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

August 15, 2016

Ms. Linda Range
Case Manager
New Jersey Department of Environmental Protection
Bureau of Southern Field Operations
401 East State Street, 5th Floor
PO Box 407
Trenton, NJ 08625

Re: Site Investigation Addendum Letter Report for Parcel 69-Building 900, Fort Monmouth, NJ
PI G000000032

Figure:

Figure 1 – Layout of Parcel 69 and Sample Locations

Tables:

Table 1 – Soil Sampling Results – Comparison to NJDEP Soil Remediation Standards
Table 2 – Groundwater Sampling Results – Comparison to NJDEP Ground Water Quality Standards

Attachments:

A. Previous Parcel 69 Correspondence
B. Soil Boring and Monitoring Well Logs
C. PAR-69-GW-MW01 Monitoring Well forms
D. Low Flow Purge and Sampling Records

Dear Ms. Range:

The U.S. Army Fort Monmouth (FTMM) has prepared this Site Investigation (SI) Addendum Letter Report for the data recently collected at Building 900 located at non-Installation Restoration Program (non-IRP) Parcel 69.

1.0 OBJECTIVES

The objective of the Supplemental ECP Phase II SI field work at Parcel 69, as described in the Environmental Condition of Property (ECP) Phase II SI Work Plan (WP), was to evaluate potential extractable petroleum hydrocarbon (EPH) contamination in soil in response to NJDEP requests. The NJDEP requested FTMM to evaluate the potential releases from a former waste oil above ground storage tank (AST). In addition, the ECP Phase II SI field work evaluated groundwater to determine if PCE concentrations exceed the GWQS, as indicated by low concentrations of PCE detected in a grab groundwater sample (P69-GW-1) in 2007 and temporary well (P69-TMP-1) in 2010. The ECP Phase II SI WP was accepted by the NJDEP without further comment for Parcel 69 in a letter dated December 30, 2015, provided in **Attachment A**.

2.0 SOIL RESULTS

Surface soil (0- to 6-inch interval) and subsurface soil (6-inch interval directly above the water table) samples were collected from four locations (PAR-69-SB-01, PAR-69-SB-02, PAR-69-SB-03, and PAR-69-SB-04) in the suspected vicinity of the former 500-gallon above ground waste oil tank, as shown on **Figure 1**. Soil boring logs are provided in **Attachment B**. All of the soil samples were analyzed for EPH (fractionated) at ALS Environmental (ALS) in Middletown, PA. EPH was detected in all nine samples (including one duplicate sample), however, all EPH samples were below the health based criteria of 1,700 mg/kg provided in the Protocol for Addressing Extractable Petroleum Hydrocarbons, (Version 5.0, August 9, 2010). Also, 25% of the samples where EPH was detected (two samples) were also analyzed for PCBs as indicated in NJDEP's May 19, 2015 comment on Parcel 69 and in FTMMs response to that comment dated November 19, 2015 (provided in **Attachment A**). The surface samples at PAR-69-SS-01 and PAR-69-SS-02 (which had the highest EPH detections at 31.3 and 39.3 mg/kg, respectively) were analyzed for PCBs. No PCBs were detected. The sampling results are provided in **Table 1**. Based on these sampling results, the contingent sampling (i.e., additional sampling locations) discussed in the work plan was not required.

3.0 GROUNDWATER RESULTS

One permanent monitoring well (PAR-69-GW-MW01) was installed and developed at the location of the former temporary wells P69-GW-1 and P69-TMP-1 (east of Building 900) (**Figure 1**). The well was installed to 18 feet below ground surface (bgs), and constructed with a two-inch diameter, 10-foot-long screen placed in the uppermost 10 feet of the saturated zone as planned in the work plan, and shown on the monitoring well log provided in **Attachment B**, and the forms provided in **Attachment C**. The monitoring well was developed using surge and purge methods in accordance with the procedure outlined in the NJDEP Field Sampling Procedures Manual ([FSPM]; NJDEP, 2005) on April 24, 2016.The well was sampled on May 24, 2016 by Low Flow Purge and Sampling (LFPS) for Volatile Organic Compounds (VOCs) plus tentatively identified compounds (TICs); two profile samples (at 10.5 and 15.5 feet) were collected as this new well contained 10 feet or more of saturated well screen. The samples were collected only after the monitored parameters had achieved stabilization in accordance with the NJDEP FSPM (NJDEP, 2005). LFPS records are provided in **Attachment D**. The only compound detected was methyl chloride, at low estimated concentrations (0.36 JB to 0.38 JB µg/l, respectively, which are less than the NJDEP groundwater quality standard).The compound was also detected in the laboratory blank, which indicates it is likely not representative of groundwater conditions at the Site. Groundwater sampling results are summarized in **Table 2**.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The data gaps that had remained in the SI have now been fully investigated in accordance with the ECP Phase II SI WP that was approved by NJDEP. Based on the results of the soil and groundwater sampling at the former waste oil tank AST, no further investigation is recommended.

In summary, the Army requests a No Further Action (NFA) designation for Parcel 69. The technical Point of Contact (POC) for this matter is Cris Grill. Ms. Grill can be reached at (617) 449-1583 or by email at cris.grill@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
BRAC Environmental Coordinator

cc: Delight Balducci, HQDA ACSIM
Joseph Pearson, Calibre
James Moore, USACE
Cris Grill, Parsons

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: "Site Investigation Addendum Letter Report for Parcel 69-Building 900"

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: BRAC Environmental Coordinator
Phone Number: (732) 380-7064 Ext: Fax:
Mailing Address: P.O. Box 148
City/Town: Oceanport State: NJ Zip Code: 07757
Email Address: william.r.colvin18.civ@mail.mil

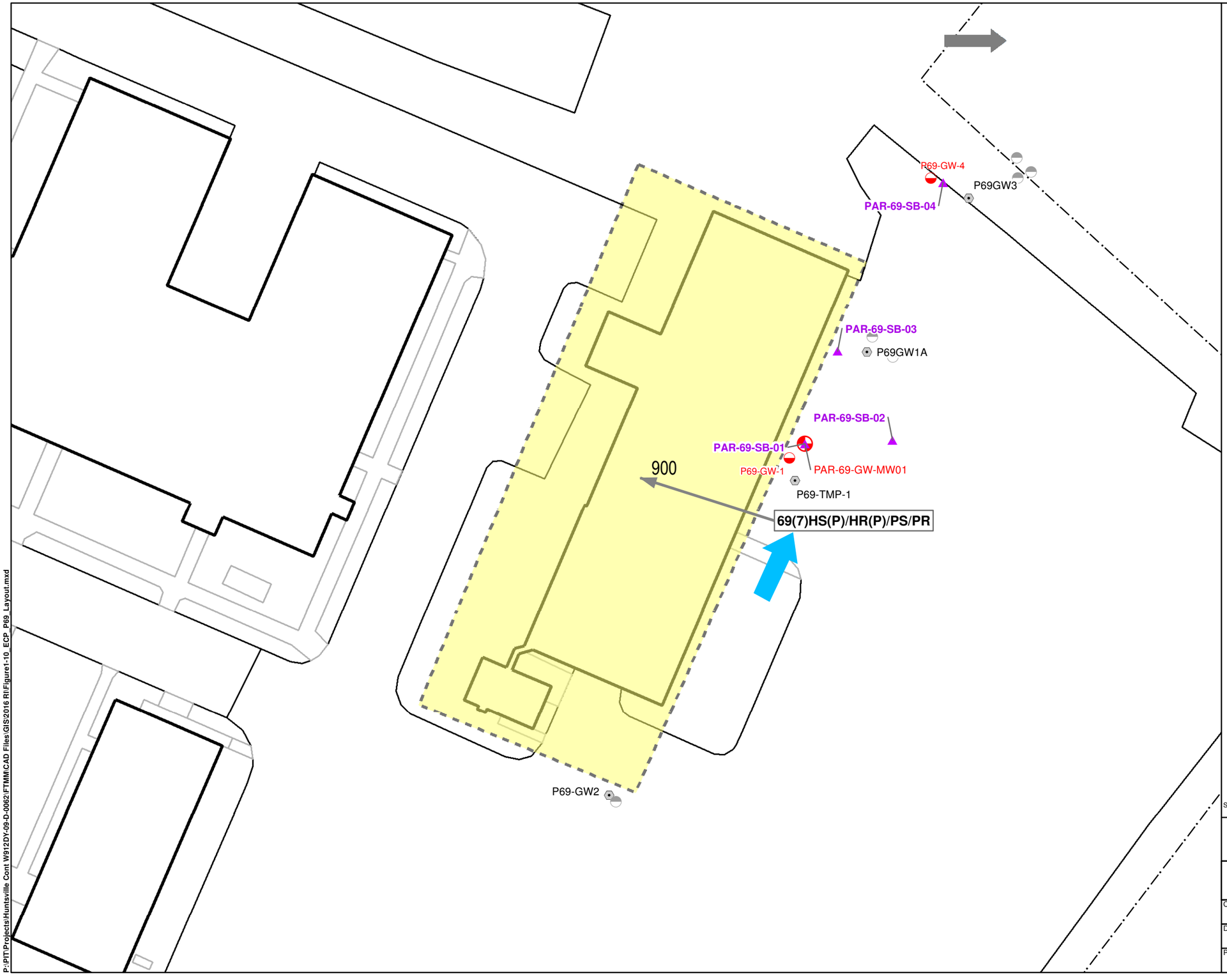
This certification shall be signed by the person responsible for conducting the remediation who is submitting this notification in accordance with Administrative Requirements for the Remediation of Contaminated Sites rule at N.J.A.C. 7:26C-1.5(a).

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: 8/15/2016

Name/Title: William R. Colvin / BRAC Environmental Coordinator

FIGURE
Figure 1 – Layout of Parcel 69 and Sample Locations



LEGEND:

- Surface / Subsurface Soil Sample Location (for analysis of EPH and polychlorinated biphenyls [PCBs]) (2016)
- Groundwater Monitoring Well (2016)
- Temporary Monitoring Well Location (2010)
- Monitoring Well and Soil Sample Location (2010)
- Temporary Monitoring Well and Soil Sample Location (2007)
- Parcel 69 Boundary
- Surface Water Feature
- Installation Boundary
- Inferred Groundwater Flow Direction
- Surface Water Flow Direction

BRAC Parcel Label Definitions

8(2)PS
- Contaminant Description
  - HS – Hazardous Substance Storage
  - HR – Hazardous Substance Release
  - PS – Petroleum Storage
  - PR – Petroleum Release
  - (P) – Possible Release or Disposal
- Category Number
- Parcel Number

N

1 inch = 30 feet

0 15 30 60 Feet

Source: FTMM Supplied CAD, 2013; U.S. Army BRAC, 2008; USGS NHD, 2012.

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\2016 RI\Figure1-10_ECP_P69_Layout.mxd

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

PARCEL 69 LAYOUT AND SAMPLING LOCATIONS

CREATED BY: RR	REVIEWED BY: ME
DATE: MAY. 2016	FIGURE NUMBER: FIGURE 1
PROJECT NUMBER: 748810-06019	FILE: Figure1-10_ECP_P69_Layout.mxd

TABLES

Table 1 – Soil Sampling Results – Comparison to NJDEP Soil Remediation Standards

Table 2 – Groundwater Sampling Results – Comparison to NJDEP Ground Water Quality Standards

TABLE 1
SOIL SAMPLING RESULTS - COMPARISON TO NJDEP SOIL REMEDIATION STANDARDS
PARCEL 69
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Residential Direct Contact SRS[1]	NJ Non-Residential Direct Contact SRS [1]	NJ Impact to GW Soil Screening Level [2]	PAR-69-SB-01			PAR-69-SB-02		PAR-69-SB-03		PAR-69-SB-04	
Sample ID				PAR-69-SB-01-0.5-1	PAR-69-SB-101-0.5-1	PAR-69-SB-01-7.5-8	PAR-69-SB-02-0.5-1	PAR-69-SB-02-6.5-7	PAR-69-SB-03-0.5-1	PAR-69-SB-03-5-5.5	PAR-69-SB-04-0.5-1	PAR-69-SB-04-6-6.5
Sample Type				SA	DU	SA	SA	SA	SA	SA	SA	SA
Sample Date				3/31/2016	3/31/2016	3/31/2016	3/31/2016	3/31/2016	3/31/2016	3/31/2016	3/31/2016	3/31/2016
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)												
C10-C12 Aromatics	NLE	NLE	NLE	**0.56 J**	< 0.5	**0.59 J**	**0.56 J**	< 0.51	**0.63 J**	**0.49 J**	< 0.5	< 0.48
C12-C16 Aliphatics	NLE	NLE	NLE	< 0.47 UJ	< 0.48	< 0.51	< 0.47 UJ	< 0.48	< 0.48 UJ	< 0.47	< 0.48	< 0.46
C12-C16 Aromatics	NLE	NLE	NLE	**0.48 J**	**0.52 J**	**0.46 J**	**0.61 J**	**0.58 J**	**0.65 J**	**0.43 J**	**0.44 J**	**0.4 J**
C16-C21 Aliphatics	NLE	NLE	NLE	< 0.46 UJ	< 0.47	< 0.5	< 0.46 UJ	< 0.47	< 0.47 UJ	< 0.46	< 0.46	< 0.45
C16-C21 Aromatics	NLE	NLE	NLE	**0.37 J**	**0.48 J**	**0.32 J**	**1.2**	**0.31 J**	**0.31 J**	**0.28 J**	**0.56 J**	**0.29 J**
C21-C36 Aromatics	NLE	NLE	NLE	**1.2 J**	**11.2 J**	**0.35 J**	**18.4**	**0.38 J**	**0.45 J**	**0.33 J**	**6**	**0.67 J**
C21-C40 Aliphatics	NLE	NLE	NLE	**28.4 J**	**36.9**	**0.79 J**	**18.1 J**	**1.3**	< 0.55 UJ	< 0.53	**6.8**	**1.2**
C9-C12 Aliphatics	NLE	NLE	NLE	< 0.13 UJ	**0.13 J**	**0.25 J**	< 0.13 UJ	**0.15 J**	< 0.13 UJ	**0.14 J**	**0.17 J**	**0.16 J**
Total Aliphatics	NLE	NLE	NLE	**28.8 J**	**37.4**	< 1.7	**18.5 J**	< 1.6	< 1.6 UJ	< 1.6	**7.1**	< 1.6
Total Aromatics	NLE	NLE	NLE	**2.6 J**	**12.6 J**	**1.7 J**	**20.8**	**1.7 J**	**2 J**	**1.5 J**	**7.4**	**1.8 J**
Total EPH	1,700 [3]	1,700 [3]	NLE	**31.3**	**50**	**3.2 J**	**39.3**	**3.4 J**	**2.8 J**	**2.3**	**14.5**	**3.3 J**
PCBs (µg/kg)												
Aroclor-1016	200	1,000	NLE	< 20	NA	NA	< 19	NA	NA	NA	NA	NA
Aroclor-1221	200	1,000	NLE	< 39	NA	NA	< 38	NA	NA	NA	NA	NA
Aroclor-1232	200	1,000	NLE	< 20	NA	NA	< 19	NA	NA	NA	NA	NA
Aroclor-1242	200	1,000	NLE	< 20	NA	NA	< 19	NA	NA	NA	NA	NA
Aroclor-1248	200	1,000	NLE	< 20	NA	NA	< 19	NA	NA	NA	NA	NA
Aroclor-1254	200	1,000	NLE	< 22	NA	NA	< 21	NA	NA	NA	NA	NA
Aroclor-1260	200	1,000	NLE	< 20	NA	NA	< 19	NA	NA	NA	NA	NA
Aroclor-1268	200	1,000	NLE	< 21	NA	NA	< 20	NA	NA	NA	NA	NA
Wet Chemistry - Solids												
Percent Solids (percent)	NLE	NLE	NLE	**90**	**89.8**	**84.3**	**89.8**	**88.9**	**89.5**	**91**	**89.3**	**93.1**

Footnote:

[1] The NJ Residential and Non-Residential Direct Contact Soil Remediation Standards refer to the NJDEP's May 7, 2012 Remediation Standards, http://www.nj.gov/dep/rules/rules/njac7_26d.pdf

[2] The NJ Impact to GW Soil Screening Level criteria refers to the Development of Site Specific Impact to Ground Water Soil Remediation Standards - Nov 2013 revised, http://www.nj.gov/dep/srp/guidance/rs/partition_equation.pdf

[3] For EPH the Protocol for Addressing Extractable Petroleum Hydrocarbons , (Version 5.0, August 9, 2010) was used to determine the applicable standards. Based on the protocol, Parcel 69 EPH results are compared to Category 2 standards. The health based criteria of 1700 mg/kg was used to determine the need to run the NJDEP EPH calculator. No samples exceeded this standard, therefore 1700 mg/kg is listed as the RDCSRS and NRDCSRS.

NLE = no limit established.

NA = not analyzed

Dectections are bolded

Cell Shade values represent a result that is above the NJ Residential or Non-Residential Direct Contact Soil Remediation Standard.

Cell Shade values represent a result that is above the NJ Impact to GW Soil Screening Level

Cell Shade values represent a result that is above both the NJ Residential, Non-Residential, AND NJ Impact to GW Soil Screening Level Direct Contact Soil Remediation Standard.

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

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

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

TABLE 2
GROUNDWATER SAMPLING RESULTS - COMPARISON TO NJDEP GROUND WATER QUALITY STANDARD
PARCEL 69
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	P69MW01	
Sample ID		PAR-69-GW-MW-01-10.5	PAR-69-GW-MW-01-15.5
Sample Date		5/24/2016	5/24/2016
Filtered		Total	Total
Volatile Organic Compounds (µg/l)			
1,1,1,2-Tetrachloroethane	1	< 0.33	< 0.33
1,1,1-Trichloroethane	30	< 0.33	< 0.33
1,1,2,2-Tetrachloroethane	1	< 0.33	< 0.33
1,1,2-Trichloroethane	3	< 0.33	< 0.33
1,1-Dichloroethane	50	< 0.33	< 0.33
1,1-Dichloroethene	1	< 0.33	< 0.33
1,1-Dichloropropene [2]	100	< 0.33	< 0.33
1,2,3-Trichlorobenzene [2]	100	< 0.33	< 0.33
1,2,3-Trichloropropane	0.03	< 1.6	< 1.6
1,2,4-Trichlorobenzene	9	< 0.33	< 0.33
1,2,4-Trimethylbenzene [2]	100	< 0.33	< 0.33
1,2-Dibromo-3-chloropropane	0.02	< 1.6	< 1.6
1,2-Dibromoethane	0.03	< 0.33	< 0.33
1,2-Dichlorobenzene	600	< 0.33	< 0.33
1,2-Dichloroethane	2	< 0.33	< 0.33
1,2-Dichloropropane	1	< 0.33	< 0.33
1,3,5-Trimethylbenzene [2]	100	< 0.33	< 0.33
1,3-Dichlorobenzene	600	< 0.33	< 0.33
1,3-Dichloropropane [2]	100	< 0.33	< 0.33
1,4-Dichlorobenzene	75	< 0.33	< 0.33
2,2-Dichloropropane [2]	100	< 0.33	< 0.33
2-Chlorotoluene [2]	100	< 0.33	< 0.33
Acetone	6,000	< 1.6	< 1.6
Benzene	1	< 0.33	< 0.33
Bromobenzene [2]	100	< 0.2	< 0.2
Bromochloromethane [2]	100	< 0.33	< 0.33
Bromodichloromethane	1	< 0.33	< 0.33
Bromoform	4	< 0.33	< 0.33
Carbon tetrachloride	1	< 0.33	< 0.33
Chlorobenzene	50	< 0.33	< 0.33
Chlorodibromomethane	1	< 0.33	< 0.33
Chloroethane [2]	5	< 0.33	< 0.33
Chloroform	70	< 0.33	< 0.33
Cis-1,2-Dichloroethene	70	< 0.33	< 0.33
Cis-1,3-Dichloropropene	1	< 0.33	< 0.33
Cymene [2]	100	< 0.33	< 0.33
Dichlorodifluoromethane	1,000	< 0.33	< 0.33
Ethyl benzene	700	< 0.33	< 0.33
Hexachlorobutadiene	1	< 0.43	< 0.43
Isopropylbenzene	700	< 0.33	< 0.33
Meta/Para Xylene	1,000	< 0.66	< 0.66
Methyl bromide	10	< 0.33	< 0.33
Methyl butyl ketone [1]	300	< 1.6	< 1.6
Methyl chloride [2]	100	**0.38 JB**	**0.36 JB**
Methyl ethyl ketone	300	< 1.6	< 1.6
Methyl isobutyl ketone [2]	100	< 1.6	< 1.6
Methyl Tertbutyl Ether	70	< 0.33	< 0.33
Methylene chloride	3	< 0.33	< 0.33
Naphthalene	300	< 0.33	< 0.33
n-Butylbenzene	100	< 0.33	< 0.33
Ortho Xylene	1,000	< 0.33	< 0.33
p-Chlorotoluene [2]	100	< 0.33	< 0.33
Propylbenzene [2]	100	< 0.33	< 0.33
sec-Butylbenzene [2]	100	< 0.33	< 0.33
Styrene	100	< 0.33	< 0.33
Tert Butyl Alcohol	100	< 8.3	< 8.3
tert-Butylbenzene [2]	100	< 0.33	< 0.33
Tetrachloroethene	1	< 0.33	< 0.33
Toluene	600	< 0.33	< 0.33
Trans-1,2-Dichloroethene	100	< 0.33	< 0.33
Trans-1,3-Dichloropropene	1	< 0.33	< 0.33
Trichloroethene	1	< 0.33	< 0.33
Trichlorofluoromethane	2,000	< 0.33	< 0.33
Vinyl chloride	1	< 0.33	< 0.33

Notes:

Chemical dectections are bolded.

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

J = estimated detected value due to a concetration 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.

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

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

[1] 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).

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

Shaded results exceed the NJDEP Ground Water Quality Standard

ATTACHMENT A
Previous Parcel 69 Correspondence

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

December 30, 2015

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

Re: **Revision 1** - *Final Environmental Condition of Property Supplemental Phase II Site Investigation Work Plan Addendum for Parcels28, 38, 39, 49, 57, 61 and 69* dated *November 2015*
Fort Monmouth
Oceanport, Monmouth County
PI G000000032

Dear Mr. Occhipinti:

The New Jersey Department of Environmental Protection (Department) has completed review of the referenced report, received November 24, 2015, prepared by Parsons Government Services Inc. (Parsons), on behalf of the U.S. Army Engineering and Support Center, Huntsville (USAESCH). As indicated in the report, activities are to be performed with the goal of Decision Document acceptance in compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the National Contingency Plan (NCP), 40 CFR Part 300, and "to the extent possible to meet the requirements of New Jersey Administrative Code (NJAC) 7:26E Technical Requirements for Site Remediation", as well as support closure of environmental sites to facilitate transfer of real property.

The workplan describes Site Investigation activities to be performed at the ECP Parcels as indicated above. The revised workplan has addressed many of the previously noted questions and issues.comments; remaining comments are as follows:

Parcel 28
Previous comments have been adequately addressed. Please note, however, although the Department of the Army may of course analyze ground water samples for both total and dissolved (filtered and unfiltered) concentrations of lead for its own purposes, this program accepts only unfiltered analytical results for consideration in decisions relative to case closure.

Parcel 38
The DEP's May 19, 2015 correspondence had indicated soil sampling was to be performed to depths of at least 36", with continuous sampling conducted in 6" increments. Although the proposal states sampling will be performed to a depth of 36 inches bgs, the proposal includes sampling only from the 0 to 0.5, 1.25 to 1.75 and 2.5 to 3.0 feet bgs. As the soils in the area have been re-worked, this is unacceptable; continuous sampling is required for adequate evaluation.

The monitor well locations as proposed are acceptable at this time. As above, however, this program does not accept filtered ground water analytical results.

Parcel 39
No additional comment.

Parcel 49
Although Section 1.9.4, and Response D1 of the November 19, 2015 correspondence accompanying the submittal generally reference only exceedances of the former NRDSCC, further review of the sampling performed during the 2007 Site Investigation indicate exceedances of the current RDCSRS at 11 locations (0-6" unless otherwise indicated) as below:

P49-SB1-C (5.5-6') – benzo(a)anthracene 0.73, benzo(a)pyrene 0.56, benzo(b)fluorene 0.75
P49-SB3 -A– PCBs 0.34; benzo(a)pyrene 0.44, benzo(b)fluorene 0.67
P49-SB4-A (6-12") – benzo(a)anthracene 2.5, benzo(a)pyrene 2.2, benzeno(b)fluorene 2.8
P49-SB5-A – benzo(a)pyrene 0.46
P49-SS7-A – PCBs 0.47; benzo(a)anthracene 80, benzo(a)pyrene 54, benzo(b)fluorene 75, benzo(k)fluorene 29, chrysene 79, dibenz(a,h)anthracene 2.6, indeno(1,2,3-cd)pyrene 18
P49-SS8-A – PCBs 8.85; benzo(a)anthracene 3.6, benzo(a)pyrene 2.6, benzo(b)fluorene 3.9, benzo(k)fluorene 1.5, indeno(1,2,3-cd)pyrene 0.93
P49-SS9-A – benzo(a)anthracene 10.0, benzo(a)pyrene 9.8, benzo(b)fluorene 9.2, bkf 6.3, chrysene 10.0, dibenz(a,h)anthracene 1.3, indeno(1,2,3-cd)pyrene 3.5
P49-SS10-A – benzo(a)pyrene 0.61, benzo(b)fluorene 0.96
P49-SS11-A – benzo(a)pyrene 0.31
P49-SS12-A – benzo(a)pyrene 0.36
P49-SS13-A – benzo(a)anthracene 0.81, benzo(a)pyrene 0.73, benzo(b)fluorene 1.2

All locations at this time are considered representative of contamination which, under the Technical Requirements for Site Remediation, must be addressed. Several of the above locations (underlined) are proposed for resampling, with step-out borings/sampling as needed. This is acceptable.

P49-SS13 has been identified in the Revised SIWP as containing an elevated level of PAHs attributable to DAP. This office does not agree. P49-SS10 through SS12 are in the area of P49-SS13, and also contain levels above applicable standard which is representative of contamination that must be addressed at this time. Benzo(a)anthracene is present at 0.81 ppm, benzo(a)pyrene from 0.31 to 0.81ppm, and benzo(b)fluorene from 0.96 to 1.2 ppm at these four locations. Additional sampling may of course be performed if it is believed the results are representative of asphalt "cross contamination".

Parcel 57

Section 1.9.5, line 38 references "PAHs detected in shallow soil can be attributed to anthropogenic sources such as asphalt, road base, and DAP versus onsite historical activities." Historic operations in this parcel also, of course, included coal storage and a railroad unloading area.

Page 1-24 line 12 discusses sampling performed in 2010 which were either non-detect or at concentrations below the RDCSRS; a review of the data indicated certain of the MDLs exceeded their respected RDCSRS.

As stated in prior correspondence, the Main Post Background Concentrations (MPBC), as with the CWBC, were never accepted by the DEP. Continued reference to the document or individual constituent "MPBC"s within a submittal will not be considered in evaluations. As previously specified, background determinations are made on an area specific basis.

Also, as above, filtered ground water analytical results as discussed on page 1-25 (and page 7 of the accompanying correspondence) are not accepted by the Department.

Parcel 61

As indicated in the May 2015 DEP correspondence, this office previously agreed no additional action was necessary. As detailed for the November conference call, no further documentation from this office is necessary.

Parcel 69

All comments addressed.

Please contact this office if you have any questions.

Sincerely,

Linda S. Range

Linda S. Range

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

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

November 19, 2015

Ms. Linda Range
New Jersey Department of Environmental Protection
Case Manager
401 East State Street, 5th Floor
PO Box 420
Trenton, NJ 08625-0028

Subject: State of New Jersey Department of Environmental Protection Comments on the Final Environmental Condition of Property Supplemental Phase II Site Investigation Work Plan for Parcels 28, 38, 39, 49, 57, 61, and 69 dated February 2015 Fort Monmouth, Oceanport, Monmouth County.
PI # G000000032

Dear Ms. Range,

Fort Monmouth (FTMM) and Parsons have reviewed the New Jersey Department of Environmental Protection (NJDEP) comments on the Final Environmental Condition of Property Supplemental Phase II Site Investigation Work Plan for Parcels 28, 38, 39, 49, 57, 61, and 69 as documented in your letter dated May 19, 2015. Responses to your comments are provided below in the order in which they were presented in the comment letter.

A. ECP Parcel 28:

A1. COMMENT: *Page 1-15, Line 33* – The arsenic noted at P28-SB3-C was considered representative of naturally occurring conditions due to site specific information for that particular area of concern, rather than relative to the "CWA Background Concentration" (CWBC) referenced on line 33 and the Weston Study alluded to throughout this and previous submittals, and the determination was made *only* for that area of concern. Although naturally occurring levels of various constituents may be present throughout various areas of the Fort, as this office has indicated (and the Army acknowledged), the background study previously performed for the property was not accepted by the Department as representative of background conditions for any constituent for any media at the site, and concentrations noted during that study should not be referenced as "background" concentrations for either the Charles Wood Area or the Main Post. Any determinations of naturally occurring conditions are to be made on an area specific basis, as previously discussed.

A1. RESPONSE: Comment noted. The text referenced in the comment has been revised to in the Work Plan read: *"The arsenic concentration at P28-SB3-C was considered representative of naturally occurring conditions due to site-specific information for this particular area of concern."*

A2. COMMENT: *Page 1-16 Sediment Investigation Results* – References to the elevated levels of constituents found close to and beyond the property bounds, upgradient of Fort activities, are not included.

A2. RESPONSE: A discussion of upstream sediment sampling data for Shrewsbury Creek reported in the Baseline Ecological Evaluation (BEE) report (with particular focus on chromium) has been added to Section 1.9.1. The BEE data described in the added text were collected at and immediately upstream of the western boundary of the CWA.

A3. COMMENT: Sampling is not included in this workplan, as it was previously performed. This office awaits submittal of the findings of same.

A3. RESPONSE: Additional data collected within Parcel 28 in July 2013 by FTMM were provided to the NJDEP in a Request for No Further Action (NFA) letter report dated June 4, 2015. Reference to this letter has been added to the first and last paragraphs of Section 1.9.1 of the Work Plan. The NFA was granted on September 22, 2015 for UST 2542-29, UST 2564-32, the former septic system and septic tank A, the former septic system east of Heliport Drive and South of Radiac Way, and the former septic system at the southeastern corner of Parcel 28 (NJDEP, 2015, provided in Appendix C).This work plan now includes the installation of a monitoring well located near the area where the high lead concentrations were found. A groundwater sample will be collected and analyzed for lead using low flow purging and sampling (LFPS) method, as requested by the NJDEP in the September 22, 2015 letter.

B. <u>ECP Parcel 38</u>:

B1. COMMENT: In July of 2012, the Department of Army submitted a Proposed *Temporary Groundwater Sampling Plan for Parcel 38 Former Outdoor Pistol Range (1940-1955).* This office approved the proposal, which included the installation of seven ground water sampling locations, in August of 2012, however, the remedial efforts were apparently not performed. The proposal included in the February 2015 workplan includes the collection of 15 shallow soil borings and the installation of three monitor wells. The proposal cannot yet be approved.

B1. RESPONSE: See responses to comments B2 and B3, which address the proposed soil and groundwater sampling plans, respectively.

B2. COMMENT: Although the soil boring locations do appropriately incorporate that area noted as within the former firing range, the sampling depth is inadequate to evaluate the soil, particularly as the area has undergone alteration. As proposed, soil samples are to be collected from surface soils or the upper inches of soil beneath the pavement, however, soil sampling must also be performed to depths of at least 36", with continuous sampling conducted in 6" increments.

B2. RESPONSE: Soil samples for visual observation and field PID screening will be obtained continuously from the ground surface to a depth of 36 inches bgs**.** In order to obtain vertical profiling data for target analytes, samples from 0 to 6 inches (0 to 0.5 feet) bgs, 15 to 21 inches (1.25 to 1.75 feet) bgs, and 30 to 36 inches (2.5 to 3.0 feet) bgs will be submitted to the laboratory for analysis. Analysis for TAL metals will be revised to target specific metals associated with firing ranges. Although lead is the primary risk driver, small arms firing ranges

may also contain antimony, copper, zinc, and arsenic (Interstate Technology Regulatory Council [ITRC], 2003). Therefore, the soil samples will only be analyzed for lead, antimony, copper, zinc, and arsenic. Section 3.2.1.2, Figure 1.5, and Tables 3.2 and 3.3 of the Work Plan have been updated to reflect the revised soil sampling plan.

ITRC. 2003. *Characterization and Remediation of Soils at Closed Small Arms Firing Ranges*. January. http://www.itrcweb.org/Guidance/GetDocument?documentID=93

B3. COMMENT: The proposed monitor well locations are not adequate to evaluate impact by this area of concern. Proposed well locations FTMM-38-GW-MW01 and FTMM-38-GW-MW02 are acceptable. However, two additional recommended well locations have been added within the former firing range area to provide evaluation points within the potential source area, particularly as the soils have been reworked. The attached figure includes recommended well locations, designated by an "X".

B3. RESPONSE: One additional monitoring well will be installed, and the locations of FTMM-38-GW-MW02 and FTMM-38-GW-MW03 will be revised to optimize the groundwater sampling plan. As shown on the revised Figure 1.5, the new well, FTMM-38-GW-MW04, will be installed adjacent to soil boring FTMM-38-SS02 to provide groundwater quality data within the hydraulically downgradient portion of the former firing range. FTMM-38-GW-MW02 will be moved approximately 15 feet farther east to provide two triangular arrays of wells (MW01/MW04/MW02 and MW02/MW03/MW04) to assess the site-specific groundwater flow direction. Depending on whether the groundwater flow direction is more northerly or northeasterly (the two most likely possibilities given the proximity of the Parcel to Lafetra Creek), MW02 will either be cross-gradient (northerly flow direction) or downgradient (northeasterly flow direction) of the former firing range. Well FTMM-38-GW-MW03 will be moved to be hydraulically upgradient (south) of the former firing range to provide site-specific background data. As with soil samples (see response to comment B2), groundwater samples will be analyzed for specific metals typically associated with small arms firing ranges, including lead, arsenic, antimony, copper, and zinc, as opposed to the full list of TAL metals. Two samples will be collected from each well, including one sample with the pump intake positioned at the midpoint of the top 5 feet of saturated screen and one sample with the pump intake positioned at the midpoint of the bottom 5 feet of saturated screen, in accordance with NJDEP's *Field Sampling Procedures Manual* (August 2005). Section 3.2.1.2, Figure 1.5, and Tables 3.2 and 3.3 of the Work Plan have been updated to reflect the revised groundwater sampling plan.

C. <u>ECP Parcel 39</u>:

C. COMMENT: No additional sampling is proposed; as referenced as anticipated on page 1-19, line 23, a request for designation of no further action for surface soil was submitted on May 11, 2015; review by this office is pending.

C. RESPONSE: Comment noted. No changes to the Work Plan are proposed in response to this comment.

D. <u>ECP Parcel 49</u>:

D1. COMMENT: *Page 1-20* discusses various reasons for the possible presence of PAHs. As indicated in the Department's July 10, 2012 correspondence, although it was agreed elevated

levels of BN (more specifically PAH) constituents found at the parcel may possibly be related to asphaltic paving rather than a discharge, insufficient information had been provided, and the previously approved proposal for additional sampling remained appropriate at each location exhibiting an exceedance (that sampling has apparently not been performed). Nor do the reasons cited on page 1-20 explain the presence of PCBs above standard which were noted at two of the original five elevated PAH locations as well as a third location.

D1. RESPONSE: Section 3.2.1.3 of the Work Plan already specifies collection and analysis of additional soil samples for PAHs and PCBs to provide additional delineation. It is the Army's position that only PAHs attributable to a CERCLA release due to historical site activities will be investigated. Therefore a review of the PAH results for the five SI locations was conducted, and further discussion of this has been added to Section 1.9 of the work plan. One location, P49-SS13-A, was originally collected to investigate a fire which destroyed Building 293, and therefore was considered a potential source of a release of chemicals from Building 293. Only one PAH, benzo(a)pyrene, exceeded the then-current NRDSCC at an estimated (J flagged) concentration of 0.730 mg/kg compared to the then-current NRDSCC of 0.66 mg/kg. Other borings (P49-SS10 through –SS12) were drilled near P49-SS13A for the same reason and all contained PAHs at similar concentrations and were below the NRDSCC. There is no clear concentration gradient or source area, and the concentrations are low and located in surface soil adjacent to a roadway, therefore it is most likely the result of diffuse anthropogenic pollution (DAP). The work plan originally proposed for sampling at this location, and based on this analysis, this location has been eliminated. The other four locations will be re-sampled to confirm and if necessary delineated vertically, and step-out borings have been added where appropriate to delineate horizontally if the PAH concentrations are confirmed, and appear attributable to a release. The sampling approach on the other four locations has also been added to the work plan.

D2. COMMENT: The proposal indicates the five locations noted in the 2008 SI as exhibiting historical PAH exceedances will be resampled to confirm the original data set. The sampling intervals are acceptable, however, please ensure sampling is performed in 6" increments. The sampling locations noted on Figure 1.7, however, do not all correlate to locations as noted on Figure 3.10-1 of the referenced 2008 SI. Specifically, original sampling locations P49-SB4 and P49-SS13 are not replicated by FTMM-49-SS-03 or FTMM-49-SS-01.

D2. RESPONSE: Samples will be collected in 6-inch increments as requested. The following sentence has been added to Section 3.2.1.3: "*Each sample submitted to the laboratory for analysis will be representative of a 6-inch interval.*" The sample locations on Figure 1.7 have been revised as needed to be consistent with the locations shown on Figure 2.10-1 of the 2008 SI.

D3. COMMENT: As regarding the resampling of the three locations exhibiting PCBs above standard, the proposal is acceptable for confirmation sampling and horizontal delineation, however, it does not appear to allow for the necessary vertical delineation?

D3. RESPONSE: Because PCBs are only slightly soluble and adhere strongly to soil, they are anticipated to be primarily in surface soil, if present. However, in order to obtain vertical profiling data for PCBs in a cost-effective manner, samples from 0 to 6 inches (0 to 0.5 feet), 12

to 18 inches (1.0 to 1.5 feet), and 24 to 30 inches (2.0 to 2.5 feet) below the asphalt and asphalt base material will be submitted to the laboratory. The surface soil samples (0-6 inches) will be analyzed first. If PCBs are detected, then the two deeper samples collected at that location will also be analyzed. If PCBs are not detected in the surface soil samples, the deeper samples collected at that location will not be analyzed. Section 3.2.1.3 has been updated to incorporate this revised sampling approach.

D4. COMMENT: Groundwater: Page 1-21 – Although it is possible the metals found in monitor wells are reflective of naturally occurring conditions in this area, the Department has not agreed the metals noted at Parcel 49 are representative of background conditions.

D4. RESPONSE: Comment noted. The referenced work plan text is factually stating the conclusion presented in the SI Report (U.S. Army BRAC, 2008); therefore, the text was not revised. Future assessments of metal concentrations in groundwater will endeavor to provide more area-specific rationale for determination of whether metals are representative of background conditions.

D5. COMMENT: As regarding the benzene and bromodichloromethane, the installation and sampling of the two permanent monitor wells as proposed is acceptable.

D5. RESPONSE: Comment noted. Additional groundwater quality information for this area was obtained subsequent to preparation of this Work Plan. The 2008 SI Report identified benzene and bromodichloromethane as COCs for groundwater (U.S. Army BRAC, 2008). These contaminants were detected at concentrations only slightly above GWQS in only one groundwater sample each. Benzene and bromodichloromethane were not detected in additional groundwater samples collected from two temporary wells (49-TMP-1 and 49-TMP-2) installed by the U.S. Army in January 2010 at approximately the same locations as the two previous temporary wells installed in 2007; therefore, it appears that concentrations of these two VOCs had decreased to below GWQS subsequent to the December 2007 sampling event. However, the sample from one of the two wells (49-TMP-1, just north of Building 293) contained vinyl chloride and cis-1,2- dichloroethene at concentrations of 1.1 µg/L and 0.71 µg/L, respectively. There were no VOC detections in the sample from 49-TMP-2.

A third groundwater sample, designated TMP-1A, was collected from another temporary well installed north of Building 293 at the former location of TMP-1 in November 2010 and analyzed for VOCs. The only detection was cis-1,2-DCE at a concentration of 0.30 µg/L below its GWQS of 70 µg/L; VC was not detected. Based on the data collected in 2010, the two permanent monitoring wells proposed for installation north of Buildings 293 and 295 will not be installed. Benzene and bromodichloromethane were not detected in January 2010. Vinyl chloride (1.1 µg/L) was only slightly above the GWQS (1.0 µg/L) in January 2010, and this VOC was not detected in November 2010.

The new historical information has been added to Section 1.9.4, and Section 3 has been revised to omit installation of permanent monitoring wells.

D6. COMMENT: Finally, the January '07 ECP Report references Table 4.2-22 in the 1995 Weston SI, which indicates 0.68 ppm PCBs was noted in soil during sampling by a pole mounted transformer on the northwest side of Building 292. No information appears to have been submitted indicating this was addressed.

D6. RESPONSE: The following text has been added to Section 1.9.4: "*During the SI performed by Weston (1995), soil samples for PCB analysis were collected beneath the former locations of pole-mounted transformers. One of the former transformers, designated MP-062, was located in Parcel 49 northwest of the northwest corner of Building 292. No visible oil stain was observed; however, the soil sample collected beneath this former transformer contained a PCB concentration of 0.68 mg/kg, which exceeded the then-current NJDEP cleanup criterion of 0.49 mg/kg. The sample was a composite of soil from three locations immediately below the transformer, each collected from 0 to 6 inches bgs.*"

The 2nd paragraph of Section 1.9.4 has been revised to include the following text: "*Historical analytical data for Parcel 49 obtained during the 2007 SI (U.S. Army BRAC, 2008) is presented in **Appendix C** (Tables 3.10-3, 3.10-4, and 3.10-5) and summarized below. Additional analytical data obtained by the U.S. Army in 2010 is also provided in **Appendix C**, and PCB data for soil obtained by Weston (1995) is summarized below.*"

The preliminary conceptual site model for Parcel 49 described in Table 3.1 has been revised to include this PCB detection.

Section 3.2.1.3, Table 3.2, and Figure 1.7 have been updated to include collection of a soil sample for PCB analysis at this former transformer location. The updated vertical profiling approach described in the response to comment D3 will be used at this new location.

E. <u>ECP Parcel 57</u>:

Please note that the NJDEP approved the Supplemental SI investigation for Parcel 57 in their September 11, 2015 email based on the Army's September 9, 2015 email which described the proposed investigation. The Army requested this accelerated approval from the NJDEP because of the opportunity to transfer the parcel due to a recent prospective buyer interested in purchasing it from FMERA. The field work for the subsurface portion of the investigation was completed in October 2015 and the groundwater sampling is scheduled in November 2015.

E1. COMMENT: *Page 1-23, line 35* – It is believed the NJDEP letter referenced in this sentence is the March 29, 2012 letter which referred to naturally occurring background conditions determined to be present at Parcel 28. That determination was specific to Parcel 28 only. The Main Post Background Concentrations (MPBC), line 38, as with the CWBC, were not accepted; background determinations are made on an area specific basis. As indicated in the Department's August 23, 2012 letter, insufficient evidence has been provided to determine the metals found in the parcel's monitor wells are unrelated to activities conducted within the parcel. Were the metals (or materials containing the metals) ever handled, used or disposed of at this parcel? What investigation was conducted to allow for this determination? Additional information/technical rationale was (is) to be provided in support of the position that exceedences are reflective of naturally occurring conditions and sample turbidity, rather than a discharge.

E1. RESPONSE: The groundwater samples collected during the 2007 SI (U.S. Army BRAC, 2008) were obtained from temporary monitoring wells installed in Geoprobe borings. Coal storage piles, such as were present in Parcel 57, are a potential source of metals contamination (http://www.epa.gov/cleanenergy/energy-and-you/affect/coal.html).

Documentation regarding additional groundwater sampling work performed at Parcel 57 by the Army in 2010 was obtained following preparation of the Work Plan. This 2010 sampling and how it impacts the proposed sampling at Parcel 57 are summarized below. A summary of sampling activities performed in 2010 and associated findings has been added to Section 1.9.5 of the Work Plan, and the relevant portions of Section 3 have been updated to describe the revised proposed sampling approach that takes the 2010 findings into account.

In March 2010 the Army collected additional groundwater samples from temporary monitoring points installed at three of the locations that previously exhibited metal concentrations exceeding GWQS during the 2007 SI (U.S. Army BRAC, 2008). The locations re-sampled in 2010 included:

- 2007 SI temporary well location P57-A-5 where six metals (Al, As, Be, Fe, Mn, and Na) exceeded the GWQC in 2007; the 2010 sample location was called P57-TMP-A5.
- 2007 SI temporary well location P57-A7 where seven metals (Al, As, Be, Cr, Fe, Pb, and Mn) exceeded the GWQC in 2007; the 2010 sample location was called P57-TMP-A7.
- 2007 SI temporary well location P57-A9 where eight metals (Al, As, Be, Cd, Co, Fe, Mn, and Ni) exceeded the GWQC in 2007; the 2010 sample location was called P57-TMP-A9.

Both unfiltered and filtered samples were collected from the temporary monitoring points in 2010 and analyzed for selected metals (beryllium and lead at P57-TMP-A5 and P57-TMP-A7; beryllium, cadmium, chromium, cobalt, and lead at P57-TMP-A9). Results are summarized below:

- P57-TMP-A5: Beryllium (2.85 µg/L) and lead (138 µg/L) in the unfiltered sample exceeded their GWQS of 1 µg/L and 5 µg/L, respectively. These metals were not detected in the filtered sample, and the field blank contained detectable concentrations of beryllium (8.09 µg/L) and Pb (37.3 µg/L).
- P57-TMP-A7: Beryllium (2.81 µg/L) and lead (43.2 µg/L) in the unfiltered sample exceeded their GWQS of 1 µg/L and 5 µg/L, respectively; these metals were not detected in the filtered sample.
- P57-TMP-A9: Cadmium (5.43 µg/L) and lead (6.74 µg/L) in the unfiltered sample exceeded their GWQS of 4 µg/L and 5 µg/L, respectively; concentrations in the filtered samples were either non-detect or detected at a level less than the GWQS.

Comparison of results for filtered and unfiltered samples indicates that exceedances of GWQS were caused by sample turbidity.

The Work Plan has been revised to add two new permanent monitoring wells in Parcel 57.

- One well was be installed at the location of former downgradient temporary wells P57-A9 (2007) and P57-TMP-A9 (2010), where concentrations of aluminum, arsenic, beryllium, cadmium, cobalt, manganese, and nickel exceeding then-current GWQC were detected during the 2007 SI (U.S. Army BRAC, 2008), and concentrations of cadmium and lead in an unfiltered temporary well sample exceeded the GWQS in 2010. The maximum concentrations of 7 of the 11 metals detected above their GWQS in 2007 were detected at this location.

- The second well was be installed at the location of former downgradient temporary wells P57-A7 (2007) and P57-TMP-A7 (2010), where aluminum, arsenic, beryllium, chromium, lead, and manganese were detected in excess of the then-current GWQC during the 2007 SI and beryllium and lead in an unfiltered temporary well sample exceeded the GWQS in 2010. The highest concentration of lead detected in 2007 and 2010 (829 µg/L) was detected at this location in 2007.

Following development, these two new wells will be sampled for TAL metals (total and dissolved) using low-flow, minimal-drawdown procedures to minimize turbidity. Two samples will be collected from each well, including one sample with the pump intake positioned at the midpoint of the top 5 feet of saturated screen and one sample with the pump intake positioned at the midpoint of the bottom 5 feet of saturated screen, in accordance with NJDEP's *Field Sampling Procedures Manual* (August 2005).

Numerous monitoring wells exist in the 800 Area upgradient of Parcel 57; these wells are clustered near Building 812 (site FTMM-64) and Building 866 (site FTMM-66). Twelve wells at FTMM-66 were sampled for TAL metals six to seven times from 2007 to 2011. Eight wells at FTMM-64 were sampled for TAL metals in 2010 and again in 2013 and/or 2014. If metal concentrations exceeding GWQS are detected in unfiltered samples from either of the two newly installed wells at Parcel 57, the existing upgradient metals data will be used to perform an area-specific background evaluation to determine whether metal concentrations in groundwater that exceed GWQS at Parcel 57 are representative of area-specific background conditions or impacts potentially related to the former coal storage areas.

E2. COMMENT: *Section 3.2.1.4*

- PCBs – The proposal for PCB sampling is approved.
- PAHs – The proposal for PAH sampling is approved, however, please ensure sampling is performed in 6" increments.

E2. RESPONSE: Comment noted. Sampling was performed in 6" increments as requested. This information has been added to Section 3.2.1.4: Vertical delineation soil samples for contingent PCB analysis were also collected at the same time as the surface soil samples. The vertical delineation samples were held at the laboratory and analyzed only if PCBs were detected in the surface soil samples.

E3. COMMENT: *Table 3.1 – Location and Extent of Contamination* – The table narrative indicates the SVOCs found in the soil samples are attributed to anthropogenic sources (e.g. asphalt). This has not yet been demonstrated to the Department, particularly as PCBs have been found in conjunction with the PAHs in two of those locations.

E3. RESPONSE: The text in Table 3.1 has been revised to state: **"***Four SVOCs (all PAHs) were detected in soil samples collected within the parking lots at concentrations above regulatory standards*."

Documentation regarding additional soil and groundwater sampling work performed at Parcel 57 by the Army in 2010-2011 was obtained following preparation of the Work Plan. This 2010 sampling and how it impacts the proposed sampling at Parcel 57 are summarized below. A

summary of sampling activities performed in 2010 and associated findings has been added to Section 1.9.5 of the Work Plan, and the relevant portions of Section 3 have been updated to describe the revised proposed sampling approach that takes the 2010-2011 findings into account.

In February 2010 the Army collected additional soil samples from soil borings advanced at two of the locations that previously exhibited elevated PAH concentrations during the 2007 SI (U.S. Army BRAC, 2008). The two 2010 locations included P57-A1-A (adjacent to 2007 boring P57-A1) and P57-C5-A (adjacent to 2007 boring P57-C5). At each location, soil samples were collected from 1.0-1.5' and 1.5-2.0' bgs. PAH concentrations in three of the four samples were either non-detect or detected at a concentration less than the RDCSRS; two PAHs in the fourth sample (P57-A1-A, 1.0-1.5') exceeded their RDCSRS and Impact to Groundwater standard, and a third PAH exceeded only the RDCSRS.

Due to the detection of PAH concentrations exceeding RDCSRS at a depth of 1.0-1.5' bgs at location P57-A1-A, five additional soil borings (P57-A1-A through P57-A1-E) were advanced to the water table in this immediate area in November 2010, and one soil sample was collected for laboratory analysis from the 6-inch interval immediately above the water table. No PAHs were detected in any of these deeper vertical extent samples. In December 2010 a monitoring well (800MW02) was installed to a depth of 20 feet bgs at P57-A1-A; the screen length was 15 feet. In February 2011 a groundwater sample was collected from this well and analyzed for VOCs+10, BN+15, and TAL metals. All VOCs and BNs were below GWQS; arsenic (4.1 µg/L) was the only metal to exceed its GWQS (3 µg/L). In addition, existing well 800MW01 was sampled in May 2010, with samples analyzed for VOCs+10 and BN+15; all analytical results were non-detect.

The sampling objectives identified in the Work Plan for PAHs now include 1) determine target PAH concentrations in surface soil samples from the 0- to 6-inch interval below the asphalt and asphalt base material, taking care not to introduce asphalt and/or road base into the samples, and 2) determine the vertical extent of target PAH contamination in soil. The soil sampling program for Parcel 57 that is outlined in Section 3.2.1.4, Tables 3.2 and 3.3, and Figure 1.8 of Work Plan has been modified based on the sampling performed in 2010:

- The PAH soil sampling location FTMM-57-SS-09, shown on Figure 1.8, is located adjacent to the 2007 SI soil sampling location P57-A1, which was resampled by the Army in 2010 (P57-A1-A). PAHs exceeding the RDCSRS were detected in the 2007 soil sample collected from 0.5-1.0 foot bgs and in the 2010 soil sample collected from 1.0 to 1.5 feet bgs. No RDCSRS exceedances were detected in the 2010 sample collected from 1.5 – 2.0 feet bgs or in multiple 2010 samples collected from just above the water table at nearby step-out locations. Therefore, vertical extent delineation at this location appears to have been achieved. A soil boring was be advanced at this location to a minimum depth of 2.0 feet bgs to 1) determine the thickness of asphalt and asphalt base material and 2) determine whether the soil samples collected in 2007 and 2010 (0.5 to 1.0, 1.0 to 1.5 and 1.5 to 2.0 feet bgs) meet the Supplemental SI soil sampling objectives described above. All materials encountered will be visually examined and described. If visual examination of subsurface materials indicate that the samples collected in 2007 and 2010 meet the objectives, then no additional sampling will be performed. If not, then soil

samples representative of 6-inch increments will be collected as required to meet objectives and will be submitted to the laboratory for analysis of target PAHs.

- The PAH soil sampling location FTMM-57-SS-16, shown on Figure 1.8, is located adjacent to the 2007 soil sampling location P57-C5, which was resampled by the Army in 2010 (P57-C5-A). One PAH exceeded the NJDEP criterion in the 2007 sample from 0.5 to 1.0 feet bgs. No exceedances of RDCSRS for PAHs were detected in the 2010 samples from 1.0 to 1.5 feet and 1.5 to 2.0 feet bgs. Therefore, vertical extent delineation at this location appears to have been achieved. A soil boring will be advanced at this location to a minimum depth of 2.0 feet bgs to 1) determine the thickness of asphalt and asphalt base material and 2) determine whether the soil samples collected in 2007 and 2010 (0.5 to 1.0, 1.0 to 1.5 and 1.5 to 2.0 feet bgs) meet the Supplemental SI soil sampling objectives described above. All materials encountered will be visually examined and described. If visual examination of subsurface materials indicate that the samples collected in 2007 and 2010 meet the objectives, then no additional sampling will be performed. If not, then soil samples representative of 6-inch increments will be collected as required to meet objectives and submitted to the laboratory for analysis of target PAHs.

F. ECP Parcel 61:

F. COMMENT: As indicated in the submittal, this office previously agreed no additional action was necessary.

F. RESPONSE: Comment noted.

G. ECP Parcel 69:

G1. COMMENT: Soil - A review of the historic data revealed no analytical results for petroleum hydrocarbons, which has always been a required parameter for characterization of waste oil AOCs. Therefore, although PCB sampling at each location is acceptable, regulations specifically require sampling at each of the locations proposed for EPH analyses, with 25% of those samples with EPH detected further analyzed for parameters as per Table 2-1 of the Technical Requirements for Site Remediation (PCBs in this instance).

G1. RESPONSE: All soil samples will be analyzed for EPH, with 25% of samples containing detectable concentrations of EPH also analyzed for PCBs, in accordance with the comment. All applicable portions of the Work Plan have been updated accordingly.

Documentation regarding additional soil sampling work performed at Parcel 69 by the Army in 2010 was obtained following preparation of the ECP Supplemental Phase II SI Work Plan. This additional sampling work and how it impacts the proposed scope of Phase II SI work are summarized below. A summary of sampling activities performed in 2010 and associated findings has been added to Section 1.9.7 of the Work Plan.

Three soil borings (P69GW-1A, P69GW-2, P69GW-3) were advanced to the water table in December 2010. Soil samples from P69GW-1A and P69GW-3 were collected from 11.5 to 12.0 feet bgs, just above the water table, and analyzed for PCE and bis(2-ethylhexyl)phthalate. The sample from P69GW-2 was collected from 2.5 to 3.0 feet bgs and analyzed for PAHs and bis(2-ethylhexyl)phthalate. All concentrations of target analytes in the soil samples were non-detect.

The 2010 soil sampling activities do not address the objective of the proposed soil sampling outlined in the ECP Work Plan (i.e., sample site soils for PCBs, and also for EPH as described earlier in this comment response). Therefore, there are no changes to the soil sampling program outlined in the Work Plan with the exception that the primary target analyte will be EPH, with PCBs being targeted in 25% of samples containing detectable concentrations of EPH, as described above.

G2. COMMENT: Ground Water – The PCE sampling, as proposed, is approved.

G2. RESPONSE: Comment noted. Documentation regarding additional groundwater sampling work performed at Parcel 69 by the Army in 2010 was obtained following preparation of the Work Plan. This additional 2010 sampling and how it impacts the proposed sampling at Parcel 69 are summarized below. The 2010 information has been added to Section 1.9.7 of the Work Plan.

In January 2010, the Army installed a temporary 2-inch diameter, PVC monitoring well (P69-TMP-1) screened across the water table adjacent to 2007 location P69GW-1. The HydroPunch sample collected in 2007 contained PCE at a concentration of 1.02 µg/L, and the purpose of the temporary well was to confirm the PCE concentration of 1.02 µg/L detected in the groundwater. In January 2010, the temporary well was purged with a peristaltic pump, and a dedicated bailer was used to obtain a sample for VOC analysis. PCE was detected at a concentration of 0.34 µg/L, and no other VOCs were detected.

To further delineate PCE concentrations in groundwater, and to obtain SVOC data, temporary monitoring wells were installed in three soil borings (P69GW-1A, P69GW-2, and P69GW-3). The well screens were installed across the water table. Groundwater samples were collected in December 2010 and analyzed for VOCs+10 (all three samples), SVOCs+TICs (P69GW-1A and P69GW-3), and PAHs (P69GW-2). PCE was detected in the sample from P69GW-2 at a concentration of 1.18 µg/L, slightly above the GWQS of 1.0 µg/L. No other VOCs were detected. There were no detections of SVOCs in the samples from P69GW-1A and P69GW-3, or PAHs in the sample from P69GW-2.

Groundwater samples collected in 2007 and 2010 indicate the presence of trace concentrations of PCE ranging from non-detect up to 1.18 µg/L in shallow groundwater at and near Building 900. However, none of the samples were collected from properly constructed and developed monitoring wells. Therefore, no changes to the groundwater sampling approach outlined in the ECP Work Plan are proposed. The proposed permanent monitoring well will be installed in the estimated worst-case area near the former waste oil UST.

G3. COMMENT: *Table 3.1 – Location and Extent of Contamination* – The narrative indicates "COCs were not detected in soil…", however, the required analyses for PCBs has not yet been performed.

G3. RESPONSE: The words "*during the 2007 SI*" have been added to the end of this sentence in Table 3.1 to clarify that it is referring to results of historical sampling.

Should you have any questions or require additional information, please contact me at (732) 383-5104 or by email at john.e.occhipinti.civ@mail.mil.

Regards,

John E. Occhipinti
Fort Monmouth Site Manager

cc: James Moore, USACE
Cris Grill, Parsons

ATTACHMENT B
Soil Boring and Monitoring Well Logs

PARSONS

Soil Boring Log

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

GROUNDWATER OBSERVATIONS
WATER LEVEL: ~8'
DATE: 3/31/16
TIME: 1335
MEAS. FROM: BGS

INSPECTOR: CW
DRILLER: JOE BARNAK
WEATHER: 65° F
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R),7822DT
DATE/TIME START: 3/31/16 1320
DATE/TIME FINISH: 3/31/16 1330
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-69-SB-01
LOCATION DESCRIPTION: Parcel 69
LOCATION PLAN: Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/31	0	0-3" Asphalt		
1345	0.5-1				3-6" F gravel, trace MC. SAND, Asphalt millings		
1					6-31" Moist, orange, loose, MC SAND, little f gravel, trace silt	III	
2							
3							
4							
5			60/44	0	0-16" No recovery		
6					16"-36" moist, orange, loose, MC, SAND, little F gravel, trace silt		
7					36"-39" Saturated, SAA	II	
1350	7.5-8				39-54" saturated, light Brown, w/ light gray mottling, M. Dense, f sand and silt, little clay		
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 Page 1 of 1

Soil Boring Log

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

INSPECTOR: CW
DRILLER: JOE BARNAK
WEATHER: 65°F WINDY
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 3/31/16 1335
DATE/TIME FINISH: 3/31/16 1345
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-69-SB-02
LOCATION DESCRIPTION: Parcel 69
LOCATION PLAN: Oceanport, New Jersey

GROUNDWATER OBSERVATIONS
WATER LEVEL: ~7'
DATE: 3/31/16
TIME: 1355
MEAS. FROM: Ops

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/44	0	0-3" Asphalt 0-6" f gravel, trace mf SAND, Asphalt millings		
1400	0.5-1						
1					6-44" moist, orange, loose MC, SAND, little f gravel, trace silt	III	
2							
3							
4							
5			60/43	0	0-17" NR 17"-25" moist, orange, loose, MC SAND, little f gravel, trace silt		
6					25"-37" Saturated, SAA	III	▽
1415	6.5-7						
7					37"-60" Saturated, light Brown w/ light grey mottling, M. Dense, F SAND and Silt, little clay		
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

Page 1 of 1

Soil Boring Log

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

GROUNDWATER OBSERVATIONS
WATER LEVEL: ~ 5.5
DATE: ~~1500~~ 3/21/16
TIME: 1520
MEAS. FROM:

INSPECTOR: C. Watson
DRILLER: JOE BARNAK
WEATHER:
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 3/21/16 1500
DATE/TIME FINISH: 3/21/16 1515
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: PAR-69-SB-03
LOCATION DESCRIPTION: Parcel 69
LOCATION PLAN: Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/37	0	0-3 Asphalt		
1520	0.5-1.0				3-6" F gravel, Asphalt millings		
1					6-37" moist, m. dense, light Brown MF SAND, some silt, little F gravel	III	
2					37-60" NR		
3							
4							
1525 5	5-5.5		60/60	0	0-5" moist, m. dense, Brown, mf SAND, some silt		
6					5"-18" Saturated, SAA	III	
7					18"-24" Saturated, orange, loose MC SAND, little F gravel		
8					24"-60" wet, light Brown, w/ light grey and light orange mottling, m. stiff, F SAND and silt, little clay		
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 Page 1 of 1

Soil Boring Log

CLIENT: USACE	INSPECTOR: CW/SM	BORING/WELL ID: PAR-69-SB-04
PROJECT NAME: FTMM - ECP	DRILLER: JOE BARNAK	LOCATION DESCRIPTION
PROJECT LOCATION: FTMM Parcel	WEATHER: 65°F cloudy	Parcel 69
PROJECT NUMBER: 748810-	CONTRACTOR: East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	RIG TYPE: Geoprobe(R) 7822DT	LOCATION PLAN
WATER LEVEL: ~6.5	DATE/TIME START: 3/31/16 1350	Oceanport, New Jersey
DATE: 3/31/16	DATE/TIME FINISH: 3/31/16 1400	
TIME:	WEIGHT OF HAMMER: N/A	
MEAS. FROM:	DROP OF HAMMER: N/A	
	TYPE OF HAMMER: N/A	

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			60/36	0	0-6" - Asphalt and gravel		
1440	0.5-1.0				6-16" - moist, mf, loose, light brown, SAND, some silt	III	
1							
2					16"-31" - moist, M. stiff, light Brown, F SAND and SILT, some clay		
3					31"-36" moist, M. Dense, MC, Orange SAND, trace silt		
4							
5			60/49"	0	6-11" NR	III	
1445	6-6.5				11"-17" - moist, M. Dense, MC orange SAND, trace silt		
6							
					17"-46" Saturated, SAA		
7					46-60 wet Grey, M. stiff, ~~brown~~ F SAND and SILT, some clay	II	
8							
9							
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

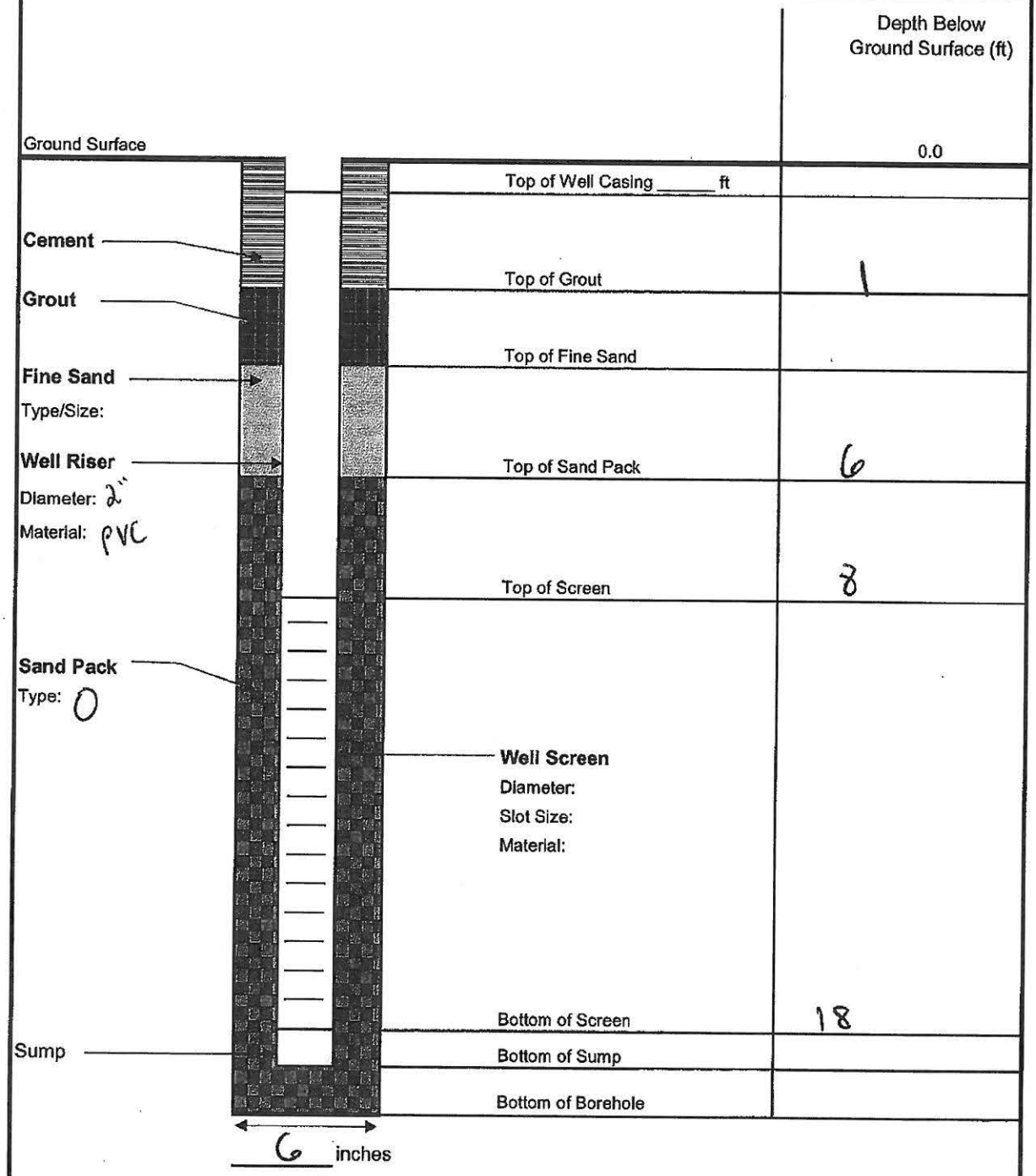
PARSONS

Well Construction Detail (Single Cased - Road Box)

Client: USACE

Well ID: PAR-69-MW-01 NJBWA Permit No.

Date Well Installed: 3/31/16 Location: Parcel 69



ATTACHMENT C
PAR-69-GW-MW01 Monitoring Well Forms

New Jersey State Department of Environmental Protection
Bureau of Water Allocation and Well Permitting
Mail Code 401-04Q PO BOX 420 Trenton, NJ 08625-0420 Tel: 609-984-6831

Well Permit Number
E201602884

WELL PERMIT

New Well

The New Jersey Department of Environmental Protection grants this permit in accordance with your application, attachments accompanying same application, and applicable laws and regulations. This permit is also subject to further conditions and stipulations enumerated in the supporting documents which are agreed to by the permittee upon acceptance of the permit

Certifying Driller: JAMES W DUFFY, MASTER LICENSE # 0001581

Permit Issued to: EAST COAST DRILLING, INC.

Company Address: 1256 N CHURCH ST MOORESTOWN, NJ 08057

PROPERTY OWNER

Name: US GOV

Organization: US Gov

Address: US Army Seli EH-E

City: Fort Monmouth State: New Jersey Zip Code: 07703

PROPOSED WELL LOCATION

Facility Name: Fort Monmouth - Parcel 69

Address: Main Street

County: Monmouth Municipality: Occanport Boro Lot: 2 Block: 110

Easting (X): 621779 Northing (Y): 538917
Coordinate System: NJ State Plane (NAD83) - USFEET

Local ID: PAR-69-GW-MW-01

SITE CHARACTERISTICS

PROPOSED CONSTRUCTION

WELL USE: MONITORING

Other Use(s):

Diameter (in.): 2

Regulatory Program Requiring Wells/Borings:

Depth (ft.): 25

Case ID Number:

Pump Capacity (gpm): 0

Deviation Requested: N

Drilling Method: Hollow Stem Augers

Attachments:

SPECIFIC CONDITIONS/REQUIREMENTS

Approval Date: March 16, 2016
Expiration Date: March 16, 2017

Approved by the authority of:
Bob Martin
Commissioner

Terry D. Pilawski

Terry Pilawski, Chief
Bureau of Water Allocation and Well Permitting

New Jersey State Department of Environmental Protection
Bureau of Water Allocation and Well Permitting
Mail Code 401-04Q PO BOX 420 Trenton, NJ 08625-0420 Tel: 609-984-6831

Well Permit Number
E201602884

MONITORING WELL RECORD

PROPERTY OWNER: US GOV

Company/Organization: US Gov

Address: US Army Seli EH-E Fort Monmouth, New Jersey 07703

WELL LOCATION: Fort Monmouth - Parcel 69

Address: Main Street

County: Monmouth Municipality: Oceanport Boro Lot: 2 Block: 110

Easting (X): 621779 Northing (Y): 538914
Coordinate System: NJ State Plane (NAD83) - USFEET

DATE WELL STARTED: March 31, 2016

DATE WELL COMPLETED: March 31, 2016

WELL USE: MONITORING

Other Use(s):

Local ID: PAR-69-GW-MW-01

WELL CONSTRUCTION

Total Depth Drilled (ft.): 18 Finished Well Depth (ft.): 18 Well Surface: Flush Mount

	Depth to Top (ft.)	Depth to Bottom (ft.)	Diameter (inches)	Material	Wgt/Rating/Screen # Used (lbs/ch no.)
Borehole	0	18	8		
Casing	0	8	2	PVC	Sch 40
Screen	8	18	2	PVC	.010

	Depth to Top (ft.)	Depth to Bottom (ft.)	Outer Diameter (in.)	Inner Diameter (in)	Material		
					Bentonite (lbs.)	Neat Cement (lbs.)	Water (gal.)
Grout	0	6	8	2	7.5	141	12
Gravel Pack	6	18	8	2	#0		

Grouting Method: Pressure method (Tremie Pipe) Drilling Method: Hollow Stem Augers

ADDITIONAL INFORMATION

Protective Casing: Yes
Static Water Level: 8 ft. below land surface
Water Level Measure Tool: M-Scope
Well Development Period: 1 hrs.
Method of Development: Pump
Pump Type:

Pump Capacity: _ gpm
Total Design Head: _ ft.
Drilling Fluid:
Drill Rig: 7822DT
Health and Safety Plan Submitted? Yes

ATTACHMENTS:

GEOLOGIC LOG
0 - 10: Light Brown GP - Poorly graded gravels and gravel-sand mixtures, little or no fines
10 - 18: Gray/Brown SW - Well-graded sands and gravelly sands, little or no fines

ADDITIONAL INFORMATION:

Driller of Record: Joseph Barnak, MONITORING LICENSE # 534717 Company: EAST COAST DRILLING, INC.

New Jersey Department of Environmental Protection
Site Remediation Program

MONITORING WELL CERTIFICATION FORM A - AS-BUILT CERTIFICATION

Date Stamp
(For Department use only)

SECTION A. SITE NAME AND LOCATION

Site Name: Fort Monmouth - Parcel 69

List all AKAs:

Street Address: Main Street

Municipality: Oceanport Boro (Township, Borough or City)

County: Monmouth Zip Code: 07757

Program Interest (PI) Number(s): Case Tracking Number(s):

SECTION B. WELL OWNER AND LOCATION

1. Name of Well Owner: US Gov
2. Well Location (Street Address): Main Street
3. Well Location (Municipal Block and Lot) Block# 110 Lot # 2

SECTION C. WELL LOCATION SPECIFICS

1. Well Permit Number (This number must be permanently affixed to the well casing):	E201602884
2. Site Well Number as shown on application or plans):	PAR-69-GW-MW-01
3. Well Completion Date:	3/31/2016
4. Distance from Top of Casing (cap off) to ground surface (nearest 0.01'):	0.00
5. Total Depth of Well to the nearest ½ foot:	18
6. Depth to Top of Screen (or top of open hole) from top of casing (nearest 0.01'):	8.00
7. Screen Length (or length of open hole) in feet:	10
8. Screen or Slot Size:	.010
9. Screen or Slot Material:	Sch. 40 PVC
10. Casing Material (PVC, steel, or other – specify):	Sch. 40 PVC
11. Casing Diameter (inches):	2
12. Static Water Level from top of casing at the time of installation (nearest 0.01'):	8.00
13. Yield (gallons per minute):	1
14. Development Techinque (specify):	Pump
15. Length of Time well is developed/pumped or bailed (hours and minutes):	1 Hour 00 Minutes

New Jersey Department of Environmental Protection
Site Remediation Program

Monitoring Well Certification Form B - Location Certification

Date Stamp
(For Department use only)

SECTION A. SITE NAME AND LOCATION

Site Name: Fort Monmouth

List all AKAs: FTMM

Street Address: OACSIM - U.S. Army Fort Monmouth, PO Box 148

Municipality: Oceanport (Township, Borough or City)

County: Monmouth Zip Code: 07757

Program Interest (PI) Number(s): G000000032 Case Tracking Number(s):

SECTION B. WELL OWNER AND LOCATION

1. Name of Well Owner US Army (Fort Monmouth)
2. Well Location (Street Address) Main Street
3. Well Location (Municipal Block and Lot) Block# 110 Lot # 2

SECTION C. WELL LOCATION SPECIFICS

1. Well Permit Number (This number must be permanently affixed to the well casing): E201602884
2. Site Well Number (As shown on application or plans): PAR-69-MW-01
3. Geographic Coordinate NAD 83 to nearest 1/100 of a second:
   Latitude: North 40° 18' 43.29" Longitude: West 74° 02' 06.18"
4. New Jersey State Plane Coordinates NAD 83 datum, US survey feet units, to nearest foot:
   North 538914 East 621779
5. Elevation of Top of Inner Casing (cap off) at reference mark (nearest 0.01'): 15.26
   Elevation Top of Outer casing: 15.55 Elevation of ground: 15.55
   Check one: ☒ NAVD 88 ☐ NVGD29 ☐ On Site Datum ☐ Other
6. Source of elevation datum (benchmark, number/description and elevation/datum). If an on-site datum is used, identify here, assume datum of 100', and give approximated actual elevation (referencing NAVD 88).
   GPS Observation
7. Significant observations and notes:

SECTION D. LAND SURVEYOR'S CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

SEAL

Professional Land Surveyor's Signature: Date

Surveyor's Name: Kenny L. Kennon License Number: 37195

Firm Name: Kennon Surveying Services, Inc. Certificate of Authorization #: 27944900

Mailing Address 5 Powder Horn Drive, Suite 4

City/Town: Warren State New Jersey Zip Code: 07059

Phone Number 732-564-1818 Ext.: Fax:

ATTACHMENT D
Low Flow Purge and Sampling Records

LOW FLOW PURGE AND SAMPLING (LFPS) RECORD - GROUNDWATER

PARSONS | CLIENT: USACE | WELL #: PAR-69-GW-MW-01

PROJECT: Fort Monmouth ECP and UHOT Groundwater Sampling

AOC # (AREA): Parcel 69

SCREENED INTERVAL (TOC): 8-18

WELL DIAMETER (in.): 2

WELL PERMIT #:

DATE: 6/24/16

SAMPLING PERSONNEL NAME: J. Lalos

SAMPLING PERSONNEL NAME:

BOREHOLE DIAMETER FACTORS

DIAMETER (INCHES):	1	1.5	2	3	4	5	6	7	8	9	10
GALLONS/FOOT:	0.041	0.092	0.163	0.367	0.654	1.02	1.47	2	2.61	3.3	5.87

WELL HEAD VOC CONCENTRATION (ppm): 0.6

WELL DEPTH (TOC): 18.00

FEET OF WATER IN WELL (ft): 11.95

FEET OF SATURATED SCREEN (ft): 10.00

DEPTH TO WATER BEFORE PUMP INSTALLATION (ft below TOC): 6.05

PUMP INTAKE DEPTH (ft below TOC): 10.5

PURGING AND SAMPLING

TIME	PURGING	SAMPLING	pH (pH units) READING	pH CHANGE*	SPECIFIC CONDUCTIVITY (mS/cm) READING	SPECIFIC CONDUCTIVITY CHANGE*	REDOX POTENTIAL (mv) READING	REDOX POTENTIAL CHANGE*	DISSOLVED OXYGEN (mg/L) READING	DISSOLVED OXYGEN CHANGE*	TURBIDITY (NTU) READING	TURBIDITY CHANGE*	TEMPERATURE (degrees C) READING	TEMPERATURE CHANGE*	PUMPING RATE (ml/min)	DEPTH TO WATER (ft below TOC)
1525	X		4.88	NA	0.642	NA	172.5	NA	2.35	NA	109	NA	17.53	NA	200	6.11
1530	X		4.73	0.15	0.648	0.006	182.5	10.0	1.59	0.76	63.2	38.7	17.15	0.38	200	6.11
1535	X		4.73	0.00	0.640	0.008	186.4	3.9	1.31	0.28	88.0	24.8	16.77	0.78	200	6.11
1540	X		4.77	0.04	0.624	0.016	188.0	1.6	1.55	0.24	110	22.0	16.66	0.11	200	6.11
1545	X		4.79	0.02	0.607	0.017	189.0	1.0	1.77	0.22	83.2	26.8	16.55	0.11	200	6.11
1550	X		4.81	0.02	0.596	0.011	189.3	0.3	1.91	0.14	61.1	22.1	16.50	0.05	200	6.11
1555	X		4.87	0.06	0.583	0.013	188.6	0.7	2.28	0.37	31.0	30.1	16.60	0.10	200	6.11
1600	X		4.90	0.03	0.573	0.010	188.0	0.6	2.31	0.03	9.21	21.79	16.51	0.09	200	6.11
1605	X		4.93	0.03	0.576	0.003	187.1	0.9	2.36	0.05	5.70	0.51	16.46	0.05	200	6.11
1610		X	4.93	0.00	0.566	0.010	186.8	0.3	2.38	0.02	5.38	0.32	16.35	0.11	200	6.11

*Indicator readings have stabilized when 3 consecutive readings are within: +/- 0.1 for pH; =+/- 3% for Specific Conductivity and Temperature; +/- 10 mv for Redox Potential; and +/- 10% for Dissolved Oxygen and Turbidity

LOW FLOW PURGE AND SAMPLING (LFPS) RECORD - GROUNDWATER

PARSONS	CLIENT: USACE	WELL #: PAR-69-GW-MW-01

SAMPLING INFORMATION

SAMPLING DEVICE: QED Sample Pro

SAMPLE NAME (ID): PAR-69-GW-MW-01-10.5 ?

SAMPLE PARAMETER	TIME	CONTAINER	COLOR	TURBIDITY	COMMENTS
VOCs + TICs	1610	(3)x 40ml w/HCl	clear	8.38	

QA\QC SAMPLES:

DUPLICATE SAMPLE COLLECTED: YES or (NO)

DUPLICATE SAMPLE NAME (ID): _____

MS/MSD SAMPLE COLLECTED: YES or (NO)

MS / MSD SAMPLE NAME (ID): _____

PURGING AND SAMPLING COMMENTS:

- well water purged w/ bladder pump through GAC
- sample collected @ 1610
- 1st saturated screen interval at (5)

INVESTIGATION DERIVED WASTE (IDW):

Date:									
Volume Transfered to Drum:									
Drum Number:									

LOW FLOW PURGE AND SAMPLING (LFPS) RECORD - GROUNDWATER

PARSONS | **CLIENT: USACE** | **WELL # : PAR-69-GW-MW-01**

PROJECT: Fort Monmouth ECP and UHOT Groundwater Sampling
AOC # (AREA): Parcel 69
SCREENED INTERVAL (TOC): 5-15
WELL DIAMETER (in.) 2

WELL PERMIT #:
DATE: 6/24/16
SAMPLING PERSONNEL NAME: D. Lizos
SAMPLING PERSONNEL NAME:

BOREHOLE DIAMETER FACTORS

DIAMETER (INCHES):	1	1.5	2	3	4	5	6	7	8	9	10
GALLONS/FOOT:	0.041	0.092	0.163	0.367	0.654	1.02	1.47	2	2.61	3.3	5.87

WELL HEAD VOC CONCENTRATION (ppm): 0.0
WELL DEPTH (TOC): 15.00
FEET OF WATER IN WELL (ft): 11.95

FEET OF SATURATED SCREEN (ft): 10.00
DEPTH TO WATER BEFORE PUMP INSTALLATION (ft below TOC): 6.05
PUMP INTAKE DEPTH (ft below TOC): 15.5

PURGING AND SAMPLING

TIME	PURGING	SAMPLING	pH (pH units) READING	pH CHANGE*	SPECIFIC CONDUCTIVITY (mS/cm) READING	SPECIFIC CONDUCTIVITY CHANGE*	REDOX POTENTIAL (mv) READING	REDOX POTENTIAL CHANGE*	DISSOLVED OXYGEN (mg/L) READING	DISSOLVED OXYGEN CHANGE*	TURBIDITY (NTU) READING	TURBIDITY CHANGE*	TEMPERATURE (degrees C) READING	TEMPERATURE CHANGE*	PUMPING RATE (ml/min)	DEPTH TO WATER (ft below TOC)
1620	X		4.88	NA	0.603	NA	187.2	NA	2.35	NA	204	NA	16.03	NA	200	6.11
1625	X		4.86	0.00	0.603	0.000	188.1	0.9	2.54	0.19	262	58	15.86	0.17	200	6.11
1630	X		4.91	0.03	0.578	0.025	187.3	0.8	2.74	0.20	236	26	15.50	0.36	200	6.11
1635	X		4.98	0.07	0.562	0.016	186.8	0.5	2.87	0.13	146	90	15.22	0.28	300	6.11
1640	X		5.04	0.06	0.563	0.001	185.6	1.2	2.99	0.12	136	10	15.10	0.12	500	6.11
1645	X		5.11	0.07	0.552	0.011	184.2	1.4	3.06	0.07	84.7	51.3	15.08	0.02	500	6.11
1650	X		5.13	0.02	0.551	0.001	183.7	0.5	3.04	0.02	68.3	16.4	15.09	0.01	500	6.11
1655	X		5.13	0.00	0.549	0.002	183.1	0.6	3.03	0.01	14.6	53.7	15.07	0.02	500	6.11
1700	X		5.14	0.01	0.548	0.001	182.7	0.4	3.03	0.00	7.28	7.32	15.06	0.01	500	6.11
1705	X		5.13	0.01	0.548	0.000	182.3	0.4	3.02	0.01	7.01	0.27	15.06	0.00	500	6.11
1710		X	5.14	0.01	0.550	0.002	182.4	0.1	3.00	0.02	6.44	0.57	15.03	0.03	500	6.11

*Indicator readings have stabilized when 3 consecutive readings are within: +/- 0.1 for pH; =+/- 3% for Specific Conductivity and Temperature; +/- 10 mv for Redox Potential; and +/- 10% for Dissolved Oxygen and Turbidity

LOW FLOW PURGE AND SAMPLING (LFPS) RECORD - GROUNDWATER

PARSONS	CLIENT: USACE	WELL #: PAL-69-GW-MW-01

SAMPLING INFORMATION

SAMPLING DEVICE: QED Sample Pro

SAMPLE NAME (ID): PAL-69-GW-MW-01-15.5

SAMPLE PARAMETER	TIME	CONTAINER	COLOR	TURBIDITY	COMMENTS
VOCs + TICs	1710	(3)x40ml w/HCl	clear	6.44	

QA\QC SAMPLES:

DUPLICATE SAMPLE COLLECTED: YES or (NO)

DUPLICATE SAMPLE NAME (ID): _____

MS/MSD SAMPLE COLLECTED: YES or (NO)

MS / MSD SAMPLE NAME (ID): _____

PURGING AND SAMPLING COMMENTS:

- well water purged w/ bladder pump through GAC
- sample collected @ 1710
- 2nd saturated screen interval ≠ (2)

INVESTIGATION DERIVED WASTE (IDW):

Date:									
Volume Transfered to Drum:									
Drum Number:									