRP) located in Bethpage, New York.

#### **Scope and Objectives**

The objective of the field activities defined in this abbreviated work plan is to rehabilitate two outpost monitoring wells (BPOW 4-1 and BPOW 4-2) that have failed well integrity testing performed in September 2013 in accordance with the UFP SAP Addendum – Well Integrity Testing Investigation and Testing Protocol (Resolution Consultants, 2013). New 2-inch wells will be installed inside of the 4-inch casings. The rehabilitated outpost monitoring wells will be land surveyed and one round of groundwater samples will be collected for VOC analysis following repair. The location of the wells is shown on Figure 1.

#### **Background**

As part of the Public Water Supply Contingency Plan (PWSCP) two outpost monitoring wells (BPOW 4-1 and 4-2) were installed for purposes of providing an early warning of potential impacts to the Levittown public water supply (5303). In May 2012, Trichlorotrifluoroethane (Freon 113) was detected in outpost well 4-1 at a concentration that met the established trigger value of 1.5 micrograms per liter (ug/L) for this well. As directed in the PWSCP, outpost well 4-1 was resampled and similar results were detected. The integrity of both of the wells was tested according to the procedures outlined in the UFP SAP Addendum – Well Integrity Investigation and Testing Protocol, and it was determined that both were compromised. Because of the potential for the migration of contaminated shallow groundwater to deeper intervals via the compromised wells, it is determined that they should be rehabilitated. Rehabilitation will be performed according to the UFP SAP Addendum – Outpost Monitoring Well Rehabilitation (Resolution Consultants, 2013).

#### **Well Repair Task Plan**

Details of the repair plan are provided below. All aspects of the field investigation specified in the UFP SAP Addendum - Outpost Monitoring Well Rehabilitation - Operable Unit 2 (Resolution Consultants, 2013) will be followed.

#### **Outpost Monitoring Well Installation**

The construction of the 2-inch wells will be as close as possible to the original construction of the existing outpost wells. Specifications for the existing wells are listed in Table 1. BPOW 4-1 has a total well depth of 692 feet (ft) below ground surface (bgs). The screened interval is 652 to 692 ft bgs. BPOW 4-2 has a total well depth of 765 ft bgs. The screened intervals are 725 to 735 ft bgs and 745 to 765 ft bgs. The repair of BPOW 4-2 will be finished off with one 40 foot screen. The boring logs and well construction logs for the two outpost monitoring wells are provided in Appendix A.

The 2-inch wells will be installed to the same depth as the original outpost monitoring wells. The wells will be constructed of 2-inch diameter, Schedule 80, National Sanitation Foundation-approved polyvinyl chloride (PVC) well screen and riser pipe. The well screens will have slot sizes of 0.010 inches (10 slot). Threaded bottom caps will be fitted to the bottom of each well. All pipe sections and bottom caps will be flush-jointed and flush-threaded.

Revision No: 0

*Revision Date: 12/3/2013* 

Primary filter packs will be installed in the annuli around the well screens. The filter packs will consist of FilterPro #1 quartz sand installed using a tremie pipe. The depths of the primary filter pack for BPOW 4-1 and BPOW 4-2 are listed in Table 1. For BPOW 4-1, the original primary filter pack is approximately 70 ft thick. For BPOW 4-2, the original primary filter pack is approximately 60 ft thick. The replacement primary filter pack for both BPOW 4-1 and 4-2 will be 65 feet thick to follow the current work practices.

Secondary filter packs comprised of a finer sand (FilterPro #0 quartz sand) will be installed in the annulus around the well riser above the primary filter pack. The depths of the secondary filter pack for BPOW 4-1 and BPOW 4-2 are listed in Table 1. For BPOW 4-1, the secondary filter pack is approximately 20 ft thick. For BPOW 4-4, the secondary filter pack is approximately 15 ft thick.

A 2- to 4-foot thick bentonite seal will be installed above the secondary filter pack. The annulus above the bentonite seal will be grouted with high-solids bentonite slurry. Both the bentonite seal and bentonite slurry will be installed using a tremie pipe.

The existing BPOW 4-1 has a K packer and 2-inch stainless steel screen inside the 4-inch casing. The K packer and screen will be removed and properly disposed.

#### **Monitoring Well Development and Groundwater Sample Collection**

BPOW 4-1 and 4-2 will be developed using a combination of air lift and mechanical surging. Field parameters, including pH, temperature, specific conductivity, and turbidity will be monitored and recorded throughout well development.

Well development of BPOW 4-1 and 4-2 will also include purging stagnant water from the well above the screen interval and rinsing the interior well casing above the water table using only water from that well. The well will be covered with a clean well cap.

In compliance with New York State Department of Environmental Conservation (NYSDEC) policy, wells will be developed until turbidity is less than 50 nephelometric turbidity units (NTU). However, in some instances, the 50 NTU standard may not be attainable. If after a "best well development effort", the 50 NTU standard cannot be attained and turbidity stabilizes (above the 50 NTU standard), the well will be considered acceptable.

After initial sampling, which will be conducted according to the UFP SAP Addendum - Groundwater Sampling Using Low Stress (Low Flow) Purging and Sampling Protocol (Resolution Consultants, 2013), a dedicated sampling pump system may be installed in the monitoring wells. These pumps will be 3-inch variable speed submersibles with an associated packer system. The pumps will be installed at a depth of approximately 20 feet above the screen interval, but no deeper than 500 feet below top of well casing.

#### **IDW**

Investigation Derived Waste (IDW) accumulated during drilling activities will be collected, containerized, accumulated at NWIRP Bethpage, and disposed off-site. All IDW activities will be consistent with the UFP SAP Addendum – VPB and Monitoring Well Installation and Sampling (Resolution Consultants, November 2013).

#### **Decontamination**

A centrally located decontamination pad at NWIRP Bethpage will be used for the collection of all decontamination-generated fluids. All decontamination fluids will be collected and staged for characterization and subsequent disposal. All decontamination activities will be consistent with the UFP SAP Addendum – VPB and Monitoring Well Installation and Sampling (Resolution Consultants, November 2013).

Revision No: 0

Revision Date: 12/3/2013

#### Surveying

Upon completion of the well repair, BPOW 4-1 and 4-2 will be surveyed by a New York State licensed surveyor. All surveying activities will be consistent with the UFP SAP Addendum – VPB and Monitoring Well Installation and Sampling (Resolution Consultants, November 2013).

#### **Data Validation**

Data validation will be conducted for the VOC groundwater samples scheduled for analyses. Data will be reviewed and qualified in accordance with the requirements of the EPA National Functional Guidelines, modified as appropriate for the DoD Quality Systems Manual (QSM) version 4.2 and method-specific requirements. The TOC data and data generated for waste characterization will not be validated or reviewed. Validation will consist of reviewing of the associated QA/QC samples and measurement performance indicators as presented on the summary forms provided in the laboratory deliverable, and will not include confirmation of calculations or review of raw data. The results of the data validation will be documented in reports which will detail any issues impacting the data quality along with qualifications affecting data bias and usability. All data validation activities will be consistent with the UFP SAP Addendum – VPB and Monitoring Well Installation and Sampling (Resolution Consultants, November 2013)

#### Reporting

A summary report will be developed to provide documentation of this investigation. Documentation required to support this project will consist of the following items:

- Field notebook
- Groundwater and air sample log sheets
- Well completion form for each well
- Well development record
- Map identifying newly repaired outpost monitoring wells.

Outpost Monitoring Well Rehabilitation Work Plan NWIRP Bethpage, NY

#### **Tables**

Revision No: 0

*Revision Date: 12/3/2013* 

## Table 1

Revision No: 0

*Revision Date: 12/3/2013* 

### **Outpost Monitoring Well Summary** Pre-Design Field Investigation Analysis Page 1 of 1

Well Number	Casing Set (ft bgs)	Total Depth (ft bgs)	Total Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Primary Sand Pack (ft bgs)	Top of Secondary Sand Pack (ft bgs)	Comments
BPOW4-1	87	700	692	652-692	620	602	Primary filter pack will be brought up to 627 feet
BPOW4-2	100	780	765	725-735 and 745-765	705	690	Well will have a 40 ft screen; Primary filter pack will be brought up to 700 feet

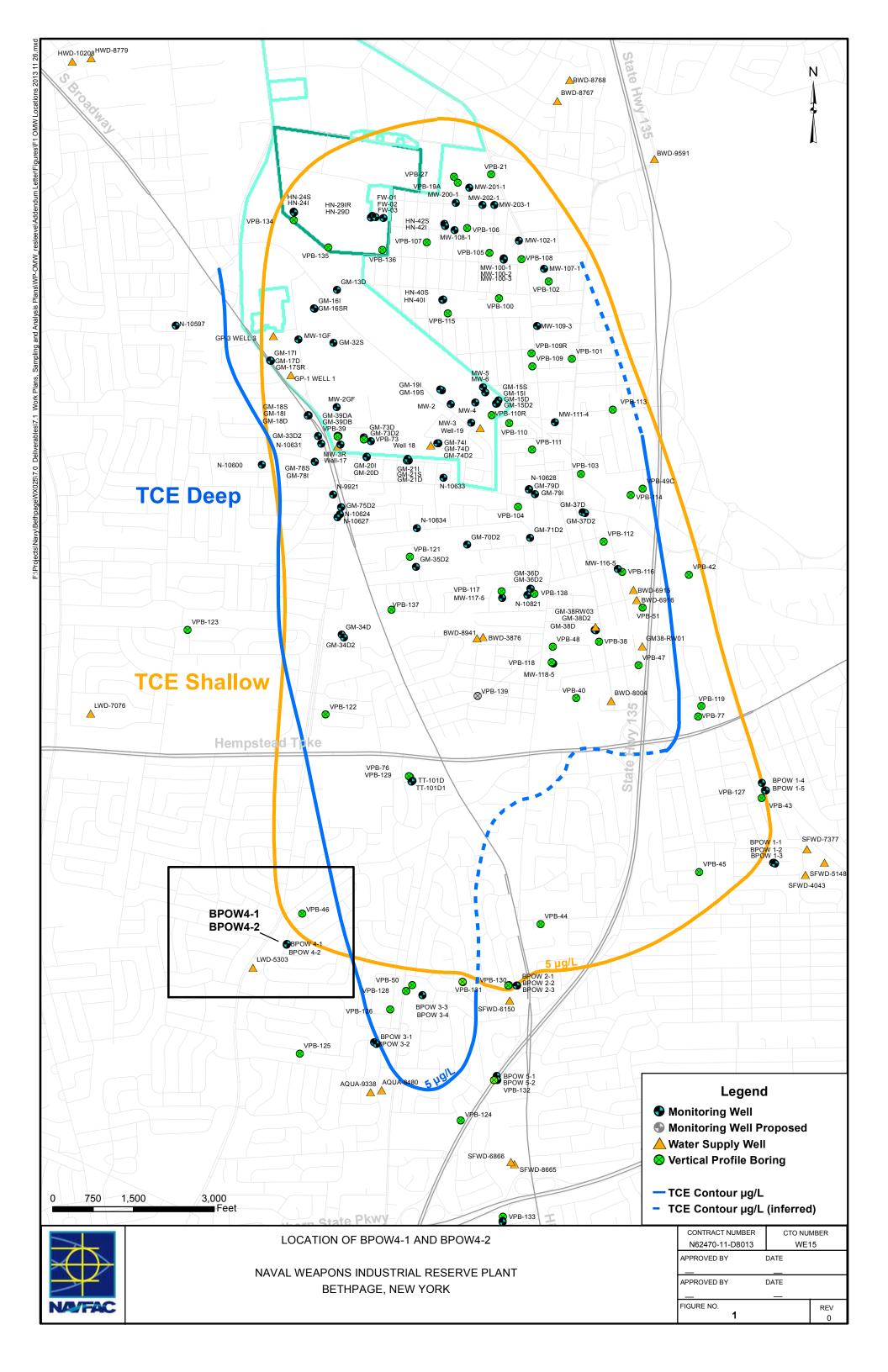
ft bgs: feet below ground surface Blank Sect.: schedule 80 PVC riser place between screened sections of the well

Outpost Monitoring Well Rehabilitation Work Plan NWIRP Bethpage, NY

#### **Figures**

Revision No: 0

Revision Date: 12/3/2013



Outpost Monitoring Well Rehabilitation Work Plan NWIRP Bethpage, NY

# Appendix A Outpost Monitoring Well Completion Logs and Boring Logs

Revision No: 0

*Revision Date: 12/3/2013* 



#### MONITORING WELL SHEET

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BPOW4-1

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Brows - 1 **BORING No.: DRILLING Co.:** UNITECH PROJECT: NWIRP DATE COMPLETED: 7/17/103 **DRILLER:** BLEMMINGS N4037 PROJECT No.: +1219103 NORTHING: MUD ROT BETHPACE **DRILLING METHOD:** SITE: **EASTING:** DEV. METHOD: AIR/PUMP CONTI **GEOLOGIST:** Elevation / Depth of Top of Riser: Elevation / Height of Top of Surface Casing: 9" I.D. of Surface Casing: STEEL Type of Surface Casing: Ground Elevation Datum: CONCRETE Type of Surface Seal: PAD 10" CAS I.D. of Riser. To 85 PUC SCH 80 Type of Riser. ·834 ×9" 85 Borehole Diameter. YAJJJOV Type of Backfill: FSAND#O Elevation / Depth of Soal: 7 (PD) AN Type of Seal: 1620 K-PACKER Elevation / Depth of Top of Filter-Pack: 642 1652 Elevation / Depth of Top of Screen: 10 SLOT 2" STAINLESS Type of Screen: PUC 56H 80 STEEL SCREEN (PLACED 7/17/03) 10 SL ×40' Slot Size x Length: INSTALLED INITIAL 12/9/03 as partof I.D. of Screen: RECONSTRUCTION OF WELL. SILICA SAND Type of Filter Pack: 1692 Elevation / Depth of Bottom of Screen: NOTE: Elevation / Depth of Bottom of 1693 10' S.S RISER Filter Pack: PLACED ABOVE Type of Backfill Below Well: SCREEN -SILICA SAND 652 -642 100 Elevation / Total Depth of Borehole: Not to Scale



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Page 9\_ of 14

PRO	PROJECT NAME: PROJECT NUMBER: DRILLING COMPANY: DRILLING RIG:			N4037	Bethpag ch	je		•	BC DA GE	ORING N TE: OLOGIS IILLER:	o.: ST:	BPOW 7-/5	14- 5-0	1 3 h,c	kor			 
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#### MONITORING WELL SHEET

WELL No.:

BPOW 4-2

**PERMIT No:** 

BORING No.: PROJECT: NWIRP DRILLING Co.: UNITECH BP0W4-2 PROJECT No.: DRILLER: BLEMINGS DATE COMPLETED: 7/7/03 N4037 **DRILLING METHOD:** NORTHING: SITE: BETH PAGE MUD ROT **GEOLOGIST:** DEV. METHOD: AIR/PUMP EASTING: THOS Elevation / Depth of Top of Riser: Elevation / Height of Top of Surface Casing: I.D. of Surface Casing: Type of Surface Casing: STEEL Ground Elevation Datum: Type of Surface Seal: CONCRETE 21×21×6" DAG 10" PVC I.D. of Riser: CAS TO 100' PVC SCH 80 Type of Riser: 91/2" Borehole Diameter: Type of Backfill: VOLCLAY Elevation / Depth ef Seal: F SAND# O 1 690 Type of Seal: Elevation / Depth of Top of Filter Pack: 705 Elevation / Depth of Top of Screen: 725 Type of Screen: PVC SCH 80 Slot Size x Length: 10 × 30 W 10 BLANK 735 >745 I.D. of Screen: Type of Filter Pack: SILICA SAND Elevation / Depth of Bottom of Screen: <u> 1765</u> Elevation / Depth of Bottom of 1766 Filter Pack: Type of Backfill Below Well: SILICA SAND Elevation / Total Depth of Borehole: 1780 Not to Scale

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Page 3 of 16

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**BORING LOG** Page <u>5</u> of <u>16</u> BORING No.: BPOW4 - 2 **NWIRP Bethpage** PROJECT NAME: → 6120103 PROJECT NUMBER: DATE: N4037 6/19/03 GEOLOGIST: Conti DRILLING COMPANY: Uni-Tech J. BLEMINGS FAILING 1500 DRILLER: **DRILLING RIG:** MATERIAL DESCRIPTION PID/FID Reeding (ppm Lithology Sample U Depth Blows / No. and 6" or ROD Recovery (FL) Change S (DeptiVFL) Soil Density/ Type or (%) Sampler BZ or Borehole\*\* C 82 Consistency Sample or Remarks Run Length Screened Color **Material Classification** S No. Oriller Rock interval Hardness 200 0 2/2 210 TO BEN K640 0 F/M SAND - TR CLAY SP 212 0 WET LEYRE. SEAM & 211' RAY 1200 JZ0 HIT SOME CLAY REACHED 230 1730230 on 6/19/03 MORE CLAY IN CUTTINGS. 0900 JUD 0 <u> අන්දූදල</u>

*When rock coring, enter rock **Include monitor reading in 6 Remarks:		@ borehole. Incr	ease reading frequency if	elevated reponse read.	Drilling Area Background (ppm): (	<u>5</u>
Converted to Well:	Yes		No	Well I.D. #:	BP0W4-2	



PRO.	JECT	NAME NUME	BER:	Bethpag	je		. <sub>.</sub> ,4	19	BORING DATE: GEOLOG	No.:	BPG GI	0W4	2 33					_	
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PROJECT NAME: NWIRP Bethpage PROJECT NUMBER: N4037						BC	RING N	0.:	BPOW4-2							
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Con	verte	d to W	ell:	Yes	X		No			Well I.	D. #	BPOW4-	<u>a</u>			-

BORING No.: BPOW 4 - 2 **NWIRP Bethpage** PROJECT NAME: DATE: 6/23/03
GEOLOGIST: Conti N4037 PROJECT NUMBER: DRILLING COMPANY: Uni-Tech DRILLER: J BLEMINGS FAILING 1500 **DRILLING RIG:** PID/FID Reading (ppm) MATERIAL DESCRIPTION U Lithology Depth (FL) 6" or RQD Recovery Change S No. and Soil Density/ (Depth/Ft.) (%) 1 Type or ОГ C Remarks Consistency RQD Run Sample Of Color **Material Classification** S Length Screened No. Interval Rock Hardness 400 6123103 SANDY CLAY- STREAKS MOIST 0 MILLEOUS (CUTTINGS) STILL IN SOME CLAY 1600 1420 MON 1630 430 6/23 6124 TUE. 0900 1940 When rock coring, enter rock brokeness. **Drilling Area** \*\* Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read. Background (ppm): Remarks: No Converted to Well: Yes



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Page 11 of 16

PROJECT PROJECT DRILLING					Bethpag	je						:: BPOW 4~ 2							
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Sample No. and Type or RQD	(FL) or Run No.	Blows / 6° or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened interval	Soil Density/ Consistency or Rock Hardness	Color	Material Clas	sification	0 s c s ·	Remarks	Sample	Sampler BZ	Borehole**	Driller BZ**					
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Con	verte	d to We	ell:	Yes			No	Well I.	D. #	BPOW 4 - 3									

Page 13 of 16

BORING No .: BPOW4 - 2 **NWIRP Bethpage** PROJECT NAME: 6124103 PROJECT NUMBER: N4037 DATE: GEOLOGIST: Conti DRILLING COMPANY: Uni-Tech FAILING 1500 J BLEMINGS DRILLER: **DRILLING RIG:** PID/FID Reading (ppm MATERIAL DESCRIPTION U Lithology Blows / Sample Sample Depth 6" or RQD Recovery No. and (Ft.) Change s (Depth/FL) Soil Density/ Type or (%) Of Driller BZ\*\* C Consistency Remarks Run Sample Of Length Screened Color **Material Classification** s No. Interval Rock Hardness 1530 ·5/.5 1550 WET > MOIST DEUSE F/M SAND - SOME TAN SANDY CLAY -T 2" OF SPOON 20 6/24

* When rock coring, enter rock					Oriting Area
** Include monitor reading in 6	foot intervals (	borehole. Incr	ease reading frequenc	cy if elevated reponse read.	Drilling Area
Remarks:					Background (ppm):
Converted to Well:	Yes	1/	No	Well I.D. #:	BPOW4-2

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Conv	ertec	to We	ell:	Yes		-	No Well I.I	D. #:	BP0W4-2				 -					

Page 14 of 16

PROJECT NAME: NWIRP Bethpage PROJECT NUMBER: N4037								BORING No.: BPOW4-2 DATE: GEOLOGIST: Conti															
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