DEPARTMENT OF THE ARMY

OFFICE OF ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
U.S. ARMY FORT MONMOUTH
P.O. 148
OCEANPORT, NEW JERSEY 07757

13 December 2019

Mr. Ashish Joshi
New Jersey Department of Environmental Protection
Division of Remediation Management & Response
Northern Bureau of Field Operations
7 Ridgedale Avenue (2nd Floor)
Cedar Knolls, NJ 07927-1112

SUBJECT: UST 211 Site Investigation Report
Request for Unrestricted Use, No Further Action Approval
Fort Monmouth, Monmouth County, Oceanport, New Jersey
PI G000000032

Dear Mr. Joshi:

The U.S. Army Fort Monmouth (FTMM) Team has prepared this Site Investigation (SI) Report to summarize previous investigations and present the results of additional field sampling at the former Underground Storage Tank (UST) 211.

1.0 OBJECTIVES

Field screening borings, monitoring well installation, and groundwater sampling activities were conducted from 2017 to 2019 to address New Jersey Department of Environmental Protection (NJDEP) comments on UST 211 (**Attachment A, Correspondences 1 and 3**). Proposed field investigation activities were documented in the Unregulated Heating Oil Tank (UHOT) Work Plan (WP) (August 2017) which was approved in October 2017 by NJDEP (**Attachment A, Correspondences 2 and 1**).

2.0 SITE DESCRIPTION

Building 211 is one of the former Officer Housing residential buildings located along Russel Avenue at the former Main Post (MP) of FTMM. Former UST 211 was located at the southeast corner of Building 211 and was a fiberglass 2,000-gallon No. 2 fuel oil UST (Registration ID 81533-9) that was removed in November 2001. The former location of UST 211 is shown on **Figure 1** and site features are shown in **Figure 2**.

2.1 Site Land Use

Future land use for the UST 211 area as described in the Fort Monmouth Reuse and Redevelopment Plan (EDAW, 2008) is residential, and the former Officer Housing buildings along Russel Avenue are currently used for residential housing.

2.2 Site Geology and Hydrogeology

The Hornerstown Formation underlies much of the MP including the UST 211 area and is approximately 25 to 30 feet thick based on other MP soil borings. This formation is distinguished by

varying proportions of glauconitic clay, silty clay, and minor sand. The Tinton Formation underlies the Hornerstown Formation and consists of dense fine sand and trace silt, glauconite, and clay.

During the November 2017 field investigation at UST 211, soil borings encountered primarily brown, some green or black, fine to coarse sand with some clay, silt, and gravel. Indications of fill such as coal, concrete and brick were observed in borings south and west of the former UST 211 location (PAR-72-211-SCREEN01 and PAR-72-211-SCREEN02) at depths up to 8 feet below ground surface (ft bgs). Soil borings logs are provided in **Attachment B**. The depth to groundwater at UST 211 ranged from approximately 5 to 12.5 ft bgs in the soil borings, and 2.95 to 10.3 ft bgs in monitoring wells (**Table 1**). Ground surface topography varies from approximately 12 to 19 ft above mean sea level**.**

3.0 PREVIOUS INVESTIGATIONS

As previously reported (**Attachment A, Correspondence 4**), UST 211 was removed in November 2001, and six soil samples were collected along the sidewalls and bottom of the excavation and analyzed by the FTMM laboratory for Total Petroleum Hydrocarbons (TPH), which were not detected (ND) in five of six soil samples. One sample (211B-Center) contained 3,968 mg/Kg of TPH; this sample was also analyzed for volatile organic compounds (VOCs). The VOC results were ND for all compounds except acetone, which is a common laboratory contaminant. The maximum TPH results is less than the NJDEP (2019) residential soil remediation criteria of 5,100 mg/kg for Category 1 (No. 2 heating oil or diesel fuel).

To assess the groundwater quality, a temporary well (PAR-72-211-TMW01) was installed and sampled in August 2016. Multiple analytes were detected in groundwater at concentrations greater than the respective Ground Water Quality Criteria (GWQC) including two VOCs (1,2,4-trimethylbenzene and benzene), five semi-volatile organic compounds (SVOCs) (2-methylnaphthalene, dibenzofuran, fluorene, naphthalene, and phenanthrene), total VOC Tentatively Identified Compounds (TICs) and total SVOC TICs (**Attachment A, Correspondence 4**),

Based on the August 2016 results, NJDEP (**Attachment A, Correspondence 3**) indicated that additional remedial efforts were required. The Army conducted additional groundwater investigations in 2017, 2018, and 2019 to monitor groundwater contamination over time.

4.0 2017, 2018 AND 2019 SITE INVESTIGATION RESULTS

In November 2017, seven field screening Geoprobe borings (PAR-72-211-SCREEN01 through -SCREEN05, -SCREEN08, and -SCREEN09; see **Figure 2**) were logged visually and with a photoionization detector (PID). Visual indications of contamination and elevated PID readings (up to 152 parts per million [ppm]) were observed in PAR-72-211-SCREEN1 through -SCREEN3 located (respectively) to the west, south and east of former UST 211 (**Attachment B**). These field indications of contamination were located near the water table. No field evidence of contamination was identified in any other screening borings located to the north of UST 211 (PAR-72-211-SCREEN4 or PAR-72-211-SCREEN9).

Also, in November 2017, five temporary monitor wells (PAR-72-211-TMW-02 through -04, -06 through -08) were installed, sampled for VOCs and SVOCs in accordance with the NJDEP requirements for No. 2 fuel oil, and subsequently abandoned (**Figure 2**). As with the field screening borings, temporary well borings were logged visually and with a PID field evidence of contamination was not encountered during the temporary monitor well installations (**Attachment B**).

Four permanent monitoring wells (PAR-72-211-MW-01 through -04) were installed in December 2017 to evaluate local groundwater flow direction and quality (**Figure 2 and Table 1**). Well PAR-72-211-MW-01 was installed at the former UST 211 tank location. Field evidence of contamination was not observed during the installation of the three permanent monitoring wells surrounding PAR-72-211-MW-01, or the fifth permanent well (PAR-72-211-MW-05) installed in May 2018 (**Attachment B**). Field notes are provided in **Attachment C**.

The first four permanent wells were sampled in January and August 2018, and well PAR-72-211-MW-05 was sampled in August 2018. Groundwater samples were analyzed for VOCs and SVOCs in accordance with the NJDEP requirements for No. 2 fuel oil. Consistent with NJDEP well profiling requirements, two wells with ten feet or more of saturated screen were sampled at two different depths (PAR-72-211-MW-01 and PAR-72-211-MW-03). Due to continued NJDEP GWQC exceedances in one permanent well, additional sampling was conducted at PAR-72-211-MW-01 in March, June, and November 2019 to evaluate benzene and 2-methylnaphthalene concentrations over time.

4.1 Groundwater Results

Analytical results for the temporary and permanent well samples are presented in **Table 2 and 3**. Groundwater elevation contours for 30 July 2018 are presented on **Figure 3;** the local groundwater flow direction was towards the southwest.

4.1.1 Exceedances of NJDEP Comparison Criteria

Exceedances of the GWQC are presented in **Figure 4** for temporary wells **and Figure 5** for permanent wells. The results from only two temporary wells sampled in 2017 exceeded the GWQC (see **Table 2**). Benzo(b)fluoranthene and indeno(1,2,3-cd)pyrene in PAR-72-211-TMW-03 were found slightly above their respective GWQC; however, these compounds are not indicative of a fuel oil release. Bis(2-ethylhexyl)phthalate in PAR-72-211-TMW-06 exceeded the GWQC; however, this compound is known to be a common laboratory contaminant.

Benzene and 2-methylnaphthalene concentrations exceeded GWQC in the samples from permanent well PAR-72-211-MW-01, which was installed in the immediate vicinity of former UST 211. As shown in **Table 2 and 3** and **Figure 4 and 5**, the concentration of these analytes was lower in the 2018 and 2019 permanent well samples, and there were fewer exceedances, than in the 2016 temporary well grab sample from the same location (PAR-72-211-TMW-01). In comparison to temporary well results, the results from the permanent wells are much more representative of groundwater conditions because the permanent well was properly developed and purged prior to low flow groundwater sampling.

Of the samples collected in 2019 at PAR-72-211-MW-01, the primary samples collected in June and November were below the NJDEP GWQS for 2-methylnaphthalene. The June 2019 concentration (30.1 µg/L) in the field duplicate was just slightly above the NJDEP GWQS (30 µg/L). Benzene did not exceed the NJDEP GWQC in any of the samples collected in 2019. Therefore, concentrations of 2-methylnaphthalene and benzene at central well PAR-72-211-MW-01 have attenuated over time and are now below the GWQS.

5.0 SUMMARY AND RECOMMENDATIONS

Benzene and 2-methylnaphthalene in permanent monitoring well PAR-72-211-MW-01 exceeded the NJDEP GWQS in 2017 and 2018. There were no exceedances of the NJDEP GWQS in November

2019. Over time, the contaminant concentrations have naturally attenuated in permanent well PAR-72-211-MW-01 and are no longer an issue. Based on the results of this investigation, the Army requests NJDEP's concurrence that no further action is needed and that an Unrestricted Use, NFA determination be issued for UST 211.

Thank you for reviewing this request; we look forward to your approval and/or comments. Our technical Point of Contact is Kent Friesen at (512) 719-6877; kent.friesen@parsons.com. I can be reached at (732) 383-5104; william.r.colvin18.civ@mail.mil.

Sincerely,

William R. Colvin
Fort Monmouth BRAC Environmental Coordinator

cc: Ashish Joshi (e-mail and 2 hard copies)
William Colvin, BEC (e-mail and 1 hard copy)
Joseph Pearson, Calibre (e-mail)
James Moore, USACE (e-mail)
Jim Kelly, USACE (e-mail)
Joseph Fallon, FMERA (e-mail)
Cris Grill, Parsons (e-mail

Attachments:
Figure 1 – UST 211 Site Location
Figure 2 – UST 211 Site Layout
Figure 3 – UST 211 Groundwater Contours – July 30, 2018
Figure 4 – UST 211 Temporary Groundwater Well Sampling Locations and Results
Figure 5 – UST 211 Permanent Groundwater Well Sampling Locations and Results

Table 1 – Groundwater Gauging Data and Elevations (July 30, 2018)
Table 2 – Ground Water Sampling Results from Temporary Monitoring Well – Comparison to NJDEP Ground Water Quality Criteria
Table 3 – Ground Water Sampling Results from Permanent Monitoring Well – Comparison to NJDEP Ground Water Quality Criteria

Attachment A – Regulatory Correspondence
Attachment B – Soil Boring Logs and Well Construction Details
Attachment C – Field Notes

REFERENCES CITED:

EDAW, Inc., 2008. *Fort Monmouth Reuse and Redevelopment Plan, Final Plan.* Prepared for Fort Monmouth Economic Revitalization Planning Authority. 22 August.

NJDEP. 2019. *Evaluation of Extractable Petroleum Hydrocarbons in Soil Technical Guidance*. Site Remediation and Waste Management Program. Version 1.0. June.

FIGURES

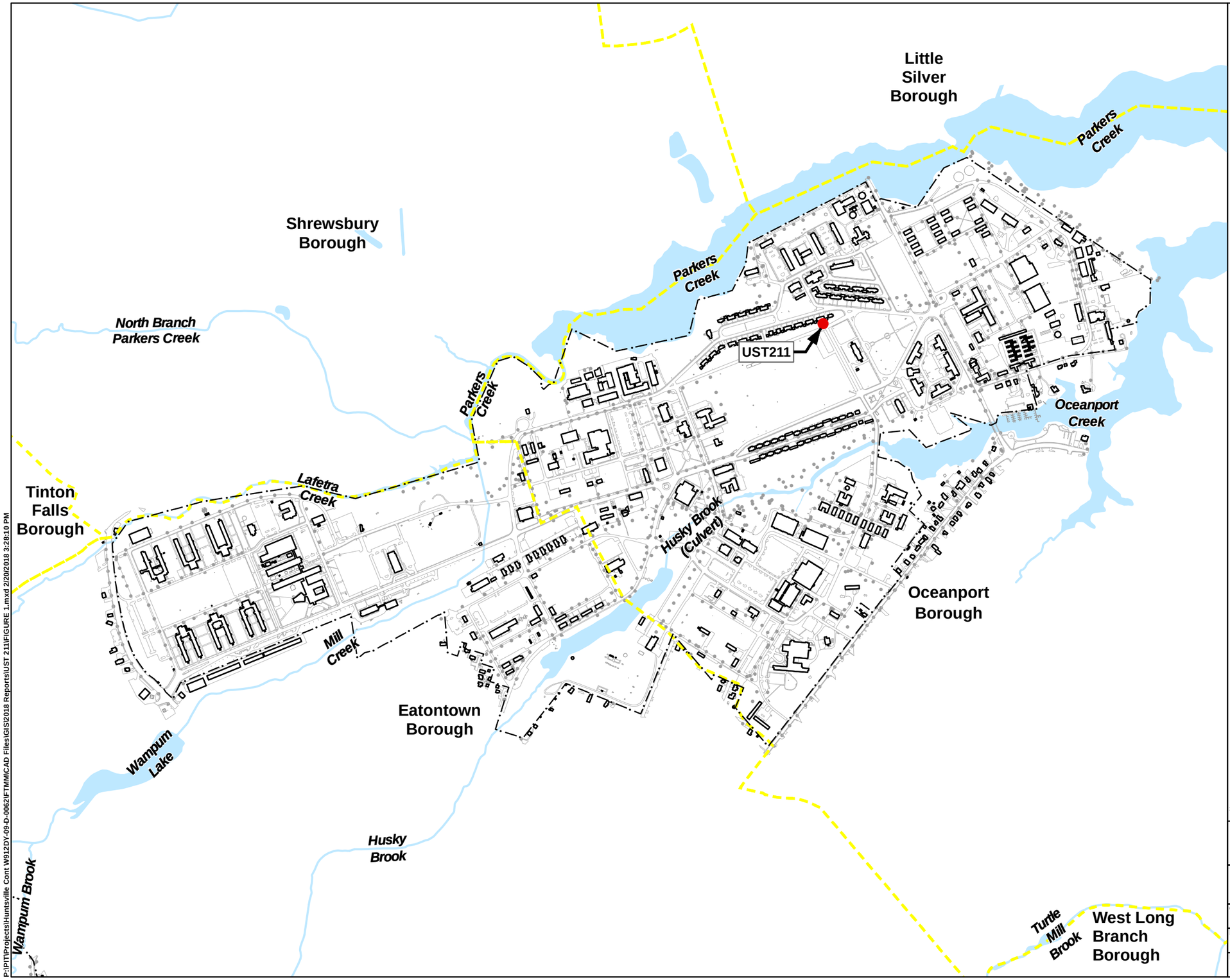
Figure 1 –UST 211 Site Location

Figure 2 –UST 211 Site Layout

Figure 3 – UST 211 Groundwater Contours – July 30, 2018

Figure 4 – UST 211 Groundwater Analytical Results from Temporary Monitoring Well Locations

Figure 5 – UST 211 Groundwater Analytical Results from Permanent Monitoring Well Locations



P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\2018 Reports\UST 211\FIGURE 1.mxd 2/20/2018 3:28:10 PM

LEGEND:

- UHOT Location
- Installation Boundary
- Municipal Boundary
- Surface Water Feature

N

1 inch = 1,000 feet

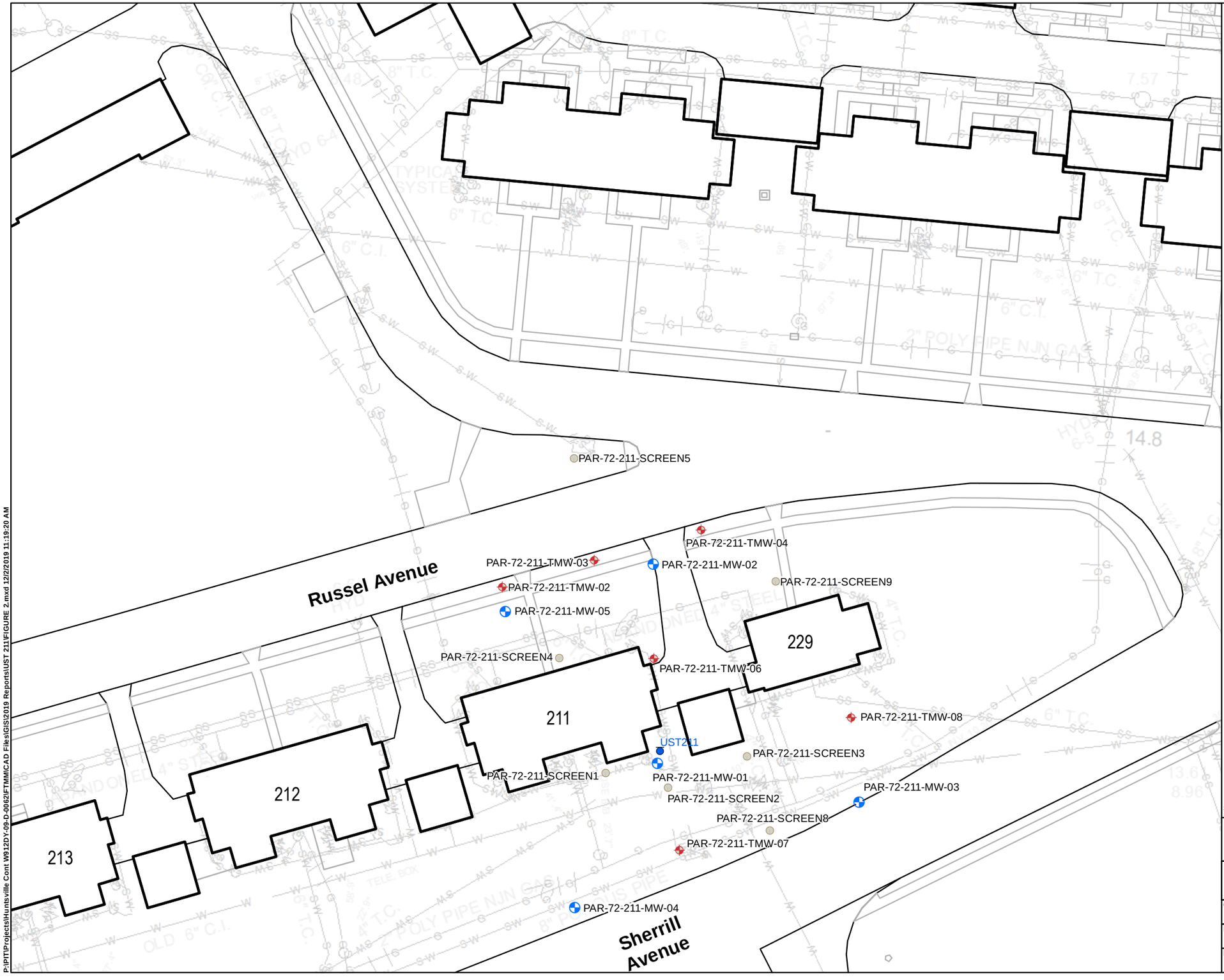
0 500 1,000 2,000 Feet

Source: FTMM Supplied CAD, 2013; ESRI Data and Maps, 2011; USGS NHD, 2012.

PARSONS 401 Diamond Drive NW, Huntsville AL	**Fort Monmouth** **New Jersey**

UST211 SITE LOCATION

CREATED BY: RR	REVIEWED BY: JC
DATE: FEB. 2018	FIGURE NUMBER: FIGURE 1
PROJECT NUMBER: 748810-02130	FILE: FIGURE 1.mxd



LEGEND:

- Temporary Monitoring Well
- Soil Boring
- Former UST Location
- Shallow Monitoring Well
- Installation Boundary
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line

N

1 inch = 40 feet

0 20 40 80 Feet

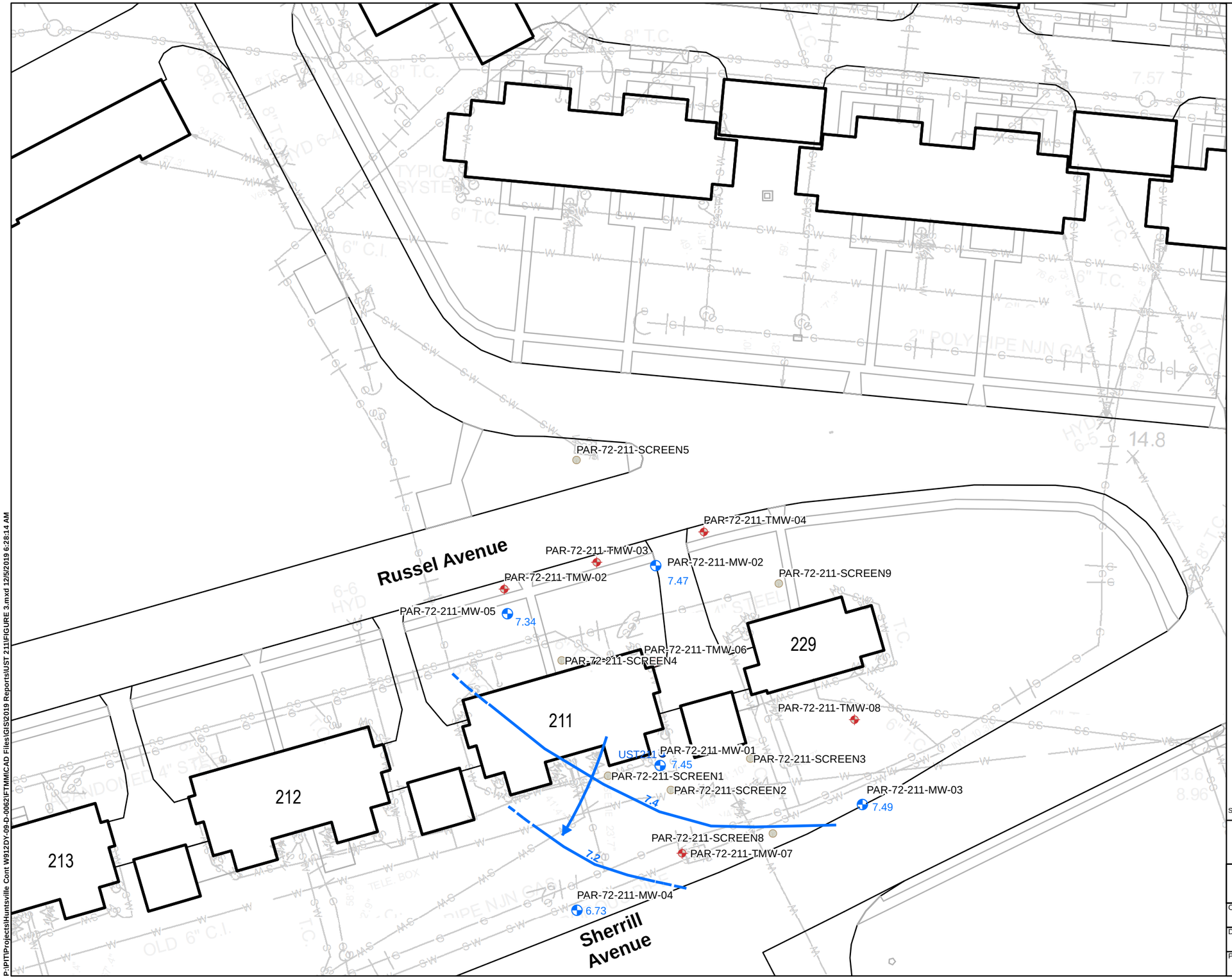
Source: FTMM Supplied CAD, 2013.

PARSONS 401 Diamond Drive NW, Huntsville AL	**Fort Monmouth** **New Jersey**

UST 211 SITE LAYOUT

CREATED BY: RR	REVIEWED BY: JC
DATE: DEC. 2019	FIGURE NUMBER: FIGURE 2
PROJECT NUMBER: 748810-06031	FILE: FIGURE 2.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\2019 Reports\UST 211\FIGURE 2.mxd 12/2/2019 11:19:20 AM



LEGEND:

- Temporary Monitoring Well
- Soil Boring
- Former UST Location
- Shallow Monitoring Well
- Installation Boundary
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Groundwater Elevation Contour
- Inferred Groundwater Elevation Contour

N

1 inch = 40 feet

0 20 40 80 Feet

Source: FTMM Supplied CAD, 2013.

PARSONS
401 Diamond Drive NW,
Huntsville AL

Fort Monmouth
New Jersey

UST 211 GROUNDWATER CONTOURS - JULY 30, 2018

CREATED BY:	REVIEWED BY:
RR	JC
DATE:	FIGURE NUMBER:
DEC. 2019	FIGURE 3
PROJECT NUMBER:	FILE:
748810-06031	FIGURE 3.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\2019 Reports\UST 211\FIGURE 3.mxd 12/5/2019 6:28:14 AM

PAR-72-211-TMW-03	
Sampling depth	11
Sample Date	11/6/2017
VOCs (µg/l) 1,2,4-Trimethylbenzene	< 0.75
VOCs (µg/l) Benzene	< 0.75
VOCs (µg/l) Naphthalene	< 0.75
VOCs (µg/l) Total TICs	**2.9 JN**
SVOCs (µg/l) 2-Methylnaphthalene	< 4
SVOCs (µg/l) Benzo(b)fluoranthene	**0.54 J**
SVOCs (µg/l) Bis(2-Ethylhexyl)phthalate	< 4
SVOCs (µg/l) Dibenzofuran	< 4
SVOCs (µg/l) Fluorene	< 4
SVOCs (µg/l) Indeno(1,2,3-cd)pyrene	**0.54 J**
SVOCs (µg/l) Naphthalene	< 4
SVOCs (µg/l) Phenanthrene	< 4
SVOCs (µg/l) Total TICs	NA

PAR-72-211-TMW-04	
Sampling depth	11
Sample Date	11/6/2017
VOCs (µg/l) 1,2,4-Trimethylbenzene	< 0.75
VOCs (µg/l) Benzene	< 0.75
VOCs (µg/l) Naphthalene	< 0.75
VOCs (µg/l) Total TICs	NA
SVOCs (µg/l) 2-Methylnaphthalene	< 4
SVOCs (µg/l) Benzo(b)fluoranthene	< 4
SVOCs (µg/l) Bis(2-Ethylhexyl)phthalate	< 4
SVOCs (µg/l) Dibenzofuran	< 4
SVOCs (µg/l) Fluorene	< 4
SVOCs (µg/l) Indeno(1,2,3-cd)pyrene	< 4
SVOCs (µg/l) Naphthalene	< 4
SVOCs (µg/l) Phenanthrene	< 4
SVOCs (µg/l) Total TICs	**36.3 JN**

PAR-72-211-TMW-06	
Sampling depth	11
Sample Date	11/6/2017
VOCs (µg/l) 1,2,4-Trimethylbenzene	< 3.8
VOCs (µg/l) Benzene	< 3.8
VOCs (µg/l) Naphthalene	< 3.8
VOCs (µg/l) Total TICs	**12.1 JN**
SVOCs (µg/l) 2-Methylnaphthalene	< 4
SVOCs (µg/l) Benzo(b)fluoranthene	< 4
SVOCs (µg/l) Bis(2-Ethylhexyl)phthalate	**25.2 J**
SVOCs (µg/l) Dibenzofuran	< 4
SVOCs (µg/l) Fluorene	< 4
SVOCs (µg/l) Indeno(1,2,3-cd)pyrene	< 4
SVOCs (µg/l) Naphthalene	< 4
SVOCs (µg/l) Phenanthrene	**11.3**
SVOCs (µg/l) Total TICs	**488.4 JN**

PAR-72-211-TMW-02	
Sampling depth	11
Sample Date	11/6/2017
VOCs (µg/l) 1,2,4-Trimethylbenzene	< 0.75
VOCs (µg/l) Benzene	< 0.75
VOCs (µg/l) Naphthalene	< 0.75
VOCs (µg/l) Total TICs	NA
SVOCs (µg/l) 2-Methylnaphthalene	< 4
SVOCs (µg/l) Benzo(b)fluoranthene	< 4
SVOCs (µg/l) Bis(2-Ethylhexyl)phthalate	< 4
SVOCs (µg/l) Dibenzofuran	< 4
SVOCs (µg/l) Fluorene	< 4
SVOCs (µg/l) Indeno(1,2,3-cd)pyrene	< 4
SVOCs (µg/l) Naphthalene	< 4
SVOCs (µg/l) Phenanthrene	< 4
SVOCs (µg/l) Total TICs	NA

PAR-72-211-TMW-08	
Sampling depth	
Sample Date	11/21/2017
VOCs (µg/l) 1,2,4-Trimethylbenzene	**0.39 J**
VOCs (µg/l) Benzene	< 0.75
VOCs (µg/l) Naphthalene	**3.9**
VOCs (µg/l) Total TICs	NA
SVOCs (µg/l) 2-Methylnaphthalene	**0.45 J**
SVOCs (µg/l) Benzo(b)fluoranthene	< 0.93
SVOCs (µg/l) Bis(2-Ethylhexyl)phthalate	**0.37 J**
SVOCs (µg/l) Dibenzofuran	< 0.93
SVOCs (µg/l) Fluorene	< 0.93
SVOCs (µg/l) Indeno(1,2,3-cd)pyrene	< 0.93
SVOCs (µg/l) Naphthalene	**2**
SVOCs (µg/l) Phenanthrene	< 0.93
SVOCs (µg/l) Total TICs	**57.9 JN**

PAR-72-211-TMW-01	
Sampling depth	
Sample Date	8/10/16
VOCs (µg/l) 1,2,4-Trimethylbenzene	**543 J**
VOCs (µg/l) Benzene	**2.8**
VOCs (µg/l) Naphthalene	**862 J**
VOCs (µg/l) Total TICs	**1,302.4 JN**
SVOCs (µg/l) 2-Methylnaphthalene	**6,680**
SVOCs (µg/l) Benzo(b)fluoranthene	< 19.2
SVOCs (µg/l) Bis(2-Ethylhexyl)phthalate	< 19.2
SVOCs (µg/l) Dibenzofuran	**247**
SVOCs (µg/l) Fluorene	**663**
SVOCs (µg/l) Indeno(1,2,3-cd)pyrene	< 19.2
SVOCs (µg/l) Naphthalene	**1,450**
SVOCs (µg/l) Phenanthrene	**1,740**
SVOCs (µg/l) Total TICs	**14,322 JN**

PAR-72-211-TMW-07	
Sampling depth	11
Sample Date	11/6/2017
VOCs (µg/l) 1,2,4-Trimethylbenzene	< 0.75
VOCs (µg/l) Benzene	< 0.75
VOCs (µg/l) Naphthalene	< 0.75
VOCs (µg/l) Total TICs	NA
SVOCs (µg/l) 2-Methylnaphthalene	< 4
SVOCs (µg/l) Benzo(b)fluoranthene	< 4
SVOCs (µg/l) Bis(2-Ethylhexyl)phthalate	< 4
SVOCs (µg/l) Dibenzofuran	< 4
SVOCs (µg/l) Fluorene	< 4
SVOCs (µg/l) Indeno(1,2,3-cd)pyrene	< 4
SVOCs (µg/l) Naphthalene	< 4
SVOCs (µg/l) Phenanthrene	**0.6 J**
SVOCs (µg/l) Total TICs	**92.5 J**

PAR-72-211-SCREEN5
PAR-72-211-TMW-04
PAR-72-211-TMW-03
PAR-72-211-MW-02
PAR-72-211-TMW-02
PAR-72-211-SCREEN9
PAR-72-211-MW-05
PAR-72-211-SCREEN4
PAR-72-211-TMW-06
PAR-72-211-TMW-08
UST211
PAR-72-211-SCREEN3
PAR-72-211-SCREEN1
PAR-72-211-MW-01
PAR-72-211-MW-03
PAR-72-211-SCREEN2
PAR-72-211-SCREEN8
PAR-72-211-TMW-07
PAR-72-211-MW-04
Russel Avenue
Sherrill Avenue
211
229

LEGEND:

- Temporary Monitoring Well
- Soil Boring
- Former UST Location
- Shallow Monitoring Well
- Installation Boundary
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Groundwater Flow Direction

Notes:

1. Green highlights shows exceedances of the New Jersey Groundwater Quality Criteria (NJ GWQS).
2. Concentrations are ug/L.
3. J - Estimated detected value due to a concentration below the reporting limit.
4. < 4 - Non detect

	Parameter	NJ Ground Water Quality Standard
VOCs (µg/l)	1,2,4-Trimethylbenzene	100
VOCs (µg/l)	Benzene	1
VOCs (µg/l)	Naphthalene	300
VOCs (µg/l)	Total TICs	500
SVOCs (µg/l)	2-Methylnaphthalene	30
SVOCs (µg/l)	Benzo(b)fluoranthene	0.2
SVOCs (µg/l)	Bis(2-Ethylhexyl)phthalate	3
SVOCs (µg/l)	Dibenzofuran	100
SVOCs (µg/l)	Fluorene	300
SVOCs (µg/l)	Indeno(1,2,3-cd)pyrene	0.2
SVOCs (µg/l)	Naphthalene	300
SVOCs (µg/l)	Phenanthrene	100
SVOCs (µg/l)	Total TICs	500

N

1 inch = 40 feet

0 20 40 80 Feet

Source: FTMM Supplied CAD, 2013.

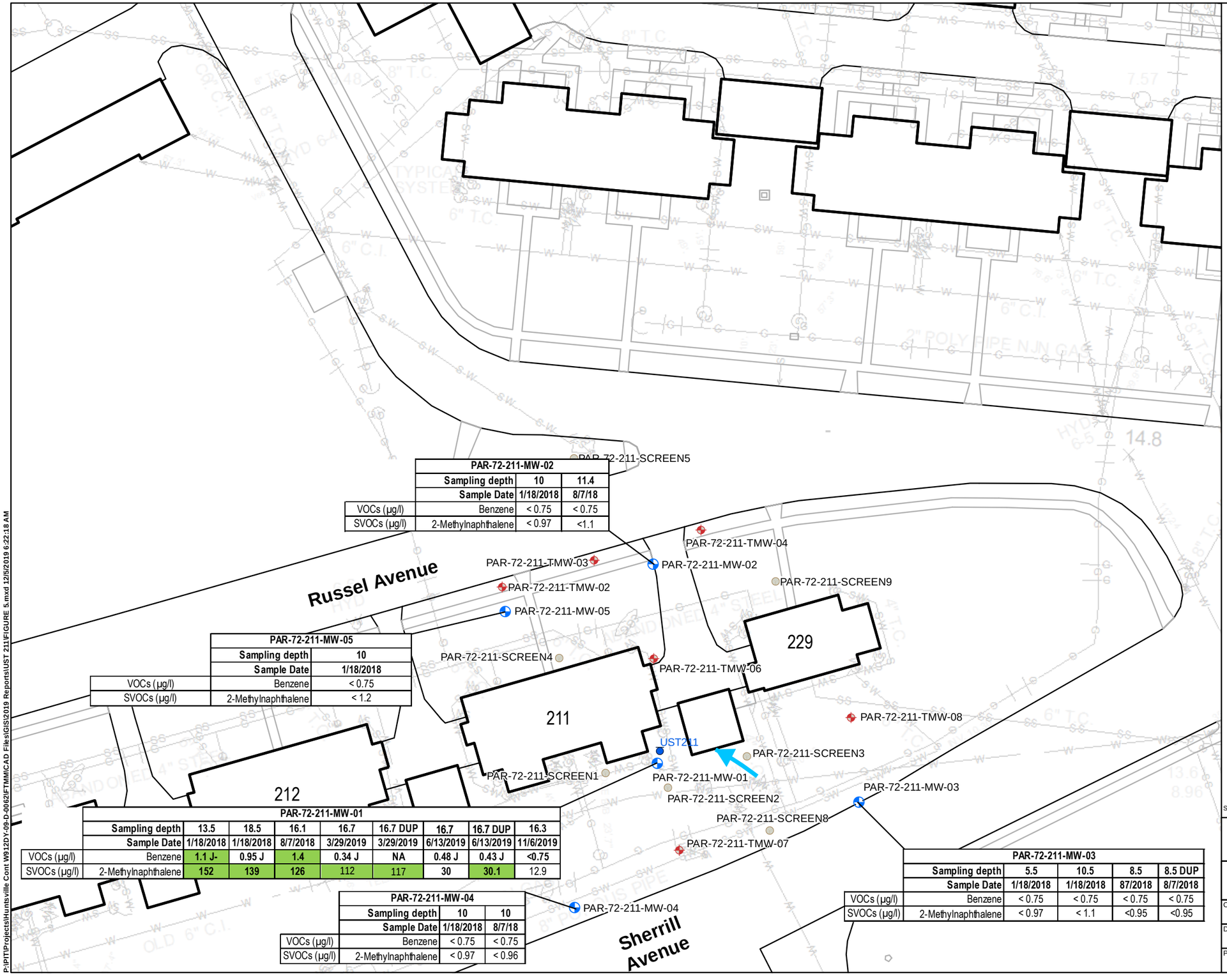
PARSONS
401 Diamond Drive NW, Huntsville AL

Fort Monmouth New Jersey

UST 211 TEMPORARY GROUNDWATER WELL SAMPLING LOCATIONS AND RESULTS

CREATED BY: RR	REVIEWED BY: JC
DATE: DEC. 2019	FIGURE NUMBER: FIGURE 4
PROJECT NUMBER: 748810-06031	FILE: FIGURE 4.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\2019 Reports\UST 211\FIGURE 4.mxd 12/5/2019 6:20:33 AM



PAR-72-211-MW-02			
	Sampling depth	10	11.4
	Sample Date	1/18/2018	8/7/18
VOCs (µg/l)	Benzene	< 0.75	< 0.75
SVOCs (µg/l)	2-Methylnaphthalene	< 0.97	<1.1

PAR-72-211-MW-05		
	Sampling depth	10
	Sample Date	1/18/2018
VOCs (µg/l)	Benzene	< 0.75
SVOCs (µg/l)	2-Methylnaphthalene	< 1.2

PAR-72-211-MW-01								
Sampling depth		13.5	18.5	16.1	16.7	16.7 DUP	16.7	16.7 DUP	16.3
Sample Date		1/18/2018	1/18/2018	8/7/2018	3/29/2019	3/29/2019	6/13/2019	6/13/2019	11/6/2019
VOCs (µg/l)	Benzene	1.1 J-	0.95 J	1.4	0.34 J	NA	0.48 J	0.43 J	<0.75
SVOCs (µg/l)	2-Methylnaphthalene	152	139	126	112	117	30	30.1	12.9

PAR-72-211-MW-04			
	Sampling depth	10	10
	Sample Date	1/18/2018	8/7/18
VOCs (µg/l)	Benzene	< 0.75	< 0.75
SVOCs (µg/l)	2-Methylnaphthalene	< 0.97	< 0.96

PAR-72-211-MW-03				
Sampling depth	5.5	10.5	8.5	8.5 DUP
Sample Date	1/18/2018	1/18/2018	87/2018	8/7/2018
Benzene	< 0.75	< 0.75	< 0.75	< 0.75
2-Methylnaphthalene	< 0.97	< 1.1	<0.95	<0.95

LEGEND:

- Temporary Monitoring Well
- Soil Boring
- Former UST Location
- Shallow Monitoring Well
- Installation Boundary
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Groundwater Flow Direction

Notes:

1. Green highlights shows exceedances of the New Jersey Groundwater Quality Criteria (NJ GWQS).
2. Concentrations are ug/L.
3. J - Estimated detected value due to a concentration below the reporting limit.
4. < 4 - Non detect

	Parameter	NJ Ground Water Quality Standard
VOCs (µg/l)	Benzene	1
SVOCs (µg/l)	2-Methylnaphthalene	30

N

1 inch = 40 feet

0 20 40 80 Feet

Source: FTMM Supplied CAD, 2013.

PARSONS
401 Diamond Drive NW, Huntsville AL

Fort Monmouth
New Jersey

UST 211 PERMANENT GROUNDWATER WELL SAMPLING LOCATIONS AND RESULTS

CREATED BY: RR	REVIEWED BY: JC
DATE: DEC. 2019	FIGURE NUMBER: FIGURE 5
PROJECT NUMBER: 748810-06031	FILE: FIGURE 5.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\2019 Reports\UST 211\FIGURE 5.mxd 12/5/2019 6:22:18 AM

TABLES

Table 1 - Groundwater Gauging Data and Elevations (July 30, 2018)

Table 2 – Ground Water Sampling Results from Temporary Monitoring Wells –
Comparison to NJDEP Ground Water Quality Criteria

Table 3 - Ground Water Sampling Results from Permanent Monitoring Wells –
Comparison to NJDEP Ground Water Quality Criteria

Table 1
Groundwater Gauging Data and Elevations (30 July 2018)
Parcel 72 UST 211
Fort Monmouth, New Jersey

Site	Well Permit #	Y Coord. (North)	X Coord. (East)	Installation Date	Depth	Well Riser Pipe Casing Length	Well Screen Length	Top of PVC Well Casing (elevation)	Slot Size	Flush Mount or Stick Up Protective Casing	Protective Casing Elevation	Ground Surface Elevation	Gauged Depth to Water	Calculated Groundwater Elevation
					(ft.)				inches	(FM or SU)			(ft. TOC)	(ft.)
PAR-72-211-MW-01	E201713122	540978.9	620941.6	11/21/2017	21	11	10	18.33	0.01	FM	18.72	18.63	10.88	7.45
PAR-72-211-MW-02	E201714057	541061.1	620939.8	12/19/2017	15	5	10	15.13	0.01	FM	15.56	15.85	7.66	7.47
PAR-72-211-MW-03	E201714058	540962.9	621024.9	12/19/2017	13	3	10	11.42	0.01	FM	11.90	12.17	3.93	7.49
PAR-72-211-MW-04	E201714059	540919.4	620907.4	12/19/2017	12	2	10	13.52	0.01	FM	13.90	11.81	6.79	6.73
PAR-72-211-MW-05	E201804506	541045	620854	5/17/2018	15	5	10	16.02	0.01	FM	16.43	16.39	8.68	7.34

Notes:

- The synoptic round of water levels in the wells was collected on 30 July 2018.
- ft = feet
- TOC = Top of Casing
- Elevation = feet above mean sea level

TABLE 2
GROUND WATER SAMPLING RESULTS FROM TEMPORARY WELLS- COMPARISON TO NJDEP GWQC
UST 211
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	PAR-72-211-TMW-01	PAR-72-211-TMW-02	PAR-72-211-TMW-03	PAR-72-211-TMW-04	PAR-72-211-TMW-06	PAR-72-211-TMW-07	PAR-72-211-TMW-08
Sample ID		PAR-72-211-TMW-01	PAR-72-211-TMW-02-11	PAR-72-211-TMW-03-11	PAR-72-211-TMW-04-11	PAR-72-211-TMW-06-11	PAR-72-211-TMW-07-11	PAR-72-211-TMW-08
Sample Date		8/10/2016	11/6/2017	11/6/2017	11/6/2017	11/6/2017	11/6/2017	11/21/2017
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,1,2-Tetrachloroethane	1	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
1,1,1-Trichloroethane	30	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
1,1,2,2-Tetrachloroethane	1	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
1,1,2-Trichloroethane	3	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
1,1-Dichloroethane	50	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
1,1-Dichloroethene	1	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
1,1-Dichloropropene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
1,2,3-Trichlorobenzene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
1,2,3-Trichloropropane	0.03	< 2.5	< 2.5	< 2.5	< 2.5	< 12.5	< 2.5	< 2.5
1,2,4-Trichlorobenzene	9	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
1,2,4-Trimethylbenzene	100	**543 J**	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	**0.39 J**
1,2-Dibromo-3-chloropropane	0.02	< 2.5	< 2.5	< 2.5	< 2.5	< 12.5	< 2.5	< 2.5
1,2-Dibromoethane	0.03	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
1,2-Dichlorobenzene	600	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
1,2-Dichloroethane	2	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
1,2-Dichloropropane	1	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
1,3,5-Trimethylbenzene	100	**81.4**	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
1,3-Dichlorobenzene	600	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
1,3-Dichloropropane	100	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
1,4-Dichlorobenzene	75	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
2,2-Dichloropropane	100	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
2-Chlorotoluene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Acetone	6,000	< 3.8	< 3.8	**4 J**	**5.5**	< 18.8	**4.3 J**	**3.6 J**
Benzene	1	**2.8**	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Bromobenzene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Bromochloromethane	100	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Bromodichloromethane	1	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Bromoform	4	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Carbon tetrachloride	1	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Chlorobenzene	50	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Chlorodibromomethane	1	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Chloroethane	5	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75 UJ
Chloroform	70	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Cis-1,2-Dichloroethene	70	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Cis-1,3-Dichloropropene	1	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Cymene	100	**16.9**	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Dichlorodifluoromethane	1,000	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Ethyl benzene	700	**92.4**	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Hexachlorobutadiene	1	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 3.8

TABLE 2
GROUND WATER SAMPLING RESULTS FROM TEMPORARY WELLS- COMPARISON TO NJDEP GWQC
UST 211
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	PAR-72-211-TMW-01	PAR-72-211-TMW-02	PAR-72-211-TMW-03	PAR-72-211-TMW-04	PAR-72-211-TMW-06	PAR-72-211-TMW-07	PAR-72-211-TMW-08
Sample ID		PAR-72-211-TMW-01	PAR-72-211-TMW-02-11	PAR-72-211-TMW-03-11	PAR-72-211-TMW-04-11	PAR-72-211-TMW-06-11	PAR-72-211-TMW-07-11	PAR-72-211-TMW-08
Sample Date		8/10/2016	11/6/2017	11/6/2017	11/6/2017	11/6/2017	11/6/2017	11/21/2017
Filtered		Total	Total	Total	Total	Total	Total	Total
Isopropylbenzene	700	**29.3**	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Meta/Para Xylene	1,000	**118**	< 1.5	< 1.5	< 1.5	< 7.5	< 1.5	< 1.5
Methyl bromide	10	< 0.75	**0.41 JB**	< 0.75	**0.4 JB**	< 3.8	**0.55 J**	< 0.75
Methyl butyl ketone	300	< 3.8	< 3.8	< 3.8	< 3.8	< 18.8	< 3.8	< 3.8
Methyl chloride	100	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Methyl ethyl ketone	300	**2.9 J**	< 3.8	< 3.8	< 3.8	< 18.8	< 3.8	< 3.8
Methyl isobutyl ketone	100	< 3.8	< 3.8	< 3.8	< 3.8	< 18.8	< 3.8	< 3.8
Methyl Tertbutyl Ether	70	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Methylene chloride	3	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Naphthalene	300	**862 J**	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	**3.9**
n-Butylbenzene	100	**26.1**	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Ortho Xylene	1,000	**39.1**	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
p-Chlorotoluene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Propylbenzene	100	**48.4**	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
sec-Butylbenzene	100	**25**	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	**0.36 J**
Styrene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Tert Butyl Alcohol	100	< 12.5	< 12.5	< 12.5	< 12.5	< 62.5	< 12.5	< 12.5
tert-Butylbenzene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Tetrachloroethene	1	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Toluene	600	**2.1**	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Total Xylenes	1,000	NA	< 2.3	< 2.3	< 2.3	< 11.3	< 2.3	< 2.3
Trans-1,2-Dichloroethene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Trans-1,3-Dichloropropene	1	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Trichloroethene	1	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Trichlorofluoromethane	2,000	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
Vinyl chloride	1	< 0.75	< 0.75	< 0.75	< 0.75	< 3.8	< 0.75	< 0.75
TIC VOCs (µg/l)								
Total TIC, VOCs	500	**1302.4 JN**	NA	**2.9 JN**	NA	**12.1 JN**	NA	NA
Semivolatile Organic Compounds (µg/l)								
1,2,4-Trichlorobenzene	9	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
1,2-Dichlorobenzene	600	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
1,2-Diphenylhydrazine	20	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
1,3-Dichlorobenzene	600	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
1,4-Dichlorobenzene	75	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
2,4,5-Trichlorophenol	700	< 57.7	< 12	< 12	< 12	< 12	< 12	< 2.8
2,4,6-Trichlorophenol	20	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
2,4-Dichlorophenol	20	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
2,4-Dimethylphenol	100	< 96.2	< 20	< 20	< 20	< 20	< 20	< 4.6
2,4-Dinitrophenol	40	< 154	< 32	< 32	< 32	< 32	< 32	< 7.4
2,4-Dinitrotoluene	10	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93

TABLE 2
GROUND WATER SAMPLING RESULTS FROM TEMPORARY WELLS- COMPARISON TO NJDEP GWQC
UST 211
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	PAR-72-211-TMW-01	PAR-72-211-TMW-02	PAR-72-211-TMW-03	PAR-72-211-TMW-04	PAR-72-211-TMW-06	PAR-72-211-TMW-07	PAR-72-211-TMW-08
Sample ID		PAR-72-211-TMW-01	PAR-72-211-TMW-02-11	PAR-72-211-TMW-03-11	PAR-72-211-TMW-04-11	PAR-72-211-TMW-06-11	PAR-72-211-TMW-07-11	PAR-72-211-TMW-08
Sample Date		8/10/2016	11/6/2017	11/6/2017	11/6/2017	11/6/2017	11/6/2017	11/21/2017
Filtered		Total	Total	Total	Total	Total	Total	Total
2,6-Dinitrotoluene	10	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
2-Chloronaphthalene	600	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
2-Chlorophenol	40	< 38.5	< 8	< 8	< 8	< 8	< 8	< 1.9
2-Methylnaphthalene	30	**6,680**	< 4	< 4	< 4	< 4	< 4	**0.45 J**
2-Methylphenol	100	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
2-Nitroaniline	100	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
2-Nitrophenol	100	< 38.5	< 8	< 8	< 8	< 8	< 8	< 1.9
3,3'-Dichlorobenzidine	30	< 57.7	< 12 UJ	< 12 UJ	< 12 UJ	< 12 UJ	< 12 UJ	< 2.8
3-Nitroaniline	100	< 38.5	< 8	< 8	< 8	< 8	< 8	< 1.9
4,6-Dinitro-2-methylphenol	1	< 96.2	< 20	< 20	< 20	< 20	< 20	< 4.6
4-Bromophenyl phenyl ether	100	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
4-Chloro-3-methylphenol	100	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
4-Chloroaniline	30	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
4-Chlorophenyl phenyl ether	100	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
4-Nitroaniline	5	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
4-Nitrophenol	100	< 96.2	< 20	< 20	< 20	< 20	< 20	< 4.6
Acenaphthene	400	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Acenaphthylene	100	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Anthracene	2,000	**195**	< 4	< 4	< 4	< 4	< 4	< 0.93
Benzidine	20	< 577	< 120 UJ	< 120 UJ	< 120 UJ	< 120 UJ	< 120 UJ	< 27.8
Benzo(a)anthracene	0.1	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Benzo(a)pyrene	0.1	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Benzo(b)fluoranthene	0.2	< 19.2	< 4	**0.54 J**	< 4	< 4	< 4	< 0.93
Benzo(ghi)perylene	100	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Benzo(k)fluoranthene	0.5	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Benzyl alcohol	2,000	< 38.5	< 8	< 8	< 8	< 8	< 8	< 1.9
Bis(2-Chloroethoxy)methane	100	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Bis(2-Chloroethyl)ether	7	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Bis(2-Chloroisopropyl)ether	300	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Bis(2-Ethylhexyl)phthalate	3	< 19.2	< 4	< 4	< 4	**25.2 J**	< 4	**0.37 J**
Butyl benzyl phthalate	100	< 19.2	< 4	< 4	< 4	**0.54 J**	< 4	< 0.93
Carbazole	100	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Chrysene	5	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Cresol	NLE	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Dibenz(a,h)anthracene	0.3	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Dibenzofuran	100	**247**	< 4	< 4	< 4	< 4	< 4	< 0.93
Diethyl phthalate	6,000	< 19.2	< 4	< 4	< 4	**0.73 J**	< 4	**0.23 J**
Dimethyl phthalate	100	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Di-n-butylphthalate	700	< 19.2	**0.94 J**	**0.72 J**	**0.96 J**	**1.3 J**	**1 J**	**0.16 J**
Di-n-octylphthalate	100	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93

TABLE 2
GROUND WATER SAMPLING RESULTS FROM TEMPORARY WELLS- COMPARISON TO NJDEP GWQC
UST 211
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	PAR-72-211-TMW-01	PAR-72-211-TMW-02	PAR-72-211-TMW-03	PAR-72-211-TMW-04	PAR-72-211-TMW-06	PAR-72-211-TMW-07	PAR-72-211-TMW-08
Sample ID		PAR-72-211-TMW-01	PAR-72-211-TMW-02-11	PAR-72-211-TMW-03-11	PAR-72-211-TMW-04-11	PAR-72-211-TMW-06-11	PAR-72-211-TMW-07-11	PAR-72-211-TMW-08
Sample Date		8/10/2016	11/6/2017	11/6/2017	11/6/2017	11/6/2017	11/6/2017	11/21/2017
Filtered		Total	Total	Total	Total	Total	Total	Total
Fluoranthene	300	< 19.2	< 4	**1.2 J**	< 4	< 4	< 4	< 0.93
Fluorene	300	**663**	< 4	< 4	< 4	< 4	< 4	< 0.93
Hexachlorobenzene	0.02	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Hexachlorobutadiene	1	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Hexachlorocyclopentadiene	40	< 38.5	< 8	< 8	< 8	< 8	< 8	< 1.9
Hexachloroethane	7	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Indeno(1,2,3-cd)pyrene	0.2	< 19.2	< 4	**0.54 J**	< 4	< 4	< 4	< 0.93
Isophorone	40	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Naphthalene	300	**1,450**	< 4	< 4	< 4	< 4	< 4	**2**
Nitrobenzene	6	< 38.5	< 8	< 8	< 8	< 8	< 8	< 1.9
N-Nitrosodimethylamine	0.8	< 38.5	< 8	< 8	< 8	< 8	< 8	< 1.9
N-Nitroso-di-n-propylamine	10	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
N-Nitrosodiphenylamine	10	< 38.5	< 8	< 8	< 8	< 8	< 8	< 1.9
Pentachlorophenol	0.3	< 154	< 32	< 32	< 32	< 32	< 32	< 7.4
Phenanthrene	100	**1,740**	< 4	< 4	< 4	**11.3**	**0.6 J**	< 0.93
Phenol	2,000	< 19.2	< 4	< 4	< 4	< 4	< 4	< 0.93
Pyrene	200	**185**	< 4	**1.2 J**	< 4	< 4	**0.9 J**	< 0.93
TIC SVOCs (µg/l)								
Total TICs, SVOCs	500	**14322 JN**	NA	NA	**36.3 JN**	**488.4 J**	**92.5 JN**	**57.9 JN**

Footnote:

1) All historical data collected prior to 2013 are reported as provided by others.

2) Number of Analyses is the number of detected and non-detected results excluding rejected results. Sample duplicate pairs have not been averaged.

3) NLE = no limit established.

4) ND = not detected in any background sample, no background concentration available.

5) Bold chemical dectection

6) SS = Site Specific action level, see "Specific Chemical Class (or Parameter)" footnote for details.

7) Chemical result qualifiers are assigned by the laboratory and are evaluated and modified (if necessary) during the data validation.

[blank] = detect, i.e. detected chemical result value.

B =Compound detected in the sample at a concentration less than or equal to 5 times (10 times for common lab contaminants) the blank concentration.

R = Rejected, data validation rejected the results.

U = non-detect, i.e. not detected at or above this value.

U-DL = Elevated sample detection limit due to difficult sample matrix.

U-ND = Analyte not detected in sample, but no detection or reporting limit provided.

J = estimated detected value due to a concetration below the reporting limit or due to discrepancies in meeting certain analyte-specific quality control.

E (or ER) = Estimated result.

D = Results from dilution of sample.

J-DL = Elevated sample detection limit due to difficult sample matrix.

JN = Tentatively identified compound, estimated concentration.

UJ=The compound was not detected: however, the results is estimated because of discrepancies in meeting certain analyte-specific QC criteria.

J+ = The result is an estimated quantity, but the result may be biased high.

J- = The result is an estimated quantity, but the result may be biased low.

8) Specific Chemical Classes (or Parameters) comments or notes regarding how data is displayed, compared to Action Levels, or represented in this table.

9) Chemical results greater than or equal to the action level (depending on criteria) are highlighted based on the Criteria that are present.

- Cell Shade values represent a result that is above the NJ Ground Water Quality Criteria ####

NJDEP Interim Specific GWQC values are presented for the NJ GWQS where there is not a Specific Ground Water Quality Criteria. A full list of compounds is available at (http://www.nj.gov/dep/wms/bwqsa/gwqs_interim_criteria_table.htm).

NJDEP Interim Generic GWQC values are presented for the NJ GWQS where there is not a XXXXX or a NJDEP Interim Specific GWQC. Available at (http://www.nj.gov/dep/wms/bwqsa/gwqs_interim_criteria_table.htm).

10) Criteria action level source document and web address.

- The NJ Ground Water Quality Criteria refers to the NJDEP Groundwater Quality Standards - Adopted July 22, 2010

http://www.state.nj.us/dep/wms/bwqsa/docs/njac79C.pdf

TABLE 3
PERMANENT GROUND WATER SAMPLING LOCATIONS AND RESULTS - COMPARISON TO NJDEP GWQC
UST 211
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	PAR-72-211-MW01							
Sample ID		PAR-72-211-GW-MW-01-13.5	PAR-72-211-GW-MW-01-18.5	PAR-72-211-GW-MW-01-16.1	PAR-72-211-GW-MW-01 16.7	PAR-72-211-GW-MW-101 16.7	PAR-72-211-GW-MW-01	PAR-72-211-GW-MW-101	PAR-72-211-GW-MW-01
Sample Date		1/18/2018	1/18/2018	8/7/2018	3/29/2019	3/29/2019	6/13/2019	6/13/2019	11/6/2019
Filtered		Total	Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)									
1,1,1,2-Tetrachloroethane	1	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	30	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	1	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	3	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
1,1-Dichloroethane	50	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
1,1-Dichloroethene	1	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
1,1-Dichloropropene	100	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	100	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	0.03	< 2.5 UJ	< 2.5	< 2.5	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	9	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	100	**40.5 J-**	**34.3**	**6.9**	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.02	< 2.5 UJ	< 2.5	< 2.5	NA	NA	NA	NA	NA
1,2-Dibromoethane	0.03	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
1,2-Dichloroethane	2	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
1,2-Dichloropropane	1	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	100	**11.8 J-**	**10**	**0.83 J**	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	600	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
1,3-Dichloropropane	100	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
2,2-Dichloropropane	100	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
2-Chlorotoluene	100	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Acetone	6,000	< 3.8 UJ	< 3.8	< 3.8	NA	NA	NA	NA	NA
Benzene	1	**1.1 J-**	**0.95 J**	**1.4**	**0.34 J**	NA	**0.48 J**	**0.43 J**	< 0.75
Bromobenzene	100	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Bromochloromethane	100	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Bromodichloromethane	1	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Bromoform	4	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Carbon tetrachloride	1	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Chlorobenzene	50	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Chlorodibromomethane	1	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Chloroethane	5	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Chloroform	70	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Cis-1,2-Dichloroethene	70	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Cis-1,3-Dichloropropene	1	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Cymene	100	**1.7 J-**	**1.6**	< 0.75	NA	NA	NA	NA	NA
Dichlorodifluoromethane	1,000	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Ethyl benzene	700	**8.1 J-**	**6.8**	**3.9**	NA	NA	NA	NA	NA
Hexachlorobutadiene	1	< 3.8 UJ	< 3.8	< 3.8	NA	NA	NA	NA	NA
Isopropylbenzene	700	**5.8 J-**	**4.9**	**4**	NA	NA	NA	NA	NA

TABLE 3
PERMANENT GROUND WATER SAMPLING LOCATIONS AND RESULTS - COMPARISON TO NJDEP GWQC
UST 211
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	PAR-72-211-MW01							
Sample ID		PAR-72-211-GW-MW-01-13.5	PAR-72-211-GW-MW-01-18.5	PAR-72-211-GW-MW-01-16.1	PAR-72-211-GW-MW-01 16.7	PAR-72-211-GW-MW-101 16.7	PAR-72-211-GW-MW-01	PAR-72-211-GW-MW-101	PAR-72-211-GW-MW-01
Sample Date		1/18/2018	1/18/2018	8/7/2018	3/29/2019	3/29/2019	6/13/2019	6/13/2019	11/6/2019
Filtered		Total	Total	Total	Total	Total	Total	Total	Total
Meta/Para Xylene	1,000	**10.7 J-**	**8.6**	**2.4**	NA	NA	NA	NA	NA
Methyl bromide	10	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Methyl butyl ketone	300	< 3.8 UJ	< 3.8	< 3.8	NA	NA	NA	NA	NA
Methyl chloride	100	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Methyl ethyl ketone	300	< 3.8 UJ	< 3.8	< 3.8	NA	NA	NA	NA	NA
Methyl isobutyl ketone	100	< 3.8 UJ	< 3.8	< 3.8	NA	NA	NA	NA	NA
Methyl Tertbutyl Ether	70	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Methylene chloride	3	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Naphthalene	300	**111 J-**	**123**	**86.1**	NA	NA	NA	NA	NA
n-Butylbenzene	100	**5.1 J-**	**5.3**	< 0.75	NA	NA	NA	NA	NA
Ortho Xylene	1,000	**4.2 J-**	**3.4**	< 0.75	NA	NA	NA	NA	NA
p-Chlorotoluene	100	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Propylbenzene	100	**6.8 J-**	**6**	**3.1**	NA	NA	NA	NA	NA
sec-Butylbenzene	100	**10.6 J-**	**10.1**	**10.2**	NA	NA	NA	NA	NA
Styrene	100	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Tert Butyl Alcohol	100	< 12.5 UJ	< 12.5	< 12.5	NA	NA	NA	NA	NA
tert-Butylbenzene	100	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Tetrachloroethene	1	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Toluene	600	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Total Xylenes	1,000	**14.8 J-**	**12**	**2.4 J**	NA	NA	NA	NA	NA
Trans-1,2-Dichloroethene	100	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Trans-1,3-Dichloropropene	1	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Trichloroethene	1	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Trichlorofluoromethane	2,000	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
Vinyl chloride	1	< 0.75 UJ	< 0.75	< 0.75	NA	NA	NA	NA	NA
TIC VOCs (µg/l)									
Total TIC, VOCs	500	**222.5 JN**	**286.8 JN**	**183.5 JN**	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (µg/l)									
1,2,4-Trichlorobenzene	9	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	600	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
1,2-Diphenylhydrazine	20	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	600	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	75	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	700	< 3.2	< 3	< 3.4	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	20	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
2,4-Dichlorophenol	20	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
2,4-Dimethylphenol	100	< 5.3	< 5	< 5.7	NA	NA	NA	NA	NA
2,4-Dinitrophenol	40	< 8.4	< 8	< 9.2	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	10	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	10	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
2-Chloronaphthalene	600	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
2-Chlorophenol	40	< 2.1	< 2	< 2.3	NA	NA	NA	NA	NA

TABLE 3
PERMANENT GROUND WATER SAMPLING LOCATIONS AND RESULTS - COMPARISON TO NJDEP GWQC
UST 211
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	PAR-72-211-MW01							
Sample ID		PAR-72-211-GW-MW-01-13.5	PAR-72-211-GW-MW-01-18.5	PAR-72-211-GW-MW-01-16.1	PAR-72-211-GW-MW-01 16.7	PAR-72-211-GW-MW-101 16.7	PAR-72-211-GW-MW-01	PAR-72-211-GW-MW-101	PAR-72-211-GW-MW-01
Sample Date		1/18/2018	1/18/2018	8/7/2018	3/29/2019	3/29/2019	6/13/2019	6/13/2019	11/6/2019
Filtered		Total	Total	Total	Total	Total	Total	Total	Total
2-Methylnaphthalene	30	**152**	**139**	**126**	**112**	**117**	**30**	**30.1**	**12.9**
2-Methylphenol	100	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
2-Nitroaniline	100	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
2-Nitrophenol	100	< 2.1	< 2	< 2.3	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	30	< 3.2	< 3	< 3.4	NA	NA	NA	NA	NA
3-Nitroaniline	100	< 2.1	< 2	< 2.3	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	1	< 5.3	< 5	< 5.7	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	100	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	100	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
4-Chloroaniline	30	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	100	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
4-Nitroaniline	5	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
4-Nitrophenol	100	< 5.3	< 5	< 5.7	NA	NA	NA	NA	NA
Acenaphthene	400	**4.2**	**3.7**	**2.3**	NA	NA	NA	NA	NA
Acenaphthylene	100	< 1.1	< 1	**0.68 J**	NA	NA	NA	NA	NA
Anthracene	2,000	< 1.1	**0.42 J**	**0.18 J**	NA	NA	NA	NA	NA
Benzidine	20	< 31.6	< 30	< 34.5	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.1	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.1	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.2	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Benzo(ghi)perylene	100	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.5	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Benzyl alcohol	2,000	< 2.1	< 2	< 2.3	NA	NA	NA	NA	NA
Bis(2-Chloroethoxy)methane	100	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Bis(2-Chloroethyl)ether	7	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Bis(2-Chloroisopropyl)ether	300	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	3	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Butyl benzyl phthalate	100	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Carbazole	100	**14.7**	**13.4**	**4.4 J**	NA	NA	NA	NA	NA
Chrysene	5	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Cresol	NLE	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	0.3	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Dibenzofuran	100	< 1.1	**5 J**	**4.6 J**	NA	NA	NA	NA	NA
Diethyl phthalate	6,000	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Dimethyl phthalate	100	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Di-n-butylphthalate	700	< 1.1	< 1	**0.52 J**	NA	NA	NA	NA	NA
Di-n-octylphthalate	100	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Fluoranthene	300	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Fluorene	300	**6.8**	**6.2**	**5.9**	NA	NA	NA	NA	NA
Hexachlorobenzene	0.02	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Hexachlorobutadiene	1	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	40	< 2.1	< 2	< 2.3	NA	NA	NA	NA	NA

TABLE 3
PERMANENT GROUND WATER SAMPLING LOCATIONS AND RESULTS - COMPARISON TO NJDEP GWQC
UST 211
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	PAR-72-211-MW01							
Sample ID		PAR-72-211-GW-MW-01-13.5	PAR-72-211-GW-MW-01-18.5	PAR-72-211-GW-MW-01-16.1	PAR-72-211-GW-MW-01 16.7	PAR-72-211-GW-MW-101 16.7	PAR-72-211-GW-MW-01	PAR-72-211-GW-MW-101	PAR-72-211-GW-MW-01
Sample Date		1/18/2018	1/18/2018	8/7/2018	3/29/2019	3/29/2019	6/13/2019	6/13/2019	11/6/2019
Filtered		Total	Total	Total	Total	Total	Total	Total	Total
Hexachloroethane	7	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.2	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Isophorone	40	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Naphthalene	300	**77**	**70.7**	**50.1**	NA	NA	NA	NA	NA
Nitrobenzene	6	< 2.1	< 2	< 2.3	NA	NA	NA	NA	NA
N-Nitrosodimethylamine	0.8	< 2.1	< 2	< 2.3	NA	NA	NA	NA	NA
N-Nitroso-di-n-propylamine	10	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	10	< 2.1	< 2	< 2.3	NA	NA	NA	NA	NA
Pentachlorophenol	0.3	< 8.4	< 8	< 9.2	NA	NA	NA	NA	NA
Phenanthrene	100	**10.5**	**10**	**9.4**	NA	NA	NA	NA	NA
Phenol	2,000	< 1.1	< 1	< 1.1	NA	NA	NA	NA	NA
Pyrene	200	**0.26 J**	**0.17 J**	< 1.1	NA	NA	NA	NA	NA
TIC SVOCs (µg/l)									
Total TICs, SVOCs	500	**199.8 JN**	**223.5 JN**	**320.8 JN**	NA	NA	NA	NA	NA

TABLE 3
PERMANENT GROUND WATER SAMPLING LOCATIONS AND RESULTS - COMPARISON TO NJDEP GWQC
UST 211
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	PAR-72-211-MW02		PAR-72-211-MW03				PAR-72-211-MW04		PAR-72-211-MW05
Sample ID		PAR-72-211-GW-MW-02-10	PAR-72-211-GW-MW-02-11.4	PAR-72-211-GW-MW-03-5.5	PAR-72-211-GW-MW-03-10.5	PAR-72-211-GW-MW-03-8.5	PAR-72-211-GW-MW-103-8.5	PAR-72-211-GW-MW-04-10	PAR-72-211-GW-MW-04-10.0	PAR-72-211-GW-MW-05-12.0
Sample Date		1/18/2018	8/7/2018	1/18/2018	1/18/2018	8/7/2018	8/7/2018	1/18/2018	8/7/2018	8/7/2018
Filtered		Total	Total	Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)										
1,1,1,2-Tetrachloroethane	1	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,1,1-Trichloroethane	30	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,1,2,2-Tetrachloroethane	1	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,1,2-Trichloroethane	3	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,1-Dichloroethane	50	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,1-Dichloroethene	1	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,1-Dichloropropene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,2,3-Trichlorobenzene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,2,3-Trichloropropane	0.03	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
1,2,4-Trichlorobenzene	9	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,2,4-Trimethylbenzene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,2-Dibromo-3-chloropropane	0.02	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
1,2-Dibromoethane	0.03	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,2-Dichlorobenzene	600	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,2-Dichloroethane	2	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,2-Dichloropropane	1	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,3,5-Trimethylbenzene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,3-Dichlorobenzene	600	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,3-Dichloropropane	100	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
1,4-Dichlorobenzene	75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
2,2-Dichloropropane	100	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
2-Chlorotoluene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Acetone	6,000	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8
Benzene	1	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Bromobenzene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Bromochloromethane	100	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Bromodichloromethane	1	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Bromoform	4	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Carbon tetrachloride	1	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Chlorobenzene	50	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Chlorodibromomethane	1	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Chloroethane	5	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Chloroform	70	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Cis-1,2-Dichloroethene	70	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Cis-1,3-Dichloropropene	1	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Cymene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Dichlorodifluoromethane	1,000	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Ethyl benzene	700	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Hexachlorobutadiene	1	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8
Isopropylbenzene	700	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75

TABLE 3
PERMANENT GROUND WATER SAMPLING LOCATIONS AND RESULTS - COMPARISON TO NJDEP GWQC
UST 211
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	PAR-72-211-MW02		PAR-72-211-MW03				PAR-72-211-MW04		PAR-72-211-MW05
Sample ID		PAR-72-211-GW-MW-02-10	PAR-72-211-GW-MW-02-11.4	PAR-72-211-GW-MW-03-5.5	PAR-72-211-GW-MW-03-10.5	PAR-72-211-GW-MW-03-8.5	PAR-72-211-GW-MW-103-8.5	PAR-72-211-GW-MW-04-10	PAR-72-211-GW-MW-04-10.0	PAR-72-211-GW-MW-05-12.0
Sample Date		1/18/2018	8/7/2018	1/18/2018	1/18/2018	8/7/2018	8/7/2018	1/18/2018	8/7/2018	8/7/2018
Filtered		Total	Total	Total	Total	Total	Total	Total	Total	Total
Meta/Para Xylene	1,000	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Methyl bromide	10	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Methyl butyl ketone	300	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8
Methyl chloride	100	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Methyl ethyl ketone	300	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8
Methyl isobutyl ketone	100	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8	< 3.8
Methyl Tertbutyl Ether	70	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Methylene chloride	3	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Naphthalene	300	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	**1.8**	< 0.75	< 0.75
n-Butylbenzene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Ortho Xylene	1,000	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
p-Chlorotoluene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Propylbenzene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
sec-Butylbenzene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Styrene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Tert Butyl Alcohol	100	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5
tert-Butylbenzene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Tetrachloroethene	1	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Toluene	600	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Total Xylenes	1,000	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3	< 2.3
Trans-1,2-Dichloroethene	100	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Trans-1,3-Dichloropropene	1	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Trichloroethene	1	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Trichlorofluoromethane	2,000	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
Vinyl chloride	1	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75	< 0.75
TIC VOCs (µg/l)										
Total TIC, VOCs	500	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (µg/l)										
1,2,4-Trichlorobenzene	9	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
1,2-Dichlorobenzene	600	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
1,2-Diphenylhydrazine	20	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
1,3-Dichlorobenzene	600	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
1,4-Dichlorobenzene	75	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
2,4,5-Trichlorophenol	700	< 2.9	< 3.2	< 2.9	< 3.2	< 2.8	< 2.8	< 2.9	< 2.9	< 3.5
2,4,6-Trichlorophenol	20	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
2,4-Dichlorophenol	20	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
2,4-Dimethylphenol	100	< 4.9	< 5.4	< 4.9	< 5.3	< 4.7	< 4.7	< 4.9	< 4.8	< 5.8
2,4-Dinitrophenol	40	< 7.8	< 8.6	< 7.8	< 8.4	< 7.6	< 7.6	< 7.8	< 7.7	< 9.3
2,4-Dinitrotoluene	10	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
2,6-Dinitrotoluene	10	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
2-Chloronaphthalene	600	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
2-Chlorophenol	40	< 1.9	< 2.2	< 1.9	< 2.1	< 1.9	< 1.9	< 1.9	< 1.9	< 2.3

TABLE 3
PERMANENT GROUND WATER SAMPLING LOCATIONS AND RESULTS - COMPARISON TO NJDEP GWQC
UST 211
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	PAR-72-211-MW02		PAR-72-211-MW03				PAR-72-211-MW04		PAR-72-211-MW05
Sample ID		PAR-72-211-GW-MW-02-10	PAR-72-211-GW-MW-02-11.4	PAR-72-211-GW-MW-03-5.5	PAR-72-211-GW-MW-03-10.5	PAR-72-211-GW-MW-03-8.5	PAR-72-211-GW-MW-103-8.5	PAR-72-211-GW-MW-04-10	PAR-72-211-GW-MW-04-10.0	PAR-72-211-GW-MW-05-12.0
Sample Date		1/18/2018	8/7/2018	1/18/2018	1/18/2018	8/7/2018	8/7/2018	1/18/2018	8/7/2018	8/7/2018
Filtered		Total	Total	Total	Total	Total	Total	Total	Total	Total
2-Methylnaphthalene	30	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
2-Methylphenol	100	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
2-Nitroaniline	100	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
2-Nitrophenol	100	< 1.9	< 2.2	< 1.9	< 2.1	< 1.9	< 1.9	< 1.9	< 1.9	< 2.3
3,3'-Dichlorobenzidine	30	< 2.9	< 3.2	< 2.9	< 3.2	< 2.8	< 2.8	< 2.9	< 2.9	< 3.5
3-Nitroaniline	100	< 1.9	< 2.2	< 1.9	< 2.1	< 1.9	< 1.9	< 1.9	< 1.9	< 2.3
4,6-Dinitro-2-methylphenol	1	< 4.9	< 5.4	< 4.9	< 5.3	< 4.7	< 4.7	< 4.9	< 4.8	< 5.8
4-Bromophenyl phenyl ether	100	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
4-Chloro-3-methylphenol	100	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
4-Chloroaniline	30	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
4-Chlorophenyl phenyl ether	100	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
4-Nitroaniline	5	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
4-Nitrophenol	100	< 4.9	< 5.4	< 4.9	< 5.3	< 4.7	< 4.7	< 4.9	< 4.8	< 5.8
Acenaphthene	400	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Acenaphthylene	100	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Anthracene	2,000	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Benzidine	20	< 29.1	< 32.3	< 29.1	< 31.6	< 28.4	< 28.4	< 29.1	< 28.7	< 34.9
Benzo(a)anthracene	0.1	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Benzo(a)pyrene	0.1	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Benzo(b)fluoranthene	0.2	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Benzo(ghi)perylene	100	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Benzo(k)fluoranthene	0.5	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Benzyl alcohol	2,000	< 1.9	< 2.2	< 1.9	< 2.1	< 1.9	< 1.9	< 1.9	< 1.9	< 2.3
Bis(2-Chloroethoxy)methane	100	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Bis(2-Chloroethyl)ether	7	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Bis(2-Chloroisopropyl)ether	300	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Bis(2-Ethylhexyl)phthalate	3	< 0.97	< 1.1	**0.31 J**	**0.33 J**	< 0.95	< 0.95	**0.41 J**	< 0.96	< 1.2
Butyl benzyl phthalate	100	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	**0.12 J**	< 1.2
Carbazole	100	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Chrysene	5	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Cresol	NLE	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Dibenz(a,h)anthracene	0.3	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Dibenzofuran	100	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Diethyl phthalate	6,000	< 0.97	< 1.1	**1.1 J**	**2.8 J**	< 0.95	**0.17 J**	< 0.97	< 0.96	< 1.2
Dimethyl phthalate	100	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Di-n-butylphthalate	700	< 0.97	**0.17 J**	**0.56 J**	**0.45 J**	**0.28 J**	**0.23 J**	**0.55 J**	**0.33 J**	**0.22 J**
Di-n-octylphthalate	100	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Fluoranthene	300	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Fluorene	300	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Hexachlorobenzene	0.02	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Hexachlorobutadiene	1	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Hexachlorocyclopentadiene	40	< 1.9	< 2.2	< 1.9	< 2.1	< 1.9	< 1.9	< 1.9	< 1.9	< 2.3

TABLE 3
PERMANENT GROUND WATER SAMPLING LOCATIONS AND RESULTS - COMPARISON TO NJDEP GWQC
UST 211
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	PAR-72-211-MW02		PAR-72-211-MW03				PAR-72-211-MW04		PAR-72-211-MW05
Sample ID		PAR-72-211-GW-MW-02-10	PAR-72-211-GW-MW-02-11.4	PAR-72-211-GW-MW-03-5.5	PAR-72-211-GW-MW-03-10.5	PAR-72-211-GW-MW-03-8.5	PAR-72-211-GW-MW-103-8.5	PAR-72-211-GW-MW-04-10	PAR-72-211-GW-MW-04-10.0	PAR-72-211-GW-MW-05-12.0
Sample Date		1/18/2018	8/7/2018	1/18/2018	1/18/2018	8/7/2018	8/7/2018	1/18/2018	8/7/2018	8/7/2018
Filtered		Total	Total	Total	Total	Total	Total	Total	Total	Total
Hexachloroethane	7	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Indeno(1,2,3-cd)pyrene	0.2	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Isophorone	40	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Naphthalene	300	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Nitrobenzene	6	< 1.9	< 2.2	< 1.9	< 2.1	< 1.9	< 1.9	< 1.9	< 1.9	< 2.3
N-Nitrosodimethylamine	0.8	< 1.9	< 2.2	< 1.9	< 2.1	< 1.9	< 1.9	< 1.9	< 1.9	< 2.3
N-Nitroso-di-n-propylamine	10	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
N-Nitrosodiphenylamine	10	< 1.9	< 2.2	< 1.9	< 2.1	< 1.9	< 1.9	< 1.9	< 1.9	< 2.3
Pentachlorophenol	0.3	< 7.8	< 8.6	< 7.8	< 8.4	< 7.6	< 7.6	< 7.8	< 7.7	< 9.3
Phenanthrene	100	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Phenol	2,000	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
Pyrene	200	< 0.97	< 1.1	< 0.97	< 1.1	< 0.95	< 0.95	< 0.97	< 0.96	< 1.2
TIC SVOCs (µg/l)										
Total TICs, SVOCs	500	NA	NA	NA	NA	NA	NA	NA	NA	NA

Footnote:

1) All historical data collected prior to 2013 are reported as provided by others.

2) Number of Analyses is the number of detected and non-detected results excluding rejected results. Sample duplicate pairs have not been averaged.

3) NLE = no limit established.

4) ND = not detected in any background sample, no background concentration available.

5) Bold chemical dectection

6) SS = Site Specific action level, see "Specific Chemical Class (or Parameter)" footnote for details.

7) Chemical result qualifiers are assigned by the laboratory and are evaluated and modified (if necessary) during the data validation.

[blank] = detect, i.e. detected chemical result value.

B =Compound detected in the sample at a concentration less than or equal to 5 times (10 times for common lab contaminants) the blank concentration.

R = Rejected, data validation rejected the results.

U = non-detect, i.e. not detected at or above this value.

U-DL = Elevated sample detection limit due to difficult sample matrix.

U-ND = Analyte not detected in sample, but no detection or reporting limit provided.

J = estimated detected value due to a concetration below the reporting limit or due to discrepancies in meeting certain analyte-specific quality control.

E (or ER) = Estimated result.

D = Results from dilution of sample.

J-DL = Elevated sample detection limit due to difficult sample matrix.

JN = Tentatively identified compound, estimated concentration.

UJ=The compound was not detected: however, the results is estimated because of discrepancies in meeting certain analyte-specific QC criteria.

J+ = The result is an estimated quantity, but the result may be biased high.

J- = The result is an estimated quantity, but the result may be biased low.

8) Specific Chemical Classes (or Parameters) comments or notes regarding how data is displayed, compared to Action Levels, or represented in this table.

9) Chemical results greater than or equal to the action level (depending on criteria) are highlighted based on the Criteria that are present.

- Cell Shade values represent a result that is above the NJ Ground Water Quality Criteria ####

NJDEP Interim Specific GWQC values are presented for the NJ GWQS where there is not a Specific Ground Water Quality Criteria. A full list of compounds is available at (http://www.nj.gov/dep/wms/bwqsa/gwqs_interim_criteria_table.htm).

NJDEP Interim Generic GWQC values are presented for the NJ GWQS where there is not a XXXXX or a NJDEP Interim Specific GWQC. Available at (http://www.nj.gov/dep/wms/bwqsa/gwqs_interim_criteria_table.htm).

10) Criteria action level source document and web address.

- The NJ Ground Water Quality Criteria refers to the NJDEP Groundwater Quality Standards - Adopted July 22, 2010

http://www.state.nj.us/dep/wms/bwqsa/docs/njac79C.pdf

Attachment A
Correspondence:

1. New Jersey Department of Environmental Protection (NJDEP). 2017. *Supplemental Unregulated Heating Oil Tank (UHOT) Work Plan, Fort Monmouth, Oceanport, Monmouth County*. 13 October.
2. Department of the Army. 2017. *Supplemental Unregulated Heating Oil Tank (UHOT) Work Plan, Fort Monmouth, New Jersey.* Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. 15 August.
3. NJDEP. 2017. *No Further Action Request Site Investigation Report Addendum ECP Parcel 72 Underground Storage Tanks dated December 13, 2016, Fort Monmouth, Oceanport, Monmouth County.* 7 February.
4. Department of the Army. 2016. *No Further Action Request, Site Investigation Report Addendum, ECP Parcel 72 Underground Storage Tanks, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. 13 December.
5. NJDEP. 2016. *Parcel 72 Select Unregulated Heating Oil Tanks (UHOTs) Work Plan Addendum, Fort Monmouth, Oceanport, Monmouth County.* 12 July.
6. Department of the Army. 2016. *Parcel 72 Select Unregulated Heating Oil Tanks (UHOTs) Work Plan Addendum, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. 1 July.

State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Northern Field Operations
7 Ridgedale Avenue
Cedar Knolls, NJ 07927
Phone #: 973-631-6401
Fax #: 973-656-4440

BOB MARTIN
Commissioner

October 13, 2017

Mr. William Colvin
BRAC Environmental Coordinator
OACSIM – U.S. Army Fort Monmouth
P. O. Box 148
Oceanport, NJ 07757

Re: Supplemental Unregulated Heating Oil Tank Work Plan
Fort Monmouth
Oceanport, Monmouth County
PI G000000032

Dear Mr. Colvin,

The New Jersey Department of Environmental Protection (Department) has completed review of the Supplemental Unregulated Heating Oil Tank Work Plan (UST Workplan). The UST Workplan included proposal for further investigation(s) at various Underground Storage Tank (UST) locations. The Department offers the following comments:

- **UST 142B, UST 202A, UST 202D** – The proposal to install monitor wells (MWs) is approved. Please ensure that all approved sampling methodologies are utilized. Please also document field observations, including the presence of free product and/or sheen in any of the MWs. Please note that the proposal to install additional MW, as needed, is also approved as this may assist in further delineating the extent of ground water contamination.
- **UST 211** – Further investigation is approved as proposed. However, the Department recommends installing one temporary well south of boring locations SCREEN 5 and SCREEN 6.
- **UST 228B** – Further investigation is approved as proposed. Based on the findings from previous investigation(s) and subsequent sampling results (soils and ground water), the Department may recommend removing the UST.
- **UST 444** – The installation of borings (6), temporary wells (3) and permanent monitor wells (3) is approved. However, as other USTs were present in the area, please ensure that results from UST 444 and other USTs' results are not co-mingled.
- **UST 490** – Further investigation is approved as proposed. However, please indicate if any previous soil remediation in the form of soil removal was performed when this UST was removed in 1990 or thereafter.
- **UST 750J, UST 800-12, UST 800-20, UST 884, UST 906A** and **UST 3035** – Further investigations are approved as proposed at these locations.

Please submit all results of the findings to my attention for review. If possible, please have each UST findings, tables, figures and maps individually prepared. Thank you and please feel free to contact me if you have any questions.

Sincerely,

A.J. Joshi

C: James Moore, USACE
Rich Harrison, FMERA
Joe Fallon, FMERA
Joe Pearson, Calibre
File

DEPARTMENT OF THE ARMY

OFFICE OF ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
U.S. ARMY FORT MONMOUTH
P.O. 148
OCEANPORT, NEW JERSEY 07757

15 August 2017

Mr. Ashish Joshi
New Jersey Department of Environmental Protection
Northern Bureau of Field Operations
7 Ridgedale Avenue
Cedar Knolls, NJ 07927

SUBJECT: Supplemental Unregulated Heating Oil Tank (UHOT) Work Plan
Fort Monmouth, New Jersey
PI G000000032

Figures:

Figure 1 – UHOT Locations
Figure 2 – UST 142B Sample Location
Figure 3 – UST 202A and UST 202D Sample Locations
Figure 4 – UST 211 Sample Locations
Figure 5 – UST 228B Sample Location
Figure 6 – UST 444 Sample Locations
Figure 7 – UST 490 Sample Locations
Figure 8 – UST 750J Sample Location
Figure 9 – UST 800-12 Sample Locations
Figure 10 – UST 800-20 Sample Locations
Figure 11 – UST 884 Sample Locations
Figure 12 – UST 906A Soil Sample Locations
Figure 13 – UST 906A Groundwater Sample Locations
Figure 14 – UST 3035 Sample Locations

Tables:

Table 1 – Sampling Summary
Table 2 – UST 906A Soil Sample Results
Table 3 – UST 906A Groundwater Sample Results

Attachments:

A. Groundwater Flow Direction Maps

Dear Mr. Joshi:

The U.S. Army Fort Monmouth (FTMM) Team has prepared this Work Plan to describe the proposed sampling and analyses activities to support environmental investigations at select unregulated heating oil tanks (UHOTs; also referred to as underground storage tanks [USTs] in this submittal) at FTMM (Figure 1).

The UHOTs described in this Work Plan are being evaluated in accordance with the New Jersey Administrative Code (NJAC) 7:26E *Technical Requirements for Site Remediation*. Most of these UHOTs require a remedial investigation (RI) in accordance with NJAC 7:26E-4.3 for delineation of an identified release of fuel oil constituents in groundwater. However, additional USTs have been included in this Work Plan that only require site investigation (SI) soil or groundwater sampling (NJAC 7:26E-3.4 or -3.5) to determine if a release has occurred, as designated below:

- UST 142B (SI)
- UST 202A (SI)
- UST 202D (RI)
- UST 211 (RI)
- UST 228B (SI)
- UST 444 (RI)
- UST 490 (RI)
- UST 750J (SI)
- UST 800-12 (RI)
- UST 800-20 (RI)
- UST 884 (RI)
- UST 906A (RI)
- UST 3035 (SI)

Specific data needs and proposed sampling at each UHOT site are described in the subsections below. Groundwater flow directions in the area where delineation in groundwater is required are generally not well established due to the distances to other nearby monitor wells. Therefore, regional groundwater flow directions from previous documents (Attachment A) were used as a basis for initial planning of groundwater sampling at each site.

The proposed groundwater assessment strategy includes a combination of field screening and groundwater sampling and analysis to delineate the groundwater plume. For a typical UHOT site without any previous plume assessment, Geoprobe soil borings will be placed in a ring around the former tank site, and each boring will be advanced to a depth below the shallow groundwater. Field screening using a photoionization detector (PID) and visual observation of the Geoprobe soil cores will be used to identify and assess areas impacted by fuel oil downgradient of the source area. Previous Geoprobe assessments at FTMM have successfully identified fuel oil contamination in areas downgradient of former UHOTs using these field screening techniques. The field screening results will be used to verify the contaminant migration direction (and by implication, the groundwater flow direction) for each UHOT site. Temporary groundwater monitoring wells will then be placed within and outside of the plume at each tank site using a Geoprobe, and the groundwater will be sampled to verify the nature and extent of groundwater contamination. Following receipt of analytical data from the temporary wells, permanent monitoring wells will be installed to establish a monitoring network with a minimum of three wells at each site: a source area well near the former tank site, a well downgradient of the source but within the plume, and a downgradient sentry well beyond the plume. Select existing monitoring wells will also be used for water level measurements to complement the monitoring network. All new permanent monitoring wells and the existing monitoring wells to be used for water level measurements will be surveyed by a New Jersey-licensed surveyor in accordance with the Sampling and Analysis Plan (SAP; Reference 23).

Sampling and analytical procedures will follow the protocols established for previous FTMM Work Plan submittals (Reference 24). All Site personnel will be required to read, understand, and comply with the safety guidelines in the Accident Prevention Plan (APP) including the Site Health and Safety Plan (SHASP), which is included as Appendix A of the APP (Reference 25). The detailed field procedures to be used for the activities described in this sampling plan are described in the SAP (Reference 23). Please let me know if you need these or any other documents referred to in this Work Plan to be sent to you.

Specific sampling and analytical requirements are summarized in Table 1, and are described for each UHOT in the subsections below.

1. UST 142B

UST 142B was a steel 550-gallon No. 2 fuel oil UST that was removed in July 1994, along with approximately 30 cubic yards of contaminated soil, as presented in Attachment H of ***USTs Within ECP Parcel 79*** (Reference 2). Subsequently, NJDEP required a groundwater investigation to be performed (Reference 13); a temporary well was installed, sampled and abandoned in August 2016. Multiple polynuclear aromatic hydrocarbons (PAHs) were detected in the groundwater sample, which was attributed to sample turbidity rather than a release of fuel oil to groundwater (as reported in Reference 10). NJDEP (Reference 22) then recommended resampling using a method to reduce turbidity due to the high concentrations for PAHs detected.

To address this data need, a 2-inch diameter permanent monitoring well will be installed at the former UST 142B tank location, as shown on Figure 2. This approach is expected to result in a low-turbidity groundwater sample without PAH exceedances. The well will be installed within a Geoprobe boring and will be completed with a 10-foot well screen to approximately 7 feet (ft) below the water table (estimated at approximately 4 ft below ground surface [bgs]). The well will be developed to meet the criteria specified in NJDEP's most recent ***Field Sampling Procedures Manual***. Low-flow sampling methods will be used to sample this well and the sample will be analyzed for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) in accordance with the requirements for No. 2 fuel oil in Table 2-1 of the NJAC 7:26E ***Technical Requirements for Site Remediation***. The Field Geologist will note any indications of fill within the soil column such as cinders, coal, or other debris. A letter report will be prepared for UST 142B that either requests a No Further Action (NFA) determination or recommends additional investigation or action, as warranted from the analytical data.

2. UST 202A

UST 202A was a fiberglass 1,000-gallon heating oil UST that was removed in October 2001, along with an unspecified quantity of contaminated soil, as presented in Attachment J of ***USTs Within ECP Parcel 79*** (Reference 2). NJDEP (Reference 13) subsequently required a groundwater investigation for the UST 202A and UST 202D area. One temporary well and two existing permanent wells were sampled in May and August 2016 (Reference 10). NJDEP then recommended installation of a permanent well nearby to assess UST 202D (Reference 22); at the same time, NFA was not approved for UST 202A. Additional data are needed to delineate groundwater contamination associated with UST 202A and to delineate groundwater contamination at nearby UST 202D (described in Section 3 below).

To address the UST 202A data need, one temporary monitoring well will be installed at the former UST 202A tank location, as shown on Figure 3. The well will be installed within a Geoprobe boring and will be completed with a 5-foot well screen to approximately 4 ft below the water table (estimated at approximately 2 ft bgs). This well will be sampled and the sample will be analyzed for VOCs and SVOCs in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E. The Army may also install and sample additional permanent wells based on the temporary well results. A letter report will be prepared for UST 202A that either requests a No Further Action (NFA) determination or recommends additional investigation or action.

3. UST 202D

UST 202D was a steel 500-gallon heating oil UST that was removed in May 2005 along with approximately 20 cubic yards of contaminated soil (Attachment L of Reference 2). A temporary well was sampled at the former UST 202D location in June 2011; benzene (1.61 µg/L) and 2-methylnaphthalene (109 to 233 µg/L) were detected at concentrations greater than NJDEP Ground Water Quality Criteria (GWQC). NJDEP subsequently required a groundwater investigation for UST 202D (Reference 13). One temporary well and two existing permanent wells were sampled in May and August 2016 (Reference 10). NJDEP then recommended installation of a permanent well to assess UST 202D with low-flow sampling and analysis for VOCs and SVOCs (Reference 22).

To address this data need, one permanent monitoring well and at least three temporary wells will be installed at the former UST 202D tank location, as shown on Figure 3. Recent temporary well results (Reference 10) suggest that fuel oil constituents have not migrated more than approximately 50 ft downgradient of the former tank location (Figure 3). Therefore, two additional downgradient temporary wells and one field screening boring will be installed for verification at offset locations approximately 50 feet downgradient of the former tank location to verify that the plume was not missed. A third temporary well will be installed at the former UST 202A location as described in Section 2.0 above. These temporary wells will be installed within a Geoprobe boring and will typically be completed with a 5-foot well screen to approximately 4 ft below the water table (estimated to be 2 ft bgs). Samples will be collected from the temporary wells for VOCs and SVOCs analyses, in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E. Additional temporary wells may be installed as needed based on the groundwater sampling described above.

It is anticipated that existing well M16MW02 will be utilized as a downgradient sentry monitor well for the UST 202D site. New well 202MW02 will be developed. Both new well 202MW02 and existing well M16MW02 will be sampled using low-flow methods; the samples will be analyzed for VOCs and SVOCs in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

Water level measurements will be collected from monitoring wells 202MW01, 202MW02, M16MW01, and M16MW02 (Figure 3) to determine the local groundwater flow direction. It is anticipated that a remedial investigation report will be prepared for UST 202D.

4. UST 211

UST 211 was a fiberglass 2000-gallon No. 2 fuel oil UST that was removed in November 2001. As presented in Attachment F.1 of Reference 8, one closure soil sample contained 3,968 mg/kg Total Petroleum Hydrocarbons (TPH). A temporary well was sampled at the former UST 211 location in August 2016; multiple analytes were detected at concentrations greater than the GWQCs including 1,2,4-trimethylbenzene (543 J µg/L), benzene (2.8 µg/L), naphthalene (1,450 µg/L), 2-methylnaphthalene (6,680 µg/L), total VOC Tentatively Identified Compounds (TICs; 1,302 µg/L) and total SVOC TICs (14,322 µg/L) (Attachment D of Reference 8). NJDEP stated that additional remedial efforts were required for this site (Reference 19). Additional data are needed to delineate groundwater contamination at UST 211.

To address this data need, multiple field screening borings, temporary monitoring wells and permanent monitoring wells will be installed near the former UST 211 tank location, as shown on Figure 4. Field screening Geoprobe borings SCREEN1 through SCREEN6 (Figure 4) will be advanced at locations around the former UST 211 location to provide field verification of the groundwater flow direction, which is assumed to be towards the north-northwest based on regional groundwater maps (Attachment A). These borings will be advanced past the water table, which is assumed to be approximately 12 ft bgs based on previous drilling at PAR-72-211-TMW-01. The field screening borings will be logged visually and with a PID, which has proven useful for identifying fuel oil contamination at FTMM. The field results will be used to validate the locations for subsequent temporary wells to assist with delineating the groundwater plume.

A total of four additional temporary monitor wells are proposed at UST 211. A line of three temporary monitor wells (TMW-02 through TMW-04) will be installed along Russel Avenue (approximately 60 ft downgradient of the tank) to verify the direction and lateral boundaries of the plume. A fourth temporary monitor well (TMW-05) will be installed further downgradient to establish the downgradient extent of the plume prior to installing a downgradient permanent sentry well. As with the field screening borings, the borings for temporary wells will be logged visually and with a PID to estimate the extent of the plume in the field. Additional field screening borings (like SCREEN7 on Figure 4) may be used to determine the downgradient extent of the plume. The temporary wells will be installed within Geoprobe borings and will typically be completed with a 5-foot well screen to approximately 4 ft below the water table (estimated at approximately 12 ft bgs). Samples will be collected from each temporary well and analyzed for VOCs and SVOCs in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

Based on the analytical results of the temporary well samples, three permanent monitoring wells will be installed for groundwater monitoring: one at the source area (MW-01); one within the plume (MW-02); and one downgradient sentry location (MW-03). The new wells will be developed and sampled using low-flow methods, and the groundwater samples will be analyzed for VOCs and SVOCs, in accordance with the requirements for No. 2 fuel oil in Table 2-1 of NJAC 7:26E.

Water level measurements will be collected from the three new monitoring wells, and from nearby wells 200MW01 (located south of Building 216; see Attachment A), 200MW06 (located north of Building 228; Figure 5), and B5MW05B (located southeast of Building 261), to determine the local groundwater flow direction. It is anticipated that a remedial investigation report will be prepared for UST 211.

14. SUMMARY

We look forward to your review of this Work Plan and approval or comments. The technical Point of Contact (POC) for this matter is Kent Friesen at (732) 383-7201 or by email at kent.friesen@parsons.com. Should you have any questions or require additional information, please contact me by phone at (732) 380-7064 or by email at william.r.colvin18.civ@mail.mil.

Sincerely,

William R Colvin

William R. Colvin, PMP, PG, CHMM
BRAC Environmental Coordinator

cc: Ashish Joshi, NJDEP (e-mail and 2 hard copies)
William Colvin, BEC (e-mail and 1 hard copy)
Joseph Pearson, Calibre (e-mail)
James Moore, USACE (e-mail)
Jim Kelly, USACE (e-mail)
Cris Grill, Parsons (e-mail)

REFERENCES CITED:

1. Department of the Army. 2015. *Underground Storage Tanks Within Parcel 68, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. April 14.
2. Department of the Army. 2015. *Underground Storage Tanks Within ECP Parcel 79, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. April 22.
3. Department of the Army. 2015. *No Further Action Request, Site Investigation Report Addendum for the 800 Area Including, ECP Parcels 55 and 56, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. June 12.
4. Department of the Army. 2016. *Parcel 68 Work Plan Addendum for a Former UST Site, Fort Monmouth, Oceanport, Monmouth County, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. March 2.
5. Department of the Army. 2016. *No Further Action Request, Site Investigation Report Addendum for the Howard Commons Underground Storage Tanks, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. April 26.
6. Department of the Army. 2016. *No Further Action Request, Site Investigation Report Addendum for the Building 750 Motor Pool Area Including Underground Storage Tanks, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. October 28.
7. Department of the Army. 2016. *Clarification of Underground Storage Tanks at Howard Commons, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. December 6.
8. Department of the Army. 2016. *No Further Action Request, Site Investigation Report Addendum, ECP Parcel 72 Underground Storage Tanks, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. December 13.
9. Department of the Army. 2017. *Request for No Further Action at Multiple 800 Area Underground Storage Tanks, Site Investigation Report Addendum, Fort Monmouth, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. January 23.
10. Department of the Army. 2017. *Request for No Further Action at Multiple Parcel 79 Storage Tank Site Investigation Report Addendum, Fort Monmouth, Oceanport, New Jersey*. Prepared by the Office of Assistant Chief of Staff for Installation Management, U.S. Army Fort Monmouth. February 8.

11. New Jersey Department of Environmental Protection (NJDEP). 2007. Letter to the Army, RE: *Underground Storage Tank Closure & Remedial Investigation Reports, 800 Area UST No. 9, 800 Area UST No. 12, Fort Monmouth, NJ.* December 31.

12. New Jersey Department of Environmental Protection (NJDEP). 2010. *Protocol for Addressing Extractable Petroleum Hydrocarbons.* Site Remediation Program. Version 5.0. August 9.

13. New Jersey Department of Environmental Protection (NJDEP). 2015. Letter to the Army, RE: *Underground Storage Tanks Within ECP Parcel 79 dated April 2015, Fort Monmouth, Oceanport, Monmouth County.* August 25.

14. New Jersey Department of Environmental Protection (NJDEP). 2015. Letter to the Army, RE: *Underground Storage Tanks Within ECP Parcel 68, 74, and 77 dated April 2015, Fort Monmouth, Oceanport, Monmouth County.* September 24.

15. New Jersey Department of Environmental Protection (NJDEP). 2015. Letter to the Army, RE: *Site Investigation Report Addendum for the 800 Area Including ECP Parcels 55 & 56, Fort Monmouth, Oceanport, Monmouth County.* November 10.

16. New Jersey Department of Environmental Protection (NJDEP). 2016. Letter to the Army, RE: *Parcel 68 Work Plan Addendum and Response to NJDEP's September 24, 2015 Comments on the April 2015 Underground Storage Tanks Within ECP Parcels 68, 74 and 77, Fort Monmouth, New Jersey & Parcel 68 Work Plan Addendum for a Former UST Site (March 2016).* March 29.

17. New Jersey Department of Environmental Protection (NJDEP). 2016. Letter to the Army, RE: *No Further Action Request Site Investigation Report Addendum for the Howard Commons Underground Storage Tanks dated April 2016, Fort Monmouth, Oceanport, Monmouth County.* November 28.

18. New Jersey Department of Environmental Protection (NJDEP). 2016. Letter to the Army, RE: *Clarification of Underground Storage Tanks at Howard Commons dated December 6, 2016, Fort Monmouth, Oceanport, Monmouth County.* December 20.

19. New Jersey Department of Environmental Protection (NJDEP). 2017. Letter to the Army, RE: *No Further Action Request Site Investigation Report Addendum ECP Parcel 72 Underground Storage Tanks dated December 13, 2016, Fort Monmouth, Oceanport, Monmouth County.* February 7.

20. New Jersey Department of Environmental Protection (NJDEP). 2017. Letter to the Army, RE: *Request for No Further Action at Multiple 800 Area Underground Storage Tanks, Site Investigation Report Addendum, Fort Monmouth, Oceanport, Monmouth County.* March 16.

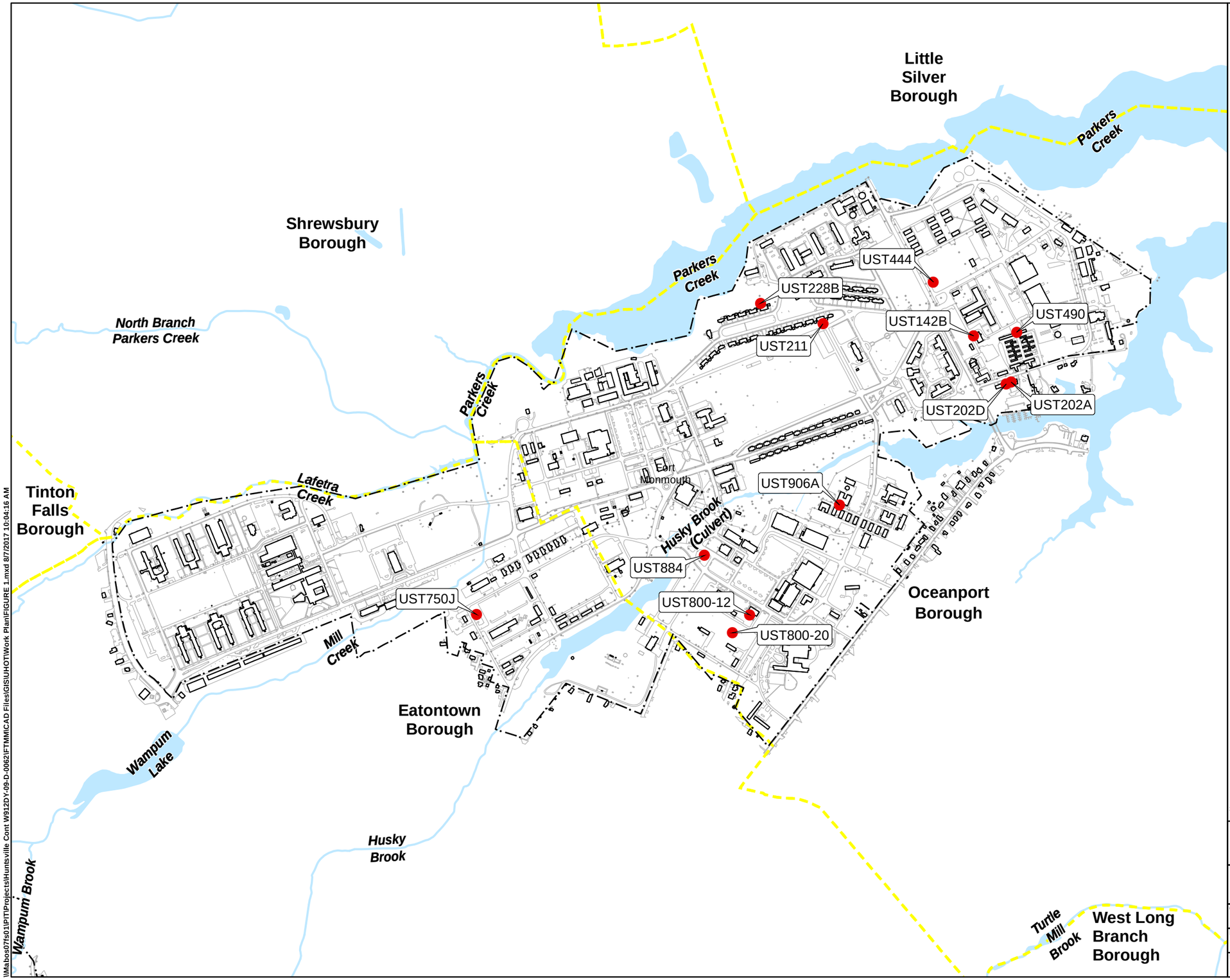
21. New Jersey Department of Environmental Protection (NJDEP). 2017. Letter to the Army, RE: *No Further Action Request Site Investigation Report Addendum for the Building 750 Motor Pool Area Including Underground Storage Tanks, Fort Monmouth, Oceanport, Monmouth County.* April 4.

22. New Jersey Department of Environmental Protection (NJDEP). 2017. Letter to the Army, RE: *Request for No Further Action at Multiple Parcel 79 Storage Tanks Site Investigation Report Addendum, Fort Monmouth, Oceanport, Monmouth County.* May 8.

23. Parsons. 2013. *Final Sampling and Analysis Plan, Remedial Investigation/Feasibility Study/Decision Documents, Fort Monmouth, Oceanport, Monmouth County, New Jersey.* Prepared for the U.S. Army Engineering and Support Center, Huntsville, AL. Revision 0. March.

24. Parsons. 2015. *Final Environmental Condition of Property Supplemental Phase II Site Investigation Work Plan for Parcels 28, 38, 39, 49, 57, 61 and 69.* Prepared for the U.S. Army Engineering and Support Center, Huntsville, AL. Revision 1. August.

25. Parsons. 2016. *Final Accident Prevention Plan, Remedial Investigation/Feasibility Study/Decision Documents, Fort Monmouth, Oceanport, Monmouth County, New Jersey.* Prepared for the U.S. Army Engineering and Support Center, Huntsville, AL. Revision 1. November.



LEGEND:

- UHOT Location
- Installation Boundary
- Municipal Boundary
- Surface Water Feature

NOTE:

UST3035 is located within the Charles Woods area, see text.

N

1 inch = 1,000 feet

0 500 1,000 2,000 Feet

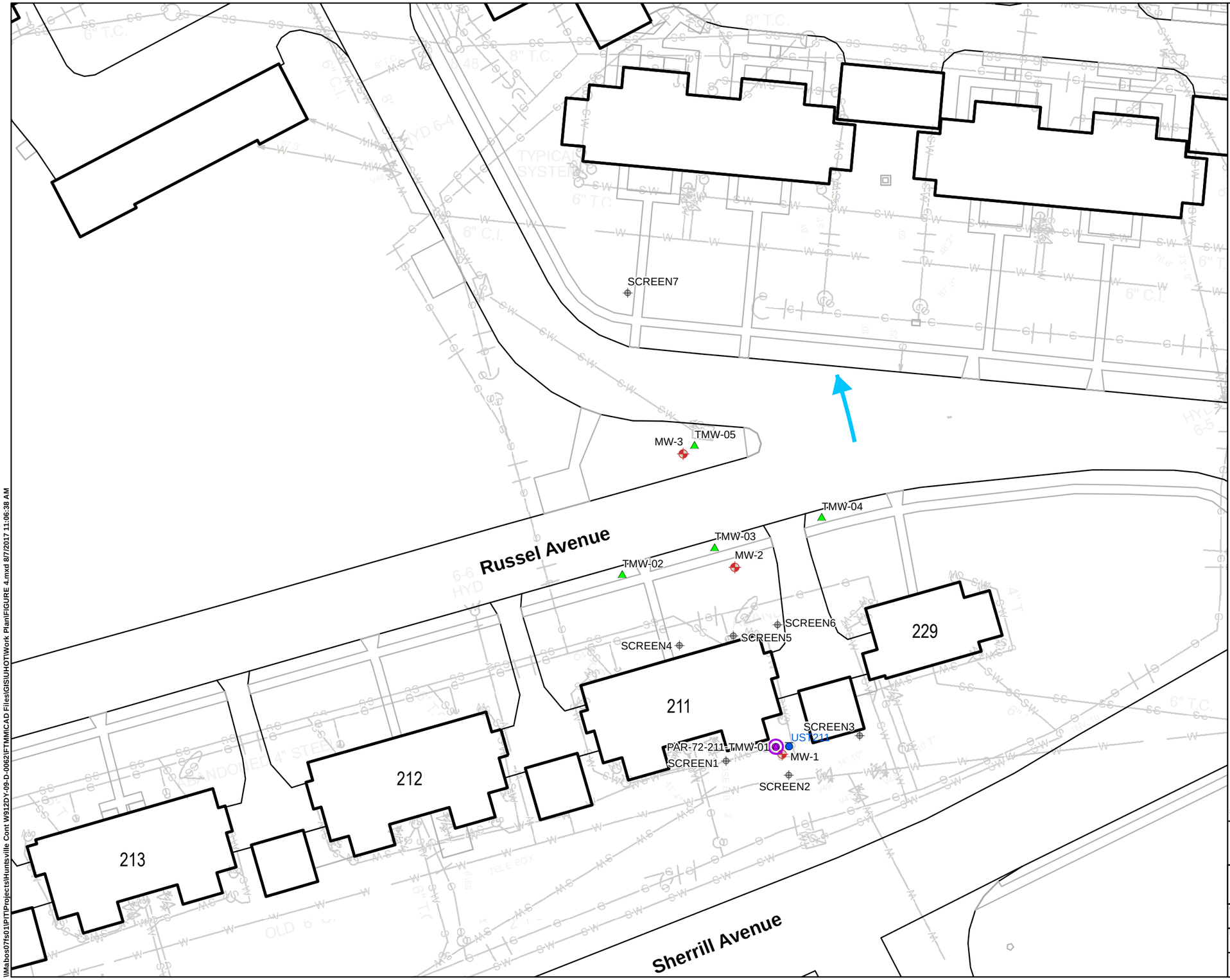
Source: FTMM Supplied CAD, 2013; ESRI Data and Maps, 2011; USGS NHD, 2012.

PARSONS 401 Diamond Drive NW, Huntsville AL	**Fort Monmouth New Jersey**

UHOT LOCATIONS

CREATED BY: RR	REVIEWED BY: KF
DATE: AUG. 2017	FIGURE NUMBER: FIGURE 1
PROJECT NUMBER: 748810-06031	FILE: FIGURE 1.mxd

\\Mabos07fs01\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\UHOT\Work Plan\FIGURE 1.mxd 8/7/2017 10:04:16 AM



LEGEND:

- Proposed Permanent Monitoring Well
- Proposed Groundwater Sample (Temporary Well)
- Proposed Field Screening Boring
- Groundwater Sample (2016)
- Former UST Location
- Exceedance of Groundwater Quality Criteria
- Shallow Monitoring Well
- Installation Boundary
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Generalized Groundwater Flow Direction

N

1 inch = 40 feet

0 20 40 80 Feet

Source: FTMM Supplied CAD, 2013.

PARSONS 401 Diamond Drive NW, Huntsville AL	**Fort Monmouth** **New Jersey**

UST 211
SAMPLE LOCATIONS

CREATED BY: RR	REVIEWED BY: KF
DATE: AUG. 2017	FIGURE NUMBER: FIGURE 4
PROJECT NUMBER: 748810-06031	FILE: FIGURE 4.mxd

\\Mabos07fs01\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMMICAD Files\GIS\UHOT\Work Plan\FIGURE 4.mxd 8/7/2017 11:06:38 AM

TABLE 1
SAMPLING SUMMARY FOR SUPPLEMENTAL UHOT WORK PLAN
FORT MONMOUTH, NEW JERSEY

Parcel	Location and General Rationale (see text)	Field Installation				Field Meter Readings [a/]	VOCs + TICs by Method 8260C [b/]	SVOCs + TICs by Method 8270D [c/]	Non-Fractionated EPH [d/ e/]
		SCRN	TMW	MW	SB				
Groundwater									
79	UST 142B (Figure 2) - 1 permanent well for low turbidity groundwater sample for release detection	--	--	1	--	1	1	1	0
81	USTs 202A and 202D (Figure 3) - Multiple groundwater samples for release detection (UST 202A) and delineation (UST 202D)	1	3	1	--	5	5	5	0
72	UST 211 (Figure 4) - multiple field screening borings and groundwater samples for delineation	7	4	3	--	14	7	7	0
79	UST 444 (Figure 6) - multiple field screening borings and groundwater samples for delineation	6	3	3	--	12	6	6	0
79	UST 490 (Figure 7) - multiple field screening borings and groundwater samples for delineation	2	4	2	--	7	7	7	0
51	UST 750J (Figure 8) - One groundwater sample for release detection	--	1	--	--	1	1	1	0
55	UST 800-12 (Figure 9) - multiple field screening borings and groundwater samples for delineation	6	4	3	--	13	7	7	0
56	UST 800-20 (Figure 10) - multiple field screening borings and groundwater samples for delineation	6	4	3	--	13	7	7	0
54	UST 884 (Figure 11) - multiple field screening borings and groundwater samples for delineation	6	4	3	--	13	7	7	0
68	UST 906A (Figure 13) - multiple groundwater samples for delineation	0	3	3	--	6	6	6	0
Soil									
72	UST 228B (Figure 5) - 1 soil sample for 2-methylnaphthalene analysis by SPLP [f/]	--	--	--	1	1	0	1 (SPLP)	0
68	UST 906A (Figure 12) - 1 additional soil boring for delineation	--	--	--	1	1	0	1	3
1	UST 3035 (Figure 14) - 3 soil borings for release detection	--	--	--	3	3	0	2	6
QA/QC samples (see SAP for additional details) [g/]									
Field Duplicates (5% Sampling Frequency per media)		NA [h/]	NA	NA	NA	NA	3	4	1
Matrix Spike (5% Sampling Frequency per media)		NA	NA	NA	NA	NA	3	4	1
Matrix Spike Duplicate (5% Sampling Frequency per m		NA	NA	NA	NA	NA	3	4	1
Trip Blank (1 per cooler of VOCs per media)		NA	NA	NA	NA	NA	3	0	0
QA Split (5% per media)		NA	NA	NA	NA	NA	3	4	1
Equipment Blank (5% Sampling Frequency per media)		NA	NA	NA	NA	NA	3	4	1
	TOTAL	**34**	**30**	**22**	**10**	**NA**	**72**	**77**	**14**

Notes:

[a/] SCRN = Geoprobe boring for field screening; TMW = temporary monitor well; MW = Permanent monitor well; SB = soil boring for soil analyses

[a/] Field meter readings include, in soil samples: photoionization detector (PID) readings along entire soil column; and in groundwater: PID headspac pH, temperature, electrical conductivity, dissolved oxygen (DO), oxidation-reduction potential (ORP), and turbidity.

[b/] VOCs = volatile organic compounds; TICs = tentatively identified compounds.

[c/] SVOCs = semivolatile organic compounds; TICs = tentatively identified compounds.

[d/] EPH = extractable petroleum hydrocarbons.

[e/] If any EPH concentrations in soil exceed 1000 mg/kg in any of the site samples, then minimum 25% of the samples where EPH exceeds 1000 m

[f/] SPLP = Synthetic Precipitation Leachate Procedure method SW1312

[g/] QA/QC = quality assurance/quality control; SAP = Sampling and Analysis Plan.

[h/] NA = not applicable.

ATTACHMENT A
Groundwater Flow Direction Maps

Main Post - Groundwater Elevation Contours - Layer 1

Brinkerhoff Environmental Services, Inc.
1913 Atlantic Avenue, Suite R5
Manasquan, New Jersey 08736

State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Case Management
401 East State Street
P.O. Box 420/Mail Code 401-05F
Trenton, NJ 08625-0028
Phone #: 609-633-1455
Fax #: 609-633-1439

BOB MARTIN
Commissioner

February 7, 2017

William Colvin
BRAC Environmental Coordinator
OACSIM – U.S. Army Fort Monmouth
PO Box 148
Oceanport, NJ 07757

Re: *No Further Action Request Site Investigation Report Addendum ECP Parcel 72 Underground Storage Tanks* dated December 13, 2016
Fort Monmouth
Oceanport, Monmouth County
PI G000000032

Dear Mr. Colvin,

The New Jersey Department of Environmental Protection (Department) has completed review of the referenced report, received December 15, 2016, prepared by the Department of the Army's Office of Assistant Chief of Staff for Installation Management to provide information sufficient to request No Further Action (NFA) determination for all USTs identified as formerly located within Parcel 72. As indicated in the submittal, two USTs require additional efforts to attain NFA. This office agrees with the proposed designation of each UST; comments are as follows:

USTs Requiring No Additional Action

Following review of the referenced information, it is agreed no further action is necessary for the following former fiberglass (unless otherwise stated) USTs removed from within Parcel 72, as referenced in the above submittal:

USTs along Russel Avenue

- UST 212 aka 212-10 – Registration #81533-10 – removed March 29, 2001
- UST 213 aka 213-11 – Registration #81533-11 – removed April 30, 2001
- UST 214 aka 214-12 – Registration #81533-12 – removed June 13, 2001
- UST 219 aka 219-13 – Registration #81533-13 – removed June 19, 2001
- UST 220B aka 220-14 – Registration #81533-14 – removed June 21, 2001
- UST 222 aka 222-15 – Registration #81533-15 – removed June 25, 2001

- UST 223 aka 223-16 – Registration #81533-16 – removed June 29, 2001

USTs along Allen Avenue

- UST 225 aka 225-17 - Registration #81533-17 - removed February 14, 2001
- UST 226 aka 226-18 - Registration #81533-18 - removed April 28, 2000
- UST 227 aka 227-19 - Registration #81533-19 - removed November 7, 2000
- UST 228 aka 228-20 - Registration # 81533-20 - removed November 1, 2000

USTs along Gosselin

- UST 234 aka 234-22 - Registration #81533-22 – removed February 5, 1999
- UST 235 aka 235-23 – Registration #81533-23 – removed January 6, 1999
- UST 236 aka 236-24 – Registration #81533-24 – removed February 5, 1999
- UST 238 aka 238-26 – Registration #81533-26 – removed January 22, 1999
- UST 239 aka 239-27 – Registration #81533-27 -removed January 4, 1999
- UST 240 aka 240-28 – Registration #81533-28 – removed January 22, 1999
- UST 241 aka 241-29 – Registration #85133-29 – removed September 23, 1998
- UST 242 aka 242-30 – Registration #81533-30 – removed October 26, 1998
- UST 243 aka 243-31 – Registration #81533-31 – removed September 28, 1998
- UST 244 aka 244-32 – Registration #81533-32 – removed October 20, 1998 - steel
- UST 245 aka 245-33 – Registration #81533-33 – removed October 6, 1998
- UST 247 aka 247-34 – Registration #81533-34 – removed October 7, 1998
- UST 248 aka 248-35 – Registration #81533-35 – removed October 15, 1998
- UST 249 aka 249-36 – Registration #81533-36 – removed November 12, 1998
- UST 250 aka 250-37 – Registration #81533-37 – removed November 16, 1998
- UST 251 aka 251-38 – Registration #81533-38 – removed November 2, 1998
- UST 252 aka 252-39 - Registration #81533-39 – removed December 9, 1998
- UST 253 aka 253-40 – Registration #81533-40 – removed November 2, 1998
- UST 254 aka 254-41 – Registration #81533-41 – removed November 20, 1998
- UST 255 aka 255-42 – Registration #81533-42 – removed October 28 1998
- UST 256 aka 256-43 – Registration #81533-43 – removed November 20, 1998
- UST 258 aka 258-44 – Registration #81533-44 – removed December 8, 1998

USTs Previously Granted NFA

- UST 233 aka 233-21 – Registration #81533-21 – NFA January 10, 2003
- UST 237 aka 237-25 – Registration #81533-25 - NFA January 10, 2003
- UST 246 – steel – Incident #98-10-20-1459-24 – NFA January 10, 2003

USTs Requiring Additional Remedial Efforts (as indicated on page D-4)

- UST 211 aka 211-9 - ground water contains elevated levels of VOs and SVOCs.

- UST 228B – the unused 1000 gallon steel tank remains in place; soil sampling near the UST noted the presence of 2-methylnaphthalene above the DIGWSSL. Sampling was not performed through the bottom of the UST, therefore, it is possible higher levels may be present directly beneath the UST. It is agreed additional efforts are required.

Please contact this office if you have any questions.

Sincerely,

Linda S. Range

C: James Moore, USACE
Rich Harrison, FMERA
Joe Fallon, FMERA
Joe Pearson, Calibre

DEPARTMENT OF THE ARMY

OFFICE OF ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
U.S. ARMY FORT MONMOUTH
P.O. 148
OCEANPORT, NEW JERSEY 07757

13 December 2016

Ms. Linda Range
New Jersey Department of Environmental Protection
Bureau of Case Management
401 East State Street
PO Box 420/Mail Code 401-05F
Trenton, NJ 08625-0028

SUBJECT: No Further Action Request
Site Investigation Report Addendum
ECP Parcel 72 Underground Storage Tanks
Fort Monmouth, New Jersey

Attachments:

A. Correspondence
B. Site Layout Drawings of Parcel 72 (Recent and Historical)
C. Summary Table of Parcel 72 Underground Storage Tanks
D. Summary Narrative for Parcel 72 Select Unregulated Heating Oil Tanks (UHOTS) Investigation Results, Fort Monmouth, NJ
   - D.1 Tables: Soil and Groundwater Results
   - D.2 Figures: Sample Locations and Exceedances
   - D.3 Field Notes
   - D.4 Boring Logs
   - D.5 Analytical Data
E. Cross Reference of Residential Building Numbers with Street Addresses
F. Unregulated Heating Oil Tanks Along Russel Avenue
   - F.1 UST 211 File Review and Analyses
   - F.2 UST 212 File Review
   - F.3 UST 213 File Review and Analyses
   - F.4 UST 214 File Review and Analyses
   - F.5 UST 219 File Review and Analyses
   - F.6 UST 220B File Review and Analyses
   - F.7 UST 222 File Review and Analyses
   - F.8 UST 223 File Review and Analyses
G. Unregulated Heating Oil Tanks Along Allen Avenue
   - G.1 UST 225 File Review and Analyses
   - G.2 UST 226 File Review and Analyses
   - G.3 UST 227 File Review and Analyses
   - G.4 UST 228 and File Review and Analyses (includes UST 228B)

H. Unregulated Heating Oil Tanks Along Gosselin Avenue
- H.1 UST 233 File Review and NFA Letter
- H.2 UST 234 File Review and Analyses
- H.3 UST 235 File Review and Analyses
- H.4 UST 236 File Review and Analyses
- H.5 UST 237 File Review and NFA Letter
- H.6 UST 238 File Review and Analyses
- H.7 UST 239 File Review and Analyses
- H.8 UST 240 File Review and Analyses
- H.9 UST 241 File Review and Analyses
- H.10 UST 242 File Review and Analyses
- H.11 UST 243 File Review and Analyses
- H.12 UST 244 File Review and Sketch Map
- H.13 UST 245 File Review and Analyses
- H.14 UST 246 File Review and NFA Letter
- H.15 UST 247 File Review and Analyses
- H.16 UST 248 File Review and Analyses
- H.17 UST 249 File Review and Analyses
- H.18 UST 250 File Review and Analyses
- H.19 UST 251 File Review and Analyses
- H.20 UST 252 File Review and Analyses
- H.21 UST 253 File Review and Analyses
- H.22 UST 254 File Review and Analyses
- H.23 UST 255 File Review and Analyses
- H.24 UST 256 File Review and Analyses
- H.25 UST 258 File Review and Analyses

Previous Correspondence (provided in Attachment A):

1. Army letter to NJDEP dated July 1, 2016, re: *Parcel 72 Select Unregulated Heating Oil Tanks (UHOTs) Work Plan Addendum, Fort Monmouth, New Jersey.*
2. NJDEP letter to the Army dated July 12, 2016, re: *Parcel 72 Select Unregulated Heating Oil Tanks (UHOTs) Work Plan Addendum*.

Dear Ms. Range:

The U.S. Army Fort Monmouth (FTMM) team has reviewed existing file information for underground storage tank (UST) sites associated with existing Officer Housing residential buildings located along Russel Avenue, Allen Avenue, and Gosselin Avenue at Fort Monmouth in New Jersey. These residential buildings are located within Environmental Condition of Property (ECP) Parcel 72. Each of these UST sites were located at residences that formerly stored No. 2 fuel oil for heating in a UST; therefore, they are considered as unregulated heating oil tanks (UHOTs) in accordance with N.J.A.C. 7:14B-1.4(b). The purpose of this submittal is to provide comprehensive documentation of the closure status of all UHOTs identified within this parcel, and to request a No Further Action (NFA) determination for qualifying UHOTs. Previous correspondence regarding select Parcel 72 Officer Housing UHOTs is provided in **Attachment A**.

Parcel 72 is located within the central portion of the Main Post. The Officer Housing area described in this submittal is generally bounded by Parcel 76 to the north and east, Parcel 51 to the west, Parcel

71 (the FTMM-12 and FTMM-14 landfills) to the south, and Parcel 74 to the east. The locations of the UHOTs within the Officer Housing area of Parcel 72 are presented in **Attachment B**, and a summary table of the UHOTs is provided in **Attachment C**. All of the UHOTs identified within Parcel 72 have been removed, except UST 228B which is empty and remains in place.

Five former UHOTs (USTs 211, 212, 220B, 226, and 228B) were previously identified as requiring additional field sampling to satisfy data needs, as described in Correspondence 1 (**Attachment A**). The results of these additional investigations are presented in **Attachment D**, which support an NFA determination for USTs 212, 220B, and 226. These results also indicate additional work would be needed for NFA determinations to be made for UST 211 and UST 228B.

Not all of the Officer Housing buildings along Russel Avenue, Allen Avenue and Gosselin Avenue had an associated fuel oil UST. Specifically, no UHOTs have been found at Buildings 215, 216, 218, 221 or 229 on Russel Avenue, or Building 224 on Allen Avenue, or the Building 230 Generals Quarters. In some cases, two UHOTs that serviced adjoining buildings were removed from the same excavation, and one set of closure soil samples were collected to represent both tanks (for example, UST 237 and UST 239). In general, these UHOTs were removed from 1990 to 2001 as the residential heating systems were converted to natural gas. Typically, the Army's records reflect removal of fiberglass tanks, which may be second generation tanks that replaced earlier steel USTs used for fuel oil storage. At Building 228, both a fiberglass UST (UST 228 which was removed) and a steel UST (UST 228B which remains in place) were documented to be present.

In some cases, UST closure documentation such as field notes and analytical reports may reference the street address of the residence, rather than the building number. Therefore, a table summarizing the building numbers and corresponding street addresses for the Officer Housing area is provided in Attachment E, for cross reference.

We are submitting the following documentation for the multiple UHOTs that were previously removed from the Parcel 72 Officer Housing area, and we request a No Further Action determination for each site unless otherwise explained further below (sites that have been previously approved for NFA by NJDEP are highlighted in green).

Along Russel Avenue (**Attachment F**):

- UST 211 file review summary and earlier (pre-2016) soil analyses are presented in Attachment F.1, and recent groundwater analyses are presented in Attachment D, which indicates an impact to groundwater by fuel oil.
- UST 212 file review summary is presented in Attachment F.2, and recent soil and groundwater analyses are presented in Attachment D.
- UST 213 file review summary and analyses are presented in Attachment F.3.
- UST 214 file review summary and analyses are presented in Attachment F.4.
- UST 219 file review summary and analyses are presented in Attachment F.5.
- UST 220B file review summary and analyses are presented in Attachment F.6, and recent groundwater analyses are presented in Attachment D.
- UST 222 file review summary and analyses are presented in Attachment F.7.
- UST 223 file review summary and analyses are presented in Attachment F.8.

Along Allen Avenue (**Attachment G**):

- UST 225 file review summary and analyses are presented in Attachment G.1.

- UST 226 file review summary and analyses are presented in Attachment G.2, and recent groundwater analyses are presented in Attachment D.
- UST 227 file review summary and analyses are presented in Attachment G.3.
- UST 228 file review summary and analyses are presented in Attachment G.4.
- Recent soil and groundwater analyses for the existing UST 228B steel tank are presented in Attachment D; additional work would be needed for a NFA determination to be made for UST 228B . NJDEP has previously indicated (Correspondence 1 of **Attachment A**) that this tank requires closure in accordance with applicable regulations.

Along Gosselin Avenue (**Attachment H**):

- UST 233 file review summary and analyses are presented in Attachment H.1; NFA was approved by NJDEP on 1/10/2003.
- UST 234 file review summary and analyses are presented in Attachment H.2.
- UST 235 file review summary and analyses are presented in Attachment H.3.
- UST 236 file review summary and analyses are presented in Attachment H.4.
- UST 237 file review summary is presented in Attachment H.5; NFA was approved by NJDEP on 1/10/2003.
- UST 238 file review summary and analyses are presented in Attachment H.6.
- UST 239 file review summary and analyses are presented in Attachment H.7; this tank was removed and sampled from the same excavation as UST 237, which was approved for NFA by NJDEP on 1/10/2003.
- UST 240 file review summary and analyses are presented in Attachment H.8.
- UST 241 file review summary and analyses are presented in Attachment H.9.
- UST 242 file review summary and analyses are presented in Attachment H.10.
- UST 243 file review summary and analyses are presented in Attachment H.11.
- UST 244 file review summary and analyses are presented in Attachment H.12; Building 244 was serviced by the same tank as Building 246, and UST 246 was approved for NFA by NJDEP on 1/10/2003.
- UST 245 file review summary and analyses are presented in Attachment H.13.
- UST 246 file review summary and analyses are presented in Attachment H.14; NFA was approved by NJDEP on 1/10/2003.
- UST 247 file review summary and analyses are presented in Attachment H.15.
- UST 248 file review summary and analyses are presented in Attachment H.16.
- UST 249 file review summary and analyses are presented in Attachment H.17.
- UST 250 file review summary and analyses are presented in Attachment H.18.
- UST 251 file review summary and analyses are presented in Attachment H.19.
- UST 252 file review summary and analyses are presented in Attachment H.20.
- UST 253 file review summary and analyses are presented in Attachment H.21.
- UST 254 file review summary and analyses are presented in Attachment H.22.
- UST 255 file review summary and analyses are presented in Attachment H.23.
- UST 256 file review summary and analyses are presented in Attachment H.24.
- UST 258 file review summary and analyses are presented in Attachment H.25.

This information supports the conclusion that multiple UHOTs identified within Parcel 72 have been adequately addressed by previous environmental activities under the FTMM tank removal and assessment program. In summary, we submit that the Army has provided adequate due diligence with regards to the environmental condition of UHOTS within the Parcel 72 Officer Housing Area, and we request that NJDEP approve No Further Action for Parcel 72 UHOTs with the exception of UST 211 and UST 228B.

The technical Point of Contact (POC) for this matter is Kent Friesen at (732) 383-7201 or by email at kent.friesen@parsons.com. Should you have any questions or require additional information, please contact me by phone at (732) 380-7064 or by email at william.r.colvin18.civ@mail.mil.

Sincerely,

William R. Colvin, PMP, CHMM, PG
BRAC Environmental Coordinator

cc: Linda Range, NJDEP (3 hard copies)
Delight Balducci, HQDA ACSIM (CD)
Joseph Pearson, Calibre (CD)
James Moore, USACE (CD)
Jim Kelly, USACE (CD)
Cris Grill, Parsons (CD)

ATTACHMENT D

Parcel 72 Select UHOTs Investigation Results

Contents:

Summary Narrative for Parcel 72 Select Unregulated Heating Oil Tanks (UHOTs) Investigation Results, Fort Monmouth, NJ

Enclosures:

D.1 Figure: Sample Locations and Exceedances for Parcel 72
D.2 Tables: Soil and Groundwater Analytical Results
D.3 Field Notes
D.4 Boring Logs
D.5 Analytical Data

Previous Correspondence (provided in Attachment A):

1. Army letter to NJDEP dated 1 July 2016, re: *Parcel 72 Select Unregulated Heating Oil Tanks (UHOTs) Work Plan Addendum, Fort Monmouth, New Jersey.*
2. NJDEP letter to the Army dated 12 July 2016, re: *Parcel 72 Select Unregulated Heating Oil Tanks (UHOTs) Work Plan Addendum.*

The U.S. Army Fort Monmouth (FTMM) has prepared this report to present the results of additional field sampling and analyses of soil and groundwater performed at five former Underground Storage Tanks (USTs) within Environmental Condition of Property (ECP) Parcel 72: UST 211, UST 212, UST 220B, UST 226, and UST 228B. These USTs were identified as requiring additional data, as described in the Work Plan Addendum (Correspondence 1) which was approved by the New Jersey Department of Environmental Protection (Correspondence 2).

One temporary groundwater monitoring well was installed with a Geoprobe® rig within 10 feet of each of the former USTs. A groundwater sample was collected from each well to determine if a fuel oil release had impacted groundwater. The groundwater samples were analyzed for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) plus tentatively identified compounds (TICs), in accordance with the analytical requirements for a petroleum storage area containing No. 2 fuel oil (Table 2-1 of the New Jersey Administrative Code (NJAC) 7:26E Technical Requirements for Site Remediation). Soil samples were also collected from borings advanced with a Geoprobe® rig at former USTs 212 and 228B to assess concentrations and vertical extent of extractable petroleum hydrocarbons (EPH) in soil. Select soil samples were also analyzed for two SVOCs (naphthalene and 2-methylnaphthalene).

The locations of the field samples are presented in **Enclosure D.1** and a summary of the analytical results and exceedances of applicable NJDEP criteria is provided in **Enclosure D.2**. Field sampling was completed on 9 and 10 August 2016; field notes are provided in **Enclosure D.3** and boring logs are provided in **Enclosure D.4**. The field crew observed that the groundwater level was routinely difficult to determine by observation during drilling at Parcel 72, due to tight soils and potential perched water layers. Therefore groundwater levels were measured within the temporary wells with a water level probe after installation. The samples were analyzed by ALS Environmental; analytical data packages are provided in **Enclosure D.5**.

The results of the sampling and analyses are provided below for each of the five UST sites. The UST numbers correspond to the building numbers shown on Figure 1 (**Enclosure D.1**).

UST 211 at Building 211, 4 and 6 Russel Avenue

UST 211 was a residential fuel oil tank that was removed in 2001 as described in **Attachment F.1**. A single temporary well PAR-72-211-TMW-01 was installed, sampled, and subsequently abandoned at the former location of UST 211 (**Enclosure D.1**). Groundwater was encountered at approximately 11 feet below ground surface (bgs) (see **Enclosure D.3)** and petroleum odor and elevated photoionization detector (PID) readings were encountered at approximately 7 to 13 feet bgs (**Enclosure D.4**). As shown on Table 2 of **Enclosure D.2**, the following VOC and SVOC analytes in groundwater exceeded the NJDEP Ground Water Quality Criteria (GWQC): 1,2,4-trimethylbenzene, benzene, naphthalene, 2-methylnaphthalene, dibenzofuran, fluorene, phenanthrene, and TICs. The results of the groundwater analyses at former UST 211 are consistent with a fuel oil release to groundwater.

UST 212 at Building 212, 8 and 10 Russel Avenue

UST 212 was a residential fuel oil tank that was removed in 2001 as described in **Attachment F.2**. Closure soil samples were also collected and analyzed in 2001, but the analytical data package was missing; therefore, two soil borings were sampled in accordance with New Jersey Department of Environmental Protection (NJDEP) comments on the Work Plan Addendum (Correspondence 2). Soil samples from borings PAR-72-212-SB-01 and PAR-72-212-SB-02 were collected from 5.0 to 5.5 feet bgs and from 11.5 to 12 feet bgs and analyzed for EPH. The maximum detected EPH in these soil samples (see Table 1 of **Enclosure D.2**) was 8.3 J ("J" signifies an estimated detected value) milligrams per kilogram (mg/kg), which is well below the 5,100 mg/kg remediation criterion for No. 2 fuel oil in soil. SVOCs were also analyzed in these soil samples, and all detected analytes (see Table 1 of **Enclosure D.2**) were below the respective Residential Direct Contact Soil Remediation Standard (RDCSRS) and the Impact to Ground Water (IGW) Screening Levels.

A single temporary well PAR-72-212-TMW-01 was installed, sampled, and subsequently abandoned at the former location of UST 212 (**Enclosure D.1**). Groundwater was encountered at approximately 12 feet bgs (**Enclosure D.3**) and there were no unusual odors or elevated PID readings encountered in the boring (**Enclosure D.4**). As shown on Table 2 of **Enclosure D.2**, the three groundwater SVOC analytes benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene slightly exceeded the GWQC. However, these detections were estimated ("J" flagged) due to the low concentrations encountered and therefore were considered *de minimis* detections that were too minor to merit additional investigation. These analytes are polycyclic aromatic hydrocarbons (PAHs) that have been encountered at other FTMM locations within surficial soils and fill. Therefore these groundwater exceedances may have resulted from entrainment of soil from other anthropogenic, non-UST related sources (such as surficial soils or fill) resulting from sample turbidity, which is common with temporary well groundwater samples. In addition, there were no detections of naphthalene or 2-methylnaphthalene in this groundwater sample, which would be more indicative of a fuel oil release. Finally, the soil sample results for UST 212 did not exceed IGW Screening Levels, which indicates that the soils do not present a significant potential for groundwater contamination. In summary, the results of the investigation at former UST 212 indicate there has not been a release of fuel oil to soil or groundwater.

UST 220B at Building 220, 32 and 34 Russel Avenue

UST 220B was a residential fuel oil tank that was removed in 2001 as described in **Attachment F.6**. In response to NJDEP's question in Correspondence 2, this tank is the same as UST-220-14 as referenced in the 2007 ECP Report (U.S. Army, 2007). A single temporary well PAR-72-220-TMW-01 was installed, sampled, and subsequently abandoned at the former location of UST 220B (**Enclosure D.1**). Groundwater was encountered at approximately 13.5 feet bgs (see **Enclosure D.3**), and there were no unusual odors or elevated PID readings encountered in the boring (**Enclosure D.4**). As shown on Table 2 of **Enclosure D.2**, the SVOC benzo(a)anthracene slightly exceeded the GWQC. However, this detection was estimated ("J" flagged) due to the low concentrations encountered, and therefore were considered a *de minimis* detection that was too minor to merit additional investigation. This analyte is a PAH that has been encountered at other FTMM locations within surficial soils and fill. Therefore this groundwater exceedance may have resulted from entrainment of soil from other anthropogenic, non-UST related sources (such as surficial soils or fill) resulting from sample turbidity, which is common with temporary well groundwater samples. In addition, naphthalene was not detected and only a very low concentration of 2-methylnaphthalene was detected in this groundwater sample; higher concentrations of these analytes would be expected if a fuel oil release had occurred. In summary, the results of the investigation at former UST 220B indicate there has not been a release of fuel oil to groundwater.

UST 226 at Building 226, 9 and 11 Allen Avenue

UST 226 was a residential fuel oil tank that was removed in 2001 as described in **Attachment G.2**. A single temporary well PAR-72-226-TMW-01 was installed, sampled, and subsequently abandoned at the former location of UST 226 (**Enclosure D.1**). Groundwater was encountered at approximately 13 feet bgs (**Enclosure D.3**), and there were no unusual odors or elevated PID readings encountered in the boring (**Enclosure D.4**). As shown on Table 2 of **Enclosure D.2**, there were no exceedances of the GWQC in this groundwater sample. Therefore the results of the investigation at former UST 220B indicate there has not been a release of fuel oil to groundwater.

UST 228B at Building 228, 1 and 3 Allen Avenue

UST 228B is a steel residential fuel oil tank that was discovered in 2010 but remains in place. In response to NJDEP's question in Correspondence 2, this tank is not the same as UST-228-20 as referenced in the 2007 ECP Report (U.S. Army, 2007). UST 228-20 (registration ID 81533-20) was a fiberglass fuel oil tank removed from the Building 228 area in 2000, as described in **Attachment G.4**. There is no registration ID for the existing steel tank that has been designated as UST 228B. UST 228B is empty based on the 2010 observations. Additional sampling was conducted in August 2016 to determine if a release had occurred from UST 228B.

Three soil borings were sampled in response to NJDEP comments on the Work Plan Addendum (Correspondence 2). Due to safety and logistical concerns, the borings were not advanced through the bottom of the tank, but rather were placed as close to the tank as reasonably possible (approximately 24 inches from the tank). Soil samples were collected from the following borings and sample intervals, and analyzed for EPH:

- Boring PAR-72-228-SB-01 was sampled from 5.0 to 5.5 feet bgs and 8.5 to 9.0 feet bgs;
- Boring PAR-72-228-SB-02 was sampled from 10.5 to 11.0 feet bgs and 12.0 to 12.5 feet bgs; and
- Boring PAR-72-228-SB-03 was sampled from 6.5 to 7.0 feet bgs and 7.0 to 7.5 feet bgs.

Groundwater was encountered at approximately 12 feet bgs (**Enclosure D.3**), and there were elevated PID readings encountered in two of the three borings (**Enclosure D.4**). As shown on Table 1 of **Enclosure D.2**, a Total EPH concentration of 3,100 mg/kg was reported in one soil sample (from the 7 to 7.5 ft bgs interval of boring PAR-72-228-SB-03). As the result of exceeding the contingency analysis threshold of 1,000 mg/kg (NJDEP, 2010), this sample was also analyzed for naphthalene and 2-methylnaphthalene. The 2-methylnaphthalene concentration of 23.9 mg/kg in this sample exceeded the NJDEP IGW screening level, but did not exceed the RDCSRS. Synthetic Precipitation Leachate Procedure (SPLP) analysis of this soil sample was not performed.

A single temporary well (PAR-72-228-TMW-01) was installed in boring PAR-72-228-SB-01, sampled, and subsequently abandoned at the location of UST 228B (**Enclosure D.1**). As shown on Table 2 of **Enclosure D.2**, there were no exceedances of the GWQC in this groundwater sample. Although 2-methylnaphthalene in soil exceeded the IGW Screening Level, 2-methylnaphthalene was notably absent in the temporary well groundwater sample.

The results of the investigation at former UST 228B indicate a release of fuel oil to soil that has not impacted groundwater. To address the 2-methylnaphthalene exceedance of the IGW Screening Level in soil, additional work would be needed which could include removal of the tank to address administrative closure, excavation of contaminated soil, or the performance of SPLP analyses.

In summary, this information supports a No Further Action (NFA) determination for UST 212, UST 220B, and UST 226. Additional work would be needed for NFA determinations to be made for UST 211 and UST 228B.

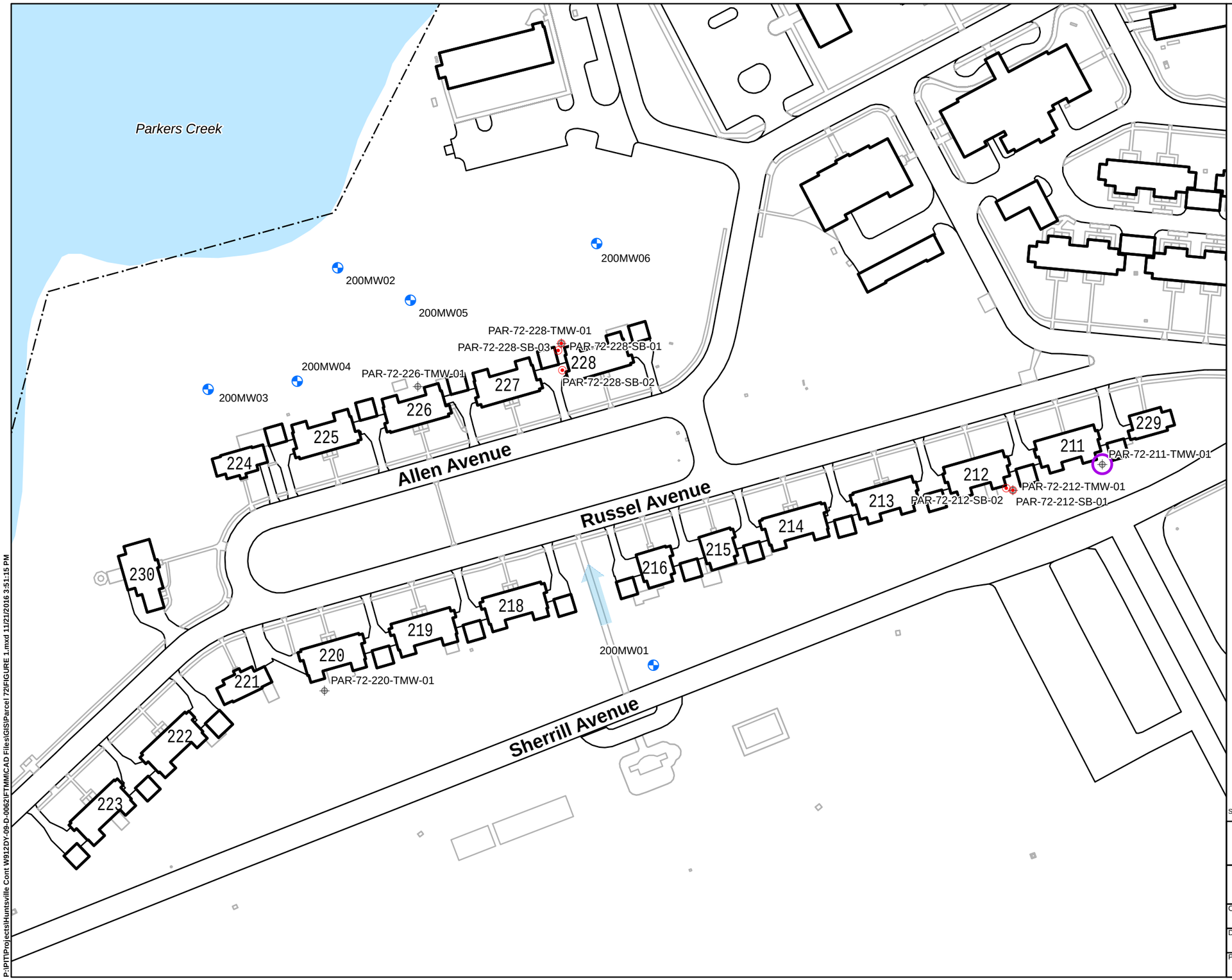
REFERENCES CITED

NJDEP. 2010. *Protocol for Addressing Extractable Petroleum Hydrocarbons.* Site Remediation Program. Version 5.0. August 9.

U.S. Army. 2007. *U.S. Army BRAC 2005 Environmental Condition of Property Report, Fort Monmouth, Monmouth County, New Jersey.* Final. January 29.

ENCLOSURE 1 of Attachment D

Figures: Sample Locations and Exceedances



LEGEND:

- Soil Boring
- Temporary Monitoring Well
- Exceedance of Groundwater Quality Criteria
- Shallow Monitoring Well
- Installation Boundary
- Generalized Groundwater Flow Direction

NOTE:

1. Steel tank UST228B was still present at Building 228.
2. Field located final sample locations based on site features to sample within 10 feet of former or existing tanks.

N

1 inch = 120 feet

0 60 120 240 Feet

Source: FTMM Supplied CAD, 2013.

PARSONS 401 Diamond Drive NW, Huntsville AL	**Fort Monmouth** **New Jersey**

SAMPLE LOCATIONS AND EXCEEDANCES FOR PARCEL 72

CREATED BY: RR	REVIEWED BY: KF
DATE: NOV. 2016	FIGURE NUMBER: FIGURE 1
PROJECT NUMBER: 748810-01000	FILE: FIGURE 1.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\Parcel 72\FIGURE 1.mxd 11/21/2016 3:51:15 PM

ENCLOSURE 2 of Attachment D

Tables: Soil and Groundwater Analytical Results

TABLE 2
DETECTED GROUNDWATER RESULTS AND COMPARISON TO NJ CRITERIA
SELECT PARCEL 72 UHOTS
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	P72-BLD-211-TMW-01	P72-BLD-212-TMW-01	P72-BLD-220-TMW-01	P72-BLD-226-TMW-01	P72-BLD-228-TMW-01
Sample ID		PAR-72-211-TMW-01	PAR-72-212-TMW-01	PAR-72-220-TMW-01	PAR-72-226-TMW-01	PAR-72-228-TMW-01
Sample Date		8/10/2016	8/10/2016	8/10/2016	8/10/2016	8/10/2016
Sample Round						
Filtered		Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)						
1,2,4-Trimethylbenzene	100	**543 J**	< 0.75	< 0.75	< 0.75	< 0.75
1,3,5-Trimethylbenzene	100	**81.4**	< 0.75	< 0.75	< 0.75	< 0.75
Acetone	6,000	< 3.8	< 3.8	**7.6 B**	**5.1 B**	**8 B**
Benzene	1	**2.8**	< 0.75	< 0.75	< 0.75	< 0.75
Cymene	100	**16.9**	< 0.75	< 0.75	< 0.75	< 0.75
Ethyl benzene	700	**92.4**	< 0.75	< 0.75	< 0.75	< 0.75
Isopropylbenzene	700	**29.3**	< 0.75	< 0.75	< 0.75	< 0.75
Meta/Para Xylene	1,000	**118**	< 1.5	< 1.5	< 1.5	< 1.5
Methyl ethyl ketone	300	**2.9 J**	< 3.8	< 3.8	< 3.8	< 3.8
Naphthalene	300	**862 J**	< 0.75	< 0.75	**0.44 J**	< 0.75
n-Butylbenzene	100	**26.1**	< 0.75	< 0.75	< 0.75	< 0.75
Ortho Xylene	1,000	**39.1**	< 0.75	< 0.75	< 0.75	< 0.75
Propylbenzene	100	**48.4**	< 0.75	< 0.75	< 0.75	< 0.75
sec-Butylbenzene	100	**25**	< 0.75	< 0.75	< 0.75	< 0.75
Toluene	600	**2.1**	< 0.75	< 0.75	< 0.75	< 0.75
TIC VOCs (µg/l)						
Total TICs, Volatile	500	**1302.4 JN**	0	0	0	0
Semivolatile Organic Compounds (µg/l)						
2-Methylnaphthalene	30	**6,680**	< 0.93	**0.16 J**	< 1.1	< 1
Acenaphthylene	100	< 19.2	< 0.93	**0.3 J**	< 1.1	< 1
Anthracene	2,000	**195**	**0.15 J**	< 0.93	< 1.1	**0.22 J**
Benzo(a)anthracene	0.1	< 19.2	**0.41 J**	**0.29 J**	< 1.1	< 1
Benzo(a)pyrene	0.1	< 19.2	**0.26 J**	< 0.93	< 1.1	< 1
Benzo(b)fluoranthene	0.2	< 19.2	**0.33 J**	**0.17 J**	< 1.1	< 1
Benzyl alcohol	2,000	< 38.5	< 1.9	**0.22 J**	< 2.1	< 2
Bis(2-Ethylhexyl)phthalate	3	< 19.2	< 0.93	**0.73 J**	< 1.1	< 1
Chrysene	5	< 19.2	**0.33 J**	**0.19 J**	< 1.1	< 1
Dibenzofuran	100	**247**	< 0.93	< 0.93	< 1.1	**0.16 J**
Diethyl phthalate	6,000	< 19.2	< 0.93	< 0.93	**1.5 J**	**0.22 J**
Di-n-butylphthalate	700	< 19.2	**0.21 J**	**0.35 J**	< 1.1	< 1
Fluoranthene	300	< 19.2	**0.73 J**	**0.26 J**	< 1.1	< 1
Fluorene	300	**663**	< 0.93	**0.19 J**	< 1.1	**0.21 J**
Indeno(1,2,3-cd)pyrene	0.2	< 19.2	< 0.93	**0.093 J**	< 1.1	< 1
Naphthalene	300	**1,450**	< 0.93	< 0.93	< 1.1	< 1
Phenanthrene	100	**1,740**	**0.45 J**	**0.46 J**	< 1.1	**0.29 J**
Pyrene	200	**185**	**0.65 J**	**0.39 J**	< 1.1	**0.17 J**
TIC SVOCs (µg/l)						
Total TICs, Semi-Volatile	500	**14322 JN**	**98.9 JN**	**187.7 JN**	**25.2 JN**	**50.1 JN**

Groundwater results Footnotes:

1) ug/l = micrograms per liter.

2) TICs - tentatively identified compounds.

3) NLE = no limit established.

4) Not used.

5) **Bold** = chemical detection

6) SS = Site Specific action level, see "Specific Chemical Class (or Parameter)" footnote for details.

7) Chemical result qualifiers are assigned by the laboratory and are evaluated and modified (if necessary) during the data validation.

[blank] = detect, i.e. detected chemical result value.

J = estimated detected value due to a concentration below the reporting limit or due to discrepancies in meeting certain analyte-specific quality control.

B =Compound detected in the sample at a concentration less than or equal to 5 times (10 times for common lab contaminants) the blank concentration.

E (or ER) = Estimated result.

R = Rejected, data validation rejected the results.

D = Results from dilution of sample.

U = non-detect, i.e. not detected at or above this value.

J-DL = Estimated detected value due to difficult sample matrix.

U-DL = Elevated sample detection limit due to difficult sample matrix.

JN = Tentatively identified compound, estimated concentration.

U-ND = Analyte not detected in sample, but no detection or reporting limit provided.

8) Not used.

9) Chemical results greater than or equal to the action level (depending on criteria) are highlighted based on the Criteria that are present.

- Cell Shade values represent a result that is above the NJ Ground Water Quality Criteria ####

NJDEP Interim Specific GWQC values are presented for the NJ GWQS where there is not a Specific Ground Water Quality Criteria. A full list of compounds is available at (http://www.nj.gov/dep/wms/bwqsa/gwqs_interim_criteria_table.htm).

NJDEP Interim Generic GWQC values are presented for the NJ GWQS where there is not a GWQC or a NJDEP Interim Specific GWQC. Available at (http://www.nj.gov/dep/wms/bwqsa/gwqs_interim_criteria_table.htm).

10) Criteria action level source document and web address.

- The NJ Ground Water Quality Criteria refers to the NJDEP Groundwater Quality Standards - Adopted July 22, 2010

http://www.state.nj.us/dep/wms/bwqsa/docs/njac79C.pdf

ENCLOSURE 3 of Attachment D

Field Notes

Aug 9 2016

Tech: C. WATSON, S. Parulkar, ECOI(2), F. Accasi
TASK: SB's + TMW's @ 72
Weather: 78°f Clear
0720: on-site
0725: Begin COC's
0746: H+S tailgate
0800: Begin sample prep QA/QC
0840: Mob to 72 (ECOI/C. watson)
0915: Mob to 228 AREA
0925: FRANK confirms mark out locations,
0930: Begin Drilling 228-SB-03
1030: Sample 228-SB-03-6.5-7
1040: Sample 228-SB-03-7-7.5
1045: Begin Drilling @ 228-SB-01
1100: ~~Inst~~ Sample 228-SB-01-5.0-5.5
1115: Sample 228-SB-01-8.5-9
1130: Install TMW-01 @ 228-SB-01
1140: Attempt 228-SB-02 and Hit refusal,
Rig needs to be moved to opposite side of fence around buildings - will attempt after TMW01 @ 226 is put in
1200: Drilling @ 226-TMW-01
1235: Install 226-TMW01
1250: Lunch
1320: Mob Rig around buildings to NEW 228-SB-02 location
1345: Begin Drilling 228-SB-02
1430: Sample ~~10.5-11.0~~ (SV) PAR-72-228-SB-02-10.5-11
1440: Sample PAR-72-228-SB-02-12-12.5
1440: Begin Drilling @ 220-TMW01
1525: Install 220 TMW01
1530: Sameera to office to begin COC's
1545: C. Watson + ECOI clean up + Demob
1600: CW Back to office - want to make note that water level was routinely difficult to Determine in parcel 72 - soil also very tight with layers of perched water, will gauge All wells in AM.
1605: Place COC's + DLAR on FRANKS Desk to be scanned, Plug in P.I.D, Cool samples
1625: off-site

Tech: C. Watson, S. Pralker, ECDI(2) AUG 10 2016
TASK: P72 Soil & water sampling
Weather: 82°F O.C - Storms all Day

0725: on-site
0735: H&S tailgate
0800: Mob to 72 AREA - S. Pralker to Sample Temp wells

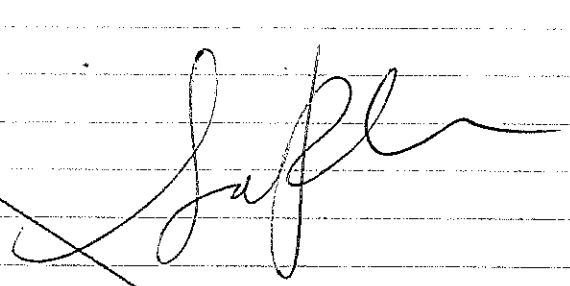
SAMPLE ID	Time	DTW	Analysis
PAR-72-228-TMW-01	0835	12.40	VOC/SVOC
PAR-72-226-TMW-01	0900	13.25	
PAR-72-220-TMW-01	0955	13.47	

0925: Sample PAR-72-212-SB-01-5-5.5 EPH SVOC
0935: Sample PAR-72-212-SB-01-11-11.5 EPH SVOC
1000: Sample PAR-72-212-SB-02-5-5.5
1015: Sample PAR-72-212-SB-02-11.5-12
1045: Install ~~TMW~~ PAR-72-211-TMW01
PAR-212-TMW01 installed @ 0950
1125: Sample PAR-72-212-TMW-01 DTW: 12.02
1200: Sample PAR-72-211-TMW-01 DTW: 11.25
1210: Mob to parcel 49
1225: Lunch
1245: Begin Drilling

SAMPLE ID	Time	Analysis
PAR-49-SB-16-0.5-1	1310	PAH
2.5-3	1320	
4.5-5	1325	
PAR-49-SB-14-0.5-1	1330	
2.5-3	1335	
4.5-5	1340	

SAMPLE ID	TIME	Analysis
PAR-49-SB-~~17~~ 0.5-1	1345	PAH
2.5-3	1350	
4.5-5	1355	
PAR-49-SB-15-0.5-1	1415	
2.5-3	1425	
4.5-5	1435	
PAR-49-SB-13-0.5-1	1440	
2.5-3	1450	
4.5-5	1500	QC

1500 mob to office
1530 ~~called~~ left* collect EB
1545 complete COCs, DCQR, prep samples
1630: offsite



ENCLOSURE 4 of Attachment D

Boring Logs

PARSONS

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM Parcel
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL: ~12
DATE: 8/10/16
TIME:
MEAS. FROM:

INSPECTOR: O. Watza
DRILLER: J. BORNAK
WEATHER: 80°F
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 8/10/16 1020
DATE/TIME FINISH: 8/10/16 1035
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FAL-72-211-TMW01
LOCATION DESCRIPTION:
LOCATION PLAN: Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0				0	0-36" Moist, M. Grey Brown Mf SAND, trace silt		
1					36"-44" Moist, Dense, Brown MF SAND, little silt		
2					44"-49" Moist, Dense, grey Mf SAND, little silt		
3							
4							
5			60/46	0	0-17" SAA		
				0	17-19" Crushed Rock		
6				0			
				0	19"-39" grey, moist, mf, M. Dense SAND, some silt, odor		
7				19.1			
				60.0			
8				1.2	39"-46" Moist, grey/orange Mf Mottled SAND, some silt		
				22.6			
9				NR			
				NR			
10							

Remarks:

Sample Types
S – Split-Spoon
U – Undisturbed Tube
C – Rock Core
A – Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)		Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM Parcel
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL: n/a
DATE:
TIME:
MEAS. FROM:

INSPECTOR:
DRILLER:
WEATHER:
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START:
DATE/TIME FINISH:
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: 72-21-TMW01
LOCATION DESCRIPTION
LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/60	1.6	0-28" SAA, saturated @ 24"		
				12.2			
1				222	28"-45" Saturated, M. Rose grey, MC SAND, little f gravel, trace silt, odor		
				117			
2				404			
				399			
3				12.2			
				8.1	45"-60" Saturated, M. Dense orange/grey/Brown, MF mottled SAND, little silt, trace f gravel		
4				0			
				0			
5							
6							
7							
8							
9							
0							

Remarks:

Sample Types
S – Split-Spoon
U – Undisturbed Tube
C – Rock Core
A – Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)			Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50		V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50		Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30			M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

ATTACHMENT F

Unregulated Heating Oil Tanks Along Russel Avenue

PARSONS

Note: red font indicates a December 2016 update to the earlier 2014 file review

UNDERGROUND STORAGE TANK FILE REVIEW
FORT MONMOUTH BRAC 05 FACILITY
OCEANPORT, NEW JERSEY

Date: *December 10, 2014* Review Performed By: *Kent Friesen, Parsons*

Site ID: ***Bldg. 211*** Registration ID: *81533-9*

Recommended Status of Site: ***Case Closed*** ***(no change)***

UST Probability (from May 2014 "Addendum 1 ECP UHOT Report"): ***High***

Based on the file review, were there indications of a contaminant release? [ ] Yes [X] No

NJDEP Release No. or DICAR (If applicable): *Not Applicable*

Did NJDEP approve No Further Action (NFA) for this site? [ ] Yes [ ] No [X] Not Applicable

Tank Description: [ ] Steel [X] Fiberglass Size: 2000 gals. Contents: No. 2 Fuel Oil

[X] Residential [ ] Commercial/Industrial

Tank Removed? [X] Yes [ ] No If "yes," removal date: 11/27/2001

Were closure soil samples taken? [X] Yes [ ] No Analyses: TPH; VOCs in 1 sample

Comparison criteria: 5,100 mg/kg TPH

Were closure soil sample results less than comparison criteria? ? [X] Yes [ ] No

Brief Narrative

Soil samples were collected from the tank excavation in 2001 and analyzed by the Fort Monmouth Environmental Laboratory for total petroleum hydrocarbons (TPH). Building 211 sample results were non-detected (ND) for TPH in 5 of the 6 soil samples. One sample (211B-Center) contained 3968 mg/kg TPH; this sample was also analyzed for volatile organic compounds (VOCs). The TPH results were less than 5,100 mg/kg, which is the current remediation criterion. The VOC results were ND for all compounds except acetone, which is a common laboratory contaminant. Therefore, no additional sampling or remedial action was warranted.

In conclusion, the analytical results support the UST Case Status designation of "Case Closed,", although certain supporting documentation (such as a map with sample locations, field notes, etc.) may not be available. Although the fiberglass tank was removed, an earlier steel UST could still be present.

Recommendations (if any): ~~None~~ Address groundwater

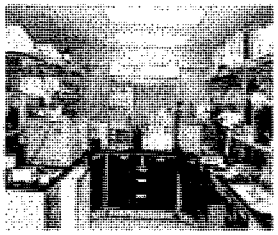
Signed: Kent A. Friesen

Kent A. Friesen, Parsons

See also Attachment D for recent (2016) analytical results; additional activities to address groundwater are warranted.

FORT MONMOUTH ENVIRONMENTAL TESTING LABORATORY

DIRECTORATE OF PUBLIC WORKS
PHONE: (732) 532-6224 FAX: (732) 532-6263
WET-CHEM - METALS - ORGANICS - FIELD SAMPLING
CERTIFICATIONS: NJDEP #13461, NYSDOH #11699



ANALYTICAL DATA REPORT
Fort Monmouth Environmental Laboratory
ENVIRONMENTAL DIVISION
Fort Monmouth, New Jersey
PROJECT: UST Program

Bldg. 211

Field Sample Location	Laboratory Sample ID#	Matrix	Date and Time Of Collection	Date Received
211A-North End/8.5-9'	1660501	Soil	27-Nov-01 09:00	11/27/01
211B-Center/9-9.5'	1660502	Soil	27-Nov-01 09:55	11/27/01
211C-South End/9-9.5'	1660503	Soil	27-Nov-01 09:20	11/27/01
211D-Piping/1-1.5'	1660504	Soil	27-Nov-01 10:30	11/27/01
211E-Piping/1-1.5'	1660505	Soil	27-Nov-01 11:00	11/27/01
211F-Duplicate/8.5-9'	1660506	Soil	27-Nov-01 09:00	11/27/01
Trip Blank	1660507	Methanol	27-Nov-01	11/27/01

ANALYSIS:
FORT MONMOUTH ENVIRONMENTAL LAB
VOA+15, TPHC, %SOLIDS

ENCLOSURE:
CHAIN OF CUSTODY
RESULTS

12-6-01
Daniel Wright/Date
Laboratory Director

Table of Contents

CHAIN OF CUSTODY

Fort Monmouth Environmental Testing Laboratory

Bldg. 173, SELFM-PW-EV, Fort Monmouth, NJ 07703
Tel (732)532-4359 Fax (732)532-6263 EMail:wrightd@mail1.monmouth.army.mil
NJDEP Certification #13461 / NYDOH Certification #11699

Chain of Custody Record

Customer: Dinker Desai
Phone #: X21475
( )DERA (X)OMA UST Assessment

Project No: ~~01-0001~~ 02-15362
Location: BLDG. 211 4+6 RUSSET
UST# 81533-9

Samplers Name / Company : Frank Accorsi/TVS

Lab Sample I.D.	Sample Location	Depth	Date	Time	Sample Type	# Bottles	TPHC	% SOLIDS	VOA+10 *	VOA ID #	PID Reading	Remarks / Preservation Method
10d05 01	211A - NORTH END	8.5-9	11-27-01	0900	SOIL	2	X	X	X	2948	0	ICE
02	211B - CENTER	9-9.5		0955			X	X	X	2949	6.0	
03	211C - SOUTH END	9-9.5		0920			X	X	X	2950	0	
04	211D - PIPING	1-1.5		1030			X	X	X	2951	0	
05	211E - PIPING	1-1.5		1100			X	X	X	2952	0	
06	211F - DUPLICATE	8.5-9		0900			X	X	X	2953	0	
07	TRIP BLANK	—		~~0900~~	AQ.	1			X	2954	—	

* = Samples Kept <4°C

OVM sn#580U-64455.343 was calibrated with zero air & w/ 245 ppm Isobutylene read 245 ppm. 11-27-01 0830 FH (time/date & initial)

Relinquished by (signature):	Date/Time:	Received by (signature):
Frank Accorsi	11-27-01 1127	
Relinquished by (signature):	Date/Time:	Received by (signature):

Comments: * VO+10 on 25% > 1,000 ppm TPH, on highest, min. one

Report Type: ( )Full, (X)Reduced, ( )Standard, ( )Screen / non-certified, ( )EDD
Turnaround time: ( )Standard 2 wks, (X)Rush 2 Days, ( )ASAP Verbal ___ Hrs.

Remarks: Dedicated Sampling Tools Used
All sample points have been GPS? (X)YES ( )NO ( )NA

000002

print legibly

USTcoc.xls6/22/01

Change of Chain of Custody

Lab Project ID#: 166605 Site/Project Name: Bldg 211

Date Received: 11/27 Date of Change: 11/28

Requested by: print Hermes Sign: Hermes

Turnaround Time: Std.

1. Were the correct containers and/or preservatives used for the tests indicated? Yes No
2. Was a sufficient amount of sample sent for the tests indicated? Yes No
3. Are samples Within Holding time for new analysis? Yes No
4. Was the change documented in the sample receipt log book? Yes No

Received by: print Sign:

Sample ID#	New Analysis		Sample ID#	New Analysis
1660502	VOA +15			9.87

Comments:

METHOD SUMMARY

Method Summary

NJDEP Method 8260
Gas Chromatographic Determination of Volatiles in Soil

A 10-gram volume of soil is combined with 25-ml of Methanol and surrogates in the field. Internal standards are added and the sample is placed on a purge and trap concentrator. The sample is purged and desorbed into a GC/MS system. Volatiles are identified and quantitated. The final concentration is calculated using soil weight, percent moisture, methanol volume and concentration.

NJDEP Method OQA-QAM-025-10/97
Gas Chromatographic Determination of Total Petroleum Hydrocarbons in Soil

Fifteen grams (15g)(wet weight) of a soil sample is added to a 125 mL acid cleaned, solvent rinsed, capped Erlenmeyer flask. 15g anhydrous sodium sulfate is added to dry sample. Surrogate standard spiking solution is then added to the flask.

Twenty-five milliliters (25mL) Methylene Chloride is added to the flask and it is secured on a orbital shaker table. The agitation rate is set to 400rpm and the sample is shaken for 30 minutes. The flask is the removed from the table and the particulate matter is allowed to settle. The extract is transferred to a Teflon capped vial. A second 25mL of Methylene Chloride is added to the flask and shaken for an additional 30 minutes. The flask is again removed and allowed to settle. The extracts are combined in the vial then transferred to a 1mL-autosampler vial.

The extract is then injected directly into a GC-FID for analysis. The sample is analyzed for petroleum hydrocarbons covering a range of C8-C42 including Pristane and Phytane. Total Petroleum Hydrocarbon concentration is determined by integrating between 5 minutes and 22 minutes. The baseline is established by starting the integration after the end of the solvent peak and stopping after the last peak.

The final concentration of Total Petroleum Hydrocarbons is calculated using percent solid, sample weight and concentration.

CONFORMANCE-
NON-
CONFORMANCE

GC/MS ANALYSIS CONFORMANCE/NON-CONFORMANCE SUMMARY FORMAT

Indicate Yes, No, N/A

1. Chromatograms labeled/Compounds identified (Field samples and method blanks) — Yes

2. Retention times for chromatograms provided — Yes

3. GC/MS Tune Specifications

   a. BFB Meet Criteria — Yes
   b. DFTPP Meet Criteria — NA

4. GC/MS Tuning Frequency – Performed every 24 hours for 600 series and 12 hours for 8000 series — Yes

5. GC/MS Calibration – Initial Calibration performed before sample analysis and continuing calibration performed within 24 hours of sample analysis for 600 series and 12 hours for 8000 series — Yes

6. GC/MS Calibration requirements

   a. Calibration Check Compounds Meet Criteria — Yes
   b. System Performance Check Compounds Meet Criteria — Yes

7. Blank Contamination – If yes, List compounds and concentrations in each blank: — No

   a. VOA Fraction _____
   b. B/N Fraction NA
   c. Acid Fraction NA

8. Surrogate Recoveries Meet Criteria — Yes

   If not met, list those compounds and their recoveries, which fall outside the acceptable range:

   a. VOA Fraction _____
   b. B/N Fraction NA
   c. Acid Fraction NA

   If not met, were the calculations checked and the results qualified as "estimated"? _____

9. Matrix Spike/Matrix Spike Duplicate Recoveries Meet Criteria (If not met, list those compounds and their recoveries, which fall outside the acceptable range) — Yes

   a. VOA Fraction _____
   b. B/N Fraction NA
   c. Acid Fraction NA

GC/MS ANALYSIS CONFORMANCE/NON-CONFORMANCE SUMMARY FORMAT (cont.)

Indicate
Yes, No, N/A

10. Internal Standard Area/Retention Time Shift Meet Criteria — Yes
(If not met, list those compounds, which fall outside the acceptable range)

a. VOA Fraction _____
b. B/N Fraction NA
c. Acid Fraction NA

11. Extraction Holding Time Met — NA

If not met, list the number of days exceeded for each sample: _____

12. Analysis Holding Time Met — Yes

If not met, list the number of days exceeded for each sample: _____

Additional Comments:

Laboratory Manager: _____ Date: 12-6-01

TPHC Conformance/Non-conformance Summary Report

		Indicate Yes, No, N/A
1.	Method Detection Limits provided.	Yes
2.	Method Blank Contamination – If yes, list the sample and the Corresponding concentrations in each blank.	No
3.	Matrix Spike Results Summary Meet Criteria (If not met, list the sample and corresponding recovery which falls outside the acceptable range).	Yes
4.	Duplicate Results Summary Meet Criteria (If not met, list the sample and corresponding recovery which falls outside the acceptable range).	Yes
5.	IR Spectra submitted for standards, blanks and samples.	NA
6.	Chromatograms submitted for standards, blanks and samples if GC fingerprinting was conducted.	Yes
7.	Analysis holding time met. (If not met, list number of days exceeded for each sample).	Yes

Additional comments: _____

Laboratory Manager

12-6-01
Date

LABORATORY CHRONICLE

Laboratory Chronicle

Lab ID: 16605 Site: Bldg. 211

	Date	Hold Time
Date Sampled	11/27/01	NA
Receipt/Refrigeration	11/27/01	NA
Extractions		
1. TPHC	11/27/01	14 days
Analyses		
1. VOA	11/30/01	14 days
2. TPHC	11/28/01	40 days

VOLATILE ORGANICS

US ARMY FT. MONMOUTH ENVIRONMENTAL LABORATORY
NJDEP CERTIFICATION # 13461

Definition of Qualifiers

MDL	:	Method Detection Limit
J	:	Compound identified below detection limit
B	:	Compound found in blank
D	:	Results are from a dilution of the sample
U	:	Compound searched for but not detected
E	:	Compound exceeds calibration limit
PQL	:	Practical Quantitation Limit
NLE	:	No limit established
RT	:	Retention time

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

MB 30Nov01

Lab Name: FMETL NJDEP # 13461

Project: 0215362 Case No.: 16605 Location: 211 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: MB

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VC007512.D

Level: (low/med) MED Date Received: 11/27/01

% Moisture: not dec. 0 Date Analyzed: 11/30/01

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 125 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	700	U
107131	Acrylonitrile	700	U
75650	tert-Butyl alcohol	1300	U
1634044	Methyl-tert-Butyl ether	300	U
108203	Di-isopropyl ether	200	U
75718	Dichlorodifluoromethane	400	U
74-87-3	Chloromethane	100	U
75-01-4	Vinyl Chloride	300	U
74-83-9	Bromomethane	200	U
75-00-3	Chloroethane	300	U
75-69-4	Trichlorofluoromethane	200	U
75-35-4	1,1-Dichloroethene	100	U
67-64-1	Acetone	200	U
75-15-0	Carbon Disulfide	100	U
75-09-2	Methylene Chloride	200	U
156-60-5	trans-1,2-Dichloroethene	200	U
75-35-3	1,1-Dichloroethane	100	U
108-05-4	Vinyl Acetate	300	U
78-93-3	2-Butanone	300	U
	cis-1,2-Dichloroethene	100	U
67-66-3	Chloroform	100	U
75-55-6	1,1,1-Trichloroethane	100	U
56-23-5	Carbon Tetrachloride	200	U
71-43-2	Benzene	100	U
107-06-2	1,2-Dichloroethane	200	U
79-01-6	Trichloroethene	100	U
78-87-5	1,2-Dichloropropane	100	U
75-27-4	Bromodichloromethane	100	U
110-75-8	2-Chloroethyl vinyl ether	200	U
10061-01-5	cis-1,3-Dichloropropene	100	U
108-10-1	4-Methyl-2-Pentanone	200	U
108-88-3	Toluene	100	U
10061-02-6	trans-1,3-Dichloropropene	200	U
79-00-5	1,1,2-Trichloroethane	200	U
127-18-4	Tetrachloroethene	100	U
591-78-6	2-Hexanone	200	U
126-48-1	Dibromochloromethane	200	U
108-90-7	Chlorobenzene	100	U
100-41-4	Ethylbenzene	200	U

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

MB 30Nov01

Lab Name: FMETL NJDEP # 13461

Project: 0215362 Case No.: 16605 Location: 211 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: MB

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VC007512.D

Level: (low/med) MED Date Received: 11/27/01

% Moisture: not dec. 0 Date Analyzed: 11/30/01

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 125 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	300	U
1330-20-7	o-Xylene	200	U
100-42-5	Styrene	200	U
75-25-2	Bromoform	200	U
79-34-5	1,1,2,2-Tetrachloroethane	200	U
541-73-1	1,3-Dichlorobenzene	300	U
106-46-7	1,4-Dichlorobenzene	300	U
95-50-1	1,2-Dichlorobenzene	300	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

MB 30Nov01

Lab Name: FMETL NJDEP # 13461

Project: 0215362 Case No.: 16605 Location: 211 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: MB

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VC007512.D

Level: (low/med) MED Date Received: 11/27/01

% Moisture: not dec. 0 Date Analyzed: 11/30/01

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 125 (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Number TICs found: 1

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	30.85	900	J

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

211B-Center

Lab Name: FMETL NJDEP # 13461

Project: 0215362 Case No.: 16605 Location: 211 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 1660502

Sample wt/vol: 9.9 (g/ml) G Lab File ID: VC007513.D

Level: (low/med) MED Date Received: 11/27/01

% Moisture: not dec. 19.79 Date Analyzed: 11/30/01

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 125 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	890	U
107131	Acrylonitrile	890	U
75650	tert-Butyl alcohol	1600	U
1634044	Methyl-tert-Butyl ether	380	U
108203	Di-isopropyl ether	250	U
75718	Dichlorodifluoromethane	510	U
74-87-3	Chloromethane	130	U
75-01-4	Vinyl Chloride	380	U
74-83-9	Bromomethane	250	U
75-00-3	Chloroethane	380	U
75-69-4	Trichlorofluoromethane	250	U
75-35-4	1,1-Dichloroethene	130	U
67-64-1	Acetone	1300	
75-15-0	Carbon Disulfide	130	U
75-09-2	Methylene Chloride	250	U
156-60-5	trans-1,2-Dichloroethene	250	U
75-35-3	1,1-Dichloroethane	130	U
108-05-4	Vinyl Acetate	380	U
78-93-3	2-Butanone	380	U
	cis-1,2-Dichloroethene	130	U
67-66-3	Chloroform	130	U
75-55-6	1,1,1-Trichloroethane	130	U
56-23-5	Carbon Tetrachloride	250	U
71-43-2	Benzene	130	U
107-06-2	1,2-Dichloroethane	250	U
79-01-6	Trichloroethene	130	U
78-87-5	1,2-Dichloropropane	130	U
75-27-4	Bromodichloromethane	130	U
110-75-8	2-Chloroethyl vinyl ether	250	U
10061-01-5	cis-1,3-Dichloropropene	130	U
108-10-1	4-Methyl-2-Pentanone	250	U
108-88-3	Toluene	130	U
10061-02-6	trans-1,3-Dichloropropene	250	U
79-00-5	1,1,2-Trichloroethane	250	U
127-18-4	Tetrachloroethene	130	U
591-78-6	2-Hexanone	250	U
126-48-1	Dibromochloromethane	250	U
108-90-7	Chlorobenzene	130	U
100-41-4	Ethylbenzene	250	U

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

211B-Center

Lab Name: FMETL NJDEP # 13461

Project: 0215362 Case No.: 16605 Location: 211 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 1660502

Sample wt/vol: 9.9 (g/ml) G Lab File ID: VC007513.D

Level: (low/med) MED Date Received: 11/27/01

% Moisture: not dec. 19.79 Date Analyzed: 11/30/01

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 125 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	380	U
1330-20-7	o-Xylene	250	U
100-42-5	Styrene	250	U
75-25-2	Bromoform	250	U
79-34-5	1,1,2,2-Tetrachloroethane	250	U
541-73-1	1,3-Dichlorobenzene	380	U
106-46-7	1,4-Dichlorobenzene	380	U
95-50-1	1,2-Dichlorobenzene	380	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

211B-Center

Lab Name: FMETL NJDEP # 13461

Project: 0215362 Case No.: 16605 Location: 211 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 1660502

Sample wt/vol: 9.9 (g/ml) G Lab File ID: VC007513.D

Level: (low/med) MED Date Received: 11/27/01

% Moisture: not dec. 19.79 Date Analyzed: 11/30/01

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 125 (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Number TICs found: 15

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 002051-30-1	Octane, 2,6-dimethyl-	28.10	2800	JN
2.	unknown	29.00	4200	J
3. 005911-04-6	Nonane, 3-methyl-	29.40	2300	JN
4.	unknown	30.05	2700	J
5.	unknown	30.64	2300	J
6. 002847-72-5	Decane, 4-methyl-	30.89	3600	JN
7.	unknown	31.93	3200	J
8.	unknown	32.03	2200	J
9.	unknown	32.10	2700	J
10.	unknown	32.34	3000	J
11. 001120-21-4	Undecane	33.10	12000	JN
12.	unknown	34.44	2800	J
13.	unknown	34.77	2000	J
14. 004292-92-6	Cyclohexane, pentyl-	34.85	4700	JN
15.	unknown	34.95	3400	J

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

Trip Blank

Lab Name: FMETL NJDEP # 13461

Project: 0215362 Case No.: 16605 Location: 211 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 1660507

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VC007514.D

Level: (low/med) MED Date Received: 11/27/01

% Moisture: not dec. 0 Date Analyzed: 11/30/01

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 125 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	700	U
107131	Acrylonitrile	700	U
75650	tert-Butyl alcohol	1300	U
1634044	Methyl-tert-Butyl ether	300	U
108203	Di-isopropyl ether	200	U
75718	Dichlorodifluoromethane	400	U
74-87-3	Chloromethane	100	U
75-01-4	Vinyl Chloride	300	U
74-83-9	Bromomethane	200	U
75-00-3	Chloroethane	300	U
75-69-4	Trichlorofluoromethane	200	U
75-35-4	1,1-Dichloroethene	100	U
67-64-1	Acetone	1000	
75-15-0	Carbon Disulfide	100	U
75-09-2	Methylene Chloride	200	U
156-60-5	trans-1,2-Dichloroethene	200	U
75-35-3	1,1-Dichloroethane	100	U
108-05-4	Vinyl Acetate	300	U
78-93-3	2-Butanone	300	U
	cis-1,2-Dichloroethene	100	U
67-66-3	Chloroform	100	U
75-55-6	1,1,1-Trichloroethane	100	U
56-23-5	Carbon Tetrachloride	200	U
71-43-2	Benzene	100	U
107-06-2	1,2-Dichloroethane	200	U
79-01-6	Trichloroethene	100	U
78-87-5	1,2-Dichloropropane	100	U
75-27-4	Bromodichloromethane	100	U
110-75-8	2-Chloroethyl vinyl ether	200	U
10061-01-5	cis-1,3-Dichloropropene	100	U
108-10-1	4-Methyl-2-Pentanone	200	U
108-88-3	Toluene	100	U
10061-02-6	trans-1,3-Dichloropropene	200	U
79-00-5	1,1,2-Trichloroethane	200	U
127-18-4	Tetrachloroethene	100	U
591-78-6	2-Hexanone	200	U
126-48-1	Dibromochloromethane	200	U
108-90-7	Chlorobenzene	100	U
100-41-4	Ethylbenzene	200	U

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

Trip Blank

Lab Name: FMETL NJDEP # 13461

Project: 0215362 Case No.: 16605 Location: 211 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 1660507

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VC007514.D

Level: (low/med) MED Date Received: 11/27/01

% Moisture: not dec. 0 Date Analyzed: 11/30/01

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 125 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	300	U
1330-20-7	o-Xylene	200	U
100-42-5	Styrene	200	U
75-25-2	Bromoform	200	U
79-34-5	1,1,2,2-Tetrachloroethane	200	U
541-73-1	1,3-Dichlorobenzene	300	U
106-46-7	1,4-Dichlorobenzene	300	U
95-50-1	1,2-Dichlorobenzene	300	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

Trip Blank

Lab Name: FMETL NJDEP # 13461

Project: 0215362 Case No.: 16605 Location: 211 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 1660507

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VC007514.D

Level: (low/med) MED Date Received: 11/27/01

% Moisture: not dec. 0 Date Analyzed: 11/30/01

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 125 (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Number TICs found: 7

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	27.44	2000	J
2.	unknown	28.02	1500	J
3.	unknown	28.44	1500	J
4. 000629-50-5	Tridecane	30.76	4300	JN
5.	unknown	31.37	2000	J
6.	unknown	32.18	1800	J
7.	unknown	34.29	2400	J

TPHC

Report of Analysis
U.S.Army, Fort Monmouth Environmental Laboratory
NJDEP Certification # 13461

Client :	U.S. Army	**Project # :**	16605
	DPW. SELFM-PW-EV	**Location :**	Bldg. 211
	Bldg. 173	**UST Reg. # :**	81533-9
	Ft. Monmouth, NJ 07703		
Analysis :	OQA-QAM-025	**Date Received :**	27-Nov-01
Matrix :	Soil	**Date Extracted :**	27-Nov-01
Inst. ID. :	GC TPHC INST. #1	**Extraction Method :**	Shake
Column Type :	RTX-5, 0.32mm ID, 30M	**Analysis Complete :**	28-Nov-01
Injection Volume :	1uL	**Analyst :**	B.Patel

Sample	Field ID	Dilution Factor	Weight (g)	% Solid	MDL (mg/kg)	TPHC Result (mg/kg)
1660501	211A	**1.00**	15.66	82.61	175	**ND**
1660502	211B	**1.00**	15.57	80.21	181	**3968.46**
1660503	211C	**1.00**	15.49	82.49	177	**ND**
1660504	211D	**1.00**	15.16	86.75	172	**ND**
1660505	211E	**1.00**	15.22	91.65	162	**ND**
1660506	211F	**1.00**	15.30	82.31	180	**ND**
METHOD BLANK	MB-2671	**1.00**	15.00	100.00	151	**ND**

ND = Not Detected

MDL = Method Detection Limit

LABORATORY DELIVERABLES CHECKLIST AND NON-CONFORMANCE SUMMARY

THIS FORM MUST BE COMPLETED BY THE LABORATORY OR ENVIRONMENTAL CONSULTANT AND ACCOMPANY ALL DATA SUBMISSIONS

The following Laboratory Deliverables checklist and Non-Conformance Summary shall be included in the data submission. All deviations from the accepted methodology and procedures, of performance values outside acceptable ranges shall be summarized in the Non-Conformance Summary. The Technical Requirements for Site Remediation, effective June 7, 1993, provides further details. The document shall be bound and paginated, contain a table of contents, and all pages shall be legible. Incomplete packages will be returned or held without review until the data package is completed.

It is recommended that the analytical results summary sheets listing all targeted and non-targeted compounds with the method detection limits, practical quantitation limits, and the laboratory and/or sample numbers be included in one section of the data package and in the main body of the report.

1. Cover page, Title Page listing Lab Certification #, facility name and address, & date of report submitted ✓
2. Table of Contents submitted ✓
3. Summary Sheets listing analytical results for all targeted and non-targeted compounds submitted ✓
4. Document paginated and legible ✓
5. Chain of Custody submitted ✓
6. Samples submitted to lab within 48 hours of sample collection ✓
7. Methodology Summary submitted ✓
8. Laboratory Chronicle and Holding Time Check submitted ✓
9. Results submitted on a dry weight basis ✓
10. Method Detection Limits submitted ✓
11. Lab certified by NJDEP for parameters of appropriate category of parameters or a member of the USEPA CLP ✓

Laboratory Manager or Environmental Consultant's Signature _____

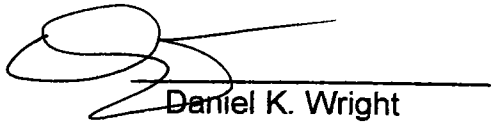
Date 12/6/01

Laboratory Certification #13461

*Refer to NJAC 7:26E - Appendix A, Section IV - Reduced Data Deliverables - Non-USEPA/CLP Methods for further guidance.

Laboratory Authentication Statement

I certify under penalty of law, where applicable, that this laboratory meets the Laboratory Performance Standards and Quality Control requirements specified in N.J.A.C. 7:18 and 40 CFR Part 136 for Water and Wastewater Analyses and SW-846 for Solid Waste Analysis. I have personally examined the information contained in this report and to the best of my knowledge, I believe that the submitted information is true, accurate, complete and meets the above referenced standards where applicable. I am aware that there are significant penalties for purposefully submitting falsified information, including the possibility of a fine and imprisonment.



Daniel K. Wright
Laboratory Manager

State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Case Management
401 East State Street
P.O. Box 420/Mail Code 401-05F
Trenton, NJ 08625-0028
Phone #: 609-633-1455
Fax #: 609-633-1439

BOB MARTIN
Commissioner

July 12, 2016

William Colvin
BRAC Environmental Coordinator
OACSIM – U.S. Army Fort Monmouth
PO Box 148
Oceanport, NJ 07757

Re: *Parcel 72 Select Unregulated Heating Oil Tanks (UHOTs) Work Plan Addendum*
Fort Monmouth
Oceanport, Monmouth County
PI G000000032

Dear Mr. Colvin:

The New Jersey Department of Environmental Protection (Department) has completed review of the referenced submittal, received on July 7, 2016, prepared by the Department of the Army, to propose soil and/or ground water sampling at four former #2 fuel underground storage tank (UST) areas and one at which the #2 fuel UST remains. Comments are as follows.

UST 211
The collection of a ground water sample as proposed is acceptable.

UST 212
Although sampling was apparently performed when the reported 2000 gallon UST was removed in 2001, the analytical data was reported as unable to be located. A single soil boring is proposed, with a sample to be collected from approximately 5-5.5' below grade (as the base of a 2000 gallon tank would often lie below that depth, perhaps a foot or so deeper should be considered), and a second interval sampled from 0-6" above the water table (which is appropriate). Based upon the former tank size, however, a minimum of two soil boring locations is necessary.

Although the UST is reported as unregulated, and therefore exempt from N.J.A.C. 7:14B, as per Section 3 *Applicability*, of the July 31, 2012 *Technical Guidance for Investigation of Underground Storage Tank Systems*, the exempted USTs must still comply with certain other Department regulations (ARRCs, Tech Rules), and use of the guidance document is appropriate. Section 5.2.1.1 of this guidance document indicates one location for each 5' of tank length is to be collected.

The collection of a ground water sample as proposed is acceptable.

UST 220B
The collection of a ground water sample as proposed is acceptable.

Is UST 220B considered the same tank as that referenced in Appendix G and Figure 15 of the '07 ECP as UST-220-14?

UST 226
The collection of a ground water sample as proposed is acceptable.

UST 228B
UST 228B (is this also known as UST 228-20 in Appendix G & Figure 15?) remains in place, however, appears to be out-of-service. Have the contents been removed? If the tank remains in service, four samples are required (Section 5.1.2 of the above referenced guidance document). If it is out of service, the tank should be closed in accordance with any applicable regulations.

USTs may only be abandoned in place if there is no contamination detected above remediation standards, or when there is evidence of a discharge but removal is not feasible (Section 5.2.2 of the guidance document). Sampling must be performed *through* the bottom of the tank to ensure no contamination is present beneath the UST, at 5' intervals along the center line. As this is a 1000 gallon UST, at least two sample locations through the bottom would be necessary.

Finally, the above comments address only those five USTs included in the work plan, rather than all USTs having been noted (including those of "high potential") within the parcel. This office looks forward to receipt of the request for NFA determination for the former USTs within the parcel as referenced in the submittal.

Please contact this office with any questions.

Sincerely,

Linda S. Range

Linda S. Range

C: Joe Pearson, Calibre
James Moore, USACE
Rick Harrison, FMERA
Joe Fallon, FMERA

DEPARTMENT OF THE ARMY

OFFICE OF ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
U.S. ARMY FORT MONMOUTH
P.O. 148
OCEANPORT, NEW JERSEY 07757

July 1, 2016

Ms. Linda Range
New Jersey Department of Environmental Protection
Bureau of Case Management
401 East State Street
PO Box 420/Mail Code 401-05F
Trenton, NJ 08625-0028

SUBJECT: Parcel 72 Select Unregulated Heating Oil Tanks (UHOTs) Work Plan Addendum Fort Monmouth, New Jersey

Attachments:

- Table 1 Summary of Select Parcel 72 UHOTs
- UST Removal Reference Map (Grid C2)
- Table 2 Summary of Proposed Sampling for Parcel 72
- Figure 1 Proposed Sampling for Parcel 72

Dear Ms. Range:

The U.S. Army Fort Monmouth (FTMM) has reviewed existing file information for underground storage tank (UST) sites at Fort Monmouth within Environmental Condition of Property (ECP) Parcel 72. The purpose of this review was to ensure that potential environmental issues associated with former UST sites within Parcel 72 have been adequately addressed to facilitate Phase II property transfer.

All of the Parcel 72 USTs are residential unregulated heating oil tanks (UHOTs), such as single family homes, apartments or barracks. Residential UHOTs are exempt from UST regulations (New Jersey Administrative Code [NJAC] 7:14B-1.4 [b][3]). However, the Army anticipates requesting a No Further Action (NFA) determination from the New Jersey Department of Environmental Protection (NJDEP) for Parcel 72 residential UHOTs within a future submittal to facilitate property transfer.

Upon review of Parcel 72 closure sample analytical data, five former UHOTs (USTs 211, 212, 220B, 226, and 228B) were identified with data needs that required additional field sampling, as summarized below. This Work Plan Addendum describes the proposed field sampling for these five Parcel 72 UHOT sites. Detailed field procedures are described in the approved March 2013 *Final Sampling and Analysis Plan* (SAP).

Attached Table 1 describes the tank characteristics for each of these five UHOT sites. The Army's recorded locations of these UHOTs are shown in the attached UST Removal Reference Map. All of these UHOTs except UST 228B were previously removed. Following is a summary of these UHOTs and the associated data needs:

- UST 211 was located at 4 Russel Avenue on the east side of Building 211. This tank was removed in 2001, and TPH concentrations up to 3,968 milligrams per kilogram (mg/kg) were reported in closure soil samples, which may indicate a release but is less than the 5,100 mg/kg human health based remedial goal for Extractible Petroleum Hydrocarbons (EPH). Analyses for volatile organic compounds (VOCs) were also performed on the sample with the highest TPH concentrations, in accordance with then-current protocol; the only VOC detected was acetone, which is a common laboratory-derived contaminant. Proposed field sampling will include collection of a groundwater sample from a temporary well installed at the former location of the tank to determine if a fuel oil release has impacted groundwater.
- UST 212 was located at 8 Russel Avenue on the east side of Building 212. This tank was removed in 2001; closure soil samples were collected and analyzed. However, the associated analytical data have not been found, and therefore soil samples will be collected from one boring using a Geoprobe to determine if a release has occurred. Also, a groundwater sample from a temporary well will be collected from the same boring to determine if there has been an impact to groundwater.
- UST 220B was located at 34 Russel Avenue on the west side of Building 220. This tank was removed in 2001. Initial soil TPH concentrations were up to 3,224 mg/kg. After removal of the contaminated soil, TPH was not detected. Analyses for VOCs were also performed on the sample with the highest TPH, in accordance with then-current protocol; no VOCs were detected. Proposed field sampling will include collection of a groundwater sample from a temporary well installed at the former location of the tank to determine if a fuel oil release has impacted groundwater.
- UST 226 was located at 9 and 10 Allen Avenue near Building 226. This tank was removed in 2000 and TPH concentrations up to 3,915 mg/kg were encountered in closure soil samples. Analyses for VOCs were also performed on the sample with the highest TPH, in accordance with then-current protocol; the VOCs ethylbenzene and xylenes were detected, but concentrations were below the NJDEP Residential Direct Contact Soil Remediation Standards (RDCSRS). Proposed field sampling will include collection of a groundwater sample from a temporary well installed at the former location of the tank to determine if a fuel oil release has impacted groundwater.
- UST 228B (a steel UST) is located at 3 Allen Avenue near Building 228. This tank was located and uncovered in 2010, and then (due primarily to resource constraints) was covered with soil and left in place. Soil samples were collected along the service piping but not from the tank vicinity. Therefore, soil samples will be collected using a Geoprobe to determine if a release has occurred. Two soil borings will be placed near the tank (within 3 feet), with adequate spacing away from the tank to ensure that the integrity of the tank is not compromised. Also, a groundwater sample from a downgradient temporary well will be collected from the northern boring location (PAR-72-228-SB-01) to determine if there has been an impact to groundwater.

Proposed soil borings and temporary wells will be sampled and analyzed as summarized in Table 2 and Figure 1. Final sample locations may be adjusted in the field based on site conditions and site-specific understanding of the former locations of the UHOTs, with the intent of placing the boring within the former UST excavation (or within 10 feet downgradient). At each sample location, a Geoprobe® boring will be completed to approximately 4 feet below the water table (groundwater is

estimated at approximately 10 feet below ground surface). Soil and groundwater samples will be collected from the Geoprobe boring as indicated in Table 2 for each UST site.

Soil samples from the UST 212 and UST 228 soil borings will be collected to assess current concentrations and vertical extent of EPH. Two soil samples will be collected from each boring. At each boring, a sample will be collected from approximately 5.0-5.5 feet below ground surface (ft bgs; or another interval representative of the vadose zone below the removed tank), and from a deeper 6-inch interval just above the water table. One of these two soil samples will be collected from the most contaminated interval encountered based on field evidence (visual, olfactory, or photoionization detector [PID] screening). If there is no field evidence of petroleum contamination, then the two soil samples will be collected from 5.0-5.5 ft bgs and from just above the water table (estimated at 10.0-10.5 ft bgs). Each soil sample will be analyzed for total EPH, with additional contingency semivolatile organic compounds (SVOCs) analysis (25 percent) for naphthalene and 2-methylnaphthalene in the event that EPH concentrations exceed 1,000 mg/kg. These soil analyses are consistent with the requirements for No. 2 fuel oil in Table 2-1 of the NJAC 7:26E Technical Requirements for Site Remediation.

Groundwater will be sampled using temporary wells within the Geoprobe borings, and then the borings will be abandoned. Each groundwater sample will be analyzed for VOCs and SVOCs plus tentatively identified compounds (TICs), which is consistent with the requirements for No. 2 fuel oil in Table 2-1 of the NJAC 7:26E Technical Requirements for Site Remediation.

We look forward to your review and approval of or comments on this submittal. The technical Point of Contact (POC) is Kent Friesen at (732) 383-7201 or by email at kent.friesen@parsons.com. Should you have any questions or require additional information, please contact me by phone at (732) 380-7064 or by email at william.r.colvin18.civ@mail.mil.

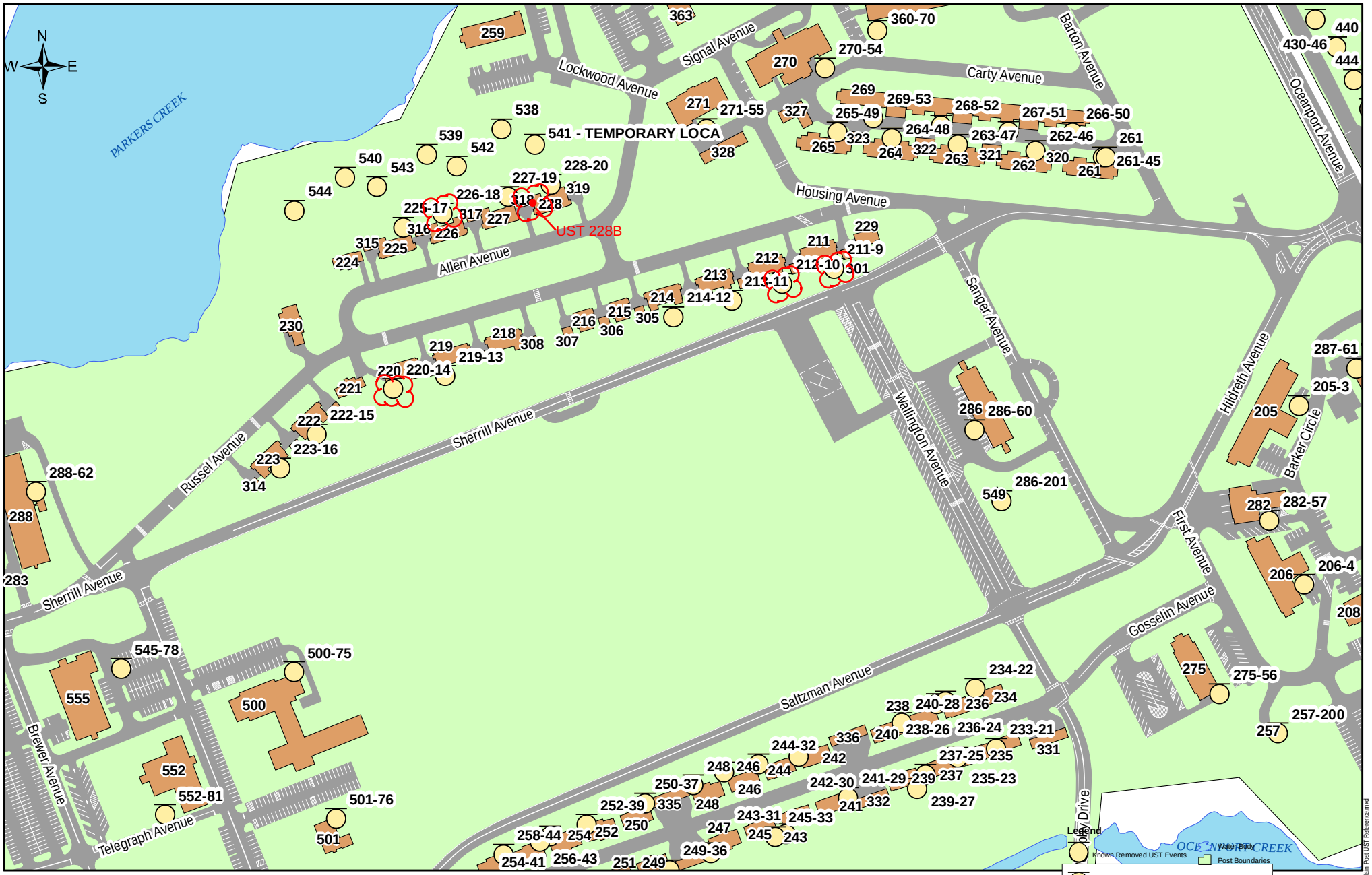
Sincerely,

William R. Colvin, PMP, PG, CHMM
BRAC Environmental Coordinator

cc: Linda Range, NJDEP (e-mail and 3 hard copies)
Delight Balducci, HQDA ACSIM (e-mail)
Joseph Pearson, Calibre (e-mail)
James Moore, USACE (e-mail)
Jim Kelly, USACE (e-mail)
Cris Grill, Parsons (e-mail)

Table 1
Summary of Select Parcel 72 UHOTs

Site Name	Residential?	Registration ID	DICAR	Tank Size and Type	Product	Comments on Current or Requested NJDEP Status
211	YES	81533-9	None	2,000 gallon fiberglass	#2 FUEL OIL	Collect groundwater sample due to TPH>1000 mg/kg
212	YES	81533-10	None	2,000 gallon fiberglass	#2 FUEL OIL	Sample soils and groundwater to determine if release has occurred
220B	YES	81533-14	None	2,000 gallon; fiberglass?	#2 FUEL OIL	Collect groundwater sample due to TPH>1000 mg/kg
226	YES	81533-18	None	2,000 gallon fiberglass	#2 FUEL OIL	Collect groundwater sample due to TPH>1000 mg/kg
228B	YES	None	None	1,000 gallon steel	#2 FUEL OIL	Steel tank confirmed present



UST Removal Reference Map
Grid C2; Main Post
Fort Monmouth, New Jersey
FOUO

UST subject to this Work Plan

Map Created by:
Fort Monmouth Installation GIO, Environmental Division
Fort Monmouth, New Jersey
Date: August 10, 2011
All drawings must be field verified.
New Jersey State Plane Feet, NAD83

August 10, 2011 H:\GIS\GIS Maps\CHUST Linked\FPO\Main Post UST Reference.mxd

TABLE 2
SUMMARY OF PROPOSED SAMPLING FOR PARCEL 72
FORT MONMOUTH, NEW JERSEY

Location ID	Location	Field Meter Readings [a/]	Unfractionated EPH [b/]	VOCs + TICs by Method 8260C [c/]	SVOCs + TICs by Method 8270C [d/]
Soil					
PAR-72-212-SB-01	Building 212 (Figure 1): 1 soil boring, 2 samples.	1 boring	2	0	0
PAR-72-228-SB-01	Building 228 (Figure 1): 1 soil boring, 2 samples.	1 boring	2	0	0
PAR-72-228-SB-02	Building 228 (Figure 1): 1 soil boring, 2 samples.	1 boring	2	0	0
Groundwater					
PAR-72-211-TMW-01	Building 211 (Figure 1): 1 temporary well, 1 sample.	1 well	0	1	1
PAR-72-212-TMW-01	Building 212 (Figure 1): 1 temporary well, 1 sample.	1 well	0	1	1
PAR-72-220-TMW-01	Building 220/UST 220B (Figure 1): 1 temporary well, 1 sample.	1 well	0	1	1
PAR-72-226-TMW-01	Building 226 (Figure 1): 1 temporary well, 1 sample.	1 well	0	1	1
PAR-72-228-TMW-01	Building 228 (Figure 1): 1 temporary well, 1 sample.	1 well	0	1	1
QA/QC samples (see SAP for additional details) [e/]					
Field Duplicates (5% Sampling Frequency per media)		NA	1	1	1
Matrix Spike (5% Sampling Frequency per media)		NA	1	1	1
Matrix Spike Duplicate (5% Sampling Frequency per media)		NA	1	1	1
Trip Blank (1 per cooler of VOCs per media)		NA	0	1	0
QA Split (5% per media)		NA	1	1	1
Equipment Blank (5% Sampling Frequency per media)		NA	1	1	1
	TOTAL	**NA**	**11**	**11**	**10**

Notes:

NA = not applicable.

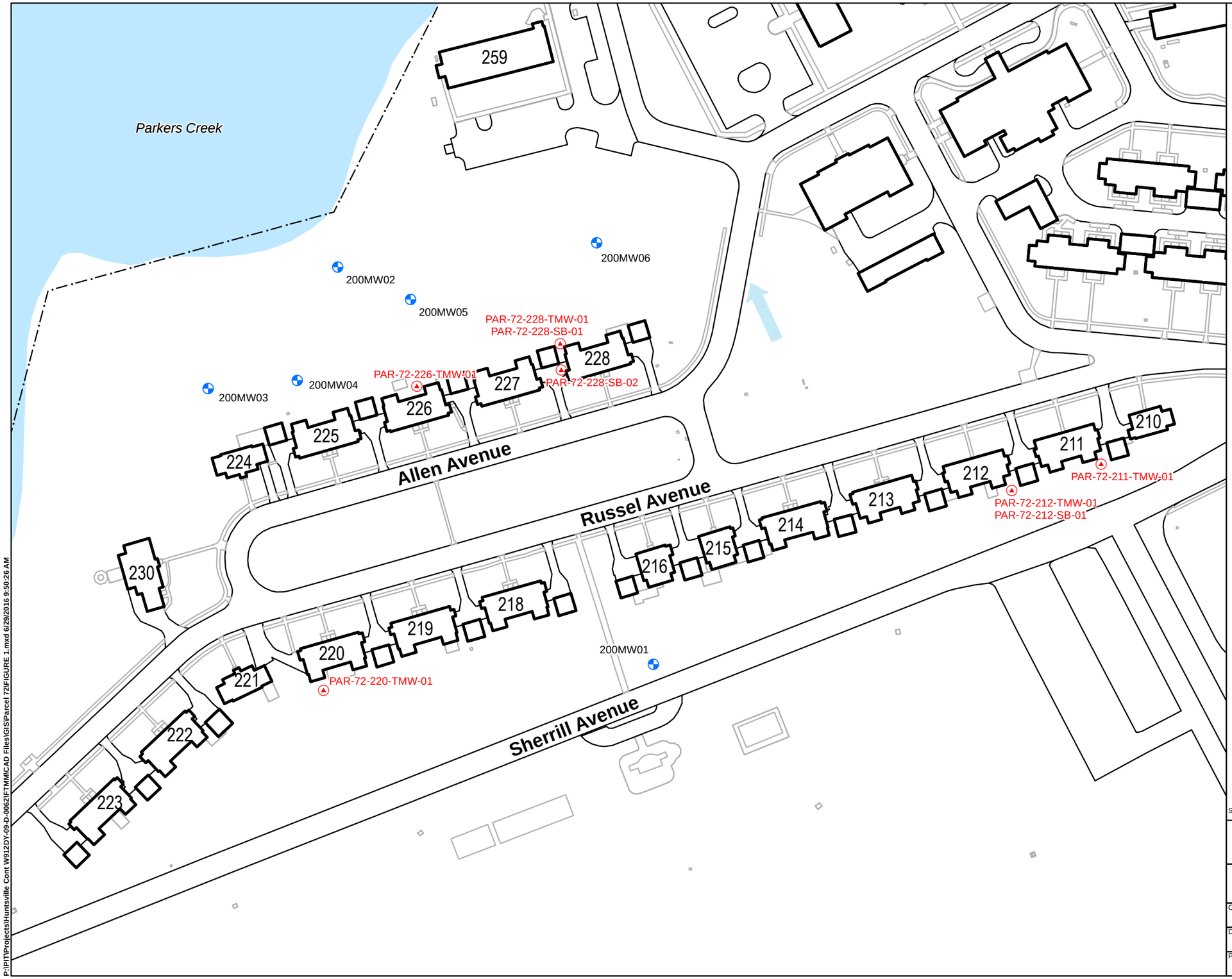
[a/] Field meter readings include, in soil samples: photoionization detector (PID) readings along entire soil column; and in groundwater: PID headspace, pH, temperature, electrical conductivity, dissolved oxygen (DO), oxidation-reduction potential (ORP), and turbidity.

[b/] EPH = extractable petroleum hydrocarbons. If any EPH concentrations in soil exceed 1000 mg/kg in any of the site samples, then minimum 25% of the samples where EPH exceeds 1000 mg/kg will also be analyzed for 2-methylnaphthalene and naphthalene.

[c/] VOCs = volatile organic compounds; TICs = tentatively identified compounds.

[d/] SVOCs = semivolatile organic compounds; TICs = tentatively identified compounds.

[e/] QA/QC = quality assurance/quality control; SAP = Sampling and Analysis Plan. The requirement for QA/QC samples may be fulfilled with samples from other parcels.



LEGEND:

- Proposed Groundwater Sample
- Shallow Monitoring Well
- Installation Boundary
- Generalized Groundwater Flow Direction

NOTE:

1. Steel tank is present at Building 228.
2. Field locate final sample locations based on site features to sample within 10 feet of former or existing tanks.

N

1 inch = 120 feet

0 60 120 240 Feet

Source: FTMM Supplied CAD, 2013.

PARSONS
401 Diamond Drive NW,
Huntsville AL

Fort Monmouth
New Jersey

PROPOSED SAMPLING FOR PARCEL 72

CREATED BY:	REVIEWED BY:
RR	KF
DATE:	FIGURE NUMBER:
JUN. 2016	FIGURE 1
PROJECT NUMBER:	FILE:
748810-01000	FIGURE 1.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\Parcel 72\FIGURE 1.mxd 6/29/2016 9:50:26 AM

Attachment B
Soil Boring Logs and Well Construction Details

PARSONS

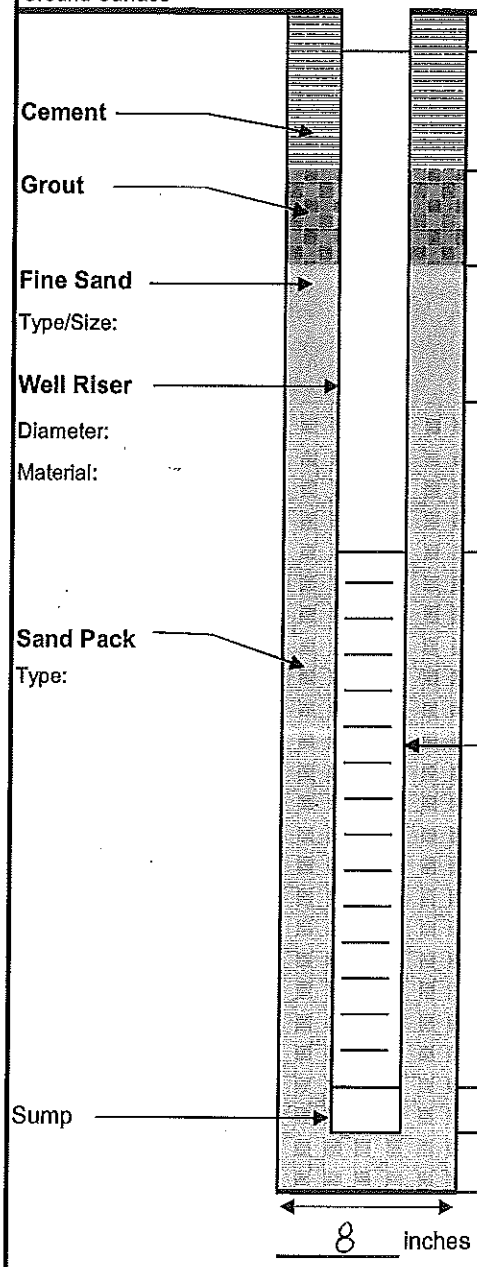
See PAR-72-211-TMW01 for boring log

Well Construction Detail (Single Cased - Road Box)

Client: USACE

Well ID: 211-MW-1 NJBWA Permit No.

Date Well Installed: Location: PAR-72-211-MW-1



	Depth Below Ground Surface (ft)
Ground Surface	0.0
Top of Well Casing 0.25 ft	
Top of Grout	1.0
Top of Fine Sand	10.0
Top of Sand Pack	11.0
Top of Screen	11.0
Well Screen Diameter: 2 Slot Size: 10-SLOT Material: PVC	
Bottom of Screen	21.0
Bottom of Sump	21.25
Bottom of Borehole	22.0

Top of Confining Unit (if present): _____

PARSONS

Well Construction Detail (Single Cased - Road Box)

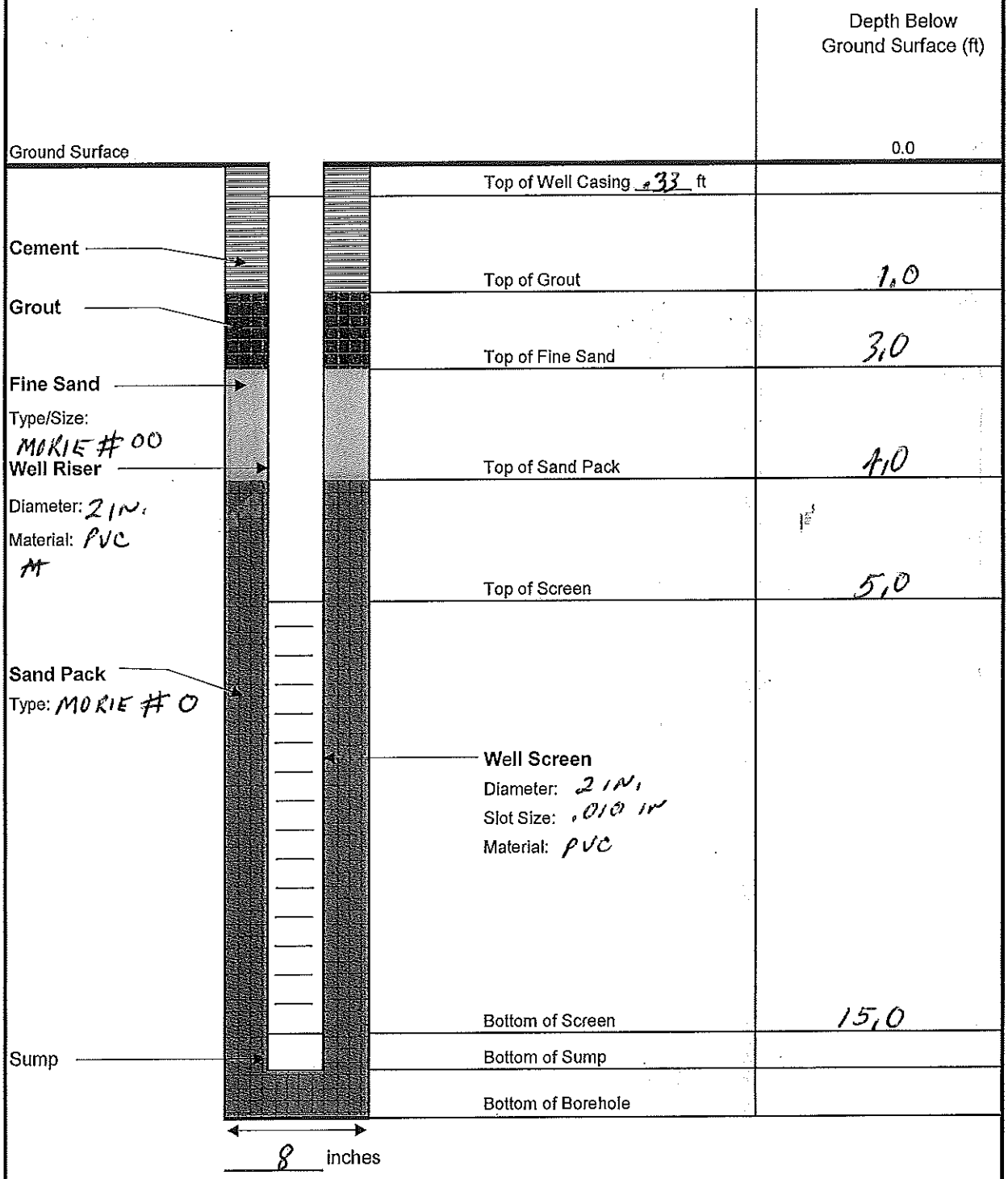
Client: USACE

Well ID: PAR-72-211-MW-02

NJBWA Permit No.

Date Well Installed: 12-19-17

Location: PARCEL 72, UST 211 FTMM



Top of Confining Unit (if present): _____

PARSONS Page 1 of 1

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: ~~FTMM~~ Parcel 72
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
(3-4' HIGHER IN ELEVATION)
WATER LEVEL: 12.0' @ MW-01
DATE: 12-19-17
TIME:
MEAS. FROM:

INSPECTOR: F. ACCORSI
DRILLER: K. ATWOOD, T. MCNALLY
WEATHER: 40° CLOUDY
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 12-19-17 0800
DATE/TIME FINISH: 12-19-17 0930
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-MW-02
LOCATION DESCRIPTION

LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0					HOLLOW STEM AUGER TO 16 FT.		
					SET SCREEN @ FROM 5 FT TO 15 FT.		
1					YELLOW BROWN TO GREEN BROWN TO		WET @ 8'
					BROWN SANDY CLAYEY SILT		
2					PID READINGS FROM SOIL		
					CUTTINGS 0 ppm		
3							
4							
5					END OF BORING @ 16 FT.		
					SEE WELL CONSTRUCTION DETAIL		
6							
7							
8							
9							
10							

Remarks:

Sample Types
S -- Split-Spoon
U -- Undisturbed Tube
C -- Rock Core
A -- Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)			Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50		V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50		Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30			M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

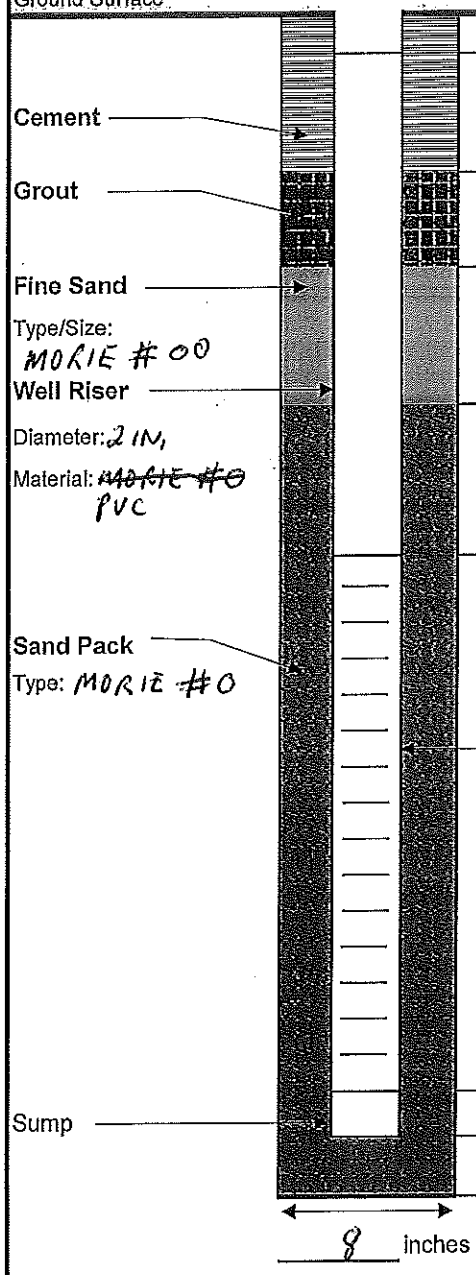
PARSONS

Well Construction Detail (Single Cased - Road Box)

Client: USACE

Well ID: PAR-72-211-MW-03 NJBWA Permit No.

Date Well Installed: 12-19-17 Location: FTMM-PARCEL 72-UST 211



	Depth Below Ground Surface (ft)
Ground Surface	0.0
Top of Well Casing 0.3 ft	
Top of Grout	1.0
Top of Fine Sand	1.5
Top of Sand Pack	2.0
Top of Screen	3.0
Well Screen Diameter: 2 IN. Slot Size: .010 IN Material: PVC	
Bottom of Screen	13.0
Bottom of Sump	13.5
Bottom of Borehole	14.0

Top of Confining Unit (if present): _____

PARSONS

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM (Parcel) 72-211
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL: ≈5 FT. @ SCREEN 08
DATE:
TIME:
MEAS. FROM:

INSPECTOR: F. ACCORSI
DRILLER: K. HATWOOD, T. McNALLY
WEATHER:
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 12-19-17 0940
DATE/TIME FINISH: 12-19-17 1050
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-MW-03
LOCATION DESCRIPTION:
LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0					HOLLOW STEM AUGER TO 14 FT. SET SCREEN FROM 3FT TO 13 FT. YELLOW BROWN TO GREEN BROWN SANDY SILT + CLAY. PID READINGS FROM SOIL CUTTINGS 0 PPM		WET @ 5FT
1							
2							
3							
4							
5					END OF BORING @ 14 FT SEE WELL CONSTRUCTION DETAIL		
6							
7							
8							
9							
10							

Remarks:

Sample Types
S – Split-Spoon
U – Undisturbed Tube
C – Rock Core
A – Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)		Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

PARSONS

Well Construction Detail (Single Cased - Stickup)

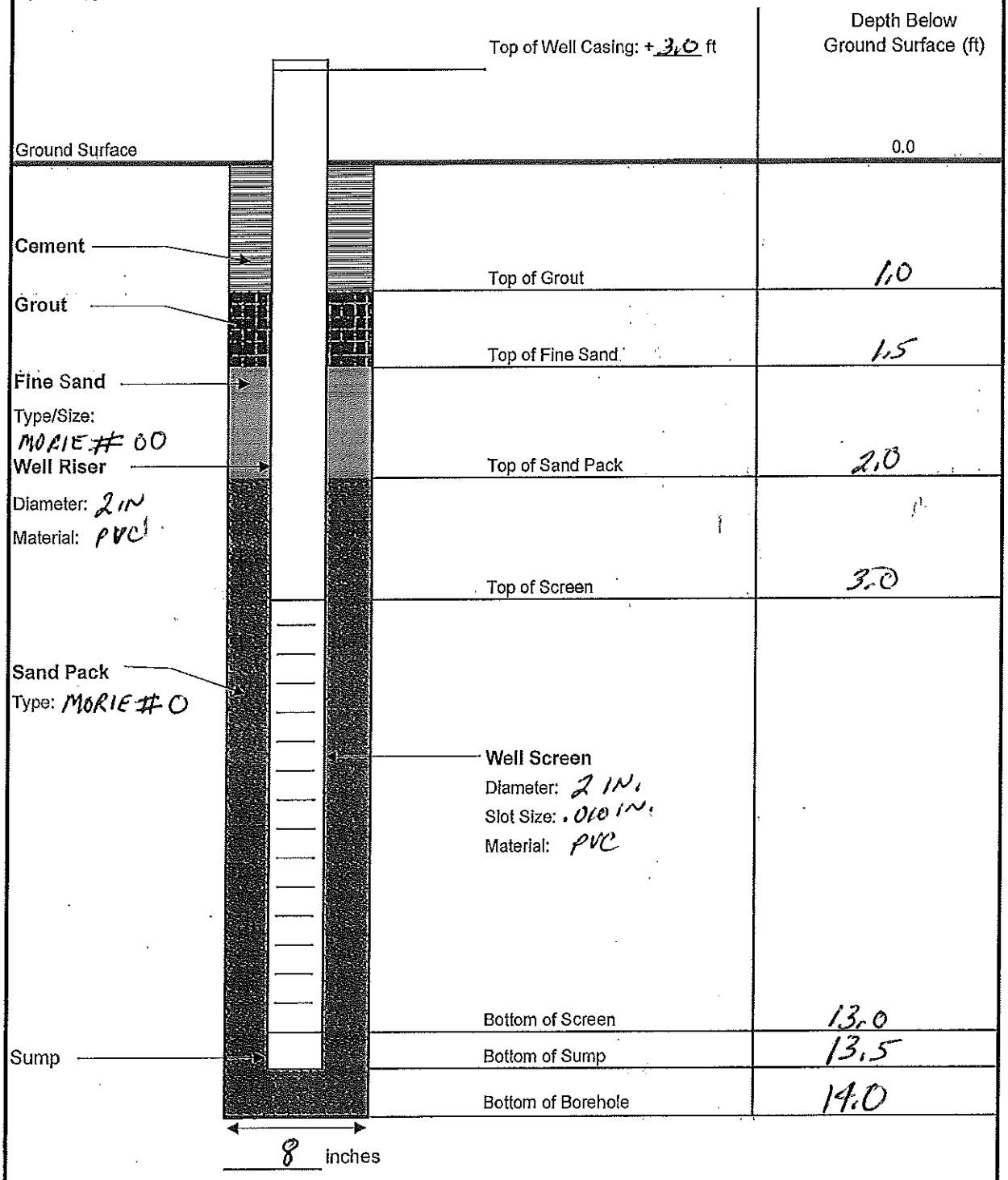
Client: USACE

Well ID: PAR-72-211-MW-04

NJBWA Permit No.

Date Well Installed:

Location: FTMM- PARCEL 72 - UST 211



Top of Confining Unit (if present): _____

PARSONS Page 1 of 1

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: ~~FTMM~~ Parcel 72-211
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL: ≈ 5'
DATE:
TIME:
MEAS. FROM:

INSPECTOR: F. ACCORSI
DRILLER: K. ATWOOD, T. McNALLY
WEATHER:
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 12-19-17 1100
DATE/TIME FINISH: 12-19-17 1230
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-MW-04
LOCATION DESCRIPTION
LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0					HOLLOW STEM AUGER TO 14 FT, SET WELL SCREEN FROM 3' TO 13'		
1					BROWN TO YELLOW BROWN TO GREEN BROWN SANDY SILT + CLAY		WET @ 5 FT.
2					PID READINGS FROM SOIL CUTTINGS 0 TO 0 PPM		
3							
4							
5					END OF BORING @ 14 FT. SEE WELL CONSTRUCTION DETAIL		
6							
7							
8							
9							
10							

Remarks:

Sample Types
S – Split-Spoon
U – Undisturbed Tube
C – Rock Core
A – Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)		Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM Parcel
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEAS. FROM: TOC

INSPECTOR: Kevin McMillin
DRILLER: Joe
WEATHER: Low 60's / Rain
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT / USA
DATE/TIME START: 05-17-18 / 1315
DATE/TIME FINISH: 05-17-18 / 1345
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PMW72-211-MW-5
LOCATION DESCRIPTION: Grass Surface
LOCATION PLAN: Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0				0	0-4" - Moist, M. dense, Brn - Drk Brn, F-M, Silty SAND		
				0			
1				0			
				0	4"-60" - Moist, Mi dense, light Brn F-M, Silty SAND, Trace Glauconite		
2				0			
				0			
3				0			
				0			
4				0			
				0			
5			60/60	0	60"-40"-SAA		
				0			
6				0	10"-24" - Wet, M. dense, Brn with Greenish Hues, F-M, Clayey SAND, little Silt, little Glauconite.		
				0			
7				0			
				0	24"-60" - Wet, M. dense, light Brn, F-M Silty SAND, Trace Clay		
8				0			
				0			
9				0			
				0			
10			60/60	0			

Remarks: Soil Cuttings Containerized in 55 gallon Drum.
Soil Screened with PID

Sample Types
S – Split-Spoon
U – Undisturbed Tube
C – Rock Core
A – Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)			Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50		V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50		Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30			M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM Parcel
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEAS. FROM:

INSPECTOR: Kevin McMullen
DRILLER: Joe
WEATHER: Lev 60s / Rain
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT / HSA
DATE/TIME START: 05-17-18 / 1315
DATE/TIME FINISH: 05-17-18 / 1345
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72
LOCATION DESCRIPTION: Grass Surface
LOCATION PLAN: Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0				0	0-22' - SAA		
				0			
1				0			
				0			
2				0			
				0			
3				0			
				0			
4				0			
				0			
5				0	EOBS @ 16' bgs		
				0	2" well ~~#1~~ Installed.		
6			11/11	0			
					See Well construction log		
7					for details		
8							
9							
20							

Remarks: Soil cuttings Containerized in 55 gallon Buckets. Soil Screened with PID

Sample Types	Consistency vs. Blowcount / Foot				
S – Split-Spoon	Granular (Sand & Gravel)		Fine Grained (Silt & Clay)		and - 35-50%
U – Undisturbed Tube	V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15	some - 20-35%
C – Rock Core	Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30	little - 10-20%
A – Auger Cuttings	M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30	trace - <10%
					moisture, density, color, gradation

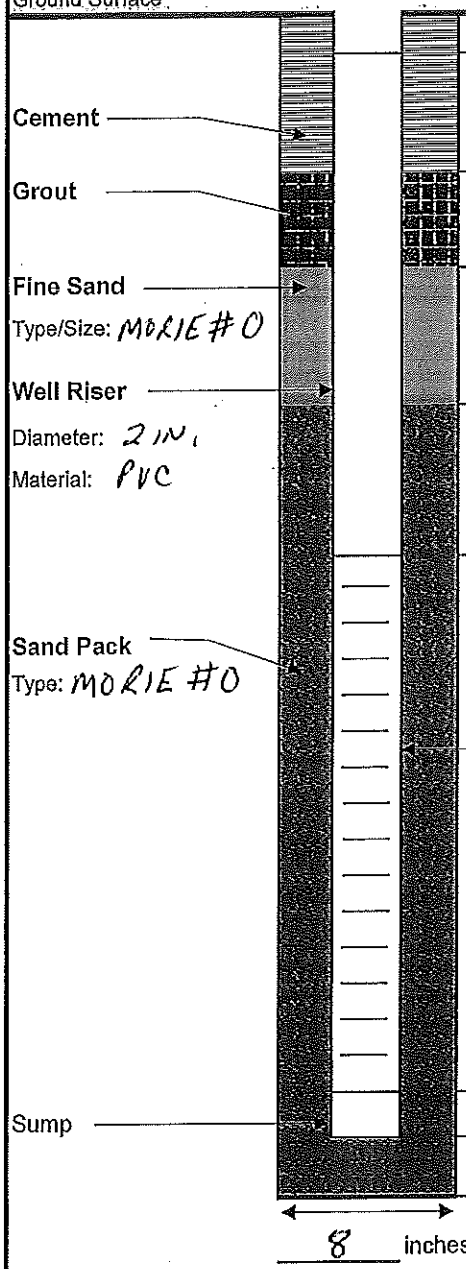
PARSONS

Well Construction Detail (Single Cased - Road Box)

Client: USACE

Well ID: PAR-72-211-MW-05 NJBWA Permit No.

Date Well Installed: 5-17-18 Location: PARCEL 72 - UST 211



	Depth Below Ground Surface (ft)
Ground Surface	0.0
Top of Well Casing 0.33 ft	
Top of Grout	1.0
Top of Fine Sand	3.0
Top of Sand Pack	4.0
Top of Screen	5.0
Well Screen Diameter: Slot Size: Material:	
Bottom of Screen	15.0
Bottom of Sump	15.5
Bottom of Borehole	16.0

Top of Confining Unit (if present): _____

PARSONS

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM Parcel 72-211
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL: ≈12.5 FT
DATE:
TIME:
MEAS. FROM:

INSPECTOR: F. ACCORSI
DRILLER: S. FOSTER
WEATHER: CLDY, OCC. RAIN, 60's
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-6-17 0945
DATE/TIME FINISH: 11-6-17 1020
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-SCREEN01
LOCATION DESCRIPTION:
LOCATION PLAN: Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/56	0	0-4" TOPSOIL 4"-56" moist, brn, cmf SAND, lit. gravel, L. clayey silt.		COAL FRAGMENTS THROUGHOUT BRICK DEBRIS CONCRETE
				0			
1				0			
				0			
2				0			
				0			
3				0			
				0			
4				0			
5			60/60	0	0-36" (SAME)		OCC. BRICK DEBRIS
				0			
6				0			
				0			
7				0			
				0			
8				0	36"-60" moist, grn, mf SAND, some clayey silt		
				0			
9				0			
				0			
10							

Remarks:

Sample Types	Consistency vs. Blowcount / Foot				
S – Split-Spoon	Granular (Sand & Gravel)		Fine Grained (Silt & Clay)		and - 35-50%
U – Undisturbed Tube	V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15	some - 20-35%
C – Rock Core	Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30	little - 10-20%
A – Auger Cuttings	M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30	trace - <10%
					moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE
PROJECT NAME: ~~FTMM~~ PARCEL 72-211
PROJECT LOCATION:
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEAS. FROM:

INSPECTOR: F. ACCORSI
DRILLER:
WEATHER:
CONTRACTOR: ~~Cascade~~ ECDI
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-6-17
DATE/TIME FINISH: 11-6-17
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-SCREEN 01
LOCATION DESCRIPTION
LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/60	0			
				0			
1				0			
				3.6			wet @ 12 FT
2				17	24"-42" wet, grn, cmf SAND, and cmf Gravel		PETROLEUM ODORS, STAINING
				0			
3				0			
				0	42"-60" wet, brn-blk, f, SAND, some silt, mottled		
4				0			
				0			
5					TOTAL DEPTH 15FT. END OF BORING		
6							
7							
8							
9							
0							

Remarks:

Sample Types
S -- Split-Spoon
U -- Undisturbed Tube
C -- Rock Core
A -- Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)			Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50		V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50		Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30			M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM Parcel 72-211
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL: ≈ 12 FT
DATE:
TIME:
MEAS. FROM:

INSPECTOR: F. ACCORSI
DRILLER: S. FOSTER
WEATHER: CLDY. 60's
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-6-17 1020
DATE/TIME FINISH: 11-6-17 1100
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-SCREEN-02
LOCATION DESCRIPTION
LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/59	0	0-6" TOPSOIL 6"-59" moist, brn, cmf SAND, l.f. gravel		COAL FRAGMENTS ↓
				0			
1				0			
				0			
2				0			
				0			
3				0			
				0			
4				0			
5			60/60	0	0-29" SAND		
				2			
6				0			
				0			
7				0	29"-60" moist, grn-brn mf SAND, some clayey silt		
				0			
8				0			
				0			
9				0			
				0			
10							

Remarks:

Sample Types	Consistency vs. Blowcount / Foot				
S -- Split-Spoon	Granular (Sand & Gravel)		Fine Grained (Silt & Clay)		and - 35-50%
U -- Undisturbed Tube	V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15	some - 20-35%
C -- Rock Core	Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30	little - 10-20%
A -- Auger Cuttings	M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30	trace - <10%
					moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE
PROJECT NAME: ~~FTMM~~ PARCEL 72-211
PROJECT LOCATION:
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEAS. FROM:

INSPECTOR: FIACCORSI
DRILLER:
WEATHER:
CONTRACTOR: ~~Cascade~~ ECDI
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-6-17 1020
DATE/TIME FINISH: 11-6-17 1100
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-SCREEN02
LOCATION DESCRIPTION

LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/54		0-12" SAME		
1				96	12"-45" moist, grn-or.brn cmt SAND, and cmt Gravel		STRONG PETROLEUM ODORS WET @12.5'
				152			
2				96	WET AT 12 FT.		
				7			
3				90			
				4,5	45"-51" wet, brn-blk cmt SAND, Li silt		
4				0			
5					END OF BORING @ 15 FT		
6							
7							
8							
9							
0							

Remarks:

Sample Types
S – Split-Spoon
U – Undisturbed Tube
C – Rock Core
A – Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)			Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50		V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50		Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30			M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM (Parcel) 72-211
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL: ≈ 10 FT.
DATE:
TIME:
MEAS. FROM:

INSPECTOR: F. ACCORSI
DRILLER: S. FOSTER
WEATHER: CLDY, 60's
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-6-17 1110
DATE/TIME FINISH: 11-6-17 1150
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-SCREEN03
LOCATION DESCRIPTION

LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/48	0	0-4" TOPSOIL 4"-48" dry, brn, cmf SAND, L.f. Gravel		
				0			
1				0			
				0			
2				0			
				0			
3				0			
				0			
4							
5			60/57	0	0-50" (SAME)		
				0			
6				0			
				0			
7				0			
				0			
8				0			
				14			PETROLEUM ODORS
9				108	50"-57" Moist, grn, cmf SAND, L.f. Gravel, L. silt		
10							

Remarks:

Sample Types
S -- Split-Spoon
U -- Undisturbed Tube
C -- Rock Core
A -- Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)		Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

PARSONS

Soil Boring Log

CLIENT: USACE
PROJECT NAME: ~~FTMM~~ PAR-72-211
PROJECT LOCATION:
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEAS. FROM:

INSPECTOR: F. ACCORSI
DRILLER:
WEATHER:
CONTRACTOR: ~~Geoprobe~~ ECDI
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-6-17
DATE/TIME FINISH: 11-6-17
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72 211-SCREEN 03
LOCATION DESCRIPTION
LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
1 0			60/54	6	0"-18" SAND		
				2.5			
1 1				2.8	18" - wet, blk-brn, f. SAND, some Silt		wet @ 12 FT.
				0			
1 2				0			
				0			
1 3				0			
				0			
1 4				0			
1 5					END OF BORING @ 15 FT.		
6							
7							
8							
9							
0							

Remarks:

Sample Types	Consistency vs. Blowcount / Foot				
S – Split-Spoon	Granular (Sand & Gravel)		Fine Grained (Silt & Clay)		and - 35-50%
U – Undisturbed Tube	V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15	some - 20-35%
C – Rock Core	Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30	little - 10-20%
A – Auger Cuttings	M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30	trace - <10%
					moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM (Parcel) 72-211
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL: ≈ 5 FT.
DATE:
TIME:
MEAS. FROM:

INSPECTOR: F. ACCORSI
DRILLER: S. FOSTER
WEATHER: CLDY, 60's
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-6-17
DATE/TIME FINISH: 11-6-17
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-SCREEN 04
LOCATION DESCRIPTION
LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/30	0	0-6" TOPSOIL		
				0	6"-30" Moist, brn, cmt SAND, L.ct gravel		
1				0			
				0			
2				0			
3							
4							
5			60/24	0	0-24" brn, wet, cmt SAND, L. silt		WET @ 5 FT
				0			
6				0			
				0			
7				0			
8							
9							
10							

Remarks:

Sample Types
S -- Split-Spoon
U -- Undisturbed Tube
C -- Rock Core
A -- Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)		Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM PARCEL 72-211
PROJECT LOCATION:
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEAS. FROM:

INSPECTOR:
DRILLER:
WEATHER:
CONTRACTOR: ~~Cascade~~ ECDI
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-6-17
DATE/TIME FINISH: 11-6-17
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72 211 - SCREEN 04
LOCATION DESCRIPTION
LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
1 0			60/48	0	0-36" (SAME)		
				0			
1 1				0			
				0			
1 2				0			
				0			
1 3				0	36"-48" wet, brn-[redacted] or. brn, cmf SAND some mf Gravel		
				0			
1 4							
1 6					END OF BORING @ 15 FT		
6							
7							
8							
9							
0							

Remarks:

Sample Types
S – Split-Spoon
U – Undisturbed Tube
C – Rock Core
A – Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)		Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

PARSONS

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM (Parcel) 72-211
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL: ≈ 5 FT.
DATE:
TIME:
MEAS. FROM:

INSPECTOR: F. ACCORSI
DRILLER: S. FOSTER
WEATHER: CLOUDY, 50's
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-7-17 1130
DATE/TIME FINISH: 11-7-17 1210
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-SCREEN-08
LOCATION DESCRIPTION
LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/30	0	0-3" TOPSOIL 3"-5" ASPHALT 5"-48" moist, brn, cm f SAND some mf Gravel, L. clayey Silt		
				0			
1				0			
				0			
2				0			
				0			
3				0			
4							
5			60/50	0	0-50 wet, brn-grn-blk, mf SAND, Li silty clay		WET @ 5'
				0			
6				0			
				0			
7				0			
				0			
8				0			
				0			
9				0			
10					END OF BORING @ 10 FT		

Remarks:

Sample Types
S -- Split-Spoon
U -- Undisturbed Tube
C -- Rock Core
A -- Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)		Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

PARSONS

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM Parcel
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEAS. FROM:

INSPECTOR: TOM HORN
DRILLER: E(D) WELLS REEVE
WEATHER: CLEAR, 55°F
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-21-17 / 1125
DATE/TIME FINISH: 11-21-17 / 1140
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-SCREEN 09
LOCATION DESCRIPTION: GRASSY AREA
LOCATION PLAN: Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0	[redacted]		36/60	0.0	DRY DK-GRAY BROWN STIFF SANDY SILT, TR GRASS / ROOTS		
				0.0	MOIST DENSE ORANGE-TAN SILTY SAND		
1				0.0	MOIST V STIFF OLIVE GRAY-BROWN		
				0.0	SANDY SILT, TR. GRAV.		
2				0.0			
				0.0			
3					NO RECOVERY		
4							
5			48/60	0.0	MOIST MOD STIFF GRAY-OLIVE		
				0.0	SANDY SILT		
6				0.0			
				0.0			
7				0.0	MOIST V. DENSE REDDISH-BROWN SILTY SAND		
				0.0	MOIST DENSE GRAY BROWN-OLIVE		
8				0.0	SILTY SAND, LITTLE VF GRAVEL		
				0.0			
9					NO RECOVERY		
10							

Remarks:

Sample Types	Consistency vs. Blowcount / Foot				
S -- Split-Spoon	Granular (Sand & Gravel)		Fine Grained (Silt & Clay)		and - 35-50%
U -- Undisturbed Tube	V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15	some - 20-35%
C -- Rock Core	Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30	little - 10-20%
A -- Auger Cuttings	M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30	trace - <10%
					moisture, density, color, gradation

PARSONS

Soil Boring Log

CLIENT: USACE	INSPECTOR:	BORING/WELL ID: MW-72-21-SCREEN 09
PROJECT NAME: FTMM	DRILLER:	LOCATION DESCRIPTION
PROJECT LOCATION:	WEATHER:	GRASSY AREA
PROJECT NUMBER: 748810-	CONTRACTOR: Cascade	
GROUNDWATER OBSERVATIONS	RIG TYPE: Geoprobe(R) 7822DT	LOCATION PLAN
	DATE/TIME START:	Oceanport, New Jersey
WATER LEVEL:	DATE/TIME FINISH:	
DATE:	WEIGHT OF HAMMER: N/A	
TIME:	DROP OF HAMMER: N/A	
MEAS. FROM:	TYPE OF HAMMER: N/A	

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10			48/60	0.0	WET V. LOOSE LT. ORANGE-GRAY TAN SILTY SAND, LITTLE F-M ROUNDED GRAVEL		
				0.0			
11				0.0			
				0.0			
12				0.0			
				0.0			
13				0.0	WET DK GRAY STIFF CLAYEY SILT		
				0.0			
14					NO RECOVERY		
15					end of boring		
16							
17							
18							
19							
20							

Remarks:

Sample Types	Consistency vs. Blowcount / Foot				
S -- Split-Spoon	Granular (Sand & Gravel)		Fine Grained (Silt & Clay)		and - 35-50%
U -- Undisturbed Tube	V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15	some - 20-35%
C -- Rock Core	Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30	little - 10-20%
A -- Auger Cuttings	M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30	trace - <10%
					moisture, density, color, gradation

PARSONS

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM Parcel
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL: ~12
DATE: 8/10/16
TIME:
MEAS. FROM:

INSPECTOR: O. Watza
DRILLER: J. BORNAK
WEATHER: 80°F
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 8/10/16 1020
DATE/TIME FINISH: 8/10/16 1035
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FAL-72-211-TMW01
LOCATION DESCRIPTION:
LOCATION PLAN: Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0				0	0-36" Moist, M. Grey Brown Mf SAND, trace silt		
1					36"-44" Moist, Dense, Brown MF SAND, little silt		
2					44"-49" Moist, Dense, grey Mf SAND, little silt		
3							
4							
5			60/46	0	0-17" SAA		
				0	17-19" Crushed Rock		
6				0			
				0	19"-39" grey, moist, mf, M. Dense SAND, some silt, odor		
7				19.1			
				60.0			
8				1.2	39"-46" Moist, grey/orange Mf Mottled SAND, some silt		
				22.6			
9				NR			
				NR			
10							

Remarks:

Sample Types
S – Split-Spoon
U – Undisturbed Tube
C – Rock Core
A – Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)		Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM Parcel
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL: n/a
DATE:
TIME:
MEAS. FROM:

INSPECTOR:
DRILLER:
WEATHER:
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START:
DATE/TIME FINISH:
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: 72-21-TMW01
LOCATION DESCRIPTION
LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/60	1.6	0-28" SAA, saturated @ 24"		
				12.2			
1				222	28"-45" Saturated, M. Rose grey, MC SAND, little f gravel, trace silt, odor		
				117			
2				404			
				399			
3				12.2			
				8.1	45"-60" Saturated, M. Dense orange/grey/Brown, MF mottled SAND, little silt, trace f gravel		
4				0			
				0			
5							
6							
7							
8							
9							
0							

Remarks:

Sample Types
S – Split-Spoon
U – Undisturbed Tube
C – Rock Core
A – Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)			Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50		V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50		Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30			M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM (Parcel) 72-211
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL: ≈ 7 FT.
DATE:
TIME:
MEAS. FROM:

INSPECTOR: F. ACCORSI
DRILLER: S. FOSTER
WEATHER: CLOY, 60's
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-6-17 1400
DATE/TIME FINISH: 11-6-17 1500
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-TMW-02
LOCATION DESCRIPTION
LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/44	0	0-3" TOPSOIL 3"-44" moist, cmf SAND, l. silt		
				0			
1				0			
				0			
2				0			
				0			
3				0			
				0			
4							
5			60/60	0	0-10" SAME		
				0			
6				0			WET @ 7'
				0			
7				0			
				0			
8				0			
				0			
9				0			
				0			
10							

Remarks:

Sample Types
S – Split-Spoon
U – Undisturbed Tube
C – Rock Core
A – Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)		Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE
PROJECT NAME: ~~FTMM~~ PARCEL 72-211
PROJECT LOCATION:
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEAS. FROM:

INSPECTOR:
DRILLER:
WEATHER:
CONTRACTOR: ~~Cascade~~ E201
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-6-17
DATE/TIME FINISH: 11-6-17
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-TMW-02
LOCATION DESCRIPTION
LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/60	0	0-10" SAME		
				0	10"-50" WET, brn, cm f SAND, some m f Gravel		
1	PAR-72-211-TMW-02-11'			0			
				0			
2				0			
				0			
3				0			
				0			
4				0			
				0	50"-60" WET, brn, cm f SAND, trSiH		
5					END OF BORING @ 15 FT.		
					TMW (10 FT. SCREEN) SET FROM		
6					5' TO 15'		
7							
8							
9							
0							

Remarks:

Sample Types
S – Split-Spoon
U – Undisturbed Tube
C – Rock Core
A – Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)			Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50		V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50		Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30			M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM (Parcel) 72-211
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEAS. FROM:

INSPECTOR: F. ACCORSI
DRILLER: S. FOSTER
WEATHER: CLDY, 60's
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-6-17 1410
DATE/TIME FINISH: 11-6-17 1440
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-TMW-03
LOCATION DESCRIPTION:
LOCATION PLAN: Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/90	0	0-4" TOPSOIL 4½ Moist, brn, f SAND, some silty clay		
				0			
1				0			
				0			
2				0			
				0			
3				0			
4							
5			60/60	0	0-60" (SAME)		
				0			
6				0			
				0			
7				0			
				0			
8				0			
				0			
9				0			
				0			
10							

Remarks:

Sample Types
S – Split-Spoon
U – Undisturbed Tube
C – Rock Core
A – Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)			Fine Grained (Silt & Clay)		
V. Loose: 0-4	Dense: 30-50		V. Soft: <2	Stiff: 8-15	
Loose: 4-10	V. Dense: >50		Soft: 2-4	V. Stiff: 15-30	
M. Dense: 10-30			M. Stiff: 4-8	Hard: > 30	

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE
PROJECT NAME: ~~ETHH~~ PARCEL 72-211
PROJECT LOCATION:
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEAS. FROM:

INSPECTOR: F. ACCORSI
DRILLER:
WEATHER:
CONTRACTOR: ~~Cascade~~ ECDI
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-6-17
DATE/TIME FINISH: 11-6-17
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-TMW03
LOCATION DESCRIPTION
LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10			60/50	0	0-50" WET, or. brn-brn cmf SAND, little Silt, l. f. Gravel		
				0			
11	PAR-72-211-TMW-03-11'			0			
				0			
12				0			
				0			
13				0			
				0			
14							
15					END OF BORING @ 15 FT.		
					TMW (10 FT. SCREEN) SET FROM 5' TO 15'		
16							
17							
18							
19							
20							

Remarks:

Sample Types
S – Split-Spoon
U – Undisturbed Tube
C – Rock Core
A – Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)			Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense:	30-50	V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense:	>50	Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30			M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM (Parcel) 72-211
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL: ≈ 7.5 FT
DATE:
TIME:
MEAS. FROM:

INSPECTOR: F. ACCORSI
DRILLER: S. FOSTER
WEATHER: CLDY, 60's
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-6-17 1300
DATE/TIME FINISH: 11-6-17 1410
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAP-72 211-TMW-04
LOCATION DESCRIPTION

LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/30	0	0-5" TOPSOIL		
				0	5"-30" Moist, brn cmf SAND, little f. Gravel, l. silty Clay		
1				0			
				0			
2				0			
				0	30"-50" moist, brn m-f SAND, some silty Clay		
3				0			
				0			
4					—		
5			60/60	0	0-60" Same		
				0			
6				0			
				0			
7				0			
				0	WET AT 8 FT		
8				0			
				0			
9				0			
				0			
10							

Remarks:

Sample Types
S – Split-Spoon
U – Undisturbed Tube
C – Rock Core
A – Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)			Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50		V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50		Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30			M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE
PROJECT NAME: ~~TMW~~ PARCEL 72-211
PROJECT LOCATION:
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEAS. FROM:

INSPECTOR: F. ACIORSI
DRILLER:
WEATHER:
CONTRACTOR: ~~Geoprobe~~ ECDI
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-6-17
DATE/TIME FINISH: 11-6-17
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-TMW04
LOCATION DESCRIPTION
LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
1 0			60/60	0	0-40" WET, brn-grn brn cmf SAND some f. Gravel		wet @ 10 ft
				0			
1 1	PAR-72-211-TMW-04-11'			0			
				0			
1 2				0			
				0			
1 3				0	40-44" wet org. brn CLAY		
				0	44-52" wet, blk clayey silt		
1 4				0	52-60 wet, grn mf SAND, L. silt		
				0			
1 5					END OF BORING @ 15 FT		
					TMW (10 FT. SCREEN) SET FROM 5' TO 15'		
6							
7							
8							
9							
0							

Remarks:

Sample Types
S – Split-Spoon
U – Undisturbed Tube
C – Rock Core
A – Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)			Fine Grained (Silt & Clay)		
V. Loose: 0-4	Dense:	30-50	V. Soft: <2	Stiff:	8-15
Loose: 4-10	V. Dense:	>50	Soft: 2-4	V. Stiff:	15-30
M. Dense: 10-30			M. Stiff: 4-8	Hard:	> 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM (Parcel) 72-211
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL: ≈ 6 FT
DATE:
TIME:
MEAS. FROM:

INSPECTOR: F. ACCORSI
DRILLER: S. FOSTER
WEATHER: CLOY., 60'S
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-6-17 1200
DATE/TIME FINISH: 11-6-17 1250
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: AR-72-211-TMW-06
LOCATION DESCRIPTION
LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/36	0	0-4" TOP SOIL		
				0	4"-36" MOIST, BRN CMF SAND, t. silt		BRICK + CONCRETE FRAGMENTS
1				0			
				0			
2				0			
				0			
3							
4							
5			60/48	0	0-18" SAME		
				0			wet @6'
6				0			
				0	18"-48" WET, BRN, mf SAND, l. clayey silt		
7				0			
				0			
8				0			
				0			
9				0			
10							

Remarks:

Sample Types
S -- Split-Spoon
U -- Undisturbed Tube
C -- Rock Core
A -- Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)		Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE
PROJECT NAME: ~~ETHM~~ PARCEL 72-211
PROJECT LOCATION:
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEAS. FROM:

INSPECTOR: E. ACCORSI
DRILLER:
WEATHER:
CONTRACTOR: ~~Cascade~~ ECOI
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-6-17
DATE/TIME FINISH: 11-6-17
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-TMW-06
LOCATION DESCRIPTION
LOCATION PLAN
Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
1 0			60/50	0	0-30" SAND		
				0			
1 1				0			
				0			
1 2	PAR-72-211-TMW-06-12'			0			
				0	30"-40" wet, grn-brn cmf SAND		
1 3				0			
				0	40"-50 wet, brn, cmf SAND, and cmf GRAVEL		
1 4							
1 5					END OF BORING @ 15 FT		
					SET TMW SCREEN (10 FT) ~~FROM~~		
6					~~5'~~ 10'-15'		
7							
8							
9							
0							

Remarks:

Sample Types
S -- Split-Spoon
U -- Undisturbed Tube
C -- Rock Core
A -- Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)			Fine Grained (Silt & Clay)		
V. Loose: 0-4	Dense:	30-50	V. Soft: <2	Stiff:	8-15
Loose: 4-10	V. Dense:	>50	Soft: 2-4	V. Stiff:	15-30
M. Dense: 10-30			M. Stiff: 4-8	Hard:	> 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

PARSONS

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: ~~FTMM~~ Parcel 72-211
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL: ≈ 5FT
DATE:
TIME:
MEAS. FROM:

INSPECTOR: F. ACCORSI
DRILLER: S. FOSTER
WEATHER: CLDY, 40's
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-7-17 1100
DATE/TIME FINISH: 11-7-17 1150
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-TMW-07
LOCATION DESCRIPTION:
LOCATION PLAN: Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/48	0	0-4" TOPSOIL 4"-48" moist, brn cmf SAND, some cmf Gravel, L. clayey silt		
				0			
1				0			
				0			
2				0			
				0			
3				0			2" ASPHALT LAYER @ 28"
				0			
4							
5			60/54	0	0-60" wet, brn-blk brn mf SAND L. silt, mottled		
				0			
6				0			
				0			
7				0			
				0			
8	PAR-72-211-TMW-07-08'			0			
				0			
9				0			
10							

Remarks:

Sample Types
S -- Split-Spoon
U -- Undisturbed Tube
C -- Rock Core
A -- Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)		Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

PARSONS

Page _____ of _____

Soil Boring Log

CLIENT: USACE
PROJECT NAME: ~~FTMM~~ PARCEL 72-211
PROJECT LOCATION:
PROJECT NUMBER: 748810-

INSPECTOR: F. ACCORSI
DRILLER:
WEATHER:
CONTRACTOR: Cascade
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-7-17
DATE/TIME FINISH: 11-7-17
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-~~SCREEN~~TMW-07
LOCATION DESCRIPTION

LOCATION PLAN
Oceanport, New Jersey

GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEAS. FROM:

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10					BORING ADVANCED DEEPER ONLY TO SET TMW, NO RETURNS.		
11							
12							
13							
14							
					END OF BORING @ 14 FT.		
15					SET TMW (10 FT. SCREEN) FROM 4FT. TO 14 FT.		
16							
17							
18							
19							
20							

Remarks:

Sample Types
S -- Split-Spoon
U -- Undisturbed Tube
C -- Rock Core
A -- Auger Cuttings

Consistency vs. Blowcount / Foot

Granular (Sand & Gravel)		Fine Grained (Silt & Clay)	
V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15
Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30
M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30

and - 35-50%
some - 20-35%
little - 10-20%
trace - <10%
moisture, density, color, gradation

PARSONS

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - ECP
PROJECT LOCATION: FTMM Parcel
PROJECT NUMBER: 748810-

GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE:
TIME:
MEAS. FROM:

INSPECTOR: Tom Horn
DRILLER: ECDI Wells Reeve
WEATHER: Clear, 55°F
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 11-21-17/ 1050
DATE/TIME FINISH: 11-21-17/ 1120
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-72-211-TMW-08
LOCATION DESCRIPTION: Grassy Area
LOCATION PLAN: Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/60	0.0	DRY DK BROWN MOD DENSE SILTY SAND TR GRASS/ROOTS		
				0.0			
1				0.0	DRY LT. OLIVE-GRAY BROWN STIFF SANDY SILT		
				0.0			
2				0.0			
				0.0			
3				0.0			
				0.0	MOIST DARK-OLIVE-GRAY-BROWN STIFF SANDY SILT, TR ROUNDED GRAVEL		
4				0.0			
				0.0			
5			60/60	0.0	MOIST V. STIFF OLIVE-GRAY-GREEN SANDY SILT, TR F ROUNDED GRAVEL		
				0.0			
6				0.0			
				0.0			
7				0.0			
				0.0	MOIST V STIFF OLIVE GRAY-GREEN SILT LITTLE CLAY, TR SAND		
8				0.0			
				0.0			
9				0.0	WET OLIVE-GRAY-GREEN V DENSE SILTY SAND, TR M GRAVEL		
				0.0			
10							

Remarks: INSTALL TMW-08 WITH SCREEN FROM 8-18' BGS

Sample Types	Consistency vs. Blowcount / Foot				
S – Split-Spoon	Granular (Sand & Gravel)		Fine Grained (Silt & Clay)		and - 35-50%
U – Undisturbed Tube	V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15	some - 20-35%
C – Rock Core	Loose: 4-10	V. Dense: >50	Soft: 2-4	V. Stiff: 15-30	little - 10-20%
A – Auger Cuttings	M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30	trace - <10%
					moisture, density, color, gradation

Soil Boring Log

CLIENT: USACE	INSPECTOR:	BORING/WELL ID: ORE-72-211-TMW-08
PROJECT NAME: FTMM	DRILLER:	LOCATION DESCRIPTION
PROJECT LOCATION:	WEATHER:	
PROJECT NUMBER: 748810-	CONTRACTOR: Cascade	
GROUNDWATER OBSERVATIONS	RIG TYPE: Geoprobe(R) 7822DT	LOCATION PLAN
	DATE/TIME START:	Oceanport, New Jersey
WATER LEVEL:	DATE/TIME FINISH:	
DATE:	WEIGHT OF HAMMER: N/A	
TIME:	DROP OF HAMMER: N/A	
MEAS. FROM:	TYPE OF HAMMER: N/A	

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10			60/60	0.0	WET V. LOOSE LT. REDDISH GRAY-BROWN SILTY SAND,		
				0.0			
11				0.0	WET MOD. DENSE DK. GRAY-OLIVE-TAN SILTY SAND		
				0.0			
12				0.0	WET & STIFF LT GRAY-BROWN-OLIVE SAND & SILT TR. CLAY		
				0.0			
13				0.0			
				0.0			
14				0.0			
				0.0	WET MOTTLED LT. ORANGE TAN AND DK OLIVE-GRAY DENSE SILTY SAND		
15			60/60	0.0	WET V. LOOSE DK OLIVE-GRAY TAN SILTY SAND		
				0.0			
16				0.0	↓		
				0.0			
17				0.0			
				0.0			
18				0.0	WET DK GRAY-BROWN-BLACK		
				0.0	STIFF CLAYEY SILT, TR VF SAND		
19				0.0			
				0.0			
20					end of boring		

Remarks:

Sample Types	Consistency vs. Blowcount / Foot				
S – Split-Spoon	Granular (Sand & Gravel)		Fine Grained (Silt & Clay)		and - 35-50%
U – Undisturbed Tube	V. Loose: 0-4	Dense: 30-50	V. Soft: <2	Stiff: 8-15	some - 20-35%
C – Rock Core	Loose: 4-10	V. Dense: >50	Soft 2-4	V. Stiff: 15-30	little - 10-20%
A – Auger Cuttings	M. Dense: 10-30		M. Stiff: 4-8	Hard: > 30	trace - <10%
					moisture, density, color, gradation

Attachment C
Field Notes

Nov 3 2017 (cont.)

1501: Begin PID screening PAR-79-490-SCREEN2

1505: 4.3 ppm at BD 0.5ft, 13.6 at 1 ft, 170 ppm at 1.5 ft, 302 ppm at 2ft, 57 ppm at 2.5 ft, 505 ppm at 3ft, 452 ppm at 3.5 ft, 32 ppm at 4 ft, 302 ppm at 5 ft, 144 ppm at 5.5 ft, 5 ppm 6ft, 5 ppm 6.5ft, 2 ppm 7ft, 2 ppm 7.5ft, 0.7 ppm 8ft, 0 ppm 8.5-10 ft.

1530: Left hole open for possible GW sampling later.

1535: Back to office.

1550: Unload cooler, COCs, Quality Control Report, clean-up

11/3/17
BD

Nov 6 2017

personnel: F. Accorsi, B. Dietert, ECDI, C. Grill

Task: GW Sampling & Soil Sampling, PID Screening at UHOT, Parcel, & IRP sites.

Weather: 65-75°, partly cloudy, showers possible in afternoon.

0740: ECDI on-site

0800: H&S meeting

0830: Load Equipt + supplies, Calibrate PID (Geoprobe-ECDI, Teflon bailers, Mini-Rae 3000 PID)

0845: Mob to Par-72-211 + 228B

0900: Begin drilling PAR-72-228-SB-04

0915: Start PID screening PAR-72-~~228~~ BD 228B

0921: No PID recordings >0.0 ppm ~ 0-10 ft

0927: Collect sample, PAR-72-228-SB-04-7.5'-8.0', SPLP 2-Methyl

0935: PAR-72-228-SB-04 decommissioned, backfilled with soil cuttings.

0940: mob to PAR-72-211

0945: Start drilling PAR-72-211-SCREEN1 (no sample)

0953: Begin PID screening SCREEN1

1010: 11.5' = 3.6 ppm, 12-12.5' = 17 ppm, 0.0 ppm all other intervals to 15 ft.

1020: Decommissioned SCREEN 1, backfilled w/ soil cuttings.

1027: Start drilling PAR-72-211-SCREEN2 (no sample)

(cont.) Nov. 6 2017

1032: Begin PID screening PAR-72-211-SCREEN2
1058: 11-11.5' = 96 ppm, 11.5-12.0 = 152 ppm, 12-12.5' = 96 ppm, 12.5-13.0 = 7 ppm, 13' = 90 ppm, 13.5' = 4.5 ppm, 13.5-15ft = 0 ppm, 0-11ft = 0 ppm.
1100: Decommisioned SCREEN 2, backfilled w/ soil cuttings.
1105: Start drilling PAR-72-211-SCREEN3
1123: Begin PID screening SCREEN3 8.5' = 14 ppm, 9' = 108 ppm, 10' = 6 ppm, 10.5' = 2.5 ppm, 11.0' = 2.8 ppm, 0 ppm 11.5'-15'
1156: Start drilling PAR-72-211-TMW-06
1200: Decommisioned PAR-72-211-SCREEN3, backfilled w/ soil cuttings.
1202: Begin PID screening PAR-72-211-TMW-06
1224: No PID recordings >0.0 ppm ~0-15 ft.
1230: Collect samples, PAR-72-211-TMW-06-12', VOC + TICs & SVOC + TICs WL = 10.3', high turbidity (silt)
1236: Start drilling PAR-72-211-SCREEN4
1255: Begin PID screening SCREEN4
1300: 10-15' sleeve jammed, retrieved most of BD sleeve with rod.
1305: No PID recording >0.0 ppm ~0-15 ft.
1312: Slow recharge on TMW-06, waiting to collect 1L SVOC sample.

(cont.) Nov. 6 2017

1325: Decommisioned PAR-72-211-SCREEN4, backfilled with soil cuttings.
1330: Lunch
1345: Start drilling PAR-72-211-TMW-04
1356: Begin PID readings TMW-04
1410: No PID recordings >0.0 ppm ~0-15 ft.
1420: Collect Sample, PAR-72-211-TMW-04-11', VOCs + TICs & SVOC + TICs (high turbidity: silt)
1422: Start drilling PAR-72-211-TMW-03.
1436: Begin PID readings TMW-03
1443: No PID recordings >0 ppm ~0-15 ft.
1445: Start drilling PAR-72-211-TMW-~~04~~ 02 BD
1458: Begin PID readings TMW-~~03~~ 02 BD WL = 8'
1500: Decommisioned TMW-04, backfilled with soil cuttings.
1515: No PID recordings >0 ppm TMW-~~03~~ 02 BD ~0-15 ft.
1520: Collect Samples, PAR-72-211-TMW-~~04~~ 03-11', VOCs + TICs & SVOC + TICs (High NTU: silt)
1550: Collect samples, PAR-72-211-TMW-~~04~~ 02 BD-11, VOCs + TICs & SVOC + TICs (High NTU) WL = 8.2'
1620: Mob back to office, COCs, unpack coolers, Quality Control Report, clean-up. ECDI departs.
1630: TMW-02 & TMW-04 ~~BD~~ painted incorrectly on ground. Refessed back to drawings to confirm. Corrected logbook and sample labels.

Nov. 7 2017

personnel: F. Accorsi, B. Dietert, ECDI (Sean, Roman)
Task: GW + Soil Sampling, PID screening at UHOT, Parcel, & IRP sites. - Complete PID screening at Parcel 72 + GW sampling, Mob to Parcel 68 (UST 9016A).
Weather: 45-55°, partly cloudy, afternoon rain
0745: ECDI onsite
0755: H&S Meeting, Discuss Agenda
0825: Load Equipt, prep bottles & coolers, Calibrate PID (mini-Rae), Geoprobe (ECDI), Disposable Teflon Bailers. All GW samples collected using teflon bailer.
0825: ECDI to Lowe's for supplies.
0845: Mob to PAR-72-211
- pickup decon supplies (bags, drum)
0850: ECDI back at FTMM. Warm-up Geoprobe.
0900: Begin drilling PAR-72-211-TMW-05
0915: Start PID screening TMW-05 WL=75'
0916: 211-TMW-02, 03, and 04 decommisioned, backfilled with soil cuttings.
0920: Spoke with Julian about change of agenda at PAR-72-211
Julian
- No samples at TMW-05, only PID screening ~0-10 ft. ~~Relocate SCREEN 7 south of screen 2 since screen 1, 2, and 3 indicated high PID readings.~~

- Justification for eliminating TMW-05, no PID hits on TMW-02, 03, & 04.
Julian
- Eliminate SCREEN 5, 6, and 7, Move SCREEN 7 & SCREEN 5 south of Bldg. 211 near Sherrill Ave & rename.
- Justification - Delineate south of bldg. 211 since SCREEN 1, 2, 3 indicated high PID readings. Label well south of SCREEN 2 (approx 30') TMW-07, do PID screening & collect GW samples (VOC, SVOC). Label well approx. 30' south of SCREEN 3
SCREEN 8 - collect PID reading, but no GW samples.
0940: Contacted Utiliquest for dig-safe mark out. Start from offsite
0945: No PID readings > 0 ppm ~0-10 ft on TMW-05.
0950: SCREEN 3 GPS location marked incorrectly on map. Actual screening location is approx. 10' south of garage bldg directly adjacent to concrete pad.
1030: Decommisioned TMW-05, backfilled hole with soil cuttings, decon Geoprobe
1040: Utiliquest on-site, marked utilities
1100: Start drilling PAR-72-211-TMW-07
1107: Begin PID screening TMW-07

1115: No PID >0 ppm ~0-10 ft. WL=5.05'
1118: Geoprobe mob off TMW-07, decon.
1125: (15) Collect samples PAR-72-211-TMW-07-10', VOC+TICs & SVOC+TICs (High NTU-silty) "Chocolate milk"
1135: Begin drilling PAR-72-211-SCREEN8
1150: No PID >0 ppm ~0-10 ft WL=5.0'
1152: ECDI decon Geoprobe, east. to lunch-
1215: Enroute to office to drop off samples for lab courier.
1230: ECDI back on-site
1235: Mob to Par-68-906A
1237: PAR-72-211: TMW-07 & SCREEN8 decommisioned, backfilled with soil cuttings.
1240: Lunch
1255: Start drilling PAR-68-906A-SB-07
1300: Begin PID SB-07 (partial recovery)
3'=81 ppm, 3.5'=45 ppm, *0-3'=0 ppm
5'=65 ppm, 5.5'=124, 6'=125 ppm,
6.5'=7 ppm, 7'=46 ppm, 7.5'=2.4 ppm
10'=8 ppm, 10.5'=1 ppm, 11'=0.8 ppm,
*11.5'-15'=0 ppm
1325: Collect soil sample, PAR-68-906A-SB-07-1.5'-2.0', Unfrac. EPH & Naph, 2-Methyl (Extract & Hold)
1328: Collect soil sample, Par-68-906A-SB-07-11.5'-12.0', Unfrac EPH & Naph, 2-Methyl (Extract & Hold)

1335: Collect soil sample, PAR-72-906A-SB-07-5.5'-6.0', Unfrac EPH & Naph, 2-Methyl (Extract & Hold)
1340: Decon Equipt & Geoprobe.
1342: Decommision SB-07, backfilled with soil cuttings.
1345: Start drilling PAR-68-906A-TMW-03
1350: Begin PID screeaing WL=7.4' (TMW-03)
1353: Decon Geoprobe
1357: Begin drilling PAR-68-906A-TMW-~~04~~ 05 BD
1403: No PID >0 ppm ~0-15 ft TMW-03
1405: (16) Collect sample, PAR-68-906A-TMW-03-11', VOC+TICs & SVOC+TICs (Turbid-light brown) amber colored.
1415: Begin PID screening TMW-~~04~~ 05 BD, Decon Geoprobe
1420: Start drilling TMW-~~05~~ 04 BD, hole drilled approx. 3 ft SE of mapped location due to concrete ramp.
1440: No PID hits >0 ppm TMW-05 ~0-15 ft. WL=5.0' TMW-05
1448: (17) Collect sample, PAR-68-906A-TMW-05-10', VOCs+TICs & SVOC+TICs (High NTU: ~~dat~~ BD "chocolate" color
1505: Begin PID screening TMW-04 WL=5.5'
1511: No PID hits >0 ppm ~0-15 ft.
1520: (18) Collect Samples, PAR-68-906A-TMW04-10', VOCs+TICs & SVOC+TICs (Turbid-light brown-amber color)

Location FTMM Date 11-21-17

Project / Client USACE

PAR-79-490 BORING / TEMP. WELL INSTALL

0730 MET FA AND NL ONSITE, CREW CREW DELAYED.

0915 CREW ONSITE HAS KICKOFF MEETING

0940 CREW TAKES ON WATER FOR ONBOARD TANK, CALIBRATE PID, NL TO DRILLING AREA

0900 FA LEADS CREW TO PAR-79-490-TMW-08 PROPOSED LOCATION.

0930 BEGIN PUSHING FOR SOIL BORING SAMPLE AND TEMPORARY WELL INSTALLATION AT TMW-08 LOCATION.

0945 CREW INSTALLS TEMP. WELL 1" PVC SCREENED FROM 0-12', MEASURE ± 4.5' DTW BGS

1000 RELOCATE TO PAR-79-490-SCREEN-03 LOCATION

1015 CREW LOADS RIG, F.A. REVIEWS

1025 COLLECT GW SAMPLE FROM TMW-08

1030 CREW LOADS EQUIPMENT, F.A. LEADS US TO PAR-72-211-TMW-08 LOCATION

1050 BEGIN PUSHING TO 20'.

1105 CREW DIRECTED TO INSTALL TEMP. WELL TMW-08 WITH 10' SCREEN FROM 8-18' BGS BASED UPON REVIEW OF SOIL BORINGS.

1125 CREW RELOCATES TO PAR-72-211, BEGINS PUSHING FOR SCREEN-09.

11-21-17

Location FTMM Date 11-21-17

Project / Client USACE

PAR 72-211 BORING / TEMP / MW INSTALL

1145 CREWS BREAK FOR LUNCH

1155 COLLECT GW SAMPLE FROM PAR-72-211-TMW-08.

1210 PROVIDE NL WITH WL INDICATOR

1230 CREW RETURNS FOR INSTALLATION OF MONITOR WELL PAR-72-211-MW-1

1245 BEGIN BORING, THE INITIAL CUTTINGS THAT EMERGED FROM 0-5' APPEARED MOIST, DK-BROWN SANDY SILT. THOSE FROM 5-10' WERE OLIVE-GREEN-GRAY SILT, SOME SAND, PETROLEUM-LIKE ODOR PID RESPONSE OF 17.8 PPM TO 65.0 PPM

1330 AT 15', CUTTINGS OBSERVED AS OLIVE-GREEN-GRAY SILTY SAND, PETRO ODOR AND PID READINGS RANGING FROM 75.0-362.0 PPM

1345 AT ±17' WATER EMERGED, CUTTINGS WERE WET, OLIVE GRAY BROWN SILT, PID READINGS RANGED FROM 95.0-1260 PPM

1355 AT 22', DECONTAMINATES THE RIG AND INSTALLS 10' OF 2" 10-SLOT SCREEN WHILE PULLING CASING, TO SET SCREEN FROM 11-21' BGS, RISER TO GRADE AND FLUSH-MOUNT BOX, CONTINUE ADDING #1 MORIE SAND FROM 22' BGS.

11-21-17

Location FTMM Date 11-21-17

Project / Client USACE

PAR-72-211

1410 ADD 4th BAG OF #1 MORIE WHILE PULLING 3rd AUGER FLIGHT.

1425 ADD 7th BAG (FINAL BAG #0 MORIE

1440 ADD BENTONITE 3/8" HOLEPLUG CHIPS

#1 MORIE FROM BOW TO 11' (TOP OF SCREEN)

#0 MORIE TO 10' BG

BENTONITE TO 1' BG.

1500 FLUSH MOUNT BOX - PROTECTIVE CASING INSTALLED WITH CONCRETE COLLAR.

TWO DRUMS OF CUTTINGS

1515 CREW LOADS EQUIPMENT, HEADS BACK TO STAGING AREA

1530 COMPLETE PAPERWORK INCLUDING CHAINS OF CUSTODY FORMS FOR ANALYTICAL SAMPLES COLLECTED TODAY AND DAILY REPORTING

1600 DEPART THE SITE

11/21/17

Location Date

Project / Client

40's cloudy

12-20-17 MW ABANDONMENT / COMPLETION / DEVELOPMENT

0703 ECDI ARRIVED (K. ATWOOD, T. MCNALLY, C. TIGHE, ROMAN C.). HELD H+S MEETING. DISCUSSED DAY'S ACTIVITIES AND GOALS. CREW 1 W/FA TO DO WELL ABANDONMENT, WELL COMPLETION @ PAR-72-211

800 CREW 2 (ZOHAR, COLIN, ROMAN) MOB. TO PAR-79-490-MW-03, 02 TO DEVELOP/COMPLETE MW'S. CREW 1 MOB TO M5MW18 TO ABANDON WELL, REMOVED 21 FT OF 4 in. PVC SCREEN + CASING, 18 FT. DEEP. GROUT MIXTURE: 35 G. H_2O W/4 BAGS (94 lb) PORTLAND TYPE II, 8:1 RATIO. GRAVITY TREMIE GROUTED HOLE (FUNNEL + PIPE) FROM BOTTOM UP.

0900 MOB TO M5MW19 - (SAME AS MW18). WILL LET SETTLE OUT AND CHECK AND TOP OFF, IF NEC. IN 2 HRS.

1010 CLEAN UP SITES, MOB TO PAR-72-211-MW-02 TO COMPLETED WELL W/FLUSH MOUNT BOX, NOT DEVELOPED (CREW 2 WILL DO 12-21)

1100 MOB TO PAR-72-211-MW-04 (SAME AS MW-02) COMPLETED, NOT DEVELOPED.

1150 CLEAN UP SITE LUNCH BREAK

1230 MOB TO PAR-72-211-MW-03 COMPLETE WELL W/STEEL STICKUP RISER, CONCRETE PAD, NOT DEVELOPED

1410 WELL FINISHED, CLEANED UP SITE. MOB TO B.699, CLEAN UP SITE, LOAD MATERIAL, GET PAPERWORK W/DRILLER IN ORDER (PERMIT #'S, ETC.) CHECK SETTLING OF ABAND. WELLS - OK

1700 ECDI DEPART

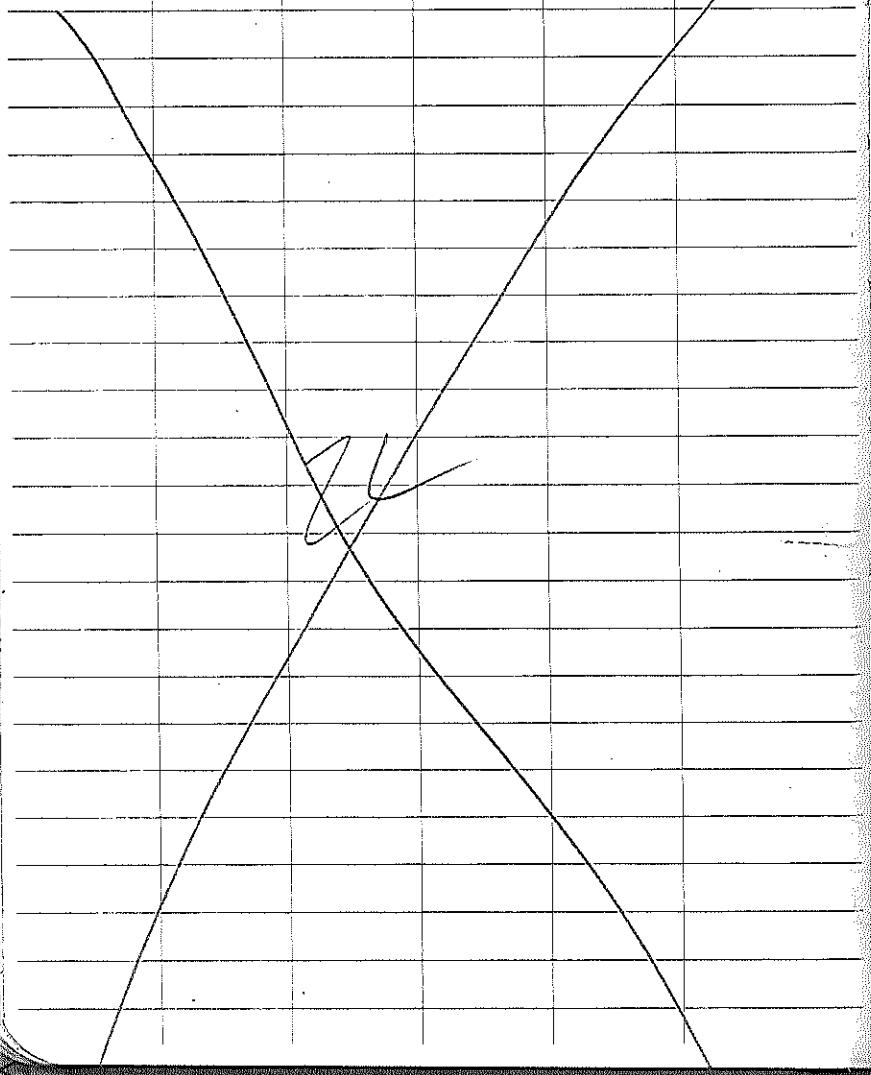
Location FTMM Date 12/20/17

Project / Client MW Development / USACE

~ 56 gallons purged

1460 - ECDI off-site.

1500 - Z-Livy off-site.



Location FTMM Date 12-21-17

Project / Client USACE, FTMM WELL DEVELOPMENT

30's PT. CLOY

0710 ECDI ONSITE (COLIN TICHE, ROMANO.) HELD HS MEETING, DISCUSSED WORK AREAS AND GOALS.

0750 MOB. TO PAR-72211-MW-02 TO DEVELOP MW. BEGIN PUMPING, SG FINISHED @ 0915 PUMPED 25 GAL, TURBIDITY 16 NTU, CLEAR

0915 MOB. TO PAR-211-MW-04 TO DEVELOP MW.

0920 START PUMPING WELL. PUMPED 16 GAL. TURBIDITY @ FINISH 11 NTU, CLEAR FLOWING

1040 FINISHED PUMPING MOB. TO PAR-72-211-MW-03 START PUMPING TO DEVELOP WELL

1130 FINISHED. PUMPED 25 GAL, TURBIDITY @ FINISH 3.7 NTU, FLOWING CLEAR

1140 MOB. TO PAR-68-906A-MW-03, COMPLETED WELL W/FLUSH MOUNT BOX.

1145 START PUMPING WELL

1245 FINISH PUMPING WELL 23 GALS. PUMPED 6.8 NTU TURBIDITY, FLOWING CLEAR

1300 CLEANUP SITE MOB TO OFFICE FOR MISC. PAPERWORK W/DRILLER, ECDI DEPART 1345

Location PTMM Date 8-7-18

Project / Client GW SAMPLING

0800 ONSITE. WEATHER, CLEAR, 90°F, HUMID. MEET FA & A-FM ONSITE.
0830 HAS KICKOFF MEETING TOPICS TODAY INCLUDED HEAT STRESS, COMMUNICATION, DRIVING SAFETY AND TICKS.
0845 CALIBRATE EQUIPMENT FOR USE WITH LOW FLOW SAMPLING PLANNED FOR TODAY.
0930 HEAD TO PAD 72.
1115 COLLECT PAD 72-211-GW-MW-05-12.0
1151 COLLECT PAD-72-211-GW-MW-04-10.0
1300 COLLECT PAD-72-211-GW-MW-02-11.4
1436 COLLECT PAD 72-211-GW-MW-03-8.5
1436 COLLECT PAD 72-211-GW-MW-103-8.5
(DUPLICATE OF PAD-72-211-GW-MW-03-8.5)
(ADDITIONAL COLLECTED MS/MSD VOLUMES HERE).
THE EQUIPMENT BLANK WAS COLLECTED AT 1330
1530 ORGANIZE EQUIPMENT FOR RETURN AND CHECK SAMPLES AGAINST THE COC.
1600 LAB COURIER NOT ONSITE. CALL OFF PINE EQUIPMENT.
PREPARE REPORTS AND DISCUSS GEO REPORT SCHEDULED FOR TOMORROW
1700 RESET STOP

8-7-18

3-28-19

FTMM / OCEANPORT

GROUNDWATER SAMPLING - LOW FLOW

0700 TH, AV, FA AND KME OF RAEGANS, WBS AND MIKE FROM CASCADE ONSITE. WEATHER: 33°F, SOME WIND 0-5 mph, CLEAR.

0705 HAS KICKOFF MEETING TOPICS INCLUDE SPLASH PROTECTION, HOSPITAL ROUTE AND SITUATIONAL AWARENESS.

0730 TH / AV CALIBRATE YSI's.

0745 TH / FA CHECK SAMPLE BOTTLES FROM GROUNDWATER-SAMPLING COMPLETED YESTERDAY AGAINST COC ENTRIES.

0800 CONTINUE YSI CALIBRATION.

0810 PROVIDE FA 2 TRIP BLANK SETS FOR INCLUSION TO THE SAMPLE COOLER FOR THE ALS COURIER PICK-UP SCHEDULED FOR THIS MORNING.

0815 CALL JC TO DISCUSS REPORTS / SCHEDULE.

0830 COMPLETE YSI CAL, DECON TWO BLADDER PUMPS USED YESTERDAY

0850 COLLECT FIELD BLANKS FOR VOLATILES SETS (8260C AND 8011) AND TWO 1-LITER AMBER BOTTLES FOR 82700 SIM.

0900 INSTALL NEW BLADDERS TO THE PUMPS

0930 ARRIVE AT AREA 22, SET UP PURGING SYSTEMS

0955 AV BEGINS PURGING AT MW41. BATTERIES ARE DEAD ON THE PUMP CONTROL BOX / COMPRESSOR. OPTS TO BE REPLACEMENT BATTERIES.

3-28-19

3-28-19

FTMM / OCEANPORT

LONGTERM GROUNDWATER SAMPLING

1010 RETURN TO SITE.

1015 BEGIN PURGING AT MW-28IR FOR 38.5' GRAB. CREW RECORDS THEIR OBSERVATIONS TO THE LOW-FLOW GROUNDWATER SAMPLING DATA SHEETS.

1035 FA CALLED TO ADVISE THAT ACOE REQUESTED A 'VERY-LONG PURGE' AT THE TWO LOCATIONS ie. 'THE GAS-STATION AND THE MOBILE-HOME AREAS' TO ENSURE THAT 'LOW-AS-POSSIBLE' TURBIDITY READINGS ARE ACHIEVED FOR THESE

1126 AV COLLECTS SAMPLE FROM MW-41-38.5

1145 TH COLLECTS SAMPLE FROM MW28IR-38.5.

1205 AV BEGINS PURGING AT MW-41-14.4

1230 TH BEGINS PURGING AT MW-40-40

1251 AV COLLECTS SAMPLE AT MW-41-14.4

1320 TH COLLECTS SAMPLE AT MW-40-40

1330 CREW CLEANS-UP WORK ZONE AND COLLECTS DEPTHS-TO-BOTTOM OF THE WELLS IN THE AREA.

1350 DEPARTS TO THE GARAGE TO DECON 2 PUMPS AND PERFORM pH CHECKS ON YSI UNITS.

1400 DECON 2 PUMPS

1405 PERFORM pH CHECKS ON YSI INSTRUMENTS

1430 TH / AV HEAD TO PARCEL 34.

1450 TH / AV SET UP FOR PURGING AT PARCEL 34 FOR MW-01R SAMPLING.

1505 TH HEADS TO PARCEL 22 AS AV BEGINS PURGE AT PARCEL 34

3-28-19

FTMM / OCEANPORT

1-28-19

GW FLOW GROUNDWATER SAMPLING

1530 TH SETS UP AT PARCEL 72 FOR PURGING OF MW-01.

1540 TH BEGINS PURGE AT MW-01.

1645 AV COLLECTS SAMPLE AT PARCEL 34: PAR-34-GW-2567 MW01 R-7.6

1700 TH COLLECTS SAMPLE AT MW-01: PAR-72-211-MW-01-16.7.

1730 TH/AV PLACE SAMPLES IN REFRIGERATOR IN BLDG 563.

1745 CLEAN AND ORGANIZE EQUIPMENT AND CHECK PAPERWORK IN THE STATION GARAGE.

1800 OFFSITE FOR THE DAY

1-28-19

FTMM / OCEANPORT

3-29-18

SOIL PILE SAMPLING

0700 TA, FA, JC, MC AND CASCADE CREW ON SITE, WEATHER OVERCAST 40°F.

0710 H&S KICKOFF TOPICS INCLUDE UNEVEN WALKING SURFACES, HEAVY LIFTING AS CASCADE WILL BE DEMOBING TO ANOTHER LOCATION. FA AND TA TO COLLECT COMPOSITE WASTE-CHARACTERIZATION SAMPLES FROM NON-HAZ AND HAZ SOIL STOCKPILES FROM FTMM-02.

0730 FA/TA HEAD TO BLDG 563 FOR GW SAMPLE MANAGEMENT.

0830 DECON WASTE PILE SAMPLING EQUIPMENT

0900 SEND SCANS OF PAPERWORK TO JC.

0930 AT AREA 7

0935 COLLECT NON-HAZ SAMPLE TO 3 8-OZ JARS AND ONE 40 mL VIAL WITH METHANOL PRESERVATIVE. THIS HOLDS THE 5 g OF SOIL.

1000 HAZ PILE SAMPLE COLLECTED

1030 COMPLETE CHAIN OF CUSTODY

1050 CALL OFF PID EQUIPMENT RENTAL

1100 TDM HORN OFFSITE, SEE SKETCH TWO PAGES AHEAD OF THIS PAGE FOR LOCATION INFO OF WASTE CHARACTERIZATION SAMPLES COLLECTED TODAY.

3-29-18

Location FTMM-22 Date 6/12/09

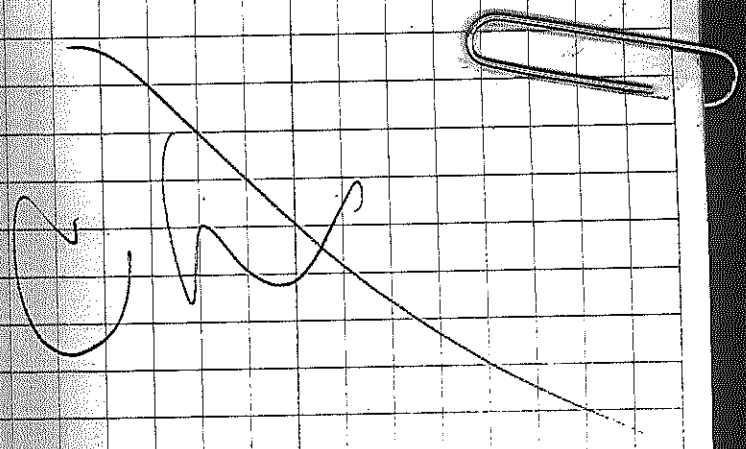
Project / Client

1440:	CW collect Equipment Blank
1345:	CWMW28IR BEGIN LF PURGING
	RISER 3.5': ADDED TO PUMP INTAKE OF 33.5
	TO GET 37' BELOW TOC, TOTAL DEPTH 45.65
1530	SAMPLE CW1MW28IR-37, W/MS, MSD,
1550	DUPLICATE (CW1MW28IR-37)
~~1730~~ 1830	MOB TO MAIN POST, PAPER WORK, SAMPLES
1800	OFFSITE

Location FTMM 22/PAR 72 Date 6/13/09

Project / Client

0700:	on-site, H+S tailgate
0735:	CAL Equipment, bottle ware loaded up
0830:	Gauge Parcel 72
0900:	FA. mob to FTMM-22
1120:	SAMPLE PAR-72-21-MW-01 (2W pmp) Turbidity
	Stable around 140. Confirm w/ S.C.
1130:	SAMPLE FTMM-22-CW1MW29R
1220:	Mob to garage.
1300:	Collect ED.
1330:	Pack up pmx Equipment, Housekeep & COC's.
1430:	Off-site (CW)



HAZWASTE TRANSFER
LANDFILL 02
TOM HORN - PARSONS

11-5-19

0600 ONSITE WEATHER 47° OVERCAST, WIND FROM NE 0-5. MEET FA AND AWT CREW FROM YESTERDAY. TWO DRIVERS - TRUCKS #435 AND #427 TRUCKS ONSITE.
0610 H&S KICKOFF MEETING LED BY FA.
0630 CREW PUTS BACK TARP USING SCISSOR-LIFTS FOR TRUCK #435, LIC# PA AF-95848 CARGO BOX # HESU 48459.
0645 AWT LOADS #435 VIA EXCAVATOR
0705 #435 OFFSITE. #427 TRUCK - LIC# PA AG-74086, CARGO BOX MJVU 03457 PREPARED FOR LOADING
0715 AWT LOADS #427
0740 #427 OFFSITE.
0935 AWT ADVISES THAT TRUCK #435 HAS RETURNED FOR A SECOND LOAD (HESU 49547)
1015 #435 LOADED, #427 ONSITE FOR SECOND LOAD (HESU 49542)
1040 HAZ PILE IS TRANSFERRED. CREW WASHES BUCKET INTO THE CONTAINER WITH TRUCK #427
1045 TRUCK #435 OFFSITE
1105 TRUCK #427 OFFSITE. CREW CLEANS UP EQUIPMENT.
1420 PINE EQUIP. ORDER ARRIVED. RUN CALIBRATION CHECK ON YSI 6820

GW SAMPLING
TOM HORN - PARSONS

11-6-19

0730 MEET F.A. ONSITE. WEATHER 50°F, CLEAR.
0740 H&S KICKOFF MEETING
0750 TH PERFORMS FIELD CALIBRATION/INSTRUMENT DOCUMENTATION AND PID CALIBRATION
FRANK PREPARES BOTTLEWARE AND COLLECTS SYNOPTIC WATER LEVELS.
0900 ARRIVE AT PARCEL 72-211. RECORD MEASUREMENTS/OBSERVATIONS TO THE LOW FLOW GROUND WATER SAMPLING DATA SHEET.
1135 FOLLOWING TROUBLESHOOTING OF THE BLADDER PUMPS AND MICROPURGE CONTROLLER TO OBTAIN PURGE FLOW, BEGIN COLLECTION OF FIELD PARAMETER DATA.
1250 COLLECT SAMPLE PAR-72-211-GW-MW-01-16,3 FOR BENZENE AND 2-METHYLNAPHTHALENE.
1315 PERFORM pH 7.00 BUFFER CHECK
1330 SET UP AT FTMM-59-MW-01
1345 BEGIN PURGE AT FTMM-59-MW-01. RECORD MEASUREMENTS AND OBSERVATIONS TO THE LOW FLOW GW SAMPLING DATA SHEET.
1500 COLLECT SAMPLE FTMM-59-GW-MW-01-12,5 FOR BENZENE.
1530 PERFORM SAMPLE MANAGEMENT.

11-6-19

GW SAMPSON
T. HORN

11-6-19

AND REFRIGERATE ITEM.
1540 CONDUCT 2nd 7.00 BUFFER CHECK.
1645 TH OFFSITE. RA TO OFFICE TO
SIGN / SEND DAILY REPORTS FOLLOWED
THEREON PRESENTED WITH J. C.

11-6-19

New Jersey Department of Environmental Protection
Site Remediation Program

Report Certifications for RCRA GPRA 2020, CERCLA, and Federal Facility Sites

These certifications are to be used for reports submitted for RCRA GPRA 2020, CERCLA, and Federal Facility Sites. The Department has developed guidance for report certifications for RCRA GPRA 2020, CERCLA, and Federal Facility Sites under traditional oversight. The "Person Responsible for Conducting the Remediation Information and Certification" is required to be submitted with each report. For those sites that are required or opt to use a Licensed Site Remediation Professional (LSRP) the report must also be certified by the LSRP using the "Licensed Site Remediation Professional Information and Statement". For additional guidance regarding the requirement for LSRPs at RCRA GPRA 2020, CERCLA and Federal Facility Sites see http://www.nj.gov/dep/srp/srra/training/matrix/quick_ref/rcra_cercla_fed_facility_sites.pdf.

Document:

- "UST 211 Site Investigation Report, Request for Unrestricted Use, No Further Action Approval, Fort Monmouth, Monmouth County, Oceanport, New Jersey" (13 December 2019)

PERSON RESPONSIBLE FOR CONDUCTING THE REMEDIATION INFORMATION AND CERTIFICATION

Full Legal Name of the Person Responsible for Conducting the Remediation: William R. Colvin
Representative First Name: William Representative Last Name: Colvin
Title: Fort Monmouth BRAC Environmental Coordinator (BEC)
Phone Number: (732) 383-5104 Ext: Fax:
Mailing Address: P.O. Box 148
City/Town: Oceanport State: NJ Zip Code: 07757
Email Address: william.r.colvin18.civ@mail.mil

This certification shall be signed by the person responsible for conducting the remediation who is submitting this notification in accordance with Administrative Requirements for the Remediation of Contaminated Sites rule at N.J.A.C. 7:26C-1.5(a).

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, including all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, to the best of my knowledge, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties.

Signature: William R Colvin Date: 13 December 2019

Name/Title: William R. Colvin
Fort Monmouth BRAC Environmental Coordinator

Completed form should be sent to:

Mr. Ashish Joshi
New Jersey Department of Environmental Protection
Division of Remediation Management & Response
Bureau of Northern Field Operations
7 Ridgedale Avenue (2nd Floor)
Cedar Knolls, New Jersey 07927-1112