REMEDIAL INVESTIGATION REPORT FOR SITE FTMM-59

FORT MONMOUTH, OCEANPORT, MONMOUTH COUNTY, NEW JERSEY

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LIST OF ACRONYMS

ACRONYM	DEFINITION
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
API	American Petroleum Institute
AST	aboveground storage tank
ATSDR	Agency for Toxic Substance and Disease Registry
BEE	Baseline Ecological Evaluation
bgs	below ground surface
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethylbenzene, xylene
CEHNC	U.S. Army Engineering and Support Center, Huntsville
CENAN	U.S. Army Corps of Engineers, New York District
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	constituent of concern
COPC	constituent of potential concern
COPEC	chemicals of potential ecological concern
CSM	conceptual site model
CWA	Charles Wood Area
cy	cubic yard
DCE	dichloroethene
DD	Decision Document
DPW	Directorate of Public Works
EA	Evans Area
ECP	Environmental Condition of Property
EPH	extractable petroleum hydrocarbons
ESC	ecological screening criteria
FMERA	Fort Monmouth Economic Redevelopment Authority
FS	feasibility study
ft	feet
ft/day	feet per day
ft/ft	foot per foot
FTMM	Fort Monmouth
FTMM-59	Fort Monmouth Site 59
GES	Groundwater & Environmental Services, Inc.
GIS	geographic information system
gpd/ft^2	gallons per day per square foot
gpm	gallons per minute
GWQS	Groundwater Quality Standard
HSDB	Hazardous Substances Data Bank
HTRW	hazardous, toxic, and radiological waste
IASL	indoor air screening levels
IC	institutional control

ACRONYM	DEFINITION
IGW	Impact to Groundwater
IRIS	Integrated Risk Info System
IRP	Installation Restoration Program
mg/kg	milligrams per kilogram
MP	Main Post
MRL	minimal risk level
MTBE	methyl tert-butyl ether
NCP	National Contingency Plan
N.J.A.C.	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NRDCSCC	Non-Residential Direct Contact Soil Cleanup Criteria
NRDCSRS	Non-Residential Direct Contact Soil Remediation Standard
PAH	polynuclear aromatic hydrocarbon
Parsons	Parsons Government Services, Inc.
PCBs	polychlorinated biphenyls
PCE	tetrachloroethene
PID	photoionization detector
POL	Petroleum, Oil and Lubricants
ppm	parts per million
PPRTV	Provisional Peer Reviewed Toxicity Values
R&D	research and development
RACR	remedial action completion report
RAGS	Risk Assessment Guidance for Superfund
RAPR	remedial action progress report
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RDCSCC	Residential Direct Contact Soil Cleanup Criteria
RDCSRS	Residential Direct Contact Soil Remediation Standard
RI	remedial investigation
RI/FS	remedial investigation/feasibility study
RIR	remedial investigation report
RSL	Regional Screening Levels
SCC	Soil Cleanup Criteria
SGSL	Soil Gas Screening Level
SI	site investigation
SRC	soil remediation criterion
SSL	soil screening level(s)
SVOCs	semi volatile organic compounds
SWQS	Surface Water Quality Standard
TAL	target analyte list
TCE	trichloroethene
THQ	Target Hazard Quotient
TICs	tentatively identified compounds

ACRONYM	DEFINITION
TO	task order
TPH	total petroleum hydrocarbons
TRSR	Technical Requirements for Site Remediation
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UST	underground storage tank
VI	vapor intrusion
VOCs	volatile organic compounds
WERS	Worldwide Environmental Restoration Services

EXECUTIVE SUMMARY

E.1 SITE DESCRIPTION

Fort Monmouth Installation Restoration Program Site 59 (FTMM-59) is located in the southwestern portion of the Main Post (MP) and north of Mill Creek. FTMM-59 is comprised of former Building 1122, the surrounding parking lot and two former storage sheds. Building 1122 formerly housed a "do-it-yourself" auto repair shop for Installation personnel. FTMM-59 was referred to as Site 1122 in earlier environmental documents. Building 1122, the chemical storage shed, and the paint booth shed were demolished in 2014. The anticipated future land use at FTMM-59 according to the Fort Monmouth Economic Redevelopment Authority (FMERA, 2019) includes mixed-use, office and institutional development, with "civic uses" as an accepted development strategy. FTMM was selected for closure by the Base Realignment and Closure (BRAC) Commission in 2005, and officially closed on 15 September 2011.

FTMM-59 is a Petroleum, Oil and Lubricants (POL) site. POL releases are excluded from the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (USEPA, 1987); therefore, the Army at FTMM-59 is subject to the New Jersey Administrative Code (N.J.A.C.) 7:26E Technical Requirements for Site Remediation (TRSR) for the investigation and remediation of site contaminants. The New Jersey Department of Environmental Protection (NJDEP) is the lead regulatory agency for investigation of all areas of known or suspected petroleum contamination at FTMM-59.

E.2 GEOLOGY AND HYDROGEOLOGY

The uppermost lithologic unit at FTMM-59 is fill material consisting of sand and gravel to a depth of approximately 1 to 6 feet (ft) below ground surface (bgs). The fill material is underlain by the Hornerstown Formation consisting of relatively fine-grained, glauconitic sand, clay, and silty clay to the maximum depth of the investigation (20 ft bgs).The depth to groundwater at FTMM-59 is approximately 6 to 10 ft bgs. Groundwater migrates to the north and northwest, toward Mill Creek.

E.3 SOIL SAMPLING RESULTS

Ninety-eight soil samples were collected during the investigations at FTMM-59 from 1992 to 2015. Concentrations of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals exceeded the current (September 2017) NJDEP Residential Direct Contact Soil Remediation Standard (RDCSRS) in at least one of the 98 soil samples evaluated. Based on the remedial investigation (RI) soil data, additional remedial measures were warranted and taken for soils:

- North of former Building 1122 and beneath the western portion of former Building 1112;
- Near the former Chemical Storage and Paint Booth Sheds; and
- The former hydraulic lifts at former Service Bays #9 and #10.

E.4 GROUNDWATER SAMPLING RESULTS

Quarterly groundwater sampling was performed at FTMM-59 from April 1997 to June 2011 using a network of five monitoring wells. A sixth monitoring well was installed in 2010 and

sampled quarterly until 2011. A seventh monitoring well was installed in 2011 but wasn't sampled until 2013.

An additional sampling event was performed in August 2013 to re-establish baseline conditions after a two-year interruption in the groundwater monitoring program. The 2013 Baseline Groundwater Report (Parsons, 2014) demonstrated there were no GWQS exceedances for VOCs in the 2013 results for the seven monitoring wells present at that time and recommended resampling the newest well for two additional rounds to confirm the 2013 results. NJDEP agreed with this recommendation and the well was sampled in October 2014 and December 2015. The first round occurred during the 2014 annual groundwater sampling, and the second round occurred as part of an RI data gap investigation in 2015.

Two groundwater grab samples were collected in September/October 2015 as part of the 2015 RI. Due to exceedances of the NJDEP GWQS for benzene, 2-methylnaphthalene and SVOC TICs in the grab samples, two additional monitoring wells were installed downgradient of the grab samples and sampled in December 2015 during the RI field investigation. The 2015 groundwater analyses found that 2-methylnapthalene concentrations were below the GWQS, and SVOC TICs were not detected; therefore, they were determined not to be constituents of concern. The analysis also confirmed that benzene exceeded the NJDEP Groundwater Quality Standard (GWQS) in one well. The well was re-sampled in July and November 2019, and benzene concentrations were less than the 2019 GWQS. Therefore, it was determined that benzene was no longer present, and no longer a groundwater constituent of concern.

Initial technical evaluation of the RI groundwater data collected in 2015 indicated possible concerns with cadmium and manganese in groundwater, which were not adequately characterized; therefore, all nine monitoring wells were re-developed and then sampled in August 2018 and July 2019 for analysis of cadmium and manganese. The analysis confirmed that cadmium and manganese exceeded the 2019 GWQS in five wells; however, based on the concentration distribution, both were not attributable to FTMM-59.

E.5 SURFACE WATER AND SEDIMENT SAMPLING RESULTS

Surface water and sediment sampling results from the following field investigations performed from 2007 to 2010 were evaluated for this RI:

- Final U.S. Army BRAC 2005 Site Investigation (SI) Report, Fort Monmouth, New Jersey (U.S. Army, 2008).
- Final Fort Monmouth Main Post and Charles Wood Area Baseline Ecological Evaluation Report, U.S. Army Garrison Fort Monmouth (Shaw, 2012)

Three locations in Mill Creek from 2007 to 2010 were evaluated to assess the impact, if any, of FTMM-59 on surface water and sediment quality. FTMM-59 is not significantly impacting VOC concentrations in the reach of Mill Creek that borders the site. Polynuclear aromatic hydrocarbon (PAHs) and metals detected in sediment adjacent to FTMM-59 may have an upstream source based on detections in upstream samples. There are no indications of surface water or sediment contamination directly associated with FTMM-59. Furthermore the Final Baseline Ecological Evaluation (BEE) Report (Shaw, 2012), which evaluated potential ecological risk at FTMM, concluded that constituents at FTMM-59 are unlikely to have a deleterious effect on sensitive ecological receptors or habitats, and additional ecological assessments related to this site

were not warranted or recommended. The NJDEP agreed with the conclusions of the BEE in a letter dated August 27, 2012.

E.6 REMEDIAL ACTION

A Remedial Action Work Plan (RAWP) was prepared and implemented to address the soil exceedances of NJDEP RDCSRSs at FTMM-59. The soil removal was implemented from May to August 2019 and documented in the 2019 Remedial Action Completion Report (RACR). Following the soil removal, post-excavation confirmation soil samples were collected from each excavation, and the sample results were less than the RDCSRSs.

E.7 CONCLUSIONS

As confirmed in the last round of ground water sampling (2019), benzene is no longer a constituent of concern in groundwater. The groundwater sampling that occurred in August 2018 and July 2019 confirmed that cadmium and manganese are present in groundwater at concentrations that exceed the 2019 NJDEP GWQS; however, based on the concentration distribution, both are not attributable to FTMM-59.

The review of previous surface water and sediment field investigations performed between 2007 and 2010 (including the 2008 SI Report and 2012 BEE) identified surface water and sediment constituents (PCE and TCE in surface water, and PAHs and metals in sediment) that exceed NJDEP standards (freshwater SWQS and RDCSRSs). However, the review confirmed conclusions from the 2012 BEE and the 2005 RI Reports (Versar, 2005; Shaw, 2012) that PCE, TCE, PAHs and metals at FTMM-59 originate from an upstream source.

Lead, benzene(a)pyrene, naphthalene, vanadium, and petroleum hydrocarbons were present in soil above the NJDEP RDCSRSs. Soil removal activities implemented in 2019 have remediated the FTMM-59 soils to levels which now meet the NJDEP RDCSRSs for lead, benzo(a)pyrene, naphthalene, and petroleum hydrocarbons. The concentrations of vanadium in soils are due to natural background conditions. Based on the results of the RI and remedial measures conducted in 2019, further remedial efforts for soils at FTMM-59 are not warranted.

Based on the results of this RI and the remedial measures conducted in 2019, no further remedial efforts are warranted at FTMM-59.

SECTION 1
INTRODUCTION

1.1 PROJECT AUTHORIZATION

This Remedial Investigation (RI) Report was prepared by Parsons Government Services, Inc. (Parsons) on behalf of the United States Army Corps of Engineers, New York District (CENAN) and the United States Army Engineering and Support Center, Huntsville (CEHNC) to address contaminated media at Fort Monmouth (FTMM) site FTMM-59 in Oceanport, Monmouth County, New Jersey. This project is being performed under task order (TO) 0012 issued under the Worldwide Environmental Restoration Services (WERS) contract number W912DY-09-D-0062.

This TO was issued to address a number of environmental sites at FTMM that are in various stages of hazardous, toxic, and radiological waste (HTRW) investigation and remediation. Specific activities that are being performed under this TO include:

1. Performance of RIs and preparation of RI Reports, Feasibility Study (FS) Reports, and/or Remedial Action Work Plans (RAWPs) to achieve acceptance of Decision Documents (DDs) in compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), National Contingency Plan (NCP), 40 Code of Federal Regulations (CFR) Part 300 and/or to meet the substantive remedial requirements of New Jersey Administrative Code (N.J.A.C.) 7:26E Technical Requirements for Site Remediation (TRSR); and
2. Supporting the closure of environmental sites to facilitate the efficient transfer of real property to other parties.

1.2 PURPOSE AND SCOPE

Parsons has prepared this Remedial Investigation Report (RIR) for site FTMM-59 based on site characterization activities performed from 1992 to 2014 by others and from 2015 through 2019 by Parsons. This report was prepared in accordance with the requirement of N.J.A.C 7:26E TRSR since the release identified at FTMM-59 is petroleum hydrocarbons and under CERCLA Petroleum, Oil and Lubricants (POL) releases are excluded. This RIR provides a summary of site background information, characterizes the nature and extent of site-related contamination, and presents the results of supplemental investigations completed in 1992 through 2019 in accordance with a New Jersey Department of Environmental Protection (NJDEP)-approved Remedial Investigation/Feasibility Study (RI/FS) Work Plan (Parsons, 2015). This report also presents the results of implementation of the Remedial Action Work Plan (RAWP; Parsons 2019) that was performed in 2019. The Army owns FTMM-59 and is addressing the POL release pursuant to its authority under the Defense Environmental Restoration Program, 10 U.S.C. 2701. The NJDEP administers the NJ petroleum storage and release program and will provide regulatory review of this document.

1.3 SITE BACKGROUND

FTMM, established in 1917, is located in the central-eastern portion of New Jersey in Monmouth County, approximately 45 miles south of New York City, New York, 70 miles northeast of Philadelphia, Pennsylvania, and 40 miles east of Trenton, New Jersey. The Atlantic Ocean is approximately three miles to the east of FTMM. FTMM was comprised of three areas:

the Main Post (MP), Charles Wood Area (CWA), and Evans Area (EA) (**Figure 1.1**). The areas of the MP and CWA are 637 acres and 489 acres, respectively. FTMM's MP and CWA were selected for closure by the BRAC Commission in 2005, and officially closed on 15 September 2011. The EA (not shown on **Figure 1.1**) was located approximately eight miles south of the MP and CWA and was formerly used for administrative, research and development (R&D), and training purposes. The EA was closed under BRAC in 1998 and has been transferred from FTMM. FTMM falls within the Boroughs of Eatontown, Oceanport, and Tinton Falls. The MP is in the Eatontown and Oceanport Boroughs, and the CWA is in the Eatontown and Tinton Falls Boroughs.

FTMM-59 is located in the southwestern portion of the MP (**Figure 1.2**) and encompasses former Building 1122, the surrounding parking lot and two former storage sheds. Building 1122 housed a modern "do-it-yourself" auto repair shop for Installation personnel. The construction date of the building is not known. Building 1122, the chemical storage shed, and the paint booth/shed (**Figure 1.3**) were demolished in June 2014. The building's foundation slab, two underground hydraulic lifts located within the footprint of the former building and associated hydraulic lift fluid storage tanks were also removed in 2014 (a third hydraulic lift was previously removed in 1995). The sanitary sewer and water services were cut and capped as part of the demolition of the building.

Other reported activities that occurred in former Building 1122 included furniture paint stripping in the Woodworking Craft Shop located at the western end of the building, and a machine shop and a welding area. Degreasing solvents were used, and hazardous waste was generated from operations in the building. Used waste oil was collected in a 55-gallon drum stored inside the auto repair shop located in the eastern two-thirds of the building. When filled, the contents were pumped into a 995-gallon double-walled aboveground waste oil storage tank (AST) located between the repair shop and the adjacent car wash located at Building 1124 to the east of FTMM-59 (U.S. Army, 2007).

The FTMM-59 area is also referred to as Environmental Condition of Property (ECP) Parcel 43 (an approximately 0.5-acre area that encompasses the former Building 1122 footprint) and Parcel 41 (an approximately 0.5-acre area located immediately north of Parcel 43). The Building 1124-former car wash is located immediately east of FTMM-59.

1.4 SITE HISTORY

Multiple environmental site features have been identified at FTMM-59, and there have been numerous soil and groundwater investigations, as well as remedial actions (Versar, 2005; VEETech, 2010; FTMM Directorate of Public Works [DPW], 2012; Parsons, 2015; and NJDEP, 2008, 2011 and 2015a). The following site features (see **Figure 1.3**) do not require additional remediation as discussed further in **Section 2.2**:

- A former 1,500-gallon fuel oil underground storage tank (UST) was located west of Building 1122 and was removed in 1994.
- A former 550-gallon waste oil UST was located near the northern corner of Building 1122 and was removed in 1992; groundwater sampling from monitoring wells was initiated in this vicinity in 1997.
- Soil was removed in January 1995 from a spill of non-polychlorinated biphenyl (PCB) transformer oil from two pole-mounted transformers.

- A release of hydraulic oil from an in-ground reservoir tank for a hydraulic lift in Bay #12 was initially reported to NJDEP (case no. 95-1-11-1429-00) in 1995; the hydraulic lift and contaminated soil were subsequently removed, as discussed further in Section 2.2.4.

Soil excavation and off-site disposal was performed at the following FTMM-59 locations in 2019 and is discussed further in Section 7:

- A fuel-contaminated area north of former Building 1122 where multiple rounds of soil and groundwater sampling were performed;
- A fuel-contaminated area located beneath the western portion of former Building 1122;
- A chemical storage shed, and a paint booth shed formerly demolished and located outside and near the northwest corner of Building 1122; and
- The location of two former hydraulic lifts that were removed from Bays #9 and #10 during Building 1122 demolition in 2014.

1.5 REPORT ORGANIZATION

This RIR has been prepared in accordance with the requirements provided in N.J.A.C. 7:26E-4.9, and includes the following:

- Introduction: Section 1 details the overall scope and objective of the project, presents the organization of the report, and presents an overview of FTMM-59;
- Investigations and Remedial Actions: Section 2 details the site characterization field activities and remedial actions (including UST removals) that have been performed at FTMM-59;
- Physical Characteristics of the Site: Section 3 describes the physical setting of FTMM-59, including surface features, surface water hydrology, geology and hydrogeology, land use, and ecological setting;
- Nature and Extent of Contamination: Section 4 summarizes the degree to which sampled media (i.e., soil, groundwater, surface water, and sediment) have been impacted by site-related contamination at FTMM-59;
- Contaminant Fate and Transport: Section 5 describes the migration and fate of selected constituents present in the subsurface based upon site-specific data and the physicochemical properties of the constituents;
- Conceptual Site Model: Section 6 describes the conceptual site model (CSM) for FTMM-59 based on site-specific information obtained to date;
- Remedial Action Implementation: Section 7 presents the results of the implementation of the RAWP;
- Remedial Investigation Summary and Conclusions: Section 8 summarizes the main findings of the RI; and
- References: Section 9 includes a list of references used in the preparation of this report.

Additional information is attached to this report as appendices:

- **Appendix A** – Key Historical Reports and Background Information (also included electronically on CD);
- **Appendix B** – Soil Boring Logs and Well Construction Details;
- **Appendix C** – Analytical Data;
- **Appendix D** – FTMM-59 Remedial Action Completion Report.

SECTION 2
PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

Previous investigations have characterized many aspects of FTMM-59, including geology/hydrogeology and the chemistry of soil, groundwater, surface water, sediment, soil gas, and indoor air. In addition, multiple remedial actions for soil and groundwater have been performed by the Army. These historical investigations and remedial actions are described below as well as the RI data gap investigation performed in 2015 in accordance with the FTMM RI/FS Work Plan (Parsons, 2015). A chronology of investigations and remedial actions is provided in **Table 1.1**.

2.1 GEOLOGIC/HYDROGEOLOGIC INVESTIGATIONS

The geologic and hydrogeologic characteristics of FTMM have been investigated during numerous historical installation-wide and site-specific environmental studies. The investigations at FTMM-59 have consisted of describing soils encountered during monitoring well and soil boring drilling, measuring water levels in site monitoring wells, and constructing potentiometric surface (i.e., groundwater surface elevation contour) maps indicating the direction and magnitude of the horizontal hydraulic gradient. Historical reports are provided in **Appendix A**. Soil boring and well construction logs produced during the 2015 RI data gap investigation are presented in **Appendix B** and analytical data are presented in **Appendix C**.

2.2 SOIL INVESTIGATIONS

2.2.1 UST 1122B Waste Oil UST

A steel 550-gallon waste oil UST (Registration ID No. 81533-199, also known as UST 1122B) was removed from outside the northeast corner of Building 1122 (**Figure 1.3**) in 1992 (U.S. Army, 2019a). An Unrestricted Use, No Further Action (NFA) determination was subsequently provided by NJDEP for UST 1122B (NJDEP, 2019a; provided in **Appendix A**).

2.2.2 UST 1122A Fuel Oil UST

One 1,500-gallon fuel oil UST (Registration ID No. 81533-171, also known as UST 1122A) located west of Building 1122 (**Figure 1.3**) was removed in 1994 (U.S. Army, 2019b). An Unrestricted Use, NFA determination was subsequently provided by NJDEP for UST 1122A (NJDEP, 2019b; provided in **Appendix A**).

2.2.3 1995 Transformer Spill and Investigation

The following excerpt from a Remedial Action Progress Report (VEETech P.C., 2010; provided in **Appendix A**) describes a 26 January 1995 electrical transformer oil spill at FTMM-59 (*clarifications have been added in italics*):

> Electric utility pole #537 was accidentally toppled over by a front-end loader during construction activities at one of the storage sheds northeast *(should be "northwest")* of the Site 1122 building. Two transformers ruptured, releasing approximately 30 gallons of transformer fluid onto a grassy area 20 feet (ft) from Mill Creek. No transformer fluid entered Mill Creek. Eleven surface soil samples (one to six inches below grade) were collected from the center as well as from the northern-, southern-, eastern-, and western-most boundaries of the spill. Three of the 11 soil samples

(1"-6" center spill, 1' center spill, and 1"-6" south end of spill) exceeded the NJDEP's soil cleanup standard for TPH of 10,000 mg/kg. On January 31, 1995, approximately 155 *(spill reports indicate 15)* cubic yards of visually stained soil at the transformer fluid spill location was excavated and disposed off-site. Analyses of 12 post-excavation soil samples indicate that TPH and PCB concentrations were in compliance with *the then-current* NJDEP soil cleanup criteria.

The FTMM spill plan (U.S. Army, 2013) described the spill history for the installation and also listed this 26 January 1995 spill of approximately 30 gallons of non-PCB transformer oil at the rear of Building 1122. This reference also indicated that the event was not reportable based on the quantity of oil released, and that the release area was adequately cleaned up by the contractor that caused the spill. The location of the January 1995 excavation area is shown on **Figure 1.3.** Spill reports and analytical data from 1995 are provided in **Appendix A**.

2.2.4 1995 Removal of Failed Hydraulic Lift at Service Bay #12

Seven soil borings (B-1 to B-7) were advanced in April 1995 at the location of a failed in-ground hydraulic vehicle lift located at Service Bay #12 (**Figure 1.3)**, and one sample from each boring was analyzed for total petroleum hydrocarbons (TPH). The TPH concentration in one soil sample collected at 8 ft below ground surface (bgs) was 16,100 milligrams per kilogram (mg/kg), which exceeded the then-current NJDEP TPH soil cleanup criterion of 10,000 mg/kg. In September 1995, the failed hydraulic lift located at Service Bay #12 was removed, and approximately 46 cubic yards (CY) of visually stained soil were excavated to an average depth of 10 ft bgs and disposed offsite (VEETech, 2010). Following removal of the lift, post-excavation soil samples were collected and analyzed for TPH at five locations (**Figure 2.1**) along the side walls and at the bottom of the excavation (FTMM59-W, FTMM59-N, FTMM59-E, FTMM59-S, and FTMM59-Bottom of Hole). The concentration of TPH in the soil sample collected from the west sidewall (at approximately 10 ft bgs) of the excavation was 204,000 mg/kg, which exceeded the then-current NJDEP TPH soil cleanup criterion of 10,000 mg/kg (VEETech, P.C., 2010). Three other post-excavation soil samples collected from the east and south sidewalls and the bottom of the excavation had TPH concentrations ranging from 5,800 to 7,500 mg/kg.

Additional soil samples were collected during the 2015 Parsons RI Data Gap Investigation at this location and analyzed for NJDEP Extractable Petroleum Hydrocarbons (EPH). The results were below the NJDEP minimum EPH threshold criteria of 2,300 mg/kg (see Section 2.2.9 for further discussions).

2.2.5 2000 Soil Borings from Northeast Corner of Parking Lot

Fourteen soil borings (FTMM59-1122-1 through FTMM59-1122-14) were sampled from the northeast corner of the parking lot and near the former UST 1122B waste oil tank. The locations of the soil borings are shown on **Figure 2.1.** Soil and groundwater samples were collected from each boring. The soil samples were analyzed for volatile organic compounds (VOCs) + 15 TICs and the results (**Appendix A**) were in compliance with NJDEP soil cleanup criteria current at the time (Versar, 2005; VEETech, P.C., 2010).

2.2.6 2004 Geoprobe Investigation of Fuel-Contaminated Area

A remedial excavation was conducted at a fuel-contaminated area north of Building 1122 and south of Mill Creek in April and May 1995 (**Figure 2.1**). Approximately 3,000 cubic yards of soil

were excavated and disposed of offsite. Post-excavation soil samples were collected and reportedly in compliance with NJDEP soil cleanup criteria current at the time (VEETech, P.C., 2010).

A Geoprobe® investigation was performed in April and May 2004 (Versar, 2005) to further evaluate site soil and groundwater conditions and potential contaminant migration from the fuel-contaminated area north of Building 1122. Eighteen soil samples were collected from 5 to 11 ft bgs at 24 boring locations (FTMM59-GW1 through FTMM59-GW24) and one seep location (FTMM59-SEEP), as shown on **Figure 2.1**. Some soil samples were analyzed for VOCs + 15 TICs and TPH, while others were only analyzed for TPH. Benzene exceeded the NJDEP Impact to Ground Water Soil Screening Level (IGW SSL) in a soil sample from boring FTMM59-GW21 at a depth of 10 ft bgs (which was below the water table that was generally present at approximately 4 to 7 ft bgs). This area had previously been excavated to a depth of 8 ft bgs in 1995 (**Figure 2.1**). Benzene, ethyl benzene and xylene detections from this FTMM59-GW21 soil sample were discussed in NJDEP's (2008) comment letter; however, review of the previous RI (Versar, 2005) and associated analytical data reports indicate that these soil results were mis-reported as mg/kg rather than µg/kg, resulting in overstating the amount of contamination present. Therefore, additional soil sampling was performed during the 2015 RI Data Gap Investigation to address data gaps within the fuel-contaminated area north of former Building 1122 and is discussed in Section 2.2.9.

2.2.7 2009 and 2010 Investigation of Failed Hydraulic Lifts at Service Bays #9 and #10

In December 2009 soil borings and temporary well points FTMM59-B1 and FTMM-59-B2 (**Figure 2.1**) were advanced adjacent to a malfunctioning in-ground hydraulic lift at Service Bay #10 located in the southeast corner inside of former Building 1122 (FTMM DPW, 2012). A soil sample from FTMM59-B2 (6.5-7.0 ft bgs) contained a TPH concentration of 21,620 mg/kg which exceeded the then-current NJDEP TPH soil cleanup criterion of 10,000 mg/kg. A groundwater sample collected from FTMM59-B2 detected concentrations of SVOC TICs (1,109 J µg/L) above the NJDEP Groundwater Quality Standards (GWQS) of 500 µg/L. There were no exceedances of the NJDEP GWQS for specific targeted semi-volatile organic compounds (SVOCs). Subsequently, three soil borings/temporary well points (FTMM59-NE, FTMM59-SE and FTMM59-FE) were advanced in March 2010 adjacent to the lift and outside the building (**Figure 2.1**) to delineate the lateral extent of potential free product and soil/groundwater contamination related to this hydraulic lift. Soil samples were collected from each boring [FTMM-59-NE (5-5.5 ft bgs), FTMM-59-SE (4-4.5 ft. bgs) and FTMM-59-FE (3-3.5 ft bgs)] and analyzed for VOCs. VOCs were not detected in these samples at concentrations above the 2017 NJDEP RDCSRS.

Additional soil sampling at Bays #9 and #10 hydraulic lifts was conducted after the demolition of Building 1122 in 2014. In August 2014, seven soil borings, JB73820-1, JB73820-2, JB73820-3, JB73820-4, JB73820-5, JB73820-6, and JB73820-7 (**Figure 2.1**) were advanced in the area of the hydraulic lifts located in Bay #9 and Bay #10 after the lifts were removed and during building demolition. Soil samples were collected at the location of the former oil reservoir tanks, piping and cylinders of each hydraulic lift and analyzed for EPH from the following intervals: 1.0 to 1.5 ft bgs, 4.0 to 4.5 ft bgs, 5.5-6.0 ft bgs and 7.5 to 8.0 ft bgs.

The EPH concentrations from the soil samples collected in Service Bay #9 ranged from 16.7 mg/kg (tank location) to 30,300 mg/kg (cylinder location). The samples collected in Bay #10 had EPH concentrations ranging from 141 mg/kg (tank location) to 23,100 mg/kg (cylinder 1 location). Overall, EPH concentrations in five of the seven samples collected from Service Bay #9 and #10

exceeded the NJDEP EPH threshold criteria of 2,300 mg/kg for calculation of a sample-specific SRC using the NJDEP online EPH SRC calculator. However, calculation of sample-specific health-based EPH SRCs for these older (2014) results was not possible due to the analysis of different petroleum fractions than required by NJDEP (2010) guidance.

Due to elevated EPH concentrations at former Bay #9 (30,300 mg/kg) and Bay #10 (23,100 mg/kg), additional soil data collection was performed during the 2015 RI Data Gap Investigation, as discussed in Section 2.2.9. Removal of soil from the former Bays #9 and #10 locations was performed in 2019 to address elevated EPH concentrations in soil (which were removed to comply with state soil clean-up standards) and discussed in Section 7.0.

2.2.8 2010 Investigation of the Chemical Storage and Paint Booth Sheds

In May 2010, soil samples were collected from six soil borings (FTMM59-Shed1/B1 through FTMM59-Shed1/B3, and FTMM59-Shed2/B1 through FTMM59-Shed2/B3) adjacent to the (now demolished) chemical and paint booth sheds (**Figure 2.1**). The following exceedances of the September 2017 NJDEP RDCSRS were detected:

- The polynuclear aromatic hydrocarbons (PAHs) benzo(a)pyrene and benzo(b)fluoranthene (exceeds the IGW SSL only) at two locations (Shed 1/B3, Shed 2/B3) sampled from 0-6 inches bgs; and
- Lead at three locations (Shed1/B1, Shed1/B2 [exceeds the IGW SSL only], and Shed 1/B3) sampled from 0-6 inches bgs.

Samples collected from a depth of 0-6 inches bgs were also analyzed for pesticides, and samples collected from a depth of 0-6 inches bgs adjacent to the former Chemical Storage Shed were analyzed for PCBs, but none of the pesticide or PCB results exceeded NJDEP RDCSRS.

Vanadium also exceeded the NJDEP RDCSRS at three sample locations; however, these occurrences were consistently at lower sample depths (for example, 5.5 to 6.0 ft bgs) and therefore are not likely attributed to site-related activities at the former chemical and paint booth sheds. As a result, NJDEP (2019c and 2015b) requested additional information to confirm that vanadium in soils is due to natural background conditions. The following information is provided to address this NJDEP requirement regarding soil vanadium occurrences at FTMM-59:

- There are no identified sources of vanadium based on the former operations at FTMM-59. Operations noted at Building 1122 included automobile maintenance, wood working, and welding. None of these operations are a known source of vanadium.
- There are few anthropogenic sources for a release of vanadium, including fossil fuels, mining tailings, vanadium-enriched slag heaps, municipal sewage sludge, and certain fertilizers (Agency for Toxic Substance and Disease Registry [ATSDR], 2012), none of which are related to FTMM-59.
- Vanadium concentrations at FTMM-59 subsurface soils are within the range found in glauconitic soils in the New Jersey Coastal Plain. Dooley (2001) analyzed 113 glauconitic (whole) soil samples from the Coastal Plain and found that the vanadium concentration ranged from 1.7 parts per million (ppm) to 707 ppm with

a 62 ± 102 ppm mean. The maximum concentration of vanadium at FTMM-59 was 82.1 mg/kg, which is well within the range encountered by Dooley. Based on the data, vanadium concentrations at FTMM appear to largely or wholly be related to background conditions expected for an area with glauconitic soils, and specifically at FTMM-59 the concentrations do not appear to be indicative of a release.

- Similar soil vanadium concentrations at FTMM Parcel 80 were previously discussed (U.S. Army, 2016b; see also FTMM, 2011), and FTMM-wide vanadium concentrations (not associated with a release) were presented. NJDEP (2016) acknowledged that no further action was necessary regarding vanadium in soil at Parcel 80.
- The NJDEP RDCSRS for vanadium is based on a provisional reference dose (RfD). However, the U.S. Environmental Protection Agency (USEPA) no longer uses the provisional RfD. The current RSL is based on an RfD that is based on the vanadium pentoxide RfD that is presented in the Integrated Risk Information System (USEPA, 2017a). Therefore, in circumstances (such as at FTMM-59) where vanadium may be related to naturally occurring conditions rather than site operations, NJDEP (2016) has accepted Alternative Remediation Standard requests based upon the USEPA residential Regional Screening Level (RSL) of 390 mg/kg, which demonstrates that the maximum soil vanadium concentration sat FTMM-59 (82.1 mg/kg) is well within Federal residential exposure criteria.

Additional soil sampling was also performed during the 2015 RI Data Gap Investigation to address data gaps regarding the extent of soil exceedances at the chemical and paint booth sheds (Section 2.2.9). Removal of soil from four locations (Shed1/B1, Shed1/B2, Shed 1/B3, and Shed 2/B3) was performed in 2019 to address the exceedances of the NJDEP RDCSRS for PAHs and lead in shallow soil samples (which were cleaned-up in compliance with state soil standards) are discussed further in Section 7.

2.2.9 2015 RI Data Gap Investigation

The primary objectives of the 2015 RI data gap investigation for soil at FTMM-59 as per the RI/FS Work Plan (Parsons 2015a) were to:

- Define the vertical and lateral extent of SVOC/PAHs and lead detected in surface soil adjacent to the former Chemical Storage and /Paint Booth sheds;
- Characterize fuel hydrocarbon concentrations in soil from the fuel-contaminated area north of former Building 1122 as a follow-up to the 2004 Geoprobe® investigation; and
- Further characterize the magnitude and extent of hydraulic oil contamination at the former Service Bays located at the eastern end of former Building 1122.

Ten soil borings (FTMM59-SO-1, FTMM59 -SO-2, FTMM59-SO-5, and FTMM59-SO-10; and FTMM59-SB1, FTMM59-SB2, FTMM59-SB3, FTMM59-SB4, FTMM59-SB6, and FTMM59-SB7) as shown on **Figure 2.1** were advanced in September 2015 using a direct push rig, and soil samples were collected for laboratory analysis. The sampling was performed in accordance with the RI/FS Work Plan (Parsons, 2015) that was approved by the NJDEP (2015b).

Soil borings FTMM-59-SB1 and FTMM-59-SB2 (**Figure 2.1**) were advanced near the former Chemical Storage and Paint Booth sheds to a depth of 5 ft bgs. Two soil samples were collected at each boring location from 0 to 0.5 ft bgs and 1.5 to 2 ft bgs. The samples were analyzed for SVOCs + TICs and lead. Delineation of the 2010 SVOCs/PAH and lead in the soil was complete since concentrations detected in the 2015 samples were below the applicable NJDEP RDCSRS.

Three soil borings FTMM59-SB3, FTMM59-SB4 and FTMM59-S0-10 (**Figure 2.1**) were advanced in the area of the former hydraulic lifts. The results from each boring and a comparison to NJDEP (2019) criteria for EPH are provided below:

- **Service Bay #12**: Soil boring FTMM-59-SB3 was advanced adjacent to the west wall of the 1995 soil excavation conducted at former Service Bay #12 where the maximum post-excavation soil TPH concentration (204,000 mg/kg) was detected. The boring was advanced to 15 ft bgs and EPH samples were collected at 8-8.5 and 10-10.5 ft bgs based on historical sampling data and field screening results. The EPH concentrations (4.2 to 4.9 mg/kg; see **Table 4.1**) in the samples were below the NJDEP EPH threshold criteria of 2,300 mg/kg for calculation of a sample-specific SRC using the NJDEP online EPH SRC calculator, which is applicable to hydraulic oil.
- **Service Bay #9**: Soil boring FTMM59-SB4 was advanced approximately 15 ft west-northwest of the 2009 boring FTMM59-B2. The boring was advanced to 15 ft bgs and samples were collected for EPH analysis at 5.5-6.0 and 11.0-11.5 ft bgs based on historical sampling data and field screening results. The EPH concentrations (4.2 to 705 mg/kg; see **Table 4.1**) detected in the samples were below the NJDEP EPH threshold criteria of 2,300 mg/kg applicable to hydraulic oil.
- **Service Bay #10**: Soil boring FTMM59-SO-10 was advanced adjacent to the location of the 2009 borings (FTMM59-B1 and FTMM59-B2) located near the former Service Bay #10 hydraulic lift; free product was previously noted at FTMM59-B1 and a TPH concentration of 21,620 mg/kg was previously detected in a soil sample (6.5-7 ft bgs) from FTMM59-B2. Soil samples were collected for EPH analysis from the boring at 5.5-6 and 10-10.5 ft bgs. The highest EPH concentration (5,900 mg/kg; see **Table 4.1**) detected in the sample from 5.5-6 ft bgs was below the calculated sample-specific EPH SRC of 10,000 mg/kg applicable to hydraulic oil.

In summary, removal of soil from former Bays #9 and #10 locations was performed in 2019 to address the elevated EPH encountered in the 201 soil sampling results and the excavations are discussed in Section 7.0. These exceedances were addressed by a 2019 removal action discussed in section 7. Additional soil removal at the Bay #12 location was not performed since the 2015 EPH analytical results did not confirm the 1995 soil results. Therefore additional remedial measures for the Bay #12 area are not warranted.

Two soil borings, FTMM-59-SB6 and FTMM-59-SB7 (**Figure 2.1**) were advanced to assess the area where benzene, ethyl benzene and xylenes were detected in soil during the 2004 Geoprobe investigation of the fuel-contaminated area north of former Building 1122. Boring FTMM-59-SB6 was advanced adjacent to boring FTMM59-GW21, and FTMM-59-SB7 was located downgradient from FTMM-59-GW21. Based on field indications of petroleum contamination (visual observations and elevated photoionization detector [PID] readings) at FTMM-59-SB6, an additional step-out soil boring FTMM59-SO-1 was advanced directly south of FTMM59-GW21 to investigate soil quality beneath the western portion of the former building. Soil samples were

collected for laboratory analysis from borings FTMM-59-SB6 (6.0-6.5, 12.5-13.0 and 19.5-20.0 ft bgs), FTMM-59-SB7 (6.0-6.5 and 12.0-12.5 ft bgs) and FTMM-59-SO1 (6.0-6.5, 12.5-13, and 14.-14.5 ft bgs) and analyzed for either VOCs + TICs, EPH, and/or lead.

Boring FTMM59-SO-5 was advanced adjacent to boring FTMM59-GW14 (**Figure 2.1**), which had the highest TPH soil concentration of 6,870 mg/kg at 11 ft bgs detected during the 2004 investigation. Three soil samples were collected at this location from 7-7.5, 10-10.5, and to 14.5-15 ft bgs, and select samples were analyzed for either VOCs +TICs, EPH, and/or lead.

An additional step-out soil boring FTMM59-SO-2 was advanced to investigate soil quality just north of the estimated extent of the 1995 soil excavation from the fuel-contaminated area north of former Building 1122. Two soil samples were collected at this location from 10.5-11 and 12.5-13 ft bgs, and analyzed for VOCs + TICs, EPH, and lead. There were no NJDEP RDCSRS exceedances at this boring location.

Naphthalene was detected above the NJDEP RDCSRS of 6 mg/kg in samples collected from FTMM59-SO-1 and FTMM59-SO-5. Therefore, removal of soil from these two boring locations was performed in 2019 to address the exceedance of the NJDEP RDCSRS and the excavations are discussed in Section 7.0.

2.3 GROUNDWATER INVESTIGATIONS

2.3.1 Groundwater Monitoring Wells Overview

Two groundwater monitoring wells (1122MW01 and 1122MW02) were initially installed in 1995 adjacent to and northwest of the former waste oil UST (**Table 2.1**). Three additional wells (1122MW03 through 1122MW05) were added in 2000, and two more wells (1122MW06 and 1122MW07) were installed in 2010 and 2013, respectively. Two new wells (FTMM59-MW-1 and FTMM-59-MW-2) were installed in 2015 as part of the RI data gap investigation to support the RI. A total of nine monitoring wells were used to evaluate M59 and the well locations are shown on **Figure 2.2**.

2.3.2 2000 Groundwater Sampling from Northeast Corner of Parking Lot

Fifteen groundwater samples were collected from borings FTMM59-1122-1 through FTMM59-1122-14 (**Figure 2.1**) advanced in the northeastern corner of the asphalt parking lot in 2000. PCE was detected in groundwater at concentrations slightly exceeding NJDEP GWQS at FTMM59-1122-2 and FTMM59-1122-3 (maximum 2.67 µg/L), and bromodichloromethane slightly exceeded the GWQS at FTMM59-1122-6 (VEETech, P.C., 2010). Based on these detections, three additional groundwater monitoring wells (1122MW03 through 1122MW05) were installed downgradient of this portion of FTMM-59 in 2000.

2.3.3 2004 Geoprobe Investigation at Fuel-Contaminated Area- Groundwater

Groundwater samples were collected at boring locations (FTMM59-GW1 through FTMM59-GW24) and one seep location (**Figure 2.1**) in April 2004 during the Geoprobe investigation to further evaluate groundwater conditions and potential contaminant migration at FTMM-59. Two VOCs (benzene and PCE) and one SVOC (n-nitrosodiphenylamine) were detected in groundwater samples from the Geoprobe® borings at concentrations exceeding their respective NJDEP GWQS. Benzene concentrations ranged up to 32.9 µg/L and exceeded the 1-µg/L GWQS at three locations near the north side of former Building 1122. PCE concentrations ranged up to 1.33 µg/L and exceeded the 1-µg/L GWQS at one location near the north side of the building. Concentrations of

n-nitrosodiphenylamine ranged up to 250 µg/L and exceeded the 20-µg/L GWQS at three locations in the northeastern portion of FTMM-59 between the north end of the paved area and Mill Creek.

2.3.4 2010 Investigation of the Chemical Storage and Paint Booth Sheds - Groundwater

Groundwater grab samples collected in May 2010 adjacent to the former paint booth and chemical storage sheds (refer to **Figure 2.1**) contained concentrations of naphthalene, aluminum, antimony, arsenic, beryllium, cadmium, iron, lead, manganese, silver, and sodium that exceeded NJDEP GWQS. A permanent monitoring well (1122MW07) was subsequently installed in this area in 2011. One additional permanent monitoring well (1122MW06) was also installed in 2010, south and hydraulically upgradient of former Building 1122, to evaluate potential contaminant migration from upgradient sources.

2.3.5 2010 Failed Hydraulic Lift at Service Bay #10 - Groundwater

Groundwater samples were collected from temporary well points FTMM-59-NE, FTMM-59-SE and FTMM-59-FE and analyzed for VOCs and SVOCs. The only exceedance of a NJDEP GWQS was tetrachloroethene (PCE) in FTMM-59-NE at a concentration of 1.01 µg/L, which was slightly above the GWQS of 1 µg/L (DPW, 2012). PCE in groundwater was subsequently addressed during later groundwater monitoring (Parsons, 2014 and 2015b); PCE was not detected in any 2013 or 2014 groundwater monitoring results. NJDEP (2014, 2016) has accepted recent decisions to discontinue long-term groundwater monitoring at FTMM-59 (subject to evaluating the groundwater results this FTMM-59 RI Report) because there were no recent GWQS exceedances in these recent (2013, 2014) results.

2.3.6 2015 RI Data Gap Investigation-Groundwater

Two groundwater grab samples (FTMM-59-GG1 and FTMM-59-GG7) were collected in September to October 2015 as part of the 2015 RI data gap investigation. Due to exceedances of the NJDEP GWQS for benzene, 2-methylnaphthalene and SVOC TICs in the grab samples, two monitoring wells (FTMM-59-MW-1 and FTMM-59-MW-2) were installed downgradient of the grab sample locations. FTMM59-MW-1 (**Figure 2.2**) was installed adjacent to a 2004 boring location FTMM59-GW21 where benzene, ethylbenzene and xylene soil concentrations were detected below the water table at a depth of 10 ft bgs. FTMM59-MW-2 (**Figure 2.2**) was installed 60 ft northwest and hydraulically downgradient of FTMM59-MW-1 to determine the downgradient extent of potential fuel hydrocarbon contamination. The two new wells were sampled for VOCs and SVOCs in December 2015; results are described in Section 4.

2.3.7 Groundwater Monitoring Program

As shown in **Table 2.2**, quarterly groundwater monitoring at FTMM-59 began in 1997. Routine monitoring of 1122MW01 and 1122MW02 began in 1997, while monitoring of 1122MW03 through 1122MW05 began in 2000. Samples were analyzed for VOCs, SVOCs, metals, pesticides, and PCBs until the NJDEP granted a reduction in groundwater parameters to volatiles in an email dated November 16, 2004 (**Appendix A**). PCE was identified as the only contaminant of concern in groundwater in the initial RI for this site (Versar, 2005). Initial PCE concentrations were relatively low (7.5 ug/L in source well 1122MW01 in 1998, compared with the GWQS of 1 ug/L), and PCE concentrations in well 1122MW01 have typically decreased over time since 1999 (VEETech, 2010). In July 2010, metals were reintroduced to the analysis. Monitoring of 1122MW06 and 1122MW07 began in August 2010 and August 2013, respectively.

Following a two-year break in the groundwater monitoring program, the seven monitoring wells were again sampled in August 2013 to reestablish baseline conditions (Parsons, 2014). Well 1122MW07 was sampled in October 2014 and December 2015. Two new monitoring wells, FTMM-59-MW1 and FTMM59-MW-2 were installed in 2015. In a letter dated 16 March 2016, the NJDEP agreed to suspend groundwater sampling at FTMM-59 until the RI was completed (**Appendix A**). The long-term groundwater monitoring program had provided sufficient understanding of the groundwater chemistry and there was minimal benefit to continuing the program while site characterization was completed under the RI process. Over time, groundwater samples have been analyzed for various combinations of VOCs, SVOCs, pesticides/PCBs, and metals (refer to **Table 2.2)**.

The nine monitoring wells were re-developed to reduce groundwater sample turbidity in 2018 and 2019 and were re-sampled to clarify the nature and extent of cadmium and manganese in groundwater. Additionally, well FTMM59-MW01 was sampled in 2019 to verify that benzene concentrations were below the NJDEP GWQS. Groundwater monitoring results are summarized in Section 4.

2.4 FREE PRODUCT RECOVERY

Versar (2005) stated that free product had been observed during the 2004 investigation of the fuel-contaminated area (Section 2.2.5) but did not specify the location where free product was observed except that it had not migrated to Mill Creek. VEETech (2010) stated the sumps were installed in the steep sloping area between monitoring wells 1122MW02, 1122MW05, and Mill Creek. Three sumps were installed in 2004 as shown on **Figure 2.1** for the removal of free-phase product. Product thicknesses measured in the sumps ranged up to 1.8 inches, and a total of 6.3 pints of product were removed from June to August 2004. No product was measured in the sumps during eight rounds of gauging between September 2004 to March 2005; product thickness measurement in the sumps was subsequently discontinued (Versar, 2005). There were no observations of recoverable free product at FTMM-59 after 2004.

2.5 SURFACE WATER INVESTIGATIONS

Versar (2005) presented a summary of laboratory analyses performed for 33 rounds of surface water sampling that were conducted at up to three locations in Mill Creek from 1996 through March 2004 (sampling points SS-16, SS-23, and SS-24). These sampling points were located 1) approximately 1,100 ft west (upstream) of FTMM-59 and adjacent to landfill FTMM-02 (SS-23), 2) at the upstream end of FTMM-59 (SS-24), and 3) approximately 150 ft downstream of FTMM-59 and the upstream end of landfill FTMM-04 (SS-16)(**Figure 2.3)**. The samples were analyzed for VOCs + 15 TICs. Surface water samples collected in June 2000 were also analyzed for PCBs. An additional sampling point was located approximately 1,100 ft downstream of FTMM-59 near the junction with Parkers Creek (SS-5) (**Figure 2.3).**

Mill Creek is an FW2 surface water, which is defined by NJDEP as fresh waters that are not designated as FW1 or Pinelands Waters. A total of six VOCs were detected in surface water samples at FTMM-59 (acetone, cis-1,2-dichloroethene [cis-1,2-DCE], methylene chloride, methyl tert-butyl ether [MTBE], PCE and trichloroethene [TCE]). Of these, only methylene chloride, PCE and TCE were detected at concentrations above the NJDEP Surface Water Quality Standards (SWQS) for FW2 surface water (N.J.A.C. 7:9B). Methylene chloride is a common laboratory contaminant; however, it was detected above the SWQS in three separate sampling rounds at one

sampling collection point. Concentrations of PCE and TCE detected in surface water samples were believed to originate from a source upstream of FTMM-59, off-site of FTMM. No surface water contamination associated with FTMM-59 was identified by Versar (2005).

Two additional surface water samples (P43-SW2 and P43-SW3, **Figure 2.3**) were collected from Mill Creek adjacent to FTMM-59 as part of the 2010 Baseline Ecological Evaluation (BEE; Shaw, 2012). One surface water sample was collected in Mill Creek to the northeast of former Building 1122 at a storm water outfall, and the other sample was collected in Mill Creek at a point closest to former Building 1122. These surface water samples were analyzed for VOCs, SVOCs, target analyte list (TAL) metals, and PCBs.

No PCBs were detected in the BEE surface water samples. Two VOCs (cis-1,2-DCE and PCE) were detected in BEE surface water samples but at concentrations less than the freshwater ecological screening criteria (ESC). Therefore, VOCs were not considered chemicals of potential ecological concern (COPECs) in surface water. Six SVOCs (anthracene, benzo[a]anthracene, benzo[a]pyrene, benzoic acid, 3,3′-dichlorobenzidine, and 1,2,4-trichlorobenzene) were detected in the BEE surface water samples. Anthracene, benzo(a)pyrene, and benzo(a)anthracene concentrations exceeded the applicable freshwater ESC and were considered COPECs in surface water adjacent to FTMM-59. However, the BEE report (Shaw, 2012) indicated that anthracene and benzo(a)anthracene were also detected in Mill Creek surface water adjacent to FTMM-02, located immediately upstream of FTMM-59, at concentrations exceeding the freshwater ESC, and were considered COPECs in surface water at that site. Therefore, PAH concentrations in surface water adjacent to FTMM-59 may have an upstream source.

A total of 12 metals were detected in BEE surface water samples; only lead was detected at concentrations greater than the applicable freshwater ESC. Therefore, lead was considered a COPEC for surface water adjacent to FTMM-59 (Shaw, 2012). Total and dissolved lead were also detected in Mill Creek surface water adjacent to upstream site FTMM-02 at concentrations exceeding the freshwater ESC, and lead was considered a COPEC in surface water at that site. Therefore, similar to PAHs, lead in surface water adjacent to FTMM-59 may have an upstream source.

2.6 SEDIMENT INVESTIGATIONS

A total of six sediment samples (SD1, SD1D, SD2, SD2D, SD3, and SD3D) were collected from three distinct locations in Mill Creek adjacent to FTMM-59 during site investigation (SI) sampling in 2007 (U.S. Army BRAC, 2008). The sample locations are shown on **Figure 2.3** and results are plotted on a map in **Appendix A**. Two samples were collected at each location in the creek; one from the 0 to 6-inch interval and another from the 1 to 1.5 ft interval. Three PAHs (anthracene, chrysene, and phenanthrene) and five metals (cadmium, chromium, copper, lead, and zinc) were detected in sediment at concentrations greater than the Marine/Estuarine Sediment Screening Values-ER-L and their respective MP background concentrations (U.S. Army BRAC, 2008). Additional sediment samples were not collected during the 2010 BEE (Shaw, 2012); instead the BEE used the data from the 2007 SI described in this subsection.

Four PAHs (chrysene, dibenzo[a,h]anthracene, fluoranthene, and pyrene), and nine metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, and selenium) were considered chemicals of potential ecological concern (COPEC) in Mill Creek sediment at site FTMM-02 (directly upstream of FTMM-59) as a result of BEE sampling (Shaw, 2012). Therefore,

PAHs and metals in sediment adjacent to FTMM-59 detected during the 2007 SI may have an upstream source.

2.7 SOIL VAPOR INTRUSION INVESTIGATIONS

Vapor intrusion (VI) at former Building 1122 was evaluated during SI field work conducted in 2007 through the collection of near-slab soil gas samples, sub-slab soil gas samples, and indoor air samples (see map provided in the U.S. Army 2008 SI in **Appendix A**). PCE and TCE exceeded the then-current (2007) NJDEP Non-Residential Soil Gas Screening Levels (SGSLs) in soil gas samples collected at FTMM-59 but were not detected in indoor air within former Building 1122. Benzene and dichloromethane were detected in indoor air at concentrations greater than the NJDEP Non-Residential indoor air screening levels (IASLs) at former Building 1122. The SI report (U.S. Army BRAC, 2008) concluded that benzene and dichloromethane detections in indoor air were likely attributable to activities within the building and the use of products that contain these constituents. A second round of indoor air sampling was recommended to confirm that constituents associated with groundwater are not present above criteria for indoor air at former Building 1122. However, a follow-on VI investigation was not performed at the building because it was located outside of the critical distance from a well containing VOCs at concentrations exceeding the GWQS (i.e., 100 ft or 30 ft, depending on the contaminant) recommended by the NJDEP (2012a) VI Guidance (AECOM, 2013). Concentrations of benzene, dichloromethane, PCE and TCE in groundwater samples from site monitoring wells collected from 2009 to 2015 did not exceed NJDEP VI groundwater screening levels. Furthermore the buildings associated with the hobby shop were demolished in 2014.

2.8 ECOLOGICAL INVESTIGATIONS

A BEE (Shaw, 2012) was performed at the MP and CWA to fulfill requirements set forth in NJDEP's TRSR (N.J.A.C. 7:26E-5.3 as cited in a previous version of the TRSR). The BEE is Tier I of the ecological evaluation and ecological risk assessment process as developed by the Site Remediation Program and is defined in the TRSR and Site Remediation News (NJDEP, 1997). The objective of the BEE at FTMM was to examine each of 23 identified sites (eight ECP parcels and 15 Installation Restoration Program [IRP] sites). The BEE was developed to be an efficient and cost-effective screening process. As such, the results of a BEE are used to determine whether potential ecological impacts are negligible or whether more site-specific ecological evaluation is warranted.

Following review of available surface water and sediment data, the Final BEE Report (Shaw, 2012) concluded that constituents at FTMM-59 are unlikely to have a deleterious effect on sensitive ecological receptors or habitats, and additional ecological assessments related to this site were not warranted or recommended. The NJDEP agreed with the conclusions of the BEE in a letter dated August 27, 2012 (NJDEP, 2012b; provided in **Appendix A**). Additional ecological information pertinent to this site was obtained from the BEE report and is summarized in Section 3.5.

SECTION 3
PHYSICAL CHARACTERISTICS OF THE SITE

3.1 SURFACE FEATURES

FTMM-59 is located in the western section of the MP (**Figure 1.2**). The closest surface water body is Mill Creek located approximately 130 ft north of former Building 1122. The ground surface topography at FTMM-59 is relatively flat with a break in slope north of the pavement around former Building 1122 where the ground surface slopes to the northwest toward Mill Creek.

3.2 SURFACE-WATER HYDROLOGY

The nearest surface water body to FTMM-59 is Mill Creek which bounds the site to the north. Mill Creek originates off-post to the west, flows to the east, and turns north at the eastern end of FTMM-59. Mill Creek merges with Lafetra Creek and becomes Parkers Creek approximately 1,300 ft north of FTMM-59 (**Figure 1.2**).

3.3 GEOLOGY AND HYDROGEOLOGY

3.3.1 Regional Geology and Hydrogeology

The MP is situated on coastal plain deposits that thicken to the southeast. The regional geologic and hydrogeologic framework for the New Jersey Coastal Plain is described by Zapecza (1989), who identified 15 regional hydrogeologic units, including nine aquifers and six confining units. A regional geologic cross-section for the FTMM vicinity based on Zapecza (1989) is provided in **Appendix A** and indicates that the depth to crystalline bedrock at FTMM is approximately 1,000 ft.

The geology of the Long Branch Quadrangle (Stanford and Sugarman, 2010) indicates that the Hornerstown, Vincentown, and Tinton formations are the unconsolidated units that outcrop or occur close to the ground surface in the area of FTMM. There is a relatively thin veneer of surficial deposits that covers most of the unconsolidated material, according to the Surficial Geology of the Long Branch Quadrangle (Stanford, 2000). The 2010 bedrock geologic cross-section is included in **Appendix A**.

The Hornerstown Formation, which underlies much of the MP, consists of glauconitic (>50%) clay and silty clay. This unstratified formation is olive, dark green, and black where unweathered and olive-brown with brown to reddish-brown mottles where weathered (Stanford and Sugarman, 2010). The Hornerstown Formation is 25 to 30 ft thick. The Vincentown Formation, which unconformably overlies the Hornerstown Formation, consists of glauconitic (5-20%), silty, medium-to-coarse, quartz sand; some fine-to-medium sand; and some very coarse sand to very fine pebbles. This formation is yellow, reddish-yellow, olive yellow, or olive-brown in color and has a total thickness of 180 ft.

The Tinton (Sand) Formation unconformably underlies the Hornerstown Formation and conformably overlies the Red Bank Sand and consists of glauconitic (5-30%), silty, medium-to-coarse and fine-to-medium, quartz sand. The color is reddish-brown, reddish-yellow, yellowish-brown where weathered, and grayish-brown, brown, and olive-brown where unweathered. It is commonly iron-cemented into beds and masses as much as 15 ft thick. The uppermost four to six ft, just below the contact with the Hornerstown Formation, is a brown to olive-gray, glauconitic, clayey silt to sandy or silty clay (Stanford and Sugarman, 2010).

The water table aquifer in the MP and CWA areas is identified as part of the "Navesink-Hornerstown Confining Units," or minor aquifers. The minor aquifers include the Navesink Formation, Red Bank Sand, Tinton Sand, Hornerstown Sand, Vincentown Formation, Manasquan Formation, Shark River Formation, Piney Point Formation, and the basal clay of the Kirkwood Formation. These geologic formations comprise a "Composite Confining Bed" for the underlying Wenonah Mount Laurel Aquifer (Zapecza, 1989). The Composite Confining Bed is estimated to be approximately 125 ft thick at FTMM (Versar, 2005). Wells installed in the Red Bank and Tinton Sands produce 2 to 25 gallons per minute (gpm) (Jablonski, 1968). Regionally, groundwater in this water table aquifer flows east towards the Atlantic Ocean.

A pumping test performed at FTMM in 1992 yielded a hydraulic conductivity of 32 gallons per day per square foot (gpd/ft^2) (4.3 feet per day [ft/day]) (Groundwater & Environmental Services, Inc. [GES], 1999). The location of the pumping test and the geologic unit tested are not known. Twenty-one hydraulic conductivity values derived from slug tests performed in monitoring wells installed at various building areas ranged from 0.3 ft/day to 31.7 ft/day with a geometric mean value of 3.2 ft/day.

3.3.2 Site-Specific Geology and Hydrogeology

FTMM-59 overlies the unconsolidated sediments of the Hornerstown Formation, according to the Bedrock Geologic Map of the Long Branch Quadrangle (Stanford and Sugarman, 2010). Naturally deposited surficial soils also exist above the unconsolidated sediments (Stanford, 2000). Observations from drilling monitor wells and borings in 2015 indicate that fill material consisting of orange, tan, brown, or gray fine to coarse sand and fine gravel is present to depths of 1 to 6 ft bgs throughout the site. Sediments underlying the fill layer at approximately 1 to 6 ft bgs, and continuing to approximately 10 ft bgs, generally consist of olive green, green brown, or mottled orange and green glauconitic sand and clay, which transition at approximately 10 ft bgs to a red/orange brown or mottled orange green soft clay until approximately 12 ft bgs; the soft clay is underlain by olive green grey or black silty clay or peat. These primarily fine-grained sediments are consistent with the lithology of the Hornerstown Formation. Two geologic cross-sections (A-A' and B-B') prepared by Versar (2005) and provided in **Appendix A** are generally consistent with the 2015 observations. Historic boring logs are provided in **Appendix A** and logs from the 2015 drilling event are provided in **Appendix B**.

The depth to groundwater in the FTMM-59 area is approximately 6 to 10 ft bgs. September 2014 and December 2015 (**Table 3.1)** groundwater elevation data from site wells were used to create potentiometric contour maps for shallow groundwater as presented in **Figures 3.1 and 3.2**. Groundwater flow in the shallow groundwater zone is to the north to northwest towards Mill Creek. The hydraulic gradient was approximately 0.044 foot per foot (ft/ft) as calculated in September 2014 (**Figure 3.1**) and ranged from approximately 0.038 ft/ft to 0.133 ft/ft in December 2015 (**Figure 3.2**). Groundwater in the area is within a Class IIA aquifer designated by the NJDEP in NJAC 7:9C. The calculated hydraulic conductivity values obtained from slug testing ranged from 0.85 ft/day at monitoring well 1122MW02 to 7.10 ft/day at well 1122MW03, with a calculated geometric mean of 3.1 ft/day (Versar, 2005).

3.4 LAND USE

FTMM-59 formerly housed a "do-it-yourself" auto repair shop in former Building 1122 for Installation personnel. Building 1122, the nearby chemical storage and paint booth sheds were

demolished in 2014; since then FTMM-59 has been vacant. The ground surface consists of a combination of broken pavement and un-mowed grass. The anticipated future land use at FTMM-59 according to FMERA (2019) includes mixed-use, office and institutional development, with "civic uses" as an accepted development strategy.

3.5 ECOLOGY

Major vegetation zones at FTMM consist of landscaped areas, estuarine and freshwater wetlands, riparian areas, upland forests, and old field habitats. Much of the upland areas of the MP consist of extensive areas of regularly mowed lawns and landscaped areas (Shaw, 2012). FTMM-59 includes an open, partially vegetated area north of former Building 1122. Mill Creek is located to the north of FTMM-59. The BEE (Shaw, 2012) indicated that the banks of Mill Creek are wetland areas with suitable habitats for endangered, threatened, or priority wildlife species, but there were no confirmed occurrences of such species. The geographic information system (GIS) digital data provided by NJDEP indicated that the wetland areas were deciduous wooded wetlands (Shaw, 2012).

Except for occasional transient species, no federally listed or proposed threatened or endangered flora or fauna are known to exist at FTMM. There was one observance in 1992 of a New Jersey-listed endangered species, the clustered sedge. No federal- or state-listed species were observed during the BEE site visit conducted on the MP in September 2009. In an August 27, 2012 letter, the NJDEP (2012b) approved "no additional ecological evaluation or assessment for the Main Post" (provided in **Appendix A)**.

SECTION 4
NATURE AND EXTENT OF CONTAMINATION

Environmental sampling results for FTMM-59 soil, groundwater, surface water, and sediment are described in this section.

4.1 SOIL QUALITY

Soil analytical data collected during previous (1992 to 2014) soil investigations and the 2015 investigation for the current RI are summarized in the following subsections. Analyses of soil samples have included VOCs, SVOCs, TPH, EPH, pesticides, PCBs, and/or metals. Soil sample locations are shown on **Figure 2.1**. Soil boring logs for FTMM-59 monitoring wells and the 2015 soil borings are in **Attachment B.** Laboratory analytical reports of the 2015 RI data are included in electronic form in **Attachment C. Table 4.1** shows the sampling results for detected analytes only and the NJDEP September 2017 comparison criteria including:

- RDCSRS,
- Non-Residential Direct Contact Soil Remediation Standards (NRDCSRS),
- Impact to Groundwater-Soil Screening Levels (IGW-SSL) (if soil samples were collected below the groundwater table then the IGW-SSL is not applicable), and
- Maximum background metal concentrations presented by Weston (1995).

A summary of the soil exceedances is presented in **Table 4.2**.

Soil samples excluded from this report (as well as **Tables 4.1** and **4.2**) due to inadequate location and analytical information include the following:

- Post-excavation samples collected in 1995 following the excavation of 3,000 cubic yards of fuel contaminated soil north of former Building 1122 and target analyte concentrations were reportedly in compliance with NJDEP soil cleanup criteria current at the time. Additional soil samples were collected from this area during a 2004 Geoprobe Investigation (Section 2.2.6) and the 2015 RI Data Gap Investigation (Section 2.2.9).
- Post-excavation samples collected in 1995 in association with the electrical transformer spill investigation (Section 2.2.3); target analyte concentrations were reportedly in compliance with NJDEP soil cleanup criteria current at that time.

The soil sampling results that are presented in **Table 4.1** and compared to NJDEP criteria and the 1995 Western Background metals include the following:

- Five post-excavation soil samples (FTMM-59-C92-678/679, FTMM59-C92-680/681, FTMM59-C92-682/683, FTMM59-C92-684/685, and FTMM59-C92-686/687) that were collected following the removal of waste oil UST 1122B in 1992, and analyzed for a limited list of VOCs, SVOCs, and TPH. This UST subsequently received an NFA determination from NJDEP (2019a).
- Thirteen post-excavation soil samples (including two duplicate samples; FTMM-SITE A through FTMM-SITE F and FTMM-SITE AA through FTMM-SITE EE) that were

collected following the removal of former No. 2 fuel oil UST 1122A and associated piping in 1994 and analyzed for TPH; this UST subsequently received an NFA determination from NJDEP (NJDEP, 2019b).

- Five post-excavation samples (FTMM59-E, FTMM59-Bot, FTMM59-N, FTMM59-S, and FTMM59-W) that were collected in September 1995 following removal of the failed hydraulic lift in Service Bay #12 of former Building 1122 and analyzed for TPH (Section 2.2.4).
- Fifteen soil samples (including one field duplicate sample; sample ID FTMM59-1122-1 through FTMM59-SS-1122-14) that were collected in March 2000 from 14 soil borings advanced in the northeastern corner of the asphalt parking lot near former waste oil UST 1122B; samples were analyzed for VOCs+TICs (Section 2.2.5).
- Eighteen soil samples (FTMM59-SEEP and FTMM59-GW5 through FTMM59-GW21) that were collected in April-May 2004 during a Geoprobe® investigation of the fuel-contaminated area north of former Building 1122 (Section 2.2.6) and analyzed for VOCs+TICs and/or TPH, depending on the location.
- Five soil samples (FTMM59-B1 [no data exists], FTMM59-B2, FTMM59-NE, FTMM59-SE and FTMM59–FE) that were collected in 2009 and 2010 near the hydraulic lift in Service Bay #10 (Section 2.2.7) and analyzed for VOCs or TPH, depending on the specific sample location (Section 2.2.7).
- Twelve soil samples (FTMM59-Shed1/B1, FTMM59-Shed1/B2, FTMM59-Shed1/B3, FTMM59-Shed2/B1, FTMM59-Shed2/B2, and FTMM59-Shed2/B3) that were collected from six soil borings in May 2010 adjacent to the former Chemical Storage and Paint Booth Sheds (Section 2.2.8) and analyzed for SVOCs+TICs, metals, pesticides, and/or PCBs depending on the specific sample location and depth (Section 2.2.8).
- Seven soil samples (JB73820-1, JB73820-2, JB73820-3, JB73820-4, JB73820-5, JB73820-6, and JB73820-7) that were collected from seven borings in August 2014 at Bays #9 and #10 hydraulic lifts (Section 2.2.7) and analyzed for EPH.
- Twenty-five soil samples that were collected from ten soil borings (FTMM-59-SB1, FTMM-59-SB2, FTMM-59-SB3, FTMM-59-SB4, FTMM-59-SB6, FTMM-59-SB7, FTMM-59-SO1, FTMM-59-SO2, FTMM-59-SO5, and FTMM-59-SO10.) at various locations across the site in September 2015 during the RI data gap investigation (Section 2.2.9). The samples were analyzed for various suites of target analytes depending on the specific sample location (Section 2.2.9).

4.1.1 Summary of Exceedances of Residential Direct Contact Comparison Criteria

Concentrations of the following constituents exceeded the 2017 NJDEP RDCSRS in at least one of the 98 soil samples collected from 1992 to 2015 and analyzed for VOCs, SVOCs, TPH, EPH, pesticides, PCBs, and/or metals (**Table 4.2**).

- The VOC naphthalene;
- The SVOC benzo(a)pyrene; and

- The metals lead and vanadium.

TPH no longer has criteria for direct comparison, however in accordance with the NJDEP Evaluation of Extractable Petroleum Hydrocarbons in Soil Technical Guidance, (Version 1.0, June, 2019) and the Health Based and Ecological Screening Criteria for Petroleum Hydrocarbon Frequently Asked Questions (Version 4.0, August 9, 2010), TPH concentrations were compared to the NJDEP EPH threshold criteria of 2,300 mg/kg, and 12 TPH samples exceeded this criterion. However, 17 fractionated EPH samples were collected throughout FTMM-59 during the 2015 RI data gap evaluation, including resampling at the highest TPH exceedance locations; therefore, the EPH sample results were used for further assessment of the site.

Only one of the 17 soil samples analyzed for EPH (FTMM-59-SO-10, 5.5-6.0 ft at 5,900 mg/kg) exceeded the EPH threshold criteria of 2,300 mg/kg; therefore, a site-specific SRC for EPH was determined in accordance with NJDEP (2019) guidance using the NJDEP's EPH calculator. The site-specific SRC was determined to be 10,000 mg/kg for this sample, which is greater than the detected EPH concentration; therefore, remediation for EPH is not necessary at this sample location. The EPH calculator spreadsheet is provided in **Table 4.3**.

4.1.2 Summary of Exceedances of Non-Residential Direct Contact Comparison Criteria

The following constituents were detected at concentrations that exceeded the 2017 NJDEP NRDCSRS in at least one of the 98 soil samples collected from 1992 to 2015 and analyzed for VOCs, SVOCs, TPH, EPH, pesticides, PCBs, and/or metals (**Table 4.2**).

- The VOC naphthalene;
- The SVOC benzo(a)pyrene;
- The metal lead.

Using the same rationale as presented for residential criteria in the last two paragraphs of Section 4.1.1, there were no exceedances of non-residential criteria for soil TPH and EPH results (see also **Table 4.3**).

4.1.3 Summary of Exceedances of Impact to Groundwater Soil Screening Level Comparison Criteria

The following constituents were detected at concentrations that exceeded the NJDEP IGW SSL in at least one of the 98 soil samples collected from 1992 to 2015 and analyzed for VOCs, SVOCs, TPH, EPH, pesticides, PCBs, and/or metals (**Table 4.2**). However, if soil samples were collected below the groundwater table of 6 ft bgs (sample depths are noted in the Sample ID field of Table 4.1) then the IGW SSL is not applicable for FTMM-59.

- The VOC methylene chloride. Methylene chloride is a common laboratory contaminant and is not associated with FTMM-59 site related activities.
- The SVOCs benzo(a)pyrene, and benzo(b)fluoranthene;
- The pesticide dieldrin; and
- The metals aluminum, beryllium, lead, manganese, mercury, silver, and zinc.

4.1.4 Summary of Soil Findings

The VOC naphthalene exceeded the NJDEP RDCSRS of 6 mg/kg at the following soil boring locations (**Figure 4.1**):

- FTMM-59-SO-01 (54 mg/kg at 6 to 6.5 ft bgs) located beneath the western portion of former Building 1122, and
- FTMM-59-SO-05 (7.2 mg/kg at 7 to 7.5 ft bgs) located north of former Building 1122 fuel contaminated area.

Potential sources of naphthalene in soil include historic auto hobby shop activities resulting in the fuel contamination in soil in the western portion of the building. The area north of former Building 1122 was initially remediated by soil excavation in 1995, and further investigated in 2004 and 2015 (Sections 2.2.5 and 2.2.9). Additional remedial measures were warranted to address the naphthalene exceedance of the NJDEP criteria in the soils as presented in the RAWP (Parsons , 2019). Implementation of the RAWP is described in Section 7.0.

The SVOC benzo(a)pyrene exceeded the NJDEP RDCSRS of 0.5 mg/kg at two locations associated with the Chemical Storage and Paint Booth Sheds (**Figure 4.2**) and include:

- Paint Booth Shed FTMM59-Shed1/B3 (2.04 mg/kg at 0 to 0.5 ft bgs), and
- Chemical Storage Shed-FTMM59-Shed2/B3 (1.03 mg/kg at 0 to 0.5 ft bgs).

Potential sources of benzo(a)pyrene in soil could include spills or discarded materials from historic auto hobby shop activities in the area. Additional remedial measures to address the exceedance of NJDEP benzo(a)pyrene criteria in soils were addressed in the RAWP (Parsons, 2019). Implementation of the RAWP is described in Section 7.0.

Lead exceeded the NJDEP RDCSRS of 400 mg/kg at two locations associated with the Chemical Storage and Paint Booth Sheds (**Figure 4.3**) and include:

- Paint Booth Shed FTMM59-Shed1/B1 (545 mg/kg at 0 to 0.5 ft bgs),
- Chemical Storage Shed FTMM59-Shed1/B3 (2840 mg/kg at 0 to 0.5 ft bgs),

Potential sources of lead in soil could include spills or discarded materials from historic auto hobby shop activities in the area of the sheds or lead-based paints. Additional measures were warranted to address the lead exceedance of NJDEP criteria in soils and were included in the RAWP (Parsons, 2019).

The soil mitigation activities were completed in May through August 2019 (see Section 7) and post-excavation confirmation sample results showed that soils were in compliance with state clean up criteria (RDCSRSs).

Vanadium exceeded the NJDEP RDCSRS of 78 mg/kg at three soil boring locations associated with the Chemical Storage and Paint Booth Sheds (**Table 4.1**): FTMM59-Shed1/B1 (82.1 mg/kg at 5.5 to 6.0 ft bgs), FTMM59-Shed1/B3 (81.3 mg/kg at 5 to 5.5 ft bgs), and FTMM59-Shed2/B1 (79.1 mg/kg at 5 to 5.5 ft bgs). The concentrations of vanadium in soils are due to natural background conditions (Section 2.2.8).

As described in Section 4.1.1 petroleum hydrocarbons in soil have been analyzed using both EPH and the older TPH methods (**Table 4.1**). Elevated TPH results for soil were found in the 1995 data (associated with the removal of the hydraulic lift at Bay #12) and in the 2009 data (associated with the investigation of the hydraulic lifts at Bays #9 and #10). SRCs cannot be calculated using TPH results (NJDEP, 2019d); therefore, soil borings were subsequently advanced adjacent to the locations with highest historical TPH concentrations and analyzed for EPH as part of the RI data gap investigation in 2015. As presented in Section 4.1.1, EPH results were less than the NJDEP threshold EPH criteria of 2,300 mg/kg, except one EPH result from boring FTMM-59-SO-10, which was less than the SRC calculated for that sample. After collection of the 2015 RI data, additional soil EPH results were found in data that had been collected in 2014 following removal of the hydraulic lifts at Service Bays #9 and #10. Based on the additional soil EPH data, additional mitigation measures were warranted and included in the RAWP for Service Bays #9 and #10 (Parsons, 2019). The soil mitigation activities were completed in May through August 2019 (see Section 7) and post-excavation confirmation sample results showed that soils were in compliance with state clean up criteria (RDCSRSs) for the following areas within FTMM-59:

- Locations of naphthalene exceedances of the RDCSRS beneath the western portion of former Building 1122 (FTMM-59-SO-01) and the fuel contaminated area north of former Building 1122 (FTMM-59-SO-05);
- Locations of lead and benzo(a)pyrene exceedances of the RDCSRS near the Chemical Storage and Paint Booth Sheds; and
- EPH exceedances at former Service Bays #9 and #10 hydraulic lifts.

4.2 GROUNDWATER QUALITY

The groundwater monitoring program conducted from May 1997 to July 2019 is summarized in **Table 2.2**. Monitoring well locations are shown on **Figure 2.2,** and well construction details are provided in **Table 2.1**. Quarterly monitoring of five wells (1122MW01 through 1122MW05) was performed from 1997 through July 2011. Well 1122MW06 was installed in 2010 and sampled quarterly to 2011, and well 1122MW07 was installed in 2011 but not sampled prior to the 2013 Baseline Sampling Event. The 2013 Baseline Groundwater Report (Parsons, 2014) demonstrated there were no GWQS exceedances for VOCs in the 2013 results for the wells present at that time (1122MW01 through 1122MW07) and recommended resampling the newest well 1122MW07 for two additional rounds to confirm the 2013 results. NJDEP (2014b) agreed with this recommendation and the well was sampled in October 2014 and December 2015. Temporary suspension of the groundwater monitoring program during the RI characterization phase was agreed to by NJDEP (NJDEP, 2016) and monitoring was to be reinstated as needed following completion and acceptance of this RIR by NJDEP.

Two groundwater grab samples (FTMM-59-GG1 and FTMM-59-GG7) were collected in September/ October 2015 as part of the 2015 RI. Due to exceedances of the NJDEP GWQS for benzene, 2-methylnaphthalene and SVOC TICs in the grab samples, two additional monitoring wells (FTMM-59-MW-1 and FTMM-59-MW-2) were installed downgradient of the grab samples and sampled in December 2015 during the RI field investigation. Well FTMM-59-MW-1 was re-sampled in August and November 2019 for analysis of benzene.

Initial technical evaluation of the RI groundwater data collected in 2015 indicated possible concerns with cadmium and manganese in groundwater, which were not adequately characterized (see Section 4.2.3); therefore, the nine Site wells were re-developed and then sampled in August 2018 and July 2019 for analysis of cadmium and manganese.

4.2.1 Summary of Groundwater Sampling Results from 1997 to 2009

Based on the results of groundwater sampling conducted from December 1997 to January 2001, Versar (2005) concluded that the only constituent of concern (COC) at FTMM-59 was PCE and recommended a reduction in sampling parameters to VOCs only. NJDEP agreed with this recommendation in an email dated 16 November 2004 (**Appendix A**). The maximum historical PCE concentration was 9 µg/L at well 1122MW01 in 1999. The remedial action progress report (RAPR) for 2nd Quarter 2004 through 4th Quarter 2008 (VEETech, 2010) demonstrated a decreasing trend for PCE concentrations, which have been below the NJDEP GWQS at well 1122MW01 since 2007 (**Table 4.4**).

4.2.2 Summary of Groundwater Sampling Results from November 2009 through December 2015

Groundwater analytical results for only those compounds detected are presented in **Table 4.4**. **Table 4.5** summarizes the number of times concentrations of a detected analyte were greater than the NJDEP GWQS from November 2009 through December 2015.

Concentrations of the following constituents exceeded their current NJDEP GWQS in at least one of the multiple samples collected from November 2009 through December 2015:

- The VOC benzene was detected above the GWQS of 1 µg/L in monitor well FTMM-59-MW01 at concentrations ranging from 1.2 J µg/L to 4.5 J µg/L (where "J" indicates an estimated value). Additional sampling for benzene was performed in 2019 to further assess this exceedance, as discussed in Section 4.2.4.
- The VOC bromodichloromethane was detected above the GWQS of 1 µg/L in monitor well 1122MW01 during one sample event (April 2010) at a concentration of 2.26 µg/L. This analyte did not exceed the GWQS in 8 sample events since then and therefore bromodichloromethane is not a groundwater constituent of concern.
- The VOC PCE was detected above the GWQS of 1 µg/L in monitor well 1122MW03 during one sample event (November 2009) at a concentration of 1.38 µg/L. This analyte did not exceed the GWQS in 7 sample events since then. Historically PCE exceeded the GWQS in well 1122MW01, but as discussed in Section 4.2.1, PCE has been below the GWQS in this well since 2007. Therefore, PCE is not a groundwater constituent of concern.
- The SVOC 2-methylnaphthalene was initially detected above the GWQS of 30 µg/L in grab sample FTMM-59-GG1 in 2015, but the concentrations of this analyte were below the GWQS in permanent monitor well FTMM-59-MW01. In comparison to grab sample results, the results from the permanent well is more representative of groundwater conditions because the permanent well was developed and purged prior to the implementation of low flow groundwater sampling. Therefore 2-methylnaphthalene is not a groundwater constituent of concern.

- Similar to 2-methylnaphthalene, the SVOC bis(2-ethylhexyl) phthalate was detected above the GWQS of 3 µg/L in grab sample FTMM-59-GG7, but this analyte was not detected in permanent monitor well FTMM-59-MW02. In comparison to grab sample results, the results from the permanent well is more representative of groundwater conditions because the permanent well was developed and purged prior to the implementation of low flow groundwater sampling. Also, bis(2-ethylhexyl) phthalate is a common laboratory contaminant and is likely not attributable to Site contamination. Therefore bis(2-ethylhexyl) phthalate is not a groundwater constituent of concern.
- The metals aluminum, antimony, arsenic, beryllium, cadmium, iron, lead, manganese, selenium, and sodium.

The metals aluminum, antimony, arsenic and lead did not exceed the maximum background concentration for the MP established by Weston (1995) and therefore were not evaluated further. Essential nutrients (iron and sodium) were also not evaluated further. The remaining metals that were detected at concentrations exceeding their NJDEP GWQS, exceed the maximum background concentration for the MP (Weston, 1995) and were not essential nutrients include beryllium, cadmium, manganese, and selenium. Exceedances of background levels for the remaining metals listed above were further evaluated below.

- The maximum background concentration for beryllium (2.1 µg/L; Weston, 1995) was exceeded only three times out of 41 samples collected during the most recent sampling events. Beryllium concentrations in samples from upgradient well 1122MW06 exceeded the 1-µg/L GWQS during four consecutive low-flow sampling events in 2010 and 2011 (**Table 4.4**). The maximum detected beryllium concentration from November 2009 to December 2015 was 2.64 µg/L in 1122MW03; this concentration is similar to the maximum concentration detected in upgradient well 1122MW06 during the same time period (1.96 µg/L). These data indicate that beryllium is not a site-related contaminant in FTMM-59 groundwater.
- The maximum background concentration for cadmium (9.5 µg/L; Weston, 1995) was exceeded in only 3 of 41 samples. These exceedances occurred in groundwater from monitoring well 1122MW01 in January and April 2011. Although these exceedances may have been an anomaly, based on the limited data set following these exceedances, and the detected concentrations during previous sampling events, cadmium was retained as a possible site-related analyte.
- The maximum background concentration for manganese (331 µg/L; Weston, 1995) was exceeded in the 2015 samples from well 1122MW07. Because of the limited data set, manganese was conservatively not attributed to background, although based on the maximum detection of 385 µg/L, which is similar to the maximum background concentration, it may be representative of natural background conditions at FTMM-59. However, manganese was retained as a possible site-related analyte.
- The maximum background concentration for selenium (29.6 µg/L; Weston, 1995) was exceeded in six out of 41 samples. The exceedances were isolated and anomalous and were followed by multiple non-detect sampling events. In addition, the highest concentration was detected in the upgradient well, 1122MW06. Therefore, selenium is

not considered to be site-related, and is considered to be representative of background conditions.

4.2.3 Summary of Cadmium and Manganese Results from 2018 and 2019

An initial technical evaluation of the RI groundwater data was performed in 2018 that indicated possible environmental concerns with cadmium and manganese in groundwater. Upon further evaluation of the available groundwater data, it was determined that the data quality was not sufficient to adequately delineate the exceedances of the GWQS for cadmium and manganese for the following reasons:

- Metals were not collected from most site wells in the 2013 Baseline monitoring events because metals were not identified as an analyte of concern during project planning;
- Metals data was only collected from 2010 to 2011 for the older site wells, and results appeared to be affected by sample turbidity (no documentation of previous use of low-flow sampling was encountered);
- There was no indication that site wells 1122MW01 through 1122MW05 had been re-developed since the wells were constructed from 1997 to 2000 (well re-development can be used to help mitigate some sample turbidity effects);
- There was only one round of metals data available for well 1122MW07 and no metals data for the most recent wells FTMM-59-MW-01 and FTMM-59-MW-02.

To address this data gap, all nine Site wells were re-developed in July 2018, and then re-sampled in August 2018 and July 2019 for cadmium and manganese analyses. These metals results are presented in **Table 4.4** and on **Figures 4.4** and **4.5.**

Exceedances of the NJDEP GWQS for cadmium of 4 µg/L were confirmed in the 2018 and 2019 analyses. Groundwater concentrations of cadmium in August 2018 ranged from non-detected to 7.7 µg/L, with the highest concentration of cadmium detected in side-gradient well 1122MW03. The distribution of cadmium in groundwater (**Figure 4.4**) does not indicate that FTMM-59 is a source of cadmium; instead, the higher concentrations of cadmium in side-gradient well 1122MW03 suggests an offsite source of cadmium. Therefore, cadmium in groundwater is not attributable to site-related activities at FTMM-59.

Exceedances of the NJDEP GWQS for manganese of 50 µg/L (a secondary drinking water parameter) were also confirmed in the 2018 and 2019 analyses. Groundwater concentrations of manganese in August 2018 ranged from 26 to 1,500 µg/L, with the highest concentration of manganese detected in the upgradient well 1122MW06. The distribution of manganese in groundwater (**Figure 4.5**) does not indicate that FTMM-59 is a source of manganese; instead, the higher concentrations of manganese in upgradient well 1122MW06 suggests an offsite source of manganese. Therefore, manganese in groundwater is not attributable to site-related activities at FTMM-59.

4.2.4 Summary of Benzene Results from 2019

As described in Section 4.2.2, benzene was detected in one well (FTMM-59-MW-1) in 2015 at concentrations (1.2 J to 4.5 J ug/L) that were slightly above the GWQS of 1 ug/L. Therefore, two additional rounds of sampling for benzene were conducted in 2019 to assess if an exceedance

was still present. Benzene concentrations in July and November 2019 (0.62 J ug/L and non-detected, respectively) were less than the GWQS (**Table 4.4**). Therefore, the benzene exceedance at well FTMM-59-MW-1 is no longer present, and benzene is not a groundwater constituent of concern.

4.2.5 Summary of Groundwater Findings

Benzene in one well was detected at concentrations (1.2 J to 4.5 J ug/L) in 2015 that were slightly above the GWQS of 1 ug/L; however, two additional rounds of sampling for benzene conducted in 2019 indicate that this exceedance is no longer present. Cadmium and manganese exceeded their respective GWQS in recent (2018 and 2019) groundwater samples; however, based on the concentration distribution, both cadmium and manganese are not attributable to FTMM-59 site-related activities. Additional remedial measures such as monitoring, or remediation are not required for groundwater at FTMM-59.

4.3 SURFACE WATER QUALITY

The results of surface water quality monitoring at FTMM-59 have been previously reported (Versar, 2005; Shaw, 2012) and are summarized in Section 2.6. Representative surface water sampling results from 2007 to 2010 are presented in **Table 4.6**, and sample locations are shown on **Figure 2.3**. Data for SS-16, which was located immediately downstream of FTMM-59, are not included in **Table 4.6** because this location was not sampled after August 2004.

PCE concentrations in surface water samples collected in Mill Creek at the nearest upstream location (SS-24), and the far-downstream location (SS-5) from the 1st Quarter 2007 through the 3rd Quarter 2010 exceeded the freshwater Surface Water Quality Standards (SWQS) for PCE of 0.34 µg/L during almost every sampling event (**Table 4.6**). PCE concentrations generally decreased in the downstream direction. PCE concentrations measured in Mill Creek at upstream surface water site FTMM-02 confirm previous reports (Versar, 2005; Shaw, 2012) that PCE at FTMM-59 originates from an upstream source. TCE also exceeded the SWQS at upstream location SS-24 in March 2009 but has since been detected at lower concentrations. TCE is a breakdown product of PCE, and is likely to have the same upstream, offsite source as PCE. In summary, the PCE and TCE concentrations in Mill Creek surface water are attributed to a source upstream of FTMM-59 (Shaw, 2012).

4.4 SEDIMENT QUALITY

Sediment sampling was conducted in Mill Creek adjacent to FTMM-59 in December 2007 as part of the SI of ECP parcels, including Parcel 43 which includes FTMM-59 (U.S. Army BRAC, 2008). Six samples were collected from three borings (locations SD1/SD1D, SD2/SD2D, and SD3/SD3D; **Figure 2.3**) and sample depths ranged from surface (0 to 6 inches below grade) to near surface (1-1.5 ft.) at each boring. Samples were analyzed for VOCs, SVOCs, PCBs, and TAL metals (**Tables 4.7**). Sediment sample results were compared to NJDEP human health-based criteria for soil for comparison purposes to determine if sediment contamination was associated with FTMM-59.

There were no exceedances of the NJDEP RDCSRS for VOCs, and no PCBs were detected. Benzo(a)pyrene and vanadium exceeded the NJDEP RDCSRSs in FTMM-59 sediment samples (**Table 4.7**). However, as described in Section 2.7, multiple PAHs and metals were considered COPECs in Mill Creek sediment at landfill site FTMM-02 (directly upstream of FTMM-59) as a

result of BEE sampling (Shaw, 2012). Therefore, PAHs and metals concentrations in Mill Creek sediment adjacent to FTMM-59 are attributable to a source upstream of FTMM-59.

SECTION 5
CONTAMINANT FATE AND TRANSPORT

This section addresses the fate and transport of SVOCs and metals detected in soil at FTMM-59 at concentrations exceeding NJDEP criteria and (in the case of metals) maximum background concentrations (see Section 4.1 for descriptions of sampling results for soil). The fate and transport of detected constituents in groundwater are not addressed because VOCs and SVOCs are not groundwater constituents of concern, and metals in groundwater are not attributable to FTMM-59 site-related activities. The fate and transport of detected constituents in surface water and sediment are not addressed because the BEE concluded that the area of contamination is limited in extent, with no definitive spatial distribution of constituents that would suggest the source of the constituents is related to site activities at FTMM-59.

The environmental fate and transport of a contaminant is controlled by the contaminant's physical and chemical properties and the nature of the subsurface media through which the contaminant is migrating (USEPA, 1998).

Unless otherwise indicated in the text, the fate and transport information presented in this section was derived from the following primary sources:

1. The online Toxnet Hazardous Substances Data Bank (HSDB) http://toxnet.nlm.nih.gov/cgi-bin/sis/search;
2. Toxicological profiles prepared by ATSDR (2013) (http://www.atsdr.cdc.gov/toxprofiles/index.asp); and
3. The Framework for Metals Risk Assessment (USEPA, 2007).

5.1 POTENTIAL ROUTES OF MIGRATION

Potential migration routes for contaminants detected in soil at FTMM-59 include the following:

- Dissolution of soluble residual contamination in soil into infiltrating precipitation that percolates through the vadose zone to the water table;
- Volatilization into soil gas and/or the atmosphere; and
- Primarily lateral migration of contaminants dissolved in groundwater toward Mill Creek.

5.2 CONTAMINANT PERSISTENCE AND MIGRATION IN SOIL

Naphthalene, benzo(a)pyrene, and lead were identified as the primary constituents above the NJDEP RDCSRS criteria in soil.

Shorter-chain, lower-molecular-weight hydrocarbons are generally the most soluble, bioavailable, and biodegradable constituents. American Petroleum Institute (API) (2011) generally classifies petroleum substances in the C9 to C25 range including naphthalene (C10) as "not readily biodegradable" because the biodegradation rate is typically slower than lighter, more volatile compounds such as benzene (C6). However, naphthalene is among the more biodegradable of the compounds in the C9 to C25 range given that biodegradability generally decreases with increasing

molecular weight and carbon number. Therefore, naphthalene is somewhat soluble and mobile in the subsurface.

The SVOCs benzo(a)pyrene is a PAH having 20 carbon atoms (i.e., C20). As hydrocarbons approach a size of approximately 15 to 20 carbon atoms, their vapor pressures and water solubilities become negligible, and partitioning to air or dissolution in water is unimportant (API, 2011). Therefore, benzo(a)pyrene is expected to be relatively persistent in vadose zone soil, relatively immobile and not readily leached into groundwater at FTMM-59.

Metals including lead and vanadium are subject to various transformation processes in soil. For example, metals can exist in the environment in several valence forms, and they can also exist as organometallic compounds that have a metal-carbon bond. In general, however, metals are elements that are resistant to natural degradation and have limited mobility in the environment, and therefore are expected to be relatively persistent in vadose zone soil at FTMM-59.

5.3 SUMMARY

Naphthalene is expected to be somewhat mobile in vadose zone soil, and its persistence is expected to be relatively low due to the effects of volatilization, biodegradation, and downward leaching. In contrast, benzo(a)pyrene is expected to be relatively immobile and less biodegradable and consequently more persistent in the soil column.

SECTION 6
CONCEPTUAL SITE MODEL

This CSM was developed to understand the possible sources of contamination, potentially affected media, and transport and exposure pathways that could impact human or ecological receptors. The CSM summarizes what is known to date into a snapshot that communicates the site's physical setting, site contaminants, and discharge or exposure mechanisms. Based on the findings of the current RI and historical investigations, the current CSM is described below. The CSM is consistent with the NJDEP *Technical Guidance for Preparation and Submission of a Conceptual Site Model* (ver. 1, December 16, 2011). Groundwater is not evaluated in the CSM because additional remedial measures for groundwater are not required (Section 4.2.5).

6.1 DESCRIPTION OF SOURCES, PATHWAYS AND RECEPTORS

6.1.1 Potential Sources

The Site was formerly occupied by a modern "do-it-yourself" auto repair shop for FTMM installation personnel. Other reported activities that occurred in former Building 1122 included furniture paint stripping, a machine shop and a welding area. Potential sources on the Site are related to these past uses and are listed below.

- A fuel-contaminated area north of Building 1122 and south of Mill Creek (Section 2.2.5);
- A fuel-contaminated area located beneath the western portion of former Building 1122;
- Hydraulic lifts that were removed from Bays #9 and #10 during Building 1122 demolition in 2014 (Section 2.2.6); and
- A chemical storage shed and paint booth shed formerly located outside and near the northwest corner of former Building 1122 (Section 2.2.7).

6.1.2 Transport and Exposure Pathways

Transport and exposure pathways that could impact human and ecological receptors include chemicals that may have been spilled on the ground surface, or released in the subsurface soil, or leached into shallow groundwater. VOCs in soil and groundwater also may have volatilized into the soil pore space above the groundwater table. Groundwater contaminants may have spread following the direction of the groundwater hydraulic gradients.

Based upon the types of chemicals present at FTMM-59 and the media in which the chemicals are present, the following mechanisms for chemical transport have been identified for the site:

- Erosion of contaminated surface soils during high precipitation events;
- Leaching of contaminants from soil into deeper soil and/or groundwater; and
- volatilization of VOCs from soil and groundwater into soil pore space (soil gas).

The following potential human exposure routes for chemicals have been identified for the site:

- dermal contact, inhalation (of dust), and incidental ingestion of soil particulates; and
- inhalation of VOCs volatized from soil.

6.1.3 Potential Receptors

In evaluating the potential receptors at the Site, it is necessary to identify the populations that may potentially be exposed to the chemicals present, and to determine the pathways by which these exposures may occur. Identification of the potentially exposed populations requires evaluating the human activity and anticipated land use at FTMM-59.

The anticipated future land use at FTMM-59 according to FMERA (2019) includes mixed-use, office and institutional development, with "civic uses" as an accepted development strategy. Therefore, current or potential future human receptors at FTMM-59 include workers, institutional/civic users (e.g., educational (school) personnel and students), and administrative personnel.

6.2 IMPACTED MEDIA AND EXPOSURE ASSESSMENT

Direct release of contaminants from potential sources at FTMM-59 have been primarily to surface soils. Contaminants could migrate to other media such as surface water, sediment, deeper soils, or groundwater via the transport mechanisms identified in Section 6.1.2.

Analytes in soil at FTMM-59 that exceeded the NJDEP RDCSRS include the VOC naphthalene, the SVOC benzo(a)pyrene, petroleum hydrocarbons, and the metal lead.

Once the potentially exposed populations are identified, the complete exposure pathways by which individuals in each of these potentially exposed populations may contact chemicals present in the soil and groundwater at the site are determined. A complete exposure pathway requires the following three key elements:

- contaminant source;
- migration route; and
- point for human exposure (e.g., soil, air, or water).

An exposure pathway is not complete unless all three elements are present.

6.2.1 Surface Soil

If pavement is removed in the future then non-intrusive workers and educational/administrative personnel may be exposed to contamination in surface soil via incidental ingestion, dermal contact, and inhalation of dust or volatiles. Intrusive workers, such as utility workers, may be exposed to contaminants in surface soil beneath the pavement via the same pathways listed above for non-intrusive workers.

6.2.2 Subsurface Soil

Only intrusive workers may be exposed to contaminants in subsurface soil via incidental ingestion, dermal contact, and inhalation of dust or volatiles.

SECTION 7
REMEDIAL ACTION WORK PLAN AND IMPLEMENATION

A RAWP (Parsons 2019) was submitted to the NJDEP to address the exceedance of NJDEP RDCSRSs in soil associated with the following areas:

- A fuel-contaminated area north of Building 1122 and south of Mill Creek;
- A fuel-contaminated area located beneath the western portion of former Building 1122;
- The Bays #9 and #10 former hydraulic lifts; and
- The former chemical storage and paint booth sheds.

The soil removal excavations and off-site disposal activities described in the RAWP were implemented in May through August 2019 and the completed actions were documented in the Remedial Action Completion Report (RACR) provided in **Appendix E**. Following soil removal, post-excavation soil samples were collected from each excavation and the post-excavation soil sample results were less than the RDCSRSs. Therefore, no further remedial actions are required for soil at FTMM-59.

SECTION 8
REMEDIAL INVESTIGATION SUMMARY AND CONCLUSIONS

8.1 NATURE AND EXTENT OF CONTAMINATION

This section summarizes key findings and recommendations of the RI, as required by N.J.A.C. 7:26E-4.9(a)6, which is applicable to POL releases. The RI is complete for FTMM-59 consistent with the TRSRs. The nature and extent of targeted constituents exceeding NJDEP comparison criteria in sampled media at FTMM-59 are summarized below.

8.1.1 Soil

Soil samples were collected at FTMM-59 from 1992 to 2015. Concentrations of the following constituents exceeded the 2017 NJDEP RDCSRS in at least one of the 98 soil samples collected and analyzed for VOCs, SVOCs, TPH, EPH, pesticides, PCBs, and/or metals.

- The VOC naphthalene;
- The SVOCs benzo(a)pyrene; and
- The metal lead.

Prior to completion of the 2019 soil removal action, concentrations of the following constituents exceeded the 2017 NJDEP NRDCSRS in at least one of the soil samples.

- The VOC naphthalene;
- The SVOC benzo(a)pyrene; and
- The metal lead.

Elevated EPH concentrations were also encountered in soil at the former hydraulic lifts at Service Bays #9 and #10 based on multiple soil samples collected during demolition of Building 1122 in 2014. The removal action was completed in 2019 and confirmatory soil sampling indicated that constituents in soil were remediated to below the state cleanup criteria (RDCSRSs).

8.1.2 Groundwater

Concentrations of the following constituents exceeded the NJDEP GWQS in at least 1 sample collected from permanent monitoring wells from November 2009 through December 2015:

- The VOC benzene; and
- The metals cadmium and manganese (additional rationale was provided in Section 4.2.2 for other metals that exceeded the GWQS in some samples but were not significant or attributable to site activities).

Site monitor wells were re-developed and re-sampled for cadmium and manganese in 2018 and 2019, and one monitor well was re-sampled for benzene in 2019. Exceedance of the respective GWQS for cadmium and manganese was confirmed; however, the concentration of these metals in upgradient and side-gradient wells indicates that the source is not attributable to FTMM-59. These metals may be naturally occurring as no onsite sources have been identified. The two most recent groundwater sampling rounds conducted in 2019 indicate concentrations of benzene in groundwater have attenuated to less than the GWQS. Therefore, additional measures such as monitoring or remediation are not required for groundwater at FTMM-59.

8.1.3 Surface Water

Surface water samples were collected in Mill Creek at locations upstream and downstream of FTMM-59 from the 1st Quarter 2007 through the 3rd Quarter 2010. PCE concentrations exceeded the freshwater SWQS during almost every sampling event. PCE concentrations in Mill Creek near FTMM-59 originate from an upstream off-site source and are not attributed to FTMM-59.

8.1.4 Sediment

Sediment samples in Mill Creek were collected in 2007 from three locations upstream and downstream of FTMM-59. There were no exceedances of the NJDEP RDCSRS for VOCs, and PCBs were not detected. One SVOC (benzo[a]pyrene) and one metal (vanadium) were detected in four of the samples at concentrations exceeding the NJDEP RDCSRS. However, PAHs and metals in sediment adjacent to FTMM-59 originate from an upstream off-site source and are not attributed to FTMM-59.

8.2 REMEDIAL ACTION

A RAWP (Parsons 2019) was prepared and implemented to address the exceedance of NJDEP RDCSRSs and elevated EPH concentrations in soil associated with multiple areas at FTMM-59. The soil removal described in the RAWP was completed in May to August 2019 and post-excavation soil samples were collected from each excavation. The sample results collected from each excavation were less than the RDCSRSs. The implementation of the RAWP is documented in the RACR (**Appendix D**). Therefore, there is no further remedial actions required for soil at FTMM-59.

8.3 CONCLUSIONS

Since POLs are excluded from CERCLA, the Army at FTMM-59 is subject to NJDEP regulations for the investigation and remediation of site contaminants. Soil removal activities implemented in 2019 have remediated the FTMM-59 soils to levels which now meet the NJDEP RDCSRSs in soil. Groundwater monitoring indicates that there are no site-related contaminants in groundwater that exceed the applicable NJDEP GWQS; metals exceedances may be attributed to naturally occurring site conditions. There are no findings of surface water or sediment impacts associated with FTMM-59.

Based on the results of this RI, the Army has determined, and requests NJDEP's concurrence, that further remedial efforts at FTMM-59 are not needed. The Army also requests that a No Further Action, Unrestricted Use determination be issued for FTMM-59.

SECTION 9
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TABLES

Table 1.1 Chronology of Events

Table 2.1 Well Construction Summary

Table 2.2 Groundwater Sampling Summary

Table 3.1 Groundwater Gauging Data and Elevations (December 16, 2015)

Table 4.1 Soil Sampling Summary of Results – Comparison to NJDEP Standards

Table 4.2 Soil Sampling Summary of Exceedances (1992-2015)

Table 4.3 NJDEP EPH Calculator Results

Table 4.4 Groundwater Sampling Results (2007-2015)

Table 4.5 Groundwater Sampling Summary of Exceedances (November 2009 - December 2015)

Table 4.6 Surface Water Sampling Summary Results (March 2007 -September 2010)

Table 4.7 Sediment Sampling Summary Results – Comparison to NJDEP Standards

TABLE 1.1
CHRONOLOGY OF EVENTS
SITE FTMM-59
FORT MONMOUTH, NEW JERSEY

1918 – Fort Monmouth (FTMM) was established.
1980 – An Installation Assessment of FTMM was prepared by the US Army Toxic and Hazardous Materials Agency (USATHAMA, 1980).
1988 – Update of the Initial Installation Assessment of FTMM and Subinstallations: Charles Wood Area and Evans Area. A survey was conducted to determine if any environmental/hazardous waste disposal conditions had changed since the Installation Assessment conducted in 1980 (USATHAMA, 1988).
1992 – A waste oil underground storage tank (UST [UST Registration No. 81533-199]) was removed and five post-excavation soil samples were collected and analyzed (Weston, 1993).
1994 – Weston performed additional site investigation (SI) activities which included surface water and sediment sampling in Mill Creek, as well as some background sampling for soils in the Main Post (MP) in 1995 (Weston, 1995), but did not specifically include FTMM-59.
1994 - A No. 2 fuel oil UST was excavated, and six post-excavation soil samples were collected and analyzed. Five additional samples for total petroleum hydrocarbon (TPH) analysis were collected following removal of the UST's copper fuel lines (Smith, 1996).
1995 - A soil excavation was conducted in the area between the former waste oil tank and Mill Creek. Post-excavation soil samples collected (VEETech, P.C., 2010).
1995 - 11 surface soil samples were collected within an electrical transformer spill area when electric utility pole #537 was hit by a front-end loader at FTMM-59 (specific location unknown). Approximately 30 gallons of transformer fluid were reportedly released onto a grassy area about 20 feet from Mill Creek (VEETech, P.C. 2010). Analyses of 12 post-excavation soil samples indicate that TPH and PCB concentrations were in compliance with the then NJDEP soil cleanup criteria
1995 - Seven soil borings were advanced in Service Bay 12 at the failed in-ground hydraulic vehicle lift; soil samples were collected both prior to and following removal of the lift and excavation of contaminated soil (VEETech, P.C., 2010).
1995 – Two monitoring wells were installed at FTMM-59, 1122MW01 and 1122MW02 adjacent to and northwest of the former waste oil UST.
1996 December – Beginning of surface water sampling to evaluate the surface water quality in Mill Creek. Samples were collected from one location on Mill Creek until June 2000 when two additional locations were added.
1997 May – Beginning of quarterly groundwater monitoring program. Initially, samples were collected from two wells, and the program was later expanded when additional wells were added.
2000 - 14 soil borings were advanced in the northeastern corner of the asphalt parking lot area of the site, and 15 soil samples and 15 groundwater samples were collected (VEETech, P.C., 2010).
2000 – Three additional monitoring wells were installed at FTMM-59: 1122MW03, 1122MW04, and 1122MW05.
2004 - A Geoprobe® investigation was performed in April 2004 to further evaluate site soil and groundwater conditions and potential contaminant migration at FTMM-59. Eighteen soil samples and 31 groundwater samples were collected at 24 boring locations and one seep location. Based on post-excavation soil sampling results collected during two UST closures at FTMM-59 (waste oil and heating oil) and analytical results for Geoprobe® soil samples collected in March 2000 and April and May 2004, a RI report (Versar, 2005) concluded that there were no identified COPCs in soils at FTMM-59.
2004 - Three sumps were installed in 2004 for the removal of free-phase product. Product thicknesses measured in the sumps ranged up to 1.8 inches, and a total of 6.3 pints of product were removed from June to August 2004; no product was recovered from Sept 2004 to March 2005, when product thickness measurement in the sumps was discontinued (Versar, 2005). There is no evidence that recoverable free product remained at the site after 2004.
2005 – FTMM (MP and Charles Wood Area [CWA]) was selected for closure by the Base Realignment and Closure Commission

TABLE 1.1
CHRONOLOGY OF EVENTS
SITE FTMM-59
FORT MONMOUTH, NEW JERSEY

2007 - A total of six sediment samples were collected from three distinct locations in Mill Creek adjacent to FTMM-59. Two samples were collected from each location; one from the 0- to 6-inch interval below the creek, and another from the 12- to 18-inch interval, measured from the bottom of the creek. (U.S. Army BRAC, 2008)
2007 – Vapor intrusion (VI) at Building 1122 was evaluated in 2007 through the collection of near-slab soil gas samples, sub-slab soil gas samples, and indoor air samples.
2008 – A SI Report was prepared under the Environmental Condition of Property (ECP) program which included sampling at Parcel 43 (Building 1122) for sediment, soil gas, and indoor air (U.S. Army BRAC, 2008)
2009 - A temporary well point B1 and B2 was advanced adjacent to a malfunctioning in-ground hydraulic lift inside Building 1122's Service Bay 10, located in the southeast corner of the building. Separate phase product was observed at B1 and environmental samples were not collected.
2010 - Borings FTMM-59-NE, FTMM-59-SE and FTMM-59-FE were advanced outside of Building 1122 to delineate boundaries for potential excavation of soil during removal of the Service Bay 10 in-ground hydraulic lift. The borings consisted of one soil sample and one groundwater sample collected via temporary well point from each location and analyzed for VOCs.
2010 - Soil and groundwater samples were collected adjacent to the (now demolished) paint booth and chemical storage sheds.
2010 – A sixth monitoring well, 1122MW06, was installed hydraulically upgradient of Building 1122 in July 2010 to evaluate contaminant migration from an upgradient source.
2010 - Two surface water samples were collected from Mill Creek adjacent to FTMM-59 and Parcel 43 as part of the 2010 baseline ecological evaluation (BEE [Shaw, 2012]).
2011 – The base was officially closed on 15 September 2011.
2013 – Groundwater sampling was conducted at 21 FTMM sites including FTMM-59 in August 2013 to re-establish baseline groundwater conditions following a 2-year suspension of groundwater sampling in 2011.
2014 – Annual groundwater sampling of select wells stated in October 2014 as recommended in the Final (2013) Baseline Groundwater Sampling Report (Parsons, 2014).
2014 – Building 1122 and the chemical and paint booth sheds were demolished.
2014 - Seven borings were advanced in the area of Service Bays 9 and 10 hydraulics lifts locations after the lift were removed during building demolition. Samples were collected at each location and analyzed for EPH**.**
2015 – A RI data gap investigation was performed which included soil and groundwater sampling as well as the installation of two new monitoring wells, FTMM-59-MW1 and FTMM59-MW-2.
2016 – NJDEP agreed to the suspension of groundwater sampling at FTMM-59 in a letter dated 16 March 2016 until a RI/FS could be completed.
2018/2019- The nine monitoring wells were re-developed to reduce groundwater sample turbidity in 2018 and 2019 and were re-sampled to clarify the nature and extent of cadmium and, manganese and benzene in groundwater.
2019 - An Unrestricted Use, No Further Action (NFA) determination was provided by NJDEP for UST 1122B, the former steel 550-gallon waste oil UST (Registration ID No. 81533-199.
2019 - An Unrestricted Use, NFA determination was provided by NJDEP for UST 1122A, the former steel 1,500-gallon fuel oil UST (Registration ID No. 81533-199.

TABLE 2.1
WELL CONSTRUCTION SUMMARY
SITE FTMM-59
FORT MONMOUTH, NEW JERSEY

Well Number	Well Permit #	Y Coord. (Northing)	X Coord. (Easting)	Installation Date	Depth (ft bgs)	Casing Length (ft)	Screen Length (ft)	Top of Casing (ft amsl)	Slot Size (inches)
1122MW01	29-33755	538337.815	617448.396	9/12/1995	18.00	5.00	13.00	**15.04**	0.02
1122MW02	29-33754	538372.256	617370.995	9/12/1995	15.00	3.00	12.00	**15.12**	0.02
1122MW03	29-43196	538342.086	617406.394	7/20/2000	14.00	4.00	10.00	**13.10**	0.01
1122MW04	29-43197	538378.349	617471.597	7/20/2000	14.00	4.00	10.00	**13.54**	0.01
1122MW05	29-43198	538393.770	617423.276	7/20/2000	15.00	5.00	10.00	**12.54**	0.01
1122MW06	E201007327	538540.000	617520.000	7/20/2010	20.00	5.00	15.00	17.53	0.01
1122MW07	E201113249	538305.000	617294.000	8/17/2011	20.00	5.00	15.00	16.41	0.01
FTMM-59-MW-1	E201510637	538283.000	617331.000	9/30/2015	17.50	7.50	10.00	14.28	0.01
FTMM-59-MW-2	E201510638	538337.000	617336.000	9/30/2015	17.50	7.50	10.00	15.98	0.01

Notes:
ft = feet
bgs = below ground surface
amsl = above mean sea level
Bolded top of casing elevations represent a mathematical adjustment between earlier NAD systems and the NAD 88 spatial system; The wells were reduced 1.09 feet to reflect the changes in the NAD systems.

TABLE 2.2
GROUNDWATER SAMPLING SUMMARY
SITE FTMM-59
FORT MONMOUTH, NEW JERSEY

	Well ID								
Date	**1122MW01**	**1122MW02**	**1122MW03**	**1122MW04**	**1122MW05**	**1122MW06**	**1122MW07**	**FTMM-59-MW-1**	**FTMM-59-MW-2**
5/2/1997	V, S, P, M	V, S, P, M	--	--	--	--	--	--	--
8/6/1997	V, S, P, M	V, S, P, M	--	--	--	--	--	--	--
10/23/1997	V, S, P, M	V, S, P, M	--	--	--	--	--	--	--
2/3/1998	V, S, P, M	V, S, P, M	--	--	--	--	--	--	--
4/22/1998	V, S, P, M	V, S, P, M	--	--	--	--	--	--	--
7/9/1998	V, S, P, M	V, S, P, M	--	--	--	--	--	--	--
11/6/1998	V, S, P, M	V, S, P, M	--	--	--	--	--	--	--
2/4/1999	V, S, P, M	V, S, P, M	--	--	--	--	--	--	--
5/4/1999	V, S, P, M	V, S, P, M	--	--	--	--	--	--	--
7/6/1999	V, S, P, M	V, S, P, M	--	--	--	--	--	--	--
10/5/1999	V, S, P, M	V, S, P, M	--	--	--	--	--	--	--
5/1/2000	V, S, P, M	V, S, P, M	--	--	--	--	--	--	--
8/1/2000	V, S, P, M	V, S, P, M	--	--	--	--	--	--	--
8/10/2000	--	--	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
8/26/2000	--	--	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
9/1/2000	M	M	M	M	M	--	--	--	--
10/13/2000	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
10/17/2000	M	M	M	M	M	--	--	--	--
1/3/2001	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
4/3/2001	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
7/13/2001	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
10/17/2001	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
1/8/2002	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
4/9/2002	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
7/10/2002	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
10/3/2002	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
1/7/2003	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
4/17/2003	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
7/11/2003	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
10/2/2003	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
1/6/2004	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
4/26/2004	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
7/16/2004	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
10/7/2004	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	V, S, P, M	--	--	--	--
1/3/2005	V	V	V	V	V	--	--	--	--
4/4/2005	V	V	V	V	V	--	--	--	--
7/5/2005	V	V	V	V	V	--	--	--	--
10/18/2005	V	V	V	V	V	--	--	--	--
1/5/2006	V	V	V	V	V	--	--	--	--
4/5/2006	V	V	V	V	V	--	--	--	--
7/5/2006	V	V	V	V	V	--	--	--	--
10/10/2006	V	V	V	V	V	--	--	--	--
1/4/2007	V	V	V	V	V	--	--	--	--
4/3/2007	V	V	V	V	V	--	--	--	--
7/5/2007	V	V	V	V	V	--	--	--	--
10/3/2007	V	V	V	V	V	--	--	--	--
1/8/2008	V	V	V	V	V	--	--	--	--
4/3/2008	V	V	V	V	V	--	--	--	--
7/10/2008	V	V	V	V	V	--	--	--	--
10/9/2008	V	V	V	V	V	--	--	--	--
1/23/2009	V	V	V	V	V	--	--	--	--
4/13/2009	V	V	V	V	V	--	--	--	--
7/20/2009	V	V	V	V	V	--	--	--	--
11/4/2009	V	V	V	V	V	--	--	--	--
1/12/2010	V	V	V	V	V	--	--	--	--
4/5/2010	V	V	V	V	V	--	--	--	--
4/5/2010	V	V	V	V	V	--	--	--	--
7/20/2010	V, M	V, M	V, M	V, M	V, M	--	--	--	--
8/19/2010	--	--	--	--	--	V, M	--	--	--
10/5/2010	V, M	V, M	V, M	V, M	V, M	V, M	--	--	--
1/19/2011	V, M	V, M	V, M	V, M	V, M	V, M	--	--	--
4/4/2011	V, M	V, M	V, M	V, M	V, M	V, M	--	--	--
7/5/2011	V, M	V, M	V, M	V, M	V, M	V, M	--	--	--
8/29/2013	V, M	V	V	V	V	V	V	--	--
10/2/2014	--	--	--	--	--	--	V	--	--
12/14/2015	S	--	--	--	--	--	V, S, M	V, S	V,S
8/6/2018	M [1/]	M [1/]	M [1/]	M [1/]	M [1/]	M [1/]	M [1/]	M [1/]	M [1/]
7/16/2019	M [1/]	M [1/]	M [1/]	M [1/]	M [1/]	M [1/]	M [1/]	M [1/]	M [1/]
8/9/2019	--	--	--	--	--	--	--	V [2/]	--
11/6/2019	--	--	--	--	--	--	--	V [2/]	--

Notes:
V = volatile organic compounds + tentatively-identified compounds (TICs)
S = semivolatile organic compounds + TICs
M = metals
P = pesticides and polychlorinated biphenyls (PCBs)
[1/] = cadmium and manganese only
[2/] = benzene only
dash (--) = not sampled

TABLE 3.1
GROUNDWATER GAUGING DATA AND ELEVATIONS (DECEMBER 16, 2015)
SITE FTMM-59
FORT MONMOUTH, NEW JERSEY

Well ID	Installation Date	Well Permit #	Y Coord. (North)	X Coord. (East)	Depth (ft bgs)	Casing Length (ft)	Screen Length (ft)	TOC Elevation (ft amsl)	Gauge Time	PID Reading (ppm)	Gauged Depth to Water (ft TOC)	Gauged Depth to Bottom (ft TOC)	Calculated Groundwater Elevation (ft amsl)
Shallow Monitoring Wells													
FTMM-59-MW-1	9/30/2015	E201510637	538283.00	617331.00	17.5	7.5	10.0	14.28	9:23	0.0	5.80	17.53	8.48
FTMM-59-MW-2	9/30/2015	E201510638	538337.00	617336.00	17.5	10.5	10.0	15.98	9:16	0.0	8.15	20.30	7.83
1122MW01	9/12/1995	29-33755	538337.82	617448.40	18.0	5.0	13.0	15.04	9:30	0.0	6.13	27.89	8.91
1122MW02	9/12/1995	29-33754	538372.26	617371.00	15.0	3.0	12.0	15.12	9:10	0.0	8.94	17.55	6.18
1122MW03	7/20/2000	29-43196	538342.09	617406.39	14.0	4.0	10.0	13.10	9:26	0.0	6.47	13.85	6.63
1122MW04	7/20/2000	29-43197	538378.35	617471.60	14.0	4.0	10.0	13.54	9:31	0.0	5.56	13.70	7.98
1122MW05	7/20/2000	29-43198	538393.77	617423.28	15.0	5.0	10.0	12.54	9:33	0.0	6.03	4.47	6.51
1122MW06	7/20/2010	E201007327	538240.00	617520.00	20.0	5.0	15.0	17.53	8:59	0.0	7.95	21.60	9.58
1122MW07	8/17/2011	E201113249	538305	617294.00	20.0	5.0	15.0	16.41	9:19	0.0	13.40	21.99	3.01

Notes:
1) The synoptic round of water levels in the wells was collected on December 16, 2015
2) Information on well permit number, X and Y coordinates, depth, screen length, screen interval and TOC elevation was provided by FTMM in June 2013.
3) ft = feet
4) DTW = depth to water (measured from the top of well casing)
5) DTB = depth to bottom of well (measured from the top of well casing)
6) bgs = below ground surface
7) PID = photoionization detector
8) ppm = parts per million (of ionizable VOCs)
9) TOC = top of casing
10) ft amsl = feet above mean sea level

TABLE 4.1
SOIL SAMPLING SUMMARY RESULTS - COMPARISON TO NJDEP STANDARDS
SITE FTMM-59
FORT MONMOUTH, NEW JERSEY

Site Area					1992 Waste Oil UST 1122B (Post-Excavation)					1994 Fuel Oil UST 1122A (Post-Excavation)									
Loc ID	**NJDEP RDCSRS**	**NJDEP NRDCSRS**	**NJDEP IGW Soil Screening Level**	**Weston 1995 Background (Main Post)**	FTMM59-C92-678/679	FTMM59-C92-680/681	FTMM59-C92-682/683	FTMM59-C92-684/685	FTMM59-C92-686/687	FTMM59-SITE A	FTMM59-SITE B	FTMM59-SITE B Dup	FTMM59-SITE C	FTMM59-SITE D	FTMM59-SITE E	FTMM59-SITE E Dup	FTMM59-SITE F	FTMM59-SITE AA
Sample ID					FTMM59-SS-C92-678/679-0-0	FTMM59-SS-C92-680/681-0-0	FTMM59-SS-C92-682/683-0-0	FTMM59-SS-C92-684/685-0-0	FTMM59-SS-C92-686/687-0-0	FTMM59-SITE A/9-9.5	FTMM59-SITE B/8.5-9	FTMM59-SITE B/8.5-9 Dup	FTMM59-SITE C/8.5-9	FTMM59-SITED/9-9.5	FTMM59-SITE E/8.5-9	FTMM59-SITE E Dup/8.5-9	FTMM59-SITE F/8.5-9	FTMM59-SITE AA/1.5-2
Sample Date					1/6/1992	1/6/1992	1/6/1992	1/6/1992	1/6/1992	6/21/1994	6/21/1994	6/21/1994	6/21/1994	6/21/1994	6/21/1994	6/21/1994	6/21/1994	6/24/1994
Volatile Organic Compounds (mg/kg)																		
1,1,1-Trichloroethane	160,000	NLE	0.3	-	**0.1**	**0.1**	**0.16**	**0.25**	**0.13**	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	70,000	NLE	19	-	< 0.03	< 0.029	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	2	5	0.005	-	< 0.03	< 0.029	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cymene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl benzene	7,800	110,000	13	-	< 0.03	< 0.029	ND	ND	**0.19 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Meta/Para Xylene	NLE	NLE	NLE	-	< 0.03	< 0.029	ND	ND	**0.091**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl butyl ketone	NLE	NLE	NLE	-	< 0.03	< 0.029	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl ethyl ketone	3,100	44,000	0.9	-	**0.28**	< 0.029	ND	**0.19**	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl isobutyl ketone	NLE	NLE	NLE	-	**0.038**	< 0.029	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl Tertbutyl Ether	110	320	0.2	-	< 0.03	< 0.029	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	46	230	0.01	-	**0.062**	**0.06**	**0.093**	**0.014**	**0.072**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	6	17	25	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ortho Xylene	NLE	NLE	NLE	-	< 0.03	< 0.029	**0.025 J**	**0.048**	**0.048**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Propylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	6,300	91,000	7	-	< 0.03	< 0.029	ND	ND	**0.038**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TIC VOCs	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (mg/kg)																		
1-Methylnaphthalene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	310	2,200	0.8	-	ND	ND	ND	**0.047 J**	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	230	2,400	8	-	ND	ND	ND	**1**	**0.27 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,400	37,000	110	-	**0.12 J**	ND	ND	**0.79 J**	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NLE	300,000	NLE	-	ND	ND	ND	**0.026 J**	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	17,000	30,000	2,400	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	5	17	0.8	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.5	2	0.2	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	5	17	2	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	380,000	30,000	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	45	170	25	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	35	140	1,200	-	**0.74 B**	**0.23 JB**	ND	ND	**0.28 JB**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	24	96	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	450	1,700	80	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,100	68,000	760	-	ND	**0.054 JB**	**0.06 JB**	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,300	24,000	1,300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	2,300	24,000	170	-	ND	ND	ND	**0.13 J**	**0.028 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	5	17	7	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	6	17	25	-	ND	ND	ND	**0.44**	**0.11 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NLE	300,000	NLE	-	ND	ND	ND	**0.44**	**0.068 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,700	18,000	840	-	**0.12 J**	ND	ND	**0.43**	**0.091 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TIC SVOCs	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons (mg/kg)																		
Total Petroleum Hydrocarbons	NLE	NLE	NLE	-	**1,220**	**960**	**190**	**610**	**445**	**26.8**	ND	ND	ND	ND	ND	ND	**7.97**	ND
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)																		
C10-C12 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C12-C16 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C12-C16 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C16-C21 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C16-C21 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C21-C36 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C21-C40 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C9-C12 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total EPH	SS	SS	SS	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calculated Residential EPH SRC (if total EPH exceeds 1,700 mg/kg) [4]				-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calculated Non-Residential EPH SRC (if total EPH exceeds 1,700 mg/kg) [4]				-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides & PCBs (mg/kg)																		
4,4'-DDD	3	13	4	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	2	9	18	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	2	8	11	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlordane	0.2	1	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	0.04	0.2	0.003	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gamma-Chlordane	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	0.07	0.3	0.01	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (mg/kg)																		
Aluminum	78,000	NLE	6,000	15,200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	31	450	6	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	19	19	19	22.9	**1.8**	ND	**1.6**	**1.9**	**1.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	16,000	59,000	2,100	32.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	16	140	0.7	2	**0.476**	**0.65**	**0.513**	**0.706**	**0.409**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	78	78	2	ND	**0.09**	**0.02**	**0.05**	**0.04**	**0.07**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NLE	NLE	NLE	921	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NLE	NLE	NLE	269	**53.6**	**33.1**	**50.6**	**53.5**	**39**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	1,600	590	90	2.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	3,100	45,000	11,000	8	**6.6**	**9.3**	**7.6**	**8.8**	**9.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NLE	NLE	NLE	55,800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	800	90	19.5	**13.3**	**31.4**	**15.2**	**29.4**	**29.9**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NLE	NLE	NLE	7,230	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	11,000	5,900	65	90.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	23	65	0.1	ND	ND	ND	ND	**0.047**	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	1,600	23,000	48	8.4	ND	ND	ND	**3.5**	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	NLE	NLE	15,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	390	5,700	1	1.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NLE	NLE	NLE	51.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	78	1,100	NLE	94.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	23,000	110,000	930	81.4	**40.4**	**40.1**	**51.3**	**60**	**68.3**	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 4.1
SOIL SAMPLING SUMMARY RESULTS - COMPARISON TO NJDEP STANDARDS
SITE FTMM-59
FORT MONMOUTH, NEW JERSEY

Site Area					1994 Fuel Oil UST 1122A (Post-Excavation)				1995 Hydraulic Lift Service Bay 12 (Post-Excavation)					2000 Soil Borings from NE Corner of Parking Lot				
Loc ID	**NJDEP RDCSRS**	**NJDEP NRDCSRS**	**NJDEP IGW Soil Screening Level**	**Weston 1995 Background (Main Post)**	FTMM59-SITE BB	FTMM59-SITE CC	FTMM59-SITE DD	FTMM59-SITE EE	MM59-E. Wall, Center, Bottc	FTMM59-Bottom of hole	MM59-n. Wall, Center, Bottc	MM59-S. Wall, Center Bottc	MM59-W. Wall, Center Bottc	FTMM59-1122	FTMM59-1122-1	FTMM59-1122-2	FTMM59-1122-3	FTMM59-1122-4
Sample ID					FTMM59-SITE BB/1.5-2	FTMM59-SITE CC/1.5-2	FTMM59-SITE DD/1.5-2	FTMM59-SITE EE/1.5-2	9-SS-E. Wall, Center, Bottom	MM59-SS-Bottom of hole-0	9-SS-n. Wall, Center, Bottom	9-SS-S. Wall, Center Bottom	9-SS-W. Wall, Center Bottom	TMM59-SS-1122-5.5-5.5-Du	FTMM59-SS-1122-1-5.5-5.5	FTMM59-SS-1122-2-5.5-5.5	FTMM59-SS-1122-3-5.5-5.5	FTMM59-SS-1122-4-5.5-5.5
Sample Date					6/24/1994	6/24/1994	6/24/1994	6/24/1994	9/21/1995	9/21/1995	9/21/1995	9/21/1995	9/21/1995	3/21/2000	3/20/2000	3/20/2000	3/20/2000	3/20/2000
Volatile Organic Compounds (mg/kg)																		
1,1,1-Trichloroethane	160,000	NLE	0.3	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.26	< 0.31	< 0.26	< 0.3	< 0.27
1,2,4-Trimethylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	70,000	NLE	19	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.53	< 0.61	< 0.51	< 0.6	< 0.54
Benzene	2	5	0.005	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.26	< 0.31	< 0.26	< 0.3	< 0.27
Cymene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl benzene	7,800	110,000	13	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.53	< 0.61	< 0.51	< 0.6	< 0.54
Isopropylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Meta/Para Xylene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.79	< 0.92	< 0.77	< 0.9	< 0.82
Methyl butyl ketone	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl ethyl ketone	3,100	44,000	0.9	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.79	< 0.92	< 0.77	< 0.9	< 0.82
Methyl isobutyl ketone	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.53	< 0.61	< 0.51	< 0.6	< 0.54
Methyl Tertbutyl Ether	110	320	0.2	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	46	230	0.01	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.53	< 0.61	< 0.51	< 0.6	< 0.54
Naphthalene	6	17	25	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ortho Xylene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.43	< 0.61	< 0.51	< 0.6	< 0.54
Propylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	6,300	91,000	7	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.26	< 0.31	< 0.26	< 0.3	< 0.27
Total TIC VOCs	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (mg/kg)																		
1-Methylnaphthalene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	310	2,200	0.8	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	230	2,400	8	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,400	37,000	110	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NLE	300,000	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	17,000	30,000	2,400	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	5	17	0.8	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.5	2	0.2	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	5	17	2	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	380,000	30,000	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	45	170	25	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	35	140	1,200	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	24	96	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	450	1,700	80	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,100	68,000	760	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,300	24,000	1,300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	2,300	24,000	170	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	5	17	7	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	6	17	25	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NLE	300,000	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,700	18,000	840	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TIC SVOCs	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons (mg/kg)																		
Total Petroleum Hydrocarbons	NLE	NLE	NLE	-	**117**	**88**	**8.83**	**17**	**6,300**	**7,500**	**1,500**	**5,800**	**204,000**	NA	NA	NA	NA	NA
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)																		
C10-C12 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C12-C16 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C12-C16 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C16-C21 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C16-C21 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C21-C36 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C21-C40 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C9-C12 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total EPH	SS	SS	SS	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calculated Residential EPH SRC (if total EPH exceeds 1,700 mg/kg) [4]				-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calculated Non-Residential EPH SRC (if total EPH exceeds 1,700 mg/kg) [4]				-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides & PCBs (mg/kg)																		
4,4'-DDD	3	13	4	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	2	9	18	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	2	8	11	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlordane	0.2	1	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	0.04	0.2	0.003	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gamma-Chlordane	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	0.07	0.3	0.01	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (mg/kg)																		
Aluminum	78,000	NLE	6,000	15,200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	31	450	6	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	19	19	19	22.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	16,000	59,000	2,100	32.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	16	140	0.7	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	78	78	2	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NLE	NLE	NLE	921	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NLE	NLE	NLE	269	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	1,600	590	90	2.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	3,100	45,000	11,000	8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NLE	NLE	NLE	55,800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	800	90	19.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NLE	NLE	NLE	7,230	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	11,000	5,900	65	90.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	23	65	0.1	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	1,600	23,000	48	8.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	NLE	NLE	15,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	390	5,700	1	1.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NLE	NLE	NLE	51.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	78	1,100	NLE	94.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	23,000	110,000	930	81.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 4.1
SOIL SAMPLING SUMMARY RESULTS - COMPARISON TO NJDEP STANDARDS
SITE FTMM-59
FORT MONMOUTH, NEW JERSEY

Site Area					2000 Soil Borings from NE Corner of Parking Lot										2004 Geoprobe Investigation			
Loc ID	NJDEP RDCSRS	NJDEP NRDCSRS	NJDEP IGW Soil Screening Level	Weston 1995 Background (Main Post)	FTMM59-1122-5	FTMM59-1122-6	FTMM59-1122-7	FTMM59-1122-8	FTMM59-1122-9	FTMM59-1122-10	FTMM59-1122-11	FTMM59-1122-12	FTMM59-1122-13	FTMM59-1122-14	FTMM59-SEEP	FTMM59-GW5	FTMM59-GW6	FTMM59-GW7
Sample ID					FTMM59-SS-1122-5-5.5-5.5	FTMM59-SS-1122-6-5.5-5.5	FTMM59-SS-1122-7-5.5-5.5	FTMM59-SS-1122-8-5.5-5.5	FTMM59-SS-1122-9-5.5-5.5	FTMM59-SS-1122-10-5.5-5.5	FTMM59-SS-1122-11-5.5-5.5	FTMM59-SS-1122-12-5.5-5.5	FTMM59-SS-1122-13-5.5-5.5	FTMM59-SS-1122-14-5.5-5.5	FTMM59-SS-SEEP-0-0.1	FTMM59-SS-GW5-5-5	FTMM59-SS-GW6-6-6	FTMM59-SS-GW7-5-5
Sample Date					3/20/2000	3/20/2000	3/20/2000	3/21/2000	3/21/2000	3/21/2000	3/21/2000	3/21/2000	3/21/2000	3/21/2000	4/21/2004	4/23/2004	4/23/2004	4/23/2004
Volatile Organic Compounds (mg/kg)																		
1,1,1-Trichloroethane	160,000	NLE	0.3	-	< 0.28	< 0.31	< 0.28	< 0.27	< 0.24	< 0.26	< 0.28	< 0.28	< 0.25	< 0.26	< 0.13	< 0.12	< 0.1	< 0.12
1,2,4-Trimethylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	70,000	NLE	19	-	< 0.56	< 0.62	< 0.57	< 0.54	< 0.49	< 0.52	< 0.56	< 0.56	< 0.5	< 0.52	**1.1 B**	**0.79 B**	**0.68 B**	**0.85 B**
Benzene	2	5	0.005	-	< 0.28	< 0.31	< 0.28	< 0.27	< 0.24	< 0.26	< 0.28	< 0.28	< 0.25	< 0.26	< 0.13	< 0.12	< 0.1	< 0.12
Cymene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl benzene	7,800	110,000	13	-	< 0.56	< 0.62	< 0.57	< 0.54	< 0.49	< 0.52	< 0.56	< 0.56	< 0.5	< 0.52	< 0.25	< 0.23	< 0.21	< 0.23
Isopropylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Meta/Para Xylene	NLE	NLE	NLE	-	< 0.83	< 0.93	< 0.85	< 0.81	< 0.73	< 0.78	< 0.84	< 0.84	< 0.75	< 0.78	< 0.38	< 0.35	< 0.31	< 0.35
Methyl butyl ketone	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl ethyl ketone	3,100	44,000	0.9	-	< 0.83	< 0.93	< 0.85	< 0.81	< 0.73	< 0.78	< 0.84	< 0.84	< 0.75	< 0.78	< 0.38	< 0.35	< 0.31	< 0.35
Methyl isobutyl ketone	NLE	NLE	NLE	-	< 0.56	< 0.62	< 0.57	< 0.54	< 0.49	< 0.52	< 0.56	< 0.56	< 0.5	< 0.52	< 0.25	< 0.23	< 0.21	< 0.23
Methyl Tertbutyl Ether	110	320	0.2	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	46	230	0.01	-	< 0.56	< 0.62	< 0.57	< 0.54	< 0.49	< 0.52	< 0.56	< 0.56	< 0.5	< 0.52	**0.17 J**	< 0.23	< 0.21	< 0.23
Naphthalene	6	17	25	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ortho Xylene	NLE	NLE	NLE	-	< 0.56	< 0.62	< 0.57	< 0.54	< 0.49	< 0.52	< 0.56	< 0.56	< 0.5	< 0.52	< 0.25	< 0.23	< 0.21	< 0.23
Propylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	6,300	91,000	7	-	< 0.28	< 0.31	< 0.28	< 0.27	< 0.24	< 0.26	< 0.28	< 0.28	< 0.25	< 0.26	< 0.13	< 0.12	< 0.1	< 0.12
Total TIC VOCs	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (mg/kg)																		
1-Methylnaphthalene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	310	2,200	0.8	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	230	2,400	8	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,400	37,000	110	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NLE	300,000	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	17,000	30,000	2,400	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	5	17	0.8	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.5	2	0.2	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	5	17	2	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	380,000	30,000	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	45	170	25	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	35	140	1,200	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	24	96	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	450	1,700	80	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,100	68,000	760	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,300	24,000	1,300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	2,300	24,000	170	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	5	17	7	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	6	17	25	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NLE	300,000	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,700	18,000	840	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TIC SVOCs	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons (mg/kg)																		
Total Petroleum Hydrocarbons	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	**2,575**
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)																		
C10-C12 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C12-C16 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C12-C16 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C16-C21 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C16-C21 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C21-C36 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C21-C40 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C9-C12 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total EPH	SS	SS	SS	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calculated Residential EPH SRC (if total EPH exceeds 1,700 mg/kg) [4]				-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calculated Non-Residential EPH SRC (if total EPH exceeds 1,700 mg/kg) [4]				-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides & PCBs (mg/kg)																		
4,4'-DDD	3	13	4	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	2	9	18	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	2	8	11	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlordane	0.2	1	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	0.04	0.2	0.003	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gamma-Chlordane	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	0.07	0.3	0.01	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (mg/kg)																		
Aluminum	78,000	NLE	6,000	15,200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	31	450	6	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	19	19	19	22.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	16,000	59,000	2,100	32.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	16	140	0.7	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	78	78	2	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NLE	NLE	NLE	921	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NLE	NLE	NLE	269	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	1,600	590	90	2.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	3,100	45,000	11,000	8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NLE	NLE	NLE	55,800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	800	90	19.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NLE	NLE	NLE	7,230	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	11,000	5,900	65	90.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	23	65	0.1	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	1,600	23,000	48	8.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	NLE	NLE	15,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	390	5,700	1	1.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NLE	NLE	NLE	51.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	78	1,100	NLE	94.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	23,000	110,000	930	81.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 4.1
SOIL SAMPLING SUMMARY RESULTS - COMPARISON TO NJDEP STANDARDS
SITE FTMM-59
FORT MONMOUTH, NEW JERSEY

Site Area					2004 Geoprobe Investigation													
Loc ID	**NJDEP RDCSRS**	**NJDEP NRDCSRS**	**NJDEP IGW Soil Screening Level**	**Weston 1995 Background (Main Post)**	FTMM59-GW8	FTMM59-GW9	FTMM59-GW10	FTMM59-GW11	FTMM59-GW12	FTMM59-GW13	FTMM59-GW14	FTMM59-GW15	FTMM59-GW16	FTMM59-GW17	FTMM59-GW18	FTMM59-GW19	FTMM59-GW20	FTMM59-GW21
Sample ID					FTMM59-SS-GW8-6-6	FTMM59-SS-GW9-7-7	FTMM59-SS-GW10-8-8	FTMM59-SS-GW11-7-7	FTMM59-SS-GW12-6-6	FTMM59-SS-GW13-8-8	FTMM59-SS-GW14-11-11	FTMM59-SS-GW15-7-7	FTMM59-SS-GW16-8-8	FTMM59-SS-GW17-8-8	FTMM59-SS-GW18-4-4	FTMM59-SS-GW19-8-8	FTMM59-SS-GW20-8-8	FTMM59-SS-GW21-10-10
Sample Date					4/23/2004	4/23/2004	5/20/2004	5/5/2004	5/5/2004	5/5/2004	5/5/2004	5/5/2004	5/5/2004	5/10/2004	5/10/2014	5/11/2004	5/11/2004	5/10/2004
Volatile Organic Compounds (mg/kg)																		
1,1,1-Trichloroethane	160,000	NLE	0.3	-	< 0.13	< 0.12	< 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.12
1,2,4-Trimethylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	70,000	NLE	19	-	**0.870 B**	**0.750 B**	< 0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.23
Benzene	2	5	0.005	-	< 0.13	< 0.12	< 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.18**
Cymene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl benzene	7,800	110,000	13	-	< 0.25	< 0.25	< 0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**5**
Isopropylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Meta/Para Xylene	NLE	NLE	NLE	-	< 0.38	< 0.37	< 0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**19 E**
Methyl butyl ketone	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl ethyl ketone	3,100	44,000	0.9	-	< 0.38	< 0.37	< 0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.35
Methyl isobutyl ketone	NLE	NLE	NLE	-	< 0.25	< 0.25	< 0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.23
Methyl Tertbutyl Ether	110	320	0.2	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	46	230	0.01	-	< 0.25	< 0.25	< 0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.23
Naphthalene	6	17	25	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ortho Xylene	NLE	NLE	NLE	-	< 0.25	< 0.25	< 0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**5**
Propylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	6,300	91,000	7	-	< 0.13	< 0.12	< 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.12
Total TIC VOCs	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (mg/kg)																		
1-Methylnaphthalene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	310	2,200	0.8	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	230	2,400	8	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,400	37,000	110	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NLE	300,000	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	17,000	30,000	2,400	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	5	17	0.8	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.5	2	0.2	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	5	17	2	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	380,000	30,000	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	45	170	25	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	35	140	1,200	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	24	96	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	450	1,700	80	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,100	68,000	760	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,300	24,000	1,300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	2,300	24,000	170	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	5	17	7	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	6	17	25	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NLE	300,000	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,700	18,000	840	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total TIC SVOCs	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons (mg/kg)																		
Total Petroleum Hydrocarbons	NLE	NLE	NLE	-	ND	ND	**2,812**	**3,853**	**178**	**208**	**6,870**	**315.42**	**6,351**	**4,188**	**3,068**	**1,483**	**397.78**	NA
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)																		
C10-C12 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C12-C16 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C12-C16 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C16-C21 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C16-C21 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C21-C36 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C21-C40 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C9-C12 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total EPH	SS	SS	SS	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calculated Residential EPH SRC (if total EPH exceeds 1,700 mg/kg) [4]				-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calculated Non-Residential EPH SRC (if total EPH exceeds 1,700 mg/kg) [4]				-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides & PCBs (mg/kg)																		
4,4'-DDD	3	13	4	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	2	9	18	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	2	8	11	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlordane	0.2	1	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	0.04	0.2	0.003	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gamma-Chlordane	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	0.07	0.3	0.01	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (mg/kg)																		
Aluminum	78,000	NLE	6,000	15,200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	31	450	6	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	19	19	19	22.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	16,000	59,000	2,100	32.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	16	140	0.7	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	78	78	2	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NLE	NLE	NLE	921	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NLE	NLE	NLE	269	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	1,600	590	90	2.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	3,100	45,000	11,000	8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NLE	NLE	NLE	55,800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	800	90	19.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NLE	NLE	NLE	7,230	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	11,000	5,900	65	90.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	23	65	0.1	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	1,600	23,000	48	8.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	NLE	NLE	15,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	390	5,700	1	1.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NLE	NLE	NLE	51.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	78	1,100	NLE	94.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	23,000	110,000	930	81.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 4.1
SOIL SAMPLING SUMMARY RESULTS - COMPARISON TO NJDEP STANDARDS
SITE FTMM-59
FORT MONMOUTH, NEW JERSEY

Site Area					2009 Investigation of Failed Lift at Service Bay 10					2010 Investigation of the Chemical and Paint Booth Sheds							
Loc ID	NJDEP RDCSRS	NJDEP NRDCSRS	NJDEP IGW Soil Screening Level	Weston 1995 Background (Main Post)	FTMM59-B2		FTMM59-FE	FTMM59-NE	FTMM59-SE	FTMM59-Shed1/B1		FTMM59-Shed1/B2		FTMM59-Shed1/B3		FTMM59-Shed2/B1	
Sample ID					FTMM59-SS-B2-4.5-5	FTMM59-SS-B2-6.5-7	FTMM59-SS-FE-3-3.5	FTMM59-SS-NE-5-5.5	FTMM59-SS-SE-4-4.5	FTMM59-SS-Shed1/B1-0-0.5	FTMM59-SS-Shed1/B1-5.5-6	FTMM59-SS-Shed1/B2-0-0.5	FTMM59-SS-Shed1/B2-7-7.5	FTMM59-SS-Shed1/B3-0-0.5	FTMM59-SS-Shed1/B3-5-5.2	FTMM59-SS-Shed2/B1-0-0.5	FTMM59-SS-Shed2/B1-5-5.5
Sample Date					12/30/2009	12/30/2009	3/9/2010	3/9/2010	3/9/2010	5/7/2010	5/7/2010	5/7/2010	5/7/2010	5/7/2010	5/7/2010	5/10/2010	5/10/2010
Volatile Organic Compounds (mg/kg)																	
1,1,1-Trichloroethane	160,000	NLE	0.3	-	NA	NA	< 0.064	< 0.063	< 0.063	NA	< 0.068	NA	< 0.077	NA	< 0.084	NA	< 0.088
1,2,4-Trimethylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	70,000	NLE	19	-	NA	NA	< 0.083	< 0.082	< 0.082	NA	< 0.089	NA	< 0.1	NA	< 0.11	NA	< 0.115
Benzene	2	5	0.005	-	NA	NA	< 0.058	< 0.057	< 0.057	NA	< 0.062	NA	< 0.069	NA	< 0.076	NA	< 0.08
Cymene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl benzene	7,800	110,000	13	-	NA	NA	< 0.07	< 0.069	< 0.069	NA	< 0.075	NA	< 0.084	NA	< 0.092	NA	< 0.097
Isopropylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Meta/Para Xylene	NLE	NLE	NLE	-	NA	NA	< 0.133	< 0.131	< 0.131	NA	< 0.142	NA	< 0.16	NA	< 0.175	NA	< 0.184
Methyl butyl ketone	NLE	NLE	NLE	-	NA	NA	< 0.048	< 0.047	< 0.047	NA	< 0.051	NA	< 0.057	NA	< 0.063	NA	< 0.066
Methyl ethyl ketone	3,100	44,000	0.9	-	NA	NA	< 0.072	< 0.071	< 0.071	NA	< 0.077	NA	< 0.087	NA	< 0.095	NA	< 0.1
Methyl isobutyl ketone	NLE	NLE	NLE	-	NA	NA	< 0.055	< 0.054	< 0.054	NA	< 0.058	NA	< 0.066	NA	< 0.072	NA	< 0.076
Methyl Tertbutyl Ether	110	320	0.2	-	NA	NA	< 0.032	< 0.032	< 0.032	NA	< 0.035	NA	< 0.039	NA	< 0.043	NA	< 0.045
Methylene chloride	46	230	0.01	-	NA	NA	< 0.066	< 0.065	< 0.065	NA	< 0.07	NA	< 0.079	NA	< 0.087	NA	< 0.091
Naphthalene	6	17	25	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ortho Xylene	NLE	NLE	NLE	-	NA	NA	< 0.063	< 0.062	< 0.062	NA	< 0.067	NA	< 0.076	NA	< 0.083	NA	< 0.087
Propylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	6,300	91,000	7	-	NA	NA	< 0.072	< 0.071	< 0.071	NA	< 0.077	NA	< 0.087	NA	< 0.095	NA	< 0.1
Total TIC VOCs	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	**83.4 J**	NA	**46.4 J**	NA	**420 J**	NA	NA
Semivolatile Organic Compounds (mg/kg)																	
1-Methylnaphthalene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	310	2,200	0.8	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	230	2,400	8	-	NA	NA	NA	NA	NA	< 0.608	**5.1**	< 0.269	**3.61**	< 1.468	< 0.32	< 0.265	NA
Acenaphthene	3,400	37,000	110	-	NA	NA	NA	NA	NA	< 0.633	< 0.316	< 0.28	< 0.329	< 1.53	< 0.333	< 0.277	NA
Acenaphthylene	NLE	300,000	NLE	-	NA	NA	NA	NA	NA	< 0.636	< 0.317	< 0.281	< 0.33	< 1.535	< 0.334	< 0.278	NA
Anthracene	17,000	30,000	2,400	-	NA	NA	NA	NA	NA	< 0.699	< 0.349	< 0.309	< 0.363	< 1.688	< 0.368	< 0.305	NA
Benzo(a)anthracene	5	17	0.8	-	NA	NA	NA	NA	NA	< 0.697	< 0.347	< 0.308	< 0.362	< 1.682	< 0.366	< 0.304	NA
Benzo(a)pyrene	0.5	2	0.2	-	NA	NA	NA	NA	NA	< 0.538	< 0.268	< 0.238	< 0.279	2.04 JD	< 0.283	**0.11 J**	NA
Benzo(b)fluoranthene	5	17	2	-	NA	NA	NA	NA	NA	< 0.5	< 0.249	< 0.221	< 0.26	**1.19 JD**	< 0.263	**0.25 J**	NA
Benzo(ghi)perylene	380,000	30,000	NLE	-	NA	NA	NA	NA	NA	< 0.432	< 0.216	< 0.191	< 0.225	**1.16 JD**	< 0.227	< 0.189	NA
Benzo(k)fluoranthene	45	170	25	-	NA	NA	NA	NA	NA	< 0.601	< 0.3	< 0.266	< 0.312	< 1.451	< 0.316	< 0.262	NA
Bis(2-Ethylhexyl)phthalate	35	140	1,200	-	NA	NA	NA	NA	NA	< 0.739	< 0.368	< 0.327	< 0.384	< 1.784	< 0.389	< 0.323	NA
Carbazole	24	96	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	450	1,700	80	-	NA	NA	NA	NA	NA	< 0.657	< 0.328	< 0.29	< 0.341	**2.85 D**	< 0.346	**0.14 J**	NA
Di-n-butylphthalate	6,100	68,000	760	-	NA	NA	NA	NA	NA	< 0.669	< 0.333	< 0.296	< 0.347	< 1.614	< 0.352	< 0.292	NA
Fluoranthene	2,300	24,000	1,300	-	NA	NA	NA	NA	NA	**0.59 JD**	< 0.346	< 0.307	< 0.361	**5.24 D**	< 0.365	**0.28 J**	NA
Fluorene	2,300	24,000	170	-	NA	NA	NA	NA	NA	< 0.662	< 0.33	< 0.292	< 0.344	< 1.597	< 0.348	< 0.289	NA
Indeno(1,2,3-cd)pyrene	5	17	7	-	NA	NA	NA	NA	NA	< 0.456	< 0.227	< 0.202	< 0.237	< 1.101	< 0.24	< 0.199	NA
Naphthalene	6	17	25	-	NA	NA	NA	NA	NA	< 0.566	< 0.282	< 0.25	**0.86**	< 1.366	< 0.333	< 0.247	NA
Phenanthrene	NLE	300,000	NLE	-	NA	NA	NA	NA	NA	< 0.694	**6.27**	< 0.307	**2.22**	**2.74 JD**	**0.84**	< 0.303	NA
Pyrene	1,700	18,000	840	-	NA	NA	NA	NA	NA	**0.47 JD**	< 0.37	< 0.328	< 0.385	**4.07 D**	< 0.39	**0.21 J**	NA
Total TIC SVOCs	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	**368.7 JN**	**139.7 JN**	**130.03 JN**	**257.9 JN**	**780 JN**	**130.8 J**	NA	NA
Total Petroleum Hydrocarbons (mg/kg)																	
Total Petroleum Hydrocarbons	NLE	NLE	NLE	-	**838.08**	**21,491 E**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)																	
C10-C12 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C12-C16 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C12-C16 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C16-C21 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C16-C21 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C21-C36 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C21-C40 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C9-C12 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total EPH	SS	SS	SS	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calculated Residential EPH SRC (if total EPH exceeds 1,700 mg/kg) [4]				-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calculated Non-Residential EPH SRC (if total EPH exceeds 1,700 mg/kg) [4]				-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides & PCBs (mg/kg)																	
4,4'-DDD	3	13	4	-	NA	NA	NA	NA	NA	**0.0044**	NA	< 0.0006	NA	**0.0067**	NA	**0.0189**	NA
4,4'-DDE	2	9	18	-	NA	NA	NA	NA	NA	**0.012**	NA	**0.0036**	NA	**0.0107**	NA	**0.0214**	NA
4,4'-DDT	2	8	11	-	NA	NA	NA	NA	NA	**0.0253**	NA	**0.0082**	NA	**0.0154**	NA	**0.0476**	NA
Chlordane	0.2	1	NLE	-	NA	NA	NA	NA	NA	< 0.0143	NA	< 0.0125	NA	< 0.0137	NA	**0.0152**	NA
Dieldrin	0.04	0.2	0.003	-	NA	NA	NA	NA	NA	< 0.002	NA	**0.0031**	NA	< 0.0019	NA	< 0.0018	NA
Gamma-Chlordane	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	< 0.0017	NA	< 0.0015	NA	**0.0026**	NA	< 0.0015	NA
Heptachlor epoxide	0.07	0.3	0.01	-	NA	NA	NA	NA	NA	**0.0015**	NA	< 0.0008	NA	< 0.0009	NA	< 0.0008	NA
Aroclor-1260	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	< 0.0298	NA	**0.064**	NA	**0.09**	NA	< 0.0259	NA
Inorganics (mg/kg)																	
Aluminum	78,000	NLE	6,000	15,200	NA	NA	NA	NA	NA	**4,260**	**15,800**	**2,480**	**15,200**	**3,190**	**18,600**	**2,950**	**17,000**
Antimony	31	450	6	ND	NA	NA	NA	NA	NA	**1.56**	< 0.682	**0.63**	**1.19**	**1.7**	**1.21**	**1.05**	**0.81**
Arsenic	19	19	19	22.9	NA	NA	NA	NA	NA	**2.65**	**8.65**	**1.62**	**11.2**	**3.12**	**9.47**	**2.9**	**9.27**
Barium	16,000	59,000	2,100	32.3	NA	NA	NA	NA	NA	**14**	**25.7**	**10.7**	**29.1**	**8.24**	**26.9**	**9.66**	**25.2**
Beryllium	16	140	0.7	2	NA	NA	NA	NA	NA	**0.265**	**1.82**	**0.123**	**1.19**	**0.259**	**1.48**	**0.192**	**1.46**
Cadmium	78	78	2	ND	NA	NA	NA	NA	NA	**1.48**	**1.31**	**0.506**	**0.823**	**0.59**	**1.02**	**0.335**	**0.968**
Calcium	NLE	NLE	NLE	921	NA	NA	NA	NA	NA	**1,030**	**302**	**259**	**416**	**401**	**316**	**1,050**	**440**
Chromium	NLE	NLE	NLE	269	NA	NA	NA	NA	NA	**23.3**	**162**	**13.6**	**128**	**28.1**	**160**	**17.2**	**155**
Cobalt	1,600	590	90	2.5	NA	NA	NA	NA	NA	**2.59**	**1.08**	**0.606**	**0.455**	**1.28**	**0.533**	**0.528**	**0.331**
Copper	3,100	45,000	11,000	8	NA	NA	NA	NA	NA	**14.5**	**4.06**	**9.65**	**5.02**	**6.81**	**6.33**	**6.76**	**7.02**
Iron	NLE	NLE	NLE	55,800	NA	NA	NA	NA	NA	**24,200**	**47,200**	**10,400**	**32,200**	**9,360**	**39,400**	**5,800**	**37,200**
Lead	400	800	90	19.5	NA	NA	NA	NA	NA	**545**	**8.91**	**138**	**6.25**	**2,840**	**7.82**	**48.6**	**8.8**
Magnesium	NLE	NLE	NLE	7,230	NA	NA	NA	NA	NA	**886**	**6,400**	**380**	**4,040**	**1,310**	**5,440**	**904**	**5,180**
Manganese	11,000	5,900	65	90.7	NA	NA	NA	NA	NA	**108**	**22.2**	**34.2**	**31.1**	**36.4**	**39.2**	**32.7**	**33.2**
Mercury	23	65	0.1	ND	NA	NA	NA	NA	NA	**0.227**	**0.016**	**0.028**	**0.02**	**0.159**	< 0.009	**0.028**	**0.025**
Nickel	1,600	23,000	48	8.4	NA	NA	NA	NA	NA	**5.44**	**7.32**	**3.47**	**4.67**	**2.99**	**5.99**	**2.3**	**5.35**
Potassium	NLE	NLE	NLE	15,400	NA	NA	NA	NA	NA	**1,300**	**14,700**	**740**	**6,780**	**1,710**	**10,400**	**1,160**	**9,730**
Silver	390	5,700	1	1.1	NA	NA	NA	NA	NA	**3.06**	**5**	**1.44**	**3.45**	**1.29**	**4.24**	**0.785**	**3.87**
Sodium	NLE	NLE	NLE	51.6	NA	NA	NA	NA	NA	< 212.586	< 206.744	< 190.833	< 210.181	< 203.911	**439**	< 181.241	**427**
Vanadium	78	1,100	NLE	94.1	NA	NA	NA	NA	NA	**13.5**	**82.1**	**9.1**	**65.8**	**17.2**	**81.3**	**11.7**	**79.1**
Zinc	23,000	110,000	930	81.4	NA	NA	NA	NA	NA	**1,500**	**47.4**	**90.6**	**32.6**	**2,180**	**47.4**	**119**	**51.1**

TABLE 4.1
SOIL SAMPLING SUMMARY RESULTS - COMPARISON TO NJDEP STANDARDS
SITE FTMM-59
FORT MONMOUTH, NEW JERSEY

Site Area					2010 Investigation of the Chemical and Paint Booth Sheds				2014 Investigation of Hydraulic Lift After Building Demolished - Bay 9			2014 Investigaiton of Hydraulic Lift After Building Demolished - Bay 10			
Loc ID	**NJDEP RDCSRS**	**NJDEP NRDCSRS**	**NJDEP IGW Soil Screening Level**	**Weston 1995 Background (Main Post)**	FTMM59-Shed2/B2		FTMM59-Shed2/B3		Bay 9-LIFT 1-CYLINDER	Bay 9-LIFT 1-PIPING	Bay 9-LIFT 1-TANK	Bay 10-LIFT 2-CYL1	Bay 10-LIFT 2-CYL2	Bay 10-LIFT 2-PIPING	Bay 10-LIFT 2-TANK
Sample ID					FTMM59-SS-Shed2/B2-0-0.5	FTMM59-SS-Shed2/B2-6-6.5	FTMM59-SS-Shed2/B3-0-0.5	FTMM59-SS-Shed2/B3-4.5-5	JB73820-3 (4-4.5)	JB73820-2 (1-1.5)	JB73820-1 (4-4.5)	JB73820-6 (7.5-8)	JB73820-7 (7.5-8)	JB73820-5 (1-1.5)	JB73820-4 (5.5-6)
Sample Date					5/10/2010	5/10/2010	5/10/2010	5/10/2010	8/8/2014	8/8/2014	8/8/2014	8/8/2014	8/8/2014	8/8/2014	8/8/2014
Volatile Organic Compounds (mg/kg)															
1,1,1-Trichloroethane	160,000	NLE	0.3	-	NA	< 0.079	NA	< 0.078	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	70,000	NLE	19	-	NA	< 0.103	NA	< 0.101	NA	NA	NA	NA	NA	NA	NA
Benzene	2	5	0.005	-	NA	< 0.072	NA	< 0.07	NA	NA	NA	NA	NA	NA	NA
Cymene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl benzene	7,800	110,000	13	-	NA	< 0.087	NA	< 0.085	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Meta/Para Xylene	NLE	NLE	NLE	-	NA	< 0.165	NA	< 0.161	NA	NA	NA	NA	NA	NA	NA
Methyl butyl ketone	NLE	NLE	NLE	-	NA	< 0.059	NA	< 0.058	NA	NA	NA	NA	NA	NA	NA
Methyl ethyl ketone	3,100	44,000	0.9	-	NA	< 0.09	NA	< 0.088	NA	NA	NA	NA	NA	NA	NA
Methyl isobutyl ketone	NLE	NLE	NLE	-	NA	< 0.068	NA	< 0.067	NA	NA	NA	NA	NA	NA	NA
Methyl Tertbutyl Ether	110	320	0.2	-	NA	< 0.04	NA	< 0.039	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	46	230	0.01	-	NA	< 0.082	NA	< 0.08	NA	NA	NA	NA	NA	NA	NA
Naphthalene	6	17	25	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ortho Xylene	NLE	NLE	NLE	-	NA	< 0.078	NA	< 0.076	NA	NA	NA	NA	NA	NA	NA
Propylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	6,300	91,000	7	-	NA	< 0.09	NA	< 0.088	NA	NA	NA	NA	NA	NA	NA
Total TIC VOCs	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (mg/kg)															
1-Methylnaphthalene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	310	2,200	0.8	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	230	2,400	8	-	< 0.277	NA	< 1.414	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,400	37,000	110	-	< 0.288	NA	< 1.474	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NLE	300,000	NLE	-	< 0.29	NA	< 1.48	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	17,000	30,000	2,400	-	< 0.318	NA	< 1.627	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	5	17	0.8	-	< 0.317	NA	< 1.621	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.5	2	0.2	-	< 0.245	NA	**1.03 JD**	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	5	17	2	-	**0.24 J**	NA	**2.48 JD**	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	380,000	30,000	NLE	-	< 0.197	NA	< 1.006	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	45	170	25	-	< 0.274	NA	**2.55 JD**	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	35	140	1,200	-	< 0.336	NA	< 1.719	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	24	96	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	450	1,700	80	-	< 0.299	NA	**1.58 JD**	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,100	68,000	760	-	< 0.304	NA	< 1.556	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,300	24,000	1,300	-	**0.22 J**	NA	**2.74 D**	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	2,300	24,000	170	-	< 0.301	NA	< 1.54	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	5	17	7	-	< 0.208	NA	< 1.061	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	6	17	25	-	< 0.258	NA	< 1.317	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NLE	300,000	NLE	-	< 0.316	NA	**1.27 JD**	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,700	18,000	840	-	**0.17 J**	NA	**2.17 JD**	NA	NA	NA	NA	NA	NA	NA	NA
Total TIC SVOCs	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons (mg/kg)															
Total Petroleum Hydrocarbons	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)															
C10-C12 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C12-C16 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C12-C16 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C16-C21 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C16-C21 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C21-C36 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C21-C40 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C9-C12 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total EPH	SS	SS	SS	-	NA	NA	NA	NA	**30,300**	**5,250**	**16.7**	**23,100**	**14,400**	**23,600**	**141**
Calculated Residential EPH SRC (if total EPH exceeds 1,700 mg/kg) [4]				-	NA	NA	NA	NA							
Calculated Non-Residential EPH SRC (if total EPH exceeds 1,700 mg/kg) [4]				-	NA	NA	NA	NA							
Pesticides & PCBs (mg/kg)															
4,4'-DDD	3	13	4	-	**0.0021**	NA	**0.0051**	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	2	9	18	-	**0.0119**	NA	**0.0278**	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	2	8	11	-	**0.0168**	NA	**0.0356**	NA	NA	NA	NA	NA	NA	NA	NA
Chlordane	0.2	1	NLE	-	< 0.0129	NA	< 0.0132	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	0.04	0.2	0.003	-	< 0.0018	NA	< 0.0019	NA	NA	NA	NA	NA	NA	NA	NA
Gamma-Chlordane	NLE	NLE	NLE	-	< 0.0015	NA	< 0.0015	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	0.07	0.3	0.01	-	**0.0022**	NA	< 0.0009	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NLE	NLE	NLE	-	< 0.0268	NA	< 0.0275	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (mg/kg)															
Aluminum	78,000	NLE	6,000	15,200	**7,570**	**11,300**	**10,300**	**12,300**	NA	NA	NA	NA	NA	NA	NA
Antimony	31	450	6	ND	< 0.645	< 0.684	**1.69**	**1.41**	NA	NA	NA	NA	NA	NA	NA
Arsenic	19	19	19	22.9	**4.1**	**4.53**	**7.61**	**3.24**	NA	NA	NA	NA	NA	NA	NA
Barium	16,000	59,000	2,100	32.3	**18.8**	**33.5**	**35.6**	**21.5**	NA	NA	NA	NA	NA	NA	NA
Beryllium	16	140	0.7	2	**0.404**	**1.27**	**0.773**	**1.35**	NA	NA	NA	NA	NA	NA	NA
Cadmium	78	78	2	ND	**0.517**	**0.671**	**0.749**	**0.727**	NA	NA	NA	NA	NA	NA	NA
Calcium	NLE	NLE	NLE	921	**357**	**517**	**2,400**	**237**	NA	NA	NA	NA	NA	NA	NA
Chromium	NLE	NLE	NLE	269	**35.4**	**92.4**	**70.3**	**106**	NA	NA	NA	NA	NA	NA	NA
Cobalt	1,600	590	90	2.5	**0.812**	**0.245**	**1.58**	**0.448**	NA	NA	NA	NA	NA	NA	NA
Copper	3,100	45,000	11,000	8	**8.33**	**5.02**	**11**	**2.93**	NA	NA	NA	NA	NA	NA	NA
Iron	NLE	NLE	NLE	55,800	**12,900**	**28,000**	**22,100**	**30,400**	NA	NA	NA	NA	NA	NA	NA
Lead	400	800	90	19.5	**16.6**	**5.62**	**22.3**	**7.14**	NA	NA	NA	NA	NA	NA	NA
Magnesium	NLE	NLE	NLE	7,230	**1,160**	**3,950**	**2,750**	**4,430**	NA	NA	NA	NA	NA	NA	NA
Manganese	11,000	5,900	65	90.7	**55.8**	**42.2**	**91.8**	**37**	NA	NA	NA	NA	NA	NA	NA
Mercury	23	65	0.1	ND	**0.04**	< 0.009	**0.008**	**0.052**	NA	NA	NA	NA	NA	NA	NA
Nickel	1,600	23,000	48	8.4	**4.37**	**4.51**	**5.62**	**5**	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	NLE	NLE	15,400	**2,110**	**8,050**	**5,220**	**9,680**	NA	NA	NA	NA	NA	NA	NA
Silver	390	5,700	1	1.1	**1.46**	**3.15**	**2.38**	**3.4**	NA	NA	NA	NA	NA	NA	NA
Sodium	NLE	NLE	NLE	51.6	**2,490**	**392**	< 204.234	**362**	NA	NA	NA	NA	NA	NA	NA
Vanadium	78	1,100	NLE	94.1	**27.9**	**49.4**	**46.3**	**54.3**	NA	NA	NA	NA	NA	NA	NA
Zinc	23,000	110,000	930	81.4	**93.3**	**32.4**	**414**	**33.4**	NA	NA	NA	NA	NA	NA	NA

TABLE 4.1
SOIL SAMPLING SUMMARY RESULTS - COMPARISON TO NJDEP STANDARDS
SITE FTMM-59
FORT MONMOUTH, NEW JERSEY

Site Area					2015 RI Data Gap Investigation											
Loc ID	NJDEP RDCSRS	NJDEP NRDCSRS	NJDEP IGW Soil Screening Level	Weston 1995 Background (Main Post)	FTMM-59-SB1			FTMM-59-SB2		FTMM-59-SB3		FTMM-59-SB4		FTMM-59-SB6	
Sample ID					FTMM-59-SB1-0.0-0.5	FTMM-59-SB101-0.0-0.5	FTMM-59-SB1-1.5-2.0	FTMM-59-SB2-0.0-0.5	FTMM-59-SB2-1.5-2.0	FTMM-59-SB3-10.0-10.5	FTMM-59-SB3-8.0-8.5	FTMM-59-SB4-11.0-11.5	FTMM-59-SB4-5.5-6.0	FTMM-59-SB6-12.5-13.0	FTMM-59-SB6-19.5-20.0
Sample Date					9/29/2015	9/29/2015	9/29/2015	9/29/2015	9/29/2015	9/29/2015	9/29/2015	9/29/2015	9/29/2015	9/29/2015	9/29/2015
Volatile Organic Compounds (mg/kg)															
1,1,1-Trichloroethane	160,000	NLE	0.3	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0022	< 0.007
1,2,4-Trimethylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.8**	< 0.007
1,3,5-Trimethylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.11**	< 0.007
Acetone	70,000	NLE	19	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.11**	**1.5 J**
Benzene	2	5	0.005	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.0015 J**	< 0.007
Cymene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.017**	< 0.007
Ethyl benzene	7,800	110,000	13	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.71**	< 0.007
Isopropylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.069**	< 0.007
Meta/Para Xylene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.084**	< 0.014
Methyl butyl ketone	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0022	< 0.007
Methyl ethyl ketone	3,100	44,000	0.9	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.036**	**0.22**
Methyl isobutyl ketone	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0022	< 0.007
Methyl Tertbutyl Ether	110	320	0.2	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.0015 J**	**0.0031 J**
Methylene chloride	46	230	0.01	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0022	< 0.007
Naphthalene	6	17	25	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**4.4**	< 0.007
n-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.095**	< 0.007
Ortho Xylene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.0041 J**	< 0.007
Propylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.86**	< 0.007
sec-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.065**	< 0.007
tert-Butylbenzene	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.0029 J**	< 0.007
Toluene	6,300	91,000	7	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.00097 J**	< 0.007
Total TIC VOCs	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**60.51 JN**	**0.075 JN**
Semivolatile Organic Compounds (mg/kg)															
1-Methylnaphthalene	NLE	NLE	NLE	-	< 0.0036	< 0.0037	< 0.0038	< 0.0034	< 0.0037	NA	NA	NA	NA	NA	NA
2-Chlorophenol	310	2,200	0.8	-	< 0.18	< 0.19 UJ	< 0.19 UJ	< 0.17 UJ	< 0.19	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	230	2,400	8	-	< 0.0036	< 0.0037	< 0.0038	< 0.0034	< 0.0037	NA	NA	NA	NA	NA	NA
Acenaphthene	3,400	37,000	110	-	< 0.0036	< 0.0037	< 0.0038	< 0.0034	< 0.0037	NA	NA	NA	NA	NA	NA
Acenaphthylene	NLE	300,000	NLE	-	< 0.0036	< 0.0037	< 0.0038	< 0.0034	< 0.0037	NA	NA	NA	NA	NA	NA
Anthracene	17,000	30,000	2,400	-	< 0.0036	< 0.0037	< 0.0038	**0.0024 J**	< 0.0037	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	5	17	0.8	-	**0.014**	< 0.0037	< 0.0038	**0.017**	< 0.0037	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.5	2	0.2	-	**0.021**	< 0.0037	< 0.0038	**0.018**	< 0.0037 UJ	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	5	17	2	-	**0.032**	< 0.0037	< 0.0038	**0.035**	< 0.0037	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	380,000	30,000	NLE	-	**0.025**	< 0.0037	< 0.0038	**0.017**	< 0.0037	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	45	170	25	-	**0.0074**	< 0.0037	< 0.0038	**0.0069**	< 0.0037	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	35	140	1,200	-	< 0.029	< 0.03	< 0.03	**0.028 J**	< 0.029	NA	NA	NA	NA	NA	NA
Carbazole	24	96	NLE	-	**0.0033 J**	< 0.0037	< 0.0038	**0.0031 J**	< 0.0037	NA	NA	NA	NA	NA	NA
Chrysene	450	1,700	80	-	**0.032**	< 0.0037	< 0.0038	**0.027**	< 0.0037	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,100	68,000	760	-	**0.1 J**	< 0.19	< 0.19	**0.094 J**	< 0.19	NA	NA	NA	NA	NA	NA
Fluoranthene	2,300	24,000	1,300	-	**0.032**	< 0.0037	< 0.0038	**0.042**	< 0.0037	NA	NA	NA	NA	NA	NA
Fluorene	2,300	24,000	170	-	< 0.0036	< 0.0037	< 0.0038	< 0.0034	< 0.0037	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	5	17	7	-	**0.011**	< 0.0037	< 0.0038	**0.015**	< 0.0037	NA	NA	NA	NA	NA	NA
Naphthalene	6	17	25	-	< 0.0036	< 0.0037	< 0.0038	< 0.0034	< 0.0037	NA	NA	NA	NA	NA	NA
Phenanthrene	NLE	300,000	NLE	-	**0.02**	< 0.0048	< 0.0049	**0.02**	< 0.0047	NA	NA	NA	NA	NA	NA
Pyrene	1,700	18,000	840	-	**0.031**	< 0.0037	< 0.0038	**0.04**	< 0.0037	NA	NA	NA	NA	NA	NA
Total TIC SVOCs	NLE	NLE	NLE	-	**15.37 JN**	**10.62 JN**	**7.7 JN**	**30.24 JN**	**31.29 JN**	NA	NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons (mg/kg)															
Total Petroleum Hydrocarbons	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)															
C10-C12 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	**1.31 J**	**1.01 J**	**1.41 J**	**1.21 J**	**1.4 J**	**11.91 J**
C12-C16 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	**1.31**	**1.01**	**1.41**	**0.91 J**	**8.2**	**2.41**
C12-C16 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	**0.45 J**	**0.52 J**	**0.32 J**	**0.78 J**	**13.4 J**	**11.91 J**
C16-C21 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	**1.31**	**1.01**	**1.41**	**48**	**7.3**	**2.41**
C16-C21 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	**0.89 J**	**0.94 J**	**1.2 J**	**19.6 J**	**42.4 J**	**8.1 J**
C21-C36 Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	**0.99 J**	**1.1 J**	**1.2 J**	**107 J**	**4.8 J**	**91.4 J**
C21-C40 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	**1.1 J**	**0.85 J**	**1.41**	**528 J**	**0.87 J**	**13.5**
C9-C12 Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	**0.58 J**	**0.26 J**	**0.31 J**	**0.38 J**	**1.5**	**0.59 J**
Total Aliphatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	**2.1**	**1.4 J**	**1.2**	**577**	**17.9**	**15.6**
Total Aromatics	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	**2.8**	**2.8 J**	**3 J**	**128 J**	**62 J**	**103 J**
Total EPH	SS	SS	SS	-	NA	NA	NA	NA	NA	**4.9**	**4.2**	**4.2 J**	**705 J**	**79.9 J**	**119 J**
Calculated Residential EPH SRC (if total EPH exceeds 1,700 mg/kg) [4]				-	NA	NA	NA	NA	NA	**1,700**	**1,700**	**1,700**	**1,700**	**1,700**	**1,700**
Calculated Non-Residential EPH SRC (if total EPH exceeds 1,700 mg/kg) [4]				-	NA	NA	NA	NA	NA	**1,700**	**1,700**	**1,700**	**1,700**	**1,700**	**1,700**
Pesticides & PCBs (mg/kg)															
4,4'-DDD	3	13	4	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	2	9	18	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	2	8	11	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlordane	0.2	1	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	0.04	0.2	0.003	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gamma-Chlordane	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	0.07	0.3	0.01	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (mg/kg)															
Aluminum	78,000	NLE	6,000	15,200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	31	450	6	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	19	19	19	22.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	16,000	59,000	2,100	32.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	16	140	0.7	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	78	78	2	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NLE	NLE	NLE	921	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NLE	NLE	NLE	269	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	1,600	590	90	2.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	3,100	45,000	11,000	8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NLE	NLE	NLE	55,800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	800	90	19.5	**14.1**	**3.1 J**	**6.3**	**9.7**	**4.5 J**	NA	NA	NA	NA	**5.1 J**	**2.9 J**
Magnesium	NLE	NLE	NLE	7,230	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	11,000	5,900	65	90.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	23	65	0.1	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	1,600	23,000	48	8.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	NLE	NLE	15,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	390	5,700	1	1.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NLE	NLE	NLE	51.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	78	1,100	NLE	94.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	23,000	110,000	930	81.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 4.1
SOIL SAMPLING SUMMARY RESULTS - COMPARISON TO NJDEP STANDARDS
SITE FTMM-59
FORT MONMOUTH, NEW JERSEY

Site Area					2015 RI Data Gap Investigation														
Loc ID	NJDEP RDCSRS	NJDEP NRDCSRS	NJDEP IGW Soil Screening Level	Weston 1995 Background (Main Post)	FTMM-59-SB7				FTMM-59-SO01			FTMM-59-SO02		FTMM-59-SO05			FTMM-59-SO10	
Sample ID					FTMM-59-SB7-6.0-6.5	FTMM-59-SB107-6.0-6.5	FTMM-59-SB7-12.0-12.5	FTMM-59-SB107-12.0-12.5	FTMM-59-SO01-6.0-6.5	FTMM-59-SO102-12.5-13.0	FTMM-59-SO01-14.0-14.5	FTMM-59-SO02-10.5-11.0	FTMM-59-SO02-12.5-13.0	FTMM-59-SO05-7.0-7.5	FTMM-59-SO05-10.5-11.0	FTMM-59-SO05-14.5-15.0	FTMM-59-SO10-5.5-6.0	FTMM-59-SO10-10.0-10.5
Sample Date					9/29/2015	9/29/2015	9/29/2015	9/29/2015	9/30/2015	9/30/2015	9/30/2015	9/30/2015	9/30/2015	9/30/2015	9/30/2015	9/30/2015	9/30/2015	9/30/2015
Volatile Organic Compounds (mg/kg)																		
1,1,1-Trichloroethane	160,000	NLE	0.3	-	< 0.0022	< 0.0027	< 0.0021	< 0.0022	< 1.4	< 0.0023	< 0.0033	< 0.26	< 0.27	< 0.72	< 0.0031	< 0.0031	NA	NA
1,2,4-Trimethylbenzene	NLE	NLE	NLE	-	**0.88 J**	**1.2 J**	**0.00097 J**	**0.001 J**	< 1.4	**0.0019 J**	< 0.0033	< 0.26	< 0.27	**4**	**0.0016 J**	< 0.0031	NA	NA
1,3,5-Trimethylbenzene	NLE	NLE	NLE	-	**0.0046**	**0.0052 J**	< 0.0021	**0.00087 J**	< 1.4	**0.0014 J**	< 0.0033	< 0.26	< 0.27	< 0.72	< 0.0031	< 0.0031	NA	NA
Acetone	70,000	NLE	19	-	**0.097 J**	**0.15 J**	**0.082**	**0.095**	< 2.8	**0.16**	**0.099**	< 0.53	< 0.55	< 1.4	**0.083**	**0.012**	NA	NA
Benzene	2	5	0.005	-	**0.004 J**	**0.0052 J**	**0.0029 J**	**0.0049**	< 1.4	**0.0014 J**	< 0.0033	< 0.26	< 0.27	< 0.72	< 0.0031	< 0.0031	NA	NA
Cymene	NLE	NLE	NLE	-	**0.018 J**	**0.044 J**	< 0.0021	< 0.0022	**3.8**	**0.00086 J**	< 0.0033	< 0.26	< 0.27	< 0.72	< 0.0031	< 0.0031	NA	NA
Ethyl benzene	7,800	110,000	13	-	**0.069 J**	**0.13 J**	**0.00052 J**	**0.0016 J**	**8**	**0.00037 J**	< 0.0033	< 0.26	< 0.27	< 0.72	< 0.0031	< 0.0031	NA	NA
Isopropylbenzene	NLE	NLE	NLE	-	**0.022 J**	**0.047 J**	< 0.0021	**0.0011 J**	**3.9**	**0.0014 J**	< 0.0033	< 0.26	< 0.27	**0.78 J**	< 0.0031	< 0.0031	NA	NA
Meta/Para Xylene	NLE	NLE	NLE	-	**0.042 J**	**0.076 J**	**0.013**	**0.0077 J**	< 2.8	< 0.0046	**0.0028 J**	< 0.53	< 0.55	< 1.4	< 0.0062	< 0.0062	NA	NA
Methyl butyl ketone	NLE	NLE	NLE	-	< 0.0022	**0.03 J**	< 0.0021	< 0.0022	< 1.4	< 0.0023	< 0.0033	< 0.26	< 0.27	< 0.72	< 0.0031	< 0.0031	NA	NA
Methyl ethyl ketone	3,100	44,000	0.9	-	**0.018 J**	**0.034**	**0.014**	**0.019**	< 1.4	**0.033**	**0.025**	< 0.26	< 0.27	< 0.72	**0.0093**	< 0.0031	NA	NA
Methyl isobutyl ketone	NLE	NLE	NLE	-	< 0.0022	< 0.0027	< 0.0021	< 0.0022	< 1.4	< 0.0023	< 0.0033	< 0.26	< 0.27	< 0.72	< 0.0031	< 0.0031	NA	NA
Methyl Tertbutyl Ether	110	320	0.2	-	< 0.0022	< 0.0027	**0.0072**	**0.0047**	< 1.4	< 0.0023	< 0.0033	< 0.26	< 0.27	< 0.72	< 0.0031	< 0.0031	NA	NA
Methylene chloride	46	230	0.01	-	< 0.0022	< 0.0027	< 0.0021	< 0.0022	< 1.4	< 0.0023	< 0.0033	< 0.26	< 0.27	< 0.72	< 0.0031	< 0.0031	NA	NA
Naphthalene	6	17	25	-	**1.6 J**	**2.2 J**	< 0.0021	< 0.0022	54	**0.029**	< 0.0033	**0.7**	**0.34 J**	**7.2**	**0.00094 B**	< 0.0031	NA	NA
n-Butylbenzene	NLE	NLE	NLE	-	**0.035 J**	**0.078 J**	< 0.0021	< 0.0022	**10**	**0.0011 J**	< 0.0033	**0.12 J**	< 0.27	**3.6**	< 0.0031	< 0.0031	NA	NA
Ortho Xylene	NLE	NLE	NLE	-	**0.0011 J**	**0.0017 J**	**0.0095**	**0.0071**	< 1.4	< 0.0023	< 0.0033	< 0.26	< 0.27	< 0.72	< 0.0031	< 0.0031	NA	NA
Propylbenzene	NLE	NLE	NLE	-	**0.064 J**	**0.15 J**	< 0.0021	< 0.0022	**8.9**	**0.001 J**	< 0.0033	< 0.26	< 0.27	**1.4 J**	< 0.0031	< 0.0031	NA	NA
sec-Butylbenzene	NLE	NLE	NLE	-	**0.027 J**	**0.06 J**	< 0.0021	< 0.0022	**7.2**	**0.0019 J**	< 0.0033	< 0.27	**0.089 J**	< 0.27	< 0.0031	< 0.0031	NA	NA
tert-Butylbenzene	NLE	NLE	NLE	-	**0.0012 J**	**0.0029 J**	< 0.0021	< 0.0022	**0.43 J**	< 0.0033	< 0.0033	< 0.26	< 0.27	**0.31 J**	< 0.0031	< 0.0031	NA	NA
Toluene	6,300	91,000	7	-	< 0.0022	< 0.0027	< 0.0021	< 0.0022	< 1.4	< 0.0023	< 0.0033	< 0.26	< 0.27	< 0.72	< 0.0031	**0.0026 B**	NA	NA
Total TIC VOCs	NLE	NLE	NLE	-	**11.086 JN**	**28.09 JN**	NA	**0.0056 JN**	**895 JN**	**0.3063 JN**	**0.012 JN**	**37.71 JN**	**11.26 JN**	**553 JN**	**0.3095 JN**	**0.0915 JN**	NA	NA
Semivolatile Organic Compounds (mg/kg)																		
1-Methylnaphthalene	NLE	NLE	NLE	-	NA	NA	NA	NA	**7.1**	NA	NA	NA	NA	**10**	NA	NA	< 0.04	NA
2-Chlorophenol	310	2,200	0.8	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	230	2,400	8	-	NA	NA	NA	NA	**12**	NA	NA	NA	NA	**10**	NA	NA	< 0.04	NA
Acenaphthene	3,400	37,000	110	-	NA	NA	NA	NA	**0.8**	NA	NA	NA	NA	< 0.11	NA	NA	< 0.04	NA
Acenaphthylene	NLE	300,000	NLE	-	NA	NA	NA	NA	< 0.2	NA	NA	NA	NA	< 0.11	NA	NA	< 0.04	NA
Anthracene	17,000	30,000	2,400	-	NA	NA	NA	NA	< 0.2	NA	NA	NA	NA	< 0.11	NA	NA	< 0.04	NA
Benzo(a)anthracene	5	17	0.8	-	NA	NA	NA	NA	< 0.2	NA	NA	NA	NA	< 0.11	NA	NA	< 0.04	NA
Benzo(a)pyrene	0.5	2	0.2	-	NA	NA	NA	NA	< 0.2	NA	NA	NA	NA	< 0.11	NA	NA	< 0.04	NA
Benzo(b)fluoranthene	5	17	2	-	NA	NA	NA	NA	< 0.2	NA	NA	NA	NA	< 0.11	NA	NA	< 0.04	NA
Benzo(ghi)perylene	380,000	30,000	NLE	-	NA	NA	NA	NA	< 0.2	NA	NA	NA	NA	< 0.11	NA	NA	< 0.04	NA
Benzo(k)fluoranthene	45	170	25	-	NA	NA	NA	NA	< 0.2	NA	NA	NA	NA	< 0.11	NA	NA	< 0.04	NA
Bis(2-Ethylhexyl)phthalate	35	140	1,200	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	24	96	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	450	1,700	80	-	NA	NA	NA	NA	< 0.2	NA	NA	NA	NA	< 0.11	NA	NA	< 0.04	NA
Di-n-butylphthalate	6,100	68,000	760	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,300	24,000	1,300	-	NA	NA	NA	NA	< 0.2	NA	NA	NA	NA	**0.17 J**	NA	NA	< 0.04	NA
Fluorene	2,300	24,000	170	-	NA	NA	NA	NA	**0.88**	NA	NA	NA	NA	**1.8**	NA	NA	< 0.04	NA
Indeno(1,2,3-cd)pyrene	5	17	7	-	NA	NA	NA	NA	< 0.2	NA	NA	NA	NA	< 0.11	NA	NA	< 0.04	NA
Naphthalene	6	17	25	-	NA	NA	NA	NA	**2.6**	NA	NA	NA	NA	**0.66**	NA	NA	< 0.04	NA
Phenanthrene	NLE	300,000	NLE	-	NA	NA	NA	NA	**2.2**	NA	NA	NA	NA	**3.5**	NA	NA	< 0.052	NA
Pyrene	1,700	18,000	840	-	NA	NA	NA	NA	**0.31 J**	NA	NA	NA	NA	< 0.11	NA	NA	< 0.04	NA
Total TIC SVOCs	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons (mg/kg)																		
Total Petroleum Hydrocarbons	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)																		
C10-C12 Aromatics	NLE	NLE	NLE	-	**0.72 J**	NA	**1.11 J**	NA	**15.1**	NA	**1.61**	**0.71 J**	**1.21**	**6.3**	**1.41**	**1.41**	**1.21**	**1.31**
C12-C16 Aliphatics	NLE	NLE	NLE	-	**10.6**	NA	**1.11**	NA	**507**	NA	**1.61**	**116 J**	**5.5**	**644**	**11.4**	**1.41**	**14.6**	**3**
C12-C16 Aromatics	NLE	NLE	NLE	-	**4.8 J**	NA	**0.54 J**	NA	**180**	NA	**0.38 J**	**1.9**	**2.3**	**116**	**2**	**0.92 J**	**0.94**	**1 J**
C16-C21 Aliphatics	NLE	NLE	NLE	-	**10**	NA	**1.11**	NA	**235**	NA	**1.61**	**55.7**	**3.6**	**314**	**6.6**	**1.41 J**	**474 J**	**72.5 J**
C16-C21 Aromatics	NLE	NLE	NLE	-	**10.8 J**	NA	**1.7 J**	NA	**335**	NA	**1.2 J**	**3**	**4.8**	**297**	**8.6**	**1.6**	**201**	**20 J**
C21-C36 Aromatics	NLE	NLE	NLE	-	**3.4 J**	NA	**1.1 J**	NA	**38.2**	NA	**4.3**	**2.4**	**1.2 J**	**10.8**	**1.7**	**1.2 J**	**1,050**	**6.3**
C21-C40 Aliphatics	NLE	NLE	NLE	-	**2.4**	NA	**1 J**	NA	**50.7**	NA	**2.2 B**	**10.9**	**2.1 B**	**61.3**	**1.6 B**	**0.88 J**	**4,160**	**467**
C9-C12 Aliphatics	NLE	NLE	NLE	-	**1.5**	NA	**0.29 J**	NA	**105**	NA	**0.26 J**	**15.6**	**1.2 J**	**95.8**	**1.5**	**0.19 J**	**0.21 J**	**0.21 J**
Total Aliphatics	NLE	NLE	NLE	-	**24.4**	NA	**1.6**	NA	**898**	NA	**3**	**198**	**12.5**	**1,120**	**21.2**	**1.9**	**4,650 J**	**543**
Total Aromatics	NLE	NLE	NLE	-	**19.7 J**	NA	**3.6 J**	NA	**568**	NA	**6**	**7.9**	**8.5**	**460**	**12.5**	**3.9 J**	**1,250**	**84.4**
Total EPH	SS	SS	SS	-	**44.2 J**	NA	**5.2 J**	NA	**1,470**	NA	**9**	**206**	**21**	**1,580**	**33.6**	**5.8**	**5,900**	**627**
Calculated Residential EPH SRC (if total EPH exceeds 1,700 mg/kg) [4]				-	**1,700**	NA	**1,700**	NA	**1,700**	NA	**1,700**	**1,700**	**1,700**	**1,700**	**1,700**	**1,700**	**7,700**	**1,700**
Calculated Non-Residential EPH SRC (if total EPH exceeds 1,700 mg/kg) [4]				-	**1,700**	NA	**1,700**	NA	**1,700**	NA	**1,700**	**1,700**	**1,700**	**1,700**	**1,700**	**1,700**	**17,000**	**1,700**
Pesticides & PCBs (mg/kg)																		
4,4'-DDD	3	13	4	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	2	9	18	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	2	8	11	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlordane	0.2	1	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	0.04	0.2	0.003	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gamma-Chlordane	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	0.07	0.3	0.01	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NLE	NLE	NLE	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (mg/kg)																		
Aluminum	78,000	NLE	6,000	15,200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	31	450	6	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	19	19	19	22.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	16,000	59,000	2,100	32.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	16	140	0.7	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	78	78	2	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NLE	NLE	NLE	921	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NLE	NLE	NLE	269	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	1,600	590	90	2.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	3,100	45,000	11,000	8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NLE	NLE	NLE	55,800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	800	90	19.5	**4.3 J**	NA	**4.3 J**	NA	**6.7**	NA	**0.826**	**4.9**	**4.5**	**5.9**	**3.6**	**5.3**	NA	NA
Magnesium	NLE	NLE	NLE	7,230	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	11,000	5,900	65	90.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	23	65	0.1	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	1,600	23,000	48	8.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	NLE	NLE	15,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	390	5,700	1	1.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NLE	NLE	NLE	51.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	78	1,100	NLE	94.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	23,000	110,000	930	81.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Footnotes:

All historical data collected prior to 2015 are reported as provided by others.

(1) The NJ Residential (RDCSRS) and Non-Residential (NRDCSRS) Direct Contact Soil Remediation Standards refers to the NJDEP's September 18, 2017 Remediation Standards (http://www.nj.gov/dep/rules/rules/njac7_26d.pdf)

(2) NJDEP Impact to Groundwater (IGW) Soil Screening Level refers to the default screening levels provided in the NJDEP guidance document for the Development of Impact to Groundwater Soil Remediation Standards Using the Soil-Water Partition Equation; Nov 2013 (http://www.nj.gov/dep/srp/guidance/rs/partition_equation.pdf)

(3) Weston, 1995. Final Site Investigation - Main Post and Charles Wood Areas, Fort Monmouth, New Jersey, December

(4) The Calculated EPH Soil Remediation Criterion (SRC) is determined based on the NJDEP Composition-Specific EPH SRC Calculator for Non-#2 Fuel Oil/Diesel Oil Petroleum Hydrocarbon Mixtures (Version 2.0, August 9, 2010) which is provided in Appendix B

(5) For TPH no limit was used, however, as per the Health Based and Ecological Screening Criteria for Petroleum Hydrocarbons Frequently Asked Questions (Version 4.0, August 9, 2010) TPH concentrations exceeding the health based standard are evaluated in the text for delineation purposes.

NJDEP criteria for total xylenes are used for xylene isomers (m+p, o)

NJDEP criteria for 4,4'-DDD and 4,4'-DDT are for total DDD and total DDT, respectively

NJDEP criterion used for aroclor 1016, aroclor 1221, aroclor 1242, and aroclor 1260 is the NJDEP criterion for total PCBs

NLE = no limit established

SS = sample specific

ND = not detected

NA = not analyzed

DUP = field duplicate sample

Dash (--) = only background concentrations for metals are being used as comparison criteria

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

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

J = Analyte detected between method detection limit (MDL) and practical quantitation limit (PQL)

B = Analyte detected in both sample and associated laboratory blank.

E = Estimated result.

D = Results from dilution of sample.

JN = Tentatively identified compound, estimated concentration.

< = analyte not detected above MDL

µg/kg = micrograms per kilogram

mg/kg = milligrams per kilogram

VOCs = volatile organic compounds

TIC = tentatively identified compounds

in. = inches

bgs = below ground surface

Detections are bolded

Shaded cells = concentration exceeds NJDEP Impact to Groundwater Quality Criterion.

Shaded cells = concentration exceeds the NJ Residential Direct Contact Soil Remediation Standard.

Shaded cells = concentration exceeds the NJ Non-Residential Direct Contact Soil Remediation Standard.

Shaded cells = concentration exceeds the NJ Residential, Non-Residential, AND NJ Impact to GW Soil Screening Level Direct Contact Soil Remediation Standard.

Shaded cells = concentration exceeds Weston (1995) background concentration (Main Post).

TABLE 4.2
SOIL SAMPLING SUMMARY OF EXCEEDANCES (1992-2015)
SITE FTMM-59
FORT MONMOUTH, NEW JERSEY

Analyte	Maximum Detected Concentration		Location of Maximum Concentration	Sample Date	Number of Samples	Number of Detections	Number of Exceedances			
							NJDEP RDCSRS [1]	NJDEP NRDCSRS [1]	NJ Impact to GW Soil Screening Level [3]	Weston 1995 Background (Main Post) [4]
Volatile Organic Compounds (mg/kg)										
Benzene	0.18		FTMM59-GW21	5/10/2004	51	7	0	0	2	n/a
Methylene chloride	0.17	J	FTMM59-SEEP	4/21/2004	51	6	0	0	6	n/a
Naphthalene	54		FTMM-59-SO01	9/30/2015	14	9	2	1	1	n/a
Semivolatile Organic Compounds (mg/kg)										
2-Methylnaphthalene	12		FTMM-59-SO01	9/30/2015	22	6	0	0	2	n/a
Benzo(a)pyrene	2.04		FTMM59-Shed1/B3	5/7/2010	17	5	2	1	2	n/a
Benzo(b)fluoranthene	2.48	JD	FTMM59-Shed2/B3	5/10/2010	17	6	0	0	1	n/a
Total Petroleum Hydrocarbons (mg/kg)										
Total Petroleum Hydrocarbons	204,000		FTMM59-W. Wall, Center Bottom	9/21/1995	41	30	NLE [5]	NLE [5]	NLE	n/a
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)										
Total EPH	30,300		Bay 9-LIFT 1-CYLINDER	8/8/2014	24	24	SS	SS	NLE	n/a
Pesticides & PCBs (mg/kg)										
Dieldrin	0.0031		FTMM59-Shed1/B2	5/7/2010	6	1	0	0	1	n/a
Inorganics (mg/kg)										
Aluminum	18,600		FTMM59-Shed1/B3	5/7/2010	12	12	0	NLE	8	3
Antimony	1.7		FTMM59-Shed1/B3	5/7/2010	12	9	0	0	0	9
Barium	35.6		FTMM59-Shed2/B3	5/10/2010	12	12	0	0	0	2
Beryllium	1.82		FTMM59-Shed1/B1	5/7/2010	17	17	0	0	8	0
Cadmium	1.48		FTMM59-Shed1/B1	5/7/2010	17	17	0	0	0	17
Calcium	2,400		FTMM59-Shed2/B3	5/10/2010	12	12	NLE	NLE	NLE	3
Cobalt	2.59		FTMM59-Shed1/B1	5/7/2010	12	12	0	0	0	1
Copper	14.5		FTMM59-Shed1/B1	5/7/2010	17	17	0	0	0	7
Lead	2,840		FTMM59-Shed1/B3	5/7/2010	33	33	2	1	3	8
Manganese	108		FTMM59-Shed1/B1	5/7/2010	12	12	0	0	2	2
Mercury	0.227		FTMM59-Shed1/B1	5/7/2010	17	11	0	0	2	11
Silver	5		FTMM59-Shed1/B1	5/7/2010	12	12	0	0	11	11
Sodium	2,490		FTMM59-Shed2/B2	5/10/2010	12	5	NLE	NLE	NLE	5
Vanadium	82.1		FTMM59-Shed1/B1	5/7/2010	12	12	3	0	NLE	0
Zinc	2,180		FTMM59-Shed1/B3	5/7/2010	17	17	0	0	2	6

Notes:

(1) The NJ Residential (RDCSRS) and Non-Residential (NRDCSRS) Direct Contact Soil Remediation Standards refers to the NJDEP's September 18, 2017 Remediation Standards (http://www.nj.gov/dep/rules/rules/njac7_26d.pdf)

(2) The 2017-06 USEPA RSLs for Residential and Industrial Soil and Protect Groundwater Risk-Based (HQ=0.1) refers to the EPA's Region 9 Regional Screening Levels (HQ=0.1) https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-june-2017

(3) NJDEP Impact to Groundwater (IGW) (NJDEP guidance document; Nov 2013) (http://www.nj.gov/dep/srp/guidance/rs/partition_equation.pdf)

(4) Weston, 1995. Final Site Investigation - Main Post and Charles Wood Areas, Fort Monmouth, New Jersey, December.

(5) For TPH no limit was used, however, as per the Health Based and Ecological Screening Criteria for Petroleum Hydrocarbons Frequently Asked Questions (Version 4.0, August 9, 2010) TPH concentrations exceeding the health based standard are evaluated in the text for delineation purposes.
NLE = no limit established.
RSL values were current at the time that the screening was conducted.
mg/kg = milligrams per kilogram
Dash (--) = Category does not apply to this compound, because there were no detections. Compound included in data set for the risk assessment.
COPC = contaminant of potential concern

Table 4.3

NJDEP EPH Calculator Results

EPH Category 2 Ingestion/Dermal Residential Calculator - Version 1.0, June 2019

Site Name:	FTMM-59 Auto Hobby Shop	Date:	12/10/2019
Sample ID:	SO10-5.5-6.0	Evaluated by:	Parsons

$$ECFV = \frac{THQ * AT * BW * 365\ d/yr}{(EF * ED * 10^{-6} kg/mg) * \left[\left(\frac{1}{RfD_o} * IR\right) + \left(\frac{1}{RfD_D} * SA * AF * ABS_d * EV\right)\right]}$$

$$ID_{nc} = \frac{THQ}{\frac{f_{(1)}}{ECFV_{(1)}} + \frac{f_{(2)}}{ECFV_{(2)}} + \frac{f_{(3)}}{ECFV_{(3)}} + \frac{f_{(4)}}{ECFV_{(4)}} + \frac{f_{(5)}}{ECFV_{(5)}} + \frac{f_{(6)}}{ECFV_{(6)}} + \frac{f_{(7)}}{ECFV_{(7)}} + \frac{f_{(8)}}{ECFV_{(8)}}}$$

	AL9-12 (PHC Mixture)	AL12-16 (PHC Mixture)	AL16-21 (Mineral Oil)	AL21-40 (Mineral Oil)	AR10-12 (Naphthalene)	AR12-16 (Acenaphthene)	AR16-21 (Fluorene)	AR21-36 (Fluoranthene)
RfD_o	0.1	0.1	2	2	0.041	0.06	0.04	0.04
RfD_D	0.1	0.1	2	2	0.041	0.06	0.04	0.04
ABS_d	0.1	0.1	0.1	0.1	0.13	0.13	0.13	0.13
Child ECFV	6110	6110	122210	122210	2351	3441	2294	2294
Concentration of fraction (mg/kg)	0.2	14.6	474	4160	1.2	0.9	201	1050
f	3.38874E-05	0.00247378	0.08031312	0.704857758	0.000203324	0.000152493	0.034056829	0.177908809

Parameter	***Definition***	***Units***	***Residential Scenario***
EV	Event Frequency	events/day	1
THQ	Target Hazard Quotient	unitless	1
	Conversion Factor	days/year	365
EF_c	Exposure Frequency - child	days/year	350
ED_c and AT_c	Exposure Duration and Averaging Time - child	years	6
RfD_o	Oral Reference Dose	mg/kg-day	see above
RfD_D	Dermal Reference Dose	mg/kg-day	see above
ABS_d	Dermal Absorption Fraction	unitless	see above
BW_c	Body Weight - child	kg	15
IR_c	Soil Ingestion Rate - child	mg/day	200
SA_c	Skin Surface Area - child	cm^2/day	2800
AF_c	Soil Adherence Factor - child	mg/cm^2	0.2
ECFV	Equivalent carbon fraction value	mg/kg-day	see above
f	EC Weight fraction = fraction concentration/total concentration	unitless	see above
ID_{nc}	**Residential Non-carcinogenic Health-Based Soil Criterion (ingestion/dermal)**	mg/kg	10000

Total EPH in sample: 5901.9 mg/kg

Allowable EPH in sample: 10000 mg/kg

PASS

These parameters are fixed at the default residential values.

EPH Category 2 Ingestion/Dermal Residential Soil Remediation Standard:

10000 mg/kg

TABLE 4.4
DETECTED GROUND WATER SAMPLING RESULTS - COMPARISON TO NJDEP GWQS
SITE FTMM-59 Bldg. 1122
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	Weston 1995 Background (Main Post)	1122MW01														
Sample ID			FTMM59-GW-1122MW01-45	FTMM59-GW-1122MW01-45-Dup	FTMM59-GW-1122MW01-46	FTMM59-GW-1122MW01-46-Dup	FTMM59-GW-1122MW01-47	FTMM59-GW-1122MW01-47-Dup	FTMM59-GW-1122MW01-48	FTMM59-GW-1122MW01-48-Dup	FTMM59-GW-1122MW01-49	FTMM59-GW-1122MW01-49-Dup	FTMM59-GW-1122MW01-50	FTMM59-GW-1122MW01-50-Dup	FTMM59-GW-1122MW01-51	FTMM59-GW-1122MW01-51-Dup	FTMM59-GW-1122MW01-52
Sample Date			10/3/2007	10/3/2007	1/8/2008	1/8/2008	4/3/2008	4/3/2008	7/10/2008	7/10/2008	10/9/2008	10/9/2008	1/23/2009	1/23/2009	4/13/2009	4/13/2009	7/20/2009
Sample Round			45	45	46	46	47	47	48	48	49	49	50	50	51	51	52
Filtered			Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)																	
1,2,4-Trimethylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	6,000	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.46 J**	**0.44 J**	**0.45 J**
Bromodichloromethane	1	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorodibromomethane	1	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cymene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl benzene	700	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	700	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Meta/Para Xylene	1,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl chloride	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl ethyl ketone	300	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.63 J**	**0.56 J**	**0.88**
Naphthalene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ortho Xylene	1,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Propylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1	-	ND	ND	ND	ND	**0.49 J**	**0.5 J**	ND	ND	ND	ND	**0.61 J**	**0.73 J**	ND	ND	ND
Toluene	600	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.37 J**
TIC VOCs (µg/l)																	
Total TIC, Volatile	500	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Semivolatile Organic Compounds (µg/l)																	
2-Methylnaphthalene	30	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	400	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	3	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	6,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	200	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC SVOCs (µg/l)																	
Total TIC, Semivolatile	500	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)																	
Aluminum	200	121,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	6	20.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	3	89.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	6,000	699	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	1	2.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	4	9.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NLE	45,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	70	191	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	100	18.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1,300	65.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	300	431,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	5	22.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NLE	62,700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	50	331	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	2	0.26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	100	187	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	137,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	40	29.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	40	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	50,000	21,500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NLE	108	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2,000	233	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

1) Summary Statistics were obtained from Result Sheet(s) and reflect values for the whole dataset.

TABLE 4.4
DETECTED GROUND WATER SAMPLING RESULTS - COMPARISON TO NJDEP GWQS
SITE FTMM-59 Bldg. 1122
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	Weston 1995 Background (Main Post)	1122MW01														
Sample ID			FTMM59-GW-1122MW01-53	FTMM59-GW-1122MW01-54	FTMM59-GW-1122MW01-3	FTMM59-GW-1122MW01-4	FTMM59-GW-1122MW01-5	FTMM59-GW-1122MW01-6	FTMM59-GW-1122MW01-6-Dup	FTMM59-GW-1122MW01-7	FTMM59-GW-1122MW01-8	FTMM-59-GW-1122MW01-8.25	FTMM-59-GW-1122MW01-14.75	FTMM-59-GW-1122MW01-12.34 4Q2015	1122MW01-GW-11.6	FTMM-59-GW-1122MW01-11.5
Sample Date			11/4/2009	1/12/2010	4/5/2010	7/19/2010	10/5/2010	1/20/2011	1/20/2011	4/4/2011	7/5/2011	8/29/2013	8/29/2013	12/14/2015	8/6/2018	7/17/2019
Sample Round			53	54	3	4	5	6	6	7	8	9	9			
Filtered			Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)																
1,2,4-Trimethylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA
1,3,5-Trimethylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA
Acetone	6,000	-	ND	ND	**20.57**	ND	< 0.32	< 0.32	< 0.32	< 0.32	< 10	**2.4 BJ**	**2.7 BJ**	NA	NA	NA
Benzene	1	-	ND	ND	ND	ND	< 0.12	< 0.12	< 0.12	< 0.12	< 1	< 1	< 1	NA	NA	NA
Bromodichloromethane	1	-	ND	ND	**2.26**	ND	< 0.12	< 0.12	< 0.12	< 0.12	< 1	< 1	< 1	NA	NA	NA
Chlorodibromomethane	1	-	ND	ND	**0.52**	ND	< 0.12	< 0.12	< 0.12	< 0.12	< 1	< 1	< 1	NA	NA	NA
Chloroform	70	-	ND	ND	**7.36**	ND	< 0.35	< 0.35	< 0.35	< 0.35	< 1	< 1	< 1	NA	NA	NA
Cymene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA
Ethyl benzene	700	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA
Isopropylbenzene	700	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA
Meta/Para Xylene	1,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2	< 2	NA	NA	NA
Methyl chloride	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA
Methyl ethyl ketone	300	-	ND	ND	ND	ND	< 0.22	< 0.22	< 0.22	< 0.22	< 10	< 1	< 1	NA	NA	NA
Methyl Tertbutyl Ether	70	-	ND	ND	ND	ND	< 0.11	< 0.11	< 0.11	< 0.11	< 1	< 1	< 1	NA	NA	NA
Naphthalene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA
n-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA
Ortho Xylene	1,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA
Propylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA
sec-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA
tert-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA
Tetrachloroethene	1	-	ND	**0.42 J**	ND	ND	< 0.14	**0.3 J**	**0.3 J**	**0.3 J**	< 1	< 1	< 1	NA	NA	NA
Toluene	600	-	ND	ND	ND	ND	< 0.12	< 0.12	< 0.12	< 0.12	< 1	< 1	< 1	NA	NA	NA
TIC VOCs (µg/l)																
Total TIC, Volatile	500	-	ND	ND	**5**	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA
Semivolatile Organic Compounds (µg/l)																
2-Methylnaphthalene	30	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA	NA
Acenaphthene	400	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA	NA
Bis(2-Ethylhexyl)phthalate	3	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA	NA
Carbazole	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA	NA
Dibenzofuran	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA	NA
Diethyl phthalate	6,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA	NA
Fluorene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA	NA
Naphthalene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA	NA
Phenanthrene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA	NA
Pyrene	200	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5	NA	NA
TIC SVOCs (µg/l)																
Total TIC, Semivolatile	500	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)																
Aluminum	200	121,000	NA	NA	NA	NA	**853**	**200**	< 7.8	**8,460**	**8,470**	NA	NA	NA	NA	NA
Antimony	6	20.7	NA	NA	NA	ND	< 4.7	< 2.2	< 2.2	< 1.3	< 1.3	NA	NA	NA	NA	NA
Arsenic	3	89.3	NA	NA	NA	**2.82 ER**	**2.05**	< 1.4	< 1.4	**3.2**	**5.1**	NA	NA	NA	NA	NA
Barium	6,000	699	NA	NA	NA	**13.4**	**4.33**	**291**	**291**	< 0.44	< 0.44	NA	NA	NA	NA	NA
Beryllium	1	2.1	NA	NA	NA	**0.053 ER**	< 0.4	< 0.24	< 0.24	< 0.24	< 0.24	NA	NA	NA	NA	NA
Cadmium	4	9.5	NA	NA	NA	**1.52 ER**	**7.3**	**25.6**	**25.6**	**10.3**	**3.9**	NA	NA	NA	**3**	**1.8**
Calcium	NLE	45,400	NA	NA	NA	NA	**3,380**	**345,000**	**349,000**	**8,960**	< 9	NA	NA	NA	NA	NA
Chromium	70	191	NA	NA	NA	**7.22**	**3.36**	< 0.59	< 0.59	**25.4**	**24.7**	NA	NA	NA	NA	NA
Cobalt	100	18.3	NA	NA	NA	NA	< 0.3	< 0.65	< 0.65	< 0.3	< 0.3	NA	NA	NA	NA	NA
Copper	1,300	65.6	NA	NA	NA	**91.4**	**12.8**	< 2.5	< 2.5	**52.5**	**58.9**	NA	NA	NA	NA	NA
Iron	300	431,000	NA	NA	NA	**2,630**	**1,440**	**251**	**232**	**12,700**	**12,800**	NA	NA	NA	NA	NA
Lead	5	22.7	NA	NA	NA	**2.46 ER**	< 2.1	< 1.9	< 1.9	**11.9**	**13.9**	NA	NA	NA	NA	NA
Magnesium	NLE	62,700	NA	NA	NA	NA	**593**	**39,700**	**39,400**	**5,720**	< 17	NA	NA	NA	NA	NA
Manganese	50	331	NA	NA	NA	NA	**16.1**	**80.3**	**79.4**	**170**	**166**	NA	NA	NA	**50**	**121**
Mercury	2	0.26	NA	NA	NA	**0.13 ER**	< 0.254	< 0.088	< 0.088	< 0.088	< 0.088	NA	NA	NA	NA	NA
Nickel	100	187	NA	NA	NA	**2.48 ER**	**1.27**	< 0.51	< 0.51	**13**	**12.9**	NA	NA	NA	NA	NA
Potassium	NLE	137,000	NA	NA	NA	NA	**1,100**	**11,900**	**11,700**	< 16	< 16	NA	NA	NA	NA	NA
Selenium	40	29.6	NA	NA	NA	**19.9**	< 1.36	< 1.9	< 1.9	< 1.5	< 1.5	NA	NA	NA	NA	NA
Silver	40	ND	NA	NA	NA	NA	< 0.6	< 0.53	< 0.53	< 0.72	< 0.72	NA	NA	NA	NA	NA
Sodium	50,000	21,500	NA	NA	NA	NA	**24,400**	**838,000**	**848,000**	**74,900**	**38,400**	NA	NA	NA	NA	NA
Vanadium	NLE	108	NA	NA	NA	NA	**11.9**	< 0.56	< 0.56	< 0.43	< 0.43	NA	NA	NA	NA	NA
Zinc	2,000	233	NA	NA	NA	NA	**6.75**	**47.3**	**48.8**	**94.9**	**115**	NA	NA	NA	NA	NA

1) Summary Statistics were obtained from Result Sheet(s) and reflect

TABLE 4.4
DETECTED GROUND WATER SAMPLING RESULTS - COMPARISON TO NJDEP GWQS
SITE FTMM-59 Bldg. 1122
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	Weston 1995 Background (Main Post)	1122MW02														
Sample ID			FTMM59-GW-1122MW02-45	FTMM59-GW-1122MW02-46	FTMM59-GW-1122MW02-47	FTMM59-GW-1122MW02-48	FTMM59-GW-1122MW02-49	FTMM59-GW-1122MW02-50	FTMM59-GW-1122MW02-51	FTMM59-GW-1122MW02-52	FTMM59-GW-1122MW02-52-Dup	FTMM59-GW-1122MW02-53	FTMM59-GW-1122MW02-53-Dup	FTMM59-GW-1122MW02-54	FTMM59-GW-1122MW02-54-Dup	FTMM59-GW-1122MW02-3	FTMM59-GW-1122MW02-3-Dup
Sample Date			10/3/2007	1/8/2008	4/3/2008	7/10/2008	10/9/2008	1/23/2009	4/13/2009	7/20/2009	7/20/2009	11/4/2009	11/4/2009	1/12/2010	1/12/2010	4/5/2010	4/5/2010
Sample Round			45	46	47	48	49	50	51	52	52	53	53	54	54	3	3
Filtered			Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)																	
1,2,4-Trimethylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	6,000	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorodibromomethane	1	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cymene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl benzene	700	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	700	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Meta/Para Xylene	1,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl chloride	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl ethyl ketone	300	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	-	**0.55 J**	ND	ND	**0.28 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ortho Xylene	1,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Propylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1	-	ND	ND	ND	**0.39 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	600	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)																	
Total TIC, Volatile	500	-	ND	ND	**42**	ND	ND	ND	**4**	ND	ND	ND	ND	ND	ND	ND	ND
Semivolatile Organic Compounds (µg/l)																	
2-Methylnaphthalene	30	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	400	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	3	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	6,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	200	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC SVOCs (µg/l)																	
Total TIC, Semivolatile	500	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)																	
Aluminum	200	121,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	6	20.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	3	89.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	6,000	699	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	1	2.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	4	9.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NLE	45,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	70	191	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	100	18.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1,300	65.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	300	431,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	5	22.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NLE	62,700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	50	331	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	2	0.26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	100	187	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	137,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	40	29.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	40	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	50,000	21,500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NLE	108	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2,000	233	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

1) Summary Statistics were obtained from Result Sheet(s) and reflect

TABLE 4.4
DETECTED GROUND WATER SAMPLING RESULTS - COMPARISON TO NJDEP GWQS
SITE FTMM-59 Bldg. 1122
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	Weston 1995 Background (Main Post)	1122MW02										1122MW03				
Sample ID			FTMM59-GW-1122MW02-4	FTMM59-GW-1122MW02-4-Dup	FTMM59-GW-1122MW02-5	FTMM59-GW-1122MW02-6	FTMM59-GW-1122MW02-7	FTMM59-GW-1122MW02-8	FTMM-59-GW-1122MW02-8.6	FTMM-59-GW-1122MW02-14.6	1122MW02-GW-11.8	FTMM-59-GW-1122MW02-12	FTMM59-GW-1122MW03-33	FTMM59-GW-1122MW03-34	FTMM59-GW-1122MW03-35	FTMM59-GW-1122MW03-36	FTMM59-GW-1122MW03-37
Sample Date			7/20/2010	7/20/2010	10/5/2010	1/19/2011	4/4/2011	7/5/2011	8/29/2013	8/29/2013	8/6/2018	7/16/2019	10/3/2007	1/8/2008	4/3/2008	7/10/2008	10/9/2008
Sample Round			4	4	5	6	7	8	9	9			33	34	35	36	37
Filtered			Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)																	
1,2,4-Trimethylbenzene	100	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	100	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
Acetone	6,000	-	ND	ND	< 0.32	< 0.32	< 0.32	< 10	**2.2 BJ**	**2.2 BJ**	NA	NA	ND	ND	ND	ND	ND
Benzene	1	-	ND	ND	< 0.12	< 0.12	< 0.12	< 1	< 1	< 1	NA	NA	ND	ND	ND	ND	ND
Bromodichloromethane	1	-	ND	ND	< 0.12	< 0.12	< 0.12	< 1	< 1	< 1	NA	NA	ND	ND	ND	ND	ND
Chlorodibromomethane	1	-	ND	ND	< 0.12	< 0.12	< 0.12	< 1	< 1	< 1	NA	NA	ND	ND	ND	ND	ND
Chloroform	70	-	ND	ND	< 0.35	< 0.35	< 0.35	< 1	< 1	< 1	NA	NA	ND	ND	**0.41 J**	ND	**1.03 J**
Cymene	100	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
Ethyl benzene	700	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	700	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
Meta/Para Xylene	1,000	-	NA	NA	NA	NA	NA	NA	< 2	< 2	NA	NA	NA	NA	NA	NA	NA
Methyl chloride	100	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
Methyl ethyl ketone	300	-	ND	ND	< 0.22	< 0.22	< 0.22	< 10	< 1	< 1	NA	NA	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	-	ND	ND	< 0.11	< 0.11	< 0.11	< 1	< 1	< 1	NA	NA	ND	ND	ND	ND	ND
Naphthalene	300	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
Ortho Xylene	1,000	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
Propylbenzene	100	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1	-	ND	ND	< 0.14	< 0.14	< 0.14	< 1	< 1	< 1	NA	NA	ND	ND	**0.7 J**	**0.39 J**	**0.63 J**
Toluene	600	-	ND	ND	< 0.12	< 0.12	< 0.12	< 1	< 1	< 1	NA	NA	ND	ND	ND	ND	ND
TIC VOCs (µg/l)																	
Total TIC, Volatile	500	-	ND	ND	**9**	ND	**68**	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND
Semivolatile Organic Compounds (µg/l)																	
2-Methylnaphthalene	30	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	400	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	3	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	6,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	200	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC SVOCs (µg/l)																	
Total TIC, Semivolatile	500	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)																	
Aluminum	200	121,000	NA	NA	**1,320**	**440**	**698**	**1,580**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	6	20.7	ND	ND	< 4.7	< 2.2	< 1.3	< 1.3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	3	89.3	**2.84 ER**	**2.53 ER**	**2.18**	< 1.4	**6.4**	**14.7**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	6,000	699	**14.4**	**14.3**	**14.9**	< 0.44	< 0.44	< 0.44	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	1	2.1	**0.088 ER**	**0.118 ER**	< 0.4	< 0.24	< 0.24	< 0.24	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	4	9.5	**0.823 ER**	**0.735 ER**	**0.669**	< 0.35	< 0.17	< 0.17	NA	NA	< 0.7	< 0.37	NA	NA	NA	NA	NA
Calcium	NLE	45,400	NA	NA	**5,190**	**8,710**	**9,150**	**9,090**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	70	191	**10.4**	**10.8**	**10.7**	< 0.59	< 0.9	**10.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	100	18.3	NA	NA	< 0.3	< 0.65	< 0.3	< 0.3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1,300	65.6	**7.21**	**8.01**	**2.46**	< 2.5	< 0.85	< 0.85	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	300	431,000	**5,480**	**5,540**	**4,140**	**1,370**	**13,600**	**19,700**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	5	22.7	**3.69 ER**	ND	< 2.1	< 1.9	< 0.94	< 0.94	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NLE	62,700	NA	NA	**1,530**	< 15	< 17	< 17	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	50	331	NA	NA	**41.6**	**23.4**	**88.8**	**104**	NA	NA	**27**	**28.2 B**	NA	NA	NA	NA	NA
Mercury	2	0.26	**0.19 ER**	**0.12 ER**	< 0.254	< 0.088	< 0.088	< 0.088	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	100	187	**2.53 ER**	**2.2 ER**	**1.64**	< 0.51	< 0.41	< 0.41	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	137,000	NA	NA	**634**	< 75	< 16	< 16	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	40	29.6	**19.2**	**19.1**	< 1.36	< 1.9	< 1.5	< 1.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	40	ND	NA	NA	< 0.6	< 0.53	< 0.72	< 0.72	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	50,000	21,500	NA	NA	**30,500**	**62,400**	**54,200**	**64,000**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NLE	108	NA	NA	**5.91**	< 0.56	< 0.43	< 0.43	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2,000	233	NA	NA	**17.9**	**36.9**	**33.4**	**65**	NA	NA	NA	NA	NA	NA	NA	NA	NA

1) Summary Statistics were obtained from Result Sheet(s) and reflect

TABLE 4.4
DETECTED GROUND WATER SAMPLING RESULTS - COMPARISON TO NJDEP GWQS
SITE FTMM-59 Bldg. 1122
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	Weston 1995 Background (Main Post)	1122MW03													1122MW04	
Sample ID			FTMM59-GW-1122MW03-38	FTMM59-GW-1122MW03-39	FTMM59-GW-1122MW03-40	FTMM59-GW-1122MW03-41	FTMM59-GW-1122MW03-3	FTMM59-GW-1122MW03-4	FTMM59-GW-1122MW03-5	FTMM59-GW-1122MW03-6	FTMM59-GW-1122MW03-7	FTMM59-GW-1122MW03-8	FTMM-59-GW-1122MW03-9.72	1122MW03-GW-9.4	FTMM-59-GW-1122MW03-9	FTMM59-GW-1122MW04-33	FTMM59-GW-1122MW04-34
Sample Date			1/23/2009	4/13/2009	7/20/2009	11/4/2009	4/5/2010	7/20/2010	10/5/2010	1/20/2011	4/4/2011	7/5/2011	8/29/2013	8/6/2018	7/16/2019	10/3/2007	1/8/2008
Sample Round			38	39	40	41	3	4	5	6	7	8	9			33	34
Filtered			Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)																	
1,2,4-Trimethylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA	NA	NA	NA
1,3,5-Trimethylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA	NA	NA	NA
Acetone	6,000	-	ND	ND	ND	ND	ND	ND	< 0.32	< 0.32	< 0.32	< 10	**2.3 J**	NA	NA	ND	ND
Benzene	1	-	ND	ND	ND	ND	ND	ND	< 0.12	< 0.12	< 0.12	< 1	< 1	NA	NA	ND	ND
Bromodichloromethane	1	-	ND	ND	ND	ND	ND	ND	< 0.12	< 0.12	< 0.12	< 1	< 1	NA	NA	ND	ND
Chlorodibromomethane	1	-	ND	ND	ND	ND	ND	ND	< 0.12	< 0.12	< 0.12	< 1	< 1	NA	NA	ND	ND
Chloroform	70	-	**0.74 J**	ND	ND	ND	ND	ND	< 0.35	< 0.35	< 0.35	< 1	< 1	NA	NA	ND	ND
Cymene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA	NA	NA	NA
Ethyl benzene	700	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA	NA	NA	NA
Isopropylbenzene	700	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA	NA	NA	NA
Meta/Para Xylene	1,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2	NA	NA	NA	NA
Methyl chloride	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA	NA	NA	NA
Methyl ethyl ketone	300	-	ND	ND	ND	ND	ND	ND	< 0.22	< 0.22	< 0.22	< 10	< 1	NA	NA	ND	ND
Methyl Tertbutyl Ether	70	-	ND	ND	ND	ND	ND	ND	< 0.11	< 0.11	< 0.11	< 1	< 1	NA	NA	ND	ND
Naphthalene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.71 J**	NA	NA	NA	NA
n-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA	NA	NA	NA
Ortho Xylene	1,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA	NA	NA	NA
Propylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA	NA	NA	NA
sec-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA	NA	NA	NA
tert-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1	NA	NA	NA	NA
Tetrachloroethene	1	-	**0.68 J**	ND	ND	**1.38**	**0.51**	ND	**0.37 J**	**0.94**	**0.84**	**0.66 J**	< 1	NA	NA	ND	ND
Toluene	600	-	ND	ND	ND	1.04 U-ND	ND	ND	< 0.12	< 0.12	< 0.12	< 1	< 1	NA	NA	ND	ND
TIC VOCs (µg/l)																	
Total TIC, Volatile	500	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND
Semivolatile Organic Compounds (µg/l)																	
2-Methylnaphthalene	30	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	400	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	3	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	6,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	200	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC SVOCs (µg/l)																	
Total TIC, Semivolatile	500	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)																	
Aluminum	200	121,000	NA	NA	NA	NA	NA	NA	**2,830**	**4,420**	**5,510**	**2,530**	NA	NA	NA	NA	NA
Antimony	6	20.7	NA	NA	NA	NA	NA	ND	< 4.7	< 2.2	< 1.3	< 1.3	NA	NA	NA	NA	NA
Arsenic	3	89.3	NA	NA	NA	NA	NA	ND	**0.81**	< 1.4	< 0.92	< 0.92	NA	NA	NA	NA	NA
Barium	6,000	699	NA	NA	NA	NA	NA	**166**	**129**	< 0.44	< 0.44	< 0.44	NA	NA	NA	NA	NA
Beryllium	1	2.1	NA	NA	NA	NA	NA	**2.64**	**1.86**	**1.9**	**2.2**	**1.3**	NA	NA	NA	NA	NA
Cadmium	4	9.5	NA	NA	NA	NA	NA	**1.31 ER**	< 0.4	< 0.35	< 0.17	< 0.17	NA	**24**	**4.8**	NA	NA
Calcium	NLE	45,400	NA	NA	NA	NA	NA	NA	**14,700**	**20,100**	**22,900**	**11,700**	NA	NA	NA	NA	NA
Chromium	70	191	NA	NA	NA	NA	NA	**1.53 ER**	< 0.6	< 0.59	< 0.9	< 0.9	NA	NA	NA	NA	NA
Cobalt	100	18.3	NA	NA	NA	NA	NA	NA	**5.12**	< 0.65	< 0.3	< 0.3	NA	NA	NA	NA	NA
Copper	1,300	65.6	NA	NA	NA	NA	NA	ND	< 0.8	< 2.5	< 0.85	< 0.85	NA	NA	NA	NA	NA
Iron	300	431,000	NA	NA	NA	NA	NA	ND	**64**	< 18	< 7.7	**572**	NA	NA	NA	NA	NA
Lead	5	22.7	NA	NA	NA	NA	NA	ND	< 2.1	< 1.9	< 0.94	< 0.94	NA	NA	NA	NA	NA
Magnesium	NLE	62,700	NA	NA	NA	NA	NA	NA	**14,900**	**19,300**	**21,400**	**10,900**	NA	NA	NA	NA	NA
Manganese	50	331	NA	NA	NA	NA	NA	NA	**27.9**	**42.4**	**50.3**	**27.8**	NA	**410**	**284**	NA	NA
Mercury	2	0.26	NA	NA	NA	NA	NA	**0.19 ER**	< 0.254	< 0.088	< 0.088	< 0.088	NA	NA	NA	NA	NA
Nickel	100	187	NA	NA	NA	NA	NA	**20.7**	**15.3**	**20.5**	**23.1**	**12.7**	NA	NA	NA	NA	NA
Potassium	NLE	137,000	NA	NA	NA	NA	NA	NA	**3,110**	< 75	< 16	< 16	NA	NA	NA	NA	NA
Selenium	40	29.6	NA	NA	NA	NA	NA	**43.2**	< 1.36	< 1.9	< 1.5	< 1.5	NA	NA	NA	NA	NA
Silver	40	ND	NA	NA	NA	NA	NA	NA	**1.57**	< 0.53	< 0.72	< 0.72	NA	NA	NA	NA	NA
Sodium	50,000	21,500	NA	NA	NA	NA	NA	NA	**119,000**	**151,000**	**202,000**	**152,000**	NA	NA	NA	NA	NA
Vanadium	NLE	108	NA	NA	NA	NA	NA	NA	**0.622**	< 0.56	< 0.43	< 0.43	NA	NA	NA	NA	NA
Zinc	2,000	233	NA	NA	NA	NA	NA	NA	**86.9**	**105**	**110**	**80.4**	NA	NA	NA	NA	NA

1) Summary Statistics were obtained from Result Sheet(s) and reflect

TABLE 4.4
DETECTED GROUND WATER SAMPLING RESULTS - COMPARISON TO NJDEP GWQS
SITE FTMM-59 Bldg. 1122
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	Weston 1995 Background (Main Post)	1122MW04														
Sample ID			FTMM59-GW-1122MW04-35	FTMM59-GW-1122MW04-36	FTMM59-GW-1122MW04-37	FTMM59-GW-1122MW04-38	FTMM59-GW-1122MW04-39	FTMM59-GW-1122MW04-40	FTMM59-GW-1122MW04-41	FTMM59-GW-1122MW04-42	FTMM59-GW-1122MW04-3	FTMM59-GW-1122MW04-4	FTMM59-GW-1122MW04-5	FTMM59-GW-1122MW04-5-Dup	FTMM59-GW-1122MW04-6	FTMM59-GW-1122MW04-7	FTMM59-GW-1122MW04-8
Sample Date			4/3/2008	7/10/2008	10/9/2008	1/23/2009	4/13/2009	7/20/2009	11/4/2009	1/12/2010	4/5/2010	7/20/2010	10/6/2010	10/6/2010	1/20/2011	4/4/2011	7/5/2011
Sample Round			35	36	37	38	39	40	41	42	3	4	5	5	6	7	8
Filtered			Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)																	
1,2,4-Trimethylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	6,000	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.32	< 0.32	< 0.32	< 0.32	< 10
Benzene	1	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.12	< 0.12	< 0.12	< 0.12	< 1
Bromodichloromethane	1	-	ND	ND	ND	ND	ND	**0.21 J**	ND	ND	ND	ND	< 0.12	< 0.12	< 0.12	< 0.12	< 1
Chlorodibromomethane	1	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.12	< 0.12	< 0.12	< 0.12	< 1
Chloroform	70	-	ND	**3.96**	**3.42**	**2.77**	ND	**3.8**	ND	ND	ND	ND	< 0.35	< 0.35	< 0.35	< 0.35	< 1
Cymene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl benzene	700	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	700	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Meta/Para Xylene	1,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl chloride	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl ethyl ketone	300	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.22	< 0.22	< 0.22	< 0.22	< 10
Methyl Tertbutyl Ether	70	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.11	< 0.11	< 0.11	< 0.11	< 1
Naphthalene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ortho Xylene	1,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Propylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1	-	**0.59 J**	**0.53 J**	**0.52 J**	**0.41 J**	**0.4 J**	**0.57**	**0.35 J**	**0.41 J**	**0.49 J**	ND	< 0.14	< 0.14	< 0.14	**0.31 J**	**0.43 J**
Toluene	600	-	ND	ND	ND	ND	ND	ND	ND	**3.19**	ND	ND	< 0.12	< 0.12	< 0.12	< 0.12	< 1
TIC VOCs (µg/l)																	
Total TIC, Volatile	500	-	ND	ND	ND	ND	ND	ND	**4**	ND	ND	ND	ND	ND	ND	ND	ND
Semivolatile Organic Compounds (µg/l)																	
2-Methylnaphthalene	30	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	400	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	3	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	6,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	200	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC SVOCs (µg/l)																	
Total TIC, Semivolatile	500	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)																	
Aluminum	200	121,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2,450**	**2,390**	**2,570**	**2,300**	**2,010**
Antimony	6	20.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	**5.88**	< 4.7	**5.81**	< 2.2	< 1.3	< 1.3
Arsenic	3	89.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	**1.03**	**1.08**	< 1.4	< 0.92	< 0.92
Barium	6,000	699	NA	NA	NA	NA	NA	NA	NA	NA	NA	**423**	**408**	**399**	**425**	**385**	**337**
Beryllium	1	2.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.95**	**2.11**	**2.05**	**1.6**	**1.4**	**1.4**
Cadmium	4	9.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.57**	**1.83**	**1.39**	< 0.35	< 0.17	< 0.17
Calcium	NLE	45,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**27,600**	**26,900**	**29,800**	**29,800**	**24,200**
Chromium	70	191	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	< 0.6	< 0.6	< 0.59	< 0.9	< 0.9
Cobalt	100	18.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**9.46**	**9.41**	< 0.65	< 0.3	< 0.3
Copper	1,300	65.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	NA	< 0.8	< 2.5	< 0.85	< 0.85
Iron	300	431,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	**428**	**739**	**779**	**427**	**4,930**	**9,260**
Lead	5	22.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	< 2.1	< 2.1	< 1.9	< 0.94	< 0.94
Magnesium	NLE	62,700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**17,900**	**17,800**	**18,500**	**18,700**	**15,300**
Manganese	50	331	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**179**	**175**	**191**	**189**	**160**
Mercury	2	0.26	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.34 ER**	< 0.254	< 0.254	< 0.088	< 0.088	< 0.088
Nickel	100	187	NA	NA	NA	NA	NA	NA	NA	NA	NA	**26.3**	**26**	**25.7**	**26.4**	**25.5**	**21.8**
Potassium	NLE	137,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**6,690**	**6,070**	< 75	< 16	< 16
Selenium	40	29.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	**57.5**	< 1.36	< 1.36	< 1.9	< 1.5	< 1.5
Silver	40	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.6	**1.86**	< 0.53	< 0.72	< 0.72
Sodium	50,000	21,500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**169,000**	**169,000**	**190,000**	**197,000**	**171,000**
Vanadium	NLE	108	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.716**	**0.534**	< 0.56	< 0.43	< 0.43
Zinc	2,000	233	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**92.9**	**90.7**	**88.5**	**81.5**	**88.4**

1) Summary Statistics were obtained from Result Sheet(s) and reflect

TABLE 4.4
DETECTED GROUND WATER SAMPLING RESULTS - COMPARISON TO NJDEP GWQS
SITE FTMM-59 Bldg. 1122
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	Weston 1995 Background (Main Post)	1122MW04			1122MW05											
Sample ID			FTMM-59-GW-1122MW04-9.1	1122MW04-GW-9.8	FTMM-59-GW-1122MW04-8.5	FTMM59-GW-1122MW05-33	FTMM59-GW-1122MW05-34	FTMM59-GW-1122MW05-35	FTMM59-GW-1122MW05-36	FTMM59-GW-1122MW05-37	FTMM59-GW-1122MW05-38	FTMM59-GW-1122MW05-39	FTMM59-GW-1122MW05-40	FTMM59-GW-1122MW05-41	FTMM59-GW-1122MW05-42	FTMM59-GW-1122MW05-3	FTMM59-GW-1122MW05-4
Sample Date			8/29/2013	8/6/2018	7/16/2019	10/3/2007	1/8/2008	4/3/2008	7/10/2008	10/9/2008	1/23/2009	4/13/2009	7/20/2009	11/4/2009	1/12/2010	4/5/2010	7/19/2010
Sample Round			9			33	34	35	36	37	38	39	40	41	42	3	4
Filtered			Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)																	
1,2,4-Trimethylbenzene	100	-	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	100	-	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	6,000	-	**1.9 BJ**	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1	-	< 1	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	-	< 1	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorodibromomethane	1	-	< 1	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	-	< 1	NA	NA	ND	ND	ND	ND	ND	ND	ND	**0.36 J**	ND	ND	ND	ND
Cymene	100	-	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl benzene	700	-	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	700	-	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Meta/Para Xylene	1,000	-	< 2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl chloride	100	-	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl ethyl ketone	300	-	< 1	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	-	< 1	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	300	-	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	100	-	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ortho Xylene	1,000	-	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Propylbenzene	100	-	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	100	-	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	100	-	< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1	-	< 1	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	600	-	< 1	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)																	
Total TIC, Volatile	500	-	ND	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Semivolatile Organic Compounds (µg/l)																	
2-Methylnaphthalene	30	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	400	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	3	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	6,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	200	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC SVOCs (µg/l)																	
Total TIC, Semivolatile	500	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)																	
Aluminum	200	121,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	6	20.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**4.81 ER**
Arsenic	3	89.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND
Barium	6,000	699	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**385**
Beryllium	1	2.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.995 ER**
Cadmium	4	9.5	NA	**7.3**	**6.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.46 ER**
Calcium	NLE	45,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	70	191	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.85 ER**
Cobalt	100	18.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1,300	65.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.8 ER**
Iron	300	431,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**497**
Lead	5	22.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND
Magnesium	NLE	62,700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	50	331	NA	**560**	**982**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	2	0.26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.17 ER**
Nickel	100	187	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**12.8**
Potassium	NLE	137,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	40	29.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**33.5**
Silver	40	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	50,000	21,500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NLE	108	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2,000	233	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

1) Summary Statistics were obtained from Result Sheet(s) and reflect

TABLE 4.4
DETECTED GROUND WATER SAMPLING RESULTS - COMPARISON TO NJDEP GWQS
SITE FTMM-59 Bldg. 1122
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	Weston 1995 Background (Main Post)	1122MW05											1122MW06			
Sample ID			FTMM59-GW-1122MW05-4-Dup	FTMM59-GW-1122MW05-5	FTMM59-GW-1122MW05-6	FTMM59-GW-1122MW05-7	FTMM59-GW-1122MW05-8	FTMM-59-GW-1122MW05-7.5	FTMM-59-GW-1122MW05-12.5	FTMM-59-GW-1122MW105-12	1122MW05-GW-10.3	FTMM-59-GW-1122MW05-8.0	FTMM-59-GW-1122MW105-8.0	FTMM59-GW-1122MW06-1	FTMM59-GW-1122MW06-1-Dup	FTMM59-GW-1122MW06-2	FTMM59-GW-1122MW06-2-Dup
Sample Date			7/19/2010	10/5/2010	1/19/2011	4/4/2011	7/5/2011	8/29/2013	8/29/2013	8/29/2013	8/6/2018	7/16/2019	7/16/2019	8/19/2010	8/19/2010	10/5/2010	10/5/2010
Sample Round			4	5	6	7	8	9	9	9				1	1	2	2
Filtered			Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)																	
1,2,4-Trimethylbenzene	100	-	NA	NA	NA	NA	NA	< 1	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	100	-	NA	NA	NA	NA	NA	< 1	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
Acetone	6,000	-	ND	< 0.32	< 0.32	< 0.32	< 10	**2.4 BJ**	**2.6 BJ**	**2.5 BJ**	NA	NA	NA	< 0.32	< 0.32	< 0.32	< 0.32
Benzene	1	-	ND	< 0.12	< 0.12	< 0.12	< 1	< 1	< 1	< 1	NA	NA	NA	< 0.12	< 0.12	< 0.12	< 0.12
Bromodichloromethane	1	-	ND	< 0.12	< 0.12	< 0.12	< 1	< 1	< 1	< 1	NA	NA	NA	< 0.12	< 0.12	< 0.12	< 0.12
Chlorodibromomethane	1	-	ND	< 0.12	< 0.12	< 0.12	< 1	< 1	< 1	< 1	NA	NA	NA	< 0.12	< 0.12	< 0.12	< 0.12
Chloroform	70	-	ND	< 0.35	< 0.35	< 0.35	< 1	< 1	< 1	< 1	NA	NA	NA	< 0.35	< 0.35	< 0.35	< 0.35
Cymene	100	-	NA	NA	NA	NA	NA	< 1	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
Ethyl benzene	700	-	NA	NA	NA	NA	NA	< 1	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	700	-	NA	NA	NA	NA	NA	< 1	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
Meta/Para Xylene	1,000	-	NA	NA	NA	NA	NA	< 2	< 2	< 2	NA	NA	NA	NA	NA	NA	NA
Methyl chloride	100	-	NA	NA	NA	NA	NA	< 1	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
Methyl ethyl ketone	300	-	ND	< 0.22	< 0.22	< 0.22	< 10	< 1	< 1	< 1	NA	NA	NA	< 0.22	< 0.22	< 0.22	< 0.22
Methyl Tertbutyl Ether	70	-	ND	< 0.11	< 0.11	< 0.11	< 1	< 1	< 1	< 1	NA	NA	NA	< 0.11	< 0.11	< 0.11	< 0.11
Naphthalene	300	-	NA	NA	NA	NA	NA	< 1	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	100	-	NA	NA	NA	NA	NA	< 1	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
Ortho Xylene	1,000	-	NA	NA	NA	NA	NA	< 1	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
Propylbenzene	100	-	NA	NA	NA	NA	NA	< 1	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	100	-	NA	NA	NA	NA	NA	< 1	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
tert-Butylbenzene	100	-	NA	NA	NA	NA	NA	< 1	< 1	< 1	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1	-	ND	< 0.14	< 0.14	< 0.14	< 1	< 1	< 1	< 1	NA	NA	NA	< 0.14	< 0.14	< 0.14	< 0.14
Toluene	600	-	ND	< 0.12	< 0.12	< 0.12	< 1	< 1	< 1	< 1	NA	NA	NA	< 0.12	< 0.12	< 0.12	< 0.12
TIC VOCs (µg/l)																	
Total TIC, Volatile	500	-	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND
Semivolatile Organic Compounds (µg/l)																	
2-Methylnaphthalene	30	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	400	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	3	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	6,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	200	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC SVOCs (µg/l)																	
Total TIC, Semivolatile	500	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)																	
Aluminum	200	121,000	NA	**4,650**	**607**	**2,200**	**2,310**	NA	NA	NA	NA	NA	NA	NA	NA	**6,790**	**7,060**
Antimony	6	20.7	ND	< 4.7	< 2.2	< 1.3	< 1.3	NA	NA	NA	NA	NA	NA	< 10	**7.09**	< 4.7	< 4.7
Arsenic	3	89.3	**0.73 ER**	**3.29**	< 1.4	< 0.92	< 0.92	NA	NA	NA	NA	NA	NA	**1**	**1.19**	**1.52**	< 0.62
Barium	6,000	699	**387**	**16.1**	< 0.44	< 0.44	< 0.44	NA	NA	NA	NA	NA	NA	**344**	**299**	**317**	**330**
Beryllium	1	2.1	**1.02**	< 0.4	< 0.24	< 0.24	< 0.24	NA	NA	NA	NA	NA	NA	**1.96**	**1.69**	**1.79**	**1.85**
Cadmium	4	9.5	**1.68 ER**	**0.413**	< 0.35	< 0.17	< 0.17	NA	NA	NA	**1 J**	**0.58 J**	**0.41 J**	**1.01**	**1.11**	**1.26**	**1.35**
Calcium	NLE	45,400	NA	**531**	**7,230**	**7,750**	< 9	NA	NA	NA	NA	NA	NA	NA	NA	**30,100**	**31,700**
Chromium	70	191	**2.39 ER**	**47.9**	< 0.59	**19.2**	**18.4**	NA	NA	NA	NA	NA	NA	**1.12**	< 5	< 0.6	**0.712**
Cobalt	100	18.3	NA	< 0.3	< 0.65	< 0.3	< 0.3	NA	NA	NA	NA	NA	NA	NA	NA	**9.43**	**9.39**
Copper	1,300	65.6	**3.61 ER**	**11.3**	< 2.5	< 0.85	< 0.85	NA	NA	NA	NA	NA	NA	**4.53**	**4.12**	**1.86**	**2.33**
Iron	300	431,000	**542**	**11,600**	**1,170**	**5,060**	**4,940**	NA	NA	NA	NA	NA	NA	**162**	**162**	**79.2**	**81.8**
Lead	5	22.7	ND	**4.46**	< 1.9	< 0.94	NA	NA	NA	NA	NA	NA	NA	< 5	< 5	< 2.1	< 2.1
Magnesium	NLE	62,700	NA	**1,450**	< 15	< 17	< 17	NA	NA	NA	NA	NA	NA	NA	NA	**19,600**	**20,400**
Manganese	50	331	NA	**15.8**	< 0.46	**17.8**	**19.6**	NA	NA	NA	**26**	**35.5 BJ**	**61.7 BJ**	NA	NA	**221**	**228**
Mercury	2	0.26	ND	< 0.254	< 0.088	< 0.088	**0.2**	NA	NA	NA	NA	NA	NA	< 0.5	< 0.5	< 0.254	< 0.254
Nickel	100	187	**12.8**	**4.48**	< 0.51	< 0.41	< 0.41	NA	NA	NA	NA	NA	NA	**31.1**	**27**	**28.1**	**28.1**
Potassium	NLE	137,000	NA	**2,260**	< 75	< 16	< 16	NA	NA	NA	NA	NA	NA	NA	NA	**6,200**	**6,710**
Selenium	40	29.6	**34.8**	**1.64**	< 1.9	< 1.5	< 1.5	NA	NA	NA	NA	NA	NA	**59.2**	**42.1**	< 1.36	**2.34**
Silver	40	ND	NA	< 0.6	< 0.53	< 0.72	< 0.72	NA	NA	NA	NA	NA	NA	NA	NA	**1.94**	**2.65**
Sodium	50,000	21,500	NA	**17,200**	**50,400**	**946,000**	**75,100**	NA	NA	NA	NA	NA	NA	NA	NA	**221,000**	**228,000**
Vanadium	NLE	108	NA	**24.7**	< 0.56	< 0.43	< 0.43	NA	NA	NA	NA	NA	NA	NA	NA	< 0.5	< 0.5
Zinc	2,000	233	NA	**33.8**	**22.8**	**33.6**	**90.8**	NA	NA	NA	NA	NA	NA	NA	NA	**125**	**129**

1) Summary Statistics were obtained from Result Sheet(s) and reflect

TABLE 4.4
DETECTED GROUND WATER SAMPLING RESULTS - COMPARISON TO NJDEP GWQS
SITE FTMM-59 Bldg. 1122
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	Weston 1995 Background (Main Post)	1122MW06								1122MW06	
Sample ID			FTMM59-GW-1122MW06-3	FTMM59-GW-1122MW06-3-Dup	FTMM59-GW-1122MW06-4	FTMM59-GW-1122MW06-4-Dup	FTMM59-GW-1122MW06-5	FTMM59-GW-1122MW06-5-Dup	FTMM-59-GW-1122MW06-10.67	FTMM-59-GW-1122MW06-18.11	1122MW06-GW-13.5	FTMM-59-GW-1122MW06-14
Sample Date			1/19/2011	1/19/2011	4/4/2011	4/4/2011	7/5/2011	7/5/2011	8/29/2013	8/29/2013	8/6/2018	7/17/2019
Sample Round			3	3	4	4	5	5	6	6		
Filtered			Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)												
1,2,4-Trimethylbenzene	100	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
1,3,5-Trimethylbenzene	100	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Acetone	6,000	-	< 0.32	< 0.32	< 0.32	< 0.32	< 10	< 10	**3.3 J**	**4 BJ**	NA	NA
Benzene	1	-	< 0.12	< 0.12	< 0.12	< 0.12	< 1	< 1	< 1	< 1	NA	NA
Bromodichloromethane	1	-	< 0.12	< 0.12	< 0.12	< 0.12	< 1	< 1	< 1	< 1	NA	NA
Chlorodibromomethane	1	-	< 0.12	< 0.12	< 0.12	< 0.12	< 1	< 1	< 1	< 1	NA	NA
Chloroform	70	-	< 0.35	< 0.35	< 0.35	< 0.35	< 1	< 1	< 1	< 1	NA	NA
Cymene	100	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Ethyl benzene	700	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Isopropylbenzene	700	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Meta/Para Xylene	1,000	-	NA	NA	NA	NA	NA	NA	< 2	< 2	NA	NA
Methyl chloride	100	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Methyl ethyl ketone	300	-	< 0.22	< 0.22	< 0.22	< 0.22	< 10	< 10	< 1	< 1	NA	NA
Methyl Tertbutyl Ether	70	-	< 0.11	< 0.11	< 0.11	< 0.11	< 1	< 1	< 1	< 1	NA	NA
Naphthalene	300	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
n-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Ortho Xylene	1,000	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Propylbenzene	100	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
sec-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
tert-Butylbenzene	100	-	NA	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Tetrachloroethene	1	-	< 0.14	< 0.14	< 0.14	< 0.14	< 1	< 1	< 1	< 1	NA	NA
Toluene	600	-	< 0.12	< 0.12	< 0.12	< 0.12	< 1	< 1	< 1	< 1	NA	NA
TIC VOCs (µg/l)												
Total TIC, Volatile	500	-	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Semivolatile Organic Compounds (µg/l)												
2-Methylnaphthalene	30	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	400	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	3	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	6,000	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	300	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	100	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	200	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC SVOCs (µg/l)												
Total TIC, Semivolatile	500	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)												
Aluminum	200	121,000	**7,640**	**7,790**	**6,310**	**6,100**	**4,900**	**4,110**	NA	NA	NA	NA
Antimony	6	20.7	< 2.2	< 2.2	< 1.3	< 1.3	< 1.3	< 1.3	NA	NA	NA	NA
Arsenic	3	89.3	< 1.4	< 1.4	< 0.92	< 0.92	< 0.92	< 0.92	NA	NA	NA	NA
Barium	6,000	699	**317**	**324**	**218**	< 0.44	< 0.44	< 0.44	NA	NA	NA	NA
Beryllium	1	2.1	**1.5**	**1.5**	**1.1**	**1**	< 0.24	< 0.24	NA	NA	NA	NA
Cadmium	4	9.5	< 0.35	< 0.35	< 0.17	< 0.17	< 0.17	< 0.17	NA	NA	**7.7**	**3**
Calcium	NLE	45,400	**39,700**	**40,200**	**26,000**	**23,100**	**18,100**	**18,200**	NA	NA	NA	NA
Chromium	70	191	< 0.59	< 0.59	< 0.9	**10.2**	**12.4**	< 0.9	NA	NA	NA	NA
Cobalt	100	18.3	< 0.65	< 0.65	< 0.3	< 0.3	< 0.3	< 0.3	NA	NA	NA	NA
Copper	1,300	65.6	< 2.5	< 2.5	< 0.85	< 0.85	< 0.85	< 0.85	NA	NA	NA	NA
Iron	300	431,000	< 18	< 18	**2,060**	**2,580**	**3,170**	**1,620**	NA	NA	NA	NA
Lead	5	22.7	< 1.9	< 1.9	< 0.94	< 0.94	NA U	< 0.94	NA	NA	NA	NA
Magnesium	NLE	62,700	**20,300**	**20,700**	**14,500**	**13,100**	**10,700**	**10,600**	NA	NA	NA	NA
Manganese	50	331	**258**	**263**	**235**	**208**	**169**	**170**	NA	NA	**1,500**	**1,670**
Mercury	2	0.26	< 0.088	< 0.088	< 0.088	< 0.088	< 0.088	< 0.088	NA	NA	NA	NA
Nickel	100	187	**32.9**	**33.4**	**23.9**	**22.6**	**18.4**	**18**	NA	NA	NA	NA
Potassium	NLE	137,000	< 75	< 75	< 16	< 16	< 16	< 16	NA	NA	NA	NA
Selenium	40	29.6	< 1.9	< 1.9	< 1.5	< 1.5	< 1.5	< 1.5	NA	NA	NA	NA
Silver	40	ND	< 0.53	< 0.53	< 0.72	< 0.72	< 0.72	< 0.72	NA	NA	NA	NA
Sodium	50,000	21,500	**254,000**	**263,000**	**208,000**	**182,000**	**169,000**	**170,000**	NA	NA	NA	NA
Vanadium	NLE	108	< 0.56	< 0.56	< 0.43	< 0.43	< 0.43	< 0.43	NA	NA	NA	NA
Zinc	2,000	233	**117**	**120**	**95.5**	**87.8**	**94.8**	**89.9**	NA	NA	NA	NA

1) Summary Statistics were obtained from Result Sheet(s) and reflect values for the whole dataset.

TABLE 4.4
DETECTED GROUND WATER SAMPLING RESULTS - COMPARISON TO NJDEP GWQS
SITE FTMM-59 Bldg. 1122
FORT MONMOUTH, NEW JERSEY

Loc ID			1122MW07						1122MW07			FTMM-59-GG1	FTMM-59-GG7	FTMM-59-MW01		
Sample ID	NJ Ground Water Quality Criteria	Weston 1995 Background (Main Post)	FTMM-59-GW-1122MW07-15.22	FTMM-59-GW-1122MW07-16.67_2014-Q4	FTMM-59-GW-1122MW107-16.67_2014-Q4	FTMM-59-GW-1122MW07-14.48 DISS_4Q2015	FTMM-59-GW-1122MW07-14.48_4Q2015	FTMM-59-GW-1122MW107-14.48_4Q2015	1122MW07-GW-15.2	FTMM-59-GW-1122MW07-14	FTMM-59-GW-1122MW07-14 Dis	FTMM-59-GG1-15.0	FTMM-59-GG7-12.0	FTMM-59-GW-MW01-10.00	FTMM-59-GW-MW101-10.00	FTMM-59-GW-MW01-15.00
Sample Date			8/29/2013	10/2/2014	10/2/2014	12/15/2015	12/15/2015	12/15/2015	8/6/2018	7/16/2019	7/16/2019	9/30/2015	9/30/2015	12/14/2015	12/14/2015	12/14/2015
Sample Round			1													
Filtered			Total	Total	Total	Dissolved	Total	Total	Total	Total	Dissolved	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)																
1,2,4-Trimethylbenzene	100	-	< 1	< 1	< 1	NA	< 1	NA	NA	NA	NA	**1.4 J**	**6.2**	**14 J**	**8 J**	**27**
1,3,5-Trimethylbenzene	100	-	< 1	< 1	< 1	NA	< 1	NA	NA	NA	NA	**0.78 J**	**0.71 J**	**3.4 J**	**1.9 J**	**6.2**
Acetone	6,000	-	**2.8 J**	**2.7 J**	**2.6 J**	NA	**3.6 J**	NA	NA	NA	NA	**4.3 J**	**16**	**4.6 J**	**4.6 J**	**3.1 J**
Benzene	1	-	< 1	< 1	< 1	NA	< 1	NA	NA	NA	NA	**1 J**	**3.4 J**	**2.3 J**	**1.2 J**	**4.5 J**
Bromodichloromethane	1	-	< 1	< 1	< 1	NA	< 1	NA	NA	NA	NA	< 1	< 1	< 1	< 1	< 1
Chlorodibromomethane	1	-	< 1	< 1	< 1	NA	< 1	NA	NA	NA	NA	< 1	< 1	< 1	< 1	< 1
Chloroform	70	-	< 1	< 1	< 1	NA	< 1	NA	NA	NA	NA	< 1	< 1	< 1	< 1	< 1
Cymene	100	-	< 1	< 1	< 1	NA	< 1	NA	NA	NA	NA	**0.76 J**	**0.56 J**	**0.41 J**	**0.27 J**	**0.64 J**
Ethyl benzene	700	-	< 1	< 1	< 1	NA	< 1	NA	NA	NA	NA	**13**	**5.4**	**8.7**	**4.5 J**	**19**
Isopropylbenzene	700	-	**0.58 J**	**0.83 J**	**0.83 J**	NA	**0.35 J**	NA	NA	NA	NA	**4.8 J**	**1.6 J**	**1.1 J**	**0.58 J**	**1.8 J**
Meta/Para Xylene	1,000	-	< 2	< 2	< 2	NA	< 2	NA	NA	NA	NA	**0.66 J**	**7 J**	**5.2**	**2.9 J**	**9.1**
Methyl chloride	100	-	< 1	< 1	< 1	NA	< 1	NA	NA	NA	NA	< 1	**0.29 J**	< 1	< 1	< 1
Methyl ethyl ketone	300	-	< 1	< 1	< 1	NA	< 1	NA	NA	NA	NA	< 1	**3.6 J**	< 1	< 1	< 1
Methyl Tertbutyl Ether	70	-	< 1	< 1	< 1	NA	< 1	NA	NA	NA	NA	**0.69 J**	**2.8 J**	**1.9 J**	**1.5 J**	**2.1 J**
Naphthalene	300	-	< 1	**0.8 B**	**1.1 B**	NA	**0.37 J**	NA	NA	NA	NA	**92**	**16**	**11 J**	**6.6 J**	**22**
n-Butylbenzene	100	-	< 1	< 1	< 1	NA	< 1	NA	NA	NA	NA	**2.7 J**	**0.42 J**	**0.87 J**	**0.49 J**	**0.85 J**
Ortho Xylene	1,000	-	< 1	< 1	< 1	NA	< 1	NA	NA	NA	NA	**0.32 J**	**3.2 J**	**0.57 J**	**0.31 J**	**1 J**
Propylbenzene	100	-	< 1	**0.33 J**	**0.37 J**	NA	< 1	NA	NA	NA	NA	**7.5**	**2.3 J**	**1.9 J**	**1.1 J**	**3.7 J**
sec-Butylbenzene	100	-	< 1	**0.43 J**	**0.46 J**	NA	< 1	NA	NA	NA	NA	**2.5 J**	**0.69 J**	**0.64 J**	**0.46 J**	**0.94 J**
tert-Butylbenzene	100	-	< 1	**0.37 J**	**0.37 J**	NA	**0.21 J**	NA	NA	NA	NA	**0.23 J**	**0.23 J**	< 1	< 1	< 1
Tetrachloroethene	1	-	< 1	< 1	< 1	NA	< 1	NA	NA	NA	NA	< 1	< 1	< 1	< 1	< 1
Toluene	600	-	< 1	< 1	< 1	NA	< 1	NA	NA	NA	NA	< 1	< 1	< 1	< 1	< 1
TIC VOCs (µg/l)																
Total TIC, Volatile	500	-	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (µg/l)																
2-Methylnaphthalene	30	-	NA	NA	NA	NA	< 5	< 5	NA	NA	NA	**70**	**21**	**9.7**	NA	**5.6 J**
Acenaphthene	400	-	NA	NA	NA	NA	< 5	< 5	NA	NA	NA	**1.8 J**	**3.4 J**	< 5	NA	< 5
Bis(2-Ethylhexyl)phthalate	3	-	NA	NA	NA	NA	< 5	< 5	NA	NA	NA	< 5	**13**	< 5	NA	< 5
Carbazole	100	-	NA	NA	NA	NA	< 5	< 5	NA	NA	NA	< 5	**3 J**	< 5	NA	< 5
Dibenzofuran	100	-	NA	NA	NA	NA	< 5	< 5	NA	NA	NA	**1.5 J**	**2.1 J**	< 5	NA	< 5
Diethyl phthalate	6,000	-	NA	NA	NA	NA	< 5	< 5	NA	NA	NA	< 5	**3.3 J**	< 5	NA	< 5
Fluorene	300	-	NA	NA	NA	NA	< 5	< 5	NA	NA	NA	**2.2 J**	**3.3 J**	**1.1 J**	NA	< 5
Naphthalene	300	-	NA	NA	NA	NA	< 5	< 5	NA	NA	NA	**47**	**17**	**12**	NA	**8.7 J**
Phenanthrene	100	-	NA	NA	NA	NA	< 5	< 5	NA	NA	NA	**3 J**	**5.9 J**	**1.1 J**	NA	< 5
Pyrene	200	-	NA	NA	NA	NA	< 5	< 5	NA	NA	NA	< 5	**4.1 J**	< 5	NA	< 5
TIC SVOCs (µg/l)																
Total TIC, Semivolatile	500	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	**280.6 JN**	**1172 JN**	**133 JN**	NA	**63.3 JN**
Inorganics (µg/l)																
Aluminum	200	121,000	NA	NA	NA	**28.8 B**	**167**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	6	20.7	NA	NA	NA	< 30	< 30	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	3	89.3	NA	NA	NA	**5.1 J**	**5.5 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	6,000	699	NA	NA	NA	**23.8**	**19.5 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	1	2.1	NA	NA	NA	< 2.5	< 2.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	4	9.5	NA	NA	NA	**0.5 J**	**0.5 J**	NA	< 0.7	< 0.37	< 0.37	NA	NA	NA	NA	NA
Calcium	NLE	45,400	NA	NA	NA	**21,000**	**17,500**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	70	191	NA	NA	NA	**0.37 B**	**4.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	100	18.3	NA	NA	NA	< 25	< 25	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1,300	65.6	NA	NA	NA	< 10	< 10	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	300	431,000	NA	NA	NA	**78,000**	**62,600**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	5	22.7	NA	NA	NA	< 2.5	< 2.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NLE	62,700	NA	NA	NA	**8,700**	**7,090**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	50	331	NA	NA	NA	**385**	**350**	NA	**79**	**28.7 B**	**21.7**	NA	NA	NA	NA	NA
Mercury	2	0.26	NA	NA	NA	< 0.1	< 0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	100	187	NA	NA	NA	< 20	< 20	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	137,000	NA	NA	NA	**1,010 J**	**1,160 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	40	29.6	NA	NA	NA	< 5	< 5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	40	ND	NA	NA	NA	**2.1 J**	**1.9 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	50,000	21,500	NA	NA	NA	**48,500**	**49,700**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NLE	108	NA	NA	NA	< 25	**1.4 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2,000	233	NA	NA	NA	**7.4 J**	**9.6 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA

1) Summary Statistics were obtained from Result Sheet(s) and reflect \

TABLE 4.4
DETECTED GROUND WATER SAMPLING RESULTS - COMPARISON TO NJDEP GWQS
SITE FTMM-59 Bldg. 1122
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	Weston 1995 Background (Main Post)	FTMM59-MW-01					FTMM-59-MW02			
Sample ID			FTMM-59-GW-MW-01-11.4	FTMM-59-GW-MW-01-12.5	FTMM-59-GW-MW-01-12.5_2019Q3	FTMM-59-GW-MW-01-12.5_2019Q4	FTMM-59-GW-MW-101-12.5_2019Q4	FTMM-59-GW-MW02-12.00	FTMM-59-GW-MW02-17.00	FTMM-59-GW-MW-02-15.5	FTMM-59-GW-MW-02-15.5_2019Q2
Sample Date			8/6/2018	7/16/2019	8/9/2019	11/6/2019	11/6/2019	12/14/2015	12/15/2015	8/6/2018	7/16/2019
Sample Round											
Filtered			Total	Total	Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)											
1,2,4-Trimethylbenzene	100	-	NA	NA	NA	NA	NA	< 1 UJ	**0.23 J**	NA	NA
1,3,5-Trimethylbenzene	100	-	NA	NA	NA	NA	NA	< 1 UJ	< 1	NA	NA
Acetone	6,000	-	NA	NA	NA	NA	NA	**1.6 J**	**1.8 J**	NA	NA
Benzene	1	-	NA	NA	**0.62 J**	< 0.33	< 0.33	< 1	< 1	NA	NA
Bromodichloromethane	1	-	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Chlorodibromomethane	1	-	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Chloroform	70	-	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Cymene	100	-	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Ethyl benzene	700	-	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Isopropylbenzene	700	-	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Meta/Para Xylene	1,000	-	NA	NA	NA	NA	NA	< 2	< 2	NA	NA
Methyl chloride	100	-	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Methyl ethyl ketone	300	-	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Methyl Tertbutyl Ether	70	-	NA	NA	NA	NA	NA	**0.32 J**	**0.37 J**	NA	NA
Naphthalene	300	-	NA	NA	NA	NA	NA	**0.71 J**	**1.5 J**	NA	NA
n-Butylbenzene	100	-	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Ortho Xylene	1,000	-	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Propylbenzene	100	-	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
sec-Butylbenzene	100	-	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
tert-Butylbenzene	100	-	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Tetrachloroethene	1	-	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
Toluene	600	-	NA	NA	NA	NA	NA	< 1	< 1	NA	NA
TIC VOCs (µg/l)											
Total TIC, Volatile	500	-	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (µg/l)											
2-Methylnaphthalene	30	-	NA	NA	NA	NA	NA	< 5	< 5	NA	NA
Acenaphthene	400	-	NA	NA	NA	NA	NA	< 5	< 5	NA	NA
Bis(2-Ethylhexyl)phthalate	3	-	NA	NA	NA	NA	NA	< 5	< 5	NA	NA
Carbazole	100	-	NA	NA	NA	NA	NA	< 5	< 5	NA	NA
Dibenzofuran	100	-	NA	NA	NA	NA	NA	< 5	< 5	NA	NA
Diethyl phthalate	6,000	-	NA	NA	NA	NA	NA	< 5	< 5	NA	NA
Fluorene	300	-	NA	NA	NA	NA	NA	< 5	< 5	NA	NA
Naphthalene	300	-	NA	NA	NA	NA	NA	< 5	< 5	NA	NA
Phenanthrene	100	-	NA	NA	NA	NA	NA	< 5	< 5	NA	NA
Pyrene	200	-	NA	NA	NA	NA	NA	< 5	< 5	NA	NA
TIC SVOCs (µg/l)											
Total TIC, Semivolatile	500	-	NA	NA	NA	NA	NA	**32.7 JN**	NA	NA	NA
Inorganics (µg/l)											
Aluminum	200	121,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	6	20.7	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	3	89.3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	6,000	699	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	1	2.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	4	9.5	< 0.7	< 0.37	NA	NA	NA	NA	NA	< 0.7	< 0.37
Calcium	NLE	45,400	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	70	191	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	100	18.3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1,300	65.6	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	300	431,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	5	22.7	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NLE	62,700	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	50	331	**500**	**347**	NA	NA	NA	NA	NA	**620**	**634**
Mercury	2	0.26	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	100	187	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	137,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	40	29.6	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	40	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	50,000	21,500	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NLE	108	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2,000	233	NA	NA	NA	NA	NA	NA	NA	NA	NA

1) Summary Statistics were obtained from Result Sheet(s) and reflect \

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).

- Cell Style values represent a result that is above the Weston 1995 Background (Main Post). ###

n/a = all concentrations were less than the detection limit, therefore, no location of maximum value identified.

Dash (-) = only background concentrations for metals are being used as comparison criteria.

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

- The Weston 1995 Background (Main Post) refers to the FTMM reports.

NA

TABLE 4.5
GROUND WATER SAMPLING SUMMARY OF DETECTIONS
SITE FTMM-59 Bldg. 1122
FORT MONMOUTH, NEW JERSEY

Analyte	Maximum Detected Concentration		Location of Maximum Concentration	Sample Date	Number of Samples	Number of Detections	Number of Detections		Significance of Results	
							NJDEP GWQS (1)	Weston 1995 Background (Main Post) (2)	Site-Related or of Concern?	Rationale
Volatile Organic Compounds (µg/l)										
1,2,4-Trimethylbenzene	27		FTMM-59-MW01	12/14/2015	20	4	0	n/a	No	Less than NJDEP GWQS
1,3,5-Trimethylbenzene	6.2		FTMM-59-MW01	12/14/2015	20	3	0	n/a	No	Less than NJDEP GWQS
Acetone	20.57		1122MW01	4/5/2010	76	21	0	n/a	No	Less than NJDEP GWQS
Benzene	4.5	J	FTMM-59-MW01	12/14/2015	79	4	3	n/a	No	Latest 2019 results are less than NJDEP GWQS
Bromodichloromethane	2.26		1122MW01	4/5/2010	76	1	1	n/a	No	Exceeded the NJDEP GWQS in a 2010 sample at 1122MW01 and was non-detect for the eight subsequent sampling events
Chlorodibromomethane	0.52		1122MW01	4/5/2010	76	1	0	n/a	No	Less than NJDEP GWQS
Chloroform	7.36		1122MW01	4/5/2010	76	1	0	n/a	No	Less than NJDEP GWQS
Cymene	0.64	J	FTMM-59-MW01	12/14/2015	20	3	0	n/a	No	Less than NJDEP GWQS
Ethyl benzene	19		FTMM-59-MW01	12/14/2015	20	3	0	n/a	No	Less than NJDEP GWQS
Isopropylbenzene	1.8	J	FTMM-59-MW01	12/14/2015	20	7	0	n/a	No	Less than NJDEP GWQS
Meta/Para Xylene	9.1		FTMM-59-MW01	12/14/2015	20	3	0	n/a	No	Less than NJDEP GWQS
Methyl Tertbutyl Ether	2.1	J	FTMM-59-MW01	12/14/2015	76	5	0	n/a	No	Less than NJDEP GWQS
Naphthalene	22		FTMM-59-MW01	12/14/2015	20	9	0	n/a	No	Less than NJDEP GWQS
n-Butylbenzene	0.87	J	FTMM-59-MW01	12/14/2015	20	3	0	n/a	No	Less than NJDEP GWQS
Ortho Xylene	1	J	FTMM-59-MW01	12/14/2015	20	3	0	n/a	No	Less than NJDEP GWQS
Propylbenzene	3.7	J	FTMM-59-MW01	12/14/2015	20	5	0	n/a	No	Less than NJDEP GWQS
sec-Butylbenzene	0.94	J	FTMM-59-MW01	12/14/2015	20	5	0	n/a	No	Less than NJDEP GWQS
tert-Butylbenzene	0.37	J	1122MW07	10/2/2014	20	3	0	n/a	No	Less than NJDEP GWQS
Tetrachloroethene	1.38		1122MW03	11/4/2009	76	15	1	n/a	No	Exceeded the NJDEP GWQS in a 2009 sample at 1122MW03 and was non-detect for the seven subsequent sampling events
Toluene	3.19		1122MW04	1/12/2010	76	1	0	n/a	No	Less than NJDEP GWQS
TIC VOCs (µg/l)										
Total TIC, VOCs	68		1122MW02	4/4/2011	68	4	0	n/a	No	Less than NJDEP GWQS
Semivolatile Organic Compounds (µg/l)										
2-Methylnaphthalene	9.7		FTMM-59-MW01	12/14/2015	7	2	0	n/a	No	Less than NJDEP GWQS
Fluorene	1.1	J	FTMM-59-MW01	12/14/2015	7	1	0	n/a	No	Less than NJDEP GWQS
Naphthalene	12		FTMM-59-MW01	12/14/2015	7	2	0	n/a	No	Less than NJDEP GWQS
Phenanthrene	1.1	J	FTMM-59-MW01	12/14/2015	7	1	0	n/a	No	Less than NJDEP GWQS
TIC SVOCs (µg/l)										
Total TIC, SVOCs	133	JN	FTMM-59-MW01	12/14/2015	3	3	0	n/a	No	Less than NJDEP GWQS
Inorganics (µg/l)										
Aluminum	8,470		1122MW01	7/5/2011	32	31	28	0	No	Less than Weston 1995 background for the Main Post
Antimony	7.09		1122MW06	8/19/2010	41	4	1	0	No	Less than Weston 1995 background for the Main Post
Arsenic	14.7		1122MW02	7/5/2011	41	19	7	0	No	Less than Weston 1995 background for the Main Post
Barium	425		1122MW04	1/20/2011	41	27	0	0	No	Less than NJDEP GWQS
Beryllium	2.64		1122MW03	7/20/2010	41	24	19	3	No	Exceeded background and the NJDEP GWQS twice in 1122MW03 and once in 1122MW04 in 2010-2011; results were similar to upgradient well 1122MW06 during the same time period
Cadmium	25.6		1122MW01	1/20/2011	61	33	9	4	No	Exceedances of NJDEP GWQS confirmed in 2018-2019 sampling; however, based on analyte distribution, an offsite source is indicated.
Calcium	349,000		1122MW01	1/20/2011	32	30	NLE	2	No	Essential Human Nutrient
Chromium	47.9		1122MW05	10/5/2010	41	20	0	0	No	Less than NJDEP GWQS

TABLE 4.5
GROUND WATER SAMPLING SUMMARY OF DETECTIONS
SITE FTMM-59 Bldg. 1122
FORT MONMOUTH, NEW JERSEY

Analyte	Maximum Detected Concentration		Location of Maximum Concentration	Sample Date	Number of Samples	Number of Detections	Number of Detections		Significance of Results	
							NJDEP GWQS (1)	Weston 1995 Background (Main Post) (2)	Site-Related or of Concern?	Rationale
Cobalt	9.46		1122MW04	10/6/2010	32	5	0	0	No	Less than NJDEP GWQS
Copper	91.4		1122MW01	7/19/2010	40	14	0	1	No	Less than NJDEP GWQS
Iron	78,000		1122MW07	12/15/2015	41	36	29	0	No	Essential Human Nutrient
Lead	13.9		1122MW01	7/5/2011	39	5	2	0	No	Less than Weston 1995 background for the Main Post
Magnesium	39,700		1122MW01	1/20/2011	32	25	NLE	0	No	Essential Human Nutrient
Manganese	1670		1122MW06	7/17/2019	52	51	35	11	No	Exceedances of NJDEP GWQS confirmed in 2018-2019 sampling; however, based on analyte distribution, an offsite source is indicated.
Mercury	0.34	ER	1122MW04	7/20/2010	41	7	0	1	No	Less than NJDEP GWQS
Nickel	33.4		1122MW06	1/19/2011	41	31	0	0	No	Less than NJDEP GWQS
Potassium	11,900		1122MW01	1/20/2011	32	12	NLE	0	No	Essential Human Nutrient
Selenium	59.2		1122MW06	8/19/2010	41	11	4	6	No	Exceedances are isolated and anomalous, and highest concentrations were encountered in an upgradient well
Silver	2.65		1122MW06	10/5/2010	32	6	0	6	No	Less than NJDEP GWQS
Sodium	946,000		1122MW05	4/4/2011	32	32	26	31	No	Essential Human Nutrient
Vanadium	24.7		1122MW05	10/5/2010	32	7	NLE	0	No	Less than NJDEP GWQS
Zinc	129		1122MW06	10/5/2010	32	32	0	0	No	Less than NJDEP GWQS

Notes:
1) 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
2) The Weston 1995 Background (Main Post) refers to the FTMM reports.
E (or ER) = Estimated result.
J = estimated detected value due to a concetration below the reporting limit or due to discrepancies in meeting certain analyte-specific quality control.
JN = Tentatively identified compound, estimated concentration.
All historical data collected prior to 2013 are reported as provided by others.
Number of Analyses is the number of detected and non-detected results excluding rejected results. Sample duplicate pairs have not been averaged.
NLE = no limit established.
ND = not detected in any background sample, no background concentration available.
Bold chemical dectection

TABLE 4.6
SURFACE WATER SAMPLING SUMMARY RESULTS
SITE FTMM-59
FORT MONMOUTH, NEW JERSEY

LOCID	USEPA National Recommended Water Quality Criteria (1)	NJDEP SWQS Fresh Water (FW2) Criteria (2)	SS-24														
Round Number			28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Date Collected			3/13/2007	6/26/2007	9/13/2007	12/19/2007	3/25/2008	6/26/2008	9/30/2008	12/29/2008	3/24/2009	6/29/2009	9/25/2009	12/7/2009	3/28/2010	6/22/2010	9/21/2010
Analyte/Lab ID			70093.13	70230.13	70339.13	70541.13	80094.06	80213.13	80346.15	80478.15	90119.15	90268.15	90398.15	90472.15	10110.15	10277.15	10402.15
VOCs (µg/L)																	
Acetone [a]	1,400	NLE	**1.33** J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butyl alcohol	NLE	NLE	ND	ND	**3.88** J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene [a]	3.6	NLE	**0.94** J	**1.50** J	**2.06**	ND	**1.16** J	**1.97** J	**0.92** J	**0.81** J	**0.79** J	**1.01** J	**1.15**	**0.82**	**0.92**	**1.03**	**1.56**
Methyl *tert*-butyl ether [a]	14	70	**0.57** J	ND	**0.78** J	ND	**0.82** J	**0.46** J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	29	0.34	**2.29**	ND	**1.05** J	**0.97** J	**1.93** J	**1.81** J	ND	**1.41** J	**2.52**	**1.87** J	**1.19**	**1.24**	**2.66**	**1.20**	**0.65**
Trichloroethene	7	1.0	**0.69** J	ND	ND	ND	**0.83** J	**0.72** J	ND	ND	**1.04** J	**0.66** J	**0.61**	**0.48** J	**0.79**	**0.42** J	**0.38** J
TICs	NLE	NLE	ND	ND	ND	**4**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Wet Chemistry																	
Ammonia (mg/L)	NLE	NLE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA
Fecal Coliform (cfu/100ml)	NLE	NLE	NA	**100**	**550**	**50**	ND	**40**	**150**	**20**	ND	NA	NA	NA	NA	NA	NA
Nitrates (mg/L)	10,000	10,000	ND	ND	ND	NA	**3.51**	**7.53**	ND	ND	ND	ND	NA	NA	NA	NA	NA
Oxygen (dissolved; mg/L)	NLE	NLE	**9.37**	**6.81**	**4.61**	**2.90**	**9.63**	**8.01**	**9.53**	**8.15**	**4.37**	**8.12**	**7.58**	**5.60**	**4.39**	**7.53**	**4.35**
pH	5-9	NLE	**7.12**	**7.28**	**8.16**	**6.88**	**7.95**	**8.43**	**7.30**	**7.19**	**7.16**	**7.45**	**7.03**	**7.22**	**7.09**	**7.27**	**5.78**
Phosphate (mg/L)	NLE	NLE	ND	ND	ND	NA	**0.04**	ND	ND	ND	**0.05**	ND	NA	NA	NA	NA	NA
Sulfate (mg/L)	NLE	250	**26.5**	**21.4**	**22.9**	NA	**21.9**	**32.99**	**37.2**	**25.4**	**43.2**	**33.1**	NA	NA	NA	NA	NA
Temperature (°C)	NLE	NLE	**8.89**	**23.3**	**20.2**	**4.80**	**8.99**	**22.94**	**18.16**	**8.29**	**5.74**	**23.17**	**19.13**	**4.49**	**7.34**	**22.32**	**16.38**
Total Coliform (cfu/100ml)	NLE	NLE	**600**	**2650**	**9800**	**600**	**100**	**4720**	**4350**	**1220**	**1220**	NA	NA	NA	NA	NA	NA

Notes:
(1) The USEPA National Recommended Water Quality Criteria (NRWQC) refers to the USEPA NRWQC - 2015-06 http://www.epa.gov/wqc/national-recommended-water-quality-criteria-human-health-criteria-table
(2) The NJ Surface Water Quality Standards (SWQS) Fresh Water (FW2) Criteria refers to the NJDEP SWQS for Human Health for fresh waters as per N.J.A.C. 7:9B effective 4-4-11. Available at:
a - Tapwater RSL was used in place of NRWQC, available at: https://semspub.epa.gov/work/03/2220595.pdf
mg/L = milligrams/liter µg/L = micrograms/liter
cfu/100 mL = colony-forming units/100 milliliters
J = Estimated concentration exceeds the method detection limit (MDL) and is less than the reporting limit (RL)
NA = Not analyzed ND = Not detected NLE = No limit established
Detections are Bolded.
Shaded cells = concentration exceeds NJDEP SWQC Human Health (Fresh Water) Criteria
NRWQC
Shaded cells = concentration exceeds NJDEP and USEPA criteria.
RSL values were current at the time that the screening was conducted.

TABLE 4.6
SURFACE WATER SAMPLING SUMMARY RESULTS
SITE FTMM-59
FORT MONMOUTH, NEW JERSEY

LOCID	USEPA National Recommended Water Quality Criteria (1)	NJDEP SWQS Fresh Water (FW2) Criteria (2)	SS-5												SS-5		
Round Number			3/13/2007	6/26/2007	9/13/2007	12/19/2007	3/25/2008	6/26/2008	9/30/2008	12/29/2008	3/24/2009	6/29/2009	9/25/2009	12/7/2009	3/28/2010	6/22/2010	9/21/2010
Date Collected			42	43	44	45	46	47	48	49	50	51	52	53	54	55	56
Analyte/Lab ID			70093.15	70234.04	70339.15	70541.15	80094.05	80213.15	80346.06	80478.06	90119.06	90268.06	90398.06	90472.06	10110.05	10277.06	10402.06
VOCs (µg/L)																	
Acetone [a]	1,400	NLE	**1.31** J	**7.15**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butyl alcohol	NLE	NLE	ND	ND	**8.65** J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene [a]	3.6	NLE	**0.79** J	ND	**0.67** J	ND	**0.79** J	**1.5** J	**0.6** J	**0.58** J	ND	**1.02** J	ND	**0.41** J	**0.79**	**0.91**	**0.95**
Methyl *tert*-butyl ether [a]	14	70	**0.44** J	ND	**0.33** J	ND	**0.66** J	**0.34** J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	29	0.34	**1.86** J	ND	**0.29**	**0.84** J	**1.4** J	**1.15** J	ND	**0.97** J	**0.47** J	**1.24** J	ND	**0.61**	**2.19**	**1**	**0.42** J
Trichloroethene	7	1.0	**0.58** J	ND	ND	ND	**0.6** J	**0.55** J	ND	ND	ND	**0.5** J	ND	ND	**0.64**	**0.37** J	**0.24** J
TICs	NLE	NLE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**8**	ND	**0**	ND	ND
Wet Chemistry																	
Ammonia (mg/L)	NLE	NLE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA
Fecal Coliform (cfu/100ml)	NLE	NLE	NA	**4500**	**3200**	**50**	**20**	**100**	**300**	**120**	ND	NA	NA	NA	NA	NA	NA
Nitrates (mg/L)	10,000	10,000	ND	ND	ND	NA	**4.02**	**5.92**	ND	ND	ND	**0.689**	NA	NA	NA	NA	NA
Oxygen (dissolved; mg/L)	NLE	NLE	**7.73**	**6.46**	**6.54**	**4.74**	**8.58**	**8.07**	**8.44**	**7.38**	**7.73**	**6.51**	**6.73**	**3.84**	**4.3**	**6.24**	**3.91**
pH	5-9	NLE	**7.37**	**6.52**	**7.59**	**7.36**	**7.76**	**8.54**	**6.94**	**7.22**	**7.6**	**7.94**	**6.26**	**6.78**	**6.59**	**6.54**	**6.57**
Phosphate (mg/L)	NLE	NLE	ND	ND	ND	NA	**0.09**	ND	ND	ND	**0.02**	ND	NA	NA	NA	NA	NA
Sulfate (mg/L)	NLE	250	**26.6**	**19**	**226**	NA	**22.9**	**64.4**	**43**	**29.4**	**93.2**	**23.7**	NA	NA	NA	NA	NA
Temperature (°C)	NLE	NLE	**11.56**	**27.3**	**20.9**	**5.89**	**10**	**23.25**	**19.22**	**7.78**	**8.46**	**23.16**	**20.32**	**4.26**	**6.85**	**23.79**	**21.62**
Total Coliform (cfu/100ml)	NLE	NLE	**500**	**37500**	**12400**	**700**	**100**	**5760**	**1450**	**500**	**160**	NA	NA	NA	NA	NA	NA

Notes:
(1) The USEPA National Recommended Water Quality Criteria (NR'
(2) The NJ Surface Water Quality Standards (SWQS) Fresh Water (
a - Tapwater RSL was used in place of NRWQC, available at: https:
mg/L = milligrams/liter µg/L = micrograms/liter
cfu/100 mL = colony-forming units/100 milliliters
J = Estimated concentration exceeds the method detection limit (ME
NA = Not analyzed ND = Not detected NLE = No limit establish
Detections are Bolded.
Shaded cells = concentration exceeds NJDEP SWQC Human Health (Fresh Water) Criteria
NRWQC
Shaded cells = concentration exceeds NJDEP and USEPA criteria.
RSL values were current at the time that the screening was conduct

TABLE 4.7
SEDIMENT SAMPLING SUMMARY RESULTS - COMPARISON TO NJDEP STANDARDS
SITE FTMM-59
FORT MONMOUTH, NEW JERSEY

Location	**NJDEP RDCSRS (1)**	**NJDEP NRDCSRS (1)**	SD1		SD1D		SD2		SD2D		SD3		SD3D	
Depth (ft)			0-0.5		1-1.5		0-0.5		1-1.5		0-0.5		1-1.5	
Sample Date			12/19/2007		12/19/2007		12/19/2007		12/19/2007		12/19/2007		12/19/2007	
Volatile Organic Compounds (VOCs) (mg/kg)														
Acetone	*70,000*	*NLE*	**0.33**	**J**	**0.29**	**J**	**0.22**	**J**	**0.38**	**J**	**0.33**	**J**	**0.21**	**J**
Methylene Chloride	*34*	*97*	0.086	JB	0.073	JB	0.072	JB	0.45	U	0.52	U	0.36	U
Semi-Volatile Organic Compounds (SVOCs)(mg/kg)														
Anthracene	*17,000*	*30,000*	**0.15**	**J**	1.5	U	1.4	U	1.8	U	2.1	U	1.4	U
Benzo[a]anthracene	*5.0*	*17*	**0.61**	**J**	**0.25**	**J**	**0.2**	**J**	**0.19**	**J**	**0.51**	**J**	1.4	U
Benzo[a]pyrene	*0.5*	*2*	**0.61**	**J**	**0.25**	**J**	**0.19**	**J**	**0.19**	**J**	**0.51**	**J**	**0.31**	**J**
Benzo[b]fluoranthene	*5.0*	*17*	**1.1**	**J**	**0.37**	**J**	**0.21**	**J**	**0.3**	**J**	**1**	**J**	1.4	U
Benzo[k]fluoranthene	*45*	*170*	**0.34**	**J**	**0.17**	**J**	**0.16**	**J**	**0.095**	**J**	**0.39**	**J**	1.4	U
Bis(2-ethylhexyl) phthalate	*35*	*140*	0.78	JB	0.56	JB	0.44	JB	0.72	JB	1.4	JB	0.35	JB
Chrysene	*450*	*1,700*	**0.86**	**J**	**0.32**	**J**	**0.25**	**J**	**0.28**	**J**	**0.88**	**J**	1.4	U
Dibenz(a,h)anthracene	*0.5*	*2*	1.8	U	1.5	U	1.4	U	1.8	U	2.1	U	1.4	U
Di-n-butyl phthalate	*6,100*	*68,000*	1.8	U	1.5	U	0.44	JB	1.8	U	2.1	U	1.4	U
Fluoranthene	*2,300*	*24,000*	**1.4**	**J**	**0.52**	**J**	**0.38**	**J**	**0.49**	**J**	**1.3**	**J**	**0.12**	**J**
Indeno(1,2,3-cd)pyrene	*5*	*17*	1.8	U	1.5	U	1.4	U	1.8	U	2.1	U	1.4	U
Phenanthrene	*NLE*	*300,000*	**0.7**	**J**	**0.28**	**J**	**0.21**	**J**	**0.2**	**J**	**0.52**	**J**	1.4	U
Pyrene	*1,700*	*18,000*	**1.6**	**J**	**0.6**	**J**	**0.45**	**J**	**0.48**	**J**	**1.4**	**J**	**0.14**	**J**
Tentativly Identified Compounds (TICs)	*NLE*	*NLE*	**100**	**J**	**83.71**	**J**	**54.1**	**J**	**224.8**	**J**	**1,331.50**	**J**	**42.22**	**J**
Metals(mg/kg)														
Aluminum	78,000	NLE	13700	B	11000	B	14500	B	8380	B	16400	B	28100	B
Arsenic	19	19	**7.48**		**6.58**		**10.2**		**5.99**		**7.99**		**7.87**	
Barium	16,000	59,000	83.5	B	69.5	B	52.4	B	69.4	B	67	B	168	B
Beryllium	16	140	**3.22**		**2.5**		**2.01**		**1.62**		**2.97**		**3.21**	
Cadmium	78	78	**1.86**		**1.34**		**0.358**		**1.67**		**1.67**		**0.854**	
Calcium	NLE	NLE	2320	B	1500	B	1490	B	1410	B	1300	B	2130	B
Chromium (Total)	NLE	NLE	155	B	125	B	161	B	71.9	B	155	B	473	B
Cobalt	1,600	590	**20.1**		**20.1**		**15.7**		**11.9**		**6.01**		**0.94**	
Copper	3,100	45,000	39.4	B	**32.5**		53.6	B	20.7	B	29.1	B	12	B
Iron	NLE	NLE	66800	B	45200	B	47800	B	21300	B	39600	B	97400	B
Lead	400	800	**74.6**		**58.8**		**116**		**29.5**		**45**		**13.6**	
Magnesium	NLE	NLE	**5490**		**4720**		**5170**		**2240**		**5190**		**15500**	
Manganese	11,000	5,900	152	B	45.8	B	140	B	38	B	31.6	B	29.3	B
Mercury	23	65	**0.47**		**0.31**		**0.25**		**0.26**		**0.28**		0.13	U
Nickel	1,600	23,000	**36.4**		**36**		**28.3**		**24.6**		**23.7**		**9.11**	
Potassium	NLE	NLE	10700	B	9620	B	9580	B	3790	B	10200	B	30100	B
Vanadium	78	1,100	**79.1**		**60.9**		**81.1**		**43.2**		**75.4**		**161**	
Zinc	23,000	110,000	286	B	237	B	108	B	157	B	252	B	84	B

Footnotes:
All historical data collected prior to 2015 are reported as provided by others.
(1) The NJ Residential (RDCSRS) and Non-Residential (NRDCSRS) Direct Contact Soil Remediation Standards refers to the NJDEP's September 18, 2017 Remediation Standards (http://www.nj.gov/dep/rules/rules/njac7_26d.pdf)
mg/kg = milligram per kilogram
NLE = No limit established
NJDEP = New Jersey Department of Environmental Protection
Chemical result qualifiers are assigned by the laboratory and are evaluated and modified (if necessary) during the data validation.
U = non-detect, i.e. not detected at or above this value
J = Analyte detected between method detection limit (MDL) and practical quantitation limit (PQL)
B = Analyte detected in both sample and associated laboratory blank.
TIC = tentatively identified compounds
Detections are bolded
Shaded cells = concentration exceeds the NJ Residential Direct Contact Soil Remediation Standard.
Shaded cells = concentration exceeds NJ Residential and Non Residential Direct Contact Soil Remediation Standard

FIGURES

Figure 1.1 Fort Monmouth Location
Figure 1.2 Main Post Layout
Figure 1.3 FTMM-59 Site Layout
Figure 2.1 Soil Sampling Locations at FTMM-59
Figure 2.2 Monitoring Well Locations at FTMM-59
Figure 2.3 Historical Surface Water and Sediment Sampling Locations at FTMM-59
Figure 3.1 FTMM-59 Shallow Groundwater Elevation Contours - September 29, 2014
Figure 3.2 FTMM-59 Shallow Groundwater Elevation Contours - December 16, 2015
Figure 4.1 Naphthalene Concentrations in Soil at FTMM-59
Figure 4.2 Benzo(a)pyrene Concentrations in Soil at FTMM-59
Figure 4.3 Lead Concentrations in Soil at FTMM-59
Figure 4.4 Cadmium Concentrations in Groundwater at FTMM-59
Figure 4.5 Manganese Concentrations in Groundwater at FTMM-59



P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMMICAD Files\GIS\2020 Reports\FTMM-59\FIGURE 1-1.mxd

LEGEND:

Installation Boundary

Site Description:
Fort Monmouth
Main Post & Charles Wood Area
Monmouth County, NJ
Longitude: 74˚ 2' 33.39" W
Latitude: 40˚ 18' 49.33" N
Longitude and Latitude represent the center point of Main Post.

N

1 inch = 2,500 feet

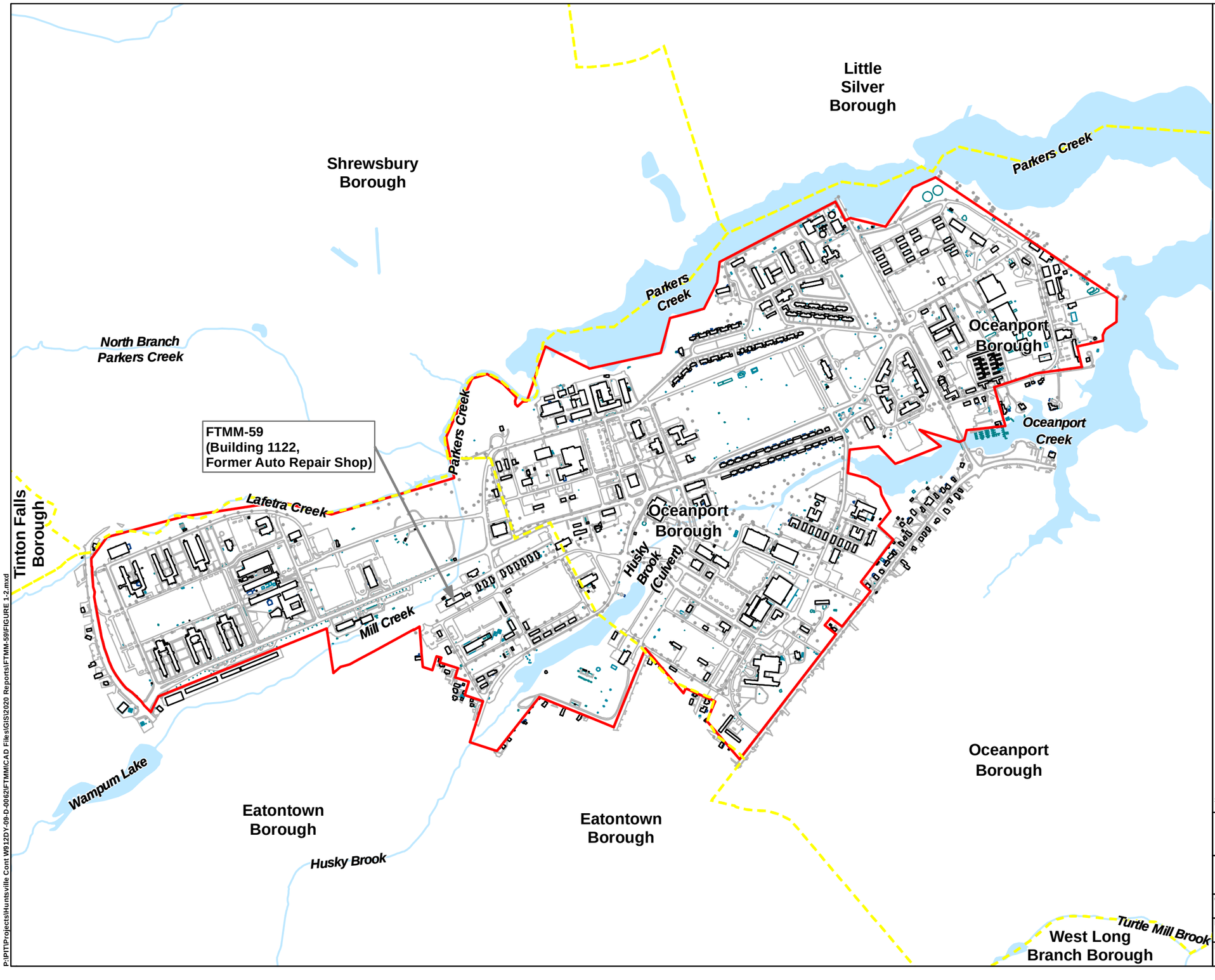
0 0.5 1 Miles

Source: Bing Maps online imagery; ESRI Data and Maps 2011.

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

FORT MONMOUTH LOCATION

CREATED BY: RR	REVIEWED BY: JH
DATE: MAR. 2020	FIGURE NUMBER: FIGURE 1.1
PROJECT NUMBER: 748810.02150	FILE: FIGURE 1-1.mxd



LEGEND:

- Surface Water Feature
- Municipal Boundary
- Installation Boundary

N

1 inch = 1,000 feet

0 500 1,000 2,000 Feet

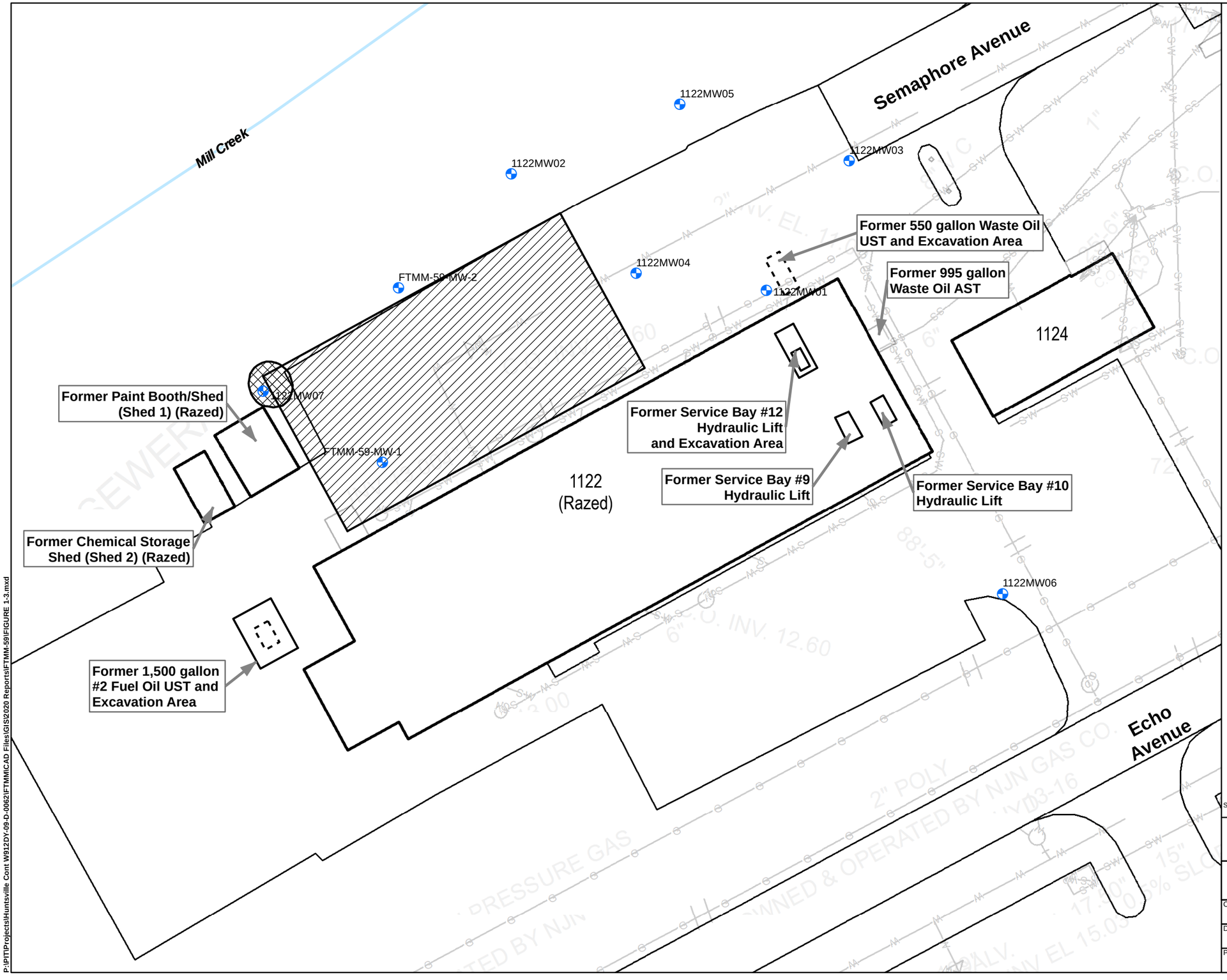
Source: Bing Maps online imagery; ESRI Data and Maps 2011; USGS NHD.

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

MAIN POST LAYOUT

CREATED BY: RR	REVIEWED BY: JH
DATE: MAR. 2020	FIGURE NUMBER: FIGURE 1.2
PROJECT NUMBER: 748810-01000	FILE: FIGURE 1-2.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\2020 Reports\FTMM-59\FIGURE 1-2.mxd



LEGEND:

- Monitoring Well
- January 2005 Excavation
- April-May 1995 Excavation
- Underground Storage Tank
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Surface Water Feature

N

1 inch = 30 feet

0 15 30 60 Feet

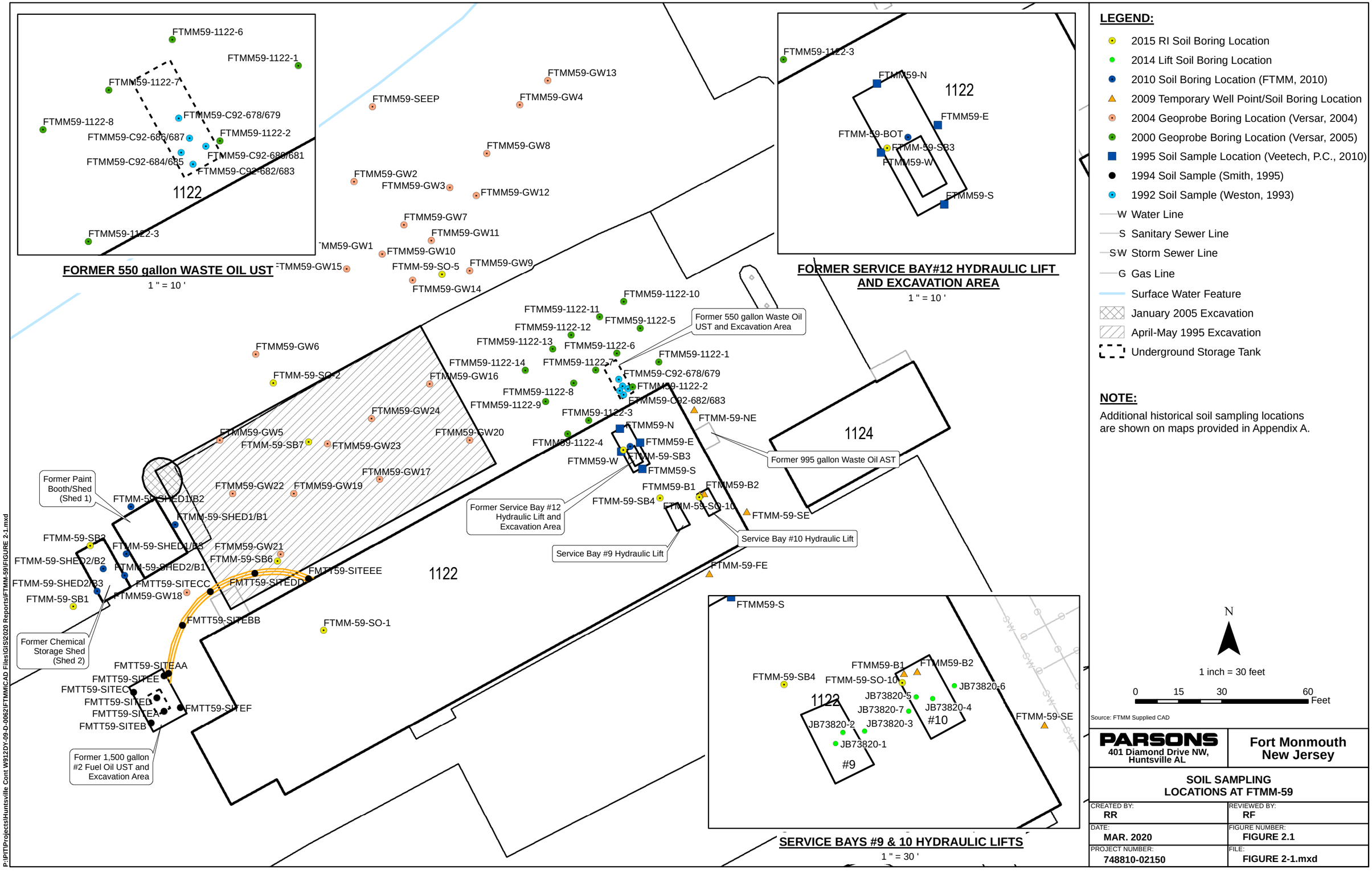
Source: FTMM Supplied CAD

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

FTMM-59 SITE LAYOUT

CREATED BY: RR	REVIEWED BY: RF
DATE: MAR. 2020	FIGURE NUMBER: FIGURE 1.3
PROJECT NUMBER: 748810-02150	FILE: FIGURE 1-3.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\2020 Reports\FTMM-59\FIGURE 1-3.mxd



FORMER 550 gallon WASTE OIL UST

1 " = 10 '

FORMER SERVICE BAY#12 HYDRAULIC LIFT AND EXCAVATION AREA

1 " = 10 '

SERVICE BAYS #9 & 10 HYDRAULIC LIFTS

1 " = 30 '

LEGEND:

- 2015 RI Soil Boring Location
- 2014 Lift Soil Boring Location
- 2010 Soil Boring Location (FTMM, 2010)
- 2009 Temporary Well Point/Soil Boring Location
- 2004 Geoprobe Boring Location (Versar, 2004)
- 2000 Geoprobe Boring Location (Versar, 2005)
- 1995 Soil Sample Location (Veetech, P.C., 2010)
- 1994 Soil Sample (Smith, 1995)
- 1992 Soil Sample (Weston, 1993)
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Surface Water Feature
- January 2005 Excavation
- April-May 1995 Excavation
- Underground Storage Tank

NOTE:

Additional historical soil sampling locations are shown on maps provided in Appendix A.

N

1 inch = 30 feet

0 15 30 60 Feet

Source: FTMM Supplied CAD

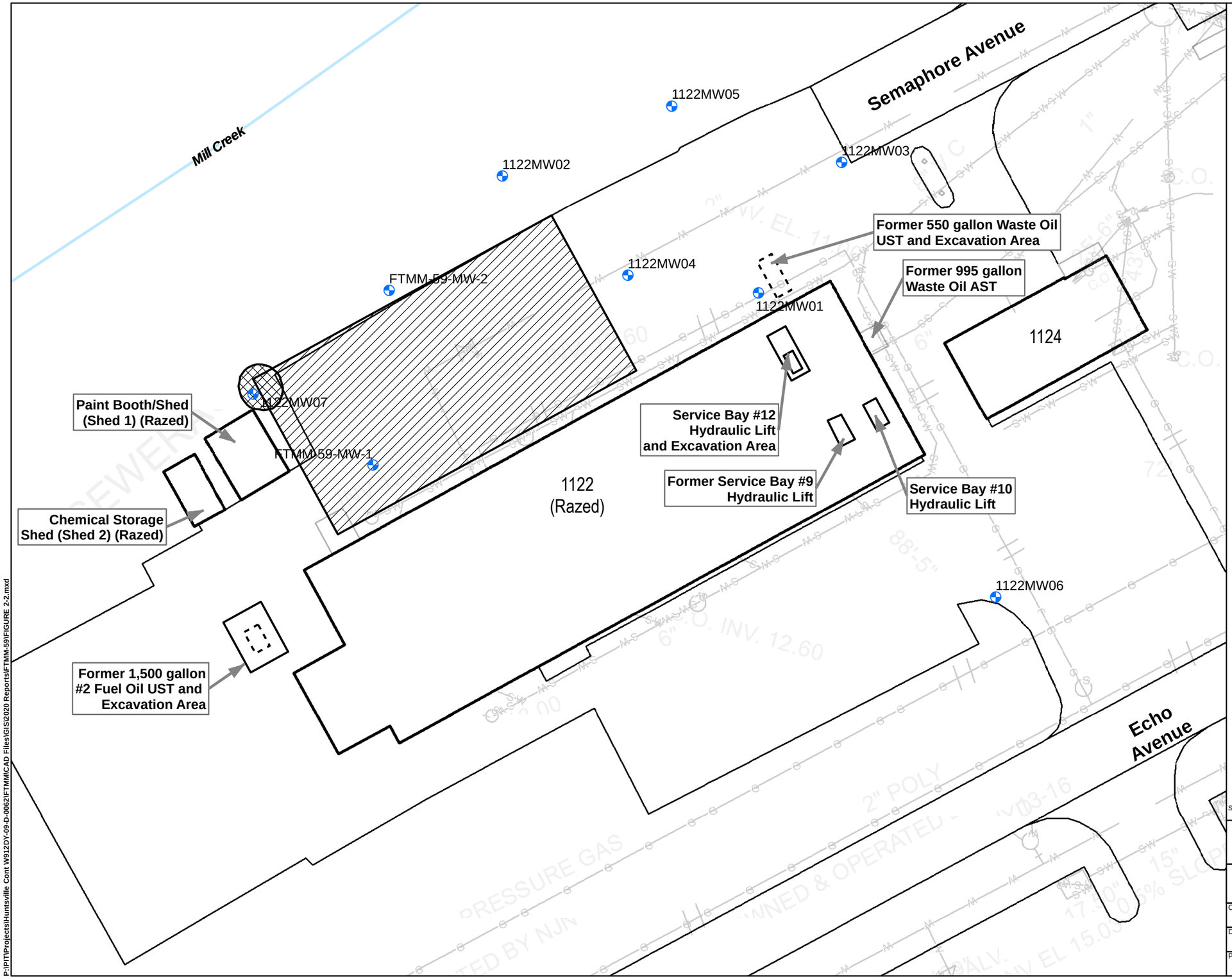
PARSONS
401 Diamond Drive NW,
Huntsville AL

Fort Monmouth
New Jersey

SOIL SAMPLING LOCATIONS AT FTMM-59

CREATED BY:	REVIEWED BY:
RR	RF
DATE:	FIGURE NUMBER:
MAR. 2020	FIGURE 2.1
PROJECT NUMBER:	FILE:
748810-02150	FIGURE 2-1.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\2020 Reports\FTMM-59\FIGURE 2-1.mxd



LEGEND:

- Monitoring Well
- January 2005 Excavation
- April-May 1995 Excavation
- Underground Storage Tank
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Surface Water Feature

N

1 inch = 30 feet

0 15 30 60 Feet

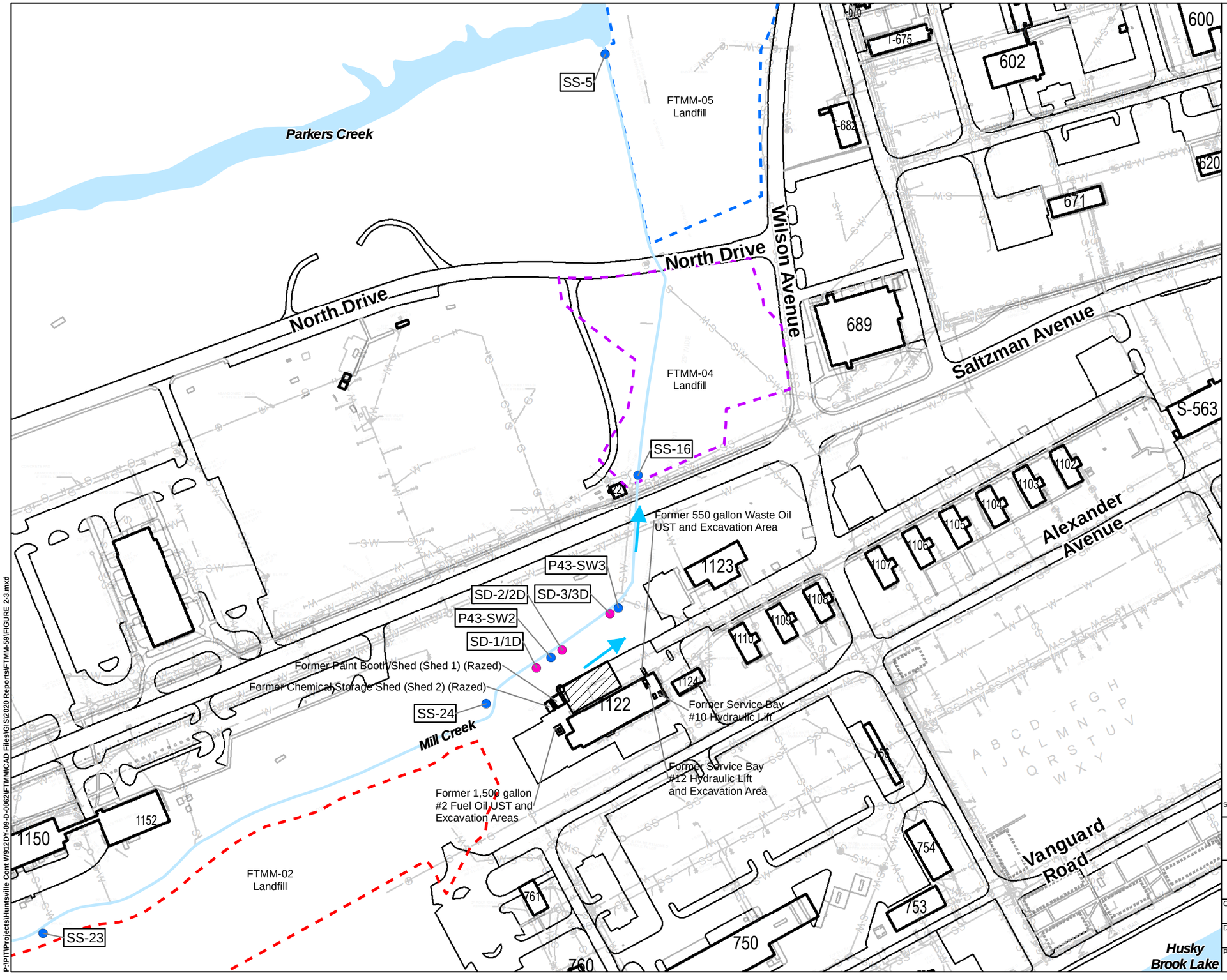
Source: FTMM Supplied CAD

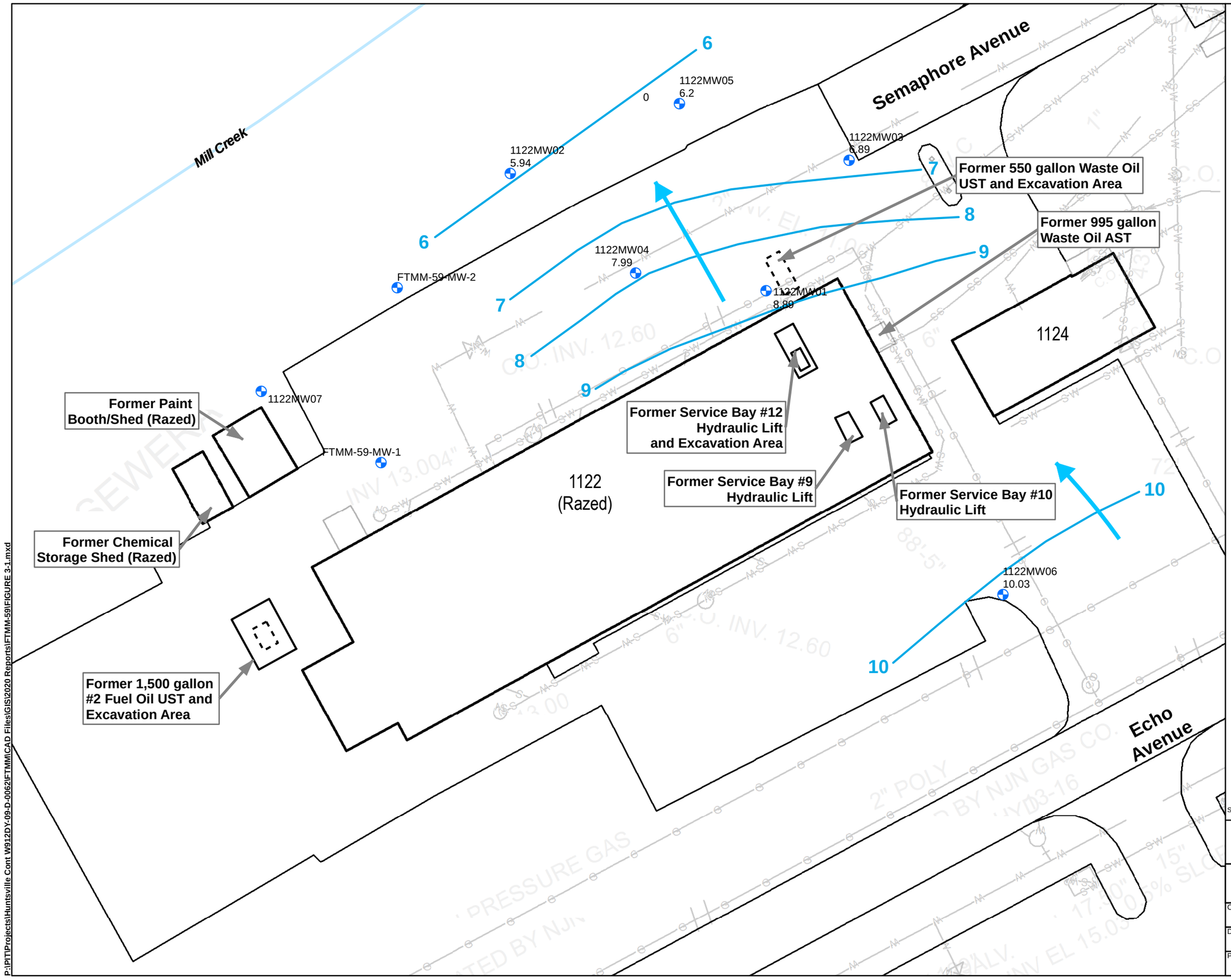
PARSONS 401 Diamond Drive NW, Huntsville AL	**Fort Monmouth New Jersey**

MONITORING WELL LOCATIONS AT FTMM-59

CREATED BY: RR	REVIEWED BY: RF
DATE: MAR. 2020	FIGURE NUMBER: FIGURE 2.2
PROJECT NUMBER: 748810-02150	FILE: FIGURE 2-2.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\2020 Reports\FTMM-59\FIGURE 2-2.mxd


SS-5
FTMM-05
Landfill
Parkers Creek
North Drive
North Drive
Wilson Avenue
FTMM-04
Landfill
SS-16
Former 550 gallon Waste Oil
UST and Excavation Area
P43-SW3
SD-2/2D
SD-3/3D
P43-SW2
SD-1/1D
Former Paint Booth/Shed (Shed 1) (Razed)
Former Chemical Storage Shed (Shed 2) (Razed)
SS-24
Mill Creek
Former Service Bay
#10 Hydraulic Lift
Former Service Bay
#12 Hydraulic Lift
and Excavation Area
Former 1,500 gallon
#2 Fuel Oil UST and
Excavation Areas
FTMM-02
Landfill
SS-23
Saltzman Avenue
Alexander
Avenue
Vanguard
Road
Husky
Brook Lake
600
602
671
689
620
1123
1122
1124
1150
1152
750
754
753
760
761
766
S-563
1102
1103
1104
1105
1106
1107
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1111
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1192



LEGEND:

- Monitoring Well
- Underground Storage Tank
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Surface Water Feature
- Groundwater Elevation Contour
- Inferred Groundwater Flow Direction
- 6.2 Groundwater Elevation

N

1 inch = 30 feet

0 15 30 60 Feet

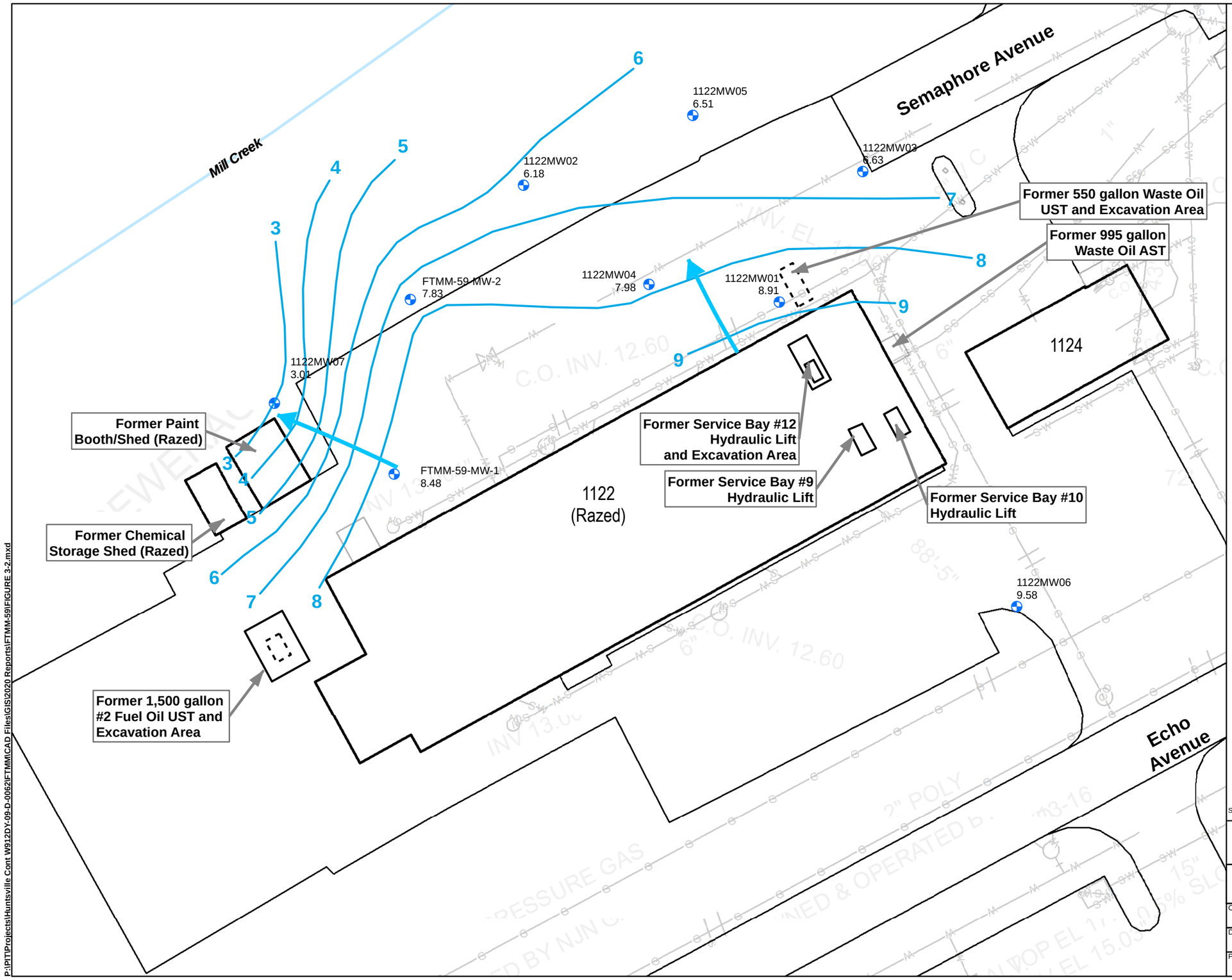
Source: FTMM Supplied CAD

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

FTMM-59 SHALLOW GROUNDWATER ELEVATION CONTOURS - SEPTEMBER 29, 2014

CREATED BY: RR	REVIEWED BY: ME
DATE: MAR. 2020	FIGURE NUMBER: FIGURE 3.1
PROJECT NUMBER: 748810-01000	FILE: FIGURE 3-1.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\2020 Reports\FTMM-59\FIGURE 3-1.mxd



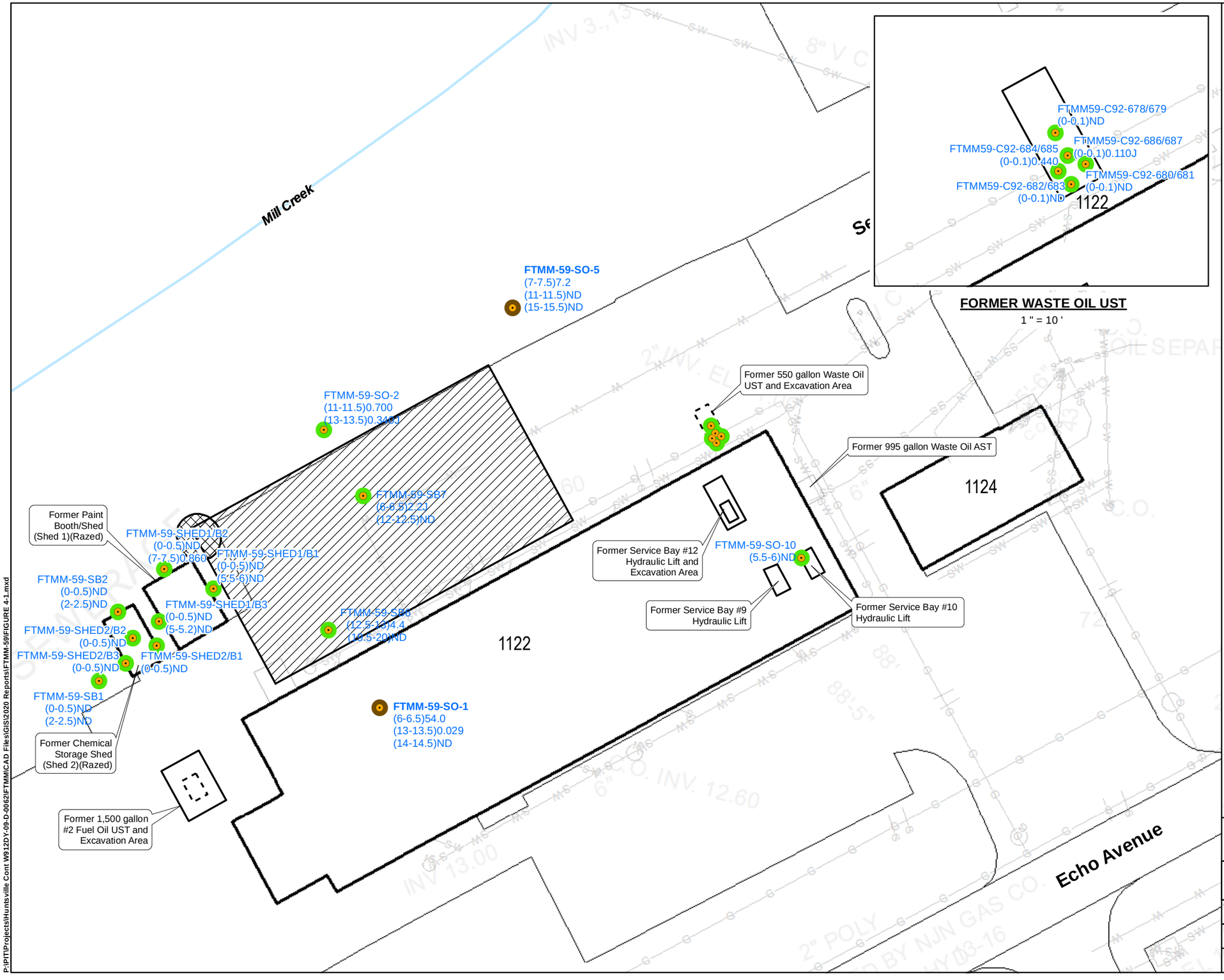
Source: FTMM Supplied CAD

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

FTMM-59 SHALLOW GROUNDWATER ELEVATION CONTOURS - DECEMBER 16, 2015

CREATED BY: RR	REVIEWED BY: ME
DATE: MAR. 2020	FIGURE NUMBER: FIGURE 3.2
PROJECT NUMBER: 748810-01000	FILE: FIGURE 3-2.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\2020 Reports\FTMM-59\FIGURE 3-2.mxd



LEGEND:

- Historic Sample Location
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Surface Water Feature
- January 2005 Excavation
- April-May 1995 Excavation
- Underground Storage Tank
- Naphthalene Concentration is Less Than NJ RDCSRS (6 mg/kg)
- Naphthalene Concentration Exceeds NJ RDCSRS (6 mg/kg)

FTMM-59-SO-1 — Boring ID
(6.5-6.5)6.7
- Concentration (mg/Kg)
- Depth

ND = Non Detect
J = Estimated Concentration

NOTE:

Concentrations were compared to NJDEP 2017 Residential Direct Contact Soil Remediation Standards (RDCSRS) for delineation.

N

1 inch = 30 feet

0 15 30 60 Feet

Source: FTMM Supplied CAD

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\2020 Reports\FTMM-59\FIGURE 4-1.mxd

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

NAPHTHALENE CONCENTRATIONS IN SOIL AT FTMM-59

CREATED BY: RR	REVIEWED BY: RF
DATE: MAR. 2020	FIGURE NUMBER: FIGURE 4.1
PROJECT NUMBER: 748810-02150	FILE: FIGURE 4-1.mxd

FORMER PAINT AND CHEMICAL STORAGE SHEDS

1 " = 20 '

Mill Creek

FTMM-59-SO-5
(7-7.5)ND

FTMM-59-SHED1/B2
(0-0.5)ND
(7-7.5)ND

FTMM-59-SHED1/B1
(0-0.5)ND
(5.5-6)ND

FTMM-59-SB2
(0-0.5)0.018
(2-2.5)ND

FTMM-59-SHED1/B3
(0-0.5)2.040
(5-5.2)ND

FTMM-59-SHED2/B2
(0-0.5)ND

FTMM-59-SHED2/B1
(0-0.5)0.110J

FTMM-59-SB1
(0-0.5)0.021
(2-2.5)ND

FTMM-59-SHED2/B3
(0-0.5)1.030JD

1122

Former 550 gallon Waste Oil UST and Excavation Area

Former 995 gallon Waste Oil AST

1124

Former Paint Booth/Shed (Shed 1) (Razed)

Former Service Bay #12 Hydraulic Lift and Excavation Area

FTMM-59-SO-10
(5.5-6)ND

Former Service Bay #9 Hydraulic Lift

Former Service Bay #10 Hydraulic Lift

1122
(Razed)

FTMM-59-SO-1
(6-6.5)ND

Former Chemical Storage Shed (Shed 2) (Razed)

Former 1,500 gallon #2 Fuel Oil UST and Excavation Area

Echo Avenue

LEGEND:

- Historic Sample Location
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Surface Water Feature
- January 2005 Excavation
- April-May 1995 Excavation
- Underground Storage Tank
- Benzo(a)pyrene Concentration is Less Than NJ RDCSRS (0.5 mg/kg)
- Benzo(a)pyrene Concentration Exceeds NJ RDCSRS (0.5 mg/kg)

FTMM-59-SO-1 — Boring ID
(6.5-6.5)6.7
- Concentration (mg/Kg)
- Depth

ND = Non Detect
J = Estimated Concentration

NOTE:

Concentrations were compared to NJDEP 2017 Residential Direct Contact Soil Remediation Standards (RDCSRS) for delineation.

N

1 inch = 30 feet

0 15 30 60 Feet

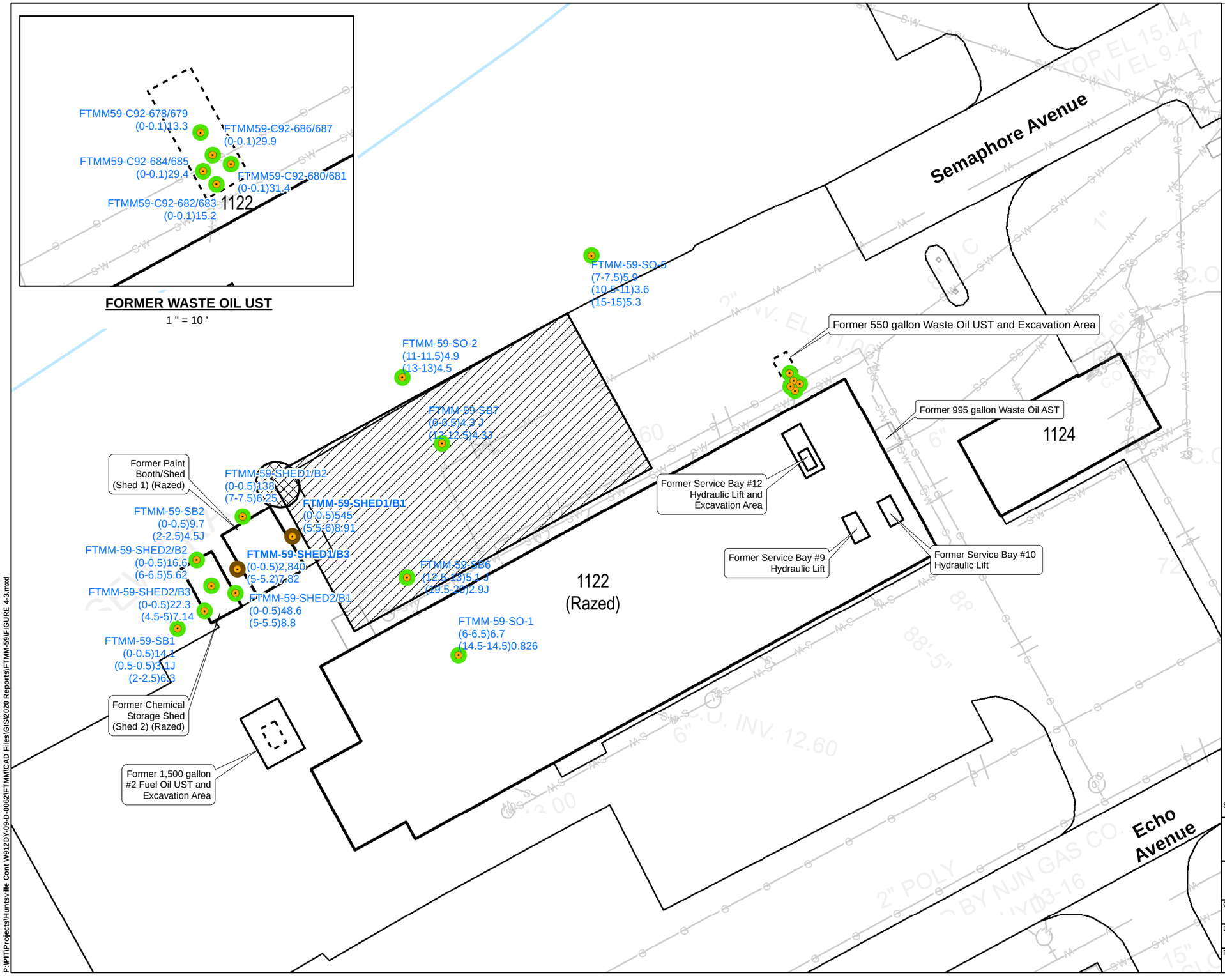
Source: FTMM Supplied CAD

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

BENZO(A)PYRENE CONCENTRATIONS IN SOIL AT FTMM-59

CREATED BY: RR	REVIEWED BY: RF
DATE: MAR. 2020	FIGURE NUMBER: FIGURE 4.2
PROJECT NUMBER: 748810-02150	FILE: FIGURE 4-2.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\2020 Reports\FTMM-59\FIGURE 4-2.mxd



LEGEND:

- Historic Sample Location
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Surface Water Feature
- January 2005 Excavation
- April-May 1995 Excavation
- Underground Storage Tank
- Lead Concentration is Less Than NJ RDCSRS (400 mg/kg)
- Lead Concentration Exceeds NJ RDCSRS (400 mg/kg)

FTMM-59-SO-1 — Boring ID
(6.5-6.5)6.7 — Concentration (mg/Kg) / Depth

ND = Non Detect
J = Estimated Concentration

NOTE:

Concentrations were compared to NJDEP 2017 Residential Direct Contact Soil Remediation Standards (RDCSRS) for delineation.

N

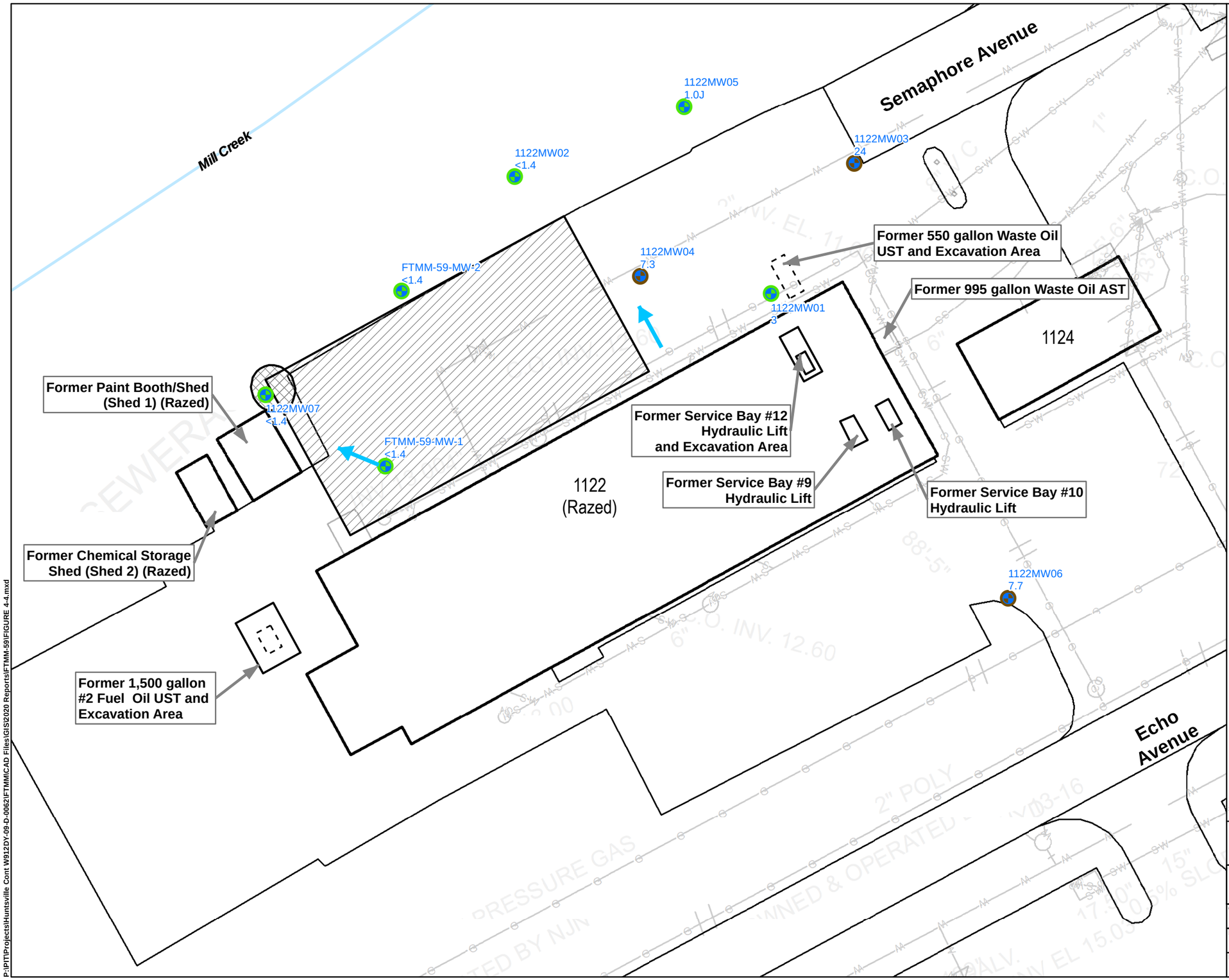
1 inch = 30 feet

0 15 30 60 Feet

Source: FTMM Supplied CAD

PARSONS 401 Diamond Drive NW, Huntsville AL	**Fort Monmouth New Jersey**
LEAD CONCENTRATIONS IN SOIL AT FTMM-59	
CREATED BY: RR	REVIEWED BY: RF
DATE: MAR. 2020	FIGURE NUMBER: FIGURE 4.3
PROJECT NUMBER: 748810-02150	FILE: FIGURE 4-3.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMMICAD Files\GIS\2020 Reports\FTMM-59\FIGURE 4-3.mxd



LEGEND:

- Monitoring Well
- January 2005 Excavation
- April-May 1995 Excavation
- Underground Storage Tank
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Surface Water Feature
- Inferred Groundwater Flow Direction
- Cadmium Concentration is Less Than NJ GWQS (4 µg/L)
- Cadmium Concentration Exceeds NJ GWQS (4 µg/L)

FTMM-59-MW-1 — Well ID
4.5J — Concentration (µg/L)

< = Less Than Concentration Shown
J = Estimated Concentration

NOTE:

1. Groundwater sampling data is from August 6, 2018.
2. Concentrations were compared to NJDEP Groundwater Quality Standards (GWQS).

N

1 inch = 30 feet

0 15 30 60 Feet

Source: FTMM Supplied CAD

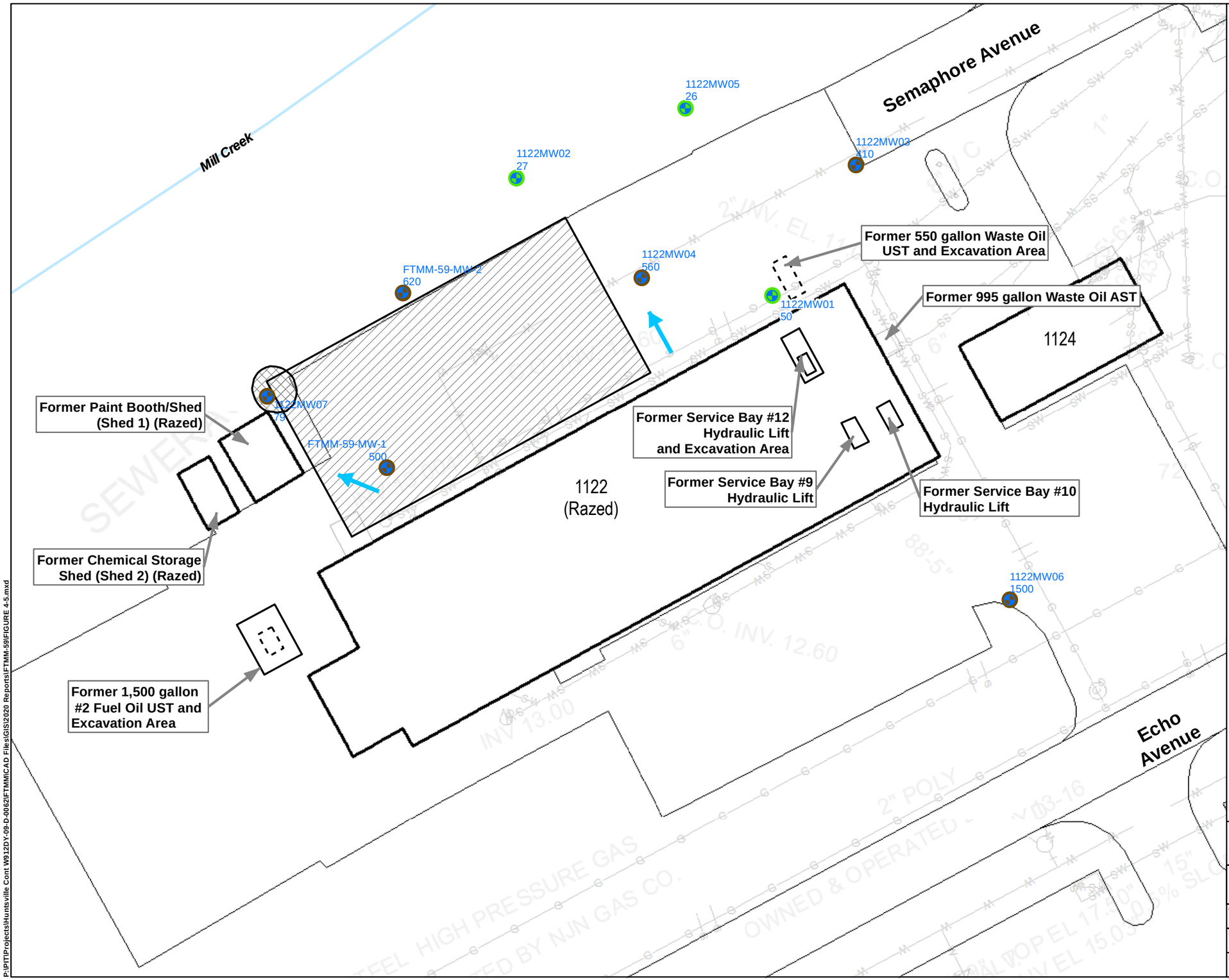
P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\2020 Reports\FTMM-59\FIGURE 4-4.mxd

PARSONS
401 Diamond Drive NW, Huntsville AL

Fort Monmouth
New Jersey

CADMIUM CONCENTRATIONS IN GROUNDWATER AT FTMM-59

CREATED BY:	REVIEWED BY:
RR	RF
DATE:	FIGURE NUMBER:
MAR. 2020	FIGURE 4.4
PROJECT NUMBER:	FILE:
748810-02150	FIGURE 4-4.mxd



LEGEND:

- Monitoring Well
- January 2005 Excavation
- April-May 1995 Excavation
- Underground Storage Tank
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Surface Water Feature
- Inferred Groundwater Flow Direction
- Manganese Concentration is Less Than NJ GWQS (50 µg/L)
- Manganese Concentration Exceeds NJ GWQS (50 µg/L)

FTMM-59-MW-1 — Well ID
4.5J — Concentration (µg/L)

ND = Non Detect
J = Estimated Concentration

NOTE:

1. Groundwater sampling data is from August 6, 2018.
2. Concentrations were compared to NJDEP Groundwater Quality Standards (GWQS).

N

1 inch = 30 feet

0 15 30 60 Feet

Source: FTMM Supplied CAD

PARSONS
401 Diamond Drive NW, Huntsville AL

Fort Monmouth New Jersey

MANGANESE CONCENTRATIONS IN GROUNDWATER AT FTMM-59

CREATED BY:	REVIEWED BY:
RR	RF
DATE:	FIGURE NUMBER:
MAR. 2020	FIGURE 4.5
PROJECT NUMBER:	FILE:
748810-02150	FIGURE 4-5.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\2020 Reports\FTMM-59\FIGURE 4-5.mxd

APPENDICES

Appendix A Key Historical Reports and Background Information (included electronically on CD)

Appendix B Soil Boring Logs and Well Construction Details

Appendix C Analytical Data (included electronically on CD)

Appendix D FTMM-59 Remedial Action Completion Report

APPENDIX A
KEY HISTORICAL REPORTS AND BACKGROUND INFORMATION

(Appendix A is included separately on the CD of this report)

APPENDIX B
SOIL BORING LOGS AND WELL CONSTRUCTION DETAILS

DWR-138 M
11/94

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER ALLOCATION

MONITORING WELL RECORD

Well Permit No. 29- 33755
Atlas Sheet Coordinates 29 14 444

OWNER IDENTIFICATION - Owner US ARMY - ECOM MONMOUTH
Address BLDG 167 DOH ENVIR
City FT MONMOUTH State NJ Zip Code

WELL LOCATION - If not the same as owner please give address. Owner's Well No. 1122 mw1
County MONMOUTH Municipality OCEANPORT BORO Lot No. N/A Block No. N/A
Address

TYPE OF WELL (as per Well Permit Categories) MONITORING Date well completed 9/12/95
Regulatory Program Requiring Well DEP Case I.D. # ~~BF 1 11 1420 20~~
CONSULTING FIRM/FIELD SUPERVISOR (if applicable) Tele. #

WELL CONSTRUCTION

Total depth drilled 18 ft.
Well finished to 18 ft.
Borehole diameter:
Top 12 in.
Bottom 10 in.
Well was finished: ☐ above grade
☒ flush mounted
If finished above grade, casing height (stick up) above land surface 0 ft.
Was steel protective casing installed? ☐ Yes ☒ No

	Depth to Top (ft.) [From land surface]	Depth to Bottom (ft.)	Diameter (inches)	Type and Material
Inner Casing	0	5	4	PVC
Outer Casing (Not Protective Casing)	—		—	
Screen (Note slot size)	5	18	4	PVC 020
Tail Piece	—	—	—	
Gravel Pack	4	18	12	#2 Sand
Annular Seal/Grout	0	4	12	Bent Slurry
Method of Grouting	Tremie Pipe			

Static water level after drilling 7 ft.
Water level was measured using Tape
Well was developed for .5 hours at 3 gpm
Method of development Mound
Was permanent pumping equipment installed? ☐ Yes ☒ No
Pump capacity NA gpm
Pump type: NA
Drilling Method HSA
Drilling Fluid NA Type of Rig A300
Name of Driller Gary Parent
Health and Safety Plan submitted? ☐ Yes ☒ No
Level of Protection used on site (circle one) None (D) C B A
N.J. License No. 12575
Name of Drilling Company GARY PARENT/SHORE DRILLING INC

GEOLOGIC LOG (Copies of other geologic logs and/or geophysical logs should be attached.)

0-4" asphalt
4"-8' Dk. Tan silt w/sand
8'-12' Medium green/tan silty clay
12'-18' dark green clay with silt

I certify that I have drilled the above-referenced well in accordance with all well permit requirements and all applicable State rules and regulations.

Driller's Signature Date

COPIES: White - DEP Canary - Driller Pink - Owner Goldenrod - Health Dept.

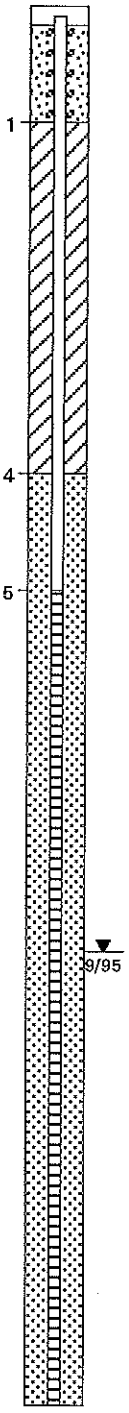
U.S. ARMY
FORT MONMOUTH
SELFM PW EV

LOG OF BORING 1122-mw1

Produced for Charles Appleby

Project Name	: BLDG. 1122	Completion Date	: 9/12/95
NJDEP Case #	: 95-1-11-1429-00	Northing	: N 5386163.782
Logged By	: Shore Drilling	Easting	: E 2171673.606
Start Date	: 9/12/95	Driller	: R. Barnes

29-33755
ELEV: 16.13



Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Samples	Blows/Ft	% Recovery
0	Asphalt and base stone		14			
1	Brown medium fine sand, moist		SW	1	7	83
2				2	6	83
4	Green-gray silty clay, moist		CL			
5				3	10	30
6	Same but mottled 6' to 10'			4	11	100
8			CL	5	9	83
10				6	12	
12						

Well Construction Information

Well Construction

Date Completed	: 9/12/95
Hole Diameter	: 8 in
Drill Method	: HSA
Company Rep	: R. Barnes

Well Casing

Material	: PVC
Diameter	: 4 in
Joints	: Threaded

Well Screen

Material	: PVC
Diameter	: 4 in
Joints	: Threaded
Opening	: 20 Slot
Sand Pack	: # 2 Morie Sand
Annulus Seal	: Bentonite/Portland : Tremmie

Well Screen

Material	: PVC
Diameter	: 4 in
Cap	:

NOTES
Well #1 is 1122 MW1

2-28-1996 C:\1122\GEO\1122 mw.ge3

U.S. ARMY
FORT MONMOUTH
SELFM PW EV

LOG OF BORING 1122-mw1

Produced for Charles Appleby

Project Name	: BLDG. 1122	Completion Date	: 9/12/95
NJDEP Case #	: 95-1-11-1429-00	Northing	: N 5385163.782
Logged By	: Shore Drilling	Easting	: E 2171673.606
Start Date	: 9/12/95	Driller	: R. Barnes

Depth in Feet	29-33755 ELEV: 16.13	DESCRIPTION	GRAPHIC	USCS	Samples	Blows/Ft	% Rec-overy	Well Construction Information
12		Black silty clay; moist		CL				
14								
16								
18	18							
20								
22								
24								

Well Construction

Date Completed	: 9/12/95
Hole Diameter	: 8 in
Drill Method	: HSA
Company Rep	: R. Barnes

Well Casing

Material	: PVC
Diameter	: 4 in
Joints	: Threaded

Well Screen

Material	: PVC
Diameter	: 4 in
Joints	: Threaded
Opening	: 20 Slot
Sand Pack	: # 2 Morie Sand
Annulus Seal	: Bentonite/Portland : Tremmie

Well Screen

Material	: PVC
Diameter	: 4 in
Cap	:

NOTES

Well #1 is 1122 MW1

2-28-1996 C:\1122\GEO\1122 mw.ge3

Groundwater & Environmental Services, Inc.

Project: Fort Monmouth Owner: DPW
Location: Bldg 1122 Permit No: 2933755
Well number: 1122 MW1 Total Depth: 18 Diameter: 4"
Casing Elevation: _____ Water Level: Init: 9-10' Static: _____
Screen Dia.: 4" Length: 13' Slot Size: 20
Casing Dia.: 4" Length: 5' Type: PVC
Drilling Method: H.S.A. Sample Method: SPLIT-SPOON
Completion Details: Flush-Mount
Driller: SHORE Log By: R. BARNES Date: 9-12-95

Boring Log Sketch Map

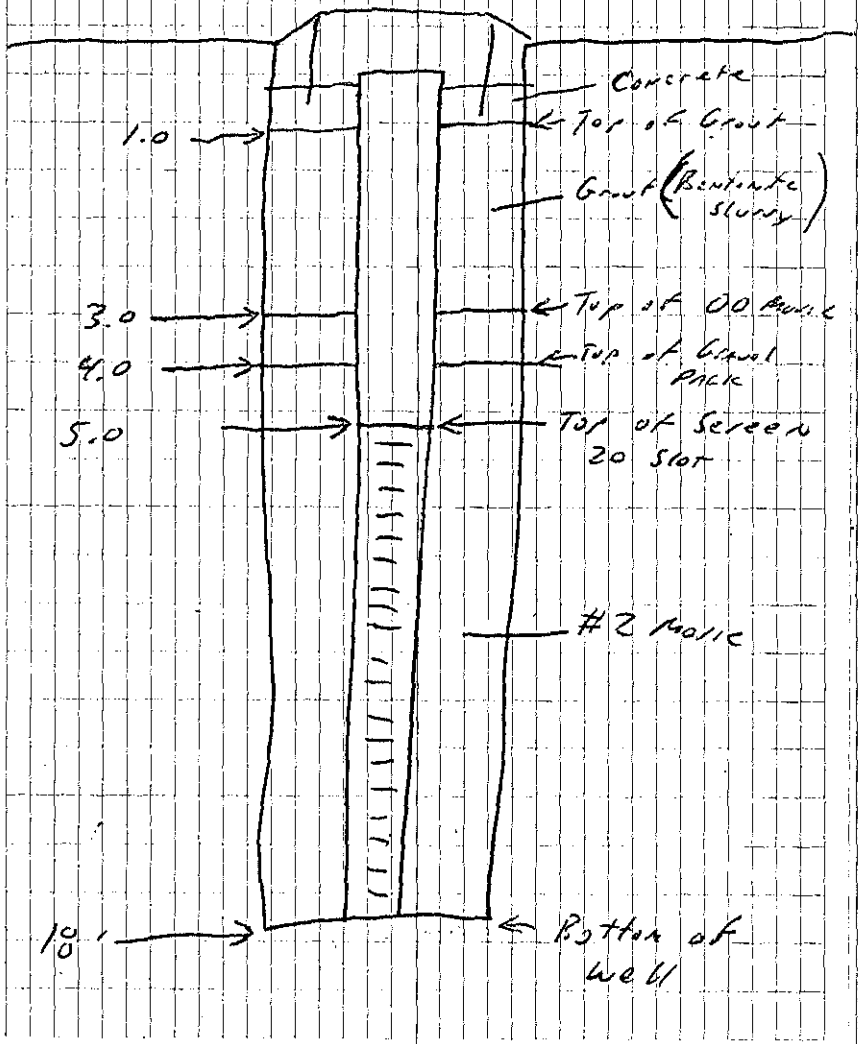
Blows Per Ft	Depth (feet)	Sample No.	Well Const.	PID (ppm)	Blow Count	Rec. (Ft)	Lithology	Unified Symbol
7	1			0	5,4	1.0	Asphalt & Base Stone to ± 1'	
	2				3,4		Br M-F S, tr f; Moist	SM
6	3			0	4,3	1.0		
	4				3,3		Green-Gray Silty CLAY, tr F S; Moist	
10	5			0	3,5	0.4		
	6				5,5			
11	7			0	4,5	1.2	Mottled at 6-10 Ft	
	8				6,6			CL-ML
9	9			0	5,3	1.5		
	10				6,6			
12	11			0	4,6	1.0		
	12				6,7			
	13						Blk Silty CLAY; Moist	
	14							
	15							
	16							
	17							
	18						E.O.B. at 18 Ft	
	19							
	20							
	21							
	22							
	23							
	24							
	25							
	26							
	27							
	28							
	29							

Fort Monmouth Tues 9-12-95

55

Bldg 1122
Well 1122 MW1

Flushmount



DWR-138 M
11/94

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER ALLOCATION

MONITORING WELL RECORD

Well Permit No. 29 - 33754
Atlas Sheet Coordinates 29 14 444

OWNER IDENTIFICATION - Owner US ARMY - FORT MONMOUTH
Address BLDG 167 DEH ENVIR
City FT MONMOUTH State NJ Zip Code

WELL LOCATION - If not the same as owner please give address. Owner's Well No. 1122 mw 2
County MONMOUTH Municipality OCEANPORT BORO Lot No. N/A Block No. N/A
Address

TYPE OF WELL (as per Well Permit Categories) MONITORING
Regulatory Program Requiring Well DEP Case I.D. # ~~95-1-11-1420-10~~
CONSULTING FIRM/FIELD SUPERVISOR (if applicable) Tele. #
Date well completed 9/12/95

WELL CONSTRUCTION

Total depth drilled 15 ft.
Well finished to 15 ft.
Borehole diameter:
Top 12 in.
Bottom 12 in.
Well was finished: [X] above grade [ ] flush mounted
If finished above grade, casing height (stick up) above land surface 3 ft.
Was steel protective casing installed? [X] Yes [ ] No

	Depth to Top (ft.) [From land surface]	Depth to Bottom (ft.)	Diameter (inches)	Type and Material
Inner Casing	+3	3	4	PVC
Outer Casing (Not Protective Casing)	—	—	—	
Screen (Note slot size)	3	15	4	PVC 020
Tail Piece	—	[illegible]	—	
Gravel Pack	2	15	12	#2 Sand
Annular Seal/Grout	0	2	12	Bent Slurry
Method of Grouting	Tremie Pipe			

Static water level after drilling 6 ft.
Water level was measured using A Tape
Well was developed for 1.5 hours at 3 gpm
Method of development Mayno
Was permanent pumping equipment installed? [ ] Yes [X] No
Pump capacity NA gpm
Pump type: NA
Drilling Method HSA
Drilling Fluid NA Type of Rig A300
Name of Driller Gary Parent
Health and Safety Plan submitted? [ ] Yes [X] No
Level of Protection used on site (circle one) None (D) C B A
N.J. License No. 12115
Name of Drilling Company GARY PARENT/SHORE DRI[illegible] INC

GEOLOGIC LOG (Copies of other geologic logs and/or geophysical logs should be attached.)

0 - 6' Dark Tan silt w/ sand
6' - 10' Medium grained Tan silty clay
10' - 15' dark green clay with silt

I certify that I have drilled the above-referenced well in accordance with all well permit requirements and all applicable State rules and regulations.

Driller's Signature Date

COPIES: White - DEP Canary - Driller Pink - Owner Goldenrod - Health Dept.

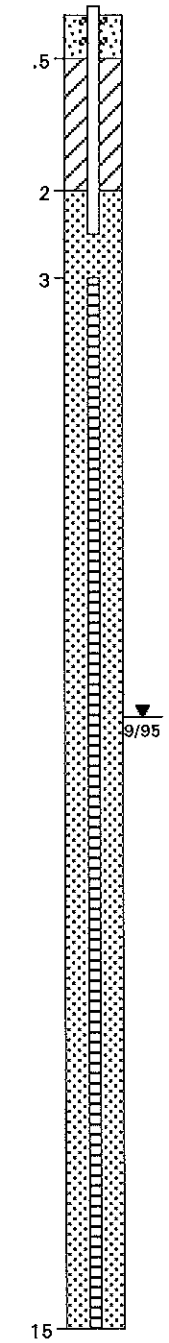
U.S. ARMY
FORT MONMOUTH
SELFM PW EV

LOG OF BORING 1122-mw2

Produced for Charles Appleby

Project Name	: BLDG. 1122	Completion Date	: 9/12/95
NJDEP Case #	: 95-1-11-1429-00	Northing	: N 538664.436
Logged By	: Shore Drilling	Easting	: E 2171695.432
Start Date	: 9/12/95	Driller	: R. Barnes

29-33754
ELEV: 16.24



Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Samples	Blows/Ft	% Rec-overy
0	Topsoil and roots, dry			1	17	17
2	Brown medium fine sand, dry fine roots		SW	2	16	83
4				3	13	59
6	Green-gray silty clay, wet		SC	4	4	50
8	Slight odor, blackish, medium fine sand, silty clay		SC	5	3	58
10						
12	Green-gray clay, Glauconite, wet		SC			
14						
15						
16						

Well Construction Information

Well Construction
Date Completed : 9/12/95
Hole Diameter : 8 in
Drill Method : HSA
Company Rep : R. Barnes

Well Casing
Material : PVC
Diameter : 4 in
Joints : Threaded

Well Screen
Material : PVC
Diameter : 4 in
Joints : Threaded
Opening : 20 Slot

Sand Pack : # 2 Morie Sand

Annulus Seal : Bentonite/Portland
: Tremmie

Well Screen
Material : PVC
Diameter : 4 in
Cap :

NOTES
Well #1 is 1122 MW2

2-28-1996 C:\1122\GEO\1122 mw2.ge3

Groundwater & Environmental Services, Inc.

Boring Log

Sketch Map

Project: Fort Monmouth Owner: DPW

Location: Bldg 1122 Permit No: 2933754

Well number: 1122 MW 2 Total Depth: 15 Diameter: 4"

Casing Elevation: _____ Water Level: Init: 6-8 Static: _____

Screen Dia.: 4" Length: 11 Slot Size: 20

Casing Dia.: 4" Length: 5 Type: PVC

Drilling Method: HSA Sample Method: Split-Spoon

Completion Details: Stick-up

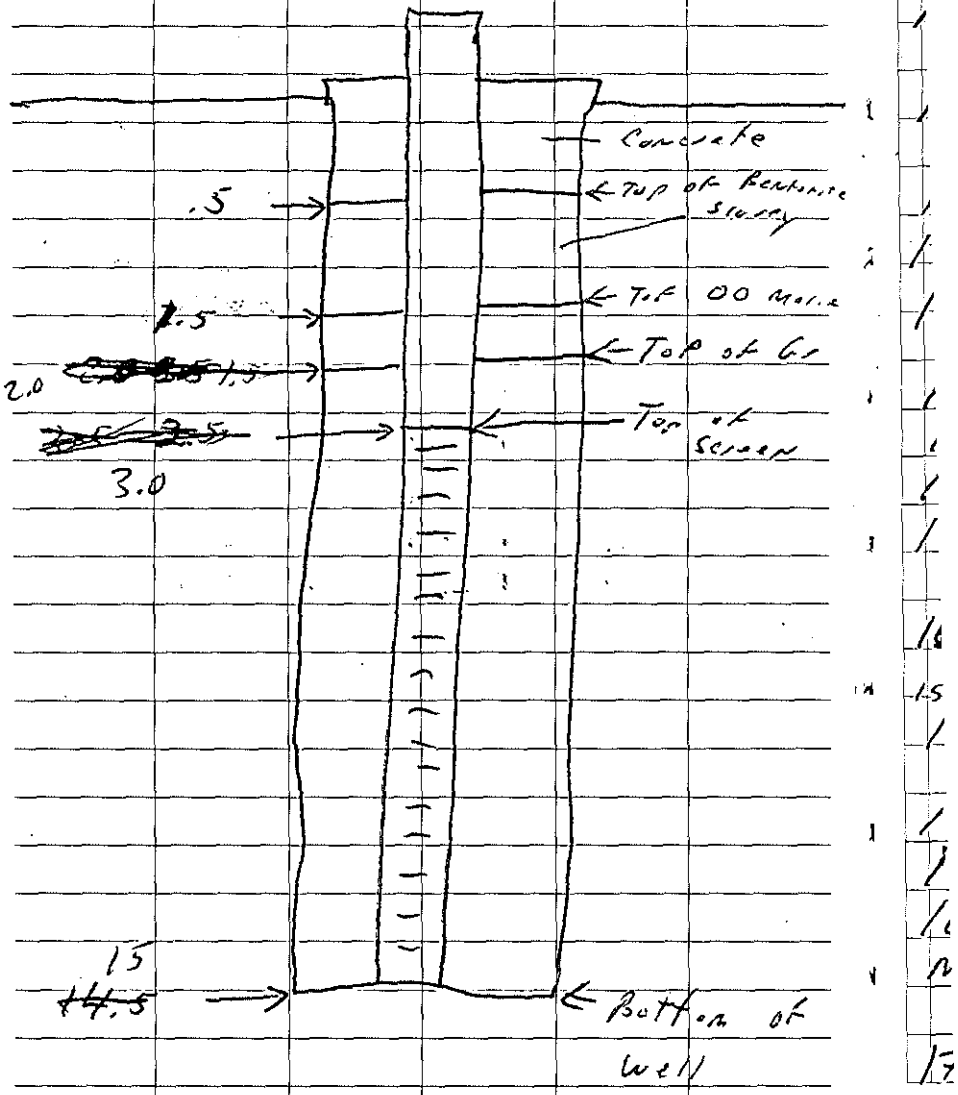
Driller: Shore Log By: R. Barnes Date: 9-12-95

Blows Per ft	Depth (feet)	Sample No.	Well Const.	PID (ppm)	Blow Count	Rec (Ft)	Lithology	Unified Symbol
17	1			0	8,9	,2	Br f; Top Soil & Roots, DRY	
	2				8,5			
16	3			0	3,8	1,0	Lt Br m-f S, li f; DRY, Fine Roots	SM
	4				0,0			
13	5			0	6,7	,7		
	6				6,3			
4	7			0	3,2	,6	Green-Gray s, Itly CLAY, fr FS; wet	CL
	8				2,3			
3	9			0	1,2	,7	Slight odor, Blk/sh m-f Sand & Silty CLAY	SC
	10				1,1			
	11							
	12						Green-Gray CLAY, fr FS; Glauconitic, wet	
	13							CL
	14							
	15						T.O.B. at 15 Ft	
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
	24							
	25							
	26							
	27							
	28							
	29							

(60) FORT MONMOUTH TUES 9-12-95

Bldg 1122 Stick up

Well 1122 MW 2



DWR-138 M
11/98

New Jersey Department of Environmental Protection
Bureau of Water Allocation

MONITORING WELL RECORD

Well Permit No. 29 - 43196

Atlas Sheet Coordinates 29 : 14 445

OWNER IDENTIFICATION - Owner US ARMY
Address 173 RIVERSIDE AVE
City FT MONMOUTH State NJ Zip Code

WELL LOCATION - If not the same as owner please give address. Owner's Well No. MW-3
County MONMOUTH Municipality EATONTOWN BORO Lot No. N/A Block No. N/A
Address 1122 ALEXANDER AVE

DATE WELL STARTED 7/20/00
DATE WELL COMPLETED 7/20/00

TYPE OF WELL (as per Well Permit Categories) MONITORING
Regulatory Program Requiring Well OTHER INVESTIGATION Case I.D.#

CONSULTING FIRM/FIELD SUPERVISOR (if applicable) Tecom Vance II Tele. #

WELL CONSTRUCTION

Total depth drilled 14 ft.
Well finished to 14 ft.

Borehole diameter:
Top 10 in.
Bottom 10 in.

Well was finished: ☐ above grade
☑ flush mounted

If finished above grade, casing height (stick up) above land surface ____ ft.

Was steel protective casing installed?
☑ Yes ☐ No

Static water level after drilling 6 ft.

Water level was measured using ____

Well was developed for 5 hours
at 21 gpm

Method of development SUBMERSIBLE PUMP

Was permanent pumping equipment installed? ☐ Yes ☒ No

Pump capacity ____ gpm

Pump type: ____

Drilling Fluid ____ Type of Rig Centerra 450

Health and Safety Plan submitted? ☒ Yes ☐ No

Level of Protection used on site (circle one) None (D) C B A

Note: Measure all depths from land surface	Depth to Top (ft.)	Depth to Bottom (ft.)	Diameter (inches)	Material	Wgt./Rating (lbs/sch no.)
Single/Inner Casing	0	4	4	PVC	Sch. 40
Middle Casing (for triple cased wells only)					
Outer Casing (largest diameter)					
Open Hole or Screen (No. Used 010)	4	14	4	PVC	Sch. 40
Blank Casings (No. Used)					
Tail Piece					
Gravel Pack	3	14	No. 1	Well Gravel	
Grout	0	3		Neat Cement	94 lbs.
				Bentonite	6 lbs.

Grouting Method TREMIE
Drilling Method AUGER

GEOLOGIC LOG

Note each depth where water was encountered in consolidated formations.

0-14' Gray/green clay, silt and sand.

I certify that I have constructed the above referenced well in accordance with all well permit requirements and applicable State rules and regulations.

Drilling Company LUTZ ENVIRONMENTAL INC.
Well Driller (Print) Timothy Westover
Driller's Signature Timothy A Westover
Registration No. M14446 Date 7/28/00

COPIES: White - DEP Canary - Driller Pink - Owner Goldenrod - Health Dept.

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.
1340 Campus Parkway, PO Box 1750
Wall, New Jersey

Well/Boring MW-3
Sheet 1 of 1

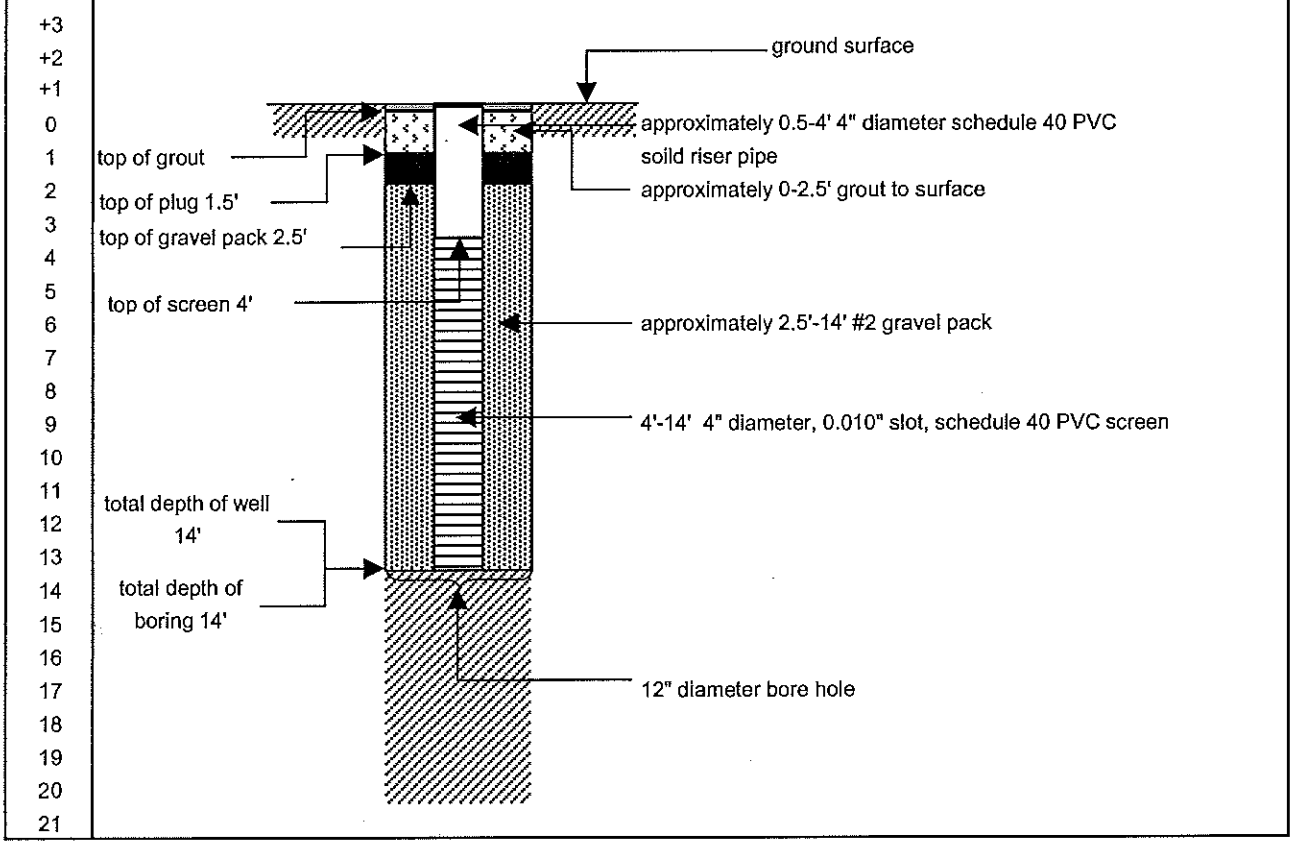
PROJECT	Fort Monmouth	DATE STARTED	07/20/2000
LOCATION	Building 1122	DATE FINISHED	07/20/2000
PROJECT NO.		ELEVATION & DATUM	
RIG TYPE	Canterra 80	COMPLETION DEPTH	14'
DRILLING METHOD	HSA	ROCK DEPTH	
BIT DIAMETER	8"	NO. OF SAMPLES	4
		WATER LEVEL	Approx. 7'
SAMPLER	140 lbs.	DRILLING CO.	Lutz
HAMMER/FALL	30"	LICENSED DRILLER	Tim Westover
		INSPECTOR	Brian Finnegan

DEPTH SCALE (ft.)	Rec (in.)	Blow Count	Sample ID	PID (ppm)	STRATIGRAPHY	REMARKS
1					Asphalt 0-8"	0-5' Hand Clear
2					Orange fine-medium Sand with Silt and Clay, dry, no odor, no stain.	USGS symbol SM
3						
4				0	Olive green Silt with fine-medium Sand and trace Clay, dry, no odor, no stain.	USGS symbol ML
5						
6		5 6	S1	0 0	Greenish black Silt with Clay and fine-medium Sand, Approximately 50% Orange Mottling, moist at 12", no odor, no stain	USGS symbol ML
7	24"	7 8	(5'-7')	0 0		
8			S2	0 0	Same as above with slightly wet Clay center, moist throughout sample	
9	24"	10 11	(7'-9')	0 0		
10		10 18	S3	0 0	0-12"Yellow tan fine-medium Sand with Silt and Clay, Saturated, approx. 40% black flecks	USGS symbol SM
11	24"	8 8	(9'-11')	0 0	12"-24" Orange and black Silt and Clay, with trace/some fine-medium Sand, moist/wet, no odor	USGS symbol CL-ML
12		9 15	S4	0 0	Black Clay and Silt with approximately 35% green mottling and trace Sand	USGS symbol CL-ML
13	12"	6 11	(11'-13')	0 0		
14		11 9		0 0		
15					End of boring at 14'	
16						
17						
18						
19						
20						

Monitoring Well Construction Sheet

Project:	Fort Monmouth	Owner:	U.S. Army		
Location:	Building 1122	Permit Number:			
Well Number:	MW-3	Total Depth:	14'		
Casing Elev.:		Water Level Initial:	approx. 7'		
Screen Diam.:	4 inches	Length:	10'	Slot Size:	0.010"
Casing Diam.:	4 inches	Length:	4'	Type:	PVC
Drilling Method:	Hollow Stem Auger	Sample Method:	2 inch Split Spoon		
Driller: Lutz		Log By: Brian Finnegan		Date: 07/20/2000	

Depth	Component Depth Below Ground Surface	Well Const.	Well Components



LUTZ ENVIRONMENTAL CO., INC.

2020 CLINTON STREET · LINDEN, NEW JERSEY 07036 · (908)862-8888

BORING LOG:

WELL NO. MW 3 COORDINATE NO. 29-14-445 PERMIT NO. 29-43196

DATE DRILLED 7-20-2000 COUNTY MONMOUTH USE MONITOR

LOCATION Bldg 1122 1122 ALEXANDER AVE. EATONTOWN NJ (Ft. Monmouth)

OWNER U.S. ARMY ADDRESS 173 RIVERSIDE AVE. FT. MONMOUTH, NJ. 077

DRILLING METHOD Auger SAMPLING METHOD SPOON / COMPOSITE

HOLE DIA. 10" TOTAL DEPTH 14

CASING:

TYPE MONO PLEX FLUSH MOUNT SLOT — DIA 4" LENGTH 4'

SCREEN:

TYPE MONO PLEX FLUSHMOUNT SLOT .010 DIA 4" LENGTH 10'

GRAVEL PACK SIZE #1 well gravel CASING SEAL CEMENT

STATIC WATER LEVEL APPROX 6' GEOLOGIC FORMATION UNCONSOLIDATED

DEPTH BELOW SURFACE	SAMPLE NUMBER	BLOWS PER 6" ON SAMPLER	WELL DESIGN	IDENTIFICATION OF SOILS/REMARKS
		SPOONS	12" STEEL MANHOLE WITH 2x2 CONCRETE PAD; CEMENT; 4'—SOLID FLUSH CASING; CEMENT BENT.; #1 well gravel; 10'-.010 SLOT SCREEN	0'-14' → GRAY GREEN CLAYS SILTS AND SANDS
		NOT		
		ELECTRONIC		
		DRILLER		→ Set well @ 14'

DWR-138.M
11/98

New Jersey Department of Environmental Protection
Bureau of Water Allocation

MONITORING WELL RECORD

Well Permit No. 29 - 43197

Atlas Sheet Coordinates 29 : 14 445

OWNER IDENTIFICATION - Owner US ARMY
Address 173 RIVERSIDE AVE
City FT MONMOUTH State NJ Zip Code

WELL LOCATION - If not the same as owner please give address. Owner's Well No. MW-4
County MONMOUTH Municipality EATONTOWN BORO Lot No. N/A Block No. N/A
Address 1122 ALEXANDER AVE

DATE WELL STARTED 7/20/00
DATE WELL COMPLETED 7/20/00

TYPE OF WELL (as per Well Permit Categories) MONITORING
Regulatory Program Requiring Well OWNER INVESTIGATION Case I.D.#

CONSULTING FIRM/FIELD SUPERVISOR (if applicable) Terra Vomell Tele. #

WELL CONSTRUCTION

Total depth drilled 14 ft.
Well finished to 14 ft.

Borehole diameter:
Top 10 in.
Bottom 10 in.

Well was finished: ☐ above grade
☑ flush mounted

If finished above grade, casing height (stick up) above land surface ____ ft.

Was steel protective casing installed?
☑ Yes ☐ No

Static water level after drilling 6 ft.

Water level was measured using ~~tape~~ STEEL TAPE

Well was developed for 5 hours
at <1 gpm

Method of development SUBMERSIBLE PUMP

Was permanent pumping equipment installed? ☐ Yes ☒ No

Pump capacity — gpm

Pump type: —

Drilling Fluid — Type of Rig Ingersoll 450

Health and Safety Plan submitted? ☒ Yes ☐ No

Level of Protection used on site (circle one) None (D) C B A

Note: Measure all depths from land surface	Depth to Top (ft.)	Depth to Bottom (ft.)	Diameter (inches)	Material	Wgt./Rating (lbs/sch no.)
Single/Inner Casing	0	4	4	PVC	Sched. 40
Middle Casing (for triple cased wells only)					
Outer Casing (largest diameter)					
Open Hole or Screen (No. Used .010)	4	14	4	PVC	Sched. 40
Blank Casings (No. Used)					
Tail Piece					
Gravel Pack	3	14		No. 1 well gravel	
Grout	0	3		Neat Cement Bentonite	94 lbs. 6 lbs.

Grouting Method TREMMIE
Drilling Method Auger

GEOLOGIC LOG

Note each depth where water was encountered in consolidated formations.

0-14' Greenish gray clay, silt and sand (color)

I certify that I have constructed the above referenced well in accordance with all well permit requirements and applicable State rules and regulations.

Drilling Company LUTZ ENVIRONMENTAL INC.
Well Driller (Print) Timothy Westover
Driller's Signature Timothy A Westover
Registration No. IM1444 Date 7/28/00

COPIES: White - DEP Canary - Driller Pink - Owner Goldenrod - Health Dept.

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.
1340 Campus Parkway, PO Box 1750
Wall, New Jersey

Well/Boring MW-4
Sheet 1 of 1

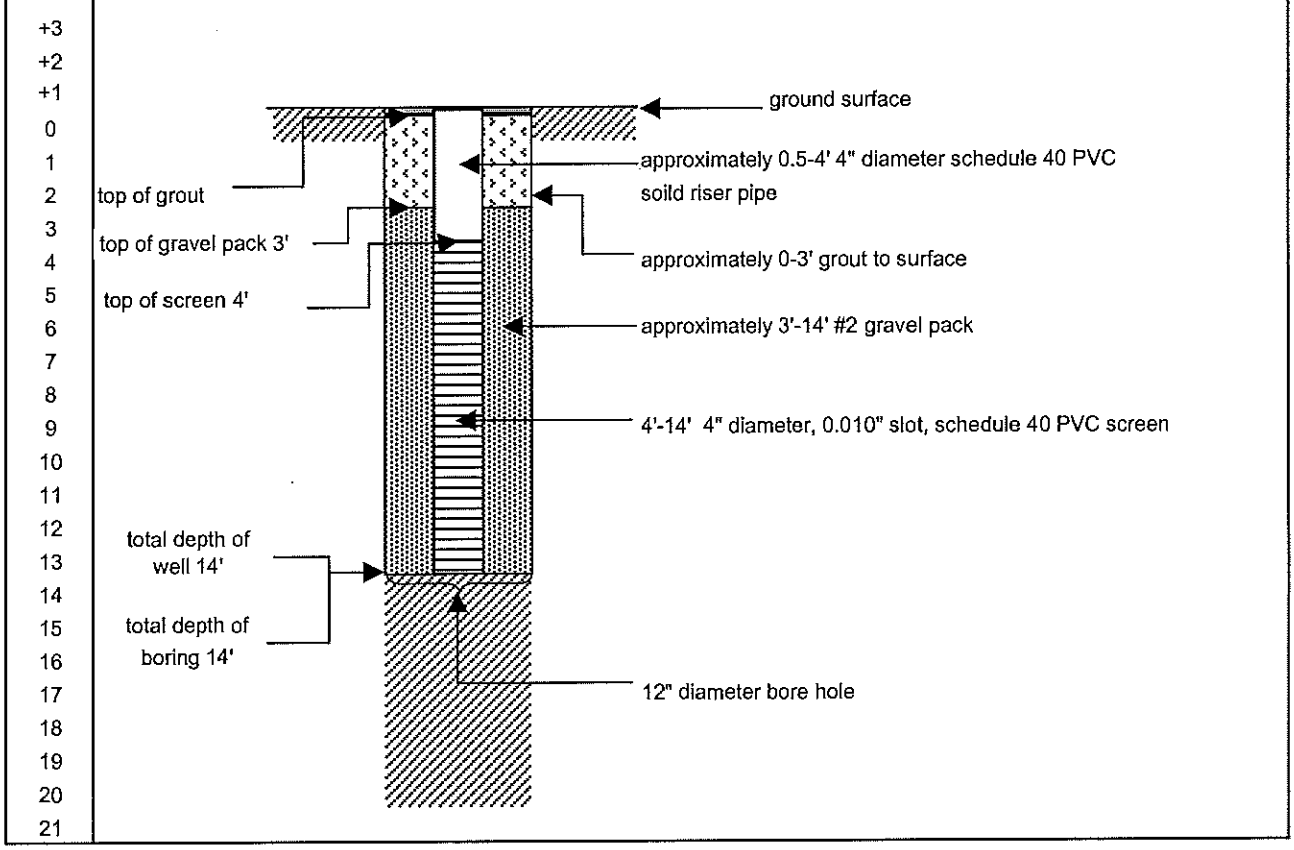
PROJECT	Fort Monmouth	DATE STARTED	07/20/2000
LOCATION	Building 1122	DATE FINISHED	07/20/2000
PROJECT NO.		ELEVATION & DATUM	
RIG TYPE	Canterra 80	COMPLETION DEPTH	14'
DRILLING METHOD	HSA	ROCK DEPTH	NA
BIT DIAMETER	12"	NO. OF SAMPLES	4
		WATER LEVEL	7'
SAMPLER	140 lbs.	DRILLING CO.	Lutz
HAMMER/FALL	30"	LICENSED DRILLER	Tim Westover
		INSPECTOR	Brian Finnegan

DEPTH SCALE (ft.)	Rec (in.)	Blow Count	Sample ID	PID (ppm)	STRATIGRAPHY	REMARKS
1					0-8" Asphalt	Hand clear 0-5'
2					Yellow tan fine-medium Sand, dry	USGS symbol-SW
3						
4						
5	8"	5	S1 (5'-7')	0		
		8		0		
6		8		0		
		9		0	Greenish tan Silt and Clay with trace fine-medium Sand, approximately 50% orange mottling, slightly moist, no odor	USGS symbol-ML-CL
7	10"	5	S2 (7'-9')	0		
		8		0		
8		12		0	Same as above with more orange mottling, approximately 60%, no odor, moist	Note: odor to some cuttings pulled off augers at 7-8'.
		12		0		
9	10"	8	S3 (9'-11')	0		
		10		0		
10		12		0	Same as above, moist, no odor, no stain	
		18		0		
11	24"	8	S4 (11'-13')	0		
		9		0		
12		12		0	0-8" Fine-medium saturated Sand with trace Silt and Clay, no odor. 8"-22" Orange black tan yellow Silt and Clay with trace fine Sand, finely laminated, wet, no odor. 22"-24" Black Silt and Clay, wet, no odor	USGS symbol SP USGS symbol ML-CL
		9		0		
13						
14						
15					End of boring at 14'	After well was set, PID was 2.3 ppm at top of well, settling to 0.8-0.9 ppm
16						
17						
18						
19						
20						

Monitoring Well Construction Sheet

Project:	Fort Monmouth	Owner:	U.S. Army		
Location:	Building 1122	Permit Number:			
Well Number:	MW-4	Total Depth:	14'		
Casing Elev.:		Water Level Initial:	approx. 7'		
Screen Diam.:	4 inches	Length:	10	Slot Size:	0.010"
Casing Diam.:	4 inches	Length:	4	Type:	PVC
Drilling Method:	Hollow Stem Auger	Sample Method:	2 inch Split Spoon		
Driller: Lutz		Log By: Brian Finnegan		Date: 07/20/2000	

Depth	Component Depth Below Ground Surface	Well Const.	Well Components



LUTZ ENVIRONMENTAL CO., INC.

2020 CLINTON STREET · LINDEN, NEW JERSEY 07036 · (908)862-8888

BORING LOG:

WELL NO. MW 4 COORDINATE NO. 29-14-445 PERMIT NO. 29-43197

DATE DRILLED 7-20-2000 COUNTY MONMOUTH USE MONITOR

LOCATION Bldg 1122 1122 ALEXANDER AVE EATONTOWN NJ (Ft. Monmouth)

OWNER U.S. ARMY ADDRESS 173 RIVERSIDE AVE. FT. MONMOUTH, NJ, 07703

DRILLING METHOD Auger SAMPLING METHOD SPOON / COMPOSITE

HOLE DIA. 10" TOTAL DEPTH 14'

CASING:

TYPE MONOFLEX FLUSH MOUNT SLOT — DIA. 4" LENGTH 4'

SCREEN:

TYPE MONO-FLEX FLUSHMOUNT SLOT .010 DIA. 4" LENGTH 10'

GRAVEL PACK SIZE #1 well gravel CASING SEAL CEMENT

STATIC WATER LEVEL APPROX. 6' GEOLOGIC FORMATION UNCONSOLIDATED

DEPTH BELOW SURFACE	SAMPLE NUMBER	BLOWS PER 6" ON SAMPLER	WELL DESIGN	IDENTIFICATION OF SOILS/REMARKS
		SOONS	12" STEEL MANHOLE with 2x2 CONCRETE PAD; CEMENT; 4'- SOLID FLUSH CASING; BENT. CEMENT; #1 well gravel; 10'- .010 SLOT SCREEN; #1 well gravel	0'-14' → gray / green clays silts and sands. (STIFF)
		NOT RECORDED		
		BY DRILLER		
				→ Set well @ 14'

DWR-138 M
11/98

New Jersey Department of Environmental Protection
Bureau of Water Allocation

MONITORING WELL RECORD

Well Permit No. 29 - 43198

Atlas Sheet Coordinates 29 : 14 445

OWNER IDENTIFICATION - Owner US ARMY
Address 173 RIVERSIDE AVE
City FT MONMOUTH State NJ Zip Code

WELL LOCATION - If not the same as owner please give address. Owner's Well No. MW-5
County MONMOUTH Municipality EATONTOWN BORO Lot No. N/A Block No. N/A
Address 1122 ALEXANDER AVE

DATE WELL STARTED 7/20/00
DATE WELL COMPLETED 7/20/00

TYPE OF WELL (as per Well Permit Categories) MONITORING
Regulatory Program Requiring Well OWNER INVESTIGATION Case I.D.#

CONSULTING FIRM/FIELD SUPERVISOR (if applicable) Terra Universal Tele. #

WELL CONSTRUCTION

Total depth drilled 15 ft.
Well finished to 15 ft.

Borehole diameter:
Top 10 in.
Bottom 10 in.

Well was finished: ☐ above grade ☑ flush mounted

If finished above grade, casing height (stick up) above land surface _____ ft.

Was steel protective casing installed? ☑ Yes ☐ No

Static water level after drilling 6 ft.

Water level was measured using _____

Well was developed for 5 hours at 21 gpm

Method of development Submersible Pump

Was permanent pumping equipment installed? ☐ Yes ☒ No

Pump capacity _____ gpm

Pump type: _____

Drilling Fluid _____ Type of Rig Canteen 450

Health and Safety Plan submitted? ☑ Yes ☐ No

Level of Protection used on site (circle one) None D C B A

Note: Measure all depths from land surface	Depth to Top (ft.)	Depth to Bottom (ft.)	Diameter (inches)	Material	Wgt./Rating (lbs/sch no.)
Single/Inner Casing	0	5	4	PVC	sched 40
Middle Casing (for triple cased wells only)					
Outer Casing (largest diameter)					
Open Hole or Screen (No. Used 010)	5	15	4	PVC	sched 40
Blank Casings (No. Used)					
Tail Piece					
Gravel Pack	4	15	N/A	1 well Gravel	
Grout	0	4		Neat Cement Bentonite	44 lbs. 6 lbs.

Grouting Method Tremmy
Drilling Method Auger

GEOLOGIC LOG

Note each depth where water was encountered in consolidated formations.

0-15' Green/gray to orange/tan clay, silt and sand.

I certify that I have constructed the above referenced well in accordance with all well permit requirements and applicable State rules and regulations.

Drilling Company LUTZ ENVIRONMENTAL INC.
Well Driller (Print) Timothy Westover
Driller's Signature Timothy A. Westover
Certification No. [illegible] Date 7/28/00

COPIES: White - DEP Canary - Driller Pink - Owner Goldenrod - Health Dept.

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.
1340 Campus Parkway, PO Box 1750
Wall, New Jersey

Well/Boring MW-5
Sheet 1 of 1

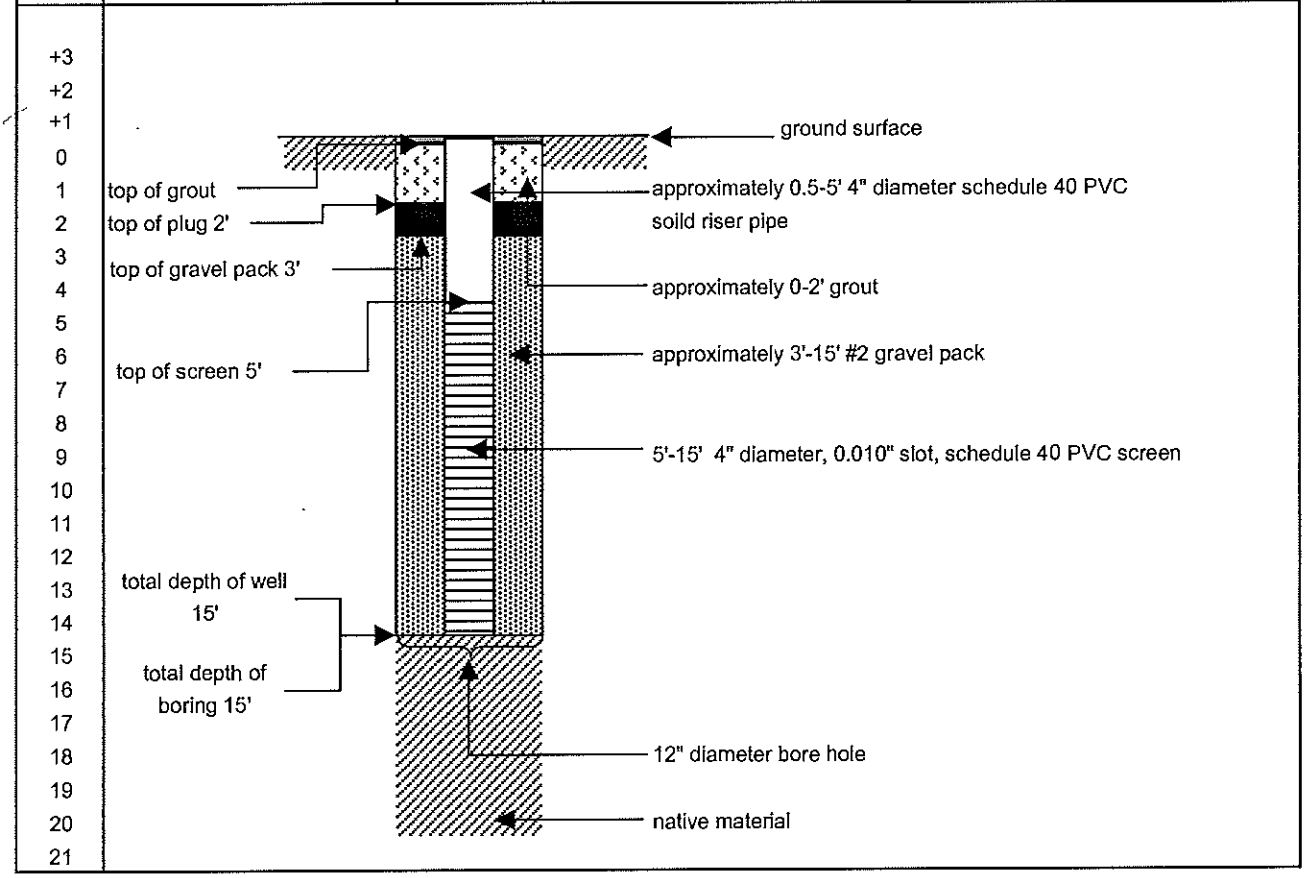
PROJECT	Fort Monmouth	DATE STARTED	07/20/2000
LOCATION	Building 1122	DATE FINISHED	07/20/2000
PROJECT NO.		ELEVATION & DATUM	
RIG TYPE	Canterra 80	COMPLETION DEPTH	15'
DRILLING METHOD	HSA	ROCK DEPTH	NA
BIT DIAMETER	12"	NO. OF SAMPLES	4
		WATER LEVEL	Approx. 8'
SAMPLER	Split spoon	DRILLING CO.	Lutz
HAMMER/FALL	140 lbs./30"	LICENSED DRILLER	Tim Westover
		INSPECTOR	Brian Finnegan

DEPTH SCALE (ft.)	Rec (in.)	Blow Count	Sample ID	PID (ppm)	STRATIGRAPHY	REMARKS
1						
2				0	Orange and tan fine-medium Sand with trace Silt, dry, no odor, no stain	USGS symbol SM
3						
4						
5	24"	4	S1 (5'-7')	0	Olive green and orange Silt with Clay and trace fine Sand	USGS symbol CL-ML
		5		0		
		7		0	0-17" Orange fine-medium Sand, slightly	USGS symbol SW
6		7		0	moist, no odor. 17"-24" Olive green, black	USGS symbol ML
7	17"	5	S2 (7'-9')	0	and orange Silt with fine-medium Sand and	
		8		0	Clay, slightly moist, no odor	
		8		0		
8		10		0	Same as 17"-24" above, no odor, moist	
9	20"	3	S3 (9'-11')	0		
		8		0		
		10		0	0-5" Same as above. 5"-7" fine-med.	USGS symbol SW
10		14		0	orange Sand, no odor.	
11		3	S4 (11'-13')	0	7"-20" Orange and black Silt and Clay with	USGS symbol CL-ML
		6		0	trace fine-med. Sand, moist	
		7		0		
12		12		0	Same as 7"-20" above no odor	
13						
14					End of boring at 15'	
15						
16						
17						
18						
19						
20						

Monitoring Well Construction Sheet

Project:	Fort Monmouth	Owner:	U.S. Army		
Location:	Building 1122	Permit Number:			
Well Number:	MW-5	Total Depth:	15'		
Casing Elev.:		Water Level Initial:	approx. 8'		
Screen Diam.:	4 inches	Length:	10'	Slot Size:	0.010"
Casing Diam.:	4 inches	Length:	5'	Type:	PVC
Drilling Method:	Hollow Stem Auger	Sample Method:	2 inch Split Spoon		
Driller: Lutz		Log By: Brian Finnegan		Date: 07/20/2000	

Depth	Component Depth Below Ground Surface	Well Const.	Well Components



LUTZ ENVIRONMENTAL CO., INC.

2020 CLINTON STREET · LINDEN, NEW JERSEY 07036 · (908)862-8888

BORING LOG:

WELL NO. MW 5 COORDINATE NO. 29-14-445 PERMIT NO. 29-43198

DATE DRILLED 7-20-2000 COUNTY MONMOUTH USE MONITOR

LOCATION Bldg 1122 1122 ALEXANDER AVE. EATONTOWN NJ (FT. MONMOUTH)

OWNER U.S. ARMY ADDRESS 173 RIVERSIDE AVE FT. MONMOUTH, NJ. 07703

DRILLING METHOD Auger SAMPLING METHOD COMPOSITE

HOLE DIA. 10" TOTAL DEPTH 15'

CASING:

TYPE MONO FLEX FLUSH MOUNT SLOT — DIA 4" LENGTH 5'

SCREEN:

TYPE MONO FLEX FLUSH MOUNT SLOT .010 DIA 4" LENGTH 10'

GRAVEL PACK SIZE #1 WELL GRAVEL CASING SEAL CEMENT

STATIC WATER LEVEL APPROX. 6' GEOLOGIC FORMATION UNCONSOLIDATED

DEPTH BELOW SURFACE	SAMPLE NUMBER	BLOWS PER 6" ON SAMPLER	WELL DESIGN	IDENTIFICATION OF SOILS/REMARKS
			12" STEEL MANHOLE with 2x2 CONCRETE PAD	
		NO	CEMENT / BENT.	0"-15' → GRAY/GREEN TO ORANGE/BROWN CLAYS SILTS AND SANDS.
		SOONS	5'-SOLID FLUSH CASING / BENT. CEMENT	
			10'-.010 SLOT SCREEN	
			#1 WELL GRAVEL	
				→ SET WELL @ 15'

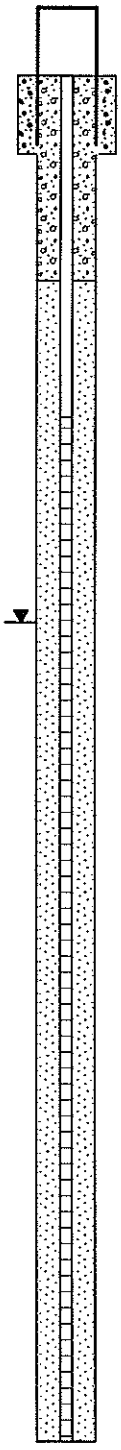
U.S.ARMY
FORT MONMOUTH
SELFM-PW-EV

LOG OF BORING 1122MW06

U.S. Army
SELFM-PW-EV
JOSEPH FALLON
SITE 1122 (FTMM-59)
GROUNDWATER INVESTIGATION

NJDEP Permit #	: E201007327	Northing	: N 538540
NJDEP Case #	: -	Easting	: E 617520
Start Date	: 7/20/2010	Logged By	: Howard Syvarth
Completion Date	: 7/20/2010	Driller	: Tabasco Drilling Corp

Well: MW06
Elevation: 17.53



Depth in Feet	DESCRIPTION	USCS	GRAPHIC	Samples	Blow Count	Well Construction Information
0–1	Topsoil					Well Construction Hole Diameter : 10 inches Drill Method : Hollow Stem Auger Sampling Method : Split Spoon Well Casing Material : PVC Diameter : 4 inches Joints : Threaded Length : 5 feet Well Screen Material : PVC Diameter : 4 inches Joints : Threaded Opening : 0.010 inch Length : 15 feet Sand Pack : No. 1 Well Sand Annulus Seal : Neat Cement/ : Bentonite
1–2	Coal slag/ash					
2–3						
3–5	Glauconitic sandy clay (bright green)	CL				
5–7						
7–8	Tan/green fine sandy silty clay w/ some gravel Groundwater encountered at 8'					Stick up: *outer casing length not indicated in well record Static water level: 8. feet *Three distinct layers encountered at this location
8–12		CL				
12–17						
17–18	Green wet glauconitic clay					
18–20		CL				

03-23-2011 Y:\ENVR_Share\Installation Restoration Program Management\IRP Sites\1122\MW Information\Well Logs (Electronic)\1122MW06.BOR

New Jersey State Department of Environmental Protection
Bureau of Water Systems and Well Permitting
PO BOX 420 Trenton, NJ 08625-0420 Tel: 609-984-6831

Well Permit Number
E201113249

WELL PERMIT

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: BARRIE WOODINGTON, MASTER LICENSE # 0001614

Permit Issued to: TABASCO DRILLING CORP

Company Address: BOX 1676 MOUNT LAUREL, NJ 08054

PROPERTY OWNER

Name: JOSEPH FALLON

Organization: United States Army

Address: 173 Riverside Avenue

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

PROPOSED WELL LOCATION

Facility Name: US Army Facility - Paint Sheds

Address: Wilson Avenue

County: Monmouth Municipality: Eatontown Boro Lot: N/A Block: N/A

Easting (X): 617300 Northing (Y): 538321
Coordinate System: NJ State Plane (NAD83) - USFEET

Local ID: 1122MW07

SITE CHARACTERISTICS

PROPOSED CONSTRUCTION

WELL USE: MONITORING

Other Use(s):

Diameter (in.): 4

Regulatory Program Requiring Wells/Borings:

Depth (ft.): 20

Case ID Number:

Pump Capacity (gpm): 0

Deviation Requested: N

Drilling Method: Hollow Stem Augers

Attachments:

SPECIFIC CONDITIONS/REQUIREMENTS

Approval Date: August 10, 2011
Expiration Date: August 9, 2012

Approved by the authority of:
Bob Martin
Commissioner

Fred Sickels, Director
Division of Water Supply

4920

MONITORING WEL RECORD

Well Permit No. E201113249

OWNER JOSEPH FALLON - United States Army
Address 173 Riverside Avenue
City Fort Monmouth, NJ 07703

WELL LOCATION US Army Facility - Paint Sheds Well No. 1122MW07
County Monmouth Municipali Oceanport Boro Lot No. N/A Block No. N/A
Address Wilson Avenue

DATE WELL STARTED 8/17/2011
WELL USE Monitoring DATE WELL COMPELTED 8/17/2011

WELL CONSTRUCTION
Total Depth Drilled 20 Ft.
Finished Well Depth 20 Ft.
Borehole Diameter:
Top 10 in.
Bottom 10 in.
Well finished: X above grade
flush mount
If finished above grade,casing h
(stickup) above land 2 Ft.

Steel Protective casing installed?
X Yes No

Static Water level 8 ft.

Depth from land surface>	to Top ft.	to Bottom ft.	Diameter(in.)	Materal	(lbs/Sch no.)
Single/inner Casing	0	5	4	PVC	Sch 40
Middle Casing					
(for triple cased wells only)					
Outer Casing					
(largest diameter)					
Open Hole or Screen	5	20	4	PVC	.010
(No. Used .010)					
Blank Casings					
(No. Used)					
Tail Piece					
Gravel Pack	3	20	10	#1 & #00	450 lbs
Grout	0	3	10	Neat Cement	100 lbs
				Bentonite	lbs
				Water	8 Gals

Grouting Method Pressure Tremie
Drilling Method H S A

Wtr level measure using tape
Well developed for 1 Hr.
at gpm

Method of development submersible pump
Pump Capacity gpm
Pump Type
Drilling Fluid Type of Rig Diedrich D-120
Health & Safety Plan Sumitted X Yes No
Procetion Level used (circle one None (D) C B A

I certify that I have constructed the above referenced well in accordance with all well permit requirements and applicable State rules and regulations.

Drilling Company: Tabasco Drilling Corporation
Well Driller (Print) William Lightner
Driller's Signature William Lightner
Registration No. MW215733 Date 8/31/2011

GEOLOGIC LOG

Note each depth where water was encountered in consolidated formations

0 - 20 Dark Green Silty Sand

As-Built Well Location
(NAD 83 Horizontal Datum)

Northing: Easting:
OR
Latitude: Longitude:

ORIGINAL: DEP COPIES: DRILLER OWNER HEALTH DEPARTMENT

PARSONS

Well Construction Detail (Single Cased - Road Box)

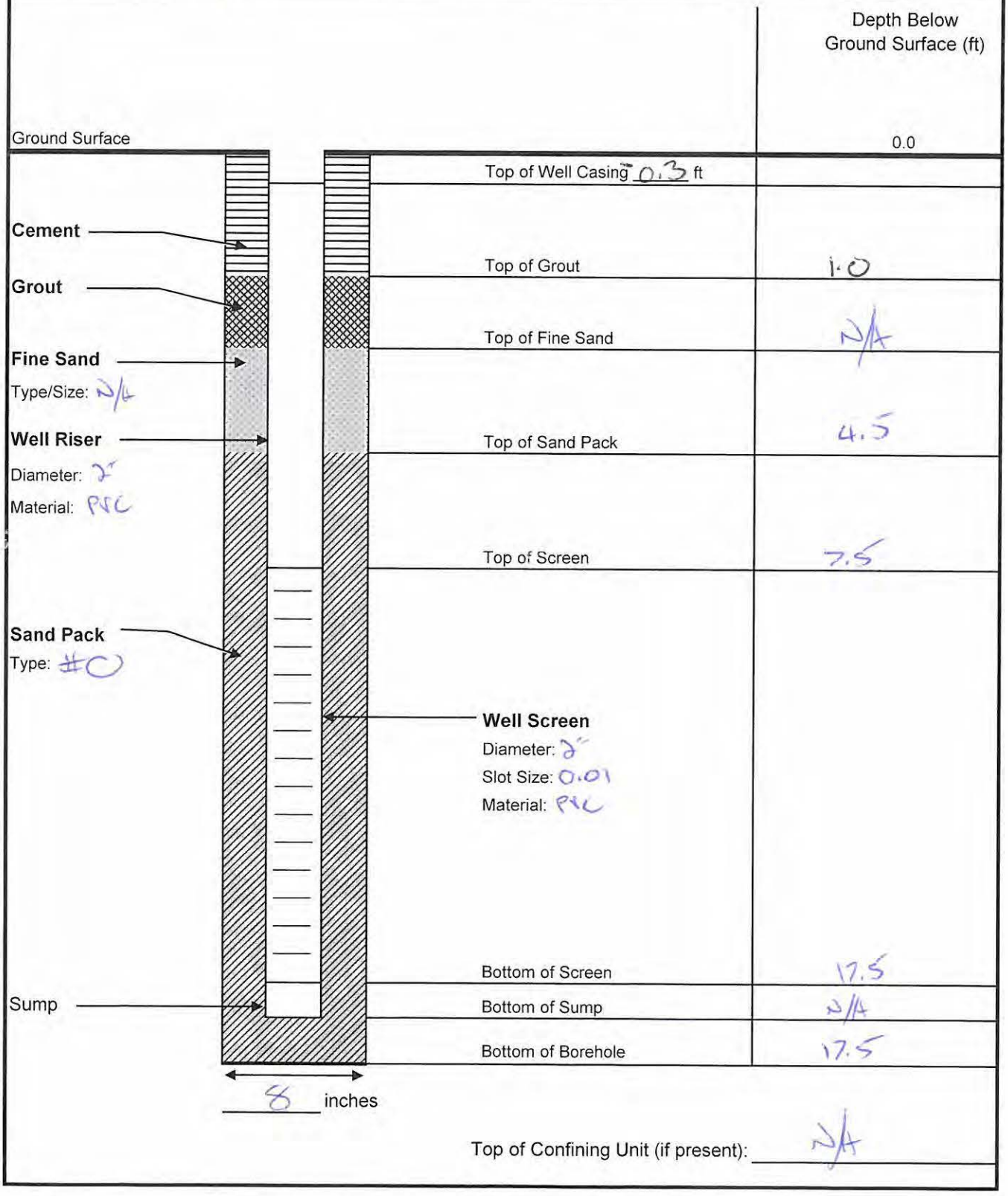
Client: USACE

Well ID: STMM-59-MW-1

NJBWA Permit No. E2015/0637

Date Well Installed: 9/30/15

Location: STMM-59



Well Detail Single Cased.xls

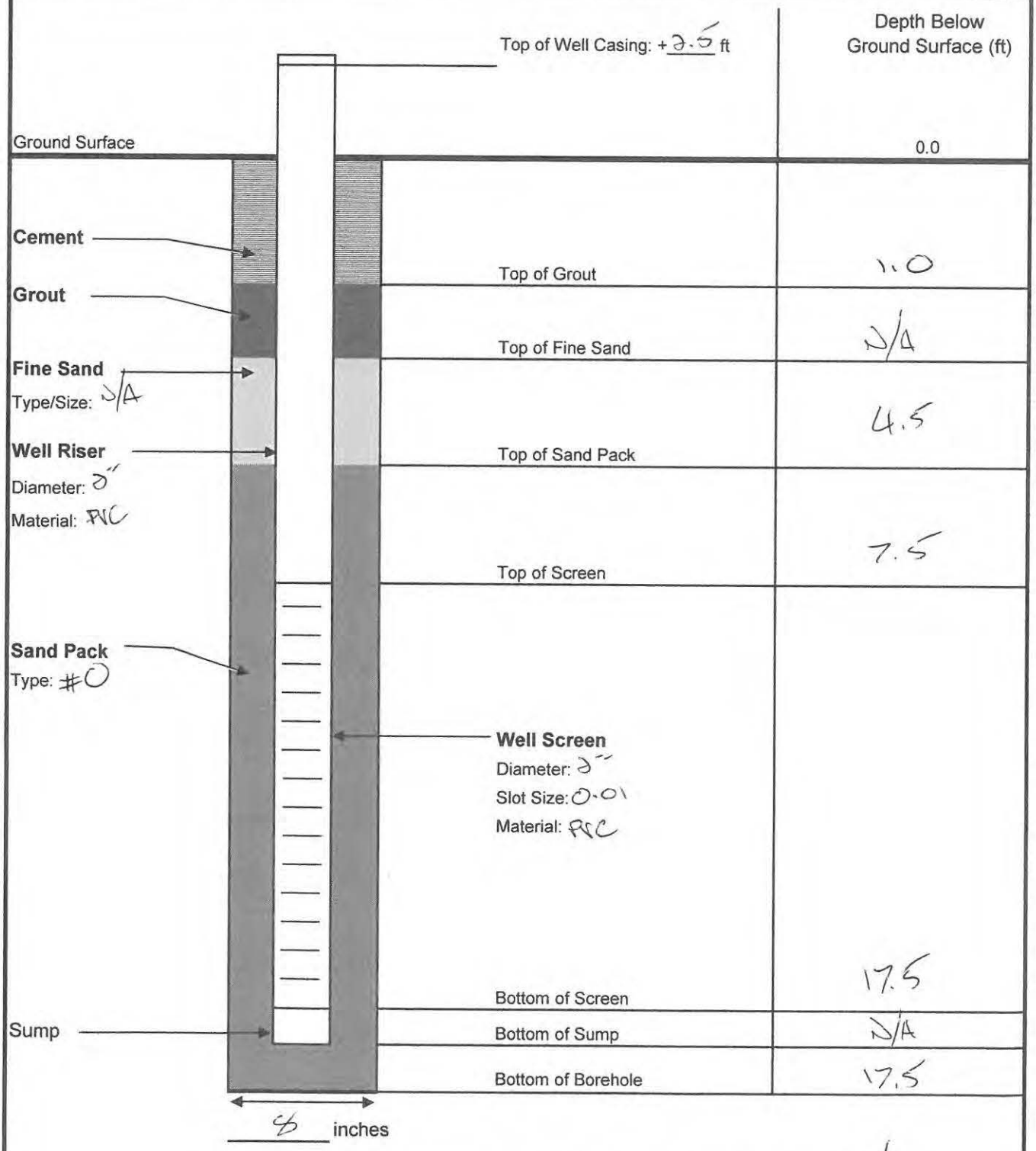
PARSONS

Well Construction Detail (Single Cased - Stickup)

Client: USACE

Well ID: FTMM-59-MW-2 NJBWA Permit No. E2015 10638

Date Well Installed: 9/30/15 Location: FTMM-59



Form_Well_Detail_Single_Cased.xls

PARSONS

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - RI
PROJECT LOCATION: FTMM - 59
PROJECT NUMBER: 748810-0150

GROUNDWATER OBSERVATIONS
WATER LEVEL: N/A
DATE: N/A
TIME: N/A
MEAS. FROM:

INSPECTOR: Nick Lorenz
DRILLER: Ken Atwood
WEATHER: 75°F, Sunny
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 9/29/15 @ 0815
DATE/TIME FINISH: 9/29/15 @ 0820
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FTMM - 59 - SB1
LOCATION DESCRIPTION: Former Chemical Shed
LOCATION PLAN: Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0	FTMM-59-SB1-0.0-0.5	0.5	60"/39"	0.0	0"-15" Dry, Dark Brown, Loose, F-M Sand, Little Silt, Little Organics, Trace F Gravel		Collect QC split sample @ 0.0-0.5'
				0.0			
1				0.0			
	FTMM-59-SB1-1.5-3.0			0.0	15"-39" Dry, Light Brown, Loose, F-M Sand, Little Clay, Trace Organics		Collect Dup sample @ 1.5'-3.0'
2				0.1			
				0.0			
3			NR	—			
			NR	—			
4			NR	—			
			NR	—			
5					5' EOB		
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

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - RI
PROJECT LOCATION: FTMM - 59
PROJECT NUMBER: 748810- 02150

GROUNDWATER OBSERVATIONS
WATER LEVEL: N/A
DATE: N/A
TIME: N/A
MEAS. FROM: N/A

INSPECTOR: Dick Leacos
DRILLER: Ken Atwood
WEATHER: 75°F, Sunny
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 9/29/15 @ 0830
DATE/TIME FINISH: 9/29/15 @ 0835
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FTMM - 59-SB7
LOCATION DESCRIPTION: Former Chemical Shed
LOCATION PLAN: Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0	FTMM-59-SB7-0.0-0.3		60"/39"	0.0	0"-39" Dry, Light Brown Tan, Loose, F-M Sand, Trace Silt, Trace Organics, Trace Concrete		
				0.0			
1				0.0			
	FTMM-59-SB7-1.5-2.0			0.0			Collect MS/MSD @ 1.5'-2.0' interval
2				0.0			
				0.0			
3				0.0			
			NR	—			
4			NR	—			
			NR	—			
5					5' EOB		
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

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - RI
PROJECT LOCATION: FTMM - 54
PROJECT NUMBER: 748810- 03150

GROUNDWATER OBSERVATIONS
WATER LEVEL: N/A
DATE: N/A
TIME: N/A
MEAS. FROM: N/A

INSPECTOR: Dirk Letzos
DRILLER: Ken Atwood
WEATHER: 75°F, Sunny
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 9/29/15 @ 0858
DATE/TIME FINISH: 9/29/15 @ 0935
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FTMM - 54-SB3
LOCATION DESCRIPTION: Former Service Bay #18
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"/33"	0.0	0"-6" Dry, Tan, Loose, F-M Sand, Little F Gravel, Little Silt, Trace Organics		
			|	0.0			
1			|	0.0	6"-33" Dry, Dark Brown, Loose, F-C Sand, And F-M Gravel, Little Silt		
			|	0.1			
2			NR	—			
			NR	—			
3			NR	—			
			NR	—			
4			NR	—			
			NR	—			
5			60"/50"	0.5	60"-67" Moist, Light Brown, ~~Dense~~, F-C Sand, And F-C Gravel, Little Silt.		
				0.1			
6				0.0	67"-110" Wet, Light Brown, ~~Dense~~, F-C Sand, And F-C Gravel, Little Silt, Trace Concrete		
				0.3			
7				0.0			
				0.5			
8	FTMM-54-SB3-8.0-8.5			0.8			Collect Dup @ 8.0-8.5 (EPH only)
				0.6			
9				0.3			
			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 - RI
PROJECT LOCATION: FTMM - 59
PROJECT NUMBER: 748810- 07150
GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE: SEE PG.1
TIME:
MEAS. FROM:

INSPECTOR: Dick Lacos
DRILLER: Ken Atwood
WEATHER: 75°F, Sunny
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 9/29/15 @ 0858
DATE/TIME FINISH: 9/29/15 @ 0935
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FTMM - 59-SB3
LOCATION DESCRIPTION: SEE PG.1
LOCATION PLAN: Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10	FTMM-59-SB3-10.0-10.5		60"/60"	0.0	120"-146" Wet, Red-Brown, Soft, Clay And F Sand		
				0.0			
11				0.0			
				0.1	146"-180" Wet, Black, Soft, Clay, And F Sand, Trace Organics		
12				0.0			
				0.0			
13				0.0			
				0.0			
14				0.0			
				0.0			
15					15' EOB		
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 - RI
PROJECT LOCATION: FTMM - 59
PROJECT NUMBER: 748810- 02150

GROUNDWATER OBSERVATIONS
WATER LEVEL: N/A
DATE: N/A
TIME: N/A
MEAS. FROM: N/A

INSPECTOR: Nick Lacco
DRILLER: Ken Atwood
WEATHER: 80°F, Partly Cloudy
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 9/22/15 @ 0940
DATE/TIME FINISH: 9/23/15 @ 1020
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FTMM - 59 - SB4
LOCATION DESCRIPTION: Former Service Bay #10
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"/34"	0.0	0"-11" Dry, Tan, Loose, F-C Sand, some F-M Gravel, Little Silt, Little Concrete		
				6.0			
1				0.0	11"-34" Moist, Red-Brown, Loose, F-M Sand, Little Silt, Trace Concrete		
				0.0			
2				0.0			
				6.0			
3			NR	—			
			NR	—			
4			NR	—			
			NR	—			
5			60"/48"	0.0	60"-67" Moist, Olive-Brown, Loose, F-M Sand, Little Clay		
	FTMM-59-SB4-5.5-6.0			0.3	67"-108" Moist, Olive-Brown-Red Mottled, Soft, Clay, some F Sand		Collect MS/MSD @ 5.5-6.0
6				0.9			
				0.3			
7				0.5			
				0.5			
8				0.3			
			NR	—			
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 - RI
PROJECT LOCATION: FTMM - 59
PROJECT NUMBER: 748810- 02150
GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE: SEE PG.1
TIME:
MEAS. FROM:

INSPECTOR: J. Chr Lewis
DRILLER: Ken Atwood
WEATHER: 80°F, Partly Cloudy
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 9/29/15 @ 0940
DATE/TIME FINISH: 9/29/15 @ 1020
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FTMM - 59-534
LOCATION DESCRIPTION: SEE PG.1
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"/60"	0.4	120"-147" Moist Olive-Brown-Red Mottled, Soft, Clay, Some F-M Sand		
				0.3			
11	FTMM-59-534-11.0-11.5			0.0	147"-180" Moist, Black, Soft, Clay, Little F Sand		
				0.0			
12				0.0			
				0.0			
13				0.0			
				0.0			
14				0.0			
				0.0			
15					15' EOB		
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 - RI
PROJECT LOCATION: FTMM - SS
PROJECT NUMBER: 748810- 02150

GROUNDWATER OBSERVATIONS
WATER LEVEL: N/A
DATE: N/A
TIME: N/A
MEAS. FROM: N/A

INSPECTOR: D. La Lewis
DRILLER: Ken Atwood
WEATHER: 81°F, Sunny
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 9/24/15 @ 1215
DATE/TIME FINISH: 9/24/15 @ 1310
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FTMM - SS - SB6
LOCATION DESCRIPTION: Next to Geoprobe location GW31
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"/55"	0.0	0"-15" Dry, Light Brown, Loose, F-C Sand, Little F-M Gravel, Little Silt		
			|	0.5			
1			|	0.6	15"-35" Moist, Light Gray, Loose, F Sand, Little Silt, Trace F Gravel		
			|	0.9			
2			|	0.0			
			V	0.1			
3			NR	—			
			NR	—			
4			NR	—			
			NR	—			
5			60"/24"	0.9	60"-73" Wet, Light Gray, Loose, F-C Gravel, Some F-C Sand, Trace Silt		
			|	15.6			
6			|	71.9			
			V	17.7	73"-84" Wet, Dark Gray, Dense, F-M Sand, Little Clay, Trace C Gravel		
7			NR	—			
			NR	—			
8			NR	—			
			NR	—			
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 - RI
PROJECT LOCATION: FTMM - 59
PROJECT NUMBER: 748810- 03150
GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE: SEE PG. 1
TIME:
MEAS. FROM:

INSPECTOR: Nick Lotzos
DRILLER: Ken Atwood
WEATHER: 61°F, Sunny
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 9/29/15 @ 1715
DATE/TIME FINISH: 9/29/15 @ 1310
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FTMM - 59-SB6
LOCATION DESCRIPTION: SEE PG.1
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"/48"	134	120"-137" Wet, Dark Gray, Loose F-M Sand, Little Silt, Little F-M Gravel, Petro Odor, Trace Staining		
			|	53.7			
11			|	47.8			
			|	76.5	137"-168" Wet, Olive Green, ~~Soft~~, Clay, Some F Sand, Petro Odor, Visible product		
12			|	58.4			
	FTMM-59-SB6-12.5-13.0		|	159			
13			|	90.3			
			V	15.7			
14			NR	—			
			NR	—			
15			60"/60"	3.6	180"-209" Wet, Olive Green, ~~Soft~~, Clay, Little F Sand		
			|	5.1			
16			|	2.0	209"-233" Wet, Dark Gray, Loose, F-M Sand, Little Organics, Little Clay		
			|	12.6			
17			|	3.1			
			|	2.7	233"-240" Wet, Black, Hard, Clay, Little Organics, Little F Sand	PEAT	
18			|	2.0			
			|	1.0			
19			|	1.1			
	FTMM-59-SB6-19.5-20.0		V	0.8			
20					20' EOB		

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 - RI
PROJECT LOCATION: FTMM - 59
PROJECT NUMBER: 748810- 03150

GROUNDWATER OBSERVATIONS
WATER LEVEL: 9.00
DATE: 9/29/15
TIME: 1310
MEAS. FROM: TOC

INSPECTOR: Nicholas Lotzo
DRILLER: Ken Atwood
WEATHER: 80°F, Sunny
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 9/29/15 @ 1035
DATE/TIME FINISH: 9/29/15 @ 1150
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FTMM - 59 - SB37
LOCATION DESCRIPTION: near Geoprobe boring GW31
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	0"-4" Dry, Dark Gray, Loose, F-M Sand, F-M Gravel, Little Silt		
				0.0	4"-38" Moist, Tan, Loose, F-M Sand, Little F Gravel		
1				0.0			
				0.0			
2				0.0	38"-37" Moist, Gray, Loose, F-C Sand, Trace Clay (Loose)		
				0.0			
3			NR	—			
			NR	—			
4			NR	—			
			NR	—			
5			60"/37"	0.3	60"-71" Wet, Light Gray, Loose, F-C Gravel, Some F-M Sand		
				0.5	71"-87" Wet, Olive Green, Soft, Clay, And F Sand, Trace Petro Staining		
6	FTMM-59-SB37-6.0-6.5			34.9			
				7.6			
7				2.0			
			NR	—			
8			NR	—			
			NR	—			
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 - RI
PROJECT LOCATION: FTMM - 59
PROJECT NUMBER: 748810- 07150
GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE: SEE PG.1
TIME:
MEAS. FROM:

INSPECTOR: Dick Lozos
DRILLER: Ken Atwood
WEATHER: 60's F, Sunny
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 9/29/15 @ 1035
DATE/TIME FINISH: 9/29/15 @ 1150
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FTMM - 59 - SB7
LOCATION DESCRIPTION: SEE PG.1
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"/59"	5.3	120'-159" Wet, Olive Green, Soft, Clay, And F Sand		
				7.0			
11				0.7			
				0.4			
12	FTMM-59-SB7-12.0-12.5			0.0			
				0.1			
13				0.0			
			NR	—			
14			NR	—			
			NR	—			
15					15" EOB.		
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 - RI
PROJECT LOCATION: FTMM - 59
PROJECT NUMBER: 748810- 02150

GROUNDWATER OBSERVATIONS
WATER LEVEL: 10.75
DATE: 9/30/15
TIME: 1420
MEAS. FROM: TOC

INSPECTOR: Dick Lotzer
DRILLER: Ken Atwood
WEATHER: 76°, Rain
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 9/30/15 @ 0825
DATE/TIME FINISH: 9/30/15 @ 0900
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FTMM - 59-50-1
LOCATION DESCRIPTION: South of Landing
FTMM-59-5536
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"/43"	0.0	0"-7" Moist, Light Brown, Loose, F-C Sand, Little Silt, Little F-M Gravel		
				6.1			
1				26.5	7"-43" Moist, Olive Green, Loose, F Sand, Little Clay		
				112			
2				130			
				101			
3				93.8			
			NR	—			
4			NR	—			
			NR	—			
5			60"/41"	81.7	60"-101" Moist, Olive-Green, Loose, F Sand, Some Clay		
				51.3			
6	FTMM-59-50-1-6.0-6.5			125			
				60.3			
7				55.0			
				14.3			
8				10.6			
			NR	—			
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 - RI
PROJECT LOCATION: FTMM - 59
PROJECT NUMBER: 748810- 62150
GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE: SEE PG.1
TIME:
MEAS. FROM:

INSPECTOR: Dick Lozos
DRILLER: Vern Atwood
WEATHER: 76°. Rain
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 9/30/15 @ 0805
DATE/TIME FINISH: 9/30/15 @ 0900
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FTMM - 59 - 50 - 1
LOCATION DESCRIPTION: SEE PG.1
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"	30.1	130"-155" Wet, Olive Green, Loose, F Sand, Little Clay		
				12.6			
11				7.1	155"-161" Wet, Dark Brown, Soft, Clay, Little F Sand, Little Organics		
				7.3			
12				4.8	161"-179" Wet, Olive Green, Loose, F Sand, Little Clay		
				1.9			
13				3.5			
				0.0			
14	FTMM-59-50-1-14.0-14.5			0.0			
			NR	—			
15					15' EOB		
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

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - RI
PROJECT LOCATION: FTMM - 59
PROJECT NUMBER: 748810-02:50

GROUNDWATER OBSERVATIONS
WATER LEVEL: N/A
DATE: N/A
TIME: N/A
MEAS. FROM: N/A

INSPECTOR: D. de Latour
DRILLER: Ken Atwood
WEATHER: 80° Overcast
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 9/30/15 @ 0940
DATE/TIME FINISH: 9/30/15 @ 1040
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FTMM - 59-SB-2
LOCATION DESCRIPTION: North of Landing FTMM-59-SB7
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	0"-36" Moist, Tan, Loose, F-C Sand, Little Silt, Little F-M Gravel		
				0.0			
1				0.0			
				0.0			
2				0.0			
			NR	—			
3			NR	—			
			NR	—			
4			NR	—			
			NR	—			
5			60"/35"	0.0	60"-73" Moist, Light Gray, Loose, F-C Sand, Little Clay, Trace F Gravel		
				0.0			
6				0.0	73"-83" Wet, Gray, Loose, F-C Gravel, Some F-C Sand		
				0.0			
7			NR	—			
			NR	—			
8			NR	—			
			NR	—			
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 - RI
PROJECT LOCATION: FTMM - 59
PROJECT NUMBER: 748810-02150
GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE: SEE PG.1
TIME:
MEAS. FROM:

INSPECTOR: D. du Lozos
DRILLER: Ken Atwood
WEATHER: 80's Overcast
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 9/30/15 @ 0940
DATE/TIME FINISH: 9/30/15 @ 1040
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FTMM - 59-SO-2
LOCATION DESCRIPTION: SEE PG.1
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"/30"	0.0	120"-150" wet, Olive Green, Loose, F Sand), little clay		Collect QA Split - MS/MSD for VOCs @ 10.5-11.0
	FTMM-59-SO-2-10.5-11.0			0.7			
1 1				0.3			
				0.0			Collect Dup for VOCs @ 10.5-13.0
1 2	FTMM-59-SO-2-10.5-13.0			0.0			
			NR	—			
1 3			NR	—			
			NR	—			
1 4			NR	—			
			NR	—			
1 5					15' EOB		
1 6							
1 7							
1 8							
1 9							
2 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

PARSONS

Soil Boring Log

CLIENT: USACE
PROJECT NAME: FTMM - RI
PROJECT LOCATION: FTMM - 59
PROJECT NUMBER: 748810- 0051-50

GROUNDWATER OBSERVATIONS
WATER LEVEL: N/A
DATE: N/A
TIME: N/A
MEAS. FROM: N/A

INSPECTOR: Nicki Lewis
DRILLER: Ken Atwood
WEATHER: 60°F, Rain
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 9/30/15 @ 1310
DATE/TIME FINISH: 9/30/15 @ 1500
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FTMM - 59-50-S
LOCATION DESCRIPTION: South of Boring FTMM-59-50-4 (Proposed) SE side of FTMM-59
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"/38"	15.8	0"-38" Dry, Light Brown, Loose, F-M Sand, Little Silt, Little organic, Trace F-M Gravel		
				5.7			
1				1.3			
				3.7			
2				3.4			
				0.0			
3				0.0			
			NR	—			
4			NR	—			
			NR	—			
5			60"/38"	1.0	60"-74" Moist, Orange-Green Mottled, Loose, F-M Sand, Trace silt, Trace Organics		
				0.0			
6				0.0	74"-98" Moist, Olive Green, Loose, F Sand, Some Clay		
				78.5			
7	FTMM-59-50-S-7.0-7.5			97.9			
				58.6			
8				11.3			
			NR	—			
9			NR	—			
			NR	—			
10							

Remarks: Boring moved 5' West of location marked on figure

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 - RI
PROJECT LOCATION: FTMM - 59
PROJECT NUMBER: 748810- 03150
GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE: SEE PG.1
TIME:
MEAS. FROM:

INSPECTOR: Nick Lozzos
DRILLER: Ken Atwood
WEATHER: 60's, Rain
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 9/30/15 @ 1210
DATE/TIME FINISH: 9/30/15 @ 1300
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FTMM - 59-SO-5
LOCATION DESCRIPTION: SEE PG.1
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"/60"	2.1	120"-174" Moist, Orange-Green Mottled, Soft, Clay, And F Sand,		
	FTMM-59-SO-5-10.5-11.0			4.3			
11				0.0	174"-180" Moist, Dark Grey, Loose, F-M Sand, Little Clay		
				0.0			
12				2.5			
				0.0			
13				0.6			
				0.0			
14				0.0			
	FTMM-59-SO-5-14.5-15.0			0.0			
15					15' EOB		
16							
17							
18							
19							
20							

Remarks: SEE PG.1

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 - RI
PROJECT LOCATION: FTMM - 59
PROJECT NUMBER: 748810- 03150

GROUNDWATER OBSERVATIONS
WATER LEVEL: N/A
DATE: N/A
TIME: N/A
MEAS. FROM:

INSPECTOR: Dick Leitzes
DRILLER: Ken Atwood
WEATHER: 80° F, Rain
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 9/30/15 @
DATE/TIME FINISH: 9/30/15 @
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FTMM - 59-50-10
LOCATION DESCRIPTION: Service Bay #10 Hydraulic Lift
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"/35"	0.0	0'-3.5" Moist, Light Brown, Loose, F-M Sand, Little Silt, Little F-M Gravel		
				0.0			
1				0.0			
				0.0			
2				0.0			
				0.0			
3				0.0			
			NR	—			
4			NR	—			
			NR	—			
5			60"/60"	0.0	6.0'-7.5" Moist, Orange-Green Mottled, Loose, F Sand, Some Clay		
	FTMM-59-10-5.5-6.0			0.0			
6				0.0	7.5'-10.0' Moist, Olive Green, Soft, Clay, Some F Sand		
				0.0			
7				0.0			
				0.0			
8				0.0			
				0.0			
9				0.0			
				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 - RI
PROJECT LOCATION: FTMM - 69
PROJECT NUMBER: 748810- 02150
GROUNDWATER OBSERVATIONS
WATER LEVEL:
DATE: SEE PG.1
TIME:
MEAS. FROM:

INSPECTOR: Dick Leitzes
DRILLER: Ken Atwood
WEATHER: 80°F, Rain
CONTRACTOR: East Coast Drilling, Inc. (ECDI)
RIG TYPE: Geoprobe(R) 7822DT
DATE/TIME START: 9/30/15 @
DATE/TIME FINISH: 9/30/15 @
WEIGHT OF HAMMER: N/A
DROP OF HAMMER: N/A
TYPE OF HAMMER: N/A

BORING/WELL ID: FTMM - 59-50-10
LOCATION DESCRIPTION: SEE PG.1
LOCATION PLAN: Oceanport, New Jersey

DEPTH (feet)	SAMPLE I.D.	BLOWS per 6"	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10	FTMM-59-50-10-10.0-10.5		60"/60"	0.0	120"-153" Light, Olive Green - Orange Mottled, Soft, Clay, Some F Sand		
				0.0			
11				0.0			
				0.0	153"-180" Med, Black, Soft, Clay, Little F Sand		
12				0.0			
				0.0			
13				0.0			
				0.0			
14				0.0			
				0.0			
15					15' EOB		
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

APPENDIX C
ANALYTICAL DATA

(Appendix C is also included separately on the CD of this report)

APPENDIX D
FTMM-59 REMEDIAL ACTION COMPLETION REPORT (RACR)

REMEDIAL ACTION COMPLETION REPORT FOR FTMM-59

FORT MONMOUTH, OCEANPORT, MONMOUTH COUNTY, NEW JERSEY

BRAC 05 Facility
Contract W912DY-09-D-0062
Task Order: 0018

Submitted To:

U.S. Corps of Engineers, New York District

and

U.S. Army Engineering and Support Center

Huntsville, Alabama



Prepared By:

PARSONS

401 Diamond Dr. NW, Huntsville, AL 35806

March 2020

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Figure 1 – FTMM-59 Site Location

Figure 2 – FTMM-59 Excavation Limits and 2019 Sampling Locations

Figure 3 – FTMM-59 Former Hydraulic Lifts Excavation Limits and 2019 Sampling Locations

Tables

Table 1 – Summary of Post-Excavation Confirmation Samples and Analyses

Table 2 - Soil Sampling Results – Comparison to NJDEP Soil Remediation Standards

Appendices

A – Photographs

B – Waste Disposal Documentation

C – Backfill Certification

D – Laboratory Analytical Reports

E – FTMM-59 Bay 9-10 EPH Calculator

1.0 OVERVIEW

This Remedial Action Completion Report (RACR) summarizes the remedial activities performed at former Fort Monmouth (FTMM) Installation Restoration Program (IRP) Site FTMM-59 (referred to herein as "FTMM-59"). The remedial action was implemented under the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§ 9601 et seq., as amended ("CERCLA"). This report was prepared in accordance with the New Jersey Administrative Code (N.J.A.C.) 7:26E Technical Requirements for Site Remediation (TRSR) since the release identified at FTMM-59 was comprised of petroleum hydrocarbons, which are excluded under CERCLA.

The removal of contaminated soils was completed in accordance with the Remedial Action Workplan (RAWP) for FTMM-59 (Parsons, 2019). NJDEP concurred with the proposed removal action (letter dated 12 April 2019). This RACR documents the removal of the contaminated soil as proposed in the RAWP. As described in this RACR, the selected remedial action for soil is complete and post-excavation sample results confirm that the site meets the requirements for unrestricted use, including the NJDEP residential and impact-to-groundwater soil cleanup standards. Based on the confirmatory sampling results, there is no remaining unacceptable risk associated with soil, and no further action is required for soil.

The Army is the lead agency for Fort Monmouth under CERCLA, its implementing regulations, the National Contingency Plan at 40 CFR Part 300 ("NCP"), and Executive Order 12580, and is responsible for selecting the final response action for FTMM-59. NJDEP is the state support agency under CERCLA and the NCP (40 CFR 300.500). This RACR was prepared in accordance with CERCLA, meets the requirements of N.J.A.C. 7:26E-5.7, and includes the following sections:

- 1.0 – Overview
- 2.0 – Remedial Actions Completed
- 3.0 – Remediation Standards Achieved
- 4.0 – Clean Fill Documentation
- 5.0 – Restoration Activities
- 6.0 – Certification Statement and
- 7.0 - References

1.1 Site Description and History

FTMM-59 is located in the southwestern portion of former FTMM's Main Post (**Figure 1**) and encompasses former Building 1122, the surrounding parking lot, and two former storage sheds. Building 1122 housed a modern "do-it-yourself" auto repair shop for Installation personnel. The construction date of the building is not known. Building 1122, the chemical storage shed, and the

paint booth/shed were demolished in June 2014. The building's foundation slab, two underground hydraulic lifts located within the footprint of the former building and associated hydraulic lift fluid storage tanks were also removed in 2014 (a third hydraulic lift was previously removed in 1995). The sanitary sewer and water services were cut and capped as part of the demolition of the building. Additional site description and history are described in the RAWP (Parsons, 2019).

Fort Monmouth was selected for closure by the Base Realignment and Closure (BRAC) Commission in 2005, and officially closed on 15 September 2011. The anticipated future land use at FTMM-59 according to the Fort Monmouth Economic Redevelopment Authority (FMERA, 2019) includes mixed-use, office, and institutional development with "civic uses."

1.2 Previous Investigations, Soil Removals, and Decision Document

Multiple phases of investigations and soil removals were previously conducted at FTMM-59. As described in the RAWP (Parsons, 2019), exceedances of the current (2017) NJDEP comparison criteria were encountered in the following three general areas during the previous soil investigations. Please note, throughout this report, the current comparison criteria in effect at the time this document was prepared were the NJDEP's 2017 Residential Direct Contact Soil Remediation Standards (RDCSRS).

Fuel-Contaminated Area

Soil removal was conducted at a fuel-contaminated area north of Building 1122 and south of Mill Creek in 1995. Approximately 3,000 cubic yards of soil were excavated and disposed of off-site. Additional soil investigations were conducted in this area in 2004 and 2015. The 2015 results exceeded the 2017 NJDEP RDCSRS of 6 mg/kg for naphthalene at soil boring FTMM59-SO-1 (54 mg/kg from 6-6.5 feet below ground surface [ft bgs]) and FTMM59-SO-5 (7.2 mg/kg from 7-7.5 ft bgs). Therefore, soil removal from these two areas was included in the RAWP (Parsons, 2019).

Chemical and Paint Booth Sheds

In May 2010, soil samples were collected from six soil borings adjacent to the now-demolished chemical and paint booth sheds. The results exceeded the 2017 NJDEP RDCSRS and/or the Impact to Ground Water Soil Screening Levels (IGW SSLs) for lead and/or the polynuclear aromatic hydrocarbons (PAHs) benzo(a)pyrene and benzo(b)fluoranthene in surface soils (0-0.5 ft bgs) at four locations. Therefore, soil removal from these four areas was included in the RAWP (Parsons, 2019).

Service Bays 9 and 10 Hydraulic Lifts

In 2014, soil samples were collected in the area of the hydraulics lifts located in Bay 9 and Bay 10 after the lifts were removed during building demolition. Elevated EPH concentrations were encountered in soils from the former Service Bay 9 and Bay 10 areas. However, calculation of sample-specific health-based EPH Site Remediation Criteria (SRC) for these results was not possible due to the analysis of different petroleum fractions than required by NJDEP (2010)

guidance. Removal of soil from one combined soil excavation area at the former Bay 9 and 10 locations was included in the RAWP (Parsons, 2019) to address the elevated EPH concentrations.

2.0 REMEDIAL ACTIONS COMPLETED IN 2019

The remedial actions conducted at FTMM-59 in 2019 were performed by Parsons Government Services (Parsons) with subcontractor support from AWT Environmental Services, Inc. (AWT) of Sayreville, New Jersey. Excavation and stockpiling of the contaminated soil were performed between 15 and 17 April 2019; backfilling of the excavations was performed on 20 and 21 May 2019; and off-site disposal of the excavated soil was performed on 14 August 2019.

The 2019 remedial actions conducted at FTMM-59 consisted of the following:

- Located and marked out the excavation areas.
- Initiated a New Jersey One Call Ticket for the location of the underground utilities.
- Placement of trench boxes in the following excavated areas that were expected to encounter groundwater (which was encountered at approximately 3.5 to 4 ft bgs):
    - Two 6-ft by 6-ft trench boxes at the FTMM59-SO-1 and FTMM59-SO-5 excavation areas, respectively; and
    - Two adjoining 10-ft by 10-ft trench boxes at the Bays 9 and 10 former hydraulic lifts excavation area.
- All excavated contaminated soil was placed on plastic and covered with plastic.
- Collection of post-excavation confirmation soil samples from the bottom of all excavations; confirmation samples were also collected from the sides of the excavation at the former Bays 9 and 10 excavation area (**Table 1**).
- Collection of soil samples from the soil stockpiles for waste characterization analysis based on the disposal facility requirements.
- Loading, transportation and offsite disposal of the stockpiled soil.
- Backfilling of the excavation with certified clean imported fill.

Soil excavated from the four areas near the chemical and paint booth sheds was stockpiled into two separate piles: one stockpile for the highest lead concentration (FTMM-59-SHED1/B3) and one stockpile for the other excavation areas (FTMM-59-SHED1/B1, FTMM-59-SHED1/B2 and FTMM-59-SHED2/B3). Each of the four resulting excavation areas were approximately 4 ft wide by 4 ft long and 1.5 ft deep.

Petroleum odors were reported in the soil removed from a depth of about 2.5 ft bgs north of former Building 1122 near soil boring FTMM59-SO-1. PID readings from soil at the FTMM59-SO-1 location were elevated (7 to 70 ppm) with the highest reading around 7 ft bgs. The resulting excavation at FTMM59-SO-1 was approximately 6 ft wide by 6 ft long and 10 ft deep. FTMM59-SO-5 also was located north of former Building 1122 and had elevated PID readings (8 to 44 ppm) and petroleum odors noted at around 8.5 ft bgs. The resulting excavation was approximately 6 ft wide by 6 ft long and 10.5 ft deep. The soil removed from both areas was placed in a combined stockpile.

At the Bays 9 and 10 former hydraulic lifts, the field team excavated to 2 ft bgs and encountered a steel tank approximately 5 ft by 1.2 ft in diameter. The tank was examined and found to be in good condition. The tank may have been a hydraulic fluid reservoir associated with the former lifts. There were no holes and no oil or liquid in the tank, so the tank was removed, and excavation continued. The final soil excavation was approximately 10 ft wide by 22 ft long, and approximately 8 ft deep on the west end and 9 ft deep on the east end.

Each of the excavations were backfilled with ¾-inch clean crushed stone. Composite samples were collected from the soil stockpiles for waste classification.

The locations of the excavation areas, the excavation dimensions, and location of the post confirmation samples are shown on **Figure 2** and **Figure 3.** Site photographs that show the extent of soil removal are included in **Appendix A**. Waste disposal documentation is provided in **Appendix B**, and backfill certification is provided in **Appendix C**. Laboratory analytical reports are provided in **Appendix D**.

A total of approximately 150 tons of impacted soil was excavated. The material was disposed off-site on 14 August 2019 at the Cumberland County Landfill near Shippensburg, Pennsylvania; waste disposal documentation is provided in **Appendix B**.

3.0 REMEDIATION STANDARDS ACHIEVED

NJDEP's soil remediation standards under the NJAC 7:26E TRSR include the RDCSRS and the IGW SSLs. Post-excavation confirmation soil samples were analyzed for lead (EPA Method 6010C); select PAHs (EPA Method 8270D) and naphthalene (EPA Method 8270D); and EPH (NJDEP method) (see **Table 1** for specific analyses for each excavation area). These post-excavation confirmation soil samples were collected from the bottom of each of the excavations; confirmation samples were also collected from the sides of the excavation at the former Bays 9 and 10 excavation area.

Table 1 Summary of Post-Excavation Confirmation Samples and Analyses

Excavation Area ID	COC[1/]	Post Excavation Analysis
Former Chemical/Paint Booth Sheds		
FTMM59-Shed1/B1	Metals (lead)	Metals (lead)
FTMM59-Shed1/B2	Metals (lead)	Metals (lead)
FTMM59-Shed1/B3	PAH (Benzo(a) pyrene) and Metals (lead)	PAH (Benzo(a) pyrene) and Metals (lead)
FTMM59-Shed2/B3	PAH (Benzo(a) pyrene and benzo(b)fluoranthene)	PAH (Benzo(a) pyrene and benzo(b)fluoranthene)
Fuel-Contaminated Area		
FTMM59-SO1	Naphthalene (VOC) and EPH	Naphthalene (VOC) and EPH

FTMM59-SO5	Naphthalene (VOC) and EPH	Naphthalene (VOC) and EPH
Former Hydraulic Lifts		
Bays 9 and 10	EPH	EPH

A total of 19 post-excavation confirmation soil samples were collected at various depths at the seven excavations. As shown on **Table 2**, all of the post-excavation confirmation soil sample results met the NJDEP RDCSRS and the IGWSSL for unrestricted use. EPH concentrations exceeded the lowest possible NJDEP health-based remediation criteria of 1,700 mg/kg in two samples, and therefore site-specific EPH SRCs were derived using the NJDEP spreadsheet calculator (**Appendix E**); all EPH results were less than the respective SRC. Based on these results, soil remediation is complete and the soils at FTMM-59 meet the standards for unrestricted use.

4.0 CLEAN FILL DOCUMENTATION

Certified clean backfill was imported to and placed in the excavations to replace the excavated soil. The excavations were backfilled in compacted lifts, as described in Section 5.0 below. Imported backfill certification is provided in **Appendix C**.

5.0 RESTORATION ACTIVITIES

Site restoration and maintenance measures were completed following remediation activities pursuant to N.J.A.C 7:26E. Site restoration activities included restoring the site and surrounding areas to their original conditions, without the establishment of vegetation. The excavations were backfilled in compacted lifts with ¾-inch clean crushed stone from the bottom (which varied from approximately 1.5 to 9 ft at the various excavation areas) up to surface grade.

6.0 CERTIFICATION STATEMENT

Under penalty of law, I certify that to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of this RACR, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

William R Colvin

William R. Colvin
BRAC Environmental Coordinator
U.S. Army Fort Monmouth

5 March 2020
Date

7.0 REFERENCES

Fort Monmouth Economic Revitalization Authority (FMERA), 2019. E-mail from Joseph Fallon to William Colvin; re: Future Land Use at FTMM-59. July 9.

New Jersey (State of), Technical Requirements for Site Remediation, New Jersey Administrative Code, N.J.A.C. 7:26E.

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

Parsons, 2019. *Final Remedial Action Work Plan for Site FTMM-59, Fort Monmouth, Oceanport, Monmouth County, New Jersey.* Submitted to U.S. Army Engineering and Support Center, Huntsville, AL. March.

Figures

Little Silver Borough

Shrewsbury Borough

Parkers Creek

North Branch Parkers Creek

Parkers Creek

Oceanport Borough

Oceanport Creek

Oceanport Borough

Tinton Falls Borough

Lafetra Creek

Husky Brook (Culvert)

Mill Creek

FTMM-59
(Building 1122, -
Former Auto Hobby Shop)

Wampum Lake

Eatontown Borough

Eatontown Borough

Wampum Brook

Husky Brook

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\FTMM-59\RAWP\FIGURE 1.mxd

LEGEND:

- Surface Water Feature
- Municipal Boundary
- Installation Boundary



N

1 inch = 1,000 feet

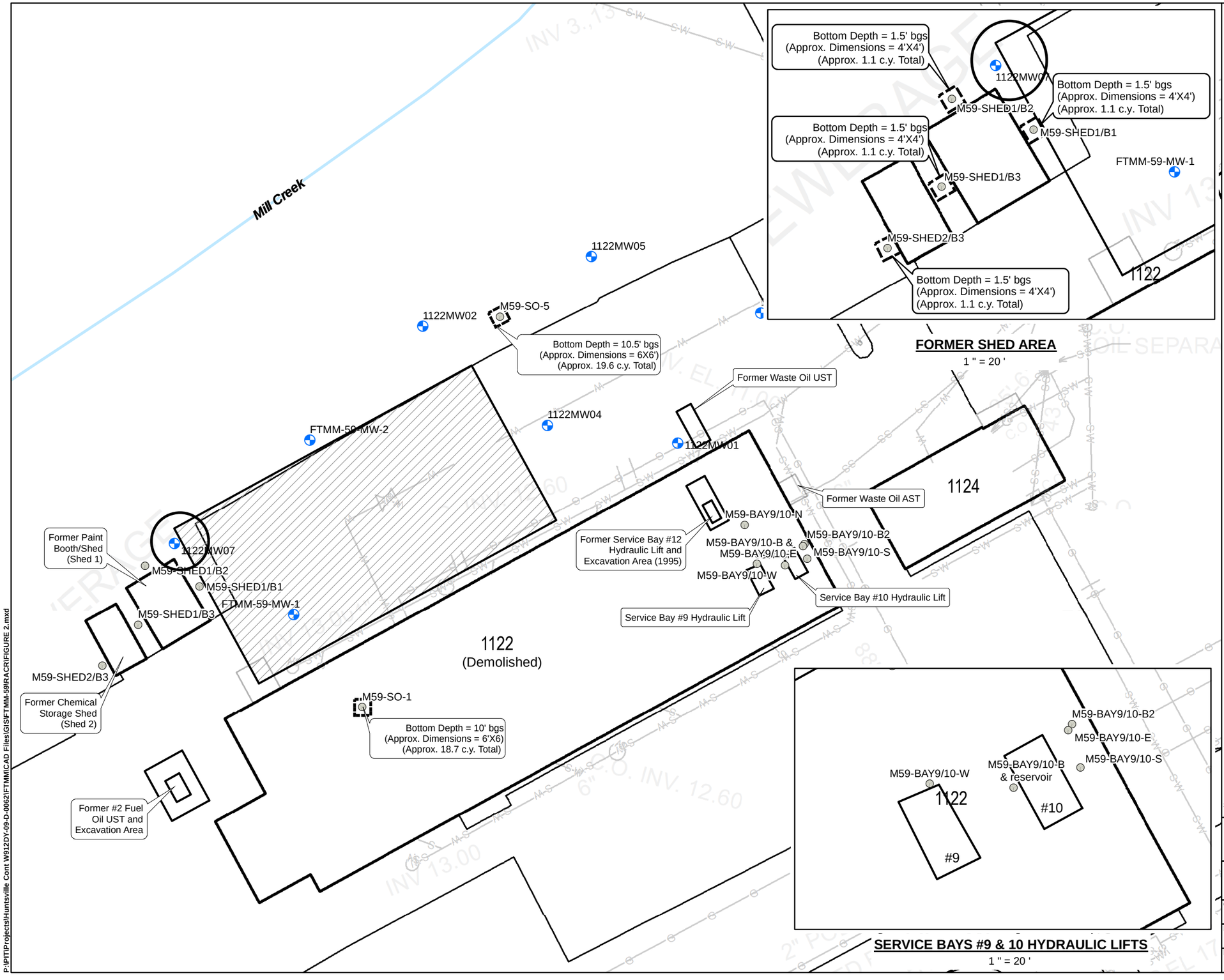
0 500 1,000 2,000 Feet

Source: Bing Maps online imagery; ESRI Data and Maps 2011; USGS NHD.

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

RAWP-FTMM59 SITE LOCATION

CREATED BY: RR	REVIEWED BY: KW
DATE: JAN. 2019	FIGURE NUMBER: FIGURE 1
PROJECT NUMBER: 110015-02000	FILE: FIGURE 1.mxd



LEGEND:

- 2019 Post-Excavation Sampling Location
- Shallow Monitoring Well
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Surface Water Feature
- January 1995 Excavation
- April-May 1995 Excavation
- April 2019 Excavation Area

NOTES:

1. Compounds were compared to the NJDEP Residential Direct Contact Soil Remediation Standard (RDCSRS).
2. See Figure 3 for the excavation locations proposed for Service Bays #9 and #10.
3. See Figure 3 for boring M59-BAY9/10-N location.

N

1 inch = 30 feet

0 15 30 60 Feet

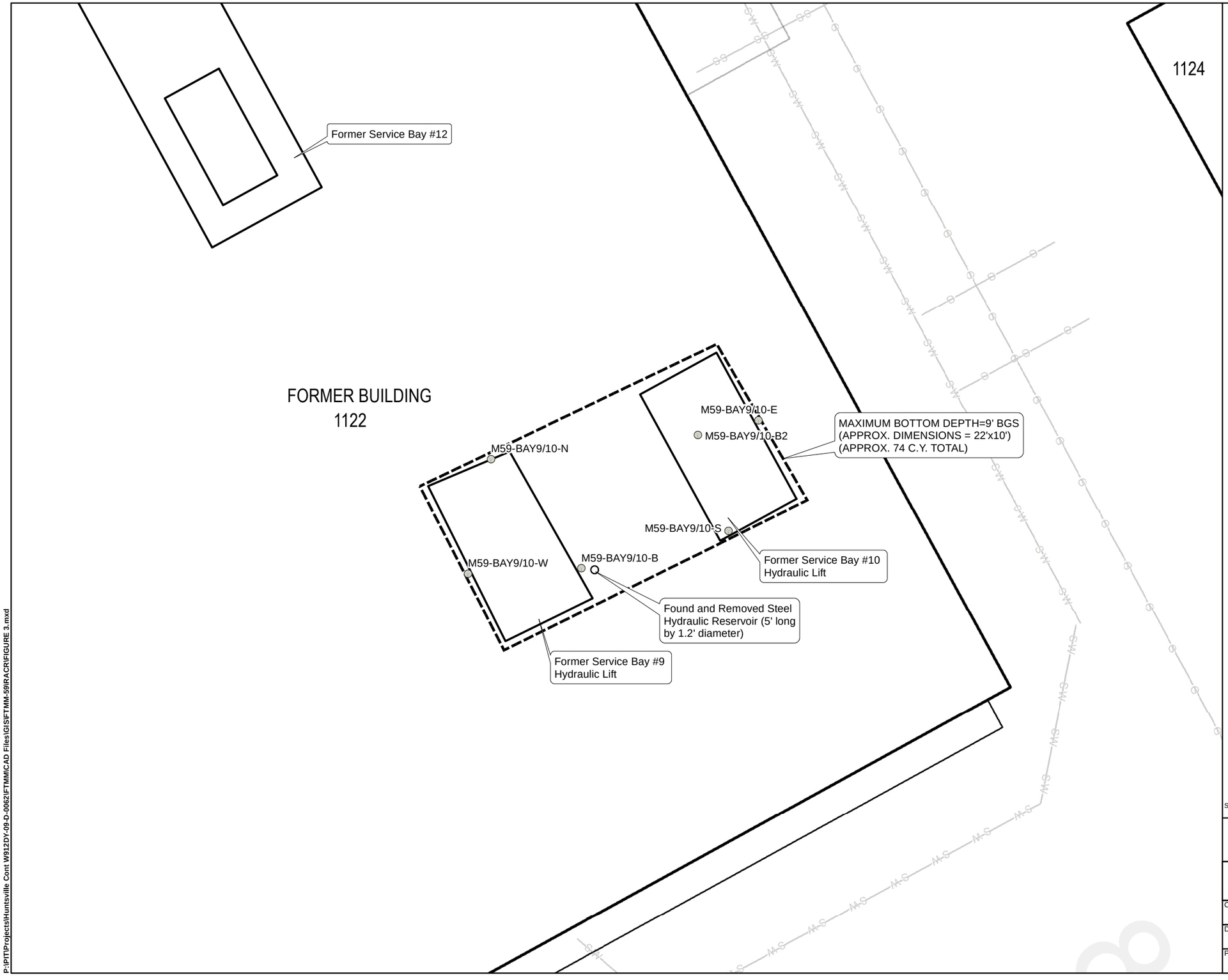
Source: FTMM Supplied CAD

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

FTMM-59 EXCAVATION LIMITS AND 2019 SAMPLING LOCATIONS

CREATED BY: RR	REVIEWED BY: CG
DATE: JUN. 2019	FIGURE NUMBER: FIGURE 2
PROJECT NUMBER: 110015-02000	FILE: FIGURE 2.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\FTMM-59\RACRIP\FIGURE 2.mxd



LEGEND:

- 2019 Post-Excavation Sampling Location
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Surface Water Feature
- April 2019 Excavation Area

N

1 inch = 5 feet

0 2.5 5 10 Feet

Source: FTMM Supplied CAD

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

FTMM-59 FORMER HYDRAULIC LIFTS EXCAVATION LIMITS AND 2019 SAMPLING LOCATIONS

CREATED BY: RR	REVIEWED BY: CG
DATE: JUL. 2019	FIGURE NUMBER: FIGURE 3
PROJECT NUMBER: 110015-02000	FILE: FIGURE 3.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\FTMM-59\RACR\FIGURE 3.mxd

Tables

TABLE 2
SOIL SAMPLING RESULTS - COMPARISON TO NJDEP Soil Remediation Standards
SITE FTMM59 - Bldg. 1122
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Residential Direct Contact SRS	NJ Non-Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	M59-BAY9/10-B	M59-BAY9/10-B2	M59-BAY9/10-E		M59-BAY9/10-N		M59-BAY9/10-S
Sample ID				M59-BAY9/10-B 8.0-8.5	M59-BAY9/10-B2-9.0-9.5	M59-BAY9/10-E-7.0-7.5	M59-BAY9/10-E-8.5-9.0	M59-BAY9/10-N-5.5-6.0	M59-BAY9/10-N-7.5-8.0	M59-BAY9/10-S-6.5-7.0
Sample Date				4/16/2019	4/16/2019	4/16/2019	4/16/2019	4/16/2019	4/16/2019	4/16/2019
Semivolatile Organic Compounds (mg/kg)										
Acenaphthene	3,400	37,000	110	NA	NA	NA	NA	NA	NA	< 0.0076
Acenaphthylene	NLE	300,000	NLE	NA	NA	NA	NA	NA	NA	< 0.0089
Anthracene	17,000	30,000	2,400	NA	NA	NA	NA	NA	NA	< 0.01
Benzo(a)anthracene	5	17	0.8	NA	NA	NA	NA	NA	NA	< 0.0063
Benzo(a)pyrene	0.5	2	0.2	NA	NA	NA	NA	NA	NA	< 0.0051
Benzo(b)fluoranthene	5	17	2	NA	NA	NA	NA	NA	NA	< 0.0063
Benzo(ghi)perylene	380,000	30,000	NLE	NA	NA	NA	NA	NA	NA	< 0.0063
Benzo(k)fluoranthene	45	170	25	NA	NA	NA	NA	NA	NA	< 0.0063
Chrysene	450	1,700	80	NA	NA	NA	NA	NA	NA	< 0.0063
Dibenz(a,h)anthracene	0.5	2	0.8	NA	NA	NA	NA	NA	NA	< 0.0076
Fluoranthene	2,300	24,000	1,300	NA	NA	NA	NA	NA	NA	< 0.0063
Fluorene	2,300	24,000	170	NA	NA	NA	NA	NA	NA	**0.037 J**
Indeno(1,2,3-cd)pyrene	5	17	7	NA	NA	NA	NA	NA	NA	< 0.0089
Naphthalene	6	17	25	NA	NA	NA	NA	NA	NA	< 0.0076
Phenanthrene	NLE	300,000	NLE	NA	NA	NA	NA	NA	NA	**0.093 J**
Pyrene	1,700	18,000	840	NA	NA	NA	NA	NA	NA	**0.034 J**
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)										
C10-C12 Aromatics	NLE	NLE	NLE	**0.76 J**	**0.6 J**	**0.88 J**	< 0.58	**0.77 J**	**0.8 J**	**0.65 J**
C12-C16 Aliphatics	NLE	NLE	NLE	**17.3**	**0.75 J**	**12.1 J-**	< 0.55	< 0.5	< 0.49 UJ	**16.9 J-**
C12-C16 Aromatics	NLE	NLE	NLE	**1.7**	**0.93 J**	**0.95 J**	**0.41 JB**	**0.75 J**	**0.94 J**	**1.5**
C16-C21 Aliphatics	NLE	NLE	NLE	**203**	**0.62 J**	**124**	**0.58 J**	< 0.49	**0.7 J**	**232**
C16-C21 Aromatics	NLE	NLE	NLE	**45.1**	**0.39 J**	**34.3**	**0.3 J**	**0.31 J**	**0.26 J**	**71.9**
C21-C36 Aromatics	NLE	NLE	NLE	**130**	**0.59 J**	**107**	**0.51 J**	**0.54 J**	**0.38 J**	**173**
C21-C40 Aliphatics	NLE	NLE	NLE	**990 J+**	**0.75 JB**	**858 J+**	**3.6 JB**	**1 JB**	**7.2 J**	**1,370 J+**
C9-C12 Aliphatics	NLE	NLE	NLE	**1.7**	**1.6 J-**	**0.66 J**	**0.61 J**	**0.49 J**	**0.59 J**	**0.82 J**
Total Aliphatics	NLE	NLE	NLE	**1,210**	**3.7 J**	**995 J-**	**5.1**	**2.1 J**	**8.9 J-**	**1,620 J-**
Total Aromatics	NLE	NLE	NLE	**178**	**2.5 J**	**143**	**1.6 J**	**2.4 J**	**2.4 J**	**247**
Total EPH	SS	SS	SS	**1,390**	**6.2 J**	**1,140**	**6.8 J**	**4.5 J**	**11.3**	**1,870**
Inorganics (mg/kg)										
Lead	400	800	90	NA	NA	NA	NA	NA	NA	NA

TABLE 2
SOIL SAMPLING RESULTS - COMPARISON TO NJDEP Soil Remediation Standards
SITE FTMM59 - Bldg. 1122
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Residential Direct Contact SRS	NJ Non-Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	M59-BAY9/10-S	M59-BAY9/10-W		M59-SHED1/B1-B		M59-SHED1/B2-B
Sample ID				M59-BAY9/10-S-8.5-9.0	M59-BAY9/10-W-5.5-6.0	M59-BAY9/10-W-8.0-8.5	M59-SHED1/B1-B-1.5-2.0	M59-SHED1/B1-B-1.5-2.0-DUP	M59-SHED1/B2-B-1.5-2.0
Sample Date				4/16/2019	4/16/2019	4/16/2019	4/15/2019	4/15/2019	4/15/2019
Semivolatile Organic Compounds (mg/kg)									
Acenaphthene	3,400	37,000	110	NA	NA	< 0.0073	NA	NA	NA
Acenaphthylene	NLE	300,000	NLE	NA	NA	< 0.0085	NA	NA	NA
Anthracene	17,000	30,000	2,400	NA	NA	< 0.0097	NA	NA	NA
Benzo(a)anthracene	5	17	0.8	NA	NA	< 0.0061	NA	NA	NA
Benzo(a)pyrene	0.5	2	0.2	NA	NA	< 0.0049	NA	NA	NA
Benzo(b)fluoranthene	5	17	2	NA	NA	< 0.0061	NA	NA	NA
Benzo(ghi)perylene	380,000	30,000	NLE	NA	NA	< 0.0061	NA	NA	NA
Benzo(k)fluoranthene	45	170	25	NA	NA	< 0.0061	NA	NA	NA
Chrysene	450	1,700	80	NA	NA	**0.02 J**	NA	NA	NA
Dibenz(a,h)anthracene	0.5	2	0.8	NA	NA	< 0.0073	NA	NA	NA
Fluoranthene	2,300	24,000	1,300	NA	NA	< 0.0061	NA	NA	NA
Fluorene	2,300	24,000	170	NA	NA	< 0.0073	NA	NA	NA
Indeno(1,2,3-cd)pyrene	5	17	7	NA	NA	< 0.0085	NA	NA	NA
Naphthalene	6	17	25	NA	NA	< 0.0073	NA	NA	NA
Phenanthrene	NLE	300,000	NLE	NA	NA	< 0.0061	NA	NA	NA
Pyrene	1,700	18,000	840	NA	NA	< 0.0061	NA	NA	NA
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)									
C10-C12 Aromatics	NLE	NLE	NLE	< 0.57	< 0.55	**0.56 J**	NA	NA	NA
C12-C16 Aliphatics	NLE	NLE	NLE	**9.8 J-**	**0.61 J**	**74.4**	NA	NA	NA
C12-C16 Aromatics	NLE	NLE	NLE	**0.99 J**	**0.48 JB**	**2.2**	NA	NA	NA
C16-C21 Aliphatics	NLE	NLE	NLE	**99.6**	< 0.51	**381**	NA	NA	NA
C16-C21 Aromatics	NLE	NLE	NLE	**37.2**	**0.24 J**	**190**	NA	NA	NA
C21-C36 Aromatics	NLE	NLE	NLE	**69.8**	**0.49 J**	**726**	NA	NA	NA
C21-C40 Aliphatics	NLE	NLE	NLE	**757 J+**	**2.1 JB**	**3,590 J+**	NA	NA	NA
C9-C12 Aliphatics	NLE	NLE	NLE	**1.2 J**	**0.93 J**	**3**	NA	NA	NA
Total Aliphatics	NLE	NLE	NLE	**867 J-**	**4.2 J**	**4,050**	NA	NA	NA
Total Aromatics	NLE	NLE	NLE	**109**	**1.7 J**	**919**	NA	NA	NA
Total EPH	SS	SS	SS	**976**	**5.9 J**	**4,970**	NA	NA	NA
Inorganics (mg/kg)									
Lead	400	800	90	NA	NA	NA	**4.9**	**8.5**	**6.7**

TABLE 2
SOIL SAMPLING RESULTS - COMPARISON TO NJDEP Soil Remediation Standards
SITE FTMM59 - Bldg. 1122
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Residential Direct Contact SRS	NJ Non-Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	M59-SHED1/B3-B		M59-SHED2/B3-B	M59-SO-1B		M59-SO-5B
Sample ID				M59-SHED1/B3-B-1.5-2.0	M59-SHED1/B3-B-1.5-2.0-DUP	M59-SHED2/B3-B-1.5-2.0	M59-SO-1-B-10.0-10.5	M59-SO-1-B-10.0-10.5-DUP	M59-SO-5-B 10.0-10.5
Sample Date				4/15/2019	4/15/2019	4/15/2019	4/16/2019	4/16/2019	4/15/2019
Semivolatile Organic Compounds (mg/kg)									
Acenaphthene	3,400	37,000	110	NA	NA	NA	NA	NA	NA
Acenaphthylene	NLE	300,000	NLE	NA	NA	NA	NA	NA	NA
Anthracene	17,000	30,000	2,400	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	5	17	0.8	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.5	2	0.2	< 0.0044	< 0.0044	< 0.0044	NA	NA	NA
Benzo(b)fluoranthene	5	17	2	NA	< 0.0054	< 0.0055	NA	NA	NA
Benzo(ghi)perylene	380,000	30,000	NLE	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	45	170	25	NA	NA	NA	NA	NA	NA
Chrysene	450	1,700	80	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	0.5	2	0.8	NA	NA	NA	NA	NA	NA
Fluoranthene	2,300	24,000	1,300	NA	NA	NA	NA	NA	NA
Fluorene	2,300	24,000	170	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	5	17	7	NA	NA	NA	NA	NA	NA
Naphthalene	6	17	25	NA	NA	NA	**2.1**	**2.8**	< 0.0081
Phenanthrene	NLE	300,000	NLE	NA	NA	NA	NA	NA	NA
Pyrene	1,700	18,000	840	NA	NA	NA	NA	NA	NA
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)									
C10-C12 Aromatics	NLE	NLE	NLE	NA	NA	NA	**3.3**	**5.1**	**2.3**
C12-C16 Aliphatics	NLE	NLE	NLE	NA	NA	NA	**0.64 JB**	< 0.54 UJ	**280**
C12-C16 Aromatics	NLE	NLE	NLE	NA	NA	NA	**4.4 J**	**23.9 J**	**78**
C16-C21 Aliphatics	NLE	NLE	NLE	NA	NA	NA	< 0.53 UJ	< 0.53 UJ	**172**
C16-C21 Aromatics	NLE	NLE	NLE	NA	NA	NA	**1.3 J**	**4.9 J**	**195**
C21-C36 Aromatics	NLE	NLE	NLE	NA	NA	NA	**2.1**	**3.3**	**30.5**
C21-C40 Aliphatics	NLE	NLE	NLE	NA	NA	NA	**0.74 JB**	**0.69 JB**	**32.2 J**
C9-C12 Aliphatics	NLE	NLE	NLE	NA	NA	NA	**1 JB**	**0.7 JB**	**46.2**
Total Aliphatics	NLE	NLE	NLE	NA	NA	NA	**2.9 J**	**2 J**	**530 J-**
Total Aromatics	NLE	NLE	NLE	NA	NA	NA	**11.1 J**	**37.2 J**	**306**
Total EPH	SS	SS	SS	NA	NA	NA	**14 J**	**39.2 J**	**836**
Inorganics (mg/kg)									
Lead	400	800	90	**7.7**	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 Residential Direct Contact Soil Remediation Standard. ####

There are no NJDEP soil standards for individual PCB Aroclors, therefore the total PCB NJDEP standards were used for individual Aroclors.

- Cell Shade values represent a result that is above the NJ 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. ###

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

10) Criteria action level source document and web address.

- The NJ Residential Direct Contact Soil Remediation Standard refers to the NJDEP's Sept 18, 2017 Remediation Standards

http://www.nj.gov/dep/rules/rules/njac7_26d.pdf

- The NJ Non-Residential Direct Contact Soil Remediation Standard refers to the NJDEP's Sept 18, 2017 Remediation Standards

http://www.nj.gov/dep/rules/rules/njac7_26d.pdf

- 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

Appendix A

Photographs



FTMM-59 Bay 9/10



FTMM-59 Bay 9/10 trench Box



FTMM-59 Bay 9/10 Reservoir



FTMM-59 Bay 9/10 reservoir Piping



FTMM-59 Bay 9/10 Trench Box



FTMM-59 Shed 1



FTMM-59 Shed 1/B1



FTMM-59 Shed 1/B2



FTMM-53 Shed 1/B3



FTMM-59 Shed 2/B3

Appendix B

Waste Disposal Documentation

CUMBERLAND COUNTY LANDFILL
620 NEWVILLE ROAD
NEWBURG, PA 17240
7174239953

001771
AWT ENVIRONMENTAL SERVICES, INC.
PO Box 128
SAYREVILLE, NJ 08871

INVOICE
INBOUND

SITE	CELL	TICKET #	OPERATOR
K3		**299304**	ABLACK

TRUCK	CONTAINER	LICENSE
HOR243		NJ AN310A

REFERENCE	IN	OUT
EC#1948243	8/14/19 11:29 am	8/14/19 12:10 pm

CONTRACT: EC#1948243 US ARMY FT MONMOUTH
BOL: 15354-1

GROSS 72,280.00 LBS Scale In
TARE 26,120.00 LBS Scale Out
NET 46,160.00 LBS

QTY	UNIT	DESCRIPTION	ORIGIN	%	RATE	TAX	TOTAL
23.08	TN	X:ADC CONTAM SOIL RESID	New Jersey	100.00			

AVIS BLACK 61934

Tax Total
Total
Paid
Change
Check#
Recpt #

ligh visibility ANSI 2 vests, eye protection, hard hats, gloves and steel toed boots must be worn when on landfill premises.
hereby certify that this load does not contain any unauthorized hazardous waste.

IGNATURE: _____

VOID - DO NOT ACCEPT - FACILITY COPY

NON-HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
	Not Required	1	732-613-1660	15354- 1

GENERATOR

5. Generator's Name and Mailing Address
United States Army - Fort Monmouth
P.O. Box 148
Oceanport, NJ 07757
Generator's Phone: 732-383-5104

Generator's Site Address (if different than mailing address)
Building 59
Oceanport, NJ 07703 Monmouth

6. Transporter 1 Company Name: Horwith Trucks Inc. — U.S. EPA ID Number: 146714878

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address
Cumberland County Landfill
135 Vaughn Road
Shippensburg, PA 17257
Facility's Phone: 717-423-5917
U.S. EPA ID Number

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	Non RCRA Non DOT Solids	1	DT	est. 22	T	
2.						
3.						
4.						

13. Special Handling Instructions and Additional Information
EC#1948243
AWT P.O. # 16354-JNV
TRUCK # 243
PA- AF89305

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: William R Colvin for USArmy — Signature: William R Colvin for USARMY — Month: 08 — Day: 13 — Year: 19

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Michael Murphy — Signature — Month: 8 — Day: 14 — Year: 19

Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator) — Month — Day — Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name — Signature — Month: 8 — Day: 14 — Year: 19

169-BLC-O 5 11977 (Rev. 9/09)

DESIGNATED FACILITY TO GENERATOR

241

RLAND COUNTY LANDFILL
WVILLE ROAD
RG, PA 17240
9953

VIRONMENTAL SERVICES, INC.
128
ILLE, NJ 08871

INVOICE
INBOUND

SITE	CELL	TICKET #	OPERATOR
K3		**299307**	ABLACK

TRUCK	CONTAINER	LICENSE
HOR242		

REFERENCE	IN	OUT
EC#1948243	8/14/19 11:42 am	8/14/19 12:16 pm

TRACT: EC#1948243 US ARMY FT MONMOUTH
BOL: 15354-2

GROSS 71,160.00 LBS Scale In
TARE 25,600.00 LBS Scale Out
NET 45,560.00 LBS

Y	UNIT	DESCRIPTION	ORIGIN	%	RATE	TAX	TOTAL
2.78	TN	X:ADC CONTAM SOIL RESID	New Jersey	100.00			

K 61934

Tax Total
Total
Paid
Change
Check#
Recpt #

y ANSI 2 vests, eye protection, hard hats, gloves and steel toed boots must be worn when on landfill premises.
ify that this load does not contain any unauthorized hazardous waste.

RE:_____

VOID - DO NOT ACCEPT - FACILITY COPY

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number: Not Required

2. Page 1 of: 1

3. Emergency Response Phone: 732-613-1660

4. Waste Tracking Number: 15354- 2

5. Generator's Name and Mailing Address
United States Army - Fort Monmouth
P.O. Box 148
Oceanport, NJ 07757
Generator's Phone: 732-383-5104

Generator's Site Address (if different than mailing address)
Building 59
Oceanport, NJ 07703 Monmouth

6. Transporter 1 Company Name: Hourigh Trucks Inc
U.S. EPA ID Number: PAD 146714878

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address
Cumberland County Landfill
135 Vaughn Road
Shippensburg, PA 17257
Facility's Phone: 717-423-5917
U.S. EPA ID Number

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
	1. Non RCRA Non DOT Solids	1	DT	23	T	
	2.					
	3.					
	4.					

13. Special Handling Instructions and Additional Information
EC#1948243
AWT P.O. # 16354-JNV
TRUCK # 242
LIC.: (PA) AF 86558

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: William R Colvin for US Army
Signature: William R Colvin for US Army
Month: 08 Day: 13 Year: 19

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Brian Williams
Signature:
Month: 08 Day: 14 Year: 19

Transporter 2 Printed/Typed Name
Signature
Month Day Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

17c. Signature of Alternate Facility (or Generator)
Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name
Signature
Month Day Year

169-BLC-O 5 11977 (Rev. 9/09)

DESIGNATED FACILITY TO GENERATOR

CUMBERLAND COUNTY LANDFILL
620 NEWVILLE ROAD
NEWBURG, PA 17240
7174239953

001771
AWT ENVIRONMENTAL SERVICES, INC.
PO Box 128
SAYREVILLE, NJ 08871

INVOICE
INBOUND

SITE	CELL	TICKET #	OPERATOR
K3		299326	ABLACK

TRUCK	CONTAINER	LICENSE
CANER94		NJ AT515E

REFERENCE	IN	OUT
EC#19148243	8/14/19 12:29 pm	8/14/19 12:56 pm

CONTRACT: EC#1948243 US ARMY FT MONMOUTH
BOL: 15354-3

GROSS 76,500.00 LBS Scale In
TARE 26,640.00 LBS Scale Out
NET 49,860.00 LBS

QTY	UNIT	DESCRIPTION	ORIGIN	%	RATE	TAX	TOTAL
24.93	TN	X:ADC CONTAM SOIL RESID	New Jersey	100.00			

AVIS BLACK 61934

Tax Total
Total
Paid
Change
Check#
Recpt #

High visibility ANSI 2 vests, eye protection, hard hats, gloves and steel toed boots must be worn when on landfill premises.
I hereby certify that this load does not contain any unauthorized hazardous waste.

SIGNATURE: _____

VOID - DO NOT ACCEPT - FACILITY COPY

94

NON-HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
	Not Required	1	732-613-1660	15354- 3

5. Generator's Name and Mailing Address
United States Army - Fort Monmouth
P.O. Box 148
Oceanport, NJ 07757
Generator's Phone: 732-383-5104

Generator's Site Address (if different than mailing address)
Building 59
Oceanport, NJ 07703 Monmouth

6. Transporter 1 Company Name: . CANET 94 — U.S. EPA ID Number: 36571

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address
Cumberland County Landfill
135 Vaughn Road
Shippensburg, PA 17257
Facility's Phone: 717-423-5917
U.S. EPA ID Number

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	Non RCRA Non DOT Solids		DT		T	
2.						
3.						
4.						

13. Special Handling Instructions and Additional Information
EC#1948243
AWT P.O. # 16354-JNV
TRUCK #94 LIC-(NJ) AT 515E

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: William R Colvin FOR US ARMY — Signature: William R Colvin for US ARMY — Month: 08 — Day: 13 — Year: 19

INT'L
15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER
16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name	Signature	Month	Day	Year
Michael Groves	Mil	08	14	19
Transporter 2 Printed/Typed Name	Signature	Month	Day	Year

DESIGNATED FACILITY
17. Discrepancy
17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
17b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:
17c. Signature of Alternate Facility (or Generator) — Month — Day — Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name	Signature	Month	Day	Year
		8	14	19

169-BLC-O 5 11977 (Rev. 9/09)

DESIGNATED FACILITY TO GENERATOR

94

CUMBERLAND COUNTY LANDFILL
620 NEWVILLE ROAD
NEWBURG, PA 17240
7174239953

001771
AWT ENVIRONMENTAL SERVICES, INC.
PO Box 128
SAYREVILLE, NJ 08871

INVOICE
INBOUND

SITE	CELL	TICKET #	OPERATOR
K3		**299328**	ABLACK

TRUCK	CONTAINER	LICENSE
CANER90		

REFERENCE	IN	OUT
EC#1948243	8/14/19 12:33 pm	8/14/19 12:58 pm

CONTRACT: EC#1948243 US ARMY FT MONMOUTH
BOL: 15354-4

GROSS 73,640.00 LBS Scale In
TARE 25,200.00 LBS Scale Out
NET 48,440.00 LBS

QTY	UNIT	DESCRIPTION	ORIGIN	%	RATE	TAX	TOTAL
24.22	TN	X:ADC CONTAM SOIL RESID	New Jersey	100.00			

AVIS BLACK 61934

Tax Total
Total
Paid
Change
Check#
Recpt #

High visibility ANSI 2 vests, eye protection, hard hats, gloves and steel toed boots must be worn when on landfill premises.
I hereby certify that this load does not contain any unauthorized hazardous waste.

SIGNATURE:_____

VOID - DO NOT ACCEPT - FACILITY COPY

NON-HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
	Not Required	1	732-613-1660	15354- 4

GENERATOR

5. Generator's Name and Mailing Address
United States Army - Fort Monmouth
P.O. Box 148
Oceanport, NJ 07757
Generator's Phone: 732-383-5104

Generator's Site Address (if different than mailing address)
Building 59
Oceanport, NJ 07703 Monmouth

6. Transporter 1 Company Name: CAVER TRANS — U.S. EPA ID Number: 36571

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address
Cumberland County Landfill
135 Vaughn Road
Shippensburg, PA 17257
717-423-5917
Facility's Phone: — U.S. EPA ID Number

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	Non RCRA Non DOT Solids		DT		T	
2.						
3.						
4.						

13. Special Handling Instructions and Additional Information
EC#1948243
AWT P.O. # 16354-JNV
TRUCK # 90
LIC. (NJ) AR 830F

14. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: William E Colvin for US ARMY — Signature: William E Colvin for US ARMY — Month: 08 — Day: 13 — Year: 19

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Jack Robinson — Signature: [signature] — Month: 08 — Day: 14 — Year: 19

Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator) — Month — Day — Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name — Signature — Month: 8 — Day: 14 — Year: 19

CUMBERLAND COUNTY LANDFILL
620 NEWVILLE ROAD
NEWBURG, PA 17240
7174239953

001771
AWT ENVIRONMENTAL SERVICES, INC.
PO Box 128
SAYREVILLE, NJ 08871

INVOICE
INBOUND

SITE	CELL	TICKET #	OPERATOR
K3		299329	ABLACK

TRUCK	CONTAINER	LICENSE
CANER92		NJ AR829F

REFERENCE	IN	OUT
EC#1948243	8/14/19 12:36 pm	8/14/19 1:00 pm

CONTRACT: EC#1948243 US ARMY FT MONMOUTH
BOL: 15354-5

GROSS 81,020.00 LBS Scale In
TARE 25,220.00 LBS Scale Out
NET 55,800.00 LBS

QTY	UNIT	DESCRIPTION	ORIGIN	%	RATE	TAX	TOTAL
27.90	TN	X:ADC CONTAM SOIL RESID	New Jersey	100.00			

AVIS BLACK 61934

Tax Total

Total
Paid
Change
Check#
Recpt #

High visibility ANSI 2 vests, eye protection, hard hats, gloves and steel toed boots must be worn when on landfill premises.
I hereby certify that this load does not contain any unauthorized hazardous waste.

SIGNATURE:_____

VOID - DO NOT ACCEPT - FACILITY COPY

NON-HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
	Not Required	1	732-613-1660	15354- 5

GENERATOR

5. Generator's Name and Mailing Address
United States Army - Fort Monmouth
P.O. Box 148
Oceanport, NJ 07757
Generator's Phone: 732-383-5104

Generator's Site Address (if different than mailing address)
Building 59
Oceanport, NJ 07703 Monmouth

6. Transporter 1 Company Name: CANER — U.S. EPA ID Number: 36571

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address
Cumberland County Landfill
135 Vaughn Road
Shippensburg, PA 17257
Facility's Phone: 717-423-5917
U.S. EPA ID Number

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	Non RCRA Non DOT Solids		DT		T	
2.						
3.						
4.						

13. Special Handling Instructions and Additional Information
EC#1948243
AWT P.O. # 16354-JNV
TRUCK #9092
LIC. (NJ) AR 829F

14. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: William R Colvin for US ARMY — Signature: William R Colvin for US ARMY — Month: 08 Day: 13 Year: 19

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: DENNIS AGOSTY — Signature: Dennis A Agosty — Month: 08 Day: 14 Year: 19

Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator) — Month — Day — Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name — Signature — Month — Day — Year

CUMBERLAND COUNTY LANDFILL
620 NEWVILLE ROAD
NEWBURG, PA 17240
7174239953

001771
AWT ENVIRONMENTAL SERVICES, INC.
PO Box 128
SAYREVILLE, NJ 08871

INVOICE
INBOUND

SITE	CELL	TICKET #	OPERATOR
K3		**299332**	ABLACK

TRUCK	CONTAINER	LICENSE
CANER85		NJ AP390S

REFERENCE	IN	OUT
EC#1948243	8/14/19 12:39 pm	8/14/19 1:10 pm

CONTRACT: EC#1948243 US ARMY FT MONMOUTH
BOL: 15354-6

GROSS 79,400.00 LBS Scale In
TARE 25,740.00 LBS Scale Out
NET 53,660.00 LBS

QTY	UNIT	DESCRIPTION	ORIGIN	%	RATE	TAX	TOTAL
26.83	TN	X:ADC CONTAM SOIL RESID	New Jersey	100.00			

AVIS BLACK 61934

Tax Total
Total
Paid
Change
Check#
Recpt #

High visibility ANSI 2 vests, eye protection, hard hats, gloves and steel toed boots must be worn when on landfill premises.
I hereby certify that this load does not contain any unauthorized hazardous waste.

SIGNATURE:

VOID - DO NOT ACCEPT - FACILITY COPY

13. Special Handling Instructions and Additional Information

NON-HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
	Not Required	1	732-613-1660	15354- 6

GENERATOR

5. Generator's Name and Mailing Address
United States Army - Fort Monmouth
P.O. Box 148
Oceanport, NJ 07757
Generator's Phone: 732-383-5104

Generator's Site Address (if different than mailing address)
Building 59
Oceanport, NJ 07703 Monmouth

6. Transporter 1 Company Name: caner 85 — U.S. EPA ID Number: 36571

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address
Cumberland County Landfill
135 Vaughn Road
Shippensburg, PA 17257
Facility's Phone: 717-423-5917
U.S. EPA ID Number

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	Non RCRA Non DOT Solids		DT		T	
2.						
3.						
4.						

13. Special Handling Instructions and Additional Information
EC#1948243
AWT P.O. # 16354-JNV
TRUCK # 85
LIC. (NJ) AF 389 S

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: William R Colvin for US ARMY — Signature: William R Colvin for US ARMY — Month: 08 — Day: 13 — Year: 19

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: YACER — Signature — Month: 08 — Day: 14 — Year: 19

Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator) — Month — Day — Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name — Signature — Month — Day — Year: 8/14/19

Appendix C

Backfill Certification Documentation

Maddox Materials, LLC
Quality Aggregates & Construction Soils

December 26, 2018

AWT Environmental
PO Box 128
Sayreville, NJ 08871

Attn: Jim Vagra
Phone: 732-613-1660
Fax: 732-613-1536

Project: Building 2700
Pearl Harbor Drive
Tinton Falls, NJ

To whom it may concern:

Please be advised that the 3/4" clean stone Maddox Materials LLC proposes to deliver to the above referenced project originates from Trap Rock Industries in Kingston, NJ. State of New Jersey Department of Labor and Workforce Development mine registration certificate # 004481. Somerset County tax map Block 1 Lots 1,2,3,38,39.

These aggregates are sourced from an undisturbed geological formation of diabase trap rock stone. The materials are not comingled with other materials or subject to processes that would result in the introduction of contaminates. To the best of my knowledge the mine is not suspected of being contaminated and has not been affected by any hazardous material or discharge of a regulated substance.

If you need any additional information, please contact me at 732-251-0054.

Respectfully Submitted,

William Maddox
Member

Maddox Materials, LLC
Quality Aggregates & Construction Soils

December 26, 2018

AWT Environmental
PO Box 128
Sayreville, NJ 08871

Attn: Jim Vagra
Phone: 732-613-1660
Fax: 732-613-1536

Project: Building 2700
Pearl Harbor Drive
Tinton Falls, NJ

To whom it may concern:

Please be advised that Maddox Materials, LLC proposes to deliver Quarry Process stone to the above referenced project. These aggregates originate from the Fanwood Crushed Stone quarry. State of New Jersey Department of Labor and Workforce Development mine registration certificate #004485. It is located at #1 New Providence Road, Watchung, NJ, Somerset County tax map Block 76.01 Lot 5 and 20.

The Quarry has been mining since 1907 from sources of virgin basalt indigenous to the region. This material is considered clean uncontaminated virgin material that does not contain extraneous debris or solid waste, it does not contain free liquids, and has not been subject to a discharged hazardous substance at any time.

If you need any additional information please contact me at 732-251-0054.

Respectfully Submitted,

William Maddox
Member

Appendix D

Laboratory Analytical Reports

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax:717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

May 1, 2019

Ms. Lorraine Weber
Parsons - Syracuse NY
301 Plainfield Road
Suite 350
Syracuse, NY 13212

Certificate of Analysis

Project Name:	**Ft. Monmouth Soils**	Workorder:	**3028384**
Purchase Order:	**PO-00065450**	Workorder ID:	**FTMM-59 Soil Confirmatory Sampling**

Dear Ms. Weber:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, April 16, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Kent Friesen , Mr. Julien Chambert , Ms. Cris Grill

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

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SAMPLE SUMMARY

Workorder: 3028384 FTMM-59 Soil Confirmatory Sampling

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3028384001	M59-SO-5-B 10.0-10.5	Solid	4/15/2019 15:00	4/16/2019 20:40	Collected by Client
3028384002	M59-SO-1-B-10.0-10.5	Solid	4/16/2019 09:30	4/16/2019 20:40	Collected by Client
3028384003	M59-SO-1-B-10.0-10.5-DUP	Solid	4/16/2019 09:30	4/16/2019 20:40	Collected by Client

ALS Environmental

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SAMPLE SUMMARY

Workorder: 3028384 FTMM-59 Soil Confirmatory Sampling

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3028384 FTMM-59 Soil Confirmatory Sampling

Lab ID: **3028384001** Date Collected: 4/15/2019 15:00 Matrix: Solid
Sample ID: **M59-SO-5-B 10.0-10.5** Date Received: 4/16/2019 20:40

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
SEMIVOLATILES												
Naphthalene	0.090U	U	mg/kg	0.13	0.090	0.0081	SW846 8270D	4/23/19	JTH	4/23/19 10:08	GEC	A
AROMATIC PETROLEUM HC's												
C10 TO C12	2.3		mg/kg	1.4	1.4	0.63	NJEPH	4/24/19	MPP	4/29/19 17:44	KJH	C
C12 TO C16	78.0		mg/kg	14.0	14.0	2.5	NJEPH	4/24/19	MPP	4/29/19 20:21	KJH	C
C16 TO C21	195		mg/kg	14.0	14.0	2.4	NJEPH	4/24/19	MPP	4/29/19 20:21	KJH	C
C21 TO C36	30.5		mg/kg	1.4	1.4	0.34	NJEPH	4/24/19	MPP	4/29/19 17:44	KJH	C
Total EPH Aromatic	306		mg/kg	5.6	5.6	1.5	NJEPH	4/24/19	MPP	4/29/19 17:44	KJH	C
Total EPH (Aliphatic+Aromatic)	836		mg/kg	11.2	11.2	3.5	NJEPH	4/24/19	MPP	4/29/19 17:44	KJH	C

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2-Bromonaphthalene (S)	88.9		%	40 - 140	NJEPH	4/24/19	MPP	4/29/19 20:21	KJH	C
2-Bromonaphthalene (S)	104		%	40 - 140	NJEPH	4/24/19	MPP	4/29/19 17:44	KJH	C
2-Fluorobiphenyl (S)	106		%	40 - 140	NJEPH	4/24/19	MPP	4/29/19 17:44	KJH	C
2-Fluorobiphenyl (S)	90.6		%	40 - 140	NJEPH	4/24/19	MPP	4/29/19 20:21	KJH	C
o-Terphenyl (S)	63.9		%	40 - 140	NJEPH	4/24/19	MPP	4/29/19 17:44	KJH	C
o-Terphenyl (S)	54.4		%	40 - 140	NJEPH	4/24/19	MPP	4/29/19 20:21	KJH	C

ALIPHATIC PETROLEUM HC's												
C9 TO C12	46.2	7	mg/kg	14.0	14.0	1.7	NJEPH	4/24/19	MPP	4/28/19 15:54	KJH	C
C12 TO C16	280		mg/kg	69.9	69.9	30.1	NJEPH	4/24/19	MPP	4/30/19 17:11	KJH	C
C16 TO C21	172		mg/kg	14.0	14.0	5.9	NJEPH	4/24/19	MPP	4/28/19 15:54	KJH	C
C21 TO C40	32.2	1,2, 3	mg/kg	1.4	1.4	0.69	NJEPH	4/24/19	MPP	4/28/19 13:16	KJH	C
Total EPH Aliphatic	530	4	mg/kg	5.6	5.6	2.0	NJEPH	4/24/19	MPP	4/28/19 13:16	KJH	C

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1-Chlorooctadecane (S)	21.7	6	%	40 - 140	NJEPH	4/24/19	MPP	4/28/19 15:54	KJH	C
1-Chlorooctadecane (S)	27.6	5	%	40 - 140	NJEPH	4/24/19	MPP	4/28/19 13:16	KJH	C
1-Chlorooctadecane (S)	0	11	%	40 - 140	NJEPH	4/24/19	MPP	4/30/19 17:11	KJH	C

WET CHEMISTRY												
Moisture	29.4		%	0.1	0.1	0.01	S2540G-11			4/18/19 09:00	AXD	
Total Solids	70.6		%	0.1	0.1	0.01	S2540G-11			4/18/19 09:00	AXD	

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3028384 FTMM-59 Soil Confirmatory Sampling

Lab ID: **3028384001** Date Collected: 4/15/2019 15:00 Matrix: Solid
Sample ID: **M59-SO-5-B 10.0-10.5** Date Received: 4/16/2019 20:40

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	*Cntr*

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 3028384 FTMM-59 Soil Confirmatory Sampling

Lab ID: **3028384002** Date Collected: 4/16/2019 09:30 Matrix: Solid
Sample ID: **M59-SO-1-B-10.0-10.5** Date Received: 4/16/2019 20:40

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
SEMIVOLATILES												
Naphthalene	2.1		mg/kg	0.13	0.084	0.0075	SW846 8270D	4/23/19	JTH	4/23/19 11:21	GEC	A
AROMATIC PETROLEUM HC's												
C10 TO C12	3.3		mg/kg	1.3	1.3	0.57	NJEPH	4/24/19	MPP	4/29/19 19:18	KJH	A
C12 TO C16	4.4		mg/kg	1.3	1.3	0.23	NJEPH	4/24/19	MPP	4/29/19 19:18	KJH	A
C16 TO C21	1.3J	J	mg/kg	1.3	1.3	0.21	NJEPH	4/24/19	MPP	4/29/19 19:18	KJH	A
C21 TO C36	2.1		mg/kg	1.3	1.3	0.30	NJEPH	4/24/19	MPP	4/29/19 19:18	KJH	A
Total EPH Aromatic	11.1		mg/kg	5.0	5.0	1.3	NJEPH	4/24/19	MPP	4/29/19 19:18	KJH	A
Total EPH (Aliphatic+Aromatic)	14.0		mg/kg	10.1	10.1	3.2	NJEPH	4/24/19	MPP	4/29/19 19:18	KJH	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2-Bromonaphthalene (S)	92.5		%	40 - 140	NJEPH	4/24/19	MPP	4/29/19 19:18	KJH	A
2-Fluorobiphenyl (S)	92.3		%	40 - 140	NJEPH	4/24/19	MPP	4/29/19 19:18	KJH	A
o-Terphenyl (S)	49.4		%	40 - 140	NJEPH	4/24/19	MPP	4/29/19 19:18	KJH	A

ALIPHATIC PETROLEUM HC's												
C9 TO C12	1.0J	J,6	mg/kg	1.3	1.3	0.15	NJEPH	4/24/19	MPP	4/28/19 14:51	KJH	A
C12 TO C16	0.64J	J	mg/kg	1.3	1.3	0.54	NJEPH	4/24/19	MPP	4/28/19 14:51	KJH	A
C16 TO C21	1.3U	U	mg/kg	1.3	1.3	0.53	NJEPH	4/24/19	MPP	4/28/19 14:51	KJH	A
C21 TO C40	0.74J	J,1, 2,3	mg/kg	1.3	1.3	0.62	NJEPH	4/24/19	MPP	4/28/19 14:51	KJH	A
Total EPH Aliphatic	2.9J	J,4	mg/kg	5.0	5.0	1.8	NJEPH	4/24/19	MPP	4/28/19 14:51	KJH	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1-Chlorooctadecane (S)	23.1	5	%	40 - 140	NJEPH	4/24/19	MPP	4/28/19 14:51	KJH	A

WET CHEMISTRY										
Moisture	23.2		%	0.1	0.1	0.01	S2540G-11			4/18/19 09:00	AXD	
Total Solids	76.8		%	0.1	0.1	0.01	S2540G-11			4/18/19 09:00	AXD	

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 3028384 FTMM-59 Soil Confirmatory Sampling

Lab ID: **3028384003** Date Collected: 4/16/2019 09:30 Matrix: Solid

Sample ID: **M59-SO-1-B-10.0-10.5-DUP** Date Received: 4/16/2019 20:40

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
SEMIVOLATILES												
Naphthalene	2.8		mg/kg	0.13	0.085	0.0076	SW846 8270D	4/23/19	JTH	4/23/19 11:46	GEC	A
AROMATIC PETROLEUM HC's												
C10 TO C12	5.1		mg/kg	1.3	1.3	0.57	NJEPH	4/24/19	MPP	4/29/19 19:50	KJH	A
C12 TO C16	23.9		mg/kg	1.3	1.3	0.23	NJEPH	4/24/19	MPP	4/29/19 19:50	KJH	A
C16 TO C21	4.9		mg/kg	1.3	1.3	0.21	NJEPH	4/24/19	MPP	4/29/19 19:50	KJH	A
C21 TO C36	3.3		mg/kg	1.3	1.3	0.30	NJEPH	4/24/19	MPP	4/29/19 19:50	KJH	A
Total EPH Aromatic	37.2		mg/kg	5.0	5.0	1.3	NJEPH	4/24/19	MPP	4/29/19 19:50	KJH	A
Total EPH (Aliphatic+Aromatic)	39.2		mg/kg	10.1	10.1	3.2	NJEPH	4/24/19	MPP	4/29/19 19:50	KJH	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2-Bromonaphthalene (S)	98.7		%	40 - 140			NJEPH	4/24/19	MPP	4/29/19 19:50	KJH	A
2-Fluorobiphenyl (S)	98.6		%	40 - 140			NJEPH	4/24/19	MPP	4/29/19 19:50	KJH	A
o-Terphenyl (S)	50		%	40 - 140			NJEPH	4/24/19	MPP	4/29/19 19:50	KJH	A
ALIPHATIC PETROLEUM HC's												
C9 TO C12	0.70J	J,6	mg/kg	1.3	1.3	0.15	NJEPH	4/24/19	MPP	4/28/19 15:22	KJH	A
C12 TO C16	1.3U	U	mg/kg	1.3	1.3	0.54	NJEPH	4/24/19	MPP	4/28/19 15:22	KJH	A
C16 TO C21	1.3U	U	mg/kg	1.3	1.3	0.53	NJEPH	4/24/19	MPP	4/28/19 15:22	KJH	A
C21 TO C40	0.69J	J,1, 2,3	mg/kg	1.3	1.3	0.62	NJEPH	4/24/19	MPP	4/28/19 15:22	KJH	A
Total EPH Aliphatic	2.0J	J,4	mg/kg	5.0	5.0	1.8	NJEPH	4/24/19	MPP	4/28/19 15:22	KJH	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1-Chlorooctadecane (S)	15.4	5	%	40 - 140			NJEPH	4/24/19	MPP	4/28/19 15:22	KJH	A
WET CHEMISTRY												
Moisture	22.8		%	0.1	0.1	0.01	S2540G-11			4/18/19 09:00	AXD	
Total Solids	77.2		%	0.1	0.1	0.01	S2540G-11			4/18/19 09:00	AXD	

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3028384 FTMM-59 Soil Confirmatory Sampling

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3028384001	1	M59-SO-5-B 10.0-10.5	NJEPH	C21 TO C40
The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte C21 TO C40.				
3028384001	2	M59-SO-5-B 10.0-10.5	NJEPH	C21 TO C40
The QC sample type LCS for method NJEPH was outside the control limits for the analyte C21 TO C40. The % Recovery was reported as 171 and the control limits were 40 to 140.				
3028384001	3	M59-SO-5-B 10.0-10.5	NJEPH	C21 TO C40
The QC sample type LCSD for method NJEPH was outside the control limits for the analyte C21 TO C40. The RPD was reported as 25.6 and the upper control limit is 25.				
3028384001	4	M59-SO-5-B 10.0-10.5	NJEPH	Total EPH Aliphatic
The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte Total EPH Aliphatic.				
3028384001	5	M59-SO-5-B 10.0-10.5	NJEPH	1-Chlorooctadecane
The surrogate 1-Chlorooctadecane for method NJEPH was outside of control limits. The % Recovery was reported as 27.6 and the control limits were 40 to 140. This result was reported at a dilution of 1.				
3028384001	6	M59-SO-5-B 10.0-10.5	NJEPH	1-Chlorooctadecane
The surrogate 1-Chlorooctadecane for method NJEPH was outside of control limits. The % Recovery was reported as 21.7 and the control limits were 40 to 140. This result was reported at a dilution of 10.				
3028384001	7	M59-SO-5-B 10.0-10.5	NJEPH	C9 TO C12
The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte C9 TO C12.				
3028384001	11	M59-SO-5-B 10.0-10.5	NJEPH	1-Chlorooctadecane
The surrogate 1-Chlorooctadecane for method NJEPH was outside of control limits. The % Recovery was reported as 0 and the control limits were 40 to 140. This result was reported at a dilution of 50.				
3028384002	1	M59-SO-1-B-10.0-10.5	NJEPH	C21 TO C40
The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte C21 TO C40.				
3028384002	2	M59-SO-1-B-10.0-10.5	NJEPH	C21 TO C40
The QC sample type LCS for method NJEPH was outside the control limits for the analyte C21 TO C40. The % Recovery was reported as 171 and the control limits were 40 to 140.				
3028384002	3	M59-SO-1-B-10.0-10.5	NJEPH	C21 TO C40
The QC sample type LCSD for method NJEPH was outside the control limits for the analyte C21 TO C40. The RPD was reported as 25.6 and the upper control limit is 25.				
3028384002	4	M59-SO-1-B-10.0-10.5	NJEPH	Total EPH Aliphatic
The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte Total EPH Aliphatic.				
3028384002	5	M59-SO-1-B-10.0-10.5	NJEPH	1-Chlorooctadecane
The surrogate 1-Chlorooctadecane for method NJEPH was outside of control limits. The % Recovery was reported as 23.1 and the control limits were 40 to 140. This result was reported at a dilution of 1.				
3028384002	6	M59-SO-1-B-10.0-10.5	NJEPH	C9 TO C12
The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte C9 TO C12.				
3028384003	1	M59-SO-1-B-10.0-10.5-DUP	NJEPH	C21 TO C40
The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte C21 TO C40.				
3028384003	2	M59-SO-1-B-10.0-10.5-DUP	NJEPH	C21 TO C40
The QC sample type LCS for method NJEPH was outside the control limits for the analyte C21 TO C40. The % Recovery was reported as 171 and the control limits were 40 to 140.				

ANALYTICAL RESULTS

Workorder: 3028384 FTMM-59 Soil Confirmatory Sampling

3028384003	3	M59-SO-1-B-10.0-10.5-DUP	NJEPH	C21 TO C40

The QC sample type LCSD for method NJEPH was outside the control limits for the analyte C21 TO C40. The RPD was reported as 25.6 and the upper control limit is 25.

3028384003	4	M59-SO-1-B-10.0-10.5-DUP	NJEPH	Total EPH Aliphatic

The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte Total EPH Aliphatic.

3028384003	5	M59-SO-1-B-10.0-10.5-DUP	NJEPH	1-Chlorooctadecane

The surrogate 1-Chlorooctadecane for method NJEPH was outside of control limits. The % Recovery was reported as 15.4 and the control limits were 40 to 140. This result was reported at a dilution of 1.

3028384003	6	M59-SO-1-B-10.0-10.5-DUP	NJEPH	C9 TO C12

The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte C9 TO C12.

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3028384 FTMM-59 Soil Confirmatory Sampling

Lab ID	Sample ID	Analysis Method	Prep Method
3028384001	M59-SO-5-B 10.0-10.5	NJEPH	SW846 3546
3028384001	M59-SO-5-B 10.0-10.5	S2540G-11	
3028384001	M59-SO-5-B 10.0-10.5	SW846 8270D	SW846 3546
3028384002	M59-SO-1-B-10.0-10.5	NJEPH	SW846 3546
3028384002	M59-SO-1-B-10.0-10.5	S2540G-11	
3028384002	M59-SO-1-B-10.0-10.5	SW846 8270D	SW846 3546
3028384003	M59-SO-1-B-10.0-10.5-DUP	NJEPH	SW846 3546
3028384003	M59-SO-1-B-10.0-10.5-DUP	S2540G-11	
3028384003	M59-SO-1-B-10.0-10.5-DUP	SW846 8270D	SW846 3546

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ALS Environmental
34 Dogwood Lane
Middletown, PA 07057
(717) 944-5541

CHAIN OF CUSTODY/ REQUEST FOR ANALYS

ALL SHADED AREAS MUST BE COMPLETED B
SAMPLER. INSTRUCTIONS ON THE BACK.

3028384

M59-02-2019 0415
3028384
Page #: 1 of 1

Client Name: Parsons Federal	Container Type	AN										Receipt Information (completed by Receiving Lab)	
Address: 100 High St. 4th Floor Boston, MA 02110	Container Size	8 oz										Cooler Temp: ____ Therm ID: ____ No. of Coolers: ____	Y / N / Initial
	Preservative	4c										Custody Seals Present?	
Contact: Lorraine Weber	ANALYSES/METHOD REQUESTED											(If present) Seals Intact?	
Phone#: 315-552-9745												Received on Ice?	
Project Name/#: FTMM-59 Soil confirmatory sampling												COC/Labels Complete/Accurate?	
Bill To: Parsons Federal												Cont. in Good Cond.?	
TAT [X] Normal-Standard TAT is 10-12 business days.												Correct Containers?	
[X] Rush-Subject to ALS approval and surcharges.												Correct Sample Volumes?	
Date Required: Approved?												Correct Preservation?	
Email? [X]-Y lorraine.weber@parsons.com												Headspace/Volatiles?	
Fax? [ ]-Y No.:												Courier/Tracking #:	

	Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	Naphthalene (8270)* Fractionated EPH (NJEPHS6)								AUTHORIZED TO RUN	Sample/COC Comments
						Enter Number of Containers Per Sample or Field Results Below.									
1	M59-SO-5B-10.0-10.5	4-15-19	1500	G	SO	1								X	* Analytical instrument will be calibrated to
2	M59-SO-5-B-10.0-10.5-MS	"	1500	G	SO	1								X	include 2-methylnaphthalene.
3	M59-SO-5-B-10.0-10.5-MSD	"	1500	G	SO	1								X	
4	M59-SO-1-B-10.0-10.5	4-16-19	0930	G	SO	1								X	
5	M59-SO-1-B-10.0-10.5-DUP	4-16-19	0930	G	SO	1								X	
6				G	SO										
7				G	SO										
8				G	SO										
9				G	SO										
10				G	SO										

ALS Field Services: [X] Pickup _Labor _Composite Sampling _Rental Equipment _Other:

Project Comments: 110016-03300
MDL Must Meet NJDEP Soil Cleanup Criteria and/or Groundwater Quality Standards

LOGGED BY(signature): E. Accorsi Date 4-15-19 Time 1600
REVIEWED BY(signature): Date Time

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 ERIK ACCORSI/PARSONS	4-16-19	1042	2 ALS	4-16-19	1042
3	4-16-19	1830	4 COMMON COURIER / ALS COURIER		
5 COMMON COURIER / ALS COURIER			6	4/16/19	2040
7			8		
9			10		

Data Deliverables: [ ] Standard [X] CLP-like [ ] USACE [ ]
Special Processing: USACE [ ] Navy [ ]
State Samples Collected In: [ ] NY [X] NJ [ ] PA [ ] NC [ ]
Reportable to PADEP? Yes [ ] PWSID #
Sample Disposal: Lab [ ] Special [ ]
EDDS: Format Type- ERPIMS & HAZSITE

* G=Grab; C=Composite
**Matrix - AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

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Middletown, PA 17057
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F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
Parsons Federal	3028384	QV	4/16/19

1. Were airbills / tracking numbers present and recorded?	(NONE)	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	NONE	(YES)	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	(NO)
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	(N/A)	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		(YES)	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	(NO)
13a. Are the samples required for SDWA compliance reporting?	(N/A)	YES	NO
13b. Did the client provide a SDWA PWS ID#?	(N/A)	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	(N/A)	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #:								
Temperature (°C):	5.C							
Thermometer ID:	H01							

COMMENTS (Required for all NO responses above and any sample non-conformance):

Sample MS9-SO-SB-10.0-10.5 has time 1500 on COC, 1300 on sample

Rev. 1/10/2019

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May 6, 2019

Ms. Lorraine Weber
Parsons - Syracuse NY
301 Plainfield Road
Suite 350
Syracuse, NY 13212

Certificate of Analysis

Project Name:	**Ft. Monmouth Soils**	Workorder:	**3028392**
Purchase Order:	**PO-00065450**	Workorder ID:	**PQF182|FTMM-59 Soil Confirmato**

Dear Ms. Weber:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, April 16, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

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ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Kent Friesen , Mr. Julien Chambert , Ms. Cris Grill

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3028392 PQF182|FTMM-59 Soil Confirmato

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3028392001	M59-SHED1/B1-B-1.5-2.0	Solid	4/15/2019 09:40	4/16/2019 20:40	Collected by Client
3028392002	M59-SHED1/B2-B-1.5-2.0	Solid	4/15/2019 10:00	4/16/2019 20:40	Collected by Client
3028392003	M59-SHED1/B3-B-1.5-2.0	Solid	4/15/2019 10:20	4/16/2019 20:40	Collected by Client
3028392004	M59-SHED2/B3-B-1.5-2.0	Solid	4/15/2019 10:30	4/16/2019 20:40	Collected by Client
3028392005	M59-SHED1/B1-B-1.5-2.0-DUP	Solid	4/15/2019 09:40	4/16/2019 20:40	Collected by Client
3028392006	M59-SHED1/B3-B-1.5-2.0-DUP	Solid	4/15/2019 10:30	4/16/2019 20:40	Collected by Client

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SAMPLE SUMMARY

Workorder: 3028392 PQF182|FTMM-59 Soil Confirmato

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3028392 PQF182|FTMM-59 Soil Confirmato

Lab ID: **3028392001** Date Collected: 4/15/2019 09:40 Matrix: Solid
Sample ID: **M59-SHED1/B1-B-1.5-2.0** Date Received: 4/16/2019 20:40

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*
WET CHEMISTRY												
Moisture	13.8		%	0.1	0.1	0.01	S2540G-11			4/18/19 09:00	AXD	
Total Solids	86.2		%	0.1	0.1	0.01	S2540G-11			4/18/19 09:00	AXD	
METALS												
Lead, Total	4.9		mg/kg	2.0	1.3	0.68	SW846 6010C	5/6/19	AHI	5/6/19 16:02	SRT	F

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ANALYTICAL RESULTS

Workorder: 3028392 PQF182|FTMM-59 Soil Confirmato

Lab ID: **3028392002** Date Collected: 4/15/2019 10:00 Matrix: Solid

Sample ID: **M59-SHED1/B2-B-1.5-2.0** Date Received: 4/16/2019 20:40

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY												
Moisture	15.1		%	0.1	0.1	0.01	S2540G-11			4/18/19 09:00	AXD	
Total Solids	84.9		%	0.1	0.1	0.01	S2540G-11			4/18/19 09:00	AXD	
METALS												
Lead, Total	6.7		mg/kg	2.3	1.5	0.76	SW846 6010C	4/25/19	AHI	4/25/19 19:03	SRT	A1

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ANALYTICAL RESULTS

Workorder: 3028392 PQF182|FTMM-59 Soil Confirmato

Lab ID: **3028392003** Date Collected: 4/15/2019 10:20 Matrix: Solid
Sample ID: **M59-SHED1/B3-B-1.5-2.0** Date Received: 4/16/2019 20:40

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
SEMIVOLATILES												
Benzo(a)pyrene	0.074U	U	mg/kg	0.11	0.074	0.0044	SW846 8270D	4/23/19	JTH	4/23/19 12:10	GEC	A
WET CHEMISTRY												
Moisture	14.3		%	0.1	0.1	0.01	S2540G-11			4/18/19 09:00	AXD	
Total Solids	85.7		%	0.1	0.1	0.01	S2540G-11			4/18/19 09:00	AXD	
METALS												
Lead, Total	7.7		mg/kg	2.2	1.5	0.73	SW846 6010C	4/25/19	AHI	4/25/19 19:07	SRT	A1

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ANALYTICAL RESULTS

Workorder: 3028392 PQF182|FTMM-59 Soil Confirmato

Lab ID: **3028392004** Date Collected: 4/15/2019 10:30 Matrix: Solid

Sample ID: **M59-SHED2/B3-B-1.5-2.0** Date Received: 4/16/2019 20:40

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*
SEMIVOLATILES												
Benzo(a)pyrene	0.074U	U	mg/kg	0.11	0.074	0.0044	SW846 8270D	4/23/19	JTH	4/23/19 12:35	GEC	A
Benzo(b)fluoranthene	0.074U	U	mg/kg	0.11	0.074	0.0055	SW846 8270D	4/23/19	JTH	4/23/19 12:35	GEC	A
WET CHEMISTRY												
Moisture	13.1		%	0.1	0.1	0.01	S2540G-11			4/18/19 09:00	AXD	
Total Solids	86.9		%	0.1	0.1	0.01	S2540G-11			4/18/19 09:00	AXD	

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ANALYTICAL RESULTS

Workorder: 3028392 PQF182|FTMM-59 Soil Confirmato

Lab ID: **3028392005** Date Collected: 4/15/2019 09:40 Matrix: Solid
Sample ID: **M59-SHED1/B1-B-1.5-2.0-DUP** Date Received: 4/16/2019 20:40

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY												
Moisture	15.6		%	0.1	0.1	0.01	S2540G-11			4/18/19 09:00	AXD	
Total Solids	84.4		%	0.1	0.1	0.01	S2540G-11			4/18/19 09:00	AXD	
METALS												
Lead, Total	8.5		mg/kg	2.2	1.5	0.75	SW846 6010C	4/25/19	AHI	4/25/19 19:22	SRT	A1

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ANALYTICAL RESULTS

Workorder: 3028392 PQF182|FTMM-59 Soil Confirmato

Lab ID: **3028392006** Date Collected: 4/15/2019 10:30 Matrix: Solid

Sample ID: **M59-SHED1/B3-B-1.5-2.0-DUP** Date Received: 4/16/2019 20:40

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*
SEMIVOLATILES												
Benzo(a)pyrene	0.073U	U	mg/kg	0.11	0.073	0.0044	SW846 8270D	4/23/19	JTH	4/23/19 13:49	GEC	A
Benzo(b)fluoranthene	0.073U	U	mg/kg	0.11	0.073	0.0054	SW846 8270D	4/23/19	JTH	4/23/19 13:49	GEC	A
WET CHEMISTRY												
Moisture	13.9		%	0.1	0.1	0.01	S2540G-11			4/18/19 09:00	AXD	
Total Solids	86.1		%	0.1	0.1	0.01	S2540G-11			4/18/19 09:00	AXD	

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3028392 PQF182|FTMM-59 Soil Confirmato

Lab ID	Sample ID	Analysis Method	Prep Method
3028392001	M59-SHED1/B1-B-1.5-2.0	S2540G-11	
3028392001	M59-SHED1/B1-B-1.5-2.0	SW846 6010C	SW846 3051
3028392002	M59-SHED1/B2-B-1.5-2.0	S2540G-11	
3028392002	M59-SHED1/B2-B-1.5-2.0	SW846 6010C	SW846 3051
3028392003	M59-SHED1/B3-B-1.5-2.0	S2540G-11	
3028392003	M59-SHED1/B3-B-1.5-2.0	SW846 6010C	SW846 3051
3028392003	M59-SHED1/B3-B-1.5-2.0	SW846 8270D	SW846 3546
3028392004	M59-SHED2/B3-B-1.5-2.0	S2540G-11	
3028392004	M59-SHED2/B3-B-1.5-2.0	SW846 8270D	SW846 3546
3028392005	M59-SHED1/B1-B-1.5-2.0-DUP	S2540G-11	
3028392005	M59-SHED1/B1-B-1.5-2.0-DUP	SW846 6010C	SW846 3051
3028392006	M59-SHED1/B3-B-1.5-2.0-DUP	S2540G-11	
3028392006	M59-SHED1/B3-B-1.5-2.0-DUP	SW846 8270D	SW846 3546

3028392

ALS Environmental
34 Dogwood Lane
Middletown, PA 07057
(717) 944-5541

CHAIN OF CUSTODY / REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY SAMPLER. INSTRUCTIONS ON THE BACK.

3028392

ALS #: M59-01-20190415 | 1 of 1

ALS Quote #:

Client Name: Parsons Federal	Container Type	AN	AN	AN								Receipt Information (completed by Receiving Lab)	
Address: 100 High St. 4th Floor	Container Size	8 oz	8 oz	8 oz								Cooler Temp: ____ Therm ID: ____	
Boston, MA 02110	Preservative	4c	4c	4c								No. of Coolers: ____	Y / N / Initial
Contact: Lorraine Weber	ANALYSES/METHOD REQUESTED											Custody Seals Present?	
Phone#: 315-552-9745												(if present) Seals Intact?	
Project Name/#: FTMM-59 Soil confirmatory sampling												Received on Ice?	
Bill To: Parsons Federal												COC/Labels Complete/Accurate?	
TAT [X] Normal-Standard TAT is 10-12 business days. [X] Rush-Subject to ALS approval and surcharges.												Cont. in Good Cond.?	
Date Required: Approved?												Correct Containers?	
Email? [X]-Y lorraine.weber@parsons.com												Correct Sample Volumes?	
Fax? [ ]-Y No.:												Correct Preservation?	
												Headspace/Volatiles?	
												Courier/Tracking #:	

	Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	Lead (6010)	Lead (6010) Benzo(a)pyrene (8270)	Benzo(a)pyrene and Benzo(b)fluoranthene (8270)							AUTHORIZED TO RUN	Sample/COC Comments
						Enter Number of Containers Per Sample or Field Results Below.										
1	M59-SHED1/B1-B-1.5-2.0	4-15-19	0940	G	SO	1									X	
2	M59-SHED1/B2-B-1.5-2.0		1000	G	SO	1									X	
3	M59-SHED1/B3-B-1.5-2.0		1020	G	SO		1								X	
4	M59-SHED2/B3-B-1.5-2.0		1030	G	SO			1							X	
5	M59-SHED1/B1-B-1.5-20-DUP		0940	G	SO	1									X	
6	M59-SHED1/B1-B-1.5-20-MS		0940	G	SO	1									X	
7	M59-SHED1/B1-B-1.5-20-MSD		0940	G	SO	2									X	
8	M59-SHED2/B3-B-1.5-20-DUP		1030	G	SO			1							X	
9	M59-SHED2/B3-B-1.5-20-MS		1030	G	SO			1							X	ALS Field Services: [X] Pickup [ ] Labor [ ] Composite Sampling [X] Rental Equipment
10	M59-SHED2/B3-B-1.5-20-MSD		1030	G	SO			1							X	[ ] Other:

Project Comments: 110016-03300
MDL Must Meet NJDEP Soil Cleanup Criteria and/or Groundwater Quality Standards

LOGGED BY(signature): F. Gaona — Date: 4-15-19 — Time: 1600

REVIEWED BY(signature): — Date: — Time:

Data Deliverables: [ ] Standard [X] CLP-like [ ] USACE [ ]

Special Processing: [ ] USACE [ ] Navy [ ]

State Samples Collected In: [ ] NY [X] NJ [ ] PA [ ] NC [ ]

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 FRANK ACCORSI/PARSONS	4-16-19	1042	2 [signature] KRS	4/16/19	1042
3 [signature]	4-16-19	1830	4 COMMON COURIER / ALS COURIER		
5 COMMON COURIER / ALS COURIER			6 [signature] [signature]	4/16/19	2040
7			8		
9			10		

Reportable to PADEP? Yes [ ] PWSID #

Sample Disposal: [ ] Lab [ ] Special

EDDS: Format Type- ERPIMS & HAZSITE

* G=Grab; C=Composite

**Matrix - AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
Parsons Federal	3028392	GW	4/16/19

1. Were airbills / tracking numbers present and recorded?	(NONE)	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	NONE	(YES)	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	(N/A)	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg))?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		(YES)	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	(NO)
13a. Are the samples required for SDWA compliance reporting?	(N/A)	YES	NO
13b. Did the client provide a SDWA PWS ID#?	(N/A)	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	(N/A)	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #: ____ ____ ____ ____ ____ ____ ____ ____

Temperature (°C): 5°C ____ ____ ____ ____ ____ ____ ____

Thermometer ID: 401

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 1/10/2019

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

May 1, 2019

Ms. Lorraine Weber
Parsons - Syracuse NY
301 Plainfield Road
Suite 350
Syracuse, NY 13212

Certificate of Analysis

Project Name:	**Ft. Monmouth Soils**	Workorder:	**3028447**
Purchase Order:	**PO-00065450**	Workorder ID:	**PQF183|FTMM-59 Soil Confirmato**

Dear Ms. Weber:

Enclosed are the analytical results for samples received by the laboratory on Wednesday, April 17, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Kent Friesen , Mr. Julien Chambert , Ms. Cris Grill

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3028447 PQF183|FTMM-59 Soil Confirmato

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3028447001	M59-BAY9/10-B 8.0-8.5	Solid	4/16/2019 13:50	4/17/2019 19:41	Collected by Client
3028447002	M59-BAY9/10-B2-9.0-9.5	Solid	4/16/2019 15:20	4/17/2019 19:41	Collected by Client
3028447003	M59-BAY9/10-N-5.5-6.0	Solid	4/16/2019 13:40	4/17/2019 19:41	Collected by Client
3028447004	M59-BAY9/10-N-7.5-8.0	Solid	4/16/2019 13:20	4/17/2019 19:41	Collected by Client
3028447005	M59-BAY9/10-E-7.0-7.5	Solid	4/16/2019 14:55	4/17/2019 19:41	Collected by Client
3028447006	M59-BAY9/10-E-8.5-9.0	Solid	4/16/2019 15:10	4/17/2019 19:41	Collected by Client
3028447007	M59-BAY9/10-S-6.5-7.0	Solid	4/16/2019 14:35	4/17/2019 19:41	Collected by Client
3028447008	M59-BAY9/10-S-8.5-9.0	Solid	4/16/2019 14:45	4/17/2019 19:41	Collected by Client
3028447009	M59-BAY9/10-W-5.5-6.0	Solid	4/16/2019 14:00	4/17/2019 19:41	Collected by Client
3028447010	M59-BAY9/10-W-8.0-8.5	Solid	4/16/2019 14:15	4/17/2019 19:41	Collected by Client

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SAMPLE SUMMARY

Workorder: 3028447 PQF183|FTMM-59 Soil Confirmato

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3028447 PQF183|FTMM-59 Soil Confirmato

Lab ID: **3028447001** Date Collected: 4/16/2019 13:50 Matrix: Solid

Sample ID: **M59-BAY9/10-B 8.0-8.5** Date Received: 4/17/2019 19:41

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
AROMATIC PETROLEUM HC's												
C10 TO C12	0.76J	J	mg/kg	1.3	1.3	0.60	NJEPH	4/19/19	MPP	4/29/19 22:27	KJH	B
C12 TO C16	1.7		mg/kg	1.3	1.3	0.24	NJEPH	4/19/19	MPP	4/29/19 22:27	KJH	B
C16 TO C21	45.1		mg/kg	13.3	13.3	2.3	NJEPH	4/19/19	MPP	4/30/19 04:45	KJH	B
C21 TO C36	130		mg/kg	13.3	13.3	3.2	NJEPH	4/19/19	MPP	4/30/19 04:45	KJH	B
Total EPH Aromatic	178		mg/kg	5.3	5.3	1.4	NJEPH	4/19/19	MPP	4/29/19 22:27	KJH	B
Total EPH (Aliphatic+Aromatic)	1390		mg/kg	10.6	10.6	3.3	NJEPH	4/19/19	MPP	4/29/19 22:27	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2-Bromonaphthalene (S)	95.4		%	40 - 140			NJEPH	4/19/19	MPP	4/29/19 22:27	KJH	B
2-Bromonaphthalene (S)	81.9		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 04:45	KJH	B
2-Fluorobiphenyl (S)	81		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 04:45	KJH	B
2-Fluorobiphenyl (S)	94.9		%	40 - 140			NJEPH	4/19/19	MPP	4/29/19 22:27	KJH	B
o-Terphenyl (S)	58.9		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 04:45	KJH	B
o-Terphenyl (S)	69.5		%	40 - 140			NJEPH	4/19/19	MPP	4/29/19 22:27	KJH	B
ALIPHATIC PETROLEUM HC's												
C9 TO C12	1.7		mg/kg	1.3	1.3	0.16	NJEPH	4/19/19	MPP	4/28/19 19:03	KJH	B
C12 TO C16	17.3		mg/kg	13.3	13.3	5.7	NJEPH	4/19/19	MPP	4/29/19 01:22	KJH	B
C16 TO C21	203		mg/kg	13.3	13.3	5.6	NJEPH	4/19/19	MPP	4/29/19 01:22	KJH	B
C21 TO C40	990	1,2	mg/kg	66.5	66.5	32.6	NJEPH	4/19/19	MPP	4/30/19 19:17	KJH	B
Total EPH Aliphatic	1210		mg/kg	5.3	5.3	1.9	NJEPH	4/19/19	MPP	4/28/19 19:03	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1-Chlorooctadecane (S)	0	3	%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 19:17	KJH	B
1-Chlorooctadecane (S)	46.3		%	40 - 140			NJEPH	4/19/19	MPP	4/28/19 19:03	KJH	B
WET CHEMISTRY												
Moisture	25.4		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	
Total Solids	74.6		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 3028447 PQF183|FTMM-59 Soil Confirmato

Lab ID: **3028447002** Date Collected: 4/16/2019 15:20 Matrix: Solid

Sample ID: **M59-BAY9/10-B2-9.0-9.5** Date Received: 4/17/2019 19:41

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
AROMATIC PETROLEUM HC's												
C10 TO C12	0.60J	J	mg/kg	1.3	1.3	0.60	NJEPH	4/19/19	MPP	4/29/19 23:30	KJH	B
C12 TO C16	0.93J	J	mg/kg	1.3	1.3	0.24	NJEPH	4/19/19	MPP	4/29/19 23:30	KJH	B
C16 TO C21	0.39J	J	mg/kg	1.3	1.3	0.23	NJEPH	4/19/19	MPP	4/29/19 23:30	KJH	B
C21 TO C36	0.59J	J	mg/kg	1.3	1.3	0.32	NJEPH	4/19/19	MPP	4/29/19 23:30	KJH	B
Total EPH Aromatic	2.5J	J	mg/kg	5.3	5.3	1.4	NJEPH	4/19/19	MPP	4/29/19 23:30	KJH	B
Total EPH (Aliphatic+Aromatic)	6.2J	J	mg/kg	10.7	10.7	3.3	NJEPH	4/19/19	MPP	4/29/19 23:30	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2-Bromonaphthalene (S)	103		%	40 - 140			NJEPH	4/19/19	MPP	4/29/19 23:30	KJH	B
2-Fluorobiphenyl (S)	102		%	40 - 140			NJEPH	4/19/19	MPP	4/29/19 23:30	KJH	B
o-Terphenyl (S)	71.9		%	40 - 140			NJEPH	4/19/19	MPP	4/29/19 23:30	KJH	B
ALIPHATIC PETROLEUM HC's												
C9 TO C12	1.6		mg/kg	1.3	1.3	0.16	NJEPH	4/19/19	MPP	4/28/19 20:07	KJH	B
C12 TO C16	0.75J	J	mg/kg	1.3	1.3	0.57	NJEPH	4/19/19	MPP	4/28/19 20:07	KJH	B
C16 TO C21	0.62J	J	mg/kg	1.3	1.3	0.56	NJEPH	4/19/19	MPP	4/28/19 20:07	KJH	B
C21 TO C40	0.75J	J,1,2	mg/kg	1.3	1.3	0.65	NJEPH	4/19/19	MPP	4/28/19 20:07	KJH	B
Total EPH Aliphatic	3.7J	J	mg/kg	5.3	5.3	2.0	NJEPH	4/19/19	MPP	4/28/19 20:07	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1-Chlorooctadecane (S)	37.4	3	%	40 - 140			NJEPH	4/19/19	MPP	4/28/19 20:07	KJH	B
WET CHEMISTRY												
Moisture	26.6		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	
Total Solids	73.4		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

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ANALYTICAL RESULTS

Workorder: 3028447 PQF183|FTMM-59 Soil Confirmato

Lab ID: **3028447003** Date Collected: 4/16/2019 13:40 Matrix: Solid

Sample ID: **M59-BAY9/10-N-5.5-6.0** Date Received: 4/17/2019 19:41

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
AROMATIC PETROLEUM HC's												
C10 TO C12	0.77J	J	mg/kg	1.2	1.2	0.53	NJEPH	4/19/19	MPP	4/30/19 00:33	KJH	B
C12 TO C16	0.75J	J	mg/kg	1.2	1.2	0.21	NJEPH	4/19/19	MPP	4/30/19 00:33	KJH	B
C16 TO C21	0.31J	J	mg/kg	1.2	1.2	0.20	NJEPH	4/19/19	MPP	4/30/19 00:33	KJH	B
C21 TO C36	0.54J	J	mg/kg	1.2	1.2	0.28	NJEPH	4/19/19	MPP	4/30/19 00:33	KJH	B
Total EPH Aromatic	2.4J	J	mg/kg	4.7	4.7	1.2	NJEPH	4/19/19	MPP	4/30/19 00:33	KJH	B
Total EPH (Aliphatic+Aromatic)	4.5J	J	mg/kg	9.4	9.4	2.9	NJEPH	4/19/19	MPP	4/30/19 00:33	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2-Bromonaphthalene (S)	95.7		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 00:33	KJH	B
2-Fluorobiphenyl (S)	95.1		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 00:33	KJH	B
o-Terphenyl (S)	69.3		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 00:33	KJH	B
ALIPHATIC PETROLEUM HC's												
C9 TO C12	0.49J	J	mg/kg	1.2	1.2	0.14	NJEPH	4/19/19	MPP	4/28/19 21:10	KJH	B
C12 TO C16	1.2U	U	mg/kg	1.2	1.2	0.50	NJEPH	4/19/19	MPP	4/28/19 21:10	KJH	B
C16 TO C21	1.2U	U	mg/kg	1.2	1.2	0.49	NJEPH	4/19/19	MPP	4/28/19 21:10	KJH	B
C21 TO C40	1.0J	J,1,2	mg/kg	1.2	1.2	0.57	NJEPH	4/19/19	MPP	4/28/19 21:10	KJH	B
Total EPH Aliphatic	2.1J	J	mg/kg	4.7	4.7	1.7	NJEPH	4/19/19	MPP	4/28/19 21:10	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1-Chlorooctadecane (S)	40.3		%	40 - 140			NJEPH	4/19/19	MPP	4/28/19 21:10	KJH	B
WET CHEMISTRY												
Moisture	15.9		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	
Total Solids	84.1		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	

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ANALYTICAL RESULTS

Workorder: 3028447 PQF183|FTMM-59 Soil Confirmato

Lab ID: **3028447004** Date Collected: 4/16/2019 13:20 Matrix: Solid

Sample ID: **M59-BAY9/10-N-7.5-8.0** Date Received: 4/17/2019 19:41

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
AROMATIC PETROLEUM HC's												
C10 TO C12	0.80J	J	mg/kg	1.1	1.1	0.51	NJEPH	4/19/19	MPP	4/30/19 01:05	KJH	B
C12 TO C16	0.94J	J	mg/kg	1.1	1.1	0.21	NJEPH	4/19/19	MPP	4/30/19 01:05	KJH	B
C16 TO C21	0.26J	J	mg/kg	1.1	1.1	0.19	NJEPH	4/19/19	MPP	4/30/19 01:05	KJH	B
C21 TO C36	0.38J	J	mg/kg	1.1	1.1	0.27	NJEPH	4/19/19	MPP	4/30/19 01:05	KJH	B
Total EPH Aromatic	2.4J	J	mg/kg	4.6	4.6	1.2	NJEPH	4/19/19	MPP	4/30/19 01:05	KJH	B
Total EPH (Aliphatic+Aromatic)	11.3		mg/kg	9.1	9.1	2.9	NJEPH	4/19/19	MPP	4/30/19 01:05	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2-Bromonaphthalene (S)	93.6		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 01:05	KJH	B
2-Fluorobiphenyl (S)	93.1		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 01:05	KJH	B
o-Terphenyl (S)	67.4		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 01:05	KJH	B
ALIPHATIC PETROLEUM HC's												
C9 TO C12	0.59J	J	mg/kg	1.1	1.1	0.14	NJEPH	4/19/19	MPP	4/28/19 21:41	KJH	B
C12 TO C16	1.1U	U	mg/kg	1.1	1.1	0.49	NJEPH	4/19/19	MPP	4/28/19 21:41	KJH	B
C16 TO C21	0.70J	J	mg/kg	1.1	1.1	0.48	NJEPH	4/19/19	MPP	4/28/19 21:41	KJH	B
C21 TO C40	7.2	1,2	mg/kg	1.1	1.1	0.56	NJEPH	4/19/19	MPP	4/28/19 21:41	KJH	B
Total EPH Aliphatic	8.9		mg/kg	4.6	4.6	1.7	NJEPH	4/19/19	MPP	4/28/19 21:41	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1-Chlorooctadecane (S)	39.2	3	%	40 - 140			NJEPH	4/19/19	MPP	4/28/19 21:41	KJH	B
WET CHEMISTRY												
Moisture	16.4		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	
Total Solids	83.6		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	

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ANALYTICAL RESULTS

Workorder: 3028447 PQF183|FTMM-59 Soil Confirmato

Lab ID: **3028447005** Date Collected: 4/16/2019 14:55 Matrix: Solid

Sample ID: **M59-BAY9/10-E-7.0-7.5** Date Received: 4/17/2019 19:41

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
AROMATIC PETROLEUM HC's												
C10 TO C12	0.88J	J	mg/kg	1.3	1.3	0.57	NJEPH	4/19/19	MPP	4/30/19 01:36	KJH	B
C12 TO C16	0.95J	J	mg/kg	1.3	1.3	0.23	NJEPH	4/19/19	MPP	4/30/19 01:36	KJH	B
C16 TO C21	34.3		mg/kg	12.7	12.7	2.2	NJEPH	4/19/19	MPP	4/30/19 05:16	KJH	B
C21 TO C36	107		mg/kg	12.7	12.7	3.0	NJEPH	4/19/19	MPP	4/30/19 05:16	KJH	B
Total EPH Aromatic	143		mg/kg	5.1	5.1	1.3	NJEPH	4/19/19	MPP	4/30/19 01:36	KJH	B
Total EPH (Aliphatic+Aromatic)	1140		mg/kg	10.1	10.1	3.2	NJEPH	4/19/19	MPP	4/30/19 01:36	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2-Bromonaphthalene (S)	104		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 01:36	KJH	B
2-Bromonaphthalene (S)	78.5		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 05:16	KJH	B
2-Fluorobiphenyl (S)	104		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 01:36	KJH	B
2-Fluorobiphenyl (S)	78.1		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 05:16	KJH	B
o-Terphenyl (S)	55.1		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 05:16	KJH	B
o-Terphenyl (S)	72.3		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 01:36	KJH	B
ALIPHATIC PETROLEUM HC's												
C9 TO C12	0.66J	J	mg/kg	1.3	1.3	0.15	NJEPH	4/19/19	MPP	4/28/19 22:13	KJH	B
C12 TO C16	12.1		mg/kg	1.3	1.3	0.54	NJEPH	4/19/19	MPP	4/28/19 22:13	KJH	B
C16 TO C21	124		mg/kg	12.7	12.7	5.3	NJEPH	4/19/19	MPP	4/29/19 03:59	KJH	B
C21 TO C40	858	3,4	mg/kg	63.3	63.3	31.0	NJEPH	4/19/19	MPP	4/30/19 19:48	KJH	B
Total EPH Aliphatic	995		mg/kg	5.1	5.1	1.8	NJEPH	4/19/19	MPP	4/28/19 22:13	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1-Chlorooctadecane (S)	23.8	5	%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 19:48	KJH	B
1-Chlorooctadecane (S)	35.6	1	%	40 - 140			NJEPH	4/19/19	MPP	4/28/19 22:13	KJH	B
1-Chlorooctadecane (S)	31.6	2	%	40 - 140			NJEPH	4/19/19	MPP	4/29/19 03:59	KJH	B
WET CHEMISTRY												
Moisture	25.0		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	
Total Solids	75.0		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	

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ANALYTICAL RESULTS

Workorder: 3028447 PQF183|FTMM-59 Soil Confirmato

Lab ID: **3028447006** Date Collected: 4/16/2019 15:10 Matrix: Solid

Sample ID: **M59-BAY9/10-E-8.5-9.0** Date Received: 4/17/2019 19:41

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
AROMATIC PETROLEUM HC's												
C10 TO C12	1.3U	U	mg/kg	1.3	1.3	0.58	NJEPH	4/19/19	MPP	4/30/19 02:08	KJH	B
C12 TO C16	0.41J	J	mg/kg	1.3	1.3	0.23	NJEPH	4/19/19	MPP	4/30/19 02:08	KJH	B
C16 TO C21	0.30J	J	mg/kg	1.3	1.3	0.22	NJEPH	4/19/19	MPP	4/30/19 02:08	KJH	B
C21 TO C36	0.51J	J	mg/kg	1.3	1.3	0.31	NJEPH	4/19/19	MPP	4/30/19 02:08	KJH	B
Total EPH Aromatic	1.6J	J	mg/kg	5.1	5.1	1.3	NJEPH	4/19/19	MPP	4/30/19 02:08	KJH	B
Total EPH (Aliphatic+Aromatic)	6.8J	J	mg/kg	10.2	10.2	3.2	NJEPH	4/19/19	MPP	4/30/19 02:08	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2-Bromonaphthalene (S)	87.5		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 02:08	KJH	B
2-Fluorobiphenyl (S)	86.2		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 02:08	KJH	B
o-Terphenyl (S)	66.6		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 02:08	KJH	B
ALIPHATIC PETROLEUM HC's												
C9 TO C12	0.61J	J	mg/kg	1.3	1.3	0.15	NJEPH	4/19/19	MPP	4/28/19 22:44	KJH	B
C12 TO C16	1.3U	U	mg/kg	1.3	1.3	0.55	NJEPH	4/19/19	MPP	4/28/19 22:44	KJH	B
C16 TO C21	0.58J	J	mg/kg	1.3	1.3	0.54	NJEPH	4/19/19	MPP	4/28/19 22:44	KJH	B
C21 TO C40	3.6	1,2	mg/kg	1.3	1.3	0.63	NJEPH	4/19/19	MPP	4/28/19 22:44	KJH	B
Total EPH Aliphatic	5.1		mg/kg	5.1	5.1	1.9	NJEPH	4/19/19	MPP	4/28/19 22:44	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1-Chlorooctadecane (S)	41.3		%	40 - 140			NJEPH	4/19/19	MPP	4/28/19 22:44	KJH	B
WET CHEMISTRY												
Moisture	25.4		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	
Total Solids	74.6		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	

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ANALYTICAL RESULTS

Workorder: 3028447 PQF183|FTMM-59 Soil Confirmato

Lab ID: **3028447007** Date Collected: 4/16/2019 14:35 Matrix: Solid

Sample ID: **M59-BAY9/10-S-6.5-7.0** Date Received: 4/17/2019 19:41

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
AROMATIC PETROLEUM HC's												
C10 TO C12	0.65J	J	mg/kg	1.3	1.3	0.57	NJEPH	4/19/19	MPP	4/30/19 02:39	KJH	B
C12 TO C16	1.5		mg/kg	1.3	1.3	0.23	NJEPH	4/19/19	MPP	4/30/19 02:39	KJH	B
C16 TO C21	71.9		mg/kg	12.6	12.6	2.1	NJEPH	4/19/19	MPP	4/30/19 05:48	KJH	B
C21 TO C36	173		mg/kg	12.6	12.6	3.0	NJEPH	4/19/19	MPP	4/30/19 05:48	KJH	B
Total EPH Aromatic	247		mg/kg	5.1	5.1	1.3	NJEPH	4/19/19	MPP	4/30/19 02:39	KJH	B
Total EPH (Aliphatic+Aromatic)	1870		mg/kg	10.1	10.1	3.2	NJEPH	4/19/19	MPP	4/30/19 02:39	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2-Bromonaphthalene (S)	92.9		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 02:39	KJH	B
2-Bromonaphthalene (S)	76.6		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 05:48	KJH	B
2-Fluorobiphenyl (S)	94.6		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 02:39	KJH	B
2-Fluorobiphenyl (S)	76.1		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 05:48	KJH	B
o-Terphenyl (S)	53.4		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 05:48	KJH	B
o-Terphenyl (S)	63.8		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 02:39	KJH	B
ALIPHATIC PETROLEUM HC's												
C9 TO C12	0.82J	J	mg/kg	1.3	1.3	0.15	NJEPH	4/19/19	MPP	4/28/19 23:16	KJH	B
C12 TO C16	16.9		mg/kg	1.3	1.3	0.54	NJEPH	4/19/19	MPP	4/28/19 23:16	KJH	B
C16 TO C21	232		mg/kg	12.6	12.6	5.3	NJEPH	4/19/19	MPP	4/29/19 05:02	KJH	B
C21 TO C40	1370	3,4	mg/kg	63.1	63.1	30.9	NJEPH	4/19/19	MPP	4/30/19 20:20	KJH	B
Total EPH Aliphatic	1620		mg/kg	5.1	5.1	1.8	NJEPH	4/19/19	MPP	4/28/19 23:16	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1-Chlorooctadecane (S)	34.7	1	%	40 - 140			NJEPH	4/19/19	MPP	4/28/19 23:16	KJH	B
1-Chlorooctadecane (S)	34.1	2	%	40 - 140			NJEPH	4/19/19	MPP	4/29/19 05:02	KJH	B
1-Chlorooctadecane (S)	0	5	%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 20:20	KJH	B
WET CHEMISTRY												
Moisture	23.4		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	
Total Solids	76.6		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	

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ANALYTICAL RESULTS

Workorder: 3028447 PQF183|FTMM-59 Soil Confirmato

Lab ID: **3028447008** Date Collected: 4/16/2019 14:45 Matrix: Solid

Sample ID: **M59-BAY9/10-S-8.5-9.0** Date Received: 4/17/2019 19:41

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
AROMATIC PETROLEUM HC's												
C10 TO C12	1.3U	U	mg/kg	1.3	1.3	0.57	NJEPH	4/19/19	MPP	4/30/19 03:10	KJH	B
C12 TO C16	0.99J	J	mg/kg	1.3	1.3	0.23	NJEPH	4/19/19	MPP	4/30/19 03:10	KJH	B
C16 TO C21	37.2		mg/kg	12.7	12.7	2.2	NJEPH	4/19/19	MPP	4/30/19 06:19	KJH	B
C21 TO C36	69.8		mg/kg	12.7	12.7	3.1	NJEPH	4/19/19	MPP	4/30/19 06:19	KJH	B
Total EPH Aromatic	109		mg/kg	5.1	5.1	1.3	NJEPH	4/19/19	MPP	4/30/19 03:10	KJH	B
Total EPH (Aliphatic+Aromatic)	976		mg/kg	10.2	10.2	3.2	NJEPH	4/19/19	MPP	4/30/19 03:10	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2-Bromonaphthalene (S)	78.3		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 06:19	KJH	B
2-Bromonaphthalene (S)	101		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 03:10	KJH	B
2-Fluorobiphenyl (S)	78		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 06:19	KJH	B
2-Fluorobiphenyl (S)	102		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 03:10	KJH	B
o-Terphenyl (S)	56		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 06:19	KJH	B
o-Terphenyl (S)	72		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 03:10	KJH	B
ALIPHATIC PETROLEUM HC's												
C9 TO C12	1.2J	J	mg/kg	1.3	1.3	0.15	NJEPH	4/19/19	MPP	4/28/19 23:47	KJH	B
C12 TO C16	9.8		mg/kg	1.3	1.3	0.55	NJEPH	4/19/19	MPP	4/28/19 23:47	KJH	B
C16 TO C21	99.6		mg/kg	12.7	12.7	5.3	NJEPH	4/19/19	MPP	4/29/19 05:34	KJH	B
C21 TO C40	757	2,3	mg/kg	12.7	12.7	6.2	NJEPH	4/19/19	MPP	4/29/19 05:34	KJH	B
Total EPH Aliphatic	867		mg/kg	5.1	5.1	1.9	NJEPH	4/19/19	MPP	4/28/19 23:47	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1-Chlorooctadecane (S)	33.2	1	%	40 - 140			NJEPH	4/19/19	MPP	4/28/19 23:47	KJH	B
1-Chlorooctadecane (S)	29.7	4	%	40 - 140			NJEPH	4/19/19	MPP	4/29/19 05:34	KJH	B
WET CHEMISTRY												
Moisture	26.2		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	
Total Solids	73.8		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3028447 PQF183|FTMM-59 Soil Confirmato

Lab ID: **3028447009** Date Collected: 4/16/2019 14:00 Matrix: Solid

Sample ID: **M59-BAY9/10-W-5.5-6.0** Date Received: 4/17/2019 19:41

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
AROMATIC PETROLEUM HC's												
C10 TO C12	1.2U	U	mg/kg	1.2	1.2	0.55	NJEPH	4/19/19	MPP	4/30/19 03:42	KJH	B
C12 TO C16	0.48J	J	mg/kg	1.2	1.2	0.22	NJEPH	4/19/19	MPP	4/30/19 03:42	KJH	B
C16 TO C21	0.24J	J	mg/kg	1.2	1.2	0.21	NJEPH	4/19/19	MPP	4/30/19 03:42	KJH	B
C21 TO C36	0.49J	J	mg/kg	1.2	1.2	0.29	NJEPH	4/19/19	MPP	4/30/19 03:42	KJH	B
Total EPH Aromatic	1.7J	J	mg/kg	4.9	4.9	1.3	NJEPH	4/19/19	MPP	4/30/19 03:42	KJH	B
Total EPH (Aliphatic+Aromatic)	5.9J	J	mg/kg	9.8	9.8	3.1	NJEPH	4/19/19	MPP	4/30/19 03:42	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2-Bromonaphthalene (S)	90.2		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 03:42	KJH	B
2-Fluorobiphenyl (S)	89.1		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 03:42	KJH	B
o-Terphenyl (S)	66		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 03:42	KJH	B
ALIPHATIC PETROLEUM HC's												
C9 TO C12	0.93J	J	mg/kg	1.2	1.2	0.15	NJEPH	4/19/19	MPP	4/29/19 00:19	KJH	B
C12 TO C16	0.61J	J	mg/kg	1.2	1.2	0.53	NJEPH	4/19/19	MPP	4/29/19 00:19	KJH	B
C16 TO C21	1.2U	U	mg/kg	1.2	1.2	0.51	NJEPH	4/19/19	MPP	4/29/19 00:19	KJH	B
C21 TO C40	2.1	1,2	mg/kg	1.2	1.2	0.60	NJEPH	4/19/19	MPP	4/29/19 00:19	KJH	B
Total EPH Aliphatic	4.2J	J	mg/kg	4.9	4.9	1.8	NJEPH	4/19/19	MPP	4/29/19 00:19	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1-Chlorooctadecane (S)	42.6		%	40 - 140			NJEPH	4/19/19	MPP	4/29/19 00:19	KJH	B
WET CHEMISTRY												
Moisture	18.4		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	
Total Solids	81.6		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3028447 PQF183|FTMM-59 Soil Confirmato

Lab ID: **3028447010** Date Collected: 4/16/2019 14:15 Matrix: Solid

Sample ID: **M59-BAY9/10-W-8.0-8.5** Date Received: 4/17/2019 19:41

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
AROMATIC PETROLEUM HC's												
C10 TO C12	0.56J	J	mg/kg	1.2	1.2	0.56	NJEPH	4/19/19	MPP	4/30/19 04:13	KJH	B
C12 TO C16	2.2		mg/kg	1.2	1.2	0.22	NJEPH	4/19/19	MPP	4/30/19 04:13	KJH	B
C16 TO C21	190		mg/kg	12.4	12.4	2.1	NJEPH	4/19/19	MPP	4/30/19 06:51	KJH	B
C21 TO C36	726		mg/kg	24.7	24.7	5.9	NJEPH	4/19/19	MPP	4/30/19 07:22	KJH	B
Total EPH Aromatic	919		mg/kg	4.9	4.9	1.3	NJEPH	4/19/19	MPP	4/30/19 04:13	KJH	B
Total EPH (Aliphatic+Aromatic)	4970		mg/kg	9.9	9.9	3.1	NJEPH	4/19/19	MPP	4/30/19 04:13	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2-Bromonaphthalene (S)	96.2		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 04:13	KJH	B
2-Bromonaphthalene (S)	80.3		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 07:22	KJH	B
2-Bromonaphthalene (S)	82.8		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 06:51	KJH	B
2-Fluorobiphenyl (S)	95.5		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 04:13	KJH	B
2-Fluorobiphenyl (S)	80.9		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 07:22	KJH	B
2-Fluorobiphenyl (S)	84.1		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 06:51	KJH	B
o-Terphenyl (S)	82.5		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 04:13	KJH	B
o-Terphenyl (S)	70.9		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 06:51	KJH	B
o-Terphenyl (S)	69.8		%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 07:22	KJH	B
ALIPHATIC PETROLEUM HC's												
C9 TO C12	3.0		mg/kg	1.2	1.2	0.15	NJEPH	4/19/19	MPP	4/29/19 00:50	KJH	B
C12 TO C16	74.4		mg/kg	12.4	12.4	5.3	NJEPH	4/19/19	MPP	4/29/19 06:36	KJH	B
C16 TO C21	381		mg/kg	61.8	61.8	26.0	NJEPH	4/19/19	MPP	4/30/19 20:52	KJH	B
C21 TO C40	3590	1,2	mg/kg	61.8	61.8	30.3	NJEPH	4/19/19	MPP	4/30/19 20:52	KJH	B
Total EPH Aliphatic	4050		mg/kg	4.9	4.9	1.8	NJEPH	4/19/19	MPP	4/29/19 00:50	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1-Chlorooctadecane (S)	0	3	%	40 - 140			NJEPH	4/19/19	MPP	4/30/19 20:52	KJH	B
1-Chlorooctadecane (S)	41.4		%	40 - 140			NJEPH	4/19/19	MPP	4/29/19 00:50	KJH	B
1-Chlorooctadecane (S)	40.5		%	40 - 140			NJEPH	4/19/19	MPP	4/29/19 06:36	KJH	B
WET CHEMISTRY												
Moisture	22.2		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	
Total Solids	77.8		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	

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ANALYTICAL RESULTS

Workorder: 3028447 PQF183|FTMM-59 Soil Confirmato

Lab ID: **3028447010** Date Collected: 4/16/2019 14:15 Matrix: Solid

Sample ID: **M59-BAY9/10-W-8.0-8.5** Date Received: 4/17/2019 19:41

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	*Cntr*

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3028447 PQF183|FTMM-59 Soil Confirmato

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3028447001	1	M59-BAY9/10-B 8.0-8.5	NJEPH	C21 TO C40
The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte C21 TO C40.				
3028447001	2	M59-BAY9/10-B 8.0-8.5	NJEPH	C21 TO C40
The QC sample type LCSD for method NJEPH was outside the control limits for the analyte C21 TO C40. The % Recovery was reported as 146 and the control limits were 40 to 140.				
3028447001	3	M59-BAY9/10-B 8.0-8.5	NJEPH	1-Chlorooctadecane
The surrogate 1-Chlorooctadecane for method NJEPH was outside of control limits. The % Recovery was reported as 0 and the control limits were 40 to 140. This result was reported at a dilution of 50.				
3028447002	1	M59-BAY9/10-B2-9.0-9.5	NJEPH	C21 TO C40
The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte C21 TO C40.				
3028447002	2	M59-BAY9/10-B2-9.0-9.5	NJEPH	C21 TO C40
The QC sample type LCSD for method NJEPH was outside the control limits for the analyte C21 TO C40. The % Recovery was reported as 146 and the control limits were 40 to 140.				
3028447002	3	M59-BAY9/10-B2-9.0-9.5	NJEPH	1-Chlorooctadecane
The surrogate 1-Chlorooctadecane for method NJEPH was outside of control limits. The % Recovery was reported as 37.4 and the control limits were 40 to 140. This result was reported at a dilution of 1.				
3028447003	1	M59-BAY9/10-N-5.5-6.0	NJEPH	C21 TO C40
The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte C21 TO C40.				
3028447003	2	M59-BAY9/10-N-5.5-6.0	NJEPH	C21 TO C40
The QC sample type LCSD for method NJEPH was outside the control limits for the analyte C21 TO C40. The % Recovery was reported as 146 and the control limits were 40 to 140.				
3028447004	1	M59-BAY9/10-N-7.5-8.0	NJEPH	C21 TO C40
The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte C21 TO C40.				
3028447004	2	M59-BAY9/10-N-7.5-8.0	NJEPH	C21 TO C40
The QC sample type LCSD for method NJEPH was outside the control limits for the analyte C21 TO C40. The % Recovery was reported as 146 and the control limits were 40 to 140.				
3028447004	3	M59-BAY9/10-N-7.5-8.0	NJEPH	1-Chlorooctadecane
The surrogate 1-Chlorooctadecane for method NJEPH was outside of control limits. The % Recovery was reported as 39.2 and the control limits were 40 to 140. This result was reported at a dilution of 1.				
3028447005	1	M59-BAY9/10-E-7.0-7.5	NJEPH	1-Chlorooctadecane
The surrogate 1-Chlorooctadecane for method NJEPH was outside of control limits. The % Recovery was reported as 35.6 and the control limits were 40 to 140. This result was reported at a dilution of 1.				
3028447005	2	M59-BAY9/10-E-7.0-7.5	NJEPH	1-Chlorooctadecane
The surrogate 1-Chlorooctadecane for method NJEPH was outside of control limits. The % Recovery was reported as 31.6 and the control limits were 40 to 140. This result was reported at a dilution of 10.				
3028447005	3	M59-BAY9/10-E-7.0-7.5	NJEPH	C21 TO C40
The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte C21 TO C40.				
3028447005	4	M59-BAY9/10-E-7.0-7.5	NJEPH	C21 TO C40
The QC sample type LCSD for method NJEPH was outside the control limits for the analyte C21 TO C40. The % Recovery was reported as 146 and the control limits were 40 to 140.				
3028447005	5	M59-BAY9/10-E-7.0-7.5	NJEPH	1-Chlorooctadecane
The surrogate 1-Chlorooctadecane for method NJEPH was outside of control limits. The % Recovery was reported as 23.8 and the control limits were 40 to 140. This result was reported at a dilution of 50.				

ANALYTICAL RESULTS

Workorder: 3028447 PQF183|FTMM-59 Soil Confirmato

3028447006	1	M59-BAY9/10-E-8.5-9.0	NJEPH	C21 TO C40
The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte C21 TO C40.				
3028447006	2	M59-BAY9/10-E-8.5-9.0	NJEPH	C21 TO C40
The QC sample type LCSD for method NJEPH was outside the control limits for the analyte C21 TO C40. The % Recovery was reported as 146 and the control limits were 40 to 140.				
3028447007	1	M59-BAY9/10-S-6.5-7.0	NJEPH	1-Chlorooctadecane
The surrogate 1-Chlorooctadecane for method NJEPH was outside of control limits. The % Recovery was reported as 34.7 and the control limits were 40 to 140. This result was reported at a dilution of 1.				
3028447007	2	M59-BAY9/10-S-6.5-7.0	NJEPH	1-Chlorooctadecane
The surrogate 1-Chlorooctadecane for method NJEPH was outside of control limits. The % Recovery was reported as 34.1 and the control limits were 40 to 140. This result was reported at a dilution of 10.				
3028447007	3	M59-BAY9/10-S-6.5-7.0	NJEPH	C21 TO C40
The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte C21 TO C40.				
3028447007	4	M59-BAY9/10-S-6.5-7.0	NJEPH	C21 TO C40
The QC sample type LCSD for method NJEPH was outside the control limits for the analyte C21 TO C40. The % Recovery was reported as 146 and the control limits were 40 to 140.				
3028447007	5	M59-BAY9/10-S-6.5-7.0	NJEPH	1-Chlorooctadecane
The surrogate 1-Chlorooctadecane for method NJEPH was outside of control limits. The % Recovery was reported as 0 and the control limits were 40 to 140. This result was reported at a dilution of 50.				
3028447008	1	M59-BAY9/10-S-8.5-9.0	NJEPH	1-Chlorooctadecane
The surrogate 1-Chlorooctadecane for method NJEPH was outside of control limits. The % Recovery was reported as 33.2 and the control limits were 40 to 140. This result was reported at a dilution of 1.				
3028447008	2	M59-BAY9/10-S-8.5-9.0	NJEPH	C21 TO C40
The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte C21 TO C40.				
3028447008	3	M59-BAY9/10-S-8.5-9.0	NJEPH	C21 TO C40
The QC sample type LCSD for method NJEPH was outside the control limits for the analyte C21 TO C40. The % Recovery was reported as 146 and the control limits were 40 to 140.				
3028447008	4	M59-BAY9/10-S-8.5-9.0	NJEPH	1-Chlorooctadecane
The surrogate 1-Chlorooctadecane for method NJEPH was outside of control limits. The % Recovery was reported as 29.7 and the control limits were 40 to 140. This result was reported at a dilution of 10.				
3028447009	1	M59-BAY9/10-W-5.5-6.0	NJEPH	C21 TO C40
The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte C21 TO C40.				
3028447009	2	M59-BAY9/10-W-5.5-6.0	NJEPH	C21 TO C40
The QC sample type LCSD for method NJEPH was outside the control limits for the analyte C21 TO C40. The % Recovery was reported as 146 and the control limits were 40 to 140.				
3028447010	1	M59-BAY9/10-W-8.0-8.5	NJEPH	C21 TO C40
The Method Blank for method NJEPH reported a value greater than the reporting level for the analyte C21 TO C40.				
3028447010	2	M59-BAY9/10-W-8.0-8.5	NJEPH	C21 TO C40
The QC sample type LCSD for method NJEPH was outside the control limits for the analyte C21 TO C40. The % Recovery was reported as 146 and the control limits were 40 to 140.				
3028447010	3	M59-BAY9/10-W-8.0-8.5	NJEPH	1-Chlorooctadecane
The surrogate 1-Chlorooctadecane for method NJEPH was outside of control limits. The % Recovery was reported as 0 and the control limits were 40 to 140. This result was reported at a dilution of 50.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3028447 PQF183|FTMM-59 Soil Confirmato

Lab ID	Sample ID	Analysis Method	Prep Method
3028447001	M59-BAY9/10-B 8.0-8.5	NJEPH	SW846 3546
3028447001	M59-BAY9/10-B 8.0-8.5	S2540G-11	
3028447002	M59-BAY9/10-B2-9.0-9.5	NJEPH	SW846 3546
3028447002	M59-BAY9/10-B2-9.0-9.5	S2540G-11	
3028447003	M59-BAY9/10-N-5.5-6.0	NJEPH	SW846 3546
3028447003	M59-BAY9/10-N-5.5-6.0	S2540G-11	
3028447004	M59-BAY9/10-N-7.5-8.0	NJEPH	SW846 3546
3028447004	M59-BAY9/10-N-7.5-8.0	S2540G-11	
3028447005	M59-BAY9/10-E-7.0-7.5	NJEPH	SW846 3546
3028447005	M59-BAY9/10-E-7.0-7.5	S2540G-11	
3028447006	M59-BAY9/10-E-8.5-9.0	NJEPH	SW846 3546
3028447006	M59-BAY9/10-E-8.5-9.0	S2540G-11	
3028447007	M59-BAY9/10-S-6.5-7.0	NJEPH	SW846 3546
3028447007	M59-BAY9/10-S-6.5-7.0	S2540G-11	
3028447008	M59-BAY9/10-S-8.5-9.0	NJEPH	SW846 3546
3028447008	M59-BAY9/10-S-8.5-9.0	S2540G-11	
3028447009	M59-BAY9/10-W-5.5-6.0	NJEPH	SW846 3546
3028447009	M59-BAY9/10-W-5.5-6.0	S2540G-11	
3028447010	M59-BAY9/10-W-8.0-8.5	NJEPH	SW846 3546
3028447010	M59-BAY9/10-W-8.0-8.5	S2540G-11	

3028447

M59-01-20190416

1 of 1

ALS Environmental
34 Dogwood Lane
Middletown, PA 07057
(717) 944-5541

CHAIN OF CUSTODY / REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY SAMPLER. INSTRUCTIONS ON THE BACK.

ALS Quote #:

Client Name: Parsons Federal
Address: 100 High St. 4th Floor, Boston, MA 02110
Contact: Lorraine Weber
Phone#: 315-552-9745
Project Name/#: FTMM-59 Soil confirmatory sampling
Bill To: Parsons Federal

TAT: [ ] Normal-Standard TAT is 10-12 business days. [X] Rush-Subject to ALS approval and surcharges.
Date Required: Approved?
Email? [X] -Y lorraine.weber@parsons.com
Fax? [ ] -Y No.:

	Container Type	AN									
	Container Size	8 oz									
	Preservative	4c									
	ANALYSES/METHOD REQUESTED										
	*G or C	**Matrix	Fractionated EPH (NJEPHS6)								AUTHORIZED TO RUN
	Enter Number of Containers Per Sample or Field Results Below.										
Sample Description/Location (as it will appear on the lab report)											
1 M59-BAY9/10-B-8.0-8.5	4-16-19	1350	G	SO	1						X
2 M59-BAY9/10-B2-9.0-9.5		1520	G	SO	1						X
3 M59-BAY9/10-N-5.5-6.0		1340	G	SO	1						X
4 M59-BAY9/10-N-7.5-8.0		1320	G	SO	1						X
5 M59-BAY9/10-E-7.0-7.5		1455	G	SO	1						X
6 M59-BAY9/10-E-8.5-9.0		1510	G	SO	1						X
7 M59-BAY9/10-S-6.5-7.0		1435	G	SO	1						X
8 M59-BAY9/10-S-8.5-9.0		1445	G	SO	1						X
9 M59-BAY9/10-W-5.5-6.0		1400	G	SO	1						X
10 M59-BAY9/10-W-8.0-8.5		1415	G	SO	1						X

Receipt Information (completed by Receiving Lab)
Cooler Temp: ____ Therm ID: ____
No. of Coolers: ____

	Y	N	Initial
Custody Seals Present?			
(If present) Seals Intact?			
Received on Ice?			
COC/Labels Complete/Accurate?			
Cont. in Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:
Sample/COC Comments

ALS Field Services: [X] Pickup [ ] Labor [ ] Composite Sampling [X] Rental Equipment
Other:

Project Comments: 110016-03300
MDL Must Meet NJDEP Soil Cleanup Criteria and/or Groundwater Quality Standards

LOGGED BY(signature): E. Reeves DATE 4-16-19 TIME 1600
REVIEWED BY(signature): DATE TIME

Data Deliverables: [ ] Standard [X] CLP-like [ ] USACE
Special Processing: [ ] USACE [ ] Navy
State Samples Collected In: [ ] NY [X] NJ [ ] PA [ ] NC

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 FRANK ACCORSI / PARSONS	4-17-19	0918	2	4/17/19	0918
3	4	1715	4 COMMON COURIER / ALS COURIER		
5 COMMON COURIER / ALS COURIER			6	4/18/19	1941
7			8		
9			10		

Reportable to PADEP? Yes [ ]
PWSID #
Sample Disposal: [ ] Lab [ ] Special
EDDS: Format Type- ERPIMS & HAZSITE

* G=Grab; C=Composite
**Matrix - AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
Parsons Federal	308447	QV	4/17/19

1. Were airbills / tracking numbers present and recorded?	(NONE)	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	NONE	(YES)	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	(N/A)	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		(YES)	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	(NO)
13a. Are the samples required for SDWA compliance reporting?	(N/A)	YES	NO
13b. Did the client provide a SDWA PWS ID#?	(N/A)	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	(N/A)	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #: _____

Temperature (°C): 4°C

Thermometer ID: 401

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 1/10/2019

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June 3, 2019

Ms. Lorraine Weber
Parsons - Syracuse NY
301 Plainfield Road
Suite 350
Syracuse, NY 13212

Certificate of Analysis

Revised Report - 6/3/2019 7:07:28 PM - See workorder comment section for explanation

Project Name:	**2018-FTMM-22 DOD WASTE CHARACTERIZATION**	Workorder:	**3029097**
Purchase Order:		Workorder ID:	**PQF185|FTMM 04/17/19**

Dear Ms. Weber:

Enclosed are the analytical results for samples received by the laboratory on Thursday, April 18, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Kent Friesen , Mr. Julien Chambert , Ms. Cris Grill

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3029097 PQF185|FTMM 04/17/19

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3029097001	FTMM-59-WC-C-S-1	Solid	4/17/2019 13:40	4/18/2019 21:48	Collected by Client
3029097002	FTMM-59-WC-G-S-1	Solid	4/17/2019 13:55	4/18/2019 21:48	Collected by Client
3029097003	FTMM-59-WC-G-S-SHED1/83	Solid	4/17/2019 12:45	4/18/2019 21:48	Collected by Client
3029097004	M59-TB-04172019	Water	4/18/2019 21:48	4/18/2019 21:48	Collected by Client

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SAMPLE SUMMARY

Workorder: 3029097 PQF185|FTMM 04/17/19

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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PROJECT SUMMARY

Workorder: 3029097 PQF185|FTMM 04/17/19

Workorder Comments

This Certificate of Analysis has been modified in order to report the ASTM COD and to correct the flags to trigger Tier III reporting.
VNB 5/29/19

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ANALYTICAL RESULTS

Workorder: 3029097 PQF185|FTMM 04/17/19

Lab ID: **3029097001** Date Collected: 4/17/2019 13:40 Matrix: Solid
Sample ID: **FTMM-59-WC-C-S-1** Date Received: 4/18/2019 21:48

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
TCLP SEMI-VOLATILES												
mp-Cresol	20.0U	U	ug/L	160	20.0	3.2	SW846 8270D	4/25/19	DXL	4/26/19 11:23	CGS	B
o-Cresol	20.0U	U	ug/L	160	20.0	5.0	SW846 8270D	4/25/19	DXL	4/26/19 11:23	CGS	B
1,4-Dichlorobenzene	20.0U	U	ug/L	160	20.0	3.6	SW846 8270D	4/25/19	DXL	4/26/19 11:23	CGS	B
2,4-Dinitrotoluene	20.0U	U	ug/L	160	20.0	2.6	SW846 8270D	4/25/19	DXL	4/26/19 11:23	CGS	B
Hexachlorobenzene	20.0U	U	ug/L	160	20.0	4.6	SW846 8270D	4/25/19	DXL	4/26/19 11:23	CGS	B
Hexachlorobutadiene	20.0U	U	ug/L	160	20.0	3.8	SW846 8270D	4/25/19	DXL	4/26/19 11:23	CGS	B
Hexachloroethane	20.0U	U	ug/L	160	20.0	6.0	SW846 8270D	4/25/19	DXL	4/26/19 11:23	CGS	B
Nitrobenzene	40.0U	U	ug/L	160	40.0	5.6	SW846 8270D	4/25/19	DXL	4/26/19 11:23	CGS	B
Pentachlorophenol	160U	U	ug/L	320	160	24.0	SW846 8270D	4/25/19	DXL	4/26/19 11:23	CGS	B
Pyridine	40.0U	U	ug/L	160	40.0	14.0	SW846 8270D	4/25/19	DXL	4/26/19 11:23	CGS	B
2,4,5-Trichlorophenol	60.0U	U	ug/L	160	60.0	11.0	SW846 8270D	4/25/19	DXL	4/26/19 11:23	CGS	B
2,4,6-Trichlorophenol	20.0U	U	ug/L	160	20.0	11.4	SW846 8270D	4/25/19	DXL	4/26/19 11:23	CGS	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2,4,6-Tribromophenol (S)	92.1		%	43 - 140			SW846 8270D	4/25/19	DXL	4/26/19 11:23	CGS	B
2-Fluorobiphenyl (S)	88.2		%	44 - 119			SW846 8270D	4/25/19	DXL	4/26/19 11:23	CGS	B
2-Fluorophenol (S)	65		%	19 - 119			SW846 8270D	4/25/19	DXL	4/26/19 11:23	CGS	B
Nitrobenzene-d5 (S)	86.8		%	44 - 120			SW846 8270D	4/25/19	DXL	4/26/19 11:23	CGS	B
Phenol-d5 (S)	40.6		%	13 - 49			SW846 8270D	4/25/19	DXL	4/26/19 11:23	CGS	B
Terphenyl-d14 (S)	106		%	50 - 134			SW846 8270D	4/25/19	DXL	4/26/19 11:23	CGS	B
PCBs												
Total Polychlorinated Biphenyl	0.26U	U	mg/kg	0.35	0.26	0.10	SW846 8082A	4/24/19	JTH	4/24/19 22:50	EGO	B
Aroclor-1016	0.029U	U	mg/kg	0.038	0.029	0.012	SW846 8082A	4/24/19	JTH	4/24/19 22:50	EGO	B
Aroclor-1221	0.029U	U	mg/kg	0.038	0.029	0.012	SW846 8082A	4/24/19	JTH	4/24/19 22:50	EGO	B
Aroclor-1232	0.029U	U	mg/kg	0.038	0.029	0.012	SW846 8082A	4/24/19	JTH	4/24/19 22:50	EGO	B
Aroclor-1242	0.029U	U	mg/kg	0.038	0.029	0.012	SW846 8082A	4/24/19	JTH	4/24/19 22:50	EGO	B
Aroclor-1248	0.029U	U	mg/kg	0.038	0.029	0.012	SW846 8082A	4/24/19	JTH	4/24/19 22:50	EGO	B
Aroclor-1254	0.029U	U	mg/kg	0.038	0.029	0.012	SW846 8082A	4/24/19	JTH	4/24/19 22:50	EGO	B
Aroclor-1260	0.029U	U	mg/kg	0.038	0.029	0.012	SW846 8082A	4/24/19	JTH	4/24/19 22:50	EGO	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
Decachlorobiphenyl (S)	85.1		%	49 - 115			SW846 8082A	4/24/19	JTH	4/24/19 22:50	EGO	B
Tetrachloro-m-xylene (S)	76.8		%	44 - 130			SW846 8082A	4/24/19	JTH	4/24/19 22:50	EGO	B
TCLP PESTICIDES												
gamma-BHC	0.40U	U	ug/L	1.0	0.40	0.18	SW846 8081B	4/25/19	DXL	4/26/19 10:31	RWS	B
Chlordane	4.0U	U	ug/L	10.0	4.0	1.4	SW846 8081B	4/25/19	DXL	4/26/19 10:31	RWS	B
Endrin	0.40U	U	ug/L	1.0	0.40	0.22	SW846 8081B	4/25/19	DXL	4/26/19 10:31	RWS	B

ANALYTICAL RESULTS

Workorder: 3029097 PQF185|FTMM 04/17/19

Lab ID: **3029097001** Date Collected: 4/17/2019 13:40 Matrix: Solid

Sample ID: **FTMM-59-WC-C-S-1** Date Received: 4/18/2019 21:48

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Heptachlor	0.40U	U	ug/L	1.0	0.40	0.16	SW846 8081B	4/25/19	DXL	4/26/19 10:31	RWS	B
Heptachlor Epoxide	0.40U	U	ug/L	1.0	0.40	0.14	SW846 8081B	4/25/19	DXL	4/26/19 10:31	RWS	B
Methoxychlor	0.40U	U	ug/L	1.0	0.40	0.24	SW846 8081B	4/25/19	DXL	4/26/19 10:31	RWS	B
Toxaphene	10.0U	U	ug/L	20.0	10.0	4.0	SW846 8081B	4/25/19	DXL	4/26/19 10:31	RWS	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
Decachlorobiphenyl (S)	81.6		%	30 - 135			SW846 8081B	4/25/19	DXL	4/26/19 10:31	RWS	B
Tetrachloro-m-xylene (S)	67		%	44 - 124			SW846 8081B	4/25/19	DXL	4/26/19 10:31	RWS	B
TCLP HERBICIDES												
2,4-D	8.0U	U	ug/L	8.0	8.0	4.0	SW846 8151A	4/25/19	DXL	4/26/19 14:00	KJH	B
2,4,5-TP	8.0U	U	ug/L	8.0	8.0	4.0	SW846 8151A	4/25/19	DXL	4/26/19 14:00	KJH	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2,4-Dichlorophenylacetic acid (S)	75.2		%	32 - 138			SW846 8151A	4/25/19	DXL	4/26/19 14:00	KJH	B
WET CHEMISTRY												
Ammonia-N, Low Level	0.10U	U,3	mg/L	0.10	0.10	0.01	SM 4500-NH3G	4/29/19	NJA	4/29/19 16:28	NJA	
Corrosivity as pH	5.07	1,2	pH_Units				SW846 9045D			4/24/19 03:48	MBW	B
Cyanide, Reactive	101		ppm	10	10	0.011	SW-846 7.3CN	4/24/19	VXF	4/25/19 14:52	JXB	B
Free Liquids	NEGATIVE						SW846 9095B			4/24/19 06:55	AXD	B
Hexane Extractable Material	2740		mg/kg	242	242	60	SW846 9071B/1664B			4/24/19 06:30	MPP	B
Moisture	18.0		%	0.1	0.1	0.01	S2540G-11			4/23/19 10:27	AXD	
Solids, Total Volatile	3.0		%	1.0	1.0	0.1	S2540G-11			4/24/19 08:00	AXD	B
Sulfide, Reactive	9.6		ppm	6.2	6.2	1.4	SW846 7.3	4/24/19	VXF	4/24/19 19:35	VXF	B
Total Solids	82.0		%	0.1	0.1	0.01	S2540G-11			4/23/19 10:27	AXD	
TCLP METALS												
Arsenic, Total	93.5U	U	ug/L	140	93.5	46.5	SW846 6010C	4/25/19	AHI	4/25/19 20:10	SRT	B1
Barium, Total	108		ug/L	55.0	36.5	18.0	SW846 6010C	4/25/19	AHI	4/25/19 20:10	SRT	B1
Cadmium, Total	7.0U	U	ug/L	11.0	7.0	3.7	SW846 6010C	4/25/19	AHI	4/25/19 20:10	SRT	B1
Chromium, Total	20.0U	U	ug/L	28.0	20.0	10.0	SW846 6010C	4/25/19	AHI	4/25/19 20:10	SRT	B1
Copper, Total	36.5U	U	ug/L	55.0	36.5	18.0	SW846 6010C	4/25/19	AHI	4/25/19 20:10	SRT	B1
Lead, Total	19.4J	J	ug/L	33.5	22.5	11.0	SW846 6010C	4/25/19	AHI	4/25/19 20:10	SRT	B1
Mercury, Total	0.33U	U	ug/L	0.50	0.33	0.16	SW846 7470A	4/26/19	MSA	4/26/19 06:21	MSA	B
Nickel, Total	70.0U	U	ug/L	110	70.0	36.5	SW846 6010C	4/25/19	AHI	4/25/19 20:10	SRT	B1
Selenium, Total	70.0U	U	ug/L	110	70.0	36.5	SW846 6010C	4/25/19	AHI	4/25/19 20:10	SRT	B1
Silver, Total	14.5U	U	ug/L	22.0	14.5	7.0	SW846 6010C	4/25/19	AHI	4/25/19 20:10	SRT	B1
Zinc, Total	91.7J	J	ug/L	110	70.0	36.5	SW846 6010C	4/25/19	AHI	4/25/19 20:10	SRT	B1

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ANALYTICAL RESULTS

Workorder: 3029097 PQF185|FTMM 04/17/19

Lab ID: **3029097001** Date Collected: 4/17/2019 13:40 Matrix: Solid

Sample ID: **FTMM-59-WC-C-S-1** Date Received: 4/18/2019 21:48

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	*Cntr*
ASTM LEACHATE											
Chemical Oxygen Demand (COD)	38200		ug/L	15000	15000	1000	EPA 410.4		4/26/19 13:23	AK	B
Oil/Grease Hexane Extractable	4.01		mg/L	4.0	4.0	1.3	EPA 1664B		4/25/19 13:00	ELS	B
Oil/Grease Silica Gel Treated	4.01		mg/L	4.0	4.0	1.3	EPA 1664B		4/25/19 13:00	ELS	B
Total Solids	671000		ug/L	5000	5000	5000	S2540B-11		4/24/19 17:00	D1C	B

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3029097 PQF185|FTMM 04/17/19

Lab ID: **3029097002** Date Collected: 4/17/2019 13:55 Matrix: Solid

Sample ID: **FTMM-59-WC-G-S-1** Date Received: 4/18/2019 21:48

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
TCLP VOLATILE ORGANICS												
Benzene	15.0U	U	ug/L	20.0	15.0	6.6	SW846 8260C			4/25/19 14:38	TMP	A
2-Butanone	75.0U	U	ug/L	100	75.0	32.0	SW846 8260C			4/25/19 14:38	TMP	A
Carbon Tetrachloride	15.0U	U	ug/L	20.0	15.0	6.6	SW846 8260C			4/25/19 14:38	TMP	A
Chlorobenzene	15.0U	U	ug/L	20.0	15.0	6.6	SW846 8260C			4/25/19 14:38	TMP	A
Chloroform	15.0U	U	ug/L	20.0	15.0	6.6	SW846 8260C			4/25/19 14:38	TMP	A
1,2-Dichloroethane	15.0U	U	ug/L	20.0	15.0	6.6	SW846 8260C			4/25/19 14:38	TMP	A
1,1-Dichloroethene	15.0U	U	ug/L	20.0	15.0	6.6	SW846 8260C			4/25/19 14:38	TMP	A
Tetrachloroethene	15.0U	U	ug/L	20.0	15.0	6.6	SW846 8260C			4/25/19 14:38	TMP	A
Trichloroethene	15.0U	U	ug/L	20.0	15.0	6.6	SW846 8260C			4/25/19 14:38	TMP	A
Vinyl Chloride	15.0U	U	ug/L	20.0	15.0	6.6	SW846 8260C			4/25/19 14:38	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	109		%	81 - 118	SW846 8260C			4/25/19 14:38	TMP	A
4-Bromofluorobenzene (S)	105		%	85 - 114	SW846 8260C			4/25/19 14:38	TMP	A
Dibromofluoromethane (S)	96.8		%	80 - 119	SW846 8260C			4/25/19 14:38	TMP	A
Toluene-d8 (S)	98.8		%	89 - 112	SW846 8260C			4/25/19 14:38	TMP	A

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3029097 PQF185|FTMM 04/17/19

Lab ID: **3029097003** Date Collected: 4/17/2019 12:45 Matrix: Solid

Sample ID: **FTMM-59-WC-G-S-SHED1/83** Date Received: 4/18/2019 21:48

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*
TCLP METALS												
Lead, Total	22.5U	U	ug/L	33.5	22.5	11.0	SW846 6010C	4/25/19	AHI	4/25/19 20:14	SRT	B1

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3029097 PQF185|FTMM 04/17/19

Lab ID: **3029097004** Date Collected: 4/18/2019 21:48 Matrix: Water
Sample ID: **M59-TB-04172019** Date Received: 4/18/2019 21:48

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	8.4		ug/L	5.0	3.8	1.6	SW846 8260C		4/23/19 14:07	TMP	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Bromobenzene	0.75U	U	ug/L	1.0	0.75	0.20	SW846 8260C		4/23/19 14:07	TMP	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
2-Butanone	2.2J	J	ug/L	5.0	3.8	1.6	SW846 8260C		4/23/19 14:07	TMP	A
tert-Butyl Alcohol	12.5U	U	ug/L	25.0	12.5	8.3	SW846 8260C		4/23/19 14:07	TMP	A
n-Butylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
tert-Butylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
sec-Butylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Chlorobenzene	0.34J	J	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
o-Chlorotoluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
p-Chlorotoluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		4/23/19 14:07	TMP	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
1,3-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
2,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
1,1-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A

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ANALYTICAL RESULTS

Workorder: 3029097 PQF185|FTMM 04/17/19

Lab ID: **3029097004** Date Collected: 4/18/2019 21:48 Matrix: Water

Sample ID: **M59-TB-04172019** Date Received: 4/18/2019 21:48

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Hexachlorobutadiene	3.8U	U	ug/L	5.0	3.8	0.43	SW846 8260C		4/23/19 14:07	TMP	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		4/23/19 14:07	TMP	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
p-Isopropyltoluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		4/23/19 14:07	TMP	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Naphthalene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
n-Propylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C		4/23/19 14:07	TMP	A
1,2,3-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
1,2,3-Trichloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		4/23/19 14:07	TMP	A
1,2,4-Trimethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
1,3,5-Trimethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
o-Xylene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		4/23/19 14:07	TMP	A
mp-Xylene	1.5U	U	ug/L	2.0	1.5	0.66	SW846 8260C		4/23/19 14:07	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	108		%	81 - 118	SW846 8260C		4/23/19 14:07	TMP	A
4-Bromofluorobenzene (S)	103		%	85 - 114	SW846 8260C		4/23/19 14:07	TMP	A
Dibromofluoromethane (S)	98.4		%	80 - 119	SW846 8260C		4/23/19 14:07	TMP	A
Toluene-d8 (S)	99.3		%	89 - 112	SW846 8260C		4/23/19 14:07	TMP	A

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ANALYTICAL RESULTS

Workorder: 3029097 PQF185|FTMM 04/17/19

Lab ID: **3029097004** Date Collected: 4/18/2019 21:48 Matrix: Water
Sample ID: **M59-TB-04172019** Date Received: 4/18/2019 21:48

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	*Cntr*

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3029097 PQF185|FTMM 04/17/19

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3029097001	1	FTMM-59-WC-C-S-1	SW846 9045D	Corrosivity as pH
The corrosivity analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
3029097001	2	FTMM-59-WC-C-S-1	SW846 9045D	Corrosivity as pH
The solid pH measured in water was 5.067 at 22.0 degrees C.				
3029097001	3	FTMM-59-WC-C-S-1	SM 4500-NH3G	Ammonia-N, Low Level
This analysis was performed on the ASTM D3987-06 leachate.				

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3029097 PQF185|FTMM 04/17/19

Lab ID	Sample ID	Analysis Method	Prep Method
3029097001	FTMM-59-WC-C-S-1	EPA 1664B	
3029097001	FTMM-59-WC-C-S-1	EPA 410.4	
3029097001	FTMM-59-WC-C-S-1	S2540B-11	
3029097001	FTMM-59-WC-C-S-1	S2540G-11	
3029097001	FTMM-59-WC-C-S-1	SM 4500-NH3G	S4500NH3B
3029097001	FTMM-59-WC-C-S-1	SW-846 7.3CN	SW-846 7.3CN
3029097001	FTMM-59-WC-C-S-1	SW846 6010C	SW846 3015
3029097001	FTMM-59-WC-C-S-1	SW846 7.3	SW846 7.3
3029097001	FTMM-59-WC-C-S-1	SW846 7470A	SW846 7470A
3029097001	FTMM-59-WC-C-S-1	SW846 8081B	SW846 3510C
3029097001	FTMM-59-WC-C-S-1	SW846 8082A	SW846 3546
3029097001	FTMM-59-WC-C-S-1	SW846 8151A	SW846 8151A
3029097001	FTMM-59-WC-C-S-1	SW846 8270D	SW846 3510C
3029097001	FTMM-59-WC-C-S-1	SW846 9045D	
3029097001	FTMM-59-WC-C-S-1	SW846 9071B/1664B	
3029097001	FTMM-59-WC-C-S-1	SW846 9095B	
3029097002	FTMM-59-WC-G-S-1	SW846 8260C	
3029097003	FTMM-59-WC-G-S-SHED1/83	SW846 6010C	SW846 3015
3029097004	M59-TB-04172019	SW846 8260C	

Monday, June 03, 2019 7:07:38 PM
Page 15 of 16
ALS

ALS Environmental
34 Dogwood Lane
Middletown, PA 07057
(717) 944-5541

CHAIN OF CUSTODY/ REQUEST FOR ANALYSI

ALL SHADED AREAS MUST BE COMPLETED BY SAMPLER. INSTRUCTIONS ON THE BACK.

* 3 0 2 9 0 9 7 *

9097

M59-01-20190417

Site #:

1 of 1

Client Name: Parsons Federal
Address: 100 High SL 4th Floor
Boston, MA 02110
Contact: Lorraine Weber
Phone#: 315-552-9745
Project Name/#: FTMM-59 Waste Characterization - soil
Bill To: Parsons Federal

TAT [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.
Date Required: Approved?
Email? [X] -Y lorraine.weber@parsons.com
Fax? [ ] -Y No.:

	Container Type	CG	CG	CG	CG	CG					
	Container Size	8 Oz	8 Oz	~~8 Oz~~	4 Oz	4oz					
	Preservative	4c	4c	4c	4c	4c					

ANALYSES/METHOD REQUESTED

	Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	pH, reactivity, free liquids, PCBs, TS, TVS, O/G	Full TCLP + TCLP Ni, Cu, Zn	ASTM COD, TS, O/G, TPH, NH3	TCLP VOCs (1311/8260B)	TCLP Pb				# CONTAINERS	AUTHORIZED TO RUN
						Enter Number of Containers Per Sample or Field Results Below.									
1	FTMM-59-WC-C-S-1	4-17-19	1340	C	SO	X	X	X						2	X
2	FTMM-59-WC-G-S-1		1355	G	SO				X					1	X
3	FTMM-59-WC-G-S-SHED1/BB		1245	G	SO					X				1	X
4	M59-TB-04172019	—	-	-	W				X					2	X
5															
6															
7															
8															
9															
10															

Receipt Information (completed by Receiving Lab)
Cooler Temp: 2 °C Therm ID: 401
No. of Coolers: _____

	Y	N	Initial
Custody Seals Present?			
(If present) Seals Intact?			
Received on Ice?			
COC/Labels Complete/Accurate?			
Cont. In Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:

Sample/COC Comments
Rec: 1 Glass Jars.
2x 40mL HCl.
DN
4/22

ALS Field Services: _Pickup _Labor _Composite Sampling _Rental Equipment _Other:

Project Comments: 110016-03300
MDL Must Meet NJDEP Soil Cleanup Criteria and/or Groundwater Quality Standards

LOGGED BY(signature): E. Aurori DATE 4-17-19 TIME 1540
REVIEWED BY(signature): DATE TIME

Data Deliverables: [ ] Standard [X] CLP-like [ ] USACE
Special Processing: USACE [ ] Navy [ ]
State Samples Collected In: [ ] NY [X] NJ [ ] PA [ ] NC [ ]
Reportable to PADEP? Yes [ ] PWSID #
Sample Disposal: Lab [ ] Special [ ]
EDDS: Format Type- ERPIMS & HAZSITE

	Relinquished By / Company Name	Date	Time		Received By / Company Name	Date	Time
1	ERHUK PARSONS	4-18-19	0900	2		4/18/19	0900
3		4/18/19	1545	4	COMMON COURIER / ALS COURIER		
5	COMMON COURIER / ALS COURIER			6		4/18/19	2148
7				8			
9				10			

* G=Grab; C=Composite **Matrix - Al=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: Parsons | Work Order #: 3029097 | Initials: DN | Date: 4/12

1. Were airbills / tracking numbers present and recorded?	(NONE)	YES	NO
Tracking number:			
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		(YES)	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	(NO)
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #: ____

Temperature (°C): 3

Thermometer ID: 401

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 1/10/2019

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May 7, 2019

Ms. Lorraine Weber
Parsons - Syracuse NY
301 Plainfield Road
Suite 350
Syracuse, NY 13212

Certificate of Analysis

Revised Report - 5/7/2019 7:03:12 PM - See workorder comment section for explanation

Project Name:	**Ft. Monmouth Soils**	Workorder:	**3031185**
Purchase Order:	**PO-00065450**	Workorder ID:	**PQF186|FTMM-59 Soil Con**

Dear Ms. Weber:

Enclosed are the analytical results for samples received by the laboratory on Friday, May 3, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

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ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Kent Friesen , Mr. Julien Chambert , Ms. Cris Grill

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3031185 PQF186|FTMM-59 Soil Con

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3028448007	M59-BAY9/10-S-6.5-7.0	Solid	4/16/2019 14:35	5/3/2019 09:01	Collected by Client
3028448010	M59-BAY9/10-W-8.0-8.5	Solid	4/16/2019 14:15	5/3/2019 09:01	Collected by Client

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SAMPLE SUMMARY

Workorder: 3031185 PQF186|FTMM-59 Soil Con

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3031185 PQF186|FTMM-59 Soil Con

Lab ID: **3028448007** Date Collected: 4/16/2019 14:35 Matrix: Solid

Sample ID: **M59-BAY9/10-S-6.5-7.0** Date Received: 5/3/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
SEMIVOLATILES												
Acenaphthene	0.085U	U	mg/kg	0.13	0.085	0.0076	SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Acenaphthylene	0.085U	U	mg/kg	0.13	0.085	0.0089	SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Anthracene	0.085U	U	mg/kg	0.13	0.085	0.010	SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Benzo(a)anthracene	0.085U	U	mg/kg	0.13	0.085	0.0063	SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Benzo(a)pyrene	0.085U	U	mg/kg	0.13	0.085	0.0051	SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Benzo(b)fluoranthene	0.085U	U	mg/kg	0.13	0.085	0.0063	SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Benzo(g,h,i)perylene	0.085U	U	mg/kg	0.13	0.085	0.0063	SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Benzo(k)fluoranthene	0.085U	U	mg/kg	0.13	0.085	0.0063	SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Chrysene	0.085U	U	mg/kg	0.13	0.085	0.0063	SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Dibenzo(a,h)anthracene	0.085U	U	mg/kg	0.13	0.085	0.0076	SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Fluoranthene	0.085U	U	mg/kg	0.13	0.085	0.0063	SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Fluorene	0.037J	J	mg/kg	0.13	0.085	0.0076	SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Indeno(1,2,3-cd)pyrene	0.085U	U	mg/kg	0.13	0.085	0.0089	SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Naphthalene	0.085U	U	mg/kg	0.13	0.085	0.0076	SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Phenanthrene	0.093J	J	mg/kg	0.13	0.085	0.0063	SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Pyrene	0.034J	J	mg/kg	0.13	0.085	0.0063	SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2,4,6-Tribromophenol (S)	75.4		%	39 - 132			SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
2-Fluorobiphenyl (S)	79.6		%	44 - 115			SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
2-Fluorophenol (S)	72.6		%	35 - 115			SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Nitrobenzene-d5 (S)	76.5		%	37 - 122			SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Phenol-d5 (S)	70.4		%	33 - 122			SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
Terphenyl-d14 (S)	83.9		%	54 - 127			SW846 8270D	4/26/19	JTH	4/27/19 19:21	GEC	B1
WET CHEMISTRY												
Moisture	23.2		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	
Total Solids	76.8		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

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ANALYTICAL RESULTS

Workorder: 3031185 PQF186|FTMM-59 Soil Con

Lab ID: **3028448010** Date Collected: 4/16/2019 14:15 Matrix: Solid

Sample ID: **M59-BAY9/10-W-8.0-8.5** Date Received: 5/3/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
SEMIVOLATILES												
Acenaphthene	0.081U	U	mg/kg	0.12	0.081	0.0073	SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Acenaphthylene	0.081U	U	mg/kg	0.12	0.081	0.0085	SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Anthracene	0.081U	U	mg/kg	0.12	0.081	0.0097	SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Benzo(a)anthracene	0.081U	U	mg/kg	0.12	0.081	0.0061	SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Benzo(a)pyrene	0.081U	U	mg/kg	0.12	0.081	0.0049	SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Benzo(b)fluoranthene	0.081U	U	mg/kg	0.12	0.081	0.0061	SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Benzo(g,h,i)perylene	0.081U	U	mg/kg	0.12	0.081	0.0061	SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Benzo(k)fluoranthene	0.081U	U	mg/kg	0.12	0.081	0.0061	SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Chrysene	0.020J	J	mg/kg	0.12	0.081	0.0061	SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Dibenzo(a,h)anthracene	0.081U	U	mg/kg	0.12	0.081	0.0073	SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Fluoranthene	0.081U	U	mg/kg	0.12	0.081	0.0061	SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Fluorene	0.081U	U	mg/kg	0.12	0.081	0.0073	SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Indeno(1,2,3-cd)pyrene	0.081U	U	mg/kg	0.12	0.081	0.0085	SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Naphthalene	0.081U	U	mg/kg	0.12	0.081	0.0073	SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Phenanthrene	0.081U	U	mg/kg	0.12	0.081	0.0061	SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Pyrene	0.081U	U	mg/kg	0.12	0.081	0.0061	SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
2,4,6-Tribromophenol (S)	90		%	39 - 132			SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
2-Fluorobiphenyl (S)	74		%	44 - 115			SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
2-Fluorophenol (S)	81		%	35 - 115			SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Nitrobenzene-d5 (S)	77.8		%	37 - 122			SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Phenol-d5 (S)	76.4		%	33 - 122			SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
Terphenyl-d14 (S)	78.8		%	54 - 127			SW846 8270D	4/26/19	JTH	4/27/19 21:24	GEC	B1
WET CHEMISTRY												
Moisture	21.9		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	
Total Solids	78.1		%	0.1	0.1	0.01	S2540G-11			4/18/19 11:07	AXD	

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ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3031185 PQF186|FTMM-59 Soil Con

Lab ID	Sample ID	Analysis Method	Prep Method
3028448007	M59-BAY9/10-S-6.5-7.0	S2540G-11	
3028448007	M59-BAY9/10-S-6.5-7.0	SW846 8270D	SW846 3546
3028448010	M59-BAY9/10-W-8.0-8.5	S2540G-11	
3028448010	M59-BAY9/10-W-8.0-8.5	SW846 8270D	SW846 3546

ALS Environmental
34 Dogwood Lane
Middletown, PA 07057
(717) 944-5541

CHAIN OF CUS... REQUEST FOR A...

3031185

COC #: M59-01-20190416 | 1 of 1

ALS Quote #:

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Client Name: Parsons Federal
Address: 100 High St 4th Floor, Boston, MA 02110
Contact: Lorraine Weber
Phone#: 315.552.9745
Project Name/#: FTMM-59 Soil confirmatory sampling
Bill To: Parsons Federal
TAT: [ ] Normal-Standard TAT is 10-12 business days. [X] Rush-Subject to ALS approval and surcharges.
Date Required: Approved?
Email? [X] Y [ ] N lorraine.weber@parsons.com
Fax? [ ] Y [ ] N

Container Type	TAT
Container Size	4 oz
Preservative	4C

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	PHS (8270)	EXTRACTIONS HOLD
1 M59-BAY9/10-B-9.0-9.5	4-16-19	1350	G	SO		X
2 M59-BAY9/10-B2-9.0-9.5		1520	G	SO		X
3 M59-BAY9/10-N-5.5-6.0		1340	G	SO		X
4 M59-BAY9/10-N-7.5-8.0		1320	G	SO		X
5 M59-BAY9/10-E-7.0-7.5		1455	G	SO		X
6 M59-BAY9/10-E-8.5-9.0		1510	G	SO		X
7 M59-BAY9/10-S-6.5-7.0		1435	G	SO		X
8 M59-BAY9/10-S-8.5-9.0		1445	G	SO		X
9 M59-BAY9/10-W-5.5-6.0		1400	G	SO		X
10 M59-BAY9/10-W-8.0-8.5		1415	G	SO		X

Enter Number of Containers Per Sample or Field Results Below

To be analyzed by Julien Chambert (5/2/2019)

Receipt Information (completed by Receiving Lab)

Cooler Temp: _____ Therm ID: _____
No. of Coolers: _____

	Y	N	Initial
Custody Seal's Present?			
(if present) Seals Intact?			
Received on Ice?			
COC/Labels Complete/Accurate?			
Cont. in Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:

Samples/COC Comments

ALS Field Services: _Pickup _Labor _Composite Sampling _Rental Equipment _Other:

Project Comments: 110018033000
MDL Must Meet NJDEP Soil Cleanup Criteria and/or Groundwater Quality Standards

LOGGED BY(signature): T. Brown 4-16-19 1600
REVIEWED BY(signature): Date Time

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 SAMPLED BY			2		
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [X] CLP-like [ ] USACE
Special Processing: [ ] USACE [ ] Navy [ ]
State Samples Collected In: [ ] NY [X] NJ [ ] PA [ ] NC [ ]
Reportable to PADEP? [ ] Yes [ ]
Sample Disposal: [ ] Lab [ ] Special [ ]
PWSID #:
EDDS: Format Type: ERPIMS & HAZSITE

*G=Grab, C=Composite **Matrix - Air/Air, DW=Drinking Water, GW=Groundwater, Oil=Oil, OL=Other Liquid, SL=Sludge, SO=Soil, WP=Wipe, WW=Wastewater

Appendix E

FTMM-59 Bay 9-10 EPH Calculator

COMPOSITION-SPECIFIC EXTRACTABLE PETROLEUM HYDROCARBON (EPH) SOIL REMEDIATION CRITERION (SRC) CALCULATOR FOR NON-#2 FUEL OIL/DIESEL OIL PETROLEUM HYDRCARBON MIXTURES (Version 3.0, October 18, 2017)

DATA ENTRY CELLS

ENTER ALL CONCENTRATIONS AS MILLIGRAMS/KILOGRAM (mg/kg)
FOR NON DETECT VALUES, ENTER "0" or "ND" (without the quotation marks)
REMEMBER TO ENTER ACTUAL SAMPLE IDENTIFICATION IN PLACE OF "SAMPLE 1", ETC.
REMEMBER TO INDICATE WHETHER THE SAMPLE IS "RESIDENTIAL" (R) OR "NON-RESIDENTIAL" (N) [OR USE DROP-DOWN LIST]
ALL DATA MUST BE ENTERED FOR EACH SAMPLE FOR THE EPH CRITERION TO BE CALCULATED
CLICK ON THE "CALCULATE EPH SRC" BUTTON TO CALCULATE THE SAMPLE-SPECIFIC EPH SOIL REMEDIATION CRITERION
IF YOU CHANGE ANY INPUT DATA, YOU MUST CLICK ON "CALCULATE EPH SRC" AGAIN TO RECALCULATE THE SOIL REMEDIATION CRITERION
IF THE RESULTS FROM THE GC ANALYSIS INDICATE AN EPH CONCENTRATION LESS THAN 1,700 mg/kg, IT IS NOT NECESSARY TO USE THIS CALCULATOR

EC* RANGE / SAMPLE ID		M59-BAY9/10-B 8.0-8.5	M59-BAY9/10-B2-9.0-9.5	M59-BAY9/10-N-5.5-6.0	M59-BAY9/10-N-7.5-8.0	M59-BAY9/10-E-7.0-7.5
Enter Residential or Non-Residential		Residential	Residential	Residential	Residential	Residential
ALIPHATICS	EC9-EC12	1.7	1.6	0.5	0.6	0.7
	EC12-EC16	17.3	0.8	0.0	0.0	12.1
	EC16-EC21	203.0	0.6	0.0	0.7	124.0
	EC21-EC40	990.0	0.8	1.0	7.2	858.0
AROMATICS	EC10-EC12	0.8	0.6	0.8	0.8	0.9
	EC12-EC16	1.7	0.9	0.8	0.9	1.0
	EC16-EC21	45.1	0.4	0.3	0.3	34.3
	EC21-EC36	130.0	0.6	0.5	0.4	107.0
Total Concentration (mg/kg)		**1,389.6**	**6.2**	**3.9**	**10.9**	**1,137.9**

Calculated EPH SRC# (mg/kg)	**12,000**	**4,000**	**3,300**	**9,000**	**12,000**
Allowable% EPH SRC (mg/kg)	**12,000**	**4,000**	**3,300**	**9,000**	**12,000**
ABOVE/BELOW ALLOWABLE EPH SRC (i.e., PASS or FAIL)	BELOW (PASS)	BELOW (PASS)	BELOW (PASS)	BELOW (PASS)	BELOW (PASS)

* = Equivalent Carbon
\# = Soil Remediation Criterion
% = Accounts for residual product
17,000^ = Default maximum value for all non-#2 fuel oil/diesel oil petroleum hydrocarbon mixtures

Calculate EPH SRC | Print Results | Intro Message

Reset Data | Instructions

Run Date = 05/02/2019

COMPOSITION-SPECIFIC EXTRACTABLE PETROLEUM HYDROCARBON (EPH) SOIL REMEDIATION CRITERION (SRC) CALCULATOR FOR NON-#2 FUEL OIL/DIESEL OIL PETROLEUM HYDRCARBON MIXTURES (Version 3.0, October 18, 2017)

DATA ENTRY CELLS

ENTER ALL CONCENTRATIONS AS MILLIGRAMS/KILOGRAM (mg/kg)
FOR NON DETECT VALUES, ENTER "0" or "ND" (without the quotation marks)
REMEMBER TO ENTER ACTUAL SAMPLE IDENTIFICATION IN PLACE OF "SAMPLE 1", ETC.
REMEMBER TO INDICATE WHETHER THE SAMPLE IS "RESIDENTIAL" (R) OR "NON-RESIDENTIAL" (N) [OR USE DROP-DOWN LIST]
ALL DATA MUST BE ENTERED FOR EACH SAMPLE FOR THE EPH CRITERION TO BE CALCULATED
CLICK ON THE "CALCULATE EPH SRC" BUTTON TO CALCULATE THE SAMPLE-SPECIFIC EPH SOIL REMEDIATION CRITERION
IF YOU CHANGE ANY INPUT DATA, YOU MUST CLICK ON "CALCULATE EPH SRC" AGAIN TO RECALCULATE THE SOIL REMEDIATION CRITERION
IF THE RESULTS FROM THE GC ANALYSIS INDICATE AN EPH CONCENTRATION LESS THAN 1,700 mg/kg, IT IS NOT NECESSARY TO USE THIS CALCULATOR

EC* RANGE / SAMPLE ID		M59-BAY9/10-E-8.5-9.0	M59-BAY9/10-S-6.5-7.0	M59-BAY9/10-S-8.5-9.0	M59-BAY9/10-W-5.5-6.0	M59-BAY9/10-W-8.0-8.5
Enter Residential or Non-Residential		Residential	Residential	Residential	Residential	Residential
ALIPHATICS	EC9-EC12	0.6	0.8	1.2	0.9	3.0
	EC12-EC16	0.0	16.9	9.8	0.6	74.4
	EC16-EC21	0.6	232.0	99.6	0.0	381.0
	EC21-EC40	3.6	1,370.0	757.0	2.1	3,590.0
AROMATICS	EC10-EC12	0.0	0.7	0.0	0.0	0.6
	EC12-EC16	0.4	1.5	1.0	0.5	2.2
	EC16-EC21	0.3	71.9	37.2	0.2	190.0
	EC21-EC36	0.5	173.0	69.8	0.5	726.0
Total Concentration (mg/kg)		**6.0**	**1,866.8**	**975.6**	**4.9**	**4,967.2**

Calculated EPH SRC# (mg/kg)	**8,000**	**12,000**	**14,000**	**5,600**	**8,600**
Allowable% EPH SRC (mg/kg)	**8,000**	**12,000**	**14,000**	**5,600**	**8,600**
ABOVE/BELOW ALLOWABLE EPH SRC (i.e., PASS or FAIL)	BELOW (PASS)	BELOW (PASS)	BELOW (PASS)	BELOW (PASS)	BELOW (PASS)

* = Equivalent Carbon
\# = Soil Remediation Criterion
% = Accounts for residual product
17,000^ = Default maximum value for all non-#2 fuel oil/diesel oil petroleum hydrocarbon mixtures

Calculate EPH SRC | Print Results | Intro Message

Reset Data | Instructions

Run Date = 05/02/2019