New Jersey Department of Environmental Protection
Site Remediation Program

Report Certifications for RCRA GPRA 2020, CERCLA, and Federal Facility Sites

These certifications are to be used for reports submitted for RCRA GPRA 2020, CERCLA, and Federal Facility Sites. The Department has developed guidance for report certifications for RCRA GPRA 2020, CERCLA, and Federal Facility Sites under traditional oversight. The "Person Responsible for Conducting the Remediation Information and Certification" is required to be submitted with each report. For those sites that are required or opt to use a Licensed Site Remediation Professional (LSRP) the report must also be certified by the LSRP using the "Licensed Site Remediation Professional Information and Statement". For additional guidance regarding the requirement for LSRPs at RCRA GPRA 2020, CERCLA and Federal Facility Sites see http://www.nj.gov/dep/srp/srra/training/matrix/quick_ref/rcra_cercla_fed_facility_sites.pdf.

Document: Remedial Investigation Report/Remedial Action Work Plan for Site FTMM-53

PERSON RESPONSIBLE FOR CONDUCTING THE REMEDIATION INFORMATION AND CERTIFICATION

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

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, including all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, to the best of my knowledge, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties.

Signature: William R Colvin Date: 25 January 2018

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FINAL

REMEDIAL INVESTIGATION REPORT/ REMEDIAL ACTION WORKPLAN FOR SITE FTMM-53

FORT MONMOUTH, OCEANPORT, MONMOUTH COUNTY, NEW JERSEY

BRAC 05 Facility
Contract W912DY-09-D-0062
Task Order: 0012, Project No. 369857

Submitted To:

U.S. Army 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

Revision No. 0
January 2018

FINAL
REMEDIAL INVESTIGATION REPORT / REMEDIAL ACTION WORKPLAN FOR SITE FTMM-53

Client Name:	**U.S. Army Engineering & Support Center (CEHNC)**
Contract Name:	**Remedial Investigation/Feasibility Study/Decision Documents, Fort Monmouth, Oceanport, Monmouth County, New Jersey**
Contract Number:	**W912DY-09-D-0062, Task Order 0012, Project No. 369857**
Contractor:	**Parsons Government Services, Inc.**
Period of Performance:	**30 September 2012 to 30 September 2019**
Date of Original:	**January 2018**
Revision:	**0**

January 2018

Reviewed and Approved by:

Project Manager: _____ 1/30
Christina Grill, P.G. Date

Program Manager: _____ 1/30/18
Don Silkebakken, V.P. Date

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LIST OF ACRONYMS

ACRONYM	DEFINITION
µg/L	micrograms per liter
µg/m^3	microgram per cubic meter
AST	aboveground storage tank
BEE	Baseline Ecological Evaluation
bgs	below ground surface
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethylbenzene, xylene
CEA	Classification Exception Area
CEHNC	U.S. Army Engineering and Support Center, Huntsville
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	constituent of concern
CSM	conceptual site model
CWA	Charles Wood Area
DD	Decision Document
DICAR	Discharge Investigation Corrective Action Report
EA	Evans Area
ECP	Environmental Condition of Property
EEB	enzyme-enhanced bioremediation
EPH	extractable petroleum hydrocarbons
FS	feasibility study
ft/day	feet per day
ft/ft	foot per foot
ft/year	feet per year
FTMM	Fort Monmouth
FTMM-53	Fort Monmouth Site 53
GES	Groundwater & Environmental Services, Inc.
GWQS	Groundwater Quality Standard
GWSL	Groundwater screening level
IASL	indoor air screening levels
IC	institutional control
IGW	Impact to Ground Water
IRP	Installation Restoration Program
LNAPL	light non-aqueous phase liquid
LTM	long-term monitoring
LTMP	long-term monitoring plan
LUC	Land Use Control
LUCIP	Land Use Control Implementation Plan
mg/kg	milligrams per kilogram
MNA	monitored natural attenuation
MP	Main Post
NCP	National Contingency Plan

ACRONYM	DEFINITION
NFA	No Further Action
N.J.A.C.	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NRDCSRS	Non-Residential Direct Contact Soil Remediation Standard
Parsons	Parsons Government Services Inc.
PCBs	polychlorinated biphenyls
PCE	Tetrachloroethene
PDB	passive diffusion bags
POL	Petroleum, Oil and Lubricants
RAPR	Remedial Action Progress Report
RAWP	Remedial Action Workplan
RCRA	Resource Conservation and Recovery Act
RDCSCC	Residential Direct Contact Soil Cleanup Criteria
RDCSRS	Residential Direct Contact Soil Remediation Standard
RI	remedial investigation
RIR	Remedial Investigation Report
SGSL	Soil Gas Screening Level
SI	site investigation
SL	screening level
SVE	soil vapor extraction
SVOCs	semivolatile organic compounds
TAL	target analyte list
TCE	Trichloroethene
TICs	tentatively identified compounds
TO	task order
TMB	trimethylbenzene
TPH	total petroleum hydrocarbons
TRSR	Technical Requirements for Site Remediation
UST	underground storage tank
VI	vapor intrusion
VOCs	volatile organic compounds
WRA	Well Restriction Area
WERS	Worldwide Environmental Restoration Services

1

EXECUTIVE SUMMARY

E.1 SITE DESCRIPTION

Fort Monmouth Site 53 (FTMM-53) is in the central portion of the Main Post (MP) and encompasses Building 699. FTMM-53 is a former fueling station and repair facility for nonmilitary vehicles. The FTMM Reuse and Redevelopment Plan (Edaw, Inc 2008) indicates that the anticipated future land use at FTMM-53 is mixed use industrial and institutional/civic use; institutional/civic uses may include schools (educational) and administrative uses. FTMM (MP and Charles Wood Area [CWA]) was selected for closure by the Base Realignment and Closure (BRAC) Commission in 2005, and officially closed on 15 September 2011.

E.2 GEOLOGY AND HYDROGEOLOGY

The uppermost lithologic unit at FTMM-53 to a depth of approximately 5 feet below ground surface (bgs) is generally comprised of medium to fine, orange and tan sand and silty sand, and clay. This uppermost unit likely consists of some combination of fill material and surficial deposits belonging to the Cape May Formation Unit 2. Deeper soil (5 to 20 feet bgs) is representative of the Hornerstown Formation and is composed of greenish, orange, and gray sandy clay with a trace of silt.

The depth to groundwater at FTMM-53 typically ranges from 6 to 9 feet bgs. Groundwater migrates towards the south and southeast (i.e., toward Husky Brook). The calculated average advective groundwater seepage velocity for the site ranges from 0.32 to 0.55 feet per day (ft/day) (117 to 201 feet per year [ft/year]).

E.3 SOIL SAMPLING RESULTS

Soil samples were collected at FTMM-53 in 1992, 1993, 1998, 1999, 2000, 2001, and 2015. Target analytes included volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), extractable petroleum hydrocarbons (EPH), polychlorinated biphenyls (PCBs), and metals. Detected analyte concentrations were compared to New Jersey Department of Environmental Protection (NJDEP) direct contact standards for residential and non-residential exposure scenarios, and NJDEP Impact to Ground Water (IGW) screening levels (SLs).

E.3.1 Historical Soil Sampling Results (1992 – 2001)

Concentrations of one VOC and one SVOC exceeded the September 2017 NJDEP Residential Direct Contact Soil Remediation Standard (RDCSRS) in at least one soil sample collected between 1992 and 2001. Concentrations of one VOC and one SVOC also exceeded the September 2017 NJDEP Non-Residential Direct Contact Soil Remediation Standard (NRDCSRS) in at least one soil sample collected between 1992 and 2001. Concentrations of eight VOCs, two SVOCs, and one metal exceeded the November 2013 NJDEP IGW Soil SL in at least one soil sample collected between 1992 and 2001.

E.3.2 Remedial Investigation (RI) Soil Sampling Results (2015)

Concentrations of one VOC exceeded the September 2017 NJDEP RDCSRS in at least one soil sample during the 2015 RI. No constituents exceeded the current NJDEP NRDCSRS in any soil samples collected in 2015. Concentrations of one VOC and one SVOC exceeded the current

NJDEP IGW SL in at least one RI soil sample. Fuel hydrocarbon concentrations in soil have decreased substantially since the 2000-2001 timeframe.

E.4 GROUNDWATER SAMPLING RESULTS

Quarterly groundwater sampling was performed at the site from April 1997 to June 2011 using a network of up to 11 monitoring wells. An additional sampling event was performed in August 2013 to re-establish baseline conditions in 14 wells after a two-year interruption in the sampling program. Quarterly groundwater samples were also collected from March 2014 through November 2015. The long-term monitoring (LTM) of groundwater provided sufficient understanding of the groundwater chemistry for the site and there was minimal benefit to continuing the LTM plan (LTMP) while site characterization was completed under the RI process. Therefore, quarterly groundwater monitoring was suspended with approval from NJDEP (letter dated March 16, 2016) as of the first quarter of 2016 and will resume following completion and final acceptance of this RI Report/Remedial Action Workplan (RIR/RAWP) by the NJDEP. Groundwater monitoring data for August 2013 through November 2015 were evaluated as being representative of more current site conditions. Detected analyte concentrations were compared to NJDEP Ground Water Quality Standards (GWQS) for potable water.

Concentrations of six VOCs exceeded the NJDEP GWQS in at least one sample collected from August 2013 to November 2015. Five of the six VOCs are fuel hydrocarbons sourced at FTMM-53. The sixth VOC is a chlorinated compound detected in the eastern portion of FTMM-53 that is part of a chlorinated volatile organics plume that originates near Building 700 east of the Site (i.e., at FTMM-68). These chlorinated organics are being addressed (delineated) under a separate RI associated with FTMM-68, and not as part of this FTMM-53 RIR/RAWP. In addition, concentrations of total volatile tentatively identified compounds exceeded the NJDEP Interim Generic Ground Water Quality Criterion during recent sampling events.

Recent groundwater quality data indicate that the fuel hydrocarbon plume is laterally bounded and localized in the immediate vicinity of the site. Fuel hydrocarbon concentrations in groundwater have decreased substantially since quarterly monitoring began in 1997.

E.5 SOIL GAS AND INDOOR AIR SAMPLING RESULTS

Near-slab soil gas samples and indoor air samples were collected adjacent to and within Building 699, respectively, in 2007. A subsequent sampling event in 2012 included collection of sub-slab soil gas samples and indoor air samples beneath and within Building 699, respectively. Based on historical groundwater analytical data and vapor intrusion (VI) data collected in 2012, it was concluded that groundwater was acting as a source for VOC contamination detected in sub-slab soil gas at Building 699. However, given that the VOCs were not detected in indoor air, the VI pathway for targeted VOCs at Building 699 was considered incomplete.

E.6 CONTAMINANT FATE AND TRANSPORT

Detected constituents of interest in terms of contaminant fate and transport at FTMM-53 include benzene and naphthalene in vadose zone soil, and various fuel-related VOCs in groundwater (i.e., benzene, toluene, ethylbenzene, and xylenes [BTEX] and trimethylbenzene [TMB] isomers).

Benzene is expected to be relatively mobile in the vadose zone, and its persistence is expected to be low because of volatilization, biodegradation, and vertical migration downward leaching. In

contrast, naphthalene is expected to be less mobile and biodegradable and consequently more persistent in the soil column.

BTEX compounds are expected to be relatively mobile in groundwater, but with a relatively low persistence and limited plume lengths due to relatively high biodegradation rates. The mobility of TMBs is also significant, but these compounds tend to sorb more readily to aquifer matrix materials and be less mobile than BTEX. Biodegradation rates for TMBs are variable depending on site-specific biogeochemical conditions. Overall, TMBs are probably less biodegradable than BTEX compounds.

E.7 CONCEPTUAL SITE MODEL

Current or potential future human receptors at FTMM-53 include workers, institutional/civic users, school and administrative personnel and students, and if the area becomes residential, future residents or potable water users (if groundwater is used as a potable water source). Potentially complete exposure pathways (either currently or under hypothetical future scenarios) include incidental ingestion of or dermal contact with contaminated soil or groundwater, inhalation of dust or vapor containing volatilized chemicals, and ingestion of groundwater as a potable water source.

E.8 CONCLUSIONS

The RI sampling results indicate that active remediation is not required at Site FTMM-53 based on historical investigations/remediation work and expected future industrial and institutional/civic land use. The recommended remedial alternative consists of implementing institutional controls in the form of a deed notice restricting use of and exposure to site soil and a Classification Exception Area (CEA)/Well Restriction Areas (WRA) that restricts use of and exposure to site groundwater until applicable cleanup goals are achieved. The duration of the CEA/WRA will be determined through modeling using BIOSCREEN and BIOCHLOR as required by the NJDEP's CEA/WRA guidance.

E.9 REMEDIAL ACTION WORKPLAN

The RAWP presented in Section 8 of this RIR/RAWP addresses fuel hydrocarbon contamination in soil and groundwater at FTMM-53. The RI sampling results indicate that active remediation is not required at FTMM-53. Institutional controls (ICs) or Land Use Controls (LUCs) (i.e., a deed notice and a CEA/WRA) will be implemented to prevent human exposure to site soil and groundwater, and monitored natural attenuation (MNA) of groundwater will be used to track and evaluate natural reductions in contaminant concentrations in groundwater at FTMM-53 over time.

SECTION 1
INTRODUCTION

1.1 PROJECT AUTHORIZATION

This Remedial Investigation Report/Remedial Action Workplan (RIR/RAWP) was prepared by Parsons Government Services, Inc. (Parsons) on behalf of the United States Army Corps of Engineers, New York District and the United States Army Engineering and Support Center, Huntsville (CEHNC) to address contaminated media at Fort Monmouth Site FTMM-53 in Oceanport, Monmouth County, New Jersey. This project is being performed under task order (TO) 0012 issued under 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 investigation and remediation. Specific activities that are being performed under this TO include:

1. Performance of Remedial Investigations (RIs) and preparation of RIR, Feasibility Study (FS) Report, and/or RAWP 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 RIR/RAWP for site FTMM-53 based on site characterization activities performed from 1992 to 2015. This report was prepared in accordance with the requirement of N.J.A.C 7:26E-TRSR since the release identified at FTMM-53 is petroleum hydrocarbons and Petroleum, Oil and Lubricants (POL) releases are excluded from CERCLA. This RIR/RAWP provides a summary of site background information, characterizes the nature and extent of site-related contamination, and proposes a remedial action. The Army owns FTMM-53 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 INFORMATION

FTMM, established in 1918, 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 the Evans Area (EA) (**Figure 1.1**). The areas of the MP and CWA are 637 acres and 489 acres, respectively. The EA (not shown on **Figure 1.1**)

was located approximately eight miles to the south of the MP and CWA and was formerly used for administrative, research and development, and training purposes. The EA was closed under Base Realignment and Closure (BRAC) 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. The CWA is in the Eatontown and Tinton Falls Boroughs.

Figure 1.2 shows the location of FTMM-53, in the central portion of the MP. The site is approximately one acre in size, encompasses Building 699, and served as a fuel filling station consisting of associated fuel storage tanks, underground piping, and gasoline dispensing islands. The closest surface water body is Husky Brook, located approximately 700 feet southeast of the site. The projected future land use at the site is mixed industrial and institutional/civic according to the Fort Monmouth Reuse and Redevelopment Plan (EDAW, Inc., 2008) included in **Appendix A**. According to this Plan, institutional uses may include a school (educational), institutional, and administrative uses.

1.4 SITE HISTORY

FTMM-53 encompasses Building 699 on the MP. Building 699 was constructed in 1953 and was used as a fueling station until installation closure in 2011. The site is approximately one acre in size and served as the only on-base MP location for nonmilitary vehicles to obtain fuel. Gasoline was distributed from two remote pumping islands, with a total of four dispensers. The building was also historically utilized as an automobile service garage. Automobile servicing was discontinued in 1997. A chronological summary of events related to the environmental characterization and remediation of FTMM-53 is provided in **Table 1.1** and detailed in this subsection. The locations of former underground storage tanks (USTs) and existing hydraulic lifts at FTMM-53 are shown on **Figure 1.3**. **Table 1.2** provides a summary of USTs, tank registration identification number, and status, including closure and NJDEP status (i.e., No Further Action [NFA]).

The Building 699 tank system included six 10,000-gallon USTs (NJDEP Registration Numbers: 81533-185 through 81533-190) used to store various grades of gasoline with two remote pumping islands. The six USTs were located northeast of the fueling island canopy based on the aerial photo of the site provided in the 2008 Site Investigation (SI) report (U.S. Army BRAC, 2008). On November 5, 1984, a tank tightness test identified a 0.333 gallon per hour leak in two of the USTs.

In 1989, approximately 11,000 gallons of gasoline were released into soil surrounding the six gasoline USTs and associated piping northeast of the canopy. On June 15, 1990, a Discharge Investigation Corrective Action Report (DICAR) was submitted to the NJDEP. Pressure testing of the gasoline system indicated that the leak was located in the product line between the tanks and the pumps (Groundwater & Environmental Services, Inc. [GES], 1999). The piping and dispensing island were replaced and a light non-aqueous phase liquid (LNAPL) recovery well with a dual pump system was installed immediately after the release. A total of 6,733 gallons of LNAPL were recovered by the summer of 1990. These recovery wells are no longer active. The six USTs were removed in April 2007 and replaced with two 10,000-gallon aboveground storage tanks (ASTs) which were in use until base closure in 2011. The ASTs were pumped out, fuel piping was blown out with nitrogen, and any residual product was drummed and properly disposed of. The ASTs, associated piping, and the dispensing islands remain in place.

In 1993, 27 soil samples were collected on the east side of the site at 5.5 feet below ground surface (bgs) (the soil-groundwater interface) using a split-spoon and hollow-stem auger drilling to define the extent of gasoline contamination from release in 1989 from the six gasoline USTs (GES, 1999). In 1993 and 1999, respectively, FTMM prepared a RAWP and subsequent RAWP Addendum at the request of NJDEP that proposed the installation of a soil vapor extraction (SVE) system and a groundwater pump and treat system with one recovery well to augment LNAPL recovery (GES, 1999). A groundwater remediation system consisting of multiple groundwater recovery, air sparging, and SVE wells as well as a groundwater and vapor treatment system was subsequently installed and began operation in 2001. This system was operated until FTMM closure in 2011, and then again intermittently until operations were discontinued with NJDEP approval in 2013. Additional information on the groundwater remediation system, as well as an evaluation of groundwater treatment effectiveness, is provided in **Appendix A**.

Hydraulic lifts were located in each of the service bays on the east end of Building 699. Visual inspections of the hydraulic oil reservoir for each of the five in-ground hydraulic lifts in Building 699 were conducted on October 18, 2017. The reservoirs were all full or nearly full, and there was no visible evidence of a release of hydraulic fluid to the environment. Furthermore, there has been no historical documented releases of hydraulic fluids from any of the lifts.

A former 1,000-gallon, single wall, steel waste oil UST (NJDEP Registration Number: 81533-197) located south of the western half of Building 699 (**Figure 1.3**) was removed in January 1992. No holes were noted during removal, and there was no visual evidence of contaminated soil. Monitoring well 699MW12 was installed at the location of the former waste oil UST in October 1992 (Weston, 1993a). Verbal approval of the tank closure report was received from NJDEP in January 2004 (Appendix G of U.S. Army, 2007).

A former No. 2 fuel oil UST (NJDEP Registration Number: 81533-112) located immediately south of Building 699 (**Figure 1.3**) was removed in June 1998 in accordance with NJDEP UST procedures (GES, 1999). NJDEP approval for NFA for the No. 2 fuel oil UST was received in a letter dated January 10, 2003 (NJDEP, 2003).

In September 1999, four abandoned 4,000-gallon steel gasoline USTs (NJDEP Registration Numbers: 81533-235 through 81533-238) were removed. The tanks were located northwest of Building 699 near the western end of the fueling island canopy. Numerous corrosion holes in the USTs were observed, and the surrounding soil was visually contaminated. A fuel sheen was observed on the groundwater surface at a depth of 10 feet bgs (Versar, 2001). NJDEP approval for NFA for the four 4,000-gallon steel gasoline USTs was received in a letter dated January 10, 2003 (NJDEP, 2003).

In October 2000, a 500-gallon waste oil UST (NJDEP Registration Number: 81533-239) was removed from the north side of Building 699 (U.S. Army, 2000). Signs of corrosion were observed, but no holes were apparent.

Proprietary biological enhancements (i.e., enzymes, nutrients, and a bacterial consortium) were injected into the shallow subsurface in November 2000 to accelerate remediation of petroleum contaminants in “hot spot” areas that were not being effectively addressed by the SVE system. Prior to the injection, soil at 83 locations across the site was sampled using a Geoprobe®, with select locations were re-sampled six months after the treatment (Versar, 2000b and 2002).

From April 1997 through June 2011, FTMM-53 monitoring wells were sampled quarterly. A groundwater sampling event using low-flow purging and sampling was conducted at 21 FTMM sites, including FTMM-53, in August 2013 to re-establish baseline groundwater conditions following temporary suspension of groundwater sampling in late 2011. Groundwater monitoring at a subset of site wells has occurred quarterly at FTMM-53 since March 2014. However, quarterly groundwater monitoring at FTMM-53 has been suspended as of the first quarter of 2016 and will resume following completion and final review/acceptance of this RIR/RAWP by the NJDEP. Temporary suspension of quarterly monitoring was agreed to by NJDEP in a letter dated March 16, 2016 (**Appendix A**).

In September 2015, Parsons performed an RI data gap investigation at FTMM-53 that involved soil and groundwater sampling and performance of aquifer slug tests. Results of this investigation are summarized in Section 3 (slug tests) and Section 4 (soil and groundwater quality).

Environmental investigations performed at FTMM-53 are summarized in greater detail in Section 2, and the nature and extent of contamination detected during the environmental investigations are summarized in Section 4.

1.5 REPORT ORGANIZATION

This RIR has been prepared in accordance with the requirements provided in N.J.A.C. 7:26E-4.9. The RI for FTMM-53 was performed in a manner consistent with the NJDEP TRSR, N.J.A.C. 7:26E.

- Introduction: Section 1 details the overall scope and objective of the project, presents the organization of the report, and presents an overview of the site and its history, including previous investigations and remedial actions.
- Previous Investigations: Section 2 provides additional details regarding the site characterization field activities that have been performed.
- Physical Characteristics of the Site: Section 3 describes the physical setting of the site, 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, soil gas, and indoor air) have been impacted by site-related contamination.
- 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) based on site-specific information obtained to date.
- Findings and Recommendations: Section 7 summarizes the main findings of the RI.
- Remedial Action Workplan: Section 8 presents the RAWP.
- References: Section 9 includes a list of references used in the preparation of this report.

Additional information is attached to this RIR/RAWP as appendices:

- **Appendix A** – Key Historical Reports and Background Information (also included electronically on CD);
- **Appendix B** – 2015 RI Data; and
- **Appendix C** – Draft Deed Notice (to be provided later).

SECTION 2
PREVIOUS INVESTIGATIONS

Previous investigations have characterized many aspects of the site, including geology/hydrogeology and the chemistry of soil, groundwater, soil vapor, and indoor air. These investigations are discussed below.

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-53 have consisted of describing soils encountered during monitoring well and soil boring drilling, measuring water levels in site monitoring and recovery wells, and constructing potentiometric surface (i.e., groundwater surface elevation contour) maps indicating the direction and magnitude of the horizontal hydraulic gradient. In addition, slug tests were performed in September 2015 to estimate the hydraulic conductivity of subsurface soil in the tested intervals. The slug tests were performed in three site wells including 699MW04, 699VP11, and newly installed well FTMM53-MW01 (**Figure 2.1**). Slug test results are summarized in Section 3.3.

2.2 SOIL AND VADOSE ZONE INVESTIGATIONS

Five post-excavation soil samples were collected along the sidewalls and base of the waste oil UST (NJDEP Registration Number: 81533-197) excavation in 1992 (Weston, 1993a), and analyzed for total petroleum hydrocarbons (TPH) and priority pollutants plus 40 tentatively identified compounds (TICs) (**Appendix A**). No potentially contaminated soils were excavated as part of the removal of the UST. All soils were free of evidence of contamination and were backfilled into the excavation following removal of the UST.

In 1993, 27 soil samples were collected on the east side of the site at 5.5 feet bgs (the soil-groundwater interface) using a split spoon sampler and hollow stem auger to define the extent of gasoline contamination near the six 10,000-gallon USTs (NJDEP Registration Numbers: 81533-185 through 81533-190) (GES, 1999) (**Appendix A**). These soil samples were analyzed for TPH, volatile organic compounds (VOCs) with a forward library search of 10 compounds (VOCs+10), and lead.

Nine post-excavation soil samples including one field duplicate sample were collected from eight locations in June 1998 during the removal of a 2,000-gallon No. 2 fuel oil UST (NJDEP Registration Number: 81533-112) on the south side of Building 699 (**Figure 1.3**) (Versar, 2000a). The samples were analyzed for TPH (**Appendix A**). Based on organic vapor analyzer air monitoring and TPH analysis results for the post-excavation soil samples, no soil exhibited signs of contamination and all excavated soils were used as backfill following removal of the UST (Versar, 2000a). NJDEP approval for NFA for the No. 2 fuel oil UST was received in a letter dated January 10, 2003 (NJDEP, 2003).

In September 1999, four USTs (NJDEP Registration Numbers: 81533-235 through 81533-238) once used to store gasoline were discovered adjacent to the pump island area on the west side of the site (**Figure 1.3**). Ten post-excavation soil samples including one field duplicate sample were collected from nine locations during the removal of the four USTs (Versar, 2001) (**Appendix**

A). Two sidewall samples were collected from a depth of 8 feet bgs, and one sample was collected at the bottom of the excavation at a depth of 9.5 feet bgs. Each sample was analyzed for lead and VOCs. Approximately 60 cubic yards of potentially contaminated soils were removed from the excavated area, and the rest of the soil that was not contaminated was used as backfill following the removal of the UST. NJDEP approval for NFA for the four 4,000-gallon steel gasoline USTs was received in a letter dated January 10, 2003 (NJDEP, 2003).

In October 2000, a 500-gallon waste oil UST (NJDEP Registration Number: 81533-239) was removed from the north side of Building 699 (U.S. Army, 2000). Four soil samples including one field duplicate sample were collected from three locations within the excavation (**Appendix A**). One sample from the north end of the excavation and one from the south end of the excavation were collected at 6.5 feet bgs, and one from the piping excavation area was collected at 1.5 feet bgs. These soil samples were analyzed for TPH and VOCs+10.

Site-wide soil sampling was performed by Versar (2000b) in March and April 2000 to further delineate the horizontal and vertical extent of soil contamination, and to identify "hot spot" areas that could be addressed by active remediation. A total of 83 soil borings were drilled at the site, with samples collected at alternating 6-inch intervals from ground surface to a depth of 12 feet bgs at each location. The samples were analyzed for VOCs, TPH, and lead. This sampling identified the existence of clay in subsurface soil at the site at an estimated depth of 3 to 4 feet bgs. Since clayey soils would not be effectively treated by the then-proposed SVE system, enzyme-enhanced bioremediation (EEB) was proposed to accelerate remediation of petroleum-related contaminants in soil in the upper soil horizon (Versar, 2000b).

Following the sampling in March-April 2000, proprietary biological amendments provided by Enzyme Technologies, Inc. of Portland, Oregon were injected into the shallow subsurface soils at identified "hot spot" areas. Approximately 1,559 gallons of the proprietary biological amendments were injected in the immediate vicinity of 17 soil boring locations from ground surface to a depth of 3 to 4 feet bgs (Versar, 2002). The 17 locations are indicated on a site map in Section 4 of this report (**Figure 4.1**) (including borings 1, 2, 5, 7, 8, 11, 13, 15, 19, 20, 21, 46, and 47) which were identified with benzene or xylene detections above the then-current NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC) within the shallow subsurface. Borings 3, 9, and 14 were included due to their proximity to the 13 boring locations discussed above and because soils identified from these borings, just below 3 feet bgs, exceeded their respective RDCSCC. Boring 48 was also included to evaluate the effectiveness of the EEB application on benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations detected in the lower subsurface. The EEB injection points were placed on 5-foot centers from each of the 17 selected boring locations for a total of nine injection points per location or 153 total injections.

Additional soil sampling was performed by Versar (2002) in 2001, approximately 180 days after completion of the EEB injection program, to evaluate the treatment's effectiveness on areas with elevated fuel hydrocarbon concentrations during the 2000 sampling event. A total of 108 soil samples were collected from alternating 6-inch intervals to a depth of 6 feet bgs in the 17 injection areas described above (**Appendix A**). These samples were analyzed for VOCs+15 and TPH. No further investigation work was performed until after the base closed in September 2011.

Parsons conducted an RI at FTMM-53 in September 2015. Three soil borings (FTMM-53-SB1, -SB2, and -SB3) were drilled near the fueling islands beneath the canopy to assess contaminant concentrations in an area which had not previously been characterized, and to

characterize soil quality in areas where minor surface spills may have occurred during vehicle refueling activities (**Figure 2.2**). Four soil borings were drilled at locations that still had elevated benzene concentrations in soil in 2001 following the EEB injection (former boring locations 2, 13, 14, and 47; the corresponding 2015 RI borings are FTMM-53-SB4, -SB5, -SB6, and -SB7, respectively [see **Figures 2.2 and 4.1 and Appendix A**]). The purpose of these four 2015 borings was to assess the degree to which fuel hydrocarbon concentrations have attenuated since 2001. Two soil borings (FTMM-53-SB8 and -SB9) were advanced on the north side of Saltzman Avenue to determine the northern extent of elevated contaminant concentrations in soil. One soil boring (FTMM-53-SB10) was drilled adjacent to former (2000) boring location 48 (**Figures 2.2 and 4.1 and Appendix A**) due to the detection of elevated contaminant concentrations at the completion depth of that boring (12 feet bgs). One soil boring (FTMM-53-SB11) was drilled south of Building 699 at the location of the former waste oil UST that was removed in 1992 (Weston, 1993a; see **Appendix A**) to evaluate current soil quality at this location. Discussion of the soil sampling results is included in Section 4.

2.3 GROUNDWATER INVESTIGATIONS

In October 1992, groundwater monitoring well 699MW12 was installed at the former location of the waste oil tank south of Building 699 (**Figure 1.3**). A groundwater sample collected following development of the well was analyzed for VOCs + 15 TICs and lead (Weston, 1993a; **Appendix A**). The well was sampled again for the same parameters in May 1993 (**Table 2.2**).

FTMM-53 monitoring wells were sampled quarterly for VOCs and metals from April 1997 through June 2011. Groundwater sampling was conducted using low flow purging and sampling at 14 monitoring wells at FTMM-53 as part of the August 2013 baseline sampling event (Parsons, 2014). Groundwater samples collected in August 2013 were analyzed for VOCs (**Table 2.2**).

Groundwater monitoring at a subset of site wells occurred quarterly at FTMM-53 from March 2014 to November 2015 using passive diffusion bags (PDBs), with samples analyzed for VOCs. At the request of NJDEP (2014a) in a letter dated April 22, 2014, FTMM agreed to sample five wells at FTMM-53 for total and dissolved lead during the 2015 RI. These wells included one new well (FTMM53-MW01) and four existing wells having volatile fuel hydrocarbon concentrations exceeding NJDEP Groundwater Quality Standards (GWQS) in August 2013. Therefore, the 2015 RI groundwater samples were collected using standard low-flow procedures rather than passive diffusion bag samplers. Groundwater monitoring results are discussed in Section 4.2. Quarterly groundwater monitoring at FTMM-53 has been suspended as of the first quarter of 2016 and will resume following completion and final review/acceptance of this RIR/RAWP by the NJDEP. The LTM of groundwater has provided sufficient understanding of the groundwater chemistry for the site and there was minimal benefit to continuing the LTMP while characterizing of the site is being completed under the RI process. Therefore, temporary suspension of quarterly monitoring was agreed to by NJDEP in a letter dated March 16, 2016 (**Appendix A**).

Well construction details are provided in **Table 2.1**, and the scope of the groundwater monitoring program from the 1990s through 2015 is summarized in **Table 2.2**. Well locations are shown on **Figure 2.2**.

2.4 SOIL VAPOR INTRUSION INVESTIGATIONS

2.4.1 2007 Soil Gas Sampling

Soil gas sampling was conducted as part of the Phase I SI (U.S. Army BRAC, 2008). The NJDEP recommended investigation of vapor intrusion (VI) where structures are within 100 feet horizontally or vertically of shallow groundwater contamination in excess of groundwater screening levels (GWSLs). In the case of petroleum hydrocarbon contamination (e.g., BTEX), a 30-foot distance was utilized. Two sub-slab and two near-slab soil gas samples were collected adjacent to and from beneath Building 699 and analyzed for VOCs. Sampling results are discussed in Section 4.3, and sampling locations are shown on **Figure 4.4.**

2.4.2 2012 VI Site Investigation

Based on concentrations of chlorinated VOCs and BTEX compounds measured in groundwater across FTMM from the second quarter 2009 through the first quarter 2011, six buildings, including Building 699 at FTMM-53, were targeted for a subsequent VI investigation (AECOM, 2013). Two sub-slab soil gas samples, one indoor air sample, one ambient air sample, and two duplicate ambient air samples were collected at Building 699 in March 2012. All samples collected at Building 699 were analyzed for 12 chlorinated VOCs based on detections of tetrachloroethene (PCE) at wells 699MW-09 and 699MW-16, the trigger wells for this investigation. Sampling results are discussed in Section 4.3, and sampling locations are shown on **Figure 4.5**.

2.5 ECOLOGICAL INVESTIGATIONS

A Baseline Ecological Evaluation (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 Environmental Condition of Property [ECP] parcels and 15 Installation Restoration Program [IRP] sites). The BEE was developed to be an efficient 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. The NJDEP has accepted the conclusions and recommendations of the BEE (Shaw, 2012) and concurs that no further evaluation of ecological risk is required.

SECTION 3
PHYSICAL CHARACTERISTICS OF THE SITE

3.1 SURFACE FEATURES

FTMM-53 is located on the south side of Saltzman Avenue in the central portion of the MP and is associated with Building 699, which is a one-story building built on slab and covering an area of approximately 4,628 square feet. Nearly all the remainder of the site is paved with asphalt or concrete. Large paved parking areas exist to the east and west of the site, and a large grassy area is found to the north across Saltzman Avenue. Topography at the site is relatively flat, sloping gradually to the southeast (Versar, 2002).

3.2 SURFACE-WATER HYDROLOGY

The nearest surface water body to FTMM-53, Husky Brook, is located approximately 700 feet southeast of the site. Mill Creek is located approximately 1,100 feet west of the site. Husky Brook originates off-post to the west and becomes Husky Brook Lake in the southwestern corner of the MP (**Figure 1.2**). Surface water drainage from the southern half of the MP, including FTMM-53, flows into Husky Brook and Husky Brook Lake through a series of drainage ditches and outfalls. Husky Brook exits Husky Brook Lake and where it is culverted for approximately 900 feet, and then becomes Oceanport Creek downstream (east of) of FTMM-53. Oceanport Creek and Husky Brook are tidally influenced below Husky Brook Lake (Weston, 1995; Shaw, 2012). Surface water that accumulates on the land surface from precipitation events at FTMM-53 is transported southward via overland flow toward Husky Brook (**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. An early regional geologic cross-section for the FTMM vicinity based on the work of Zapecza (1989) is provided in **Appendix A**. This cross-section indicates that the depth to crystalline bedrock at FTMM is approximately 1,000 feet.

The bedrock 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 map is also included in **Appendix A**.

The Hornerstown Formation, which underlies much of the MP and the northern portion of the CWA, 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 feet 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 feet.

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 feet thick. The uppermost four to six feet, 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 area 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.

A pumping test performed at FTMM in 1992 yielded a hydraulic conductivity of 32 gallons per day per square foot (4.3 feet per day [ft/day]) (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 at FTMM 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-53 is underlain by the Hornerstown Formation. Review of geologic information obtained by Parsons in September 2015 during drilling of 11 soil borings across the site confirms that the uppermost lithologic unit at FTMM-53 (from ground surface to approximately 5 feet bgs) is generally comprised of medium to fine, orange and tan sand and silty sand, and clay (**Appendix B**). This uppermost unit likely consists of some combination of fill material and surficial deposits belonging to the Cape May Formation Unit 2. Deeper soil (5 to 20 feet bgs) is representative of the Hornerstown Formation and is composed of greenish, orange, and gray sandy clay with a trace of silt.

The depth to groundwater at the MP typically ranges from approximately 2 to 9 feet bgs. At FTMM-53, the groundwater depth typically ranges from approximately 6 to 9 feet bgs based on water level depth measurements collected during recent quarterly groundwater monitoring events (**Table 3.1**). Groundwater potentiometric contour maps were created using March and November 2015 groundwater elevation data from on-site wells (**Figures 3.1 and 3.2**). **Figure 3.2** includes both FTMM-53 and adjacent site FTMM-68, and provides the best hydraulic gradient information in terms of magnitude and direction. Groundwater migrates towards the south and southeast (i.e., toward Husky Brook, **Figure 3.2**) with horizontal hydraulic gradients throughout much of the site vicinity ranging from 0.014 to 0.024 foot per foot (ft/ft). In contrast, the hydraulic gradient beneath the immediate area of the service station appears to be relatively flat.

Slug tests were performed in three shallow monitoring wells in December 2015 (699MW04, 699VP11, and FTMM-53MW01; **Figure 2.1**). Tests were analyzed using the Hvorslev Method (Hvorslev, 1951). The calculated hydraulic conductivities for the shallow zone were 0.36 ft/day for 699MW04, 2.98 ft/day for 699VP11, and 3.59 ft/day for FTMM53-MW01. The slug test analysis reports are provided for each well in **Appendix B**.

3.4 LAND USE

Building 699 is closed and was used as a full-service gas station and convenience store. The projected future land use at the site is mixed use industrial and institutional/civic use according to the Fort Monmouth Reuse and Redevelopment Plan (EDAW, Inc., 2008) included in **Appendix A**. According to this Plan, institutional/civic uses may include schools (educational) and administrative.

3.5 ECOLOGY

Major vegetation zones at FTMM consist of landscaped areas, estuarine and fresh water wetlands, riparian areas, upland forests, and old field habitats. Much of the upland areas of the MP and CWA consist of extensive areas of regularly mowed lawns and landscaped areas (Shaw, 2012). Approximately ninety percent of FTMM-53 is covered by impervious surfaces including pavement, concrete pump islands, and Building 699. Large paved parking areas exist to the east and west of the site. A large grassy area is present to the north across Saltzman Avenue. Building 699 is located approximately 700 feet northwest of Husky Brook, which empties into Oceanport Creek.

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 and CWA in September 2009. In an August 27, 2012 letter, the NJDEP approved “no additional ecological evaluation or assessment for the Main Post Area” (NJDEP, 2012a) (provided in **Appendix A**).

SECTION 4
NATURE AND EXTENT OF CONTAMINATION

Environmental sampling results for soil and groundwater at and adjacent to FTMM-53 are described in this section. No surface water or sediment samples were collected at this site since the nearest surface water body (Husky Brook) is located approximately 700 feet to the southeast (where the flow is culverted for approximately 900 feet before entering Oceanport Creek).

4.1 SOIL QUALITY

Soil analytical data collected during previous soil investigations and the current RI are summarized in the following subsections. All soil samples collected at the site during the 2015 RI were analyzed for VOCs+TICs. One sample from RI boring FTMM-53-SB11, advanced at the location of the former waste oil tank south of Building 699, was also analyzed for semivolatile organic compounds (SVOCs)+TICS, polychlorinated biphenyls (PCBs), target analyte list (TAL) metals, and extractable petroleum hydrocarbon (EPH) fractions. Two other soil samples from this boring were also analyzed for EPH fractions. Soil sample locations for the 2015 RI are shown on **Figure 2.2**.

Sampling results for detected analytes were compared to NJDEP Residential Direct Contact Soil Remediation Standards (RDCSRS), Non-Residential Direct Contact Soil Remediation Standards (NRDCSRS), and/or Impact to Ground Water screening levels (IGW SLs) and are summarized below.

4.1.1 Summary of Soil Sample Results from 1992 to 2001

Soil quality data collected in 1992 (Weston, 1993a), 1998 (Versar, 2000a), 1999 (Versar, 2001), and 2000 (U.S. Army, 2000) are summarized in **Table 4.1** and provided in **Appendix A**. Data collected by Versar in 2000 (Versar, 2000b), and 2001 (Versar, 2002) are summarized in **Tables 4.2 and 4.3**, respectively, and are included in **Appendix A**; benzene data for soil samples collected by Versar in 2000 are also shown on **Figure 4.1**. Additional soil quality data collected in 1993 (Appendix V in GES, 1999) are not summarized in tabular form in this section, but are described below and included in **Appendix A**,

Five post-excavation soil samples (SP1 through SP5) collected along the sidewalls and base of the waste oil tank (NJDEP Registration Number 81533-197) excavation south of Building 699 in 1992 (Weston, 1993a) were analyzed for TPH and priority pollutants plus 40 TICs. TPH concentrations ranged from non-detect with the lowest detected concentration at 15 milligrams per kilogram (mg/kg) up to 11,600 mg/kg (**Table 4.1**). Monitoring well 699MW12 (**Figure 2.1**) was installed at the former waste oil UST location in 1992, and three soil samples were collected for analysis of TPH during advancement of the monitoring well borehole (sample IDs C92-1009 through C92-1011). TPH concentrations in these three samples ranged from not detected to 3,095 mg/kg (**Table 4.1**).

In 1993, 27 soil samples were collected in the northeast portion of the site at 5.5 feet bgs (the soil-groundwater interface) to define the extent of gasoline contamination (six gasoline USTs, NJDEP Registration Numbers 81533-185 through -190) (see Appendix V in GES, 1999, provided in **Appendix A** of this report). Total concentrations of BTEX constituents in these samples ranged

from 125 to 2,170 mg/kg, and total VOC concentrations ranged from 307 to 2,877 mg/kg (**Appendix A**). The area where these samples were collected is outlined on **Figure 4.1**.

Eight soil samples (699A-A through 699A-H) were collected by Versar (2000a) at depths ranging from 2 to 9 feet bgs and analyzed for TPH following the removal of a 2,000-gallon No. 2 fuel oil tank (NJDEP Registration Number 81533-112) from the south side of Building 699 in 1998 (**Figure 1.3**). TPH concentrations in seven of the eight samples were non-detect, and the concentration in the eighth sample was 346 mg/kg (**Table 4.1**).

Soil sampling results reported by Versar (2001) following the 1999 removal of four gasoline USTs (NJDEP Registration Numbers 81533-235 through -238) on the west side of the site (**Figure 1.3**) indicated that benzene and xylene concentrations in soil beneath the tanks exceeded the then-current NJDEP RDCSCC (**Appendix A**). Concentrations of BTEX compounds at several locations also exceeded current September 2017 NJDEP soil criteria as shown in **Table 4.1** (samples PS-1 through PS-9). Maximum detected concentrations of benzene, toluene, ethylbenzene, and total xylenes were 36 mg/kg, 310 mg/kg, 260 mg/kg, and 1,530 mg/kg, respectively. The sample depths ranged from 1.5 to 4 feet bgs.

In October 2000, a 500-gallon waste oil tank (NJDEP Registration Number 81533-239) was removed from the north side of Building 699 (**Figure 1.3**), and three post-excavation samples were analyzed for BTEX and/or TPH (U.S. Army, 2000). Analytical results from one sample (699WO-A-North End) contained benzene and naphthalene at concentrations exceeding current September 2017 NJDEP RDCSRS direct contact soil criteria at 6.5-7 feet bgs (**Table 4.1**).

A total of 83 soil borings were advanced site-wide by Versar (2000) in March/April 2000 to further delineate the horizontal and vertical extent of soil contamination, and to identify "hot spot" areas that could be addressed by active remediation (see Section 2.2). A total of 897 samples were collected at alternating 6-inch intervals from ground surface to a depth of 12 feet bgs at each location and analyzed for VOCs, TPH, and/or lead (**Figure 4.1**). Constituents of concern (COCs) were detected at 53 of the 83 boring locations with the primary COCs being TPH and BTEX (**Table 4.2**). Benzene was detected at 22 boring locations, 20 of which had concentrations above the then-current 2000 RDCSCC of 3 mg/kg and the current September 2017 RDCSRS of 2 mg/kg (**Table 4.2**). Xylenes were detected at 21 boring locations, 17 of which had concentrations above the then-current 2000 RDCSCC of 410 mg/kg; there were no exceedances of the current September 2017 RDCSRS for total xylenes of 12,000 mg/kg. **Table 4.2** also shows which of the 21 boring locations included in this table were selected for subsequent EEB treatment later in 2000 (i.e., after the March/April 2000 sampling highlighted in **Table 4.2**). As indicated on the benzene sampling results map (**Figure 4.1**), the soil sampling performed in 2000 defined the lateral extent of benzene RDCSRS exceedances to the south, west, and east, but not to the north (i.e., hydraulically upgradient), due to the presence of Saltzman Avenue (**Appendix A**).

Additional soil sampling was performed by Versar (2002) in 2001, approximately 180 days after completion of the EEB injection program described in Section 2.2, to evaluate the treatment's effectiveness on areas with elevated COC concentrations during the 2000 sampling event. A total of 108 soil samples were collected from alternating 6-inch intervals at 17 boring locations to a depth of 6 feet bgs and analyzed for VOCs and TPH. Post- EEB benzene concentrations exceeding the current September 2017 RDCSRS of 2 mg/kg were detected at 15 of the 17 boring locations sampled in 2001 (**Table 4.3**). The post-bioremediation soil quality dataset did not adequately characterize the extent of soil contamination to the north (**Appendix A**).

Table 4.4 summarizes the number of times historical analyte concentrations were greater than one or more current September 2017 NJDEP comparison criteria, as described further in Sections 4.1.1.1 through 4.1.1.3. The results of the 27 soil samples collected in the northeast portion of the site in 1993 (GES, 1999) were not readily available electronically, and therefore were not included in **Table 4.4**. As shown on **Figure 4.1**, samples collected in the same area by Versar in 2000 and 2001 subsequently superseded the 1993 sample results.

4.1.1.1 Summary of Historical Exceedances of Residential Direct Contact Comparison Criteria

Concentrations of the following constituents exceeded the September 2017 NJDEP RDCSRS in at least one of the soil samples collected from 1992 to 2001 and analyzed for VOCs, SVOCs, TPH, PCBs, and/or metals (**Table 4.4**).

- The VOCs benzene; and
- The SVOC naphthalene.

4.1.1.2 Summary of Historical Exceedances of Non-Residential Direct Contact Comparison Criteria

Concentrations of the following constituents exceeded the September 2017 NJDEP NRDCSRS in at least one of the soil samples collected from 1992 to 2001 and analyzed for VOCs, SVOCs, TPH, PCBs, and/or metals (**Table 4.4**).

- The VOCs benzene; and
- The SVOC naphthalene.

4.1.1.3 Summary of Historical Exceedances of Impact to Ground Water Comparison Criteria

Concentrations of the following constituents exceeded the November 2013 NJDEP IGW SL in at least one of the soil samples collected from 1992 to 2001 and analyzed for VOCs, SVOCs, TPH, PCBs, and/or metals (**Table 4.4**).

- The VOCs 1,1,2-trichloroethane, acetone, benzene, ethylbenzene, methyl ethyl ketone, methylene chloride, toluene, and total xylenes;
- The SVOCs 2-methylnaphthalene, naphthalene, and phenol; and
- The metal lead.

4.1.2 Summary of 2015 RI Soil Sample Results

Eleven soil borings were advanced during the September 2015 RI sampling event, with three soil samples collected at each boring location to define the current extent and magnitude of COCs in soil (**Figure 2.2**). Borings were located in areas where historical data did not define the extent of soil contamination (i.e., north of Saltzman Avenue) and in areas where contaminant concentrations were substantially elevated in the past. Mild to very strong petroleum-like odors were noted at varying depths at nearly every location except for FTMM53-SB8, -SB9, -SB11 and FTMM53-MW01. FTMM53-SB8 and -SB9 are located at the far north end of the site, and FTMM53-SB11 and -MW01 are located at the far south end of the site (**Figure 2.2**).

Soil samples were analyzed for VOCs+TICs, SVOCs+TICs, PCBs, EPH, and/or metals, depending on the sample location; results are presented in **Table 4.5**. The full analytical laboratory report and the data validation summary report are included in **Appendix B**. **Table 4.6** summarizes the number of times analyte concentrations in the 2015 RI samples were greater than one or more of the September 2017 NJDEP comparison criteria. Locations of NJDEP RDCSRS exceedances in 2015 soil samples are shown on **Figure 4.2.**

4.1.2.1 Summary of Exceedances of Residential Direct Contact Comparison Criteria

As shown in **Tables 4.5** and **4.6**, naphthalene was the only constituent that exceeded the September 2017 NJDEP RDCSRS in soil samples collected during the 2015 RI sampling event and analyzed for VOCs+TICs, SVOCs+TICs, PCBs, EPH, and/or metals. Naphthalene concentrations exceeded the September 2017 NJDEP RDCSRS of 6 mg/kg in a total of two samples from borings FTMM-53-SB4 (16 mg/kg at 7 to 7.5 feet bgs) and FTMM-53-SB10 (6.5 mg/kg at 6.5 to 7 feet bgs) (**Figure 4.2**).

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

As shown in **Tables 4.5 and 4.6**, no constituents exceeded the September 2017 NJDEP NRDCSRS in any of soil samples collected in 2015 and analyzed for VOCs+TICs, SVOCs+TICs, PCBs, EPH, and/or metals.

4.1.2.3 Summary of Exceedances of Impact to Ground Water Comparison Criteria

As shown in **Tables 4.5 and 4.6**, concentrations of the following constituents exceeded the November 2013 NJDEP IGW SL in at least one of the soil samples collected in 2015 and analyzed for VOCs+TICs, SVOCs+TICs, PCBs, EPH, and/or metals.

- The VOC benzene (two surface soil samples collected beneath the fueling island canopy at FTMM-53-SB2 and -SB3 and one deeper sample collected near the water table at FTMM-53-SB7); and
- The SVOC TIC 2-methylnaphthalene (one sample collected near the water table at FTMM-53-SB4).

4.1.2.4 Comparison of 2015 and 2000/2001 Results for Benzene and Xylene

Based on the pre- and post-EEB 2000/2001 sampling results, it was concluded that concentrations of COCs exceeding the then-current RDCSCC decreased significantly throughout the application area during the 6-month treatment period (Versar, 2002). As shown in **Table 4.3**, the total number of RDCSRS exceedances for benzene decreased from 60 in 2000 to 45 in 2001. Benzene concentrations in 50 samples collected in 2001 decreased relative to 2000 concentrations (indicated by green font color in **Table 4.3**), and benzene concentrations in 25 samples collected in 2001 increased relative to 2000 concentrations (red font color in **Table 4.3**).

Soil analytical results from the 2015 RI sampling effort were compared to historical results from Versar (2000b and 2002) to evaluate how contaminants have attenuated in FTMM-53 soil over the past 15 years. **Table 4.7** shows the changes in concentrations of benzene and xylene at five soil borings advanced at locations having benzene concentrations exceeding the current NJDEP RDCSRS of 2 mg/kg following the 2000 and 2001 Versar investigations (FTMM-53-SB4, -SB5, -SB6, -SB7, and -SB10). As shown in **Table 4.7**, benzene and xylene concentrations have significantly decreased during the 15 years since the original samples were collected. This

indicates that insitu treatment has been successful and natural attenuation of these compounds is occurring in soil at FTMM-53.

4.2 GROUNDWATER QUALITY

The groundwater monitoring program conducted from October 1992 to November 2015 is summarized in **Table 2.2**. Analysis for TAL metals were discontinued and VOCs were targeted for analysis only at select wells starting with the 2013 baseline sampling event. The 2013 Baseline Sampling Report (Parsons, 2014) recommended continued quarterly sampling of eight wells for VOCs using PDBs. NJDEP (2014b) agreed with this proposal in an approval letter "Final Baseline Ground Water Sampling Report (August 2013)" dated July 3, 2014. A copy of the letter is provided in **Appendix A**. At the request of NJDEP, lead was added to the target analyte list for five wells sampled in November 2015. Quarterly groundwater monitoring at FTMM-53 has been suspended as of the first quarter of 2016 and will resume following completion and final review/acceptance of this RIR/RAWP by the NJDEP. Temporary suspension of quarterly monitoring was agreed to by NJDEP in a letter dated March 16, 2016 (**Appendix A**). Monitoring well locations are shown on **Figure 2.1**, and well construction details are provided in **Table 2.1**.

4.2.1 Summary of Groundwater Sampling Results from 1995 to 2006

Summary tables and charts of groundwater sampling results from 1995 to 2006 are provided in Appendix F of the *Remedial Action Progress Report (RAPR), October 2005 through September 2006* (Handex, 2008); this document is included in **Appendix A** of this report.

4.2.2 Summary of Groundwater Sampling Results from March 2008 to June 2011

FTMM-53 monitoring wells were sampled quarterly for VOCs and metals from April 1997 to June 2011. The quarterly monitoring results summarized in this subsection are representative of the 40-month period from March 2008 to June 2011. Quarterly groundwater monitoring results obtained from March 2008 to June 2011 are shown in **Table 4.8.** More comprehensive summary tables that provide groundwater quality data from May 1997 through September 2010 are provided in **Appendix A**.

4.2.3 Summary of Groundwater Sampling Results from August 2013 through November 2015

The August 2013 baseline data and quarterly groundwater monitoring data for March 2014 through November 2015 are representative of more recent conditions. **Table 4.10** summarizes the number of times concentrations of a detected analyte were greater than the July 2010 NJDEP GWQS based on sampling results from August 2013 to November 2015. Sample locations where detected analytes were greater than the GWQS NJDEP GWQS from August 2013 through November 2015 are shown on **Figures 4.3 through 4.8**.

Several fuel hydrocarbons exceeded their respective NJDEP GWQS from March to November 2015. Additionally, the chlorinated VOC PCE was detected at concentrations ranging from 1.1 J to 1.3 J micrograms per liter (µg/L), slightly above the NJDEP GWQS of 1 µg/L, in wells 699MW09 and 699MW16 during this timeframe (**Figure 4.7**). This chlorinated compound likely migrated under the natural groundwater gradient into the downgradient portions of FTMM-53 from a known release of PCE near Building 700 (adjacent site FTMM-68).

Concentrations of the following constituents exceeded their current NJDEP GWQS in at least one sample collected from August 2013 through November 2015:

- The VOCs 1,2,4- trimethylbenzene (TMB), 1,3,5-TMB, benzene, m,p-xylene, PCE, and total xylenes; and
- Total TICs, volatile.

The highest fuel hydrocarbon concentrations from August 2013 to November 2015 were detected in groundwater from wells 699RW03 and 699RW05. In 699RW03 these higher concentrations above the GWQS occurred in late 2013 and early 2014, however, all fuel hydrocarbon concentrations were below the GWQS during the most recent seven sampling events. At 699RW05, fuel hydrocarbon concentrations remained above the GWQS as of the last round of sampling (November 2015) (**Table 4.9**). The inferred groundwater flow direction at 699RW05 is toward the east (**Figure 3.2**), and the lateral extent of fuel hydrocarbon concentrations detected in this well is bounded by data for well 699MW05 (**Figure 4.3**). GWQS exceedances at well 699MW06 have been limited to benzene; detected concentrations of this VOC from August 2013 to November 2015 have ranged from 1.5 J to 9.2 µg/L and have exceeded the 1 µg/L GWQS in only three of nine sampling events during this time period. The maximum benzene concentration detected in 699MW06 during the most recent five quarterly events was 2.3 J µg/L, and in the most recent round in November 2015 benzene was not detected (<1 µg/L). The recent groundwater quality data indicate that the fuel hydrocarbon plume is laterally bounded (**Figures 4.3 through 4.6**).

The PCE detected in selected wells in the eastern portion of FTMM-53 is part of a chlorinated volatile organics plume that originates near Building 700 east of the Site (i.e., at FTMM-68). These chlorinated organics are being addressed (delineated) under a separate RI for FTMM-68, and not as part of this FTMM-53 RIR/RAWP.

4.3 SOIL GAS AND INDOOR AIR QUALITY

4.3.1 2007 Soil Gas Sampling

A total of 21 VOCs were detected in near-slab and sub-slab soil gas samples collected at Building 699 in 2007 (U.S. Army BRAC, 2008). The sample locations and results of this sampling event are shown on **Figure 4.9**. No VOCs were detected in near-slab soil gas samples above then-current (March 2007) or current (March 2013) NJDEP Generic Non-Residential Soil Gas Screening Levels (SGSLs). PCE was detected in both sub-slab soil gas samples at concentrations of 151 and 241 micrograms per cubic meter (µg/m^3), which exceeds the then-current residential and non-residential SGSLs (34 and 36 µg/m^3). However, the detected concentrations are below the current (March 2013) residential and non-residential SGSLs for PCE of 470 and 2,400 µg/m^3, respectively. No constituents present in groundwater above the GWSL at Building 699 were detected in soil gas samples above the then-current non-residential SGSLs. However, due to the PCE detections in soil gas samples, further evaluation of indoor air in Building 699 was recommended.

4.3.2 2012 VI Site Investigation

Two sub-slab soil gas samples, one indoor air sample, one ambient air sample, and two duplicate ambient air samples were collected at Building 699 in 2012 during a subsequent VI investigation (AECOM, 2013). The sample locations and results of this sampling event are shown on **Figure 4.10**. The only analytes detected in a sub-slab soil gas sample were PCE and trichloroethene (TCE). PCE was detected at concentrations of 210 and 360 µg/m^3, both of which exceeded the then-current residential and non-residential SGSLs for PCE of 34 and 36 µg/m^3,

respectively. However, the detected concentrations are below the current residential and non-residential SGSLs for PCE of 470 and 2,400 µg/m^3, respectively. TCE was detected at a concentration of 94 µg/m^3, which exceeded the then-current residential and non-residential SGSLs for TCE of 27 and 27 µg/m^3, respectively. The residential SGSL for TCE has not changed with the March 2013 updates; however, the non-residential SGSL for TCE did change (increased to 150 µg/m^3) in 2013 and based on the revised number, the TCE SGSL was not exceeded. The reporting limits for non-detect sub-slab soil gas results were below the then-current residential and non-residential SGSLs (AECOM, 2013).

The only analyte detected in an indoor air, ambient air and/or duplicate ambient air sample collected at Building 699 in 2012 was chloromethane, which was detected at a concentration of 1 µg/m^3; this concentration is below the March 2007 NJDEP residential and non-residential Indoor Air Screening Values (IASLs) for chloromethane, which are 94 and 390 µg/m^3, respectively. The reporting limits for non-detect indoor/ambient/duplicate air results were below the residential and non-residential IASLs.

Based on historical groundwater analytical data and VI data collected by AECOM (2013), it was concluded that groundwater was acting as a source for the PCE (and likely TCE) contamination detected in sub-slab soil gas at Building 699. However, given that neither PCE nor TCE were detected in indoor air, the VI pathway for PCE, TCE, and the other targeted chlorinated VOCs at Building 699 was considered incomplete. Chlorinated VOCs in groundwater and soil vapor at FTMM-53 are believed to be sourced at adjacent site FTMM-68, and were likely pulled to the vicinity of Building 699 at FTMM-53 by the pump and treat system that formerly operated in this area. While the VI investigation discussed above included Building 700, the results from this area will be presented in the RI/FS report for FTMM-68.

SECTION 5
CONTAMINANT FATE AND TRANSPORT

This section addresses the fate and transport of VOCs detected in soil and/or groundwater at FTMM-53 at concentrations exceeding NJDEP comparison criteria (see Sections 4.1 and 4.2 for descriptions of sampling results for soil and groundwater, respectively). Chlorinated VOCs are believed to be sourced at an adjacent property to the east, FTMM-68. The fate and transport of chlorinated VOCs will be addressed in the RI/FS for FTMM-68.

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 (http://toxnet.nlm.nih.gov/cgi-bin/sis/search); and
2. Toxicological profiles prepared by the Agency for Toxic Substances and Disease Registry (http://www.atsdr.cdc.gov/toxprofiles/index.asp).

5.1 POTENTIAL ROUTES OF MIGRATION

Potential migration routes for contaminants detected in soil and groundwater at FTMM-53 include the following:

- Volatilization;
- Dissolution of soluble residual contamination in soil into infiltrating precipitation that percolates through the vadose zone to the water table; and
- Primarily lateral migration of contaminants dissolved in groundwater toward Husky Brook.

5.2 CONTAMINANT PERSISTENCE AND MIGRATION IN SOIL

Benzene and naphthalene were identified as the primary constituents above the NJDEP criteria in soil. Numerous laboratory and field studies have shown that hydrocarbon-degrading microorganisms are ubiquitous in the subsurface environment and that these microorganisms can degrade a variety of organic compounds, including components of gasoline (e.g., benzene), fuel oil, and many other fuel hydrocarbons (Wiedemeier et al., 1999).

Benzene is the most volatile of the compounds, and is readily biodegradable in the subsurface. Naphthalene is less volatile and biodegrades more slowly. Benzene is also the most soluble and mobile of the two compounds in the subsurface. The soil organic carbon sorption coefficient (Koc) for benzene has been measured with a range of 60–83 (Karickhoff 1981; Kenaga 1980), indicating that benzene is highly mobile in soil and readily leaches into groundwater. Benzene released to the soil partitions to the atmosphere through volatilization and to shallow groundwater as a result of leaching.

Naphthalene is also soluble and mobile in the subsurface. As a result of its biodegradability, volatility, and mobility, benzene is expected to be less persistent in the soil column than naphthalene. 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. 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. Shorter-chain, lower-molecular-weight hydrocarbons are generally the most soluble, bioavailable, and biodegradable constituents.

5.3 CONTAMINANT PERSISTENCE AND MIGRATION IN GROUNDWATER

BTEX and TMBs were identified as the primary constituents above the NJDEP GWQS in groundwater. The biodegradation rates of the low- to moderate-weight aliphatic, alicyclic, and aromatic compounds (including BTEX) can be very high, especially under aerobic conditions (Air Force Center for Environmental Excellence [AFCEE], 1995). Previous research has shown that the majority (greater than about 85 to 90 percent or more) of the dissolved petroleum hydrocarbons plumes present in the shallow subsurface of the U.S. are at steady-state equilibrium, or are receding, probably because of intrinsic bioremediation (Wiedemeier et al., 1999).

First-order degradation rates for benzene range from 0.1 to 28 per year (Suarez and Rifai, 1999; Reinhard et al., 2005), with an average "default" rate for fate and transport modeling purposes of 1.1 per year (Falta et al., 2012). This range of rates corresponds to benzene half lives of 0.02 to 6.9 years, with an average "default" half-life of 0.6 years. Therefore, although they are relatively soluble and mobile in groundwater systems, benzene and other BTEX compounds tend to have a low degree of persistence in groundwater unless concentrations are replenished over time due to a continuing primary or secondary source.

TMBs are generally less volatile and more sorptive than BTEX, and they have been considered to be relatively recalcitrant to biodegradation under anaerobic conditions such as are typically present in fuel hydrocarbon plumes. However, research performed by Chen et al. (2008) showed that while biodegradation of TMBs under denitrifying and sulfate-reducing conditions was slow, significant biodegradation was observed under iron-reducing conditions. Therefore, biodegradation rates for TMBs are variable depending on biogeochemical conditions of the groundwater.

5.4 SUMMARY

Benzene is expected to be relatively mobile in the vadose zone, and its persistence is expected to be low due to the effects of volatilization, biodegradation, and downward leaching. In contrast, naphthalene is expected to be less mobile and biodegradable and consequently more persistent in the soil column.

BTEX compounds are expected to be relatively mobile in groundwater, but with a relatively low persistence and limited plume lengths due to relatively high biodegradation rates. The mobility of TMBs is also significant, but these compounds tend to sorb more readily to aquifer matrix materials and be less mobile than BTEX. Biodegradation rates for TMBs are variable depending on site-specific biogeochemical conditions. Overall, TMBs are probably less biodegradable than BTEX compounds.

SECTION 6
CONCEPTUAL SITE MODEL

This CSM was developed to understand the possible sources of contamination, contaminants of potential concern, potentially affected media, and transport and exposure pathways that could impact human or ecological receptors. The CSM synthesizes what is known to date into a snapshot that communicates the site's physical setting, contaminants of potential concern, 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).

6.1 DESCRIPTION OF SOURCES, PATHWAYS AND RECEPTORS

6.1.1 Potential Sources

The site was formerly occupied by a gasoline fueling station and automobile service garage, and many of the sources on the site are related to these past uses. The potential sources at FTMM-53 include the following:

- ASTs;
- USTs and associated piping;
- Fuel pump dispensers; and
- Automobile service areas.

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-53 and the media in which the chemicals are present, the following mechanisms for chemical transport have been identified for the site:

- leaching of contaminants from soil into groundwater;
- transport of contaminants in groundwater via advective groundwater flow; 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;
- inhalation of VOCs volatized from soil and groundwater; and
- dermal contact, incidental ingestion, and ingestion as a potable water source for groundwater.

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-53.

Current or potential future human receptors at FTMM-53 include workers, institutional/civic users, educational (school) personnel and students, and administrative personnel and if the area becomes residential, future residents or potable water users (if groundwater is used as a potable water source).

6.2 IMPACTED MEDIA AND EXPOSURE ASSESSMENT

COCs at FTMM-53 include fuel-related VOCs. Potentially affected media include soil and groundwater. Based on the RI sampling performed in 2015, COCs in soil that exceed the RDCSRSs include benzene and naphthalene. COCs in groundwater that exceed the GWQS include BTEX, 1,2,4-TMB, and 1,3,5-TMB. PCE is also present in FTMM-53 groundwater at concentrations above the GWQS, but is believed to be sourced at adjacent site FTMM-68; chlorinated compounds likely moved onto FTMM-53 in two ways: 1) migrated under a natural groundwater gradient onto the downgradient portions of FTMM-53 and 2) were pulled to the former service station area at FTMM-53 from the vicinity of Building 700 by the former pump and treat system that operated at FTMM-53 (it was shut down in 2013). PCE in groundwater at FTMM-53 will be addressed as part of the FTMM-68 RI/FS.

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 gas, groundwater, and soil 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

Currently the contaminated area is paved and therefore there is no potential for human exposure unless intrusive work is performed. 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. If residential development were to occur at the site in the future, then residential receptors may be exposed to contaminants in surface soil 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. If residential development were to

occur at the site in the future, then residential receptors may be exposed to contaminants in subsurface soil via the same pathways listed above for intrusive workers.

6.2.3 Groundwater

Intrusive workers may be exposed to contaminants in groundwater via incidental ingestion, dermal contact, and inhalation of volatiles. If extraction of site groundwater for potable use were to occur in the future, then potable water users may be exposed to contaminants in groundwater via potable water ingestion, and the same three pathways listed above for intrusive workers.

6.2.4 Indoor Air

Based on historical groundwater analytical data and VI data collected by AECOM (2013) at Building 699, it was determined that no complete exposure pathway exists for VOCs in indoor air at FTMM-53. Therefore, exposure to volatilized contaminants via VI into overlying structures is not a significant exposure pathway.

6.2.5 Surface Water and Sediment

The nearest surface water body (Husky Brook) is 700 feet from the site, and site-related contamination is limited to the immediate site vicinity. Therefore, there is no release mechanism for site contamination to impact surface water or sediment. The groundwater contaminant plume is stable to shrinking due to biodegradation of fuel hydrocarbons in soil and groundwater.

SECTION 7
REMEDIAL INVESTIGATION SUMMARY AND CONCLUSIONS

7.1 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-53 consistent with the TRSRs. The nature and extent of targeted constituents exceeding NJDEP comparison criteria in sampled media at FTMM-53 are summarized below.

7.1.1 Historical Soil Sampling (1992 to 2001)

Soil samples were collected in 1992 (Weston, 1993a), 1993 (Appendix V in GES, 1999), 1998 (Versar, 2000a), 1999 (Versar, 2001), 2000 (U.S. Army, 2000 and Versar, 2000b), and 2001 (Versar, 2002). The lateral extent of fuel hydrocarbon contamination in soil was defined by data presented by Versar (2000b). Concentrations of the following constituents exceeded the current September 2017 NJDEP RDCSRS in at least one of the soil samples collected from 1992 to 2001 and analyzed for VOCs+TICs, SVOCs+TICs, PCBs, TPH, and/or metals, depending on the sample location.

- The VOCs benzene; and
- The SVOC naphthalene.

Concentrations of the following constituents exceeded the current September 2017 NJDEP NRDCSRS in at least one of the soil samples collected from 1992 to 2001 and analyzed for VOCs+TICs, SVOCs+TICs, PCBs, TPH, and/or metals, depending on the sample location.

- The VOCs benzene; and
- The SVOC naphthalene.

Concentrations of the following constituents exceeded the current NJDEP IGW SL in at least one of the soil samples collected from 1992 to 2001 and analyzed for VOCs+TICs, SVOCs+TICs, PCBs, EPH, and/or metals, depending on the sample location

- The VOCs 1,1,2-trichloroethane, acetone, benzene, ethylbenzene, methyl ethyl ketone, toluene, and total xylenes;
- The SVOCs 2-methylnaphthalene and phenol; and
- The metal lead.

7.1.2 RI Soil Sampling (2015)

The vertical extent and current magnitude of fuel hydrocarbon contamination in soil was determined by the RI sampling in 2015. Naphthalene was the only constituent that exceeded its NJDEP RDCSRS in soil samples collected during the 2015 RI sampling event and analyzed for VOCs+TICs, SVOCs+TICs, PCBs, EPH, and/or metals. No constituents exceeded the current NJDEP NRDCSRS in any of soil samples collected in 2015. Fuel hydrocarbon concentrations in soil have decreased substantially since the last sampling events in the 2000-2001 timeframe.

Concentrations of the following constituents exceeded the current NJDEP IGW SL in at least one of the soil samples collected in 2015 and analyzed for VOCs+TICs, SVOCs+TICs, PCBs, EPH, and/or metals.

- The VOC benzene; and
- The SVOC 2-methylnaphthalene.

7.1.3 Groundwater

Concentrations of the following constituents exceeded their current NJDEP GWQS at least one of the groundwater samples collected during the most recent eight quarters of groundwater monitoring (March 2014 to November 2015) and the 2013 baseline sampling event:

- The VOCs 1,2,4-TMB, 1,3,5-TMB, benzene, m,p-xylene, PCE, total xylenes; and
- Total TICs, volatile.

Recent groundwater quality data indicate that the fuel hydrocarbon plume is laterally bounded and localized in the immediate vicinity of the site. Fuel hydrocarbon concentrations in groundwater have decreased substantially since quarterly monitoring began in 1997. PCE detected in selected wells in the eastern portion of FTMM-53 is part of a chlorinated volatile organics plume that originates near Building 700 east of the Site (i.e., at FTMM-68). These chlorinated organics are being addressed (delineated) under a separate RI for FTMM-68.

7.1.4 Soil Gas and Indoor Air

Near-slab and sub-slab soil gas samples and indoor air samples were collected adjacent to and within Building 699 in 2007. A subsequent sampling event in 2012 included collection of subslab soil gas samples and indoor air samples beneath and within Building 699, respectively. Comparison of sampling results to current SGSLs and IASLs did not reveal any exceedances that indicate a current site-related VI risk to Building 699.

7.2 CONTAMINANT FATE AND TRANSPORT

Benzene is expected to be relatively mobile in the vadose zone, and its persistence is expected to be low due to the effects of volatilization, biodegradation, and downward leaching. In contrast, naphthalene is expected to be less mobile and biodegradable and consequently more persistent in the soil column.

BTEX compounds are expected to be relatively mobile in groundwater, but with a relatively low persistence and limited plume lengths due to relatively high biodegradation rates. The mobility of TMBs is also significant, but these compounds tend to sorb more readily to aquifer matrix materials and be less mobile than BTEX. Biodegradation rates for TMBs are variable depending on site-specific biogeochemical conditions. Overall, TMBs are probably less biodegradable than BTEX compounds.

7.3 CONCEPTUAL SITE MODEL

Current or potential future human receptors at FTMM-53 include workers, institutional/civic users, school personnel and students, administrative personnel and if the area becomes residential, future residents or potable water users (if groundwater is used as a potable water source). Potentially complete exposure pathways (either currently or under hypothetical future scenarios) include incidental ingestion of or dermal contact with contaminated soil or groundwater, inhalation

of dust or vapor containing volatilized chemicals, and ingestion of groundwater as a potable water source.

7.4 CONCLUSIONS

The RI sampling results indicate that concentrations of hydrocarbon-related compounds are present in the soil and groundwater. However, the concentrations of these compounds have been reduced significantly over time due to the previous active remediation systems (which are no longer operating) and natural attenuation. Since POL are excluded from CERCLA, the Army at Fort Monmouth is subject to NJDEP regulations for the investigation and remediation of these contaminants.

Based on the current conditions at the site, active remediation is not required at Site FTMM-53 given the extensive past efforts performed at this site. The recommended remedial alternative consists of implementing an institutional control in the form of a deed notice, restricting use of and exposure to site soil. Monitored natural attenuation (MNA) for petroleum related compounds in groundwater is recommended, and a CEA/WRA that restricts use of and exposure to site groundwater until applicable cleanup goals are achieved.

SECTION 8
REMEDIAL ACTION WORKPLAN

8.1 INTRODUCTION

This RAWP to address fuel hydrocarbon contamination in soil and groundwater at FTMM-53 was prepared in accordance with the N.J.A.C 7:26E-5.5, and contains all applicable requirements listed in that subchapter. A summary of findings and recommendations from the RI is provided in Section 7. Interim remedial measures previously implemented at FTMM-53 include proprietary biological amendments, groundwater pump and treat, SVE, and air sparging; these systems operated from 2001-2011, and then intermittently into 2013. Descriptions of these systems are included in Section 1.4 and **Appendix A**.

8.2 REMEDIAL ACTION APPROACH

The objective of the remedial action is to protect human health by eliminating exposure to fuel hydrocarbon contamination that will remain in-place in soil and groundwater at FTMM-53 at concentrations greater than the RDCSRS and GWQS, respectively. The horizontal and vertical extents of contamination in soil and groundwater at FTMM-53 are detailed in Section 4. The RI sampling results indicate that active remediation is not required at FTMM-53. ICs consisting of a deed notice and a CEA/WRA, are proposed to be implemented to prevent human exposure to site soil and groundwater, and MNA of groundwater will be used to track and evaluate natural reductions in contaminant concentrations in groundwater at FTMM-53 over time.

8.2.1 Applicable Remediation Standards

The FTMM Reuse and Redevelopment Plan (EDAW, 2008) indicates that the anticipated future land use at FTMM-53 is for mixed use industrial and institutional/civic purposes; institutional/civic uses may include schools (educational) and administrative uses. A residential scenario is not currently anticipated for the site; however, the applicable remediation standards for FTMM-53 are the September 2017 NJDEP RDCSRS for soil and July 2010 GWQS for groundwater.

8.2.2 Institutional Controls

LUCs will be used to prevent uncontrolled exposure of potential receptors to contaminated media. The FTMM team will prepare a LUC Implementation Plan (LUCIP) to document the ICs and identify procedural responsibilities including inspections, monitoring and reporting, and long-term management requirements. The Army will be responsible for documenting and implementing the LUCs and will also be responsible to conduct regular reviews to ensure that the LUCs remain protective of human health and the environment. It is expected that the LUCs will take the form of a deed notice. When the property is transferred to private ownership, the LUCs will be incorporated into the title and the new owner would be responsible for complying with the LUCs. Although the Army may later transfer its procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Army would retain ultimate responsibility for remedy integrity.

8.2.2.1 Deed Notice

A Deed Notice, in a form acceptable to the Army and the NJDEP, will be prepared to address the presence of the fuel hydrocarbon contamination (i.e., benzene and naphthalene) above NJDEP RDCSRS remaining in site soil. The Deed Notice will be recorded upon conveyance of the property out of federal ownership and will restrict future development of the property and prevent potential exposure to contaminants that will remain in-place at the site. Use of the site will be restricted to non-residential purposes. A draft Deed Notice will be provided as part of the FTMM-53 LUCIP.

8.2.2.2 Classification Exception Area

Groundwater at FTMM-53 is not currently used as a source of potable drinking water. Concentrations of the fuel hydrocarbons 1,2,4-TMB, 1,3,5-TMB, benzene, m,p-xylene, PCE, total xylenes and total volatile TICs have recently been detected in FTMM-53 groundwater at concentrations greater than their NJDEP GWQS. A CEA/WRA will be established and prepared pursuant to N.J.A.C. 7:26C-7.3. The CEA/WRA will include sampling every year, and two sampling rounds during the final year. The CEA/WRA is a groundwater use restriction to protect a hypothetical residential user from potential risk associated with groundwater as a potable water source. The duration of the CEA/WRA will be determined through modeling using BIOSCREEN and BIOCHLOR as required by the NJDEP's CEA/WRA guidance and will remain in place until NJDEP GWQS are achieved at the Site.

8.2.3 Monitored Natural Attenuation

MNA relies on natural processes to achieve applicable groundwater remediation standards. Based on the LTM results reflecting decreased COC concentrations in groundwater and conclusions of the RI presented in Section 7, MNA has been selected as an appropriate remedy for fuel hydrocarbon contamination in groundwater at FTMM-53. The site has an existing network of monitoring wells that have been sampled for site-related contaminants for 17 years. The groundwater contaminant plume is mature and stable to diminishing, and fuel hydrocarbon concentrations in groundwater have been reduced substantially due to a combination of insitu remediation and natural attenuation. The MNA program at FTMM-53 will be conducted in accordance with NJDEP's *Site Remediation Program Monitored Natural Attenuation Guidance* (NJDEP, 2012b) with periodic monitoring to evaluate changes in groundwater contaminant concentrations. Fuel hydrocarbon concentrations in groundwater have decreased substantially since quarterly monitoring began in 1997.

8.2.4 Perimeter Air Monitoring and Action Plan

No remedial actions are planned at FTMM-53 that would produce dust, vapors, or odors. Therefore, a perimeter air monitoring and action plan is not required at this time.

8.2.5 Required Permits

No permits are currently required to perform the remedial actions described above. If the MNA remedy requires installation of new wells in the future, drilling and well permits will be obtained at that time.

8.2.6 Fill Use Plan

No remedial actions are planned at FTMM-53 that require either alternative or clean fill. Therefore, a fill use plan is not required at this time.

8.2.7 Treatment and Disposal Methods

No wastes will be treated or disposed on-site. As described in Section 8.2.2.1, a Deed Notice will be prepared to address fuel hydrocarbon contamination remaining in site soil.

8.2.8 Health and Safety Plan

The types and levels of contaminants at FTMM-53 have been adequately characterized. The primary COCs at the site consist of fuel-related VOCs. Based on these observations, it is anticipated that remedial actions at the site (i.e., groundwater monitoring) will require standard *Level "D"* personal protective equipment. Groundwater monitoring will be performed per the health and safety procedures outlined in the current installation-wide Accident Prevention Plan (Parsons, 2016) that is used for groundwater monitoring at multiple FTMM sites.

8.2.9 Quality Assurance/Quality Control Plan

Site activities are conducted in accordance with the current NJDEP TRSR N.J.A.C 7:26E. All groundwater sampling will be completed in accordance with the NJDEP *Field Sampling Procedures Manual* (August 2005) and the TRSR. Groundwater monitoring will be performed per the quality assurance/quality control procedures outlined in the current installation-wide Sampling and Analysis Plan (Parsons, 2013) that is used for groundwater monitoring at multiple FTMM sites.

8.2.10 Site Restoration Plan

There will be no disturbance to the ground surface or any existing structures at FTMM-53. Therefore, no site restoration will be required following implementation of the remedial actions.

8.2.11 Remedial Action Schedule

The remedial actions described above will be implemented upon NJDEP acceptance of this RAWP.

SECTION 9
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TABLES

TABLE 1.1
CHRONOLOGY OF EVENTS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

1918 – Fort Monmouth (FTMM) was established.
1953 – Building 699 was constructed for use as a fueling station.
1984 – Tank tightness test was performed on the six 10,000-gallon underground storage tanks (USTs) located on the northeast of the island canopy. A 0.333 gallon per hour leak was identified in two of the USTs.
1989 – Line leak was identified and piping was excavated and replaced between the canopy and the six 10,000-gallon USTs.
1989 – Approximately 11,000 gallons of gasoline were released into soil surrounding the gasoline USTs and associated piping (October 19). Piping and dispensing island were replaced in December and a light non-aqueous phase liquid (LNAPL) recovery well with dual pump system was installed.
1990 – A second dual-pump LNAPL recovery well was activated in March 1990. A total of 6,733 gallons of LNAPL were recovered by the summer of 1990. These recovery wells are no longer active (GES, 1999).
1990 – Discharge Investigation and Corrective Action Report (DICAR) submitted in July (Handex, 2006).
1992 – One 1,000-gallon waste oil UST located south of Building 699 was removed in January (Weston, 1993) and verbal approval of the tank closure report was received from NJDEP in January 2004 (Appendix G of U.S. Army, 2007). The former waste oil tank was located south of Building 699 and monitoring well MW-12 was installed within the excavation footprint.
1993 – Soil boring investigation to further define the extent of gasoline contamination on the east side of the site. A total of 27 soil samples were collected in July at 5.5 ft bgs (GES, 1999).
1993 – Remedial Action Workplan (RAWP) submitted October 12 (Handex, 2006).
1998 – One 2,000-gallon No. 2 fuel oil UST located south of Building 699 was removed in June and NJDEP approval for no further action (NFA) was received in a letter dated January 10, 2003 (Versar, 2000a).
1999 – Four 4,000-gallon steel USTs containing gasoline located northwest of Building 699 were removed in September. Corrosion holes in the USTs were observed and surrounding soil was visually contaminated (Versar, 2001).
1999 – RAWP Addendum submitted in June proposing installation of pump-and-treat and soil vapor extraction (SVE) systems (Versar, 1999).
2000 – Soil investigation of the UST leak contamination extent. In March and April, 83 Geoprobe locations sampled on a grid pattern across FTMM-53 site (Versar, 2000b).
2000 – One 500-gallon waste oil tank (UST) located north of Building 699 was removed (October). Tank was observed to have rusting, scaling, pitting, and corrosion but no apparent holes.
2000 – Second RAWP Addendum submitted to conduct enzyme – enhanced bioremediation (EBB) of soil in addition to planned pump-and-treat and SVE systems (October).
2000 – Application of EBB in soil in November (Versar, 2002).
2001 – Activated pump and treat and SVE systems (April and September, respectively). Systems remained operating until 2013.
2002 – Remedial Action Progress Report (RAPR) on the effectiveness of EBB. Submitted by Versar in December (Versar, 2002).
2002 – RAPR for April 2001 through March 2002. Submitted by Handex (September 2004).
2004 – RAPR for April 2002 through September 2004. Submitted by Handex (April 2005).
2005 – RAPR for October 2004 through September 2005. Submitted by Handex (March 2006).
2006 – RAPR for October 2005 through September 2006. Submitted by Handex (October 2008).
2007 – Six 10,000-gallon gasoline USTs were removed and replaced by two 10,000-gallon above ground storage tanks (ASTs) (April).

TABLE 1.1
CHRONOLOGY OF EVENTS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

2007 – Classification Exception Area (CEA) Groundwater Modeling Report submitted by Gilmore & Associates, Inc. (October).
2008 – RAPR for 4th Quarter 2006 through 4th Quarter 2008. Submitted by Handex (June 2010).
2011 – FTMM installation closure.
2013 – Groundwater sampling was conducted at 21 FTMM sites, including FTMM-53, in August 2013 to re-establish baseline groundwater conditions following temporary suspension of groundwater sampling in late 2011 (Parsons, 2013).
2015 – RI data gap investigation conducted at FTMM-53 in September; results are presented in this report. Quarterly groundwater sampling events performed in March, June, September, and November.

TABLE 1.2
UST CLOSURE STATUS FOR FTMM-53 AREA
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Site Name	Residential	NJDEP Registration Number	DICAR	Tank Size and Type	Product	UST Status; Comments on Current NJDEP Status
565	NO	None	11-04-11-1514-26	500 gallon steel	Dry Cleaner Solvent	Removed; Addressed under FTMM-68
699	NO	81533-235	--	4,000 gallon steel	Gasoline	NFA approved per 01/10/2003 NJDEP letter
699	NO	81533-236	--	4,000 gallon steel	Gasoline	NFA approved per 01/10/2003 NJDEP letter
699	NO	81533-237	--	4,000 gallon steel	Gasoline	NFA approved per 01/10/2003 NJDEP letter
699	NO	81533-238	--	4,000 gallon steel	Gasoline	NFA approved per 01/10/2003 NJDEP letter
699A	NO	81533-112	--	2,000 gallon fiberglass	#2 Fuel Oil	Removed; NFA approved per 01/10/2003 NJDEP letter
699B	NO	81533-197	FILED W/699DICAR	1,000 gallon steel	Waste Oil	Removed; See 1993 Weston Report, and 2015 supplemental data
699C	NO	81533-185	89-10-19-1329	10,000 gallon fiberglass	Gasoline	Removed; Addressed under FTMM-53
699C	NO	81533-186	89-10-19-1329	10,000 gallon fiberglass	Gasoline	Removed; Addressed under FTMM-53
699C	NO	81533-187	89-10-19-1329	10,000 gallon fiberglass	Gasoline	Removed; Addressed under FTMM-53
699C	NO	81533-188	89-10-19-1329	10,000 gallon fiberglass	Gasoline	Removed; Addressed under FTMM-53
699C	NO	81533-189	89-10-19-1329	10,000 gallon fiberglass	Gasoline	Removed; Addressed under FTMM-53
699C	NO	81533-190	89-10-19-1329	10,000 gallon fiberglass	Gasoline	Removed; Addressed under FTMM-53
699WO	NO	81533-239	--	500 gallon steel	Waste Oil	Removed; 2000 soil data exceeds RDCSRS for benzene and naphthalene

DICAR = Discharge Investigation and Corrective Action Report
NFA = No Further Action

TABLE 2.1
WELL CONSTRUCTION SUMMARY
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Well ID	Well Permit #	Y Coord. (North)	X Coord. (East)	Installation Date	Depth	Casing Length	Screen Length	Top of Casing Elevation	Slot Size
					feet				inches
600MW01	29-30968	539100.480	618593.011	7/8/1994	15.0	2.0	13.0	**15.27**	0.02
616MW01	29-33760	539282.814	618630.807	8/17/1995	14.0	4.0	10.0	17.64	0.02
699MW01	29-23677-1	539094.956	618689.924	11/2/1989	15.0	2.0	13.0	14.48	0.02
699MW02	29-23678-9	539212.459	618724.121	11/2/1989	17.0	2.0	15.0	15.13	0.02
699MW03	29-23679	539127.360	618797.755	11/2/1989	15.0	1.5	13.5	15.80	0.02
699MW04	29-23680-7	539111.313	618732.386	11/2/1989	20.0	2.0	18.0	15.03	0.02
699MW05	29-23808	539142.503	618894.896	11/30/1989	15.0	3.0	12.0	**13.22**	0.02
699MW06	29-23809-1	539071.235	618810.053	12/1/1989	15.0	2.0	13.0	16.75	0.02
699MW07	29-23810	unknown	unknown	12/1/1989	15.0	3.0	12.0	15.97	0.02
699MW08	29-23811	539060.005	618593.218	12/1/1989	15.0	2.0	13.0	14.88	0.02
699MW09	29-24639	538950.010	618849.406	5/1/1990	15.0	2.0	13.0	14.70	0.02
699MW10	29-24640	unknown	unknown	5/1/1990	14.0	1.0	13.0	15.97	0.02
699MW12	29-28907	538918.899	618702.388	10/14/1992	15.0	5.0	10.0	15.50	0.02
699MW15	29-33753	539404.555	618692.152	8/17/1995	13.5	3.5	10.0	15.70	0.02
699MW16	29-33757	538859.181	618896.350	8/17/1995	13.5	3.5	10.0	15.27	0.02
699RW03	29-43891	539070.639	618693.863	10/26/2000	20.0	5.0	15.0	**14.87**	0.01
699RW04	29-43892	538969.453	618694.382	10/26/2000	19.0	4.0	15.0	**15.38**	0.01
699RW05	29-56509	539121.709	618786.556	9/18/2007	15.0	4.5	10.0	13.91	0.01
699RW11	29-28031	539063.440	618770.989	5/20/1992	20.0	5.0	15.0	**13.13**	0.02
699SP-01	29-43893	539071.037	618771.324	10/25/2000	20.5	18.0	2.5	**14.89**	0.01
699SP-02	29-43894	538969.850	618771.842	10/25/2000	20.2	17.7	2.5	**14.83**	0.01
699SP-03	29-43895	539070.639	618693.864	10/25/2000	19.3	16.8	2.5	**15.47**	0.01
699SP-04	29-43896	539171.826	618693.345	10/25/2000	19.7	16.2	2.5	**15.23**	0.01
699SP-05	29-43897	539075.620	618727.660	10/25/2000	20.2	17.7	2.5	**15.19**	0.01
699SP-06	29-43898	539067.150	618696.890	10/26/2000	20.2	17.7	2.5	**15.36**	0.01
699SP-07	29-43899	539055.710	618653.480	10/26/2000	19.4	16.9	2.5	**15.70**	0.01
699SP-08	29-43900	539060.020	618612.960	10/26/2000	19.4	16.9	2.5	**15.47**	0.01
699SP-09	2900056512	539121.828	618809.794	9/18/2007	18.0	16.0	2.0	14.81	0.01
699SP-10	2900056513	539152.065	618786.400	9/19/2007	18.0	16.0	2.0	15.09	0.01
699-VP-10	2900056511	539101.472	618786.660	9/18/2007	13.0	3.0	10.0	**13.35**	0.01
699-VP-11	2900056510	539141.907	618778.706	9/18/2007	13.0	3.0	10.0	14.75	0.01
FTMM-53-MW-01	E201510+41	538906.000	618777.000	10/5/2015	15.0	5.0	10.0	15.66	0.01
FTMM-53-MW-02	E201510642	539055.000	619096.000	10/7/2015	25.0	18.0	10.0	15.43	0.01

Bolded top of casing elevations represent a mathematical adjustment between earlier NAD systems and the NAD 88 spatial system; the adjusted monitoring wells will be resurveyed. The wells were reduced 1.09 feet to reflect the changes in the NAD systems.

All missing information for monitoring wells installed prior to 2008 (e.g. well records, well permits, Form B and well abandonment forms) had been requested from NJDEP BWA in 2009. In 2009, BWA provided all documentation in their records. The information in files represents all information available to BWA at the time of the request. All wells installed after 2009, documentation is pending from driller.

TABLE 2.2
GROUNDWATER SAMPLING SUMMARY
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

	Well ID																
Date	**699MW01**	**699MW02**	**699MW03**	**699MW04**	**699MW05**	**699MW06**	**699MW08**	**699MW09**	**699MW12**	**699MW15**	**699MW16**	**699RW03**	**699RW04**	**699RW05**	**699RW11**	**616MW01**	**FTMM-53-MW01**
Oct-92	--	--	--	--	--	--	--	--	V,Pb	--	--	--	--	--	--	--	--
May-93	--	--	--	--	--	--	--	--	V,Pb	--	--	--	--	--	--	--	--
Apr-97	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Jul-97	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Oct-97	V,M	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Jan-98	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Jun-98	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Jul-98	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Dec-98	--	V,M	--	--	V,M	--	V,M	V,M	V,M	V,M	V,M	--	--	--	--	V,M	--
Mar-99	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Jun-99	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Sep-99	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Nov-99	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Mar-00	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Jun-00	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Sep-00	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Dec-00	--	V,M	--	--	V,M	--	V,M	V,M	V,M	V,M	V,M	--	--	--	--	V,M	--
Mar-01	--	V,M	--	--	V,M	--	V,M	V,M	V,M	V,M	V,M	--	--	--	--	V,M	--
Jun-01	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Aug-01	V,M	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Dec-01	--	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	--	V,M	--
Mar-02	--	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Jun-02	--	V,M	V,M	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Sep-02	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Nov-02	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Mar-03	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Jun-03	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Sep-03	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Dec-03	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Mar-04	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Jun-04	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Sep-04	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Dec-04	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Mar-05	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
May-05	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Sep-05	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Dec-05	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	--	V,M	V,M	--
Feb-06	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	--	V,M	V,M	--
Jun-06	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	--	V,M	V,M	--
Sep-06	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	--	V,M	V,M	--
Nov-06	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	--	V,M	V,M	--
Feb-07	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	--	V,M	V,M	--
May-07	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	--	V,M	V,M	--
Aug-07	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	--	V,M	V,M	--
Dec-07	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	--	V,M	V,M	--
Mar-08	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	--	V,M	V,M	--

TABLE 2.2
GROUNDWATER SAMPLING SUMMARY
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

	Well ID																
Date	**699MW01**	**699MW02**	**699MW03**	**699MW04**	**699MW05**	**699MW06**	**699MW08**	**699MW09**	**699MW12**	**699MW15**	**699MW16**	**699RW03**	**699RW04**	**699RW05**	**699RW11**	**616MW01**	**FTMM-53-MW01**
Jun-08	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	V,M	V,M	V,M	--
Sep-08	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	V,M	V,M	V,M	--
Dec-08	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	V,M	V,M	--
Mar-09	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	V,M	--
Jun-09	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	V,M	V,M	--
Aug-09	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	V,M	V,M	--
Nov-09	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	V,M	V,M	--
Mar-10	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	--	V,M	V,M	--
Jun-10	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	V,M	V,M	--
Sep-10	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	V,M	V,M	--
Dec-10	--	--	--	--	--	--	V,M	--	V,M	--	--	--	--	--	--	--	--
Jan-11	V,M	V,M	--	V,M	V,M	V,M	--	V,M	--	V,M	V,M	V,M	--	V,M	V,M	V,M	--
Mar-11	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	V,M	V,M	--
May-11	--	V,M	--	--	--	--	--	--	--	V,M	--	--	--	--	--	V,M	--
Jun-11	V,M	--	--	V,M	V,M	V,M	V,M	V,M	V,M	--	V,M	V,M	V,M	V,M	V,M	--	--
Aug-13	V	V	--	V	V	V	V	V	V	V	V	V	--	V	V	V	--
Mar-14	V	--	--	V	--	V	--	V	--	--	V	V	--	V	V	--	--
Jul-14	V	--	--	V	--	V	--	V	--	--	V	V	--	V	V	--	--
Sep-14	V	--	--	V	--	V	--	V	--	--	V	V	--	V	V	--	--
Dec-14	V	--	--	V	--	V	--	V	--	--	V	V	--	V	V	--	--
Mar-15	V	--	--	V	--	V	--	V	--	--	V	V	--	V	V	--	--
Jun-15	V	--	--	V	--	V	--	V	--	--	V	V	--	V	V	--	--
Sep-15	V	--	--	V	--	V	--	V	--	--	V	V	--	V	V	--	--
Nov-15	V	--	--	V	--	V,Pb	--	V	--	--	--	V,Pb	--	V,Pb	V,Pb	--	V,Pb

V = volatile organic compounds (VOCs) + tentatively-identified compounds (TICs)
S = semivolatile organic compounds (SVOCs) + TICs
M = metals
P = pesticides and polychlorinated biphenyls (PCBs), dash (--) = not sampled.
Pb = lead

TABLE 3.1
GROUNDWATER GAUGING DATA 2015
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Site/Well ID	Installation Date	Well Permit #	Y Coord. (North)	X Coord. (East)	Depth (ft. bgs)	Casing Length (ft)	Screen Length (ft)	TOC Elevation (ft)	Gauge Time	PID Reading (ppm)	Gauged Depth to Water (ft. TOC)	Gauged Depth to Bottom (ft. TOC)	Calculated Groundwater Elevation (ft)	Well Sampled this Event
Shallow Monitoring Wells														
FTMM-53														
616MW01	8/17/1995	29-33760	539282.81	618630.81	14.0	4.0	10.0	17.64	9:51	0.0	5.65	13.35	11.99	x
699MW01	11/2/1989	29-23677-1	539094.96	618689.92	15.0	2.0	13.0	14.48	10:36	0.0	8.35	16.49	6.13	
699MW02	11/2/1989	29-23678-9	539212.46	618724.12	17.0	2.0	15.0	15.13	10:31	0.0	7.78	16.63	7.35	
699MW03	11/2/1989	29-23679	539127.36	618797.76	15.0	1.5	13..5	15.80	10:24	0.0	5.40	12.06	10.40	
699MW04	11/2/1989	29-23680-7	539111.31	618732.39	20.0	2.0	18.0	15.03	10:03	0.0	5.78	17.34	9.25	x
699MW05	11/30/1989	29-23808	539142.50	618894.90	15.0	3.0	12.0	13.22	10:28	0.0	5.61	4.98	7.61	
699MW06	12/1/1989	29-23809-1	539071.24	618810.05	15.0	2.0	13.0	16.75	10:11	0.0	7.63	14.95	9.12	x
699MW08	12/1/1989	29-23811	539060.01	618593.22	15.0	2.0	13.0	14.88	9:42	0.0	6.15	13.25	8.73	
699MW09	5/1/1990	29-24639	538950.01	618849.41	15.0	2.0	13.0	14.70	11:01	0.0	5.91	12.15	8.79	x
699MW12	10/14/1992	29-28907	538918.90	618702.39	15.0	5.0	10.0	15.50	10:45	0.0	6.55	14.80	8.95	
699MW15	8/17/1995	29-33753	539404.56	618692.15	13.5	3.5	10.0	15.70	10:38	0.0	5.22	13.95	10.48	
699MW16	8/17/1995	29-33757	538859.18	618896.35	13.5	3.5	10.0	15.27	10:56	0.0	8.85	14.09	6.42	x
699RW03	10/26/2000	29-43891	539070.64	618693.86	20.0	5.0	15.0	14.87	9:54	0.0	5.74	17.70	9.13	x
699RW04	10/26/2000	29-43892	538969.45	618694.38	19.0	4.0	15.0	15.38	10:49	0.0	6.47	15.03	8.91	
699RW05	9/18/2007	29-56509	539121.71	618786.56	15.0	4.5	10.0	13.91	10:15	0.0	4.68	12.30	9.23	x
699RW11	5/20/1992	29-28031	539063.44	618770.99	20.0	5.0	15.0	13.13	10:07	0.0	6.03	17.00	7.10	x
FTMM-53-MW01	10/5/2015	E201510+41	538906.000	618777.000	15.00	5.00	10.00	15.03	11:28	0.0	6.26	15.20	8.77	
FTMM-68 (Guaging data used for Figure 3.2)														
FTMM-53-MW02	10/7/2015	E201510642	539055	619096	25.0	15.0	10.0	15.43	12:59	0.0	7.87	24.2	7.56	
FTMM-68-MW02	10/6/2015	E201510650	539176	619392	25.0	18.0	10.0	14.28	12:43	0.0	7.74	28.43	6.54	
FTMM-68-MW03	10/6/2015	E201510651	539100	619444	25.0	15.0	10.0	14.33	12:55	0.0	8.00	25.27	6.33	
FTMM-68-MW04	10/5/2015	E201510652	538941	619412	25.0	18.0	10.0	14.12	12:58	0.0	7.70	28.35	6.42	

Notes:
1) The synoptic round of water levels in the wells was collected on November 16, 2015.
2) Information on well permit number, X and Y coordinates, depth, screen length, screen interval and TOC elevation were provided by FTMM in a table 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) ppm = parts per million (of VOCs)
8) TOC = Top of Casing
9) Elevation = feet above mean sea level
10) N/A = information not available

TABLE 4.1
SOIL SAMPLING SUMMARY OF RESULTS - HISTORICAL DATA -
COMPARISON TO NJDEP CRITERIA
SITE FTMM-53 BUILDING 699
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Residential Direct Contact SRS	NJ Non-Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	C92-1009	C92-1010	C92-1011	SP1	SP2	SP3	SP4	SP5	PS-1	PS-2
Sample ID				C92-1009	C92-1010	C92-1011	B699-SP1	B699-SP2	B699-SP3	B699-SP4	B699-SP5	PS-1 3.5-4.0	PS-2 3.0-3.5
Sample Date				10/14/1992	10/14/1992	10/14/1992	1/6/1992	1/6/1992	1/6/1992	1/6/1992	1/6/1992	9/29/1999	9/29/1999
Volatile Organic Compounds (mg/kg)													
1,1,2-Trichloroethane	2	6	0.02	NA	NA	NA	**0.13**	**0.11**	**0.17**	**0.12**	**0.15**	NA	NA
2-Chloroethylvinylether	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	**16**	**15**
Acetone	70,000	NLE	19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	2	5	0.005	NA	NA	NA	NA	NA	NA	NA	NA	**36**	**35 D**
Ethyl benzene	7,800	110,000	13	NA	NA	NA	NA	NA	NA	NA	NA	**200**	**240 D**
Meta/Para Xylene	NLE	NLE	NLE	NA	NA	NA	ND	ND	ND	ND	**0.16 J**	NA	NA
Methylene chloride	46	230	0.01	NA	NA	NA	**0.094**	**0.068**	**0.14**	**0.13**	**0.13**	NA	NA
Ortho Xylene	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	6,300	91,000	7	NA	NA	NA	NA	NA	NA	NA	NA	**310**	**310 D**
Total Xylenes	12,000	170,000	19	NA	NA	NA	NA	NA	NA	NA	NA	**1,280**	**1,530 D**
Semivolatile Organic Compounds (mg/kg)													
2-Chlorophenol	310	2,200	0.8	NA	NA	NA	**0.64 J**	**0.57 J**	ND	ND	ND	NA	NA
2-Methylnaphthalene	230	2,400	8	NA	NA	NA	ND	**0.38 J**	ND	ND	ND	NA	NA
4-Chloro-3-methylphenol	NLE	NLE	NLE	NA	NA	NA	**0.59 J**	**0.84 J**	ND	ND	ND	NA	NA
Acenaphthene	3,400	37,000	110	NA	NA	NA	ND	**0.38 J**	ND	ND	ND	NA	NA
Anthracene	17,000	30,000	2,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	35	140	1,200	NA	NA	NA	**2.6 JB**	**2.3 JB**	**2.9 JB**	**0.24 JB**	**0.23 JB**	NA	NA
Di-n-butylphthalate	6,100	68,000	760	NA	NA	NA	**0.95 JB**	**1.2 JB**	ND	**0.88 JB**	**0.054 JB**	NA	NA
Fluoranthene	2,300	24,000	1,300	NA	NA	NA	ND	ND	ND	ND	**0.16 J**	NA	NA
Fluorene	2,300	24,000	170	NA	NA	NA	ND	ND	**0.38 J**	ND	ND	NA	NA
Naphthalene	6	17	25	NA	NA	NA	ND	ND	**1.7 J**	ND	ND	NA	NA
Phenanthrene	NLE	300,000	NLE	NA	NA	NA	ND	**0.21 J**	**0.84 J**	ND	ND	NA	NA
Phenol	18,000	210,000	8	NA	NA	NA	ND	**21**	ND	ND	ND	NA	NA
Pyrene	1,700	18,000	840	NA	NA	NA	**0.62 J**	**0.79 J**	**1.3 J**	ND	ND	NA	NA
Total Petroleum Hydrocarbons (mg/kg)													
Total Petroleum Hydrocarbons	NLE	NLE	NLE	**22**	**3,095**	ND	**6,090**	**11,600**	**2,800**	ND	**15**	NA	NA
PCBs (mg/kg) (No Detects)													
Inorganics (mg/kg)													
Arsenic	19	19	19	NA	NA	NA	ND	**2.3**	ND	ND	ND	NA	NA
Beryllium	16	140	0.7	NA	NA	NA	**0.187**	**0.423**	**0.108**	**0.19**	**0.31**	NA	NA
Cadmium	78	78	2	NA	NA	NA	**0.01**	**0.02**	**0.04**	**0.02**	**0.04**	NA	NA
Chromium	NLE	NLE	NLE	NA	NA	NA	**21.7**	**32.7**	< 12.5	**16.7**	**27.4**	NA	NA
Copper	3,100	45,000	11,000	NA	NA	NA	**6**	**8.3**	**7.6**	**4.6**	**7.7**	NA	NA
Lead	400	800	90	NA	NA	NA	**12**	**332.7**	**18.4**	**4.6**	**9.5**	ND	ND
Nickel	1,600	23,000	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	390	5,700	11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	23,000	110,000	930	NA	NA	NA	**15.1**	**62.5**	**18.4**	**14.4**	**30.4**	NA	NA

TABLE 4.1
SOIL SAMPLING SUMMARY OF RESULTS - HISTORICAL DATA -
COMPARISON TO NJDEP CRITERIA
SITE FTMM-53 BUILDING 699
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Residential Direct Contact SRS	NJ Non-Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	PS-3		PS-4	PS-5	PS-6		PS-7	PS-8	
Sample ID				PS-3 2.5-3.0	PS-3 Duplicate	PS-4 2.5-3.0	PS-5 3.0-3.5	PS-6 3.0-3.5	PS-6 Duplicate	PS-7 2.5-3.0	PS-8 1.5-2.0	PS-8 Duplicate
Sample Date				9/29/1999	9/29/1999	9/29/1999	9/30/1999	9/30/1999	9/30/1999	10/4/1999	10/4/1999	10/4/1999
Volatile Organic Compounds (mg/kg)												
1,1,2-Trichloroethane	2	6	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloroethylvinylether	NLE	NLE	NLE	ND	ND	**3**	NA	NA	NA	NA	NA	NA
Acetone	70,000	NLE	19	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	2	5	0.005	**0.85**	ND	**7.1**	**3**	**2.7**	**2.3**	**7.5**	**3.7**	**4.3**
Ethyl benzene	7,800	110,000	13	**2.5 D**	**2.5**	**150 D**	**97 D**	**120 D**	**130 D**	**260**	**50**	**57**
Meta/Para Xylene	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	46	230	0.01	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ortho Xylene	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	6,300	91,000	7	**13**	**2.5**	**80 D**	**1.5**	**1.6**	**1.8**	**29**	**62**	**63**
Total Xylenes	12,000	170,000	19	**16.2**	**11.7**	**580 D**	**466 D**	**532 D**	**570 D**	**1,030 D**	**354**	**410**
Semivolatile Organic Compounds (mg/kg)												
2-Chlorophenol	310	2,200	0.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	230	2,400	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,400	37,000	110	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
Bis(2-Ethylhexyl)phthalate	35	140	1,200	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
Fluoranthene	2,300	24,000	1,300	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	2,300	24,000	170	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	6	17	25	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NLE	300,000	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	18,000	210,000	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,700	18,000	840	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
PCBs (mg/kg) (No Detects)												
Inorganics (mg/kg)												
Arsenic	19	19	19	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	16	140	0.7	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	78	78	2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	3,100	45,000	11,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	800	90	ND	ND	ND	ND	**19.02**	ND	ND	**37.17**	**33.43**
Nickel	1,600	23,000	48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	390	5,700	11	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	23,000	110,000	930	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 4.1
SOIL SAMPLING SUMMARY OF RESULTS - HISTORICAL DATA -
COMPARISON TO NJDEP CRITERIA
SITE FTMM-53 BUILDING 699
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Residential Direct Contact SRS	NJ Non-Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	PS-9	699A-A	699A-B	699A-C	699A-D	699A-DUPA	699A-E	699A-F	699A-G	699A-H
Sample ID				PS-9 1.5-2.0	699A-A	699A-B	699A-C	699A-D	699A-DUPA	699A-E	699A-F	699A-G	699A-H
Sample Date				10/4/1999	6/10/1998	6/10/1998	6/10/1998	6/10/1998	6/10/1998	6/10/1998	6/10/1998	6/10/1998	6/10/1998
Volatile Organic Compounds (mg/kg)													
1,1,2-Trichloroethane	2	6	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloroethylvinylether	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	70,000	NLE	19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	2	5	0.005	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl benzene	7,800	110,000	13	**32**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Meta/Para Xylene	NLE	NLE	NLE	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	NA
Ortho Xylene	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	6,300	91,000	7	**3.9**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Xylenes	12,000	170,000	19	**205**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds (mg/kg)													
2-Chlorophenol	310	2,200	0.8	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
4-Chloro-3-methylphenol	NLE	NLE	NLE	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
Anthracene	17,000	30,000	2,400	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
Di-n-butylphthalate	6,100	68,000	760	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
Fluorene	2,300	24,000	170	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	6	17	25	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
Phenol	18,000	210,000	8	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
Total Petroleum Hydrocarbons (mg/kg)													
Total Petroleum Hydrocarbons	NLE	NLE	NLE	NA	< 184	< 181	< 191	< 162	< 181	< 180	< 175	< 172	**346.04**
PCBs (mg/kg) (No Detects)													
Inorganics (mg/kg)													
Arsenic	19	19	19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	16	140	0.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	78	78	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	3,100	45,000	11,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	800	90	**25.98**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	1,600	23,000	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	390	5,700	11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	23,000	110,000	930	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 4.1
SOIL SAMPLING SUMMARY OF RESULTS - HISTORICAL DATA -
COMPARISON TO NJDEP CRITERIA
SITE FTMM-53 BUILDING 699
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Residential Direct Contact SRS	NJ Non-Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	699WO-A-North End	699WO-B-South End		699WO-C Piping	699 Excv Bottom
Sample ID				699WO-A-North End 6.5-7ft.	699WO-B-South End 6.5-7ft.	699WO-D Duplicate	699WO-C Piping 1.5-2ft.	699I-Bottom 9.5-10.0
Sample Date				10/17/2000	10/17/2000	10/17/2000	10/17/2000	9/1/1999
Volatile Organic Compounds (mg/kg)								
1,1,2-Trichloroethane	2	6	0.02	NA	NA	NA	NA	NA
2-Chloroethylvinylether	NLE	NLE	NLE	NA	NA	NA	NA	NA
Acetone	70,000	NLE	19	**2.4**	NA	NA	NA	NA
Benzene	2	5	0.005	**14**	NA	NA	NA	**0.53**
Ethyl benzene	7,800	110,000	13	**47 D**	NA	NA	NA	**2.1**
Meta/Para Xylene	NLE	NLE	NLE	**150 D**	NA	NA	NA	NA
Methylene chloride	46	230	0.01	NA	NA	NA	NA	NA
Ortho Xylene	NLE	NLE	NLE	**69 D**	NA	NA	NA	NA
Toluene	6,300	91,000	7	**15 D**	NA	NA	NA	**3.3**
Total Xylenes	12,000	170,000	19	NA	NA	NA	NA	**9.4**
Semivolatile Organic Compounds (mg/kg)								
2-Chlorophenol	310	2,200	0.8	NA	NA	NA	NA	NA
2-Methylnaphthalene	230	2,400	8	**16 D**	NA	NA	NA	NA
4-Chloro-3-methylphenol	NLE	NLE	NLE	NA	NA	NA	NA	NA
Acenaphthene	3,400	37,000	110	**0.28 J**	NA	NA	NA	NA
Anthracene	17,000	30,000	2,400	**0.28 J**	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	35	140	1,200	**0.18 J**	NA	NA	NA	NA
Di-n-butylphthalate	6,100	68,000	760	NA	NA	NA	NA	NA
Fluoranthene	2,300	24,000	1,300	NA	NA	NA	NA	NA
Fluorene	2,300	24,000	170	**0.62 J**	NA	NA	NA	NA
Naphthalene	6	17	25	**18 D**	NA	NA	NA	NA
Phenanthrene	NLE	300,000	NLE	**1.4**	NA	NA	NA	NA
Phenol	18,000	210,000	8	NA	NA	NA	NA	NA
Pyrene	1,700	18,000	840	**0.17 J**	NA	NA	NA	NA
Total Petroleum Hydrocarbons (mg/kg)								
Total Petroleum Hydrocarbons	NLE	NLE	NLE	**4,194**	**879.79**	**1,043**	< 260	NA
PCBs (mg/kg) (No Detects)								
Inorganics (mg/kg)								
Arsenic	19	19	19	**2.61**	NA	NA	NA	NA
Beryllium	16	140	0.7	**0.502**	NA	NA	NA	NA
Cadmium	78	78	2	< 0.119	NA	NA	NA	NA
Chromium	NLE	NLE	NLE	**47.2**	NA	NA	NA	NA
Copper	3,100	45,000	11,000	**4.09**	NA	NA	NA	NA
Lead	400	800	90	**8.56**	NA	NA	NA	ND
Nickel	1,600	23,000	48	**4.14**	NA	NA	NA	NA
Selenium	390	5,700	11	**0.731**	NA	NA	NA	NA
Zinc	23,000	110,000	930	**19.9**	NA	NA	NA	NA

TABLE 4.1
SOIL SAMPLING SUMMARY OF RESULTS - HISTORICAL DATA -
COMPARISON TO NJDEP CRITERIA
SITE FTMM-53 BUILDING 699
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Residential Direct Contact SRS	NJ Non-Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	699 Excv East Wall-North	699 Excv East Wall-South	699 Excv North Wall-East	699 Excv North Wall-West	699 Excv South Wall-East
Sample ID				699H-East Wall 8.0-8.5 N	699G-East Wall 8.0-8.5 S	699A-North Wall 8.0-8.5 E	699B-North Wall 8.0-8.5 W	699F-South Wall 8.0-8.5 E
Sample Date				9/1/1999	9/1/1999	9/1/1999	9/1/1999	9/1/1999
Volatile Organic Compounds (mg/kg)								
1,1,2-Trichloroethane	2	6	0.02	NA	NA	NA	NA	NA
2-Chloroethylvinylether	NLE	NLE	NLE	NA	NA	NA	NA	NA
Acetone	70,000	NLE	19	NA	NA	NA	NA	NA
Benzene	2	5	0.005	**24 D**	**9**	**18**	**8.2**	ND
Ethyl benzene	7,800	110,000	13	**74 D**	**82 D**	**30**	**30 D**	**0.22 J**
Meta/Para Xylene	NLE	NLE	NLE	NA	NA	NA	NA	NA
Methylene chloride	46	230	0.01	NA	NA	NA	NA	NA
Ortho Xylene	NLE	NLE	NLE	NA	NA	NA	NA	NA
Toluene	6,300	91,000	7	**160 D**	**8.7**	**54 D**	**89 D**	**0.4**
Total Xylenes	12,000	170,000	19	**390 D**	**241 D**	**96 D**	**213 D**	**1.53 J**
Semivolatile Organic Compounds (mg/kg)								
2-Chlorophenol	310	2,200	0.8	NA	NA	NA	NA	NA
2-Methylnaphthalene	230	2,400	8	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NLE	NLE	NLE	NA	NA	NA	NA	NA
Acenaphthene	3,400	37,000	110	NA	NA	NA	NA	NA
Anthracene	17,000	30,000	2,400	NA	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	35	140	1,200	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,100	68,000	760	NA	NA	NA	NA	NA
Fluoranthene	2,300	24,000	1,300	NA	NA	NA	NA	NA
Fluorene	2,300	24,000	170	NA	NA	NA	NA	NA
Naphthalene	6	17	25	NA	NA	NA	NA	NA
Phenanthrene	NLE	300,000	NLE	NA	NA	NA	NA	NA
Phenol	18,000	210,000	8	NA	NA	NA	NA	NA
Pyrene	1,700	18,000	840	NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons (mg/kg)								
Total Petroleum Hydrocarbons	NLE	NLE	NLE	NA	NA	NA	NA	NA
PCBs (mg/kg) (No Detects)								
Inorganics (mg/kg)								
Arsenic	19	19	19	NA	NA	NA	NA	NA
Beryllium	16	140	0.7	NA	NA	NA	NA	NA
Cadmium	78	78	2	NA	NA	NA	NA	NA
Chromium	NLE	NLE	NLE	NA	NA	NA	NA	NA
Copper	3,100	45,000	11,000	NA	NA	NA	NA	NA
Lead	400	800	90	ND	ND	ND	ND	ND
Nickel	1,600	23,000	48	NA	NA	NA	NA	NA
Selenium	390	5,700	11	NA	NA	NA	NA	NA
Zinc	23,000	110,000	930	NA	NA	NA	NA	NA

TABLE 4.1
SOIL SAMPLING SUMMARY OF RESULTS - HISTORICAL DATA -
COMPARISON TO NJDEP CRITERIA
SITE FTMM-53 BUILDING 699
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Residential Direct Contact SRS	NJ Non-Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	699 Excv South Wall-West	699 Excv West Wall-North	699 Excv West Wall-South	
Sample ID				699E-South Wall 8.0-8.5 W	699C-West Wall 8.0-8.5 N	699D Dup	699D-West Wall 8.0-8.5 S
Sample Date				9/1/1999	9/1/1999	9/1/1999	9/1/1999
Volatile Organic Compounds (mg/kg)							
1,1,2-Trichloroethane	2	6	0.02	NA	NA	NA	NA
2-Chloroethylvinylether	NLE	NLE	NLE	NA	NA	NA	NA
Acetone	70,000	NLE	19	NA	NA	NA	NA
Benzene	2	5	0.005	ND	**6.6**	**0.37**	**0.29**
Ethyl benzene	7,800	110,000	13	**1.2**	**83 D**	**26**	**18**
Meta/Para Xylene	NLE	NLE	NLE	NA	NA	NA	NA
Methylene chloride	46	230	0.01	NA	NA	NA	NA
Ortho Xylene	NLE	NLE	NLE	NA	NA	NA	NA
Toluene	6,300	91,000	7	**2.1**	**240 D**	**21 D**	**22 D**
Total Xylenes	12,000	170,000	19	**7.6**	**510 D**	**167 D**	**60 D**
Semivolatile Organic Compounds (mg/kg)							
2-Chlorophenol	310	2,200	0.8	NA	NA	NA	NA
2-Methylnaphthalene	230	2,400	8	NA	NA	NA	NA
4-Chloro-3-methylphenol	NLE	NLE	NLE	NA	NA	NA	NA
Acenaphthene	3,400	37,000	110	NA	NA	NA	NA
Anthracene	17,000	30,000	2,400	NA	NA	NA	NA
Bis(2-Ethylhexyl)phthalate	35	140	1,200	NA	NA	NA	NA
Di-n-butylphthalate	6,100	68,000	760	NA	NA	NA	NA
Fluoranthene	2,300	24,000	1,300	NA	NA	NA	NA
Fluorene	2,300	24,000	170	NA	NA	NA	NA
Naphthalene	6	17	25	NA	NA	NA	NA
Phenanthrene	NLE	300,000	NLE	NA	NA	NA	NA
Phenol	18,000	210,000	8	NA	NA	NA	NA
Pyrene	1,700	18,000	840	NA	NA	NA	NA
Total Petroleum Hydrocarbons (mg/kg)							
Total Petroleum Hydrocarbons	NLE	NLE	NLE	NA	NA	NA	NA
PCBs (mg/kg) (No Detects)							
Inorganics (mg/kg)							
Arsenic	19	19	19	NA	NA	NA	NA
Beryllium	16	140	0.7	NA	NA	NA	NA
Cadmium	78	78	2	NA	NA	NA	NA
Chromium	NLE	NLE	NLE	NA	NA	NA	NA
Copper	3,100	45,000	11,000	NA	NA	NA	NA
Lead	400	800	90	ND	ND	ND	ND
Nickel	1,600	23,000	48	NA	NA	NA	NA
Selenium	390	5,700	11	NA	NA	NA	NA
Zinc	23,000	110,000	930	NA	NA	NA	NA

TABLE 4.1
SOIL SAMPLING SUMMARY OF RESULTS - HISTORICAL DATA - COMPARISON TO NJDEP CRITERIA
SITE FTMM-53 BUILDING 699
FORT MONMOUTH, NEW JERSEY

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 detection

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

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

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

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

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

E (or ER) = Estimated result.

R = Rejected, data validation rejected the results.

D = Results from dilution of sample.

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

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

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

JN = Tentatively identified compound, estimated concentration.

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

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

a) DELETE THIS NOTE BEFORE GOING FINAL: Refer to the NJDEP Protocol for Addressing Extractable Petroleum Hydrocarbons (Version 5.0, August 9, 2010) and the NJDEP Health Based end Ecological Screening Criteria for Petroleum Hydrocarbons (Version 4.0, August 9, 2010) to determine the category of tank being investigated and the appropriate cleanup standards or screening levels for that category of tank.

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

TABLE 4.2
SUMMARY OF VERSAR (2000) SOIL ANALYTICAL RESULTS FOR BENZENE AND XYLENE
AT BORINGS WITH DETECTIONS ABOVE NJDEP SOIL CLEANUP CRITERIA
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

BENZENE (mg/kg)

Boring No.	1	2	3	5	7	8	9	10	11	13	14	15	16	18	19	20	21	22	46	47	48
Depth																					
6-12"	ND	ND	ND	ND	ND	**5.9**	ND	ND	ND	**5.2**	ND	ND	1.5	ND	ND	ND	ND	ND	**3.9**	**3.7**	1.2
18-24"	0.66	1.1	ND	ND	ND	**14**	ND	ND	ND	**6.5**	ND	ND	0.35	**4.4**	ND	ND	ND	ND	**3**	**3.3**	1.1
30-36"	**9.4**	**3.4**	ND	ND	**39**	**35**	ND	ND	**7.6**	**77**	ND	**14**	1.1	ND	**19**	**26**	**22**	**17**	**19**	ND	0.86
42-48"	**7.4**	**9.4**	**60**	ND	**14**	**34**	ND	ND	**7.8**	**35**	**13**	**17**	ND	ND	**16**	**55**	**25**	ND	**30**	**23**	1.5
54-60"	**18**	**49**	**220**	ND	**20**	**110**	**14**	ND	**9.9**	**64**	ND	**84**	**9.2**	ND	**30**	**41**	**25**	**2.3J**	**49**	**30**	**5.2**
66-72"	**11**	**54**	**43**	ND	**3**	**230**	**6.1**	ND	ND	**44**	**7.5**	ND	**51**	ND	**16**	**21**	**100**	ND	**28**	**69**	**110**
78-84"	**8.2**	**63**	**25**	ND	**6.5**	**54**	**12**	ND	ND	**24**	**12**	**34**	**18**	ND	**38**	**46**	**15**	ND	**48**	**13**	0.67
90-96"	**2.2**	**15**	**3.3**	ND	**12**	**17**	ND	ND	ND	**11**	**7.6**	**16**	**61**	ND	ND	**44**	**6.3**	ND	**41**	**21**	1.5
102-108"	ND	**46**	**18**	ND	ND	ND	**15**	ND	ND	**47**	**11**	**9.5**	**43**	ND	**13**	**81**	**38**	ND	**48**	**15**	**150**
114-120"	ND	**15**	**11**	ND	ND	ND	**21**	ND	ND	**54**	**9.5**	**14**	**110**	ND	**25**	**58**	ND	ND	**31**	**36**	**590**
126-132"	ND	**4.2**	**6.5**	ND	ND	ND	**12**	0.78	ND	**15**	**13**	ND	**8.9**	ND	**13**	**140**	ND	ND	**67**	**33**	**200**
138-144"	0.38	1.1	**3.7**	ND	ND	ND	ND	**6.9**	ND	**10**	**11**	ND	ND	ND	ND	ND	ND	ND	**18**	**3.6**	**260**

Note: Current (September 2017) NJDEP Residential Direct Contact Soil Remediation Standard for Benzene = 2 mg/kg

XYLENE (mg/kg)

Boring No.	1	2	3	5	7	8	9	10	11	13	14	15	16	18	19	20	21	22	46	47	48
Depth																					
6-12"	ND	ND	0.35J	6.2J	ND	323	8.8J	NA	16J	24	ND	16J	1.5	ND	5J	ND	16J	ND	17.8	22.1	8.62
18-24"	0.66J	0.36J	0.38J	202	ND	127	13J	NA	47	35	ND	ND	0.67J	70	27.4	ND	204	36.3	7	10.8	4.73
30-36"	262	1.76	8.9	**730**	**850**	360	10J	NA	**920**	**880**	ND	**680**	8.72	ND	**670**	**490**	**1420**	**1070**	262	9.5J	2.57
42-48"	360	198	**1610**	**1030**	380	**450**	85	NA	**810**	**470**	**1390**	**840**	210	ND	**600**	**1060**	**1970**	271	400	400	5.8
54-60"	**680**	**460**	**3890E**	257	**690**	**750**	302	NA	**900**	**780**	**860**	**3590E**	339	ND	**850**	**800**	**1330**	12J	**510**	**590**	173
66-72"	360	348	**410**	**243**	155	**1670**	72	NA	116	**540**	**610**	16J	**2300**	ND	400	340	**5200E**	12J	360	**1490**	**2870**
78-84"	222	360	285	**880E**	**460**	350	119	NA	267	294	289	**1390**	**690**	6.7J	**730**	**750**	**880**	ND	**640**	225	33.1
90-96"	62	41	5.4J	67	**820**	**1100**	ND	NA	ND	96	38	**620**	**1020**	ND	80	**730**	364	77	**560**	370	50
102-108"	3.65	329	184	230	140	ND	180	NA	400	**580**	**1170**	355	**840**	14	207	**1370**	**2410**	96	**640**	358	**1780**
114-120"	0.65J	40	76	150	**700**	ND	263	NA	330	**750**	**480**	**550**	**1640**	64.8	**460**	**960**	116	ND	303	**550**	**6900**
126-132"	0.56J	8.7	21	95	**1190**	ND	98	ND	329	167	47	72	63	6.6J	208	**2480**	ND	ND	**870**	**440**	**2990**
138-144"	ND	1.47	3.4J	2.06J	208	19J	ND	132	ND	114	40	ND	ND	ND	32.9J	16J	ND	ND	183	6.4	**1340**

Note: Current (September 2017) NJDEP Residential Direct Contact Soil Remediation Standard for Xylene = 12,000 mg/kg Source: Versar, 2000b

KEY:
- Detection above the Residential Direct Contact Soil Cleanup Criterion then-current as of 2000 (benzene=3 mg/kg, xylene = 410 mg/kg).
- Target depth for enzyme-enhanced bioremediation (EEB) application
- Selected boring locations for EEB application

mg/kg = milligrams per kilogram.
E or J = estimated value.
ND = not detected; NA = not analyzed.

TABLE 4.3
VERSAR 2000 AND 2001 SOIL ANALYTICAL RESULTS COMPARISONS BY BORING
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Boring	Depth	Benzene		Ethylbenzene		Toluene		Total Xylenes		TPHC	
RDCSRS (mg/kg)		2		7,800		6,300		12,000		-- (see notes)	
Date		2000	2001	2000	2001	2000	2001	2000	2001	2000	2001
1	6-12"	U	U	U	U	U	11	U	16	U	U
1	18-24"	1	U	0	U	0	U	1	U	U	U
1	30-36"	**9**	U	40	15	120	37	262	91	220	1,818
1	42-48"	**7**	**11**	54	99	140	200	360	610	1,131	1,879
1	54-60"	**18**	U	100	35	300	80	680	224	U	945
1	66-72"	**11**	U	55	18	170	41	360	108	774	U
2	6-12"	U	U	U	U	U	U	U	U	797	U
2	18-24"	1	U	U	U	1	7	0	U	768	U
2	30-36"	**3**	**37**	0	76	4	300	2	480	470	U
2	42-48"	**9**	**26**	31	28	100	140	198	170	901	589
2	54-60"	**49**	**45**	77	58	280	260	460	360	201	300
2	66-72"	**54**	**34**	58	47	240	210	348	280	442	282
3	6-12"	U	U	U	U	U	U	0	U	338	U
3	18-24"	U	U	U	U	U	U	4	U	U	U
3	30-36"	U	U	14	U	25	U	89	U	200	U
3	42-48"	**60**	**17**	190	74	690	170	1,610	400	855	1,351
3	54-60"	**220**	**12**	630	57	1,900	130	3,890	322	1,016	604
3	66-72"	**43**	**17**	76	51	260	110	410	279	1,831	371
5	6-12"	U	U	U	U	U	U	6	U	352	U
5	18-24"	U	U	32	U	13	U	202	U	248	U
5	30-36"	U	U	110	U	53	U	730	U	1,366	U
5	42-48"	U	U	190	100	100	24	1,030	800	4,530	1,537
5	54-60"	U	U	39	80	22	29	257	610	1,314	1,370
5	66-72"	U	U	38	100	23	61	243	620	852	1,555
7*	6-12"	U	U	U	U	U	U	U	U	U	U
7*	18-24"	U	U	U	U	U	U	U	U	187	U
7*	30-36"	**39**	U	170	U	350	U	850	U	1,450	215
7*	42-48"	**14**	**8**	62	130	180	200	380	800	682	2,901
7*	54-60"	**20**	U	120	65	270	87	690	390	927	1,631
7*	66-72"	**3**	U	26	71	60	100	155	410	425	1,718
8*	6-12"	**6**	U	6	U	22	18	323	30	U	U
8*	18-24"	**14**	U	23	U	71	U	127	U	211	U
8*	30-36"	**35**	**26**	63	51	190	170	360	290	812	2,103
8*	42-48"	**34**	**48**	76	110	240	360	450	630	300	1,569
8*	54-60"	**110**	**16**	180	31	450	120	750	179	327	673
8*	66-72"	**230**	**6**	290	U	740	14	1,670	10	221	258
9	6-12"	U	U	U	6	U	U	9	19	U	179
9	18-24"	U	U	U	7	U	9	13	38	U	U
9	30-36"	U	**8**	U	78	U	95	10	397	U	320
9	42-48"	U	U	16	33	23	50	85	176	U	180
9	54-60"	**14**	**14**	57	60	120	130	302	318	541	722
9	66-72"	**6**	**13**	13	32	36	96	72	169	U	565
11	6-12"	U	U	U	31	U	48	16	550	U	919
11	18-24"	U	U	8	48	U	50	47	460	173	1,200
11	30-36"	**8**	U	160	50	95	54	920	312	417	2,226
11	42-48"	**8**	U	140	68	110	67	810	389	5,067	1,041
11	54-60"	**10**	U	160	8	140	10	900	45	1,173	1,235
11	66-72"	U	U	20	59	17	77	116	343	888	1,057
13*	6-12"	**5**	**19**	6	16	U	8	24	74	177	U
13*	18-24"	**7**	**7**	6	7	15	17	35	41	188	1,325
13*	30-36"	**77**	**36**	150	74	1,100	240	880	450	1,666	3,038
13*	42-48"	**35**	**50**	79	110	260	370	470	690	1,071	4,135
13*	54-60"	**64**	**100**	130	260	400	850	780	1,560	213	1,745
13*	66-72"	**44**	**28**	92	85	310	260	540	540	1,985	1,209
14*	6-12"	U	U	U	21	U	46	U	106	406	U
14*	18-24"	U	**22**	U	150	U	340	U	840	U	2,831
14*	30-36"	U	**29**	U	210	U	480	U	1,100	676	2,608
14*	42-48"	**13**	**37**	240	210	270	520	1,390	1,110	3,490	277
14*	54-60"	U	**19**	140	61	140	190	860	324	1,222	323
14*	66-72"	**8**	**38**	100	130	110	340	610	670	1,050	U
15*	6-12"	U	U	U	U	U	U	16	U	U	1,550

TABLE 4.3
VERSAR 2000 AND 2001 SOIL ANALYTICAL RESULTS COMPARISONS BY BORING
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Boring	Depth	Benzene		Ethylbenzene		Toluene		Total Xylenes		TPHC	
RDCSRS (mg/kg)		2		7,800		6,300		12,000		-- (see notes)	
Date		2000	2001	2000	2001	2000	2001	2000	2001	2000	2001
15*	18-24"	U	0	U	1	U	1	U	7	U	549
15*	30-36"	**14**	3	130	13	200	21	680	74	522	411
15*	42-48"	**17**	29	160	230	280	420	840	1,180	571	3,793
15*	54-60"	**84**	17	690	140	1,300	270	3,590	690	6,958	1,770
15*	66-72"	U	57	U	400	12	750	16	1,970	2,750	3,928
19	6-12"	U	U	3	4	U	5	5	5	409	U
19	18-24"	U	U	6	14	9	19	27	73	1,494	1,467
19	30-36"	**19**	3	130	20	190	31	670	101	1,268	1,086
19	42-48"	**16**	4	120	21	190	38	600	106	2,889	1,597
19	54-60"	**30**	2	170	10	310	22	850	53	3,892	250
19	66-72"	**16**	U	77	U	170	3	400	U	1,406	U
20	6-12"	U	U	U	U	U	U	U	4	533	U
20	18-24"	U	U	U	U	U	U	U	U	454	U
20	30-36"	**26**	U	98	U	180	U	490	3	555	U
20	42-48"	**55**	U	210	U	410	U	1,060	3	1,073	U
20	54-60"	**41**	U	160	7	320	10	800	342	375	506
20	66-72"	**21**	4	66	35	160	45	340	158	1,108	1,122
21	6-12"	U	6	U	10	U	U	16	27	199	261
21	18-24"	U	U	44	28	34	24	204	125	258	658
21	30-36"	**22**	U	310	38	300	34	1,420	174	865	2,091
21	42-48"	**25**	U	380	43	380	39	1,970	200	1,536	3,543
21	54-60"	**25**	6	430	71	410	85	1,330	321	3,205	710
21	66-72"	**100**	2	1,100	30	1,400	38	5,200	136	8,740	1,366
46	6-12"	**4**	2	3	5	14	14	18	31	U	U
46	18-24"	**3**	0	U	0	8	2	7	1	U	U
46	30-36"	**19**	33	42	91	160	250	262	420	938	2,077
46	42-48"	**30**	20	63	40	240	140	400	255	1,785	670
46	54-60"	**49**	18	120	37	340	140	510	240	238	709
46	66-72"	**28**	12	59	31	240	120	360	196	684	735
47	6-12"	**4**	0	4	U	15	0	22	0	U	U
47	18-24"	**3**	5	U	6	8	29	11	32	U	188
47	30-36"	U	23	U	61	6	150	4	340	U	2,404
47	42-48"	**23**	47	60	120	210	220	400	570	1,089	5,613
47	54-60"	**30**	45	86	99	290	210	590	500	1,328	2,765
47	66-72"	**69**	47	230	97	800	200	1,490	480	1,759	971
48	6-12"	1	0	2	1	2	1	9	3	U	U
48	18-24"	1	0	1	0	1	0	5	1	U	U
48	30-36"	1	3	1	74	1	67	3	370	U	1,464
48	42-48"	2	1	1	54	2	56	6	294	U	2,382
48	54-60"	**5**	1	29	2	56	4	173	9	10,534	U
48	66-72"	**110**	2	490	5	990	9	2,870	25	326	U
Total Number* of RDCSRS Exceedances:		Benzene		Ethylbenzene		Toluene		Total Xylenes		TPHC	
		60	45	0	0	0	0	0	0	1	0

Source: Versar, 2002

Notes
The Residential Direct Contact Soil Remediation Standard (RDCSRS) refers to the NJDEP's September 2017 Remediation Standards.
*Borings 7, 8, 13, 14, and 15 were repositioned between 2000 and 2001.
-- = There is no single TPHC criterion for this site given the variety of petroleum substances historically stored and used (i.e., gasoline, #2 fuel oil, waste oil).
U = Not detected.
All results in milligrams per kilogram (mg/kg).
Bold and shaded: exceeds RDCSRS.
Decrease in concentration between 2000 and 2001 analytical result.
Increase in concentration between 2000 and 2001 analytical result.

TABLE 4.4
SOIL SAMPLING SUMMARY OF HISTORICAL EXCEEDANCES (1992-2001)
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Analyte	Maximum Detected Concentration		Location of Maximum Concentration	Number of Samples	Number of Detections	Number of Exceedances[1]		
						RDCSRS	NRDCSRS	IGW
Volatile Organic Compounds (mg/kg)								
1,1,2-Trichloroethane	0.17		SP3	5	5	0	0	5
Acetone	68	E	FTMM53-31	748	11	0	NLE	10
Benzene	590		FTMM53-48	877	237	15	10	237
Ethyl benzene	1,200		FTMM53-48	877	309	0	0	235
Methyl ethyl ketone	320		FTMM53-15	854	35	0	0	35
Methylene chloride	170		FTMM53-16	859	67	0	0	67
Toluene	2,500		FTMM53-48	877	296	0	0	262
Total Xylenes	6,900		FTMM53-48	876	334	0	0	264
Semivolatile Organic Compounds (mg/kg)								
2-Methylnaphthalene	16	D	699WO-A-North End	6	2	0	0	1
Naphthalene	18	D	699WO-A-North End	6	2	1	1	0
Phenol	21		SP2	5	1	0	0	1
Inorganics (mg/kg)								
Cadmium	0.04		SP3 SP5	6	5	0	0	0
Copper	8.3		SP2	6	6	0	0	0
Lead	332.7		SP2	775	65	0	0	2

Notes:
1) Criteria action level source document and web address.
- The NJ Residential Direct Contact Soil Remediation Standard (RDCSRS) refers to the NJDEP's September 2017 Remediation Standards http://www.nj.gov/dep/rules/rules/njac7_26d.pdf
- The NJ Non-Residential Direct Contact Soil Remediation Standard (NRDCSRS) refers to the NJDEP's September 2017 Remediation Standards. http://www.nj.gov/dep/rules/rules/njac7_26d.pdf
- The NJ Impact to GW (IGW) Soil Screening Level criteria refers to the Development of Site Specific Impact to Ground Water Soil Remediation Standards - http://www.nj.gov/dep/srp/guidance/rs/partition_equation.pdf

TABLE 4.5
SOIL SAMPLING SUMMARY OF RESULTS – 2015 REMEDIAL INVESTIGATION -
COMPARISON TO NJDEP CRITERIA
SITE FTMM-53 BUILDING 699
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Residential Direct Contact SRS	NJ Non-Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	FTMM-53-SB1			FTMM-53-SB2			FTMM-53-SB3		
Sample ID				FTMM-53-SB1-0.5-1.0	FTMM-53-SB1-13.5-14.0	FTMM-53-SB1-6.5-7.0	FTMM-53-SB2-0.5-1.0	FTMM-53-SB2-13.0-13.5	FTMM-53-SB2-6.0-6.5	FTMM-53-SB3-0.5-1.0	FTMM-53-SB3-12.5-13.0	FTMM-53-SB3-6.5-7.0
Sample Date				9/21/2015	9/21/2015	9/21/2015	9/21/2015	9/21/2015	9/21/2015	9/22/2015	9/22/2015	9/22/2015
Volatile Organic Compounds (mg/kg)												
1,2,4-Trimethylbenzene	NLE	NLE	NLE	< 0.0015 UJ	< 0.0026 UJ	**93 J**	**0.014 J**	< 0.0027 UJ	**2.4 J**	**0.0035 J**	< 0.0026	**56**
1,3,5-Trimethylbenzene	NLE	NLE	NLE	< 0.0022 UJ	< 0.0026 UJ	**25 J**	**0.0051 J**	< 0.0027 UJ	**1.3 J**	**0.0012 J**	< 0.0026	**46**
Acetone	70,000	NLE	19	< 0.5 UJ	**0.0052 J**	< 0.51 UJ	< 0.0048 UJ	**0.0059 J**	< 0.58 UJ	**0.097**	**0.042**	< 2
Benzene	2	5	0.005	**0.0023 J**	< 0.0026 UJ	< 0.26 UJ	**0.069 J**	< 0.0027 UJ	< 0.29 UJ	**0.0071**	**0.00052 J**	< 0.98
Chlorobenzene	510	7,400	0.6	< 0.0022 UJ	< 0.0026 UJ	< 0.26 UJ	< 0.0024 UJ	< 0.0027 UJ	< 0.29 UJ	< 0.0024	< 0.0026	< 0.98
Cymene	NLE	NLE	NLE	< 0.0022 UJ	< 0.0026 UJ	**1 J**	< 0.0024 UJ	< 0.0027 UJ	**0.14 J**	< 0.0024	< 0.0026	**2.9**
Ethyl benzene	7,800	110,000	13	**0.0015 J**	< 0.0026 UJ	**3.7 J**	**0.027 J**	< 0.0027 UJ	**0.079 J**	**0.0035 J**	**0.00074 J**	**2.8**
Isopropylbenzene	NLE	NLE	NLE	< 0.0022 UJ	< 0.0026 UJ	**4.2 J**	**0.00074 J**	< 0.0027 UJ	< 0.29 UJ	< 0.0024	< 0.0026	**1.1 J**
Meta/Para Xylene	NLE	NLE	NLE	**0.0027 J**	< 0.0052 UJ	**7.6 J**	**0.081 J**	< 0.0053 UJ	**0.75 J**	**0.007 J**	< 0.0053	**24**
Methyl chloride	4	12	NLE	< 0.0022 UJ	< 0.0026 UJ	**0.05 J**	< 0.0024 UJ	< 0.0027 UJ	< 0.29 UJ	< 0.0024	< 0.0026	< 0.98
Methyl ethyl ketone	3,100	44,000	0.9	**0.043 J**	< 0.0026 UJ	< 0.26 UJ	< 0.0024 UJ	< 0.0027 UJ	< 0.29 UJ	**0.03**	**0.0058**	< 0.98
Methyl isobutyl ketone	NLE	NLE	NLE	< 0.0022 UJ	< 0.0026 UJ	< 0.26 UJ	< 0.0024 UJ	< 0.0027 UJ	< 0.29 UJ	< 0.0024	< 0.0026	< 0.98
Naphthalene	6	17	25	**0.0025 J**	< 0.0026 UJ	**4.2 J**	**0.00053 J**	< 0.0027 UJ	**0.2 J**	**0.0013 J**	< 0.0026	**2.7**
n-Butylbenzene	NLE	NLE	NLE	< 0.0022 UJ	< 0.0026 UJ	**6.2 J**	< 0.0024 UJ	< 0.0027 UJ	< 0.29 UJ	< 0.0024	< 0.0026	< 0.98
Ortho Xylene	NLE	NLE	NLE	**0.00042 J**	< 0.0026 UJ	< 0.26 UJ	**0.019 J**	< 0.0027 UJ	< 0.29 UJ	**0.0013 J**	**0.001 J**	**3.7**
Propylbenzene	NLE	NLE	NLE	**0.0014 J**	< 0.0026 UJ	**8 J**	**0.0036 J**	< 0.0027 UJ	**0.14 J**	**0.0016 J**	< 0.0026	**3.4**
sec-Butylbenzene	NLE	NLE	NLE	**0.0057 J**	< 0.0026 UJ	**1.5 J**	< 0.0024 UJ	< 0.0027 UJ	< 0.29 UJ	< 0.0024	< 0.0026	**1.5 J**
tert-Butylbenzene	NLE	NLE	NLE	**0.00096 J**	< 0.0026 UJ	**0.11 J**	< 0.0024 UJ	< 0.0027 UJ	< 0.29 UJ	< 0.0024	< 0.0026	< 0.98
Toluene	6,300	91,000	7	**0.0011 J**	< 0.0026 UJ	< 0.26 UJ	**0.12 J**	< 0.0027 UJ	< 0.29 UJ	**0.0014 J**	**0.0018 J**	< 0.98
TIC VOCs (mg/kg)												
1,2,3,5-Tetramethylbenzene	NLE	NLE	NLE	NA	NA	NA	NA	NA	**6.2 JN**	NA	NA	**35 JN**
1,2,3-Trimethylbenzene	NLE	NLE	NLE	NA	NA	**36 JN**	**0.0087 JN**	NA	NA	NA	NA	**28 JN**
1H-Indane, 2,3-dihydro-4-methyl-	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylbutane	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylpentane	NLE	NLE	NLE	**0.099 JN**	NA	**18 JN**	NA	NA	NA	**0.074 JN**	NA	NA
2,5-Dimethylstrene	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	**35 JN**
2-Ethyl toluene	NLE	NLE	NLE	NA	NA	**27 JN**	**0.016 JN**	NA	NA	NA	NA	**25 JN**
2-Methylbutane	NLE	NLE	NLE	NA	NA	NA	**0.012 JN**	NA	NA	NA	NA	NA
2-Methylnaphthalene	230	2,400	8	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylpentane	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Methylpentane	NLE	NLE	NLE	NA	NA	NA	**0.008 JN**	NA	NA	NA	NA	NA
4-Ethyltoluene	NLE	NLE	NLE	NA	NA	NA	**0.0052 JN**	NA	NA	NA	NA	NA
Benzene, 1,2,4,5-tetramethyl-	NLE	NLE	NLE	**1.1 JN**	NA	NA	NA	NA	NA	**0.02 JN**	NA	**31 JN**
Benzene, 1-ethyl-3-methyl-	NLE	NLE	NLE	NA	NA	NA	**0.033 JN**	NA	NA	NA	NA	NA
Benzene, 1-methyl-3-(1-methylethyl	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	**0.017 JN**	NA	NA
Benzene, 2-ethyl-1,4-dimethyl-	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	**59 JN**
Methylcyclopentane	NLE	NLE	NLE	NA	NA	NA	**0.012 JN**	NA	NA	NA	NA	NA
TIC Unknown	NLE	NLE	NLE	**8.946 JN**	**0.132 J**	**589 J**	**0.1549 JN**	**0.0305 JN**	**133.2 J**	**1.2799 JN**	NA	**637 J**
Semivolatile Organic Compounds (mg/kg)												
Bis(2-Ethylhexyl)phthalate	35	140	1,200	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC SVOCs (mg/kg)												
TIC Unknown	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)												
C12-C16 Aliphatics	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
C12-C16 Aromatics	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
C16-C21 Aliphatics	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
C16-C21 Aromatics	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
C21-C36 Aromatics	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
C21-C40 Aliphatics	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
C9-C12 Aliphatics	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Aliphatics	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs (mg/kg) (No Detects)												
Inorganics (mg/kg)												
Aluminum	78,000	NLE	6,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	31	450	6	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	19	19	19	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	16,000	59,000	2,100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	16	140	0.7	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	1,600	590	90	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	3,100	45,000	11,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	800	90	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	11,000	5,900	65	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	23	65	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	1,600	23,000	48	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	78	1,100	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	23,000	110,000	930	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 4.5
SOIL SAMPLING SUMMARY OF RESULTS – 2015 REMEDIAL INVESTIGATION -
COMPARISON TO NJDEP CRITERIA
SITE FTMM-53 BUILDING 699
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Residential Direct Contact SRS	NJ Non-Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	FTMM-53-SB4			FTMM-53-SB5			FTMM-53-SB6			
Sample ID				FTMM-53-SB4-1.5-2.0	FTMM-53-SB4-15.0-15.5	FTMM-53-SB4-7.0-7.5	FTMM-53-SB5-0.4-0.9	FTMM-53-SB5-13.5-14.0	FTMM-53-SB5-6.5-7.0	FTMM-53-SB6-0.7-1.2	FTMM-53-SB6-13.5-14.0	FTMM-53-SB6-6.5-7.0	FTMM-53-SB7-0.3-0.8
Sample Date				9/22/2015	9/22/2015	9/22/2015	9/22/2015	9/22/2015	9/22/2015	9/22/2015	9/22/2015	9/22/2015	9/23/2015
Volatile Organic Compounds (mg/kg)													
1,2,4-Trimethylbenzene	NLE	NLE	NLE	**0.00089 J**	**0.0029 J**	**400**	**0.0006 J**	**13**	**32**	**0.0022 J**	**0.00069 J**	**3.3 D**	< 0.0024
1,3,5-Trimethylbenzene	NLE	NLE	NLE	< 0.0023	**0.0026 J**	**160**	< 0.0021	**8**	**13**	**0.0011 J**	< 0.0025	**0.82 D**	< 0.0024
Acetone	70,000	NLE	19	**0.052**	**0.012**	< 21	**0.021**	< 0.76	< 0.59	**0.089**	**0.04**	**0.027**	**0.035**
Benzene	2	5	0.005	**0.00081 J**	**0.0003 J**	< 10	**0.0028 J**	< 0.38	< 0.29	< 0.0021	< 0.0025	< 0.0027	< 0.0024
Chlorobenzene	510	7,400	0.6	< 0.0023	< 0.0024	< 10	< 0.0021	< 0.38	< 0.29	< 0.0021	< 0.0025	**0.0051 J**	< 0.0024
Cymene	NLE	NLE	NLE	< 0.0023	< 0.0024	**5.1 J**	< 0.0021	< 0.38	**0.75**	< 0.0021	< 0.0025	**0.089**	< 0.0024
Ethyl benzene	7,800	110,000	13	**0.00036 J**	**0.0013 J**	**8.8 J**	**0.00032 J**	**12**	**2.2**	**0.0012 J**	**0.00052 J**	**0.066**	< 0.0024
Isopropylbenzene	NLE	NLE	NLE	< 0.0023	< 0.0024	**12 J**	< 0.0021	**2.7**	**1**	< 0.0021	< 0.0025	**0.074**	< 0.0024
Meta/Para Xylene	NLE	NLE	NLE	< 0.0046	< 0.0048	**80**	**0.00099 J**	**1.6**	**0.81 J**	< 0.0043	< 0.0051	< 0.0054	< 0.0048
Methyl chloride	4	12	NLE	< 0.0023	< 0.0024	< 10	< 0.0021	**0.098 J**	**0.055 J**	< 0.0021	< 0.0025	< 0.0027	< 0.0024
Methyl ethyl ketone	3,100	44,000	0.9	**0.014**	**0.0026 J**	< 10	**0.0082**	< 0.38	< 0.29	**0.023**	**0.0065**	**0.0083**	**0.01**
Methyl isobutyl ketone	NLE	NLE	NLE	< 0.0023	< 0.0024	< 10	< 0.0021	< 0.38	< 0.29	< 0.0021	< 0.0025	**0.059**	< 0.0024
Naphthalene	6	17	25	**0.0017 J**	**0.0011 J**	**16 J**	< 0.0021	**4.7**	**2.5**	**0.0037 J**	**0.00064 J**	**0.051**	< 0.0024
n-Butylbenzene	NLE	NLE	NLE	**0.0011 J**	< 0.0024	**33**	< 0.0021	< 0.38	**5.1**	< 0.0021	< 0.0025	**0.74 D**	< 0.0024
Ortho Xylene	NLE	NLE	NLE	**0.00065 J**	< 0.0024	**11 J**	**0.00044 J**	**3.6**	**3.2**	**0.0005 J**	< 0.0025	**0.0047 J**	< 0.0024
Propylbenzene	NLE	NLE	NLE	< 0.0023	**0.0014 J**	**46**	< 0.0021	**6.2**	**3**	**0.00081 J**	< 0.0025	**0.37 J**	< 0.0024
sec-Butylbenzene	NLE	NLE	NLE	**0.00088 J**	< 0.0024	**7.5 J**	< 0.0021	**0.13 J**	**0.96**	**0.00078 J**	< 0.0025	**0.19**	< 0.0024
tert-Butylbenzene	NLE	NLE	NLE	< 0.0023	< 0.0024	< 10	< 0.0021	< 0.38	< 0.29	< 0.0021	< 0.0025	**0.0091**	< 0.0024
Toluene	6,300	91,000	7	**0.0011 J**	< 0.0024	< 10	**0.00089 J**	< 0.38	< 0.29	**0.00093 J**	**0.0016 J**	< 0.0027	< 0.0024
TIC VOCs (mg/kg)													
1,2,3,5-Tetramethylbenzene	NLE	NLE	NLE	NA	NA	**68 JN**	NA	NA	**19 JN**	NA	NA	**4.3 JN**	NA
1,2,3-Trimethylbenzene	NLE	NLE	NLE	NA	NA	**120 JN**	NA	**4.8 JN**	**8.8 JN**	NA	NA	NA	NA
1H-Indane, 2,3-dihydro-4-methyl-	NLE	NLE	NLE	NA	NA	NA	NA	**1.9 JN**	**17 JN**	NA	NA	NA	NA
2,3-Dimethylbutane	NLE	NLE	NLE	NA	NA	NA	NA	**2.7 JN**	NA	NA	NA	NA	NA
2,3-Dimethylpentane	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	**0.0074 JN**	NA	NA	NA
2,5-Dimethylstrene	NLE	NLE	NLE	NA	NA	**84 JN**	NA	NA	NA	NA	NA	NA	NA
2-Ethyl toluene	NLE	NLE	NLE	NA	NA	**390 JN**	NA	**7.4 JN**	**7.9 JN**	NA	NA	NA	NA
2-Methylbutane	NLE	NLE	NLE	NA	NA	NA	NA	**1.7 JN**	NA	NA	NA	NA	NA
2-Methylnaphthalene	230	2,400	8	NA	NA	**55 JN**	NA	NA	NA	NA	NA	NA	NA
2-Methylpentane	NLE	NLE	NLE	NA	NA	**58 JN**	NA	**6.1 JN**	NA	NA	NA	NA	NA
3-Methylpentane	NLE	NLE	NLE	NA	NA	NA	NA	**4.8 JN**	NA	NA	NA	NA	NA
4-Ethyltoluene	NLE	NLE	NLE	NA	NA	**120 JN**	NA	**3.5 JN**	NA	NA	NA	NA	NA
Benzene, 1,2,4,5-tetramethyl-	NLE	NLE	NLE	NA	NA	NA	NA	NA	**15 JN**	**0.017 JN**	NA	**0.29 JN**	NA
Benzene, 1-ethyl-3-methyl-	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-3-(1-methylethyl	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	**0.011 JN**	NA	NA	NA
Benzene, 2-ethyl-1,4-dimethyl-	NLE	NLE	NLE	NA	NA	NA	NA	NA	**10 JN**	NA	NA	**0.21 JN**	NA
Methylcyclopentane	NLE	NLE	NLE	NA	NA	NA	NA	**7.2 JN**	NA	NA	NA	NA	NA
TIC Unknown	NLE	NLE	NLE	**0.3374 J**	NA	**1,203 J**	**0.0073 J**	**23.17 JN**	**173.6 J**	**0.3063 JN**	NA	**72.42 JN**	NA
Semivolatile Organic Compounds (mg/kg)													
Bis(2-Ethylhexyl)phthalate	35	140	1,200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC SVOCs (mg/kg)													
TIC Unknown	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)													
C12-C16 Aliphatics	NLE	NLE	NLE	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
C16-C21 Aliphatics	NLE	NLE	NLE	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
C21-C36 Aromatics	NLE	NLE	NLE	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
C9-C12 Aliphatics	NLE	NLE	NLE	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
PCBs (mg/kg) (No Detects)													
Inorganics (mg/kg)													
Aluminum	78,000	NLE	6,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	31	450	6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	19	19	19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	16,000	59,000	2,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	16	140	0.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	1,600	590	90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	3,100	45,000	11,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	800	90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	11,000	5,900	65	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	23	65	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	1,600	23,000	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	78	1,100	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	23,000	110,000	930	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 4.5
SOIL SAMPLING SUMMARY OF RESULTS – 2015 REMEDIAL INVESTIGATION -
COMPARISON TO NJDEP CRITERIA
SITE FTMM-53 BUILDING 699
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Residential Direct Contact SRS	NJ Non-Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	FTMM-53-SB7		FTMM-53-SB8			FTMM-53-SB9			FTMM-53-SB10	
Sample ID				FTMM-53-SB7-18.5-19.0	FTMM-53-SB7-7.0-7.5	FTMM-53-SB8-0.5-1.0	FTMM-53-SB8-14.5-15.0	FTMM-53-SB8-6.5-7.0	FTMM-53-SB9-1.0-1.5	FTMM-53-SB9-14.0-14.5	FTMM-53-SB9-6.7-7.0	FTMM-53-SB10-0.3-0.8	FTMM-53-SB10-14.0-14.5
Sample Date				9/23/2015	9/23/2015	9/25/2015	9/25/2015	9/25/2015	9/25/2015	9/25/2015	9/25/2015	9/23/2015	9/23/2015
Volatile Organic Compounds (mg/kg)													
1,2,4-Trimethylbenzene	NLE	NLE	NLE	**0.00062 J**	**31 D**	< 0.0028 UJ	< 0.0039	< 0.0024	< 0.0025 UJ	< 0.0028	< 0.0024	< 0.0028 UJ	< 0.0026
1,3,5-Trimethylbenzene	NLE	NLE	NLE	**0.00093 J**	**9.4 D**	< 0.0028 UJ	< 0.0039	< 0.0024	< 0.0025 UJ	< 0.0028	< 0.0024	< 0.0028 UJ	< 0.0026
Acetone	70,000	NLE	19	**0.012**	**0.088**	**0.019 J**	**0.0075 J**	**0.006**	**0.025 J**	**0.006**	**0.0079**	**0.032 J**	< 0.0052
Benzene	2	5	0.005	**0.00059 J**	**0.11**	< 0.0028 UJ	< 0.0039	< 0.0024	< 0.0025 UJ	< 0.0028	< 0.0024	< 0.0028 UJ	**0.0011 J**
Chlorobenzene	510	7,400	0.6	< 0.0025	**0.0035 J**	< 0.0028 UJ	< 0.0039	< 0.0024	< 0.0025 UJ	< 0.0028	< 0.0024	< 0.0028 UJ	< 0.0026
Cymene	NLE	NLE	NLE	< 0.0025	**4.7 D**	< 0.0028 UJ	< 0.0039	< 0.0024	< 0.0025 UJ	< 0.0028	< 0.0024	< 0.0028 UJ	< 0.0026
Ethyl benzene	7,800	110,000	13	**0.0017 J**	**8.1 D**	< 0.0028 UJ	< 0.0039	< 0.0024	< 0.0025 UJ	< 0.0028	< 0.0024	< 0.0028 UJ	< 0.0026
Isopropylbenzene	NLE	NLE	NLE	**0.008**	**2.4 D**	< 0.0028 UJ	< 0.0039	< 0.0024	< 0.0025 UJ	< 0.0028	< 0.0024	< 0.0028 UJ	< 0.0026
Meta/Para Xylene	NLE	NLE	NLE	< 0.0049	**33 D**	< 0.0056 UJ	< 0.0078	< 0.0048	< 0.005 UJ	< 0.0055	< 0.0049	< 0.0055 UJ	< 0.0052
Methyl chloride	4	12	NLE	< 0.0025	< 0.0023	< 0.0028 UJ	< 0.0039	< 0.0024	< 0.0025 UJ	< 0.0028	< 0.0024	< 0.0028 UJ	< 0.0026
Methyl ethyl ketone	3,100	44,000	0.9	**0.0031 J**	**0.036**	**0.0031 J**	< 0.0039	< 0.0024	**0.0056 J**	< 0.0028	< 0.0024	< 0.0028 UJ	< 0.0026
Methyl isobutyl ketone	NLE	NLE	NLE	< 0.0025	< 0.0023	< 0.0028 UJ	< 0.0039	< 0.0024	< 0.0025 UJ	< 0.0028	< 0.0024	< 0.0028 UJ	< 0.0026
Naphthalene	6	17	25	**0.0099**	**4 D**	< 0.0028 UJ	< 0.0039	< 0.0024	**0.00072 J**	< 0.0028	< 0.0024	**0.00093 J**	< 0.0026
n-Butylbenzene	NLE	NLE	NLE	**0.0011 J**	**3.1 D**	< 0.0028 UJ	< 0.0039	< 0.0024	< 0.0025 UJ	< 0.0028	< 0.0024	< 0.0028 UJ	< 0.0026
Ortho Xylene	NLE	NLE	NLE	< 0.0025	**9.5 D**	< 0.0028 UJ	< 0.0039	< 0.0024	< 0.0025 UJ	< 0.0028	< 0.0024	< 0.0028 UJ	< 0.0026
Propylbenzene	NLE	NLE	NLE	**0.0071**	**4.8 D**	< 0.0028 UJ	< 0.0039	< 0.0024	< 0.0025 UJ	< 0.0028	< 0.0024	< 0.0028 UJ	< 0.0026
sec-Butylbenzene	NLE	NLE	NLE	**0.0019 J**	**0.77 J**	< 0.0028 UJ	< 0.0039	< 0.0024	< 0.0025 UJ	< 0.0028	< 0.0024	< 0.0028 UJ	< 0.0026
tert-Butylbenzene	NLE	NLE	NLE	< 0.0025	< 0.0023	< 0.0028 UJ	< 0.0039	< 0.0024	< 0.0025 UJ	< 0.0028	< 0.0024	< 0.0028 UJ	< 0.0026
Toluene	6,300	91,000	7	< 0.0025	**3.5 D**	< 0.0028 UJ	< 0.0039	< 0.0024	< 0.0025 UJ	< 0.0028	< 0.0024	< 0.0028 UJ	< 0.0026
TIC VOCs (mg/kg)													
1,2,3,5-Tetramethylbenzene	NLE	NLE	NLE	**0.0091 JN**	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	NLE	NLE	NLE	NA	**5.3 JN**	NA	NA	NA	NA	NA	NA	NA	NA
1H-Indane, 2,3-dihydro-4-methyl-	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylbutane	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylpentane	NLE	NLE	NLE	**0.02 JN**	**9.4 JN**	NA	NA	NA	NA	NA	NA	NA	NA
2,5-Dimethylstrene	NLE	NLE	NLE	**0.032 JN**	**0.14 JN**	NA	NA	NA	NA	NA	NA	NA	NA
2-Ethyl toluene	NLE	NLE	NLE	NA	**0.55 JN**	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylbutane	NLE	NLE	NLE	NA	NA	NA	NA	NA	**0.02 JN**	NA	NA	NA	NA
2-Methylnaphthalene	230	2,400	8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylpentane	NLE	NLE	NLE	NA	**10 JN**	NA	NA	NA	NA	NA	NA	NA	NA
3-Methylpentane	NLE	NLE	NLE	**0.01 JN**	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Ethyltoluene	NLE	NLE	NLE	NA	**13 JN**	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4,5-tetramethyl-	NLE	NLE	NLE	**0.0094 JN**	**6.6 JN**	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-3-methyl-	NLE	NLE	NLE	NA	**0.21 JN**	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-3-(1-methylethyl	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-ethyl-1,4-dimethyl-	NLE	NLE	NLE	NA	**0.14 JN**	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclopentane	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC Unknown	NLE	NLE	NLE	**0.1615 JN**	**98.166 J**	**0.0185 JN**	NA	NA	**1.543 J**	**0.0491 J**	**0.0056 JN**	**0.0062 J**	NA
Semivolatile Organic Compounds (mg/kg)													
Bis(2-Ethylhexyl)phthalate	35	140	1,200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC SVOCs (mg/kg)													
TIC Unknown	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)													
C12-C16 Aliphatics	NLE	NLE	NLE	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
C16-C21 Aliphatics	NLE	NLE	NLE	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
C21-C36 Aromatics	NLE	NLE	NLE	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
C9-C12 Aliphatics	NLE	NLE	NLE	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
PCBs (mg/kg) (No Detects)													
Inorganics (mg/kg)													
Aluminum	78,000	NLE	6,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	31	450	6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	19	19	19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	16,000	59,000	2,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	16	140	0.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	1,600	590	90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	3,100	45,000	11,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	800	90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	11,000	5,900	65	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	23	65	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	1,600	23,000	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NLE	NLE	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	78	1,100	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	23,000	110,000	930	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 4.5
SOIL SAMPLING SUMMARY OF RESULTS – 2015 REMEDIAL INVESTIGATION -
COMPARISON TO NJDEP CRITERIA
SITE FTMM-53 BUILDING 699
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Residential Direct Contact SRS	NJ Non-Residential Direct Contact SRS	NJ Impact to GW Soil Screening Level	FTMM-53-SB11			
Sample ID				FTMM-53-SB10-6.5-7.0	FTMM-53-SB11-13.0-13.5	FTMM-53-SB11-3.0-3.5	FTMM-53-SB11-6.0-6.5
Sample Date				9/23/2015	9/25/2015	9/25/2015	9/25/2015
Volatile Organic Compounds (mg/kg)							
1,2,4-Trimethylbenzene	NLE	NLE	NLE	**130 D**	< 0.0027	NA	NA
1,3,5-Trimethylbenzene	NLE	NLE	NLE	**49 D**	< 0.0027	NA	NA
Acetone	70,000	NLE	19	< 0.55	**0.01**	NA	NA
Benzene	2	5	0.005	< 0.27	< 0.0027	NA	NA
Chlorobenzene	510	7,400	0.6	< 0.27	< 0.0027	NA	NA
Cymene	NLE	NLE	NLE	**2.1**	< 0.0027	NA	NA
Ethyl benzene	7,800	110,000	13	**11**	< 0.0027	NA	NA
Isopropylbenzene	NLE	NLE	NLE	**6.7**	< 0.0027	NA	NA
Meta/Para Xylene	NLE	NLE	NLE	**17**	< 0.0054	NA	NA
Methyl chloride	4	12	NLE	**0.047 J**	< 0.0027	NA	NA
Methyl ethyl ketone	3,100	44,000	0.9	< 0.27	< 0.0027	NA	NA
Methyl isobutyl ketone	NLE	NLE	NLE	< 0.27	< 0.0027	NA	NA
Naphthalene	6	17	25	**6.5**	< 0.0027	NA	NA
n-Butylbenzene	NLE	NLE	NLE	**14**	< 0.0027	NA	NA
Ortho Xylene	NLE	NLE	NLE	**20**	< 0.0027	NA	NA
Propylbenzene	NLE	NLE	NLE	**16**	< 0.0027	NA	NA
sec-Butylbenzene	NLE	NLE	NLE	**3.4**	< 0.0027	NA	NA
tert-Butylbenzene	NLE	NLE	NLE	**0.21 J**	< 0.0027	NA	NA
Toluene	6,300	91,000	7	< 0.27	< 0.0027	NA	NA
TIC VOCs (mg/kg)							
1,2,3,5-Tetramethylbenzene	NLE	NLE	NLE	**28 JN**	NA	NA	NA
1,2,3-Trimethylbenzene	NLE	NLE	NLE	**21 JN**	NA	NA	NA
1H-Indane, 2,3-dihydro-4-methyl-	NLE	NLE	NLE	NA	NA	NA	NA
2,3-Dimethylbutane	NLE	NLE	NLE	NA	NA	NA	NA
2,3-Dimethylpentane	NLE	NLE	NLE	NA	NA	NA	NA
2,5-Dimethylstrene	NLE	NLE	NLE	NA	NA	NA	NA
2-Ethyl toluene	NLE	NLE	NLE	**57 JN**	NA	NA	NA
2-Methylbutane	NLE	NLE	NLE	NA	NA	NA	NA
2-Methylnaphthalene	230	2,400	8	NA	NA	NA	NA
2-Methylpentane	NLE	NLE	NLE	NA	NA	NA	NA
3-Methylpentane	NLE	NLE	NLE	NA	NA	NA	NA
4-Ethyltoluene	NLE	NLE	NLE	**36 JN**	NA	NA	NA
Benzene, 1,2,4,5-tetramethyl-	NLE	NLE	NLE	**18 JN**	NA	NA	NA
Benzene, 1-ethyl-3-methyl-	NLE	NLE	NLE	**24 JN**	NA	NA	NA
Benzene, 1-methyl-3-(1-methylethyl	NLE	NLE	NLE	**20 JN**	NA	NA	NA
Benzene, 2-ethyl-1,4-dimethyl-	NLE	NLE	NLE	**23 JN**	NA	NA	NA
Methylcyclopentane	NLE	NLE	NLE	NA	NA	NA	NA
TIC Unknown	NLE	NLE	NLE	**676 J**	NA	NA	NA
Semivolatile Organic Compounds (mg/kg)							
Bis(2-Ethylhexyl)phthalate	35	140	1,200	NA	**0.3 J**	NA	NA
TIC SVOCs (mg/kg)							
TIC Unknown	NLE	NLE	NLE	NA	**11.12 J**	NA	NA
Extractable/Volatile Petroleum Hydrocarbons (mg/kg)							
C12-C16 Aliphatics	NLE	NLE	NLE	NA	**1.11**	**1.21**	**1.11**
C12-C16 Aromatics	NLE	NLE	NLE	NA	**0.41 J**	< 1.21 UJ	< 1.11 UJ
C16-C21 Aliphatics	NLE	NLE	NLE	NA	**1.11**	**1.21**	**1.11**
C16-C21 Aromatics	NLE	NLE	NLE	NA	< 1.2 UJ	**0.73 J**	**0.49 J**
C21-C36 Aromatics	NLE	NLE	NLE	NA	< 1.2 UJ	**0.68 J**	**0.54 J**
C21-C40 Aliphatics	NLE	NLE	NLE	NA	**0.56 J**	**1 J**	**0.59 J**
C9-C12 Aliphatics	NLE	NLE	NLE	NA	**0.23 J**	**0.27 J**	**0.3 J**
Total Aliphatics	NLE	NLE	NLE	NA	**1.1**	**1.6**	**1.3**
PCBs (mg/kg) (No Detects)							
Inorganics (mg/kg)							
Aluminum	78,000	NLE	6,000	NA	**1,754**	NA	NA
Antimony	31	450	6	NA	**0.52 J**	NA	NA
Arsenic	19	19	19	NA	**1.638 J**	NA	NA
Barium	16,000	59,000	2,100	NA	**4.2 EB**	NA	NA
Beryllium	16	140	0.7	NA	**0.148 J**	NA	NA
Calcium	NLE	NLE	NLE	NA	**84.6 J**	NA	NA
Chromium	NLE	NLE	NLE	NA	**19.8**	NA	NA
Cobalt	1,600	590	90	NA	**0.23 J**	NA	NA
Copper	3,100	45,000	11,000	NA	**1.414 J**	NA	NA
Iron	NLE	NLE	NLE	NA	**3,680**	NA	NA
Lead	400	800	90	NA	**1.1 J**	NA	NA
Magnesium	NLE	NLE	NLE	NA	**314**	NA	NA
Manganese	11,000	5,900	65	NA	**4.4**	NA	NA
Mercury	23	65	0.1	NA	**0.02 J**	NA	NA
Nickel	1,600	23,000	48	NA	**1.376 J**	NA	NA
Potassium	NLE	NLE	NLE	NA	**682**	NA	NA
Sodium	NLE	NLE	NLE	NA	**35.6 J**	NA	NA
Vanadium	78	1,100	NLE	NA	**10.4**	NA	NA
Zinc	23,000	110,000	930	NA	**5.2**	NA	NA

TABLE 4.5
SOIL SAMPLING SUMMARY OF RESULTS – 2015 REMEDIAL INVESTIGATION - COMPARISON TO NJDEP CRITERIA
SITE FTMM-53 BUILDING 699
FORT MONMOUTH, NEW JERSEY

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 detection

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

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

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

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

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

E (or ER) = Estimated result.

R = Rejected, data validation rejected the results.

D = Results from dilution of sample.

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

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

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

JN = Tentatively identified compound, estimated concentration.

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

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

a) DELETE THIS NOTE BEFORE GOING FINAL: Refer to the NJDEP Protocol for Addressing Extractable Petroleum Hydrocarbons (Version 5.0, August 9, 2010) and the NJDEP Health Based end Ecological Screening Criteria for Petroleum Hydrocarbons (Version 4.0, August 9, 2010) to determine the category of tank being investigated and the appropriate cleanup standards or screening levels for that category of tank.

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

TABLE 4.6
SOIL SAMPLING SUMMARY OF NJDEP EXCEEDANCES (2015)
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Analyte	Maximum Detected Concentration		Location of Maximum Concentration	Sample Date	Number of Samples	Number of Detections	Number of Exceedances [1]		
							RDCSRS	NRDCSRS	IGW
Volatile Organic Compounds (mg/kg)									
Benzene	0.11		FTMM-53-SB7	9/23/2015	31	10	0	0	3
Naphthalene	16	J	FTMM-53-SB4	9/22/2015	31	19	2	0	0
TIC VOCs (mg/kg)									
2-Methylnaphthalene	55	JN	FTMM-53-SB4	9/22/2015	31	1	0	0	1
Inorganics (mg/kg)									
Antimony	0.52	J	FTMM-53-SB11	9/25/2015	1	1	0	0	0
Mercury	0.02	J	FTMM-53-SB11	9/25/2015	1	1	0	0	0

1) Criteria action level source document and web address.

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

TABLE 4.7
COMPARISON OF VERSAR 2000, VERSAR 2001, AND 2015 RI SOIL ANALYTICAL RESULTS FOR BENZENE AND XYLENE AT SELECT BORINGS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

BENZENE (mg/kg)

Boring No.	2			13			14			47			48		
Depth	2000	2001	2015 (SB6)	2000	2001	2015 (SB5)	2000	2001	2015 (SB4)	2000	2001	2015 (SB7)	2000	2001	2015 (SB10)
6-12"	ND	ND	<0.0021	**5.2**	**19**	0.0028 J	ND	ND	--	**3.7**	0.35	<0.0024	1.2	0.18	<0.0028
18-24"	1.1	ND	--	**6.5**	**7.1**	--	ND	**22**	0.00081 J	**3.3**	**5**	--	1.1	0.15	--
30-36"	**3.4**	**37**	--	**77**	**36**	--	ND	**29**	--	ND	**23**	--	0.86	**3.2**	--
42-48"	**9.4**	**26**	--	**35**	**50**	--	**13**	**37**	--	**23**	**47**	--	1.5	1.1	--
54-60"	**49**	**45**	--	**64**	**100**	--	ND	**19**	--	**30**	**45**	--	**5.2**	0.5	--
66-72"	**54**	**34**	--	**44**	**28**	--	**7.5**	**38**	--	**69**	**47**	--	**110**	1.5	--
78-84"	**63**	--	<0.0027	**24**	--	<0.290	**12**	--	<10	**13**	--	0.11	0.67	--	<0.270
90-96"	**15**	--	--	**11**	--	--	**7.6**	--		**21**	--		1.5	--	--
102-108"	**46**	--	--	**47**	--	--	**11**	--	--	**15**	--	--	**150**	--	--
114-120"	**15**	--	--	**54**	--	--	**9.5**	--	--	**36**	--	--	**590**	--	--
126-132"	**4.2**	--	--	**15**	--	--	**13**	--	--	**33**	--	--	**200**	--	--
138-144"	1.1	--	--	**10**	--	--	**11**	--	--	**3.6**	--	--	**260**	--	--
162-168"	--	--	<0.0025	--	--	<0.380	--	--	--	--	--	--	--	--	0.0011 J
180-186"	--	--	--	--	--	--	--	--	0.0003 J	--	--	--	--	--	

NJDEP September 2017 Residential Direct Contact Soil Remediation Standard for Benzene = 2 mg/kg

XYLENE (mg/kg)

Boring No.	2			13			14			47			48		
Depth	2000	2001	2015 (SB6)	2000	2001	2015 (SB5)	2000	2001	2015 (SB4)	2000	2001	2015 (SB7)	2000	2001	2015 (SB10)
6-12"	ND	ND	0.0005 J	24	74	0.00143 J	ND	106	--	22.1	0.44	<0.0048	8.62	2.7	<0.0055
18-24"	0.36J	ND	--	35	40.7	--	ND	840	0.00065 J	10.8	31.8	--	4.73	1.34	--
30-36"	1.76	480	--	880	450	--	ND	1100	--	9.5J	340	--	2.57	370	--
42-48"	198	170	--	470	690	--	1390	1110	--	400	570	--	5.8	294	--
54-60"	460	360	--	780	1560	--	860	324	--	590	500	--	173	9.4	--
66-72"	348	280	--	540	540	--	610	670	--	1490	480	--	2870	25.4	--
78-84"	360	--	0.0047 J	294	--	4.01	289	--	91	225	--	42.5	33.1	--	37
90-96"	41	--	--	96	--	--	38	--		370	--		50	--	--
102-108"	329	--	--	580	--	--	1170	--	--	358	--	--	1780	--	--
114-120"	40	--	--	750	--	--	480	--	--	550	--	--	6900	--	--
126-132"	8.7	--	--	167	--	--	47	--	--	440	--	--	2990	--	--
138-144"	1.47	--	--	114	--	--	40	--	--	6.4	--	--	1340	--	--
162-168"	--	--	<0.0051	--	--	7.61	--	--	--	--	--	--	--	--	<0.0052
180-186"	--	--	--	--	--	--	--	--	<0.0048	--	--	--	--	--	

NJDEP September 2017 Residential Direct Contact Soil Remediation Standard for Total Xylenes = 12,000 mg/kg

KEY:		
	- Concentration exceeds the Residential Direct Contact Soil Remediation Standard	mg/kg = milligrams per kilogram.
	- Target depth for enzyme-enhanced bioremediation (EEB) application	E or J = estimated value.
	- Selected boring locations for EEB application	ND = not detected, -- = not analyzed..

TABLE 4.8
DETECTED GROUNDWATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	616MW01						
Sample ID		FTMM53-GW-616MW01-44	FTMM53-GW-616MW01-45	FTMM53-GW-616MW01-46	FTMM53-GW-616MW01-47	FTMM53-GW-616MW01-48	FTMM53-GW-616MW01-49	FTMM53-GW-616MW01-50
Sample Date		3/30/2008	6/4/2008	9/29/2008	12/30/2008	3/27/2009	6/24/2009	8/26/2009
Sample Round		44	45	46	47	48	49	50
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	ND	ND	ND	ND	ND	ND	ND
Meta/Para Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	ND	ND	ND
Ortho Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	ND	ND	ND	ND
Inorganics (µg/l)								
Aluminum	200	NA	NA	NA	NA	NA	NA	NA
Antimony	6	NA	NA	NA	NA	NA	NA	NA
Arsenic	3	NA	NA	NA	NA	NA	NA	NA
Barium	6,000	NA	NA	NA	NA	NA	NA	NA
Beryllium	1	NA	NA	NA	NA	NA	NA	NA
Cadmium	4	NA	NA	NA	NA	NA	NA	NA
Calcium	NLE	NA	NA	NA	NA	NA	NA	NA
Chromium	70	NA	NA	NA	NA	NA	NA	NA
Cobalt	100	NA	NA	NA	NA	NA	NA	NA
Copper	1,300	NA	NA	NA	NA	NA	NA	NA
Iron	300	NA	NA	NA	NA	NA	NA	NA
Lead	5	ND	ND	ND	**5.45**	**2.64 ER**	**2.13 ER**	**3.33 ER**
Magnesium	NLE	NA	NA	NA	NA	NA	NA	NA
Manganese	50	NA	NA	NA	NA	NA	NA	NA
Mercury	2	NA	NA	NA	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	NA	NA	NA	NA	NA	NA	NA
Selenium	40	NA	NA	NA	NA	NA	NA	NA
Silver	40	NA	NA	NA	NA	NA	NA	NA
Sodium	50,000	NA	NA	NA	NA	NA	NA	NA
Thallium	2	NA	NA	NA	NA	NA	NA	NA
Vanadium	NLE	NA	NA	NA	NA	NA	NA	NA
Zinc	2,000	NA	NA	NA	NA	NA	NA	NA

TABLE 4.8
DETECTED GROUNDWATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	616MW01						
Sample ID		FTMM53-GW-616MW01-51	FTMM53-GW-616MW01-1	FTMM53-GW-616MW01-2	FTMM53-GW-616MW01-2-Dup	FTMM53-GW-616MW01-3	FTMM53-GW-616MW01-4	FTMM53-GW-616MW01-5
Sample Date		11/16/2009	3/25/2010	6/15/2010	6/15/2010	9/16/2010	1/7/2011	3/15/2011
Sample Round		51	1	2	2	3	4	5
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	ND	ND	ND	ND	ND	ND	ND
Meta/Para Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	ND	ND	ND
Ortho Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	ND	ND	ND	ND
Inorganics (µg/l)								
Aluminum	200	NA	**681**	**121**	**122**	**119**	**508**	**1,770**
Antimony	6	NA	ND	ND	ND	ND	< 6	< 6
Arsenic	3	NA	**0.87 ER**	ND	ND	ND	< 3	< 3
Barium	6,000	NA	**29.8**	**75.6**	**74**	**80.7**	< 200	< 200
Beryllium	1	NA	ND	**0.331 ER**	**0.345 ER**	**0.269 ER**	< 1	< 1
Cadmium	4	NA	ND	ND	ND	ND	< 3	< 3
Calcium	NLE	NA	**8,070**	**1,520**	**1,600**	**1,870**	< 5000	**5,680**
Chromium	70	NA	**5.51**	ND	ND	ND	< 10	**14.9**
Cobalt	100	NA	ND	**1.12 ER**	**1.17 ER**	**1.05 ER**	< 50	< 50
Copper	1,300	NA	ND	**1**	**2.15 ER**	**2.75 ER**	< 10	**14.2**
Iron	300	NA	**1,310**	ND	ND	**151 ER**	**180**	**4,070**
Lead	5	ND	ND	ND	ND	ND	< 3	**5**
Magnesium	NLE	NA	**2,750**	**2,570**	**2,600**	**2,530**	< 5000	< 5000
Manganese	50	NA	**7.31**	**14.3**	**15.2**	**13**	**24.5**	< 15
Mercury	2	NA	ND	ND	ND	ND	ND	< 0.2
Nickel	100	NA	**3.05 ER**	**5.98**	**6.38**	**7.43**	**14.3**	< 10
Potassium	NLE	NA	**2,420**	**1,570**	**1,540**	**1,780**	< 10000	< 10000
Selenium	40	NA	**14 ER**	NA	NA	ND	< 10	< 10
Silver	40	NA	ND	**1.06 ER**	**1.55 ER**	ND	< 10	< 10
Sodium	50,000	NA	**4,040 ER**	**6,270**	**5,900**	**5,900**	< 10000	< 10000
Thallium	2	NA	ND	ND	ND	ND	< 2	< 2
Vanadium	NLE	NA	**3.15 ER**	ND	ND	**0.641 ER**	< 50	< 50
Zinc	2,000	NA	**8.97 ER**	**17.3 ER**	**17.7 ER**	**20.9 ER**	**34.2**	**38.9**

TABLE 4.8
DETECTED GROUNDWATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	616MW01		699MW01				
Sample ID		FTMM53-GW-616MW01-5-Dup	FTMM53-GW-616MW01-6	FTMM53-GW-699MW01-43	FTMM53-GW-699MW01-43-Dup	FTMM53-GW-699MW01-44	FTMM53-GW-699MW01-45	FTMM53-GW-699MW01-46
Sample Date		3/15/2011	5/27/2011	3/30/2008	3/30/2008	6/4/2008	9/29/2008	12/30/2008
Sample Round		5	6	43	43	44	45	46
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	**2.62**	NA	ND	ND	ND
Acetone	6,000	ND	ND	**9.38**	NA	**1.7 J**	ND	ND
Benzene	1	ND	ND	**7.04**	NA	**1.16 J**	**1.9 J**	**3.61**
Bromodichloromethane	1	ND	ND	ND	NA	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	NA	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	NA	ND	ND	ND
Chloroform	70	ND	ND	ND	NA	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	NA	ND	ND	ND
Ethyl benzene	700	ND	ND	**248.83**	NA	**44.45**	**146.77**	**195.49**
Meta/Para Xylene	1,000	ND	ND	**571.88**	NA	**60.92**	**75.57**	**197.66**
Methyl ethyl ketone	300	ND	ND	ND	NA	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	NA	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	NA	ND	ND	ND
Ortho Xylene	1,000	ND	ND	**462.49**	NA	**96.17**	**155**	**235.14**
Styrene	100	ND	ND	ND	NA	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	NA	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	NA	ND	ND	ND
Toluene	600	ND	ND	**39.13**	NA	**4.06**	**9.25**	**15.06**
Trichloroethene	1	ND	ND	ND	NA	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	**438**	NA	**238**	**477**	**642**
Inorganics (µg/l)								
Aluminum	200	**1,740**	**2,560**	NA	NA	NA	NA	NA
Antimony	6	< 6	< 6	NA	NA	NA	NA	NA
Arsenic	3	< 3	**6.9**	NA	NA	NA	NA	NA
Barium	6,000	< 200	< 200	NA	NA	NA	NA	NA
Beryllium	1	< 1	< 1	NA	NA	NA	NA	NA
Cadmium	4	< 3	< 3	NA	NA	NA	NA	NA
Calcium	NLE	**5,470**	**108,000**	NA	NA	NA	NA	NA
Chromium	70	**14.4**	**16.1**	NA	NA	NA	NA	NA
Cobalt	100	< 50	< 50	NA	NA	NA	NA	NA
Copper	1,300	< 10	< 10	NA	NA	NA	NA	NA
Iron	300	**3,930**	**9,520**	NA	NA	NA	NA	NA
Lead	5	**4**	**9.4**	**0.914 ER**	**1.8 ER**	**16.6**	**9.2**	**3.72 ER**
Magnesium	NLE	< 5000	**13,600**	NA	NA	NA	NA	NA
Manganese	50	< 15	**125**	NA	NA	NA	NA	NA
Mercury	2	< 0.2	< 0.2	NA	NA	NA	NA	NA
Nickel	100	< 10	**22.5**	NA	NA	NA	NA	NA
Potassium	NLE	< 10000	**13,500**	NA	NA	NA	NA	NA
Selenium	40	< 10	< 10	NA	NA	NA	NA	NA
Silver	40	< 10	< 10	NA	NA	NA	NA	NA
Sodium	50,000	< 10000	**33,600**	NA	NA	NA	NA	NA
Thallium	2	< 2	< 2	NA	NA	NA	NA	NA
Vanadium	NLE	< 50	< 50	NA	NA	NA	NA	NA
Zinc	2,000	**20.4**	**109**	NA	NA	NA	NA	NA

TABLE 4.8
DETECTED GROUNDWATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW01						
Sample ID		FTMM53-GW-699MW01-46-Dup	FTMM53-GW-699MW01-47	FTMM53-GW-699MW01-48	FTMM53-GW-699MW01-48-Dup	FTMM53-GW-699MW01-49	FTMM53-GW-699MW01-50	FTMM53-GW-699MW01-1
Sample Date		12/30/2008	3/27/2009	6/25/2009	6/25/2009	8/26/2009	11/16/2009	3/25/2010
Sample Round		46	47	48	48	49	50	1
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	**3.5**	**10.5**	**0.7 J**	**0.77 J**	**9.63**	**6.56 D**	**1.41**
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	**190.2**	**419.87 D**	**5.68**	**8.35**	**587.78 D**	**376.59 D**	**45.63**
Meta/Para Xylene	1,000	**193.83**	**874.09 D**	**2.09 J**	**3.94 J**	**606.88 D**	**218.2 D**	**12.23**
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	ND	ND	ND
Ortho Xylene	1,000	**231.05**	**940.67 D**	**15.21**	**22.31**	**866.01 D**	**448.44 D**	**36.35**
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	**14.94**	**53.67 D**	**0.31 J**	**0.49 J**	**30.28**	**13.27 D**	**1.72**
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	**654**	**1,018**	**80**	**106**	**462**	**9,140**	**562**
Inorganics (µg/l)								
Aluminum	200	NA	NA	NA	NA	NA	NA	**883**
Antimony	6	NA	NA	NA	NA	NA	NA	**5.65 ER**
Arsenic	3	NA	NA	NA	NA	NA	NA	**4.49 ER**
Barium	6,000	NA	NA	NA	NA	NA	NA	**76**
Beryllium	1	NA	NA	NA	NA	NA	NA	**0.428 ER**
Cadmium	4	NA	NA	NA	NA	NA	NA	**2.13**
Calcium	NLE	NA	NA	NA	NA	NA	NA	**54,000**
Chromium	70	NA	NA	NA	NA	NA	NA	ND
Cobalt	100	NA	NA	NA	NA	NA	NA	**6.36**
Copper	1,300	NA	NA	NA	NA	NA	NA	ND
Iron	300	NA	NA	NA	NA	NA	NA	**18,600**
Lead	5	**3.07 ER**	**7.3**	**5.62**	**6.34**	ND	**2.53 ER**	ND
Magnesium	NLE	NA	NA	NA	NA	NA	NA	**19,200**
Manganese	50	NA	NA	NA	NA	NA	NA	**819**
Mercury	2	NA	NA	NA	NA	NA	NA	ND
Nickel	100	NA	NA	NA	NA	NA	NA	**9.24**
Potassium	NLE	NA	NA	NA	NA	NA	NA	**9,530**
Selenium	40	NA	NA	NA	NA	NA	NA	**37.6**
Silver	40	NA	NA	NA	NA	NA	NA	ND
Sodium	50,000	NA	NA	NA	NA	NA	NA	**529,000 E**
Thallium	2	NA	NA	NA	NA	NA	NA	ND
Vanadium	NLE	NA	NA	NA	NA	NA	NA	**4.31 ER**
Zinc	2,000	NA	NA	NA	NA	NA	NA	**48.2 ER**

TABLE 4.8
DETECTED GROUNDWATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW01						699MW02
Sample ID		FTMM53-GW-699MW01-2	FTMM53-GW-699MW01-3	FTMM53-GW-699MW01-4	FTMM53-GW-699MW01-5	FTMM53-GW-699MW01-6	FTMM53-GW-699MW01-6-Dup	FTMM53-GW-699MW02-44
Sample Date		6/16/2010	9/17/2010	1/10/2011	3/15/2011	6/3/2011	6/3/2011	3/30/2008
Sample Round		2	3	4	5	6	6	44
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	**0.99**	**9.65**	**0.3 J**	ND	**0.35 J**	**0.48 J**	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	**11.97**	**143.24 D**	**16.25**	**1.18**	**12.68**	**17.45**	ND
Meta/Para Xylene	1,000	**0.38 J**	**4.25**	**0.74 J**	ND	**13.24**	**18.57**	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	**0.36 J**	**0.3 J**	ND
Ortho Xylene	1,000	**13.8**	**97.6 D**	**6.32**	**2.42**	**14.23**	**20.51**	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	ND	**9.9**	**0.31 J**	ND	**0.67**	**0.92**	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	**281**	**1,983**	**139**	**7**	**154**	**188**	ND
Inorganics (µg/l)								
Aluminum	200	**1,390**	**198**	**375**	**1,620**	**1,620**	**2,810**	NA
Antimony	6	**7.44 ER**	**6.88 ER**	< 6	< 6	< 6	< 6	NA
Arsenic	3	**3.07 ER**	**11.79**	< 3	< 3	**9**	**12.1**	NA
Barium	6,000	**63.1**	**41.9**	< 200	< 200	< 200	< 200	NA
Beryllium	1	**1.65**	**0.1 ER**	< 1	< 1	< 1	< 1	NA
Cadmium	4	ND	**0.835 ER**	< 3	< 3	< 3	< 3	NA
Calcium	NLE	**20,500**	**23,500**	**114,000**	**15,700**	**16,600**	**16,700**	NA
Chromium	70	ND	ND	< 10	**11.2**	< 10	< 10	NA
Cobalt	100	**10.8**	**2.42**	< 50	< 50	< 50	< 50	NA
Copper	1,300	**2.03 ER**	**1.28 ER**	< 10	**13.8**	< 10	< 10	NA
Iron	300	**3,710**	**23,000**	**3,990**	**3,880**	**7,640**	**10,500**	NA
Lead	5	ND	ND	< 3	**6**	< 3	**5.8**	ND
Magnesium	NLE	**12,400**	**13,300**	**21,600**	< 5000	**6,470**	**6,620**	NA
Manganese	50	**565**	**561**	**345**	**21.9**	**323**	**328**	NA
Mercury	2	**0.1 ER**	ND	ND	< 0.2	< 0.2	< 0.2	NA
Nickel	100	**12.4**	**1.49 ER**	< 10	< 10	< 10	< 10	NA
Potassium	NLE	**5,400**	**6,520**	**13,100**	< 10000	< 10000	< 10000	NA
Selenium	40	NA	**2.7 ER**	< 10	< 10	< 10	< 10	NA
Silver	40	**1.04 ER**	**3.7 ER**	< 10	< 10	< 10	< 10	NA
Sodium	50,000	**285,000**	**316,000**	**577,000**	**121,000**	**248,000**	**254,000**	NA
Thallium	2	ND	ND	< 2	< 2	< 2	< 2	NA
Vanadium	NLE	ND	ND	< 50	< 50	< 50	< 50	NA
Zinc	2,000	**74.6**	ND	< 20	< 20	**25.3**	**38.2**	NA

TABLE 4.8
DETECTED GROUNDWATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW02						
Sample ID		FTMM53-GW-699MW02-45	FTMM53-GW-699MW02-46	FTMM53-GW-699MW02-47	FTMM53-GW-699MW02-48	FTMM53-GW-699MW02-49	FTMM53-GW-699MW02-49-Dup	FTMM53-GW-699MW02-50
Sample Date		6/4/2008	9/29/2008	12/30/2008	3/27/2009	6/24/2009	6/24/2009	8/26/2009
Sample Round		45	46	47	48	49	49	50
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	ND	ND	ND	ND	ND	ND	ND
Meta/Para Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	ND	ND	ND
Ortho Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	ND	ND	ND	ND
Inorganics (µg/l)								
Aluminum	200	NA	NA	NA	NA	NA	NA	NA
Antimony	6	NA	NA	NA	NA	NA	NA	NA
Arsenic	3	NA	NA	NA	NA	NA	NA	NA
Barium	6,000	NA	NA	NA	NA	NA	NA	NA
Beryllium	1	NA	NA	NA	NA	NA	NA	NA
Cadmium	4	NA	NA	NA	NA	NA	NA	NA
Calcium	NLE	NA	NA	NA	NA	NA	NA	NA
Chromium	70	NA	NA	NA	NA	NA	NA	NA
Cobalt	100	NA	NA	NA	NA	NA	NA	NA
Copper	1,300	NA	NA	NA	NA	NA	NA	NA
Iron	300	NA	NA	NA	NA	NA	NA	NA
Lead	5	ND	**2.48 ER**	**4.18 ER**	**2.33 ER**	**1.65 ER**	**1.76 ER**	ND
Magnesium	NLE	NA	NA	NA	NA	NA	NA	NA
Manganese	50	NA	NA	NA	NA	NA	NA	NA
Mercury	2	NA	NA	NA	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	NA	NA	NA	NA	NA	NA	NA
Selenium	40	NA	NA	NA	NA	NA	NA	NA
Silver	40	NA	NA	NA	NA	NA	NA	NA
Sodium	50,000	NA	NA	NA	NA	NA	NA	NA
Thallium	2	NA	NA	NA	NA	NA	NA	NA
Vanadium	NLE	NA	NA	NA	NA	NA	NA	NA
Zinc	2,000	NA	NA	NA	NA	NA	NA	NA

TABLE 4.8
DETECTED GROUNDWATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW02						
Sample ID		FTMM53-GW-699MW02-51	FTMM53-GW-699MW02-51-Dup	FTMM53-GW-699MW02-1	FTMM53-GW-699MW02-1-Dup	FTMM53-GW-699MW02-2	FTMM53-GW-699MW02-3	FTMM53-GW-699MW02-4
Sample Date		11/16/2009	11/16/2009	3/26/2010	3/26/2010	6/15/2010	9/16/2010	1/6/2011
Sample Round		51	51	1	1	2	3	4
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	ND	ND	ND	ND	ND	ND	ND
Meta/Para Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	ND	ND	ND
Ortho Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	ND	ND	ND	ND
Inorganics (µg/l)								
Aluminum	200	NA	NA	**129**	**139**	**68.2 ER**	**68.6 ER**	< 200
Antimony	6	NA	NA	**5.66 ER**	**7.2 ER**	**7.15 ER**	**15.4**	< 6
Arsenic	3	NA	NA	**1.36 ER**	**0.67 ER**	**1.92 ER**	**2.77 ER**	< 3
Barium	6,000	NA	NA	**9.46**	**9.43**	**10.4**	**15.1**	< 200
Beryllium	1	NA	NA	ND	ND	**0.158 ER**	**0.157 ER**	< 1
Cadmium	4	NA	NA	**1.19 ER**	**0.938 ER**	**0.572 ER**	**1.44 ER**	< 3
Calcium	NLE	NA	NA	**72,800**	**69,600**	**52,900**	**66,600**	**128,000**
Chromium	70	NA	NA	ND	ND	ND	ND	< 10
Cobalt	100	NA	NA	**0.8 ER**	**0.716 ER**	**4.52**	**7.47**	< 50
Copper	1,300	NA	NA	**2.22 ER**	**5.74**	**1.64 ER**	**2.11 ER**	< 10
Iron	300	NA	NA	**186 ER**	**240 ER**	**3,380**	**5,800**	< 100
Lead	5	**6.58**	ND	ND	ND	**3.05 ER**	ND	< 3
Magnesium	NLE	NA	NA	**5,110**	**4,890**	**8,560**	**12,200**	**27,500**
Manganese	50	NA	NA	**6.12**	**6.42**	**38.8**	**117**	**69.2**
Mercury	2	NA	NA	ND	ND	**0.07 ER**	ND	ND
Nickel	100	NA	NA	**5.82**	**5.25**	**9.75**	**12.2**	**26.8**
Potassium	NLE	NA	NA	**2,860**	**2,880**	**3,100**	**5,820**	**10,200**
Selenium	40	NA	NA	**62**	**59.2**	NA	**1.53 ER**	< 10
Silver	40	NA	NA	**3.3 ER**	**3.12 ER**	ND	ND	< 10
Sodium	50,000	NA	NA	**12,700**	**11,100**	**14,700**	**18,300**	**60,200**
Thallium	2	NA	NA	**0.86 ER**	ND	ND	ND	< 2
Vanadium	NLE	NA	NA	**1.2 ER**	**1.64 ER**	ND	**0.771 ER**	< 50
Zinc	2,000	NA	NA	**27.5 ER**	**30.2 ER**	**49.2 ER**	**62.7**	**61.7**

TABLE 4.8
DETECTED GROUNDWATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW02			699MW04			
Sample ID		FTMM53-GW-699MW02-5	FTMM53-GW-699MW02-6	FTMM53-GW-699MW02-6-Dup	FTMM53-GW-699MW04-42	FTMM53-GW-699MW04-43	FTMM53-GW-699MW04-43-Dup	FTMM53-GW-699MW04-44
Sample Date		3/15/2011	5/27/2011	5/27/2011	3/30/2008	6/4/2008	6/4/2008	9/29/2008
Sample Round		5	6	6	42	43	43	44
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	**1.47 J**	ND	ND	ND
Benzene	1	ND	ND	ND	**9.35**	**32.21**	**45.15**	**25.37**
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	ND	ND	ND	**39.32**	**36.72**	**88.46**	**17.61**
Meta/Para Xylene	1,000	ND	ND	ND	**85.47**	**52.71**	**140.04**	**25.36**
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	**78.05**	**48.41**	**115.01**	**40.79**
Ortho Xylene	1,000	ND	ND	ND	**48.91**	**35.43**	**43.03**	**15.05**
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	ND	ND	ND	**3.77**	**2.53**	**3.53**	**2.36**
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	**296**	**503**	**575**	**747**
Inorganics (µg/l)								
Aluminum	200	**437**	**2,550**	**1,570**	NA	NA	NA	NA
Antimony	6	< 6	< 6	< 6	NA	NA	NA	NA
Arsenic	3	< 3	< 3	**5.7**	NA	NA	NA	NA
Barium	6,000	< 200	< 200	< 200	NA	NA	NA	NA
Beryllium	1	< 1	< 1	< 1	NA	NA	NA	NA
Cadmium	4	< 3	< 3	< 3	NA	NA	NA	NA
Calcium	NLE	**62,800**	< 5000	**109,000**	NA	NA	NA	NA
Chromium	70	< 10	**19.8**	**10.8**	NA	NA	NA	NA
Cobalt	100	< 50	< 50	< 50	NA	NA	NA	NA
Copper	1,300	< 10	< 10	< 10	NA	NA	NA	NA
Iron	300	**865**	**5,000**	**7,760**	NA	NA	NA	NA
Lead	5	< 3	**5.3**	**5.7**	ND	**4.56 ER**	**4.25 ER**	**4.69 ER**
Magnesium	NLE	**5,040**	< 5000	**13,600**	NA	NA	NA	NA
Manganese	50	< 15	**23.7**	**123**	NA	NA	NA	NA
Mercury	2	< 0.2	< 0.2	< 0.2	NA	NA	NA	NA
Nickel	100	< 10	**10.6**	**20.4**	NA	NA	NA	NA
Potassium	NLE	**25,900**	< 10000	**13,300**	NA	NA	NA	NA
Selenium	40	< 10	< 10	< 10	NA	NA	NA	NA
Silver	40	< 10	< 10	< 10	NA	NA	NA	NA
Sodium	50,000	**16,300**	< 10000	**33,900**	NA	NA	NA	NA
Thallium	2	< 2	< 2	< 2	NA	NA	NA	NA
Vanadium	NLE	< 50	< 50	< 50	NA	NA	NA	NA
Zinc	2,000	**77.4**	**51**	**96.7**	NA	NA	NA	NA

TABLE 4.8
DETECTED GROUNDWATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW04						
Sample ID		FTMM53-GW-699MW04-44-Dup	FTMM53-GW-699MW04-45	FTMM53-GW-699MW04-46	FTMM53-GW-699MW04-47	FTMM53-GW-699MW04-48	FTMM53-GW-699MW04-49	FTMM53-GW-699MW04-1
Sample Date		9/29/2008	12/30/2008	3/27/2009	6/25/2009	8/26/2009	11/16/2009	3/26/2010
Sample Round		44	45	46	47	48	49	1
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	**25.44**	**13.31**	**20.32**	**21.62**	**4.69**	**7.34**	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	**18.31**	**53.28**	**118.21 D**	**289.42 D**	**5.46**	**66.76**	**0.99**
Meta/Para Xylene	1,000	**26.96**	**81.63**	**139.14 D**	**540.66 D**	**7.71**	**71.01**	**0.97 J**
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	**41.42**	**27.62**	**49.49**	**47.72**	**5.05**	**22.77**	**6.16**
Ortho Xylene	1,000	**16.09**	**71.16**	**141.12 D**	**396.44 D**	**4.57**	**70.77**	**1.1**
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	**2.57**	**4.2**	**5.65**	**16.03**	**0.48 J**	**2.73**	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	**807**	**405**	**1,302**	**923**	**778**	**626**	ND
Inorganics (µg/l)								
Aluminum	200	NA	NA	NA	NA	NA	NA	**2,430**
Antimony	6	NA	NA	NA	NA	NA	NA	**7.88 ER**
Arsenic	3	NA	NA	NA	NA	NA	NA	**1.11 ER**
Barium	6,000	NA	NA	NA	NA	NA	NA	**60.7**
Beryllium	1	NA	NA	NA	NA	NA	NA	**1.46**
Cadmium	4	NA	NA	NA	NA	NA	NA	**7.09**
Calcium	NLE	NA	NA	NA	NA	NA	NA	**85,100**
Chromium	70	NA	NA	NA	NA	NA	NA	ND
Cobalt	100	NA	NA	NA	NA	NA	NA	**23.8**
Copper	1,300	NA	NA	NA	NA	NA	NA	ND
Iron	300	NA	NA	NA	NA	NA	NA	**1,510**
Lead	5	**8.37**	**4.31 ER**	**6.92**	**1.63 ER**	ND	ND	ND
Magnesium	NLE	NA	NA	NA	NA	NA	NA	**22,300**
Manganese	50	NA	NA	NA	NA	NA	NA	**854**
Mercury	2	NA	NA	NA	NA	NA	NA	ND
Nickel	100	NA	NA	NA	NA	NA	NA	**46.7**
Potassium	NLE	NA	NA	NA	NA	NA	NA	**8,630**
Selenium	40	NA	NA	NA	NA	NA	NA	**61.9**
Silver	40	NA	NA	NA	NA	NA	NA	**3.03 ER**
Sodium	50,000	NA	NA	NA	NA	NA	NA	**256,000**
Thallium	2	NA	NA	NA	NA	NA	NA	ND
Vanadium	NLE	NA	NA	NA	NA	NA	NA	**1.42 ER**
Zinc	2,000	NA	NA	NA	NA	NA	NA	**376**

TABLE 4.8
DETECTED GROUNDWATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW04						699MW05
Sample ID		FTMM53-GW-699MW04-2	FTMM53-GW-699MW04-3	FTMM53-GW-699MW04-4	FTMM53-GW-699MW04-4-Dup	FTMM53-GW-699MW04-5	FTMM53-GW-699MW04-6	FTMM53-GW-699MW05-44
Sample Date		6/16/2010	9/17/2010	1/10/2011	1/10/2011	3/15/2011	6/2/2011	3/30/2008
Sample Round		2	3	4	4	5	6	44
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	**10.92**
Benzene	1	ND	**9.07**	**1.62**	**1.8**	ND	**58.16**	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	**1.71**	**93.76**	**3.83**	**4.04**	**0.3 J**	**85.35**	ND
Meta/Para Xylene	1,000	ND	**36.73**	**1.92**	**1.95**	**0.46 J**	**100.97**	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	**3.08**
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	**3.03**	**25.13**	**10.87**	**10.06**	**1.95**	**12.58**	ND
Ortho Xylene	1,000	**1.34**	**30.9**	**0.52**	**0.42 J**	**0.3 J**	**63.17**	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	**19.67**	ND	ND	ND	**8.35**	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	ND	**10.33**	ND	ND	ND	**7.35**	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	**4**	**1,219**	**90**	**108**	ND	**968**	ND
Inorganics (µg/l)								
Aluminum	200	**1,470**	**161**	**287**	**262**	**4,080**	**4,220**	NA
Antimony	6	**9.37 ER**	**12.8**	< 6	< 6	< 6	< 6	NA
Arsenic	3	**1.18 ER**	**4.18 ER**	< 3	< 3	< 3	**6.7**	NA
Barium	6,000	**51.5**	**15.1**	< 200	< 200	< 200	< 200	NA
Beryllium	1	**1.33**	**0.078 ER**	< 1	< 1	**1.1**	**1.1**	NA
Cadmium	4	**1.39 ER**	**1.4 ER**	< 3	< 3	**4.3**	< 3	NA
Calcium	NLE	**58,700**	**22,500**	**24,500**	**25,200**	**89,600**	**50,700**	NA
Chromium	70	ND	ND	< 10	< 10	< 10	< 10	NA
Cobalt	100	**6.44**	**0.876 ER**	< 50	< 50	< 50	< 50	NA
Copper	1,300	ND	ND	< 10	< 10	< 10	< 10	NA
Iron	300	**838**	**27,700**	**4,110**	**4,470**	**1,800**	**14,600**	NA
Lead	5	ND	ND	< 3	< 3	< 3	**3.5**	ND
Magnesium	NLE	**16,000**	**6,260**	**6,250**	**6,390**	**22,500**	**14,200**	NA
Manganese	50	**470**	**149**	**226**	**228**	**651**	**528**	NA
Mercury	2	**0.09 ER**	ND	ND	ND	< 0.2	< 0.2	NA
Nickel	100	**14**	**1.95 ER**	< 10	< 10	**34.2**	**19.8**	NA
Potassium	NLE	**6,000**	**3,020**	< 10000	< 10000	< 10000	< 10000	NA
Selenium	40	NA	**1.77 ER**	< 10	< 10	< 10	< 10	NA
Silver	40	ND	**4.2 ER**	< 10	< 10	< 10	< 10	NA
Sodium	50,000	**177,000**	**102,000**	**111,000**	**113,000**	**293,000**	**201,000**	NA
Thallium	2	ND	ND	< 2	< 2	< 2	< 2	NA
Vanadium	NLE	**0.622 ER**	ND	< 50	< 50	< 50	< 50	NA
Zinc	2,000	**90.6**	**13.3 ER**	**20.3**	< 20	**180**	**107**	NA

TABLE 4.8
DETECTED GROUNDWATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW05						
Sample ID		FTMM53-GW-699MW05-45	FTMM53-GW-699MW05-46	FTMM53-GW-699MW05-47	FTMM53-GW-699MW05-48	FTMM53-GW-699MW05-49	FTMM53-GW-699MW05-50	FTMM53-GW-699MW05-51
Sample Date		6/4/2008	9/29/2008	12/30/2008	3/27/2009	6/24/2009	8/26/2009	11/16/2009
Sample Round		45	46	47	48	49	50	51
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	ND	ND	ND	ND	ND	ND	ND
Meta/Para Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	ND	ND	ND
Ortho Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	ND	ND	ND	ND
Inorganics (µg/l)								
Aluminum	200	NA	NA	NA	NA	NA	NA	NA
Antimony	6	NA	NA	NA	NA	NA	NA	NA
Arsenic	3	NA	NA	NA	NA	NA	NA	NA
Barium	6,000	NA	NA	NA	NA	NA	NA	NA
Beryllium	1	NA	NA	NA	NA	NA	NA	NA
Cadmium	4	NA	NA	NA	NA	NA	NA	NA
Calcium	NLE	NA	NA	NA	NA	NA	NA	NA
Chromium	70	NA	NA	NA	NA	NA	NA	NA
Cobalt	100	NA	NA	NA	NA	NA	NA	NA
Copper	1,300	NA	NA	NA	NA	NA	NA	NA
Iron	300	NA	NA	NA	NA	NA	NA	NA
Lead	5	ND	**1.99 ER**	**2.8 ER**	ND	ND	ND	ND
Magnesium	NLE	NA	NA	NA	NA	NA	NA	NA
Manganese	50	NA	NA	NA	NA	NA	NA	NA
Mercury	2	NA	NA	NA	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	NA	NA	NA	NA	NA	NA	NA
Selenium	40	NA	NA	NA	NA	NA	NA	NA
Silver	40	NA	NA	NA	NA	NA	NA	NA
Sodium	50,000	NA	NA	NA	NA	NA	NA	NA
Thallium	2	NA	NA	NA	NA	NA	NA	NA
Vanadium	NLE	NA	NA	NA	NA	NA	NA	NA
Zinc	2,000	NA	NA	NA	NA	NA	NA	NA

TABLE 4.8
DETECTED GROUNDWATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW05						
Sample ID		FTMM53-GW-699MW05-1	FTMM53-GW-699MW05-1-Dup	FTMM53-GW-699MW05-2	FTMM53-GW-699MW05-3	FTMM53-GW-699MW05-4	FTMM53-GW-699MW05-5	FTMM53-GW-699MW05-5-Dup
Sample Date		3/24/2010	3/24/2010	6/16/2010	9/16/2010	1/5/2011	3/11/2011	3/11/2011
Sample Round		1	1	2	3	4	5	5
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	ND	ND	ND	ND	ND	ND	ND
Meta/Para Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	ND	ND	ND
Ortho Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	ND	ND	ND	ND
Inorganics (µg/l)								
Aluminum	200	**432**	**367**	**27.9 ER**	**4,860**	**2,650**	**1,640**	**1,620**
Antimony	6	**5.38 ER**	**9.89 ER**	**6.14 ER**	**10**	< 6	< 6	< 6
Arsenic	3	**1.76 ER**	**0.84 ER**	ND	**1.44 ER**	< 3	< 3	< 3
Barium	6,000	**51.4**	**59.5**	**41.2**	**181**	< 200	< 200	< 200
Beryllium	1	ND	ND	ND	**3.59**	**1.2**	< 1	< 1
Cadmium	4	ND	ND	**0.579 ER**	**1.98 ER**	< 3	< 3	< 3
Calcium	NLE	**29,100**	**35,000**	**20,700**	**28,300**	**30,000**	**21,800**	**22,000**
Chromium	70	**1.87 ER**	**1.77 ER**	ND	ND	< 10	< 10	< 10
Cobalt	100	ND	ND	ND	**8.46**	< 50	< 50	< 50
Copper	1,300	**8.44**	**9.08**	**2.01 ER**	**1.38 ER**	< 10	< 10	< 10
Iron	300	**827**	**619**	ND	**54 ER**	**220**	**1,060**	**983**
Lead	5	ND	ND	ND	ND	< 3	< 3	< 3
Magnesium	NLE	**3,040**	**3,640**	**2,990**	**8,200**	**6,590**	< 5000	< 5000
Manganese	50	**51.7**	**59.9**	**46.7**	**268**	**285**	**127**	**128**
Mercury	2	ND	ND	**0.06 ER**	ND	ND	< 0.2	< 0.2
Nickel	100	**4.49 ER**	**4.17 ER**	**1.37 ER**	**19.1**	**10.8**	< 10	< 10
Potassium	NLE	**15,000**	**15,900**	**6,370**	**4,350**	< 10000	< 10000	< 10000
Selenium	40	**29.6**	**42.5**	NA	**1.45 ER**	< 10	< 10	< 10
Silver	40	**2.13 ER**	**3.01 ER**	**0.903 ER**	ND	< 10	< 10	< 10
Sodium	50,000	**862,000 E**	**1,030,000 E**	**530,000 E**	**246,000**	**267,000**	**192,000**	**190,000**
Thallium	2	ND	ND	ND	ND	< 2	< 2	< 2
Vanadium	NLE	**4.09 ER**	**3.45 ER**	**1.23 ER**	**0.679 ER**	< 50	< 50	< 50
Zinc	2,000	**17.5 ER**	**18.8 ER**	**49.2 ER**	**137**	**58.1**	**155**	**142**

TABLE 4.8
DETECTED GROUNDWATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW05	699MW06					
Sample ID		FTMM53-GW-699MW05-6	FTMM53-GW-699MW06-43	FTMM53-GW-699MW06-44	FTMM53-GW-699MW06-45	FTMM53-GW-699MW06-46	FTMM53-GW-699MW06-47	FTMM53-GW-699MW06-48
Sample Date		6/1/2011	3/30/2008	6/4/2008	9/29/2008	12/30/2008	3/27/2009	6/24/2009
Sample Round		6	43	44	45	46	47	48
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	**2.29**	ND	ND	ND	ND	ND
Benzene	1	ND	**6.27**	**34.82**	**73.8**	**9.24**	**26.73**	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	**22.95**	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	ND	**50.27**	**283.29**	**333.11**	**44.48**	**427.63 D**	ND
Meta/Para Xylene	1,000	ND	**65.44**	**224.14**	**176.29**	**33.93**	**541.18 D**	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	**6.02**	**2.93**	**0.72 J**	**0.58 J**	**0.7 J**	ND
Ortho Xylene	1,000	ND	**29.01**	**108.41**	**25.77**	**14.49**	**197.76 D**	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	ND	**2.69**	**13.82**	**5.1**	**1.21 J**	**14.15**	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	**86**	**210**	**212**	**123**	**632**	ND
Inorganics (µg/l)								
Aluminum	200	**3,020**	NA	NA	NA	NA	NA	NA
Antimony	6	< 6	NA	NA	NA	NA	NA	NA
Arsenic	3	< 3	NA	NA	NA	NA	NA	NA
Barium	6,000	< 200	NA	NA	NA	NA	NA	NA
Beryllium	1	**1.7**	NA	NA	NA	NA	NA	NA
Cadmium	4	< 3	NA	NA	NA	NA	NA	NA
Calcium	NLE	**29,500**	NA	NA	NA	NA	NA	NA
Chromium	70	< 10	NA	NA	NA	NA	NA	NA
Cobalt	100	< 50	NA	NA	NA	NA	NA	NA
Copper	1,300	< 10	NA	NA	NA	NA	NA	NA
Iron	300	**754**	NA	NA	NA	NA	NA	NA
Lead	5	< 3	ND	**5.99**	**3.76 ER**	**2.53 ER**	**6.11**	ND
Magnesium	NLE	**6,180**	NA	NA	NA	NA	NA	NA
Manganese	50	**288**	NA	NA	NA	NA	NA	NA
Mercury	2	< 0.2	NA	NA	NA	NA	NA	NA
Nickel	100	**16.6**	NA	NA	NA	NA	NA	NA
Potassium	NLE	< 10000	NA	NA	NA	NA	NA	NA
Selenium	40	< 10	NA	NA	NA	NA	NA	NA
Silver	40	< 10	NA	NA	NA	NA	NA	NA
Sodium	50,000	**256,000**	NA	NA	NA	NA	NA	NA
Thallium	2	< 2	NA	NA	NA	NA	NA	NA
Vanadium	NLE	< 50	NA	NA	NA	NA	NA	NA
Zinc	2,000	**61.9**	NA	NA	NA	NA	NA	NA

TABLE 4.8
DETECTED GROUNDWATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW06						
Sample ID		FTMM53-GW-699MW06-49	FTMM53-GW-699MW06-50	FTMM53-GW-699MW06-1	FTMM53-GW-699MW06-2	FTMM53-GW-699MW06-3	FTMM53-GW-699MW06-4	FTMM53-GW-699MW06-5
Sample Date		8/26/2009	11/16/2009	3/26/2010	6/16/2010	9/17/2010	1/5/2011	3/11/2011
Sample Round		49	50	1	2	3	4	5
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	**13.93**	**2.08**	**0.59**	**1.03**	**4.22**	ND	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	**735.48 D**	**31.39**	**26.31**	**11.82**	**3.02**	ND	ND
Meta/Para Xylene	1,000	**1,048 D**	**38.73**	**37.9**	**6.55**	**3.32**	ND	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	ND	ND	ND
Ortho Xylene	1,000	**146.76 D**	**5.82**	**16.54**	**0.75**	**1.2**	ND	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	**11.3**	**0.44 J**	**1.43**	ND	ND	ND	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	**533**	**75**	**57**	**56**	**104**	ND	ND
Inorganics (µg/l)								
Aluminum	200	NA	NA	**12,900**	**852**	**232**	< 200	**3,400**
Antimony	6	NA	NA	**7.69 ER**	ND	**13.2**	< 6	< 6
Arsenic	3	NA	NA	**10.16**	**2.2 ER**	**2.04 ER**	< 3	< 3
Barium	6,000	NA	NA	**63.1**	**22.5**	**19.9**	< 200	< 200
Beryllium	1	NA	NA	**0.819**	**0.066 ER**	ND	< 1	< 1
Cadmium	4	NA	NA	**1.84 ER**	ND	**0.552 ER**	< 3	< 3
Calcium	NLE	NA	NA	**39,400**	**18,400**	**27,900**	**74,200**	**11,500**
Chromium	70	NA	NA	**104**	**7.24**	**8.12**	< 10	**29.3**
Cobalt	100	NA	NA	**6.02**	ND	**0.662 ER**	< 50	< 50
Copper	1,300	NA	NA	**1.41 ER**	ND	**6.86**	< 20	**13.5**
Iron	300	NA	NA	**21,000**	**1,710**	**2,840**	**489**	**7,480**
Lead	5	ND	ND	**8.68**	ND	ND	< 3	**4.8**
Magnesium	NLE	NA	NA	**8,290**	**3,790**	**4,360**	**8,660**	< 5000
Manganese	50	NA	NA	**73.3**	**48.7**	**14.5**	< 15	**23.2**
Mercury	2	NA	NA	ND	**0.08 ER**	ND	ND	< 0.2
Nickel	100	NA	NA	**18.7**	**4.11 ER**	**4.6 ER**	< 10	< 10
Potassium	NLE	NA	NA	**8,810**	**2,330**	**2,340**	< 10000	< 10000
Selenium	40	NA	NA	**23.8**	NA	**2.62 ER**	< 10	< 10
Silver	40	NA	NA	ND	**0.885 ER**	ND	< 10	< 10
Sodium	50,000	NA	NA	**63,100**	**62,300**	**72,600**	**78,200**	**20,500**
Thallium	2	NA	NA	ND	ND	ND	< 2	< 2
Vanadium	NLE	NA	NA	**56.2**	**3.5 ER**	**2.16 ER**	< 50	< 50
Zinc	2,000	NA	NA	**121**	**18 ER**	**16.7 ER**	< 20	**21.9**

TABLE 4.8
DETECTED GROUNDWATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW06		699MW08				
Sample ID		FTMM53-GW-699MW06-6	FTMM53-GW-699MW06-6-Dup	FTMM53-GW-699MW08-44	FTMM53-GW-699MW08-45	FTMM53-GW-699MW08-46	FTMM53-GW-699MW08-47	FTMM53-GW-699MW08-48
Sample Date		6/2/2011	6/2/2011	3/30/2008	6/4/2008	9/29/2008	12/30/2008	3/27/2009
Sample Round		6	6	44	45	46	47	48
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	**0.69**	**0.78**	ND	ND	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	**89.43**	**98.65**	ND	ND	ND	ND	ND
Meta/Para Xylene	1,000	**78.95**	**88.01**	ND	ND	ND	ND	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	ND	ND	ND
Ortho Xylene	1,000	**20.48**	**21.27**	ND	ND	ND	ND	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	**0.83**	**0.91**	ND	ND	ND	ND	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	**294**	**319**	ND	ND	ND	ND	ND
Inorganics (µg/l)								
Aluminum	200	**3,070**	**2,000**	NA	NA	NA	NA	NA
Antimony	6	< 6	< 6	NA	NA	NA	NA	NA
Arsenic	3	**16**	**12.7**	NA	NA	NA	NA	NA
Barium	6,000	< 200	< 200	NA	NA	NA	NA	NA
Beryllium	1	< 1	< 1	NA	NA	NA	NA	NA
Cadmium	4	< 3	< 3	NA	NA	NA	NA	NA
Calcium	NLE	**20,300**	**20,400**	NA	NA	NA	NA	NA
Chromium	70	**33.5**	**22.8**	NA	NA	NA	NA	NA
Cobalt	100	< 50	< 50	NA	NA	NA	NA	NA
Copper	1,300	< 10	< 10	NA	NA	NA	NA	NA
Iron	300	**12,200**	**8,590**	NA	NA	NA	NA	NA
Lead	5	**5**	**3.1**	ND	ND	ND	**4.27 ER**	ND
Magnesium	NLE	< 5000	< 5000	NA	NA	NA	NA	NA
Manganese	50	**36.3**	**34.2**	NA	NA	NA	NA	NA
Mercury	2	< 0.2	< 0.2	NA	NA	NA	NA	NA
Nickel	100	< 10	< 10	NA	NA	NA	NA	NA
Potassium	NLE	< 10000	< 10000	NA	NA	NA	NA	NA
Selenium	40	< 10	< 10	NA	NA	NA	NA	NA
Silver	40	< 10	< 10	NA	NA	NA	NA	NA
Sodium	50,000	**57,200**	**57,000**	NA	NA	NA	NA	NA
Thallium	2	< 2	< 2	NA	NA	NA	NA	NA
Vanadium	NLE	< 50	< 50	NA	NA	NA	NA	NA
Zinc	2,000	**36.6**	**30.1**	NA	NA	NA	NA	NA

TABLE 4.8
DETECTED GROUNDWATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW08						
Sample ID		FTMM53-GW-699MW08-48-Dup	FTMM53-GW-699MW08-49	FTMM53-GW-699MW08-50	FTMM53-GW-699MW08-51	FTMM53-GW-699MW08-1	FTMM53-GW-699MW08-2	FTMM53-GW-699MW08-2-Dup
Sample Date		3/27/2009	6/24/2009	8/26/2009	11/16/2009	3/24/2010	6/16/2010	6/16/2010
Sample Round		48	49	50	51	1	2	2
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	ND	ND	ND	ND	ND	ND	ND
Meta/Para Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	ND	ND	ND
Ortho Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	ND	ND	ND	ND
Inorganics (µg/l)								
Aluminum	200	NA	NA	NA	NA	**2,110**	**6,020**	**6,090**
Antimony	6	NA	NA	NA	NA	**9.45 ER**	**10.5**	**12.3**
Arsenic	3	NA	NA	NA	NA	ND	**1.5 ER**	ND
Barium	6,000	NA	NA	NA	NA	**153**	**320**	**322**
Beryllium	1	NA	NA	NA	NA	**0.885**	**2.46**	**2.51**
Cadmium	4	NA	NA	NA	NA	**3.16**	**2.88**	**2.77**
Calcium	NLE	NA	NA	NA	NA	**56,000**	**50,500**	**51,200**
Chromium	70	NA	NA	NA	NA	ND	ND	ND
Cobalt	100	NA	NA	NA	NA	**24.5**	**18.6**	**19**
Copper	1,300	NA	NA	NA	NA	**1.25 ER**	ND	ND
Iron	300	NA	NA	NA	NA	**88.2 ER**	ND	ND
Lead	5	ND	ND	ND	ND	ND	**2.74 ER**	ND
Magnesium	NLE	NA	NA	NA	NA	**22,900**	**29,900**	**30,300**
Manganese	50	NA	NA	NA	NA	**1,950**	**980**	**997**
Mercury	2	NA	NA	NA	NA	ND	**0.08 ER**	**0.09 ER**
Nickel	100	NA	NA	NA	NA	**42.9**	**30.2**	**30.4**
Potassium	NLE	NA	NA	NA	NA	**10,600**	**9,280**	**9,360**
Selenium	40	NA	NA	NA	NA	**52.8**	NA	NA
Silver	40	NA	NA	NA	NA	**3.12 ER**	ND	ND
Sodium	50,000	NA	NA	NA	NA	**248,000**	**265,000**	**268,000**
Thallium	2	NA	NA	NA	NA	ND	ND	ND
Vanadium	NLE	NA	NA	NA	NA	**1.06 ER**	ND	ND
Zinc	2,000	NA	NA	NA	NA	**75**	**111**	**112**

TABLE 4.8
DETECTED GROUNDWATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW08				699MW09		
Sample ID		FTMM53-GW-699MW08-3	FTMM53-GW-699MW08-4	FTMM53-GW-699MW08-5	FTMM53-GW-699MW08-6	FTMM53-GW-699MW09-44	FTMM53-GW-699MW09-45	FTMM53-GW-699MW09-46
Sample Date		9/16/2010	12/30/2010	3/11/2011	6/2/2011	3/30/2008	6/4/2008	9/29/2008
Sample Round		3	4	5	6	44	45	46
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	ND	ND	ND	ND	ND	ND	ND
Meta/Para Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	ND	ND	**1.07 J**
Ortho Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	**6.97**
Toluene	600	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	ND	ND	ND	ND
Inorganics (µg/l)								
Aluminum	200	**6,330**	**6,060**	**3,780**	**5,160**	NA	NA	NA
Antimony	6	**14.6**	< 6	< 6	< 6	NA	NA	NA
Arsenic	3	**1.19 ER**	< 3	< 3	< 3	NA	NA	NA
Barium	6,000	**405**	**339**	**230**	**306**	NA	NA	NA
Beryllium	1	**3.31**	**2.2**	**1.5**	**2.1**	NA	NA	NA
Cadmium	4	**3.01**	< 3	< 3	**4**	NA	NA	NA
Calcium	NLE	**53,400**	**49,900**	**48,900**	**54,800**	NA	NA	NA
Chromium	70	ND	< 10	< 10	< 10	NA	NA	NA
Cobalt	100	**22.9**	< 50	< 50	< 50	NA	NA	NA
Copper	1,300	ND	< 10	< 10	< 10	NA	NA	NA
Iron	300	ND	**167**	**404**	**597**	NA	NA	NA
Lead	5	ND	< 3	< 3	< 3	ND	**1.51 ER**	**6.44**
Magnesium	NLE	**32,100**	**26,100**	**21,100**	**23,400**	NA	NA	NA
Manganese	50	**1,280**	**965**	**1,150**	**1,500**	NA	NA	NA
Mercury	2	ND	ND	< 0.2	< 0.2	NA	NA	NA
Nickel	100	**34.8**	**30.3**	**31.8**	**43.6**	NA	NA	NA
Potassium	NLE	**13,300**	< 10000	< 10000	**11,800**	NA	NA	NA
Selenium	40	**1.41 ER**	< 10	< 10	< 10	NA	NA	NA
Silver	40	ND	< 10	< 10	< 10	NA	NA	NA
Sodium	50,000	**296,000**	**265,000**	**261,000**	**275,000**	NA	NA	NA
Thallium	2	ND	< 2	< 2	< 2	NA	NA	NA
Vanadium	NLE	ND	< 50	< 50	< 50	NA	NA	NA
Zinc	2,000	**148**	**125**	**105**	**114**	NA	NA	NA

TABLE 4.8
DETECTED GROUND WATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW09						
Sample ID		FTMM53-GW-699MW09-47	FTMM53-GW-699MW09-48	FTMM53-GW-699MW09-49	FTMM53-GW-699MW09-50	FTMM53-GW-699MW09-51	FTMM53-GW-699MW09-1	FTMM53-GW-699MW09-2
Sample Date		12/30/2008	3/27/2009	6/24/2009	8/26/2009	11/16/2009	3/26/2010	6/16/2010
Sample Round		47	48	49	50	51	1	2
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	ND	ND	ND	ND	ND	ND	ND
Meta/Para Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	ND	ND	ND
Ortho Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	**1.65**	**1.88**	ND	**0.51**
Toluene	600	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	ND	ND	ND	ND
Inorganics (µg/l)								
Aluminum	200	NA	NA	NA	NA	NA	**2,810**	**3,310**
Antimony	6	NA	NA	NA	NA	NA	ND	ND
Arsenic	3	NA	NA	NA	NA	NA	**0.65 ER**	**0.77 ER**
Barium	6,000	NA	NA	NA	NA	NA	**33.4**	**90.9**
Beryllium	1	NA	NA	NA	NA	NA	**1.02**	**1.31**
Cadmium	4	NA	NA	NA	NA	NA	ND	**0.793 ER**
Calcium	NLE	NA	NA	NA	NA	NA	**2,250**	**12,700**
Chromium	70	NA	NA	NA	NA	NA	**2.48 ER**	ND
Cobalt	100	NA	NA	NA	NA	NA	**4.68**	**7.91**
Copper	1,300	NA	NA	NA	NA	NA	ND	ND
Iron	300	NA	NA	NA	NA	NA	**1,520**	**954**
Lead	5	**4.34 ER**	**2.25 ER**	ND	ND	ND	ND	ND
Magnesium	NLE	NA	NA	NA	NA	NA	**3,690**	**4,450**
Manganese	50	NA	NA	NA	NA	NA	**10.1**	**61.8**
Mercury	2	NA	NA	NA	NA	NA	ND	**0.08 ER**
Nickel	100	NA	NA	NA	NA	NA	**10.7**	**11.9**
Potassium	NLE	NA	NA	NA	NA	NA	**1,250**	**1,470**
Selenium	40	NA	NA	NA	NA	NA	ND	NA
Silver	40	NA	NA	NA	NA	NA	ND	**0.628 ER**
Sodium	50,000	NA	NA	NA	NA	NA	**42,300**	**97,100**
Thallium	2	NA	NA	NA	NA	NA	**0.68 ER**	ND
Vanadium	NLE	NA	NA	NA	NA	NA	**1.01 ER**	ND
Zinc	2,000	NA	NA	NA	NA	NA	**49.1 ER**	**178**

TABLE 4.8
DETECTED GROUND WATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW09				699MW12		
Sample ID		FTMM53-GW-699MW09-3	FTMM53-GW-699MW09-4	FTMM53-GW-699MW09-5	FTMM53-GW-699MW09-6	FTMM53-GW-699MW12-44	FTMM53-GW-699MW12-45	FTMM53-GW-699MW12-46
Sample Date		9/17/2010	1/5/2011	3/11/2011	6/1/2011	3/30/2008	6/4/2008	9/29/2008
Sample Round		3	4	5	6	44	45	46
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	**0.53**	ND	ND	ND	ND	ND	ND
Meta/Para Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	**1.78**	**2.93**	ND	ND	**0.51 J**	ND	ND
Ortho Xylene	1,000	**0.28 J**	ND	ND	ND	ND	ND	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	**2.32**	**1.09**	ND	ND	ND	ND	ND
Toluene	600	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	ND	ND	ND	ND
Inorganics (µg/l)								
Aluminum	200	**2,700**	**3,540**	**1,430**	**5,180**	NA	NA	NA
Antimony	6	**6.6 ER**	< 6	< 6	< 6	NA	NA	NA
Arsenic	3	ND	< 3	< 3	**3.6**	NA	NA	NA
Barium	6,000	**90.5**	< 200	< 200	< 200	NA	NA	NA
Beryllium	1	**1.35**	**1.8**	< 1	**1.9**	NA	NA	NA
Cadmium	4	**1.22 ER**	< 3	< 3	< 3	NA	NA	NA
Calcium	NLE	**11,100**	**13,900**	< 5000	**9,230**	NA	NA	NA
Chromium	70	**1.95 ER**	< 10	< 10	< 10	NA	NA	NA
Cobalt	100	**7.32**	< 50	< 50	< 50	NA	NA	NA
Copper	1,300	ND	< 10	< 10	< 10	NA	NA	NA
Iron	300	**1,640**	**2,390**	**545**	**4,150**	NA	NA	NA
Lead	5	ND	< 3	< 3	< 3	ND	ND	ND
Magnesium	NLE	**3,970**	**6,680**	< 5000	**6,320**	NA	NA	NA
Manganese	50	**63.5**	**68.8**	< 15	**54.9**	NA	NA	NA
Mercury	2	ND	ND	< 0.2	< 0.2	NA	NA	NA
Nickel	100	**12.1**	**23.5**	< 10	**22.3**	NA	NA	NA
Potassium	NLE	**1,860**	< 10000	< 10000	< 10000	NA	NA	NA
Selenium	40	ND	< 10	< 10	< 10	NA	NA	NA
Silver	40	ND	< 10	< 10	< 10	NA	NA	NA
Sodium	50,000	**106,000**	**153,000**	**31,700**	**141,000**	NA	NA	NA
Thallium	2	ND	< 2	< 2	< 2	NA	NA	NA
Vanadium	NLE	**1.32 ER**	< 50	< 50	< 50	NA	NA	NA
Zinc	2,000	**159**	**142**	**37.5**	**187**	NA	NA	NA

TABLE 4.8
DETECTED GROUND WATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW12						
Sample ID		FTMM53-GW-699MW12-47	FTMM53-GW-699MW12-48	FTMM53-GW-699MW12-49	FTMM53-GW-699MW12-50	FTMM53-GW-699MW12-51	FTMM53-GW-699MW12-1	FTMM53-GW-699MW12-2
Sample Date		12/30/2008	3/27/2009	6/24/2009	8/26/2009	11/16/2009	3/24/2010	6/15/2010
Sample Round		47	48	49	50	51	1	2
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	ND	ND	ND	ND	ND	ND	ND
Meta/Para Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	ND	ND	ND
Ortho Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	ND	ND	ND	ND
Inorganics (µg/l)								
Aluminum	200	NA	NA	NA	NA	NA	**2,650**	**3,000**
Antimony	6	NA	NA	NA	NA	NA	**5.04 ER**	**6.01 ER**
Arsenic	3	NA	NA	NA	NA	NA	ND	ND
Barium	6,000	NA	NA	NA	NA	NA	**101**	**150**
Beryllium	1	NA	NA	NA	NA	NA	**1.03**	**1.88**
Cadmium	4	NA	NA	NA	NA	NA	**1.68 ER**	**1.73 ER**
Calcium	NLE	NA	NA	NA	NA	NA	**21,900**	**20,200**
Chromium	70	NA	NA	NA	NA	NA	ND	**1.3 ER**
Cobalt	100	NA	NA	NA	NA	NA	**12.2**	**15.1**
Copper	1,300	NA	NA	NA	NA	NA	ND	ND
Iron	300	NA	NA	NA	NA	NA	ND	ND
Lead	5	**3.64 ER**	**2.09 ER**	ND	ND	ND	ND	ND
Magnesium	NLE	NA	NA	NA	NA	NA	**20,600**	**24,900**
Manganese	50	NA	NA	NA	NA	NA	**171**	**121**
Mercury	2	NA	NA	NA	NA	NA	ND	ND
Nickel	100	NA	NA	NA	NA	NA	**37.5**	**49.4**
Potassium	NLE	NA	NA	NA	NA	NA	**4,840**	**4,120**
Selenium	40	NA	NA	NA	NA	NA	**21.5**	NA
Silver	40	NA	NA	NA	NA	NA	**1.33 ER**	ND
Sodium	50,000	NA	NA	NA	NA	NA	**51,800**	**64,500**
Thallium	2	NA	NA	NA	NA	NA	ND	ND
Vanadium	NLE	NA	NA	NA	NA	NA	ND	ND
Zinc	2,000	NA	NA	NA	NA	NA	**130**	**167**

TABLE 4.8
DETECTED GROUND WATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW12						699MW15
Sample ID		FTMM53-GW-699MW12-3	FTMM53-GW-699MW12-3-Dup	FTMM53-GW-699MW12-4	FTMM53-GW-699MW12-4-Dup	FTMM53-GW-699MW12-5	FTMM53-GW-699MW12-6	FTMM53-GW-699MW15-44
Sample Date		9/17/2010	9/17/2010	12/30/2010	12/30/2010	3/11/2011	6/2/2011	3/30/2008
Sample Round		3	3	4	4	5	6	44
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	ND	ND	ND	ND	ND	ND	ND
Meta/Para Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	ND	ND	ND
Ortho Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	ND	ND	ND	ND
Inorganics (µg/l)								
Aluminum	200	**1,640**	**1,540**	**1,310**	**1,330**	**2,080**	**3,160**	NA
Antimony	6	**6.33 ER**	ND	< 6	< 6	< 6	< 6	NA
Arsenic	3	ND	ND	< 3	< 3	< 3	< 3	NA
Barium	6,000	**137**	**128**	< 200	< 200	< 200	< 200	NA
Beryllium	1	**1.98**	**1.86**	**1.1**	**1.1**	**1**	**1.6**	NA
Cadmium	4	**1.67 ER**	**1.07 ER**	< 3	< 3	< 3	< 3	NA
Calcium	NLE	**10,300**	**9,690**	**8,580**	**8,700**	**15,300**	**25,600**	NA
Chromium	70	ND	ND	< 10	< 10	< 10	< 10	NA
Cobalt	100	**13**	**12.1**	< 50	< 50	< 50	< 50	NA
Copper	1,300	ND	**2.89 ER**	< 10	< 10	< 10	< 10	NA
Iron	300	ND	ND	< 100	< 100	**353**	**162**	NA
Lead	5	ND	ND	< 3	< 3	< 3	< 3	**2.29 ER**
Magnesium	NLE	**19,300**	**18,200**	**14,700**	**14,800**	**17,500**	**21,900**	NA
Manganese	50	**78.5**	**73.8**	**66.3**	**66.9**	**109**	**202**	NA
Mercury	2	ND	ND	ND	ND	< 0.2	< 0.2	NA
Nickel	100	**44.3**	**42.7**	**36.6**	**37**	**36.7**	**43**	NA
Potassium	NLE	**4,550**	**4,280**	< 10000	< 10000	< 10000	< 10000	NA
Selenium	40	ND	**1.8 ER**	< 10	< 10	< 10	< 10	NA
Silver	40	ND	ND	< 10	< 10	< 10	< 10	NA
Sodium	50,000	**65,000**	**62,000**	**29,400**	**29,800**	**39,500**	**66,700**	NA
Thallium	2	ND	ND	< 2	< 2	< 2	< 2	NA
Vanadium	NLE	ND	ND	< 50	< 50	< 50	< 50	NA
Zinc	2,000	**172**	**165**	**143**	**144**	**130**	**158**	NA

TABLE 4.8
DETECTED GROUND WATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW15						
Sample ID		FTMM53-GW-699MW15-45	FTMM53-GW-699MW15-46	FTMM53-GW-699MW15-47	FTMM53-GW-699MW15-48	FTMM53-GW-699MW15-49	FTMM53-GW-699MW15-50	FTMM53-GW-699MW15-51
Sample Date		6/4/2008	9/29/2008	12/30/2008	3/27/2009	6/24/2009	8/26/2009	11/16/2009
Sample Round		45	46	47	48	49	50	51
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	ND	ND	ND	ND	ND	ND	ND
Meta/Para Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	ND	ND	ND
Ortho Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	ND	ND	ND	ND
Inorganics (µg/l)								
Aluminum	200	NA	NA	NA	NA	NA	NA	NA
Antimony	6	NA	NA	NA	NA	NA	NA	NA
Arsenic	3	NA	NA	NA	NA	NA	NA	NA
Barium	6,000	NA	NA	NA	NA	NA	NA	NA
Beryllium	1	NA	NA	NA	NA	NA	NA	NA
Cadmium	4	NA	NA	NA	NA	NA	NA	NA
Calcium	NLE	NA	NA	NA	NA	NA	NA	NA
Chromium	70	NA	NA	NA	NA	NA	NA	NA
Cobalt	100	NA	NA	NA	NA	NA	NA	NA
Copper	1,300	NA	NA	NA	NA	NA	NA	NA
Iron	300	NA	NA	NA	NA	NA	NA	NA
Lead	5	**7.12**	**5.62**	**7.16**	**1.79 ER**	**3.85 ER**	**3.04 ER**	**2.71 ER**
Magnesium	NLE	NA	NA	NA	NA	NA	NA	NA
Manganese	50	NA	NA	NA	NA	NA	NA	NA
Mercury	2	NA	NA	NA	NA	NA	NA	NA
Nickel	100	NA	NA	NA	NA	NA	NA	NA
Potassium	NLE	NA	NA	NA	NA	NA	NA	NA
Selenium	40	NA	NA	NA	NA	NA	NA	NA
Silver	40	NA	NA	NA	NA	NA	NA	NA
Sodium	50,000	NA	NA	NA	NA	NA	NA	NA
Thallium	2	NA	NA	NA	NA	NA	NA	NA
Vanadium	NLE	NA	NA	NA	NA	NA	NA	NA
Zinc	2,000	NA	NA	NA	NA	NA	NA	NA

TABLE 4.8
DETECTED GROUND WATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW15						
Sample ID		FTMM53-GW-699MW15-1	FTMM53-GW-699MW15-1-Dup	FTMM53-GW-699MW15-2	FTMM53-GW-699MW15-3	FTMM53-GW-699MW15-4	FTMM53-GW-699MW15-4-Dup	FTMM53-GW-699MW15-5
Sample Date		3/25/2010	3/25/2010	6/15/2010	9/16/2010	1/7/2011	1/7/2011	3/15/2011
Sample Round		1	1	2	3	4	4	5
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	ND	ND	ND	ND	ND	ND	ND
Meta/Para Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	ND	ND	ND
Ortho Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	ND	ND	ND	ND
Inorganics (µg/l)								
Aluminum	200	**10,200**	**6,350**	**273**	**971**	**903**	**895**	**2,460**
Antimony	6	ND	ND	ND	**8.17 ER**	< 6	< 6	< 6
Arsenic	3	**4.64 ER**	**4.25 ER**	**2.06 ER**	**2.27 ER**	< 3	< 3	< 3
Barium	6,000	**112**	**90.3**	**61.3**	**63.6**	< 200	< 200	< 200
Beryllium	1	**0.469 ER**	**0.26 ER**	**0.071 ER**	**0.088 ER**	< 1	< 1	< 1
Cadmium	4	**0.649 ER**	ND	ND	ND	< 3	< 3	< 3
Calcium	NLE	**20,900**	**17,900**	**10,800**	**6,460**	**6,860**	**6,790**	**11,000**
Chromium	70	**53.8**	**32.9**	**1.46 ER**	**4.15 ER**	< 10	< 10	**14.2**
Cobalt	100	**0.969 ER**	**0.643 ER**	ND	**2.88**	< 50	< 50	< 50
Copper	1,300	**42.6**	**32.9**	**13.7**	**12.6**	**11.8**	**13.1**	**34.2**
Iron	300	**15,900**	**9,990**	**163 ER**	**1,450**	**1,390**	**1,390**	**4,540**
Lead	5	**31.1**	**19.7**	**3.5 ER**	ND	**3**	**3.2**	**10.9**
Magnesium	NLE	**5,420**	**4,230**	**2,300**	**2,400**	< 5000	< 5000	< 5000
Manganese	50	**28**	**20.2**	**17.9**	**41**	< 15	< 15	**20.2**
Mercury	2	ND	ND	**0.07 ER**	ND	ND	ND	< 0.2
Nickel	100	**8.68**	**6.39**	**2.14 ER**	**4.07 ER**	< 10	< 10	< 10
Potassium	NLE	**8,200**	**6,310**	**3,330**	**3,680**	< 10000	< 10000	< 10000
Selenium	40	**12.2 ER**	**15.1 ER**	NA	**1.75 ER**	< 10	< 10	< 10
Silver	40	ND	ND	**0.841 ER**	ND	< 10	< 10	< 10
Sodium	50,000	**6,230**	**5,490**	**5,100**	**4,880 ER**	< 10000	< 10000	< 10000
Thallium	2	ND	ND	ND	ND	< 2	< 2	< 2
Vanadium	NLE	**36.8**	**22.4**	ND	**2.84 ER**	< 50	< 50	< 50
Zinc	2,000	**135**	ND	**57.5**	**91.5**	**71**	**72.5**	**82.6**

TABLE 4.8
DETECTED GROUND WATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW15	699MW16					
Sample ID		FTMM53-GW-699MW15-6	FTMM53-GW-699MW16-44	FTMM53-GW-699MW16-45	FTMM53-GW-699MW16-46	FTMM53-GW-699MW16-47	FTMM53-GW-699MW16-48	FTMM53-GW-699MW16-49
Sample Date		5/27/2011	3/30/2008	6/4/2008	9/29/2008	12/30/2008	3/27/2009	6/24/2009
Sample Round		6	44	45	46	47	48	49
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	ND	ND	**0.41 J**	ND	ND	**0.45 J**	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	**0.88 J**	ND	ND	ND	ND
Chloroform	70	ND	**32.23**	**39.61**	**4.68**	**23.77**	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	ND	ND	ND	ND	ND	ND	ND
Meta/Para Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	ND	ND	ND
Ortho Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	**0.72 J**	**1.93 J**	**0.51 J**	**0.65 J**	ND
Toluene	600	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	ND	ND	ND	ND
Inorganics (µg/l)								
Aluminum	200	**3,620**	NA	NA	NA	NA	NA	NA
Antimony	6	< 6	NA	NA	NA	NA	NA	NA
Arsenic	3	**3.5**	NA	NA	NA	NA	NA	NA
Barium	6,000	< 200	NA	NA	NA	NA	NA	NA
Beryllium	1	< 1	NA	NA	NA	NA	NA	NA
Cadmium	4	< 3	NA	NA	NA	NA	NA	NA
Calcium	NLE	**9,630**	NA	NA	NA	NA	NA	NA
Chromium	70	**19.3**	NA	NA	NA	NA	NA	NA
Cobalt	100	< 50	NA	NA	NA	NA	NA	NA
Copper	1,300	**26.7**	NA	NA	NA	NA	NA	NA
Iron	300	**6,670**	NA	NA	NA	NA	NA	NA
Lead	5	**13.3**	ND	ND	ND	**4 ER**	ND	ND
Magnesium	NLE	< 5000	NA	NA	NA	NA	NA	NA
Manganese	50	**23.4**	NA	NA	NA	NA	NA	NA
Mercury	2	< 0.2	NA	NA	NA	NA	NA	NA
Nickel	100	< 10	NA	NA	NA	NA	NA	NA
Potassium	NLE	< 10000	NA	NA	NA	NA	NA	NA
Selenium	40	< 10	NA	NA	NA	NA	NA	NA
Silver	40	< 10	NA	NA	NA	NA	NA	NA
Sodium	50,000	< 10000	NA	NA	NA	NA	NA	NA
Thallium	2	< 2	NA	NA	NA	NA	NA	NA
Vanadium	NLE	< 50	NA	NA	NA	NA	NA	NA
Zinc	2,000	**121**	NA	NA	NA	NA	NA	NA

TABLE 4.8
DETECTED GROUND WATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW16						
Sample ID		FTMM53-GW-699MW16-50	FTMM53-GW-699MW16-50-Dup	FTMM53-GW-699MW16-51	FTMM53-GW-699MW16-1	FTMM53-GW-699MW16-2	FTMM53-GW-699MW16-2-Dup	FTMM53-GW-699MW16-3
Sample Date		8/26/2009	8/26/2009	11/16/2009	3/26/2010	6/17/2010	6/17/2010	9/17/2010
Sample Round		50	50	51	1	2	2	3
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	ND	ND	ND	ND	ND	ND	**0.42 J**
Meta/Para Xylene	1,000	ND	ND	ND	ND	ND	ND	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	ND	ND	ND
Ortho Xylene	1,000	ND	ND	ND	ND	ND	ND	**0.22 J**
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	**0.93**	**1.04**	**1.09**	**0.96**	**0.99**	**0.97**	**1.71**
Toluene	600	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	ND	ND	ND	ND
Inorganics (µg/l)								
Aluminum	200	NA	NA	NA	**2,540**	**1,470**	**1,580**	**2,160**
Antimony	6	NA	NA	NA	ND	ND	ND	ND
Arsenic	3	NA	NA	NA	ND	**1.76 ER**	**1.74 ER**	ND
Barium	6,000	NA	NA	NA	**20.4**	**17.2**	**18.9**	**19.7**
Beryllium	1	NA	NA	NA	**0.654**	**0.524**	**0.544**	**0.682**
Cadmium	4	NA	NA	NA	ND	ND	ND	**0.981 ER**
Calcium	NLE	NA	NA	NA	**7,870**	**5,230**	**5,670**	**4,990**
Chromium	70	NA	NA	NA	ND	**1.03 ER**	**1.21 ER**	ND
Cobalt	100	NA	NA	NA	**5.99**	**4.13**	**4.41**	**5.43**
Copper	1,300	NA	NA	NA	ND	ND	ND	**2.31 ER**
Iron	300	NA	NA	NA	**98.3 ER**	**2,920**	**3,080**	**659**
Lead	5	ND	ND	ND	ND	ND	ND	ND
Magnesium	NLE	NA	NA	NA	**19,000**	**14,500**	**15,500**	**18,000**
Manganese	50	NA	NA	NA	**73.1**	**51.2**	**54.6**	**58.7**
Mercury	2	NA	NA	NA	ND	**0.12 ER**	**0.08 ER**	ND
Nickel	100	NA	NA	NA	**27.5**	**20.1**	**20.7**	**25.6**
Potassium	NLE	NA	NA	NA	**3,700**	**3,320**	**3,630**	**4,260**
Selenium	40	NA	NA	NA	**8.1 ER**	NA	NA	ND
Silver	40	NA	NA	NA	ND	**1.25 ER**	**0.814 ER**	ND
Sodium	50,000	NA	NA	NA	**16,600**	**11,600**	**12,000**	**14,500**
Thallium	2	NA	NA	NA	**1.41 ER**	ND	ND	ND
Vanadium	NLE	NA	NA	NA	ND	ND	ND	ND
Zinc	2,000	NA	NA	NA	**57.7**	**45.5 ER**	**46.6 ER**	**89.7**

TABLE 4.8
DETECTED GROUND WATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW16				699RW03		
Sample ID		FTMM53-GW-699MW16-4	FTMM53-GW-699MW16-5	FTMM53-GW-699MW16-6	FTMM53-GW-699MW16-6-Dup	FTMM53-GW-699RW03-1	FTMM53-GW-699RW03-2	FTMM53-GW-699RW03-3
Sample Date		1/5/2011	3/15/2011	6/1/2011	6/1/2011	12/30/2008	3/27/2009	6/25/2009
Sample Round		4	5	6	6	1	2	3
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	ND	ND	ND	ND	**26.93**	**257.57 D**	**42.28 D**
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	ND	ND	ND	ND	**143.23**	**230.43 D**	**146.89 D**
Meta/Para Xylene	1,000	ND	ND	ND	ND	**269.83**	**444.31 D**	**245.27 D**
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	ND	**24.58**	**48.59**	**20.22**
Ortho Xylene	1,000	ND	ND	ND	ND	**115.12**	**201.3 D**	**125.01 D**
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	**1.06**	**0.59**	**0.42 J**	**0.41 J**	ND	ND	ND
Toluene	600	ND	ND	ND	ND	**15.54**	**378.26 D**	**16.08**
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	ND	**646**	**1,140**	**455**
Inorganics (µg/l)								
Aluminum	200	**2,520**	**1,830**	**1,910**	**1,910**	NA	NA	NA
Antimony	6	< 6	< 6	< 6	< 6	NA	NA	NA
Arsenic	3	< 3	< 3	< 3	< 3	NA	NA	NA
Barium	6,000	< 200	< 200	< 200	< 200	NA	NA	NA
Beryllium	1	< 1	< 1	< 1	< 1	NA	NA	NA
Cadmium	4	< 3	< 3	< 3	< 3	NA	NA	NA
Calcium	NLE	**5,640**	< 5000	< 5000	< 5000	NA	NA	NA
Chromium	70	< 10	< 10	< 10	< 10	NA	NA	NA
Cobalt	100	< 50	< 50	< 50	< 50	NA	NA	NA
Copper	1,300	< 10	< 10	< 10	< 10	NA	NA	NA
Iron	300	**183**	**741**	**607**	**1,010**	NA	NA	NA
Lead	5	< 3	< 3	< 3	< 3	**2.61 ER**	**12.9**	**11.3**
Magnesium	NLE	**16,400**	**11,700**	**11,100**	**10,800**	NA	NA	NA
Manganese	50	**61.5**	**46.1**	**41.3**	**41.3**	NA	NA	NA
Mercury	2	ND	< 0.2	< 0.2	< 0.2	NA	NA	NA
Nickel	100	**25**	**18.2**	**19.6**	**21**	NA	NA	NA
Potassium	NLE	< 10000	< 10000	< 10000	< 10000	NA	NA	NA
Selenium	40	< 10	< 10	< 10	< 10	NA	NA	NA
Silver	40	< 10	< 10	< 10	< 10	NA	NA	NA
Sodium	50,000	**12,500**	**12,100**	**12,900**	**12,300**	NA	NA	NA
Thallium	2	< 2	< 2	< 2	< 2	NA	NA	NA
Vanadium	NLE	< 50	< 50	< 50	< 50	NA	NA	NA
Zinc	2,000	**65.8**	**46.2**	**47.2**	**52.5**	NA	NA	NA

TABLE 4.8
DETECTED GROUND WATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699RW03						
Sample ID		FTMM53-GW-699RW03-4	FTMM53-GW-699RW03-5	FTMM53-GW-699RW03-6	FTMM53-GW-699RW03-7	FTMM53-GW-699RW03-8	FTMM53-GW-699RW03-9	FTMM53-GW-699RW03-10
Sample Date		8/26/2009	11/16/2009	3/31/2010	6/17/2010	9/27/2010	1/10/2011	3/15/2011
Sample Round		4	5	6	7	8	9	10
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	**32.01**	**13.49**	ND	**11.29**	**1.3**	**9.75**	**16.33**
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	**78.96 D**	**85.08**	**0.96**	**24.37**	**15.89**	**93.59**	**88.78**
Meta/Para Xylene	1,000	**75.41**	**71.66**	**0.68 J**	**6.02**	**45.92**	**72.6**	**141.87**
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	**18.89**	**17.26**	ND	**8.96**	**1.69**	**5.57**	**10.23**
Ortho Xylene	1,000	**39.17**	**51.14**	**0.19 J**	**8.02**	**36.84**	**61.47**	**74.75**
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	**46.89**	ND	ND	**28.08**	ND	**8.81**	**21.19**
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	**3.77**	**1.96**	ND	**0.58**	**2.21**	**2.39**	**4.14**
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	**348**	**187**	**8**	**468**	**313**	**858**	**934**
Inorganics (µg/l)								
Aluminum	200	NA	NA	**1,390**	**79,600**	**2,390**	**19,800**	**65,900**
Antimony	6	NA	NA	**5.94 ER**	**7.49 ER**	**8.4 ER**	< 6	< 6
Arsenic	3	NA	NA	ND	**19.42**	**1.74 ER**	**10.5**	**11.9**
Barium	6,000	NA	NA	**11.4**	**36.9**	**111**	< 200	< 400
Beryllium	1	NA	NA	**0.063 ER**	**10.5**	**0.86**	**3.6**	**10**
Cadmium	4	NA	NA	**0.548 ER**	**13.5**	**3.71**	< 3	< 3
Calcium	NLE	NA	NA	**15,500**	**19,300**	**28,800**	**23,900**	**36,900**
Chromium	70	NA	NA	**5.28**	**17.2**	**2.21 ER**	< 10	< 10
Cobalt	100	NA	NA	**1.9 ER**	**720**	**10.1**	**151**	**323**
Copper	1,300	NA	NA	**12**	ND	**12**	< 10	< 10
Iron	300	NA	NA	**2,930**	**287,000 E**	**23,600**	**84,900**	**177,000**
Lead	5	ND	**7.14**	ND	**29.3**	**2.82 ER**	< 3	**5.5**
Magnesium	NLE	NA	NA	**3,770**	**702 ER**	**17,400**	**31,200**	**48,900**
Manganese	50	NA	NA	**45.4**	**15,200**	**615**	**785**	**757**
Mercury	2	NA	NA	ND	**0.14 ER**	**0.28 ER**	ND	< 0.2
Nickel	100	NA	NA	**4.35 ER**	**1,430**	**16.4**	**346**	**892**
Potassium	NLE	NA	NA	**3,250**	**8,410**	**5,810**	< 10000	< 20000
Selenium	40	NA	NA	**25.4**	NA	**2.07 ER**	< 10	< 10
Silver	40	NA	NA	ND	**37.7**	**2.85 ER**	< 10	< 10
Sodium	50,000	NA	NA	**118,000**	**152,000**	**286,000**	**292,000**	**303,000**
Thallium	2	NA	NA	ND	**0.94 ER**	ND	< 4	< 2
Vanadium	NLE	NA	NA	**3.5 ER**	**40.9**	ND	< 50	< 50
Zinc	2,000	NA	NA	**357**	**3,920**	**2,300**	**950**	**2,310**

TABLE 4.8
DETECTED GROUND WATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699RW03	699RW04					699RW05
Sample ID		FTMM53-GW-699RW03-11	FTMM53-GW-699RW04-9	FTMM53-GW-699RW04-10	FTMM53-GW-699RW04-11	FTMM53-GW-699RW04-12	FTMM53-GW-699RW04-13	FTMM53-GW-699RW05-1
Sample Date		6/3/2011	3/30/2008	6/4/2008	9/29/2008	3/27/2009	6/3/2011	6/4/2008
Sample Round		11	9	10	11	12	13	1
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	**6.85**	**6.19**	**2.54**	ND	ND	ND	**34.42**
Benzene	1	**4.49**	**23.33**	**28.19**	**0.38 J**	**1.43 J**	ND	**878.97**
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	**3.88**	ND	ND	ND	ND	ND	**1.16 J**
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	**0.78**	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	**5.5**	**94.27**	**27.78**	ND	**0.77 J**	ND	**770.76**
Meta/Para Xylene	1,000	**12.54**	**252.17**	**44.87**	ND	**1.25 J**	ND	**2,391**
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	**8.39**	**24.27**	**30.85**	**9.96**	**2.21**	ND	**38.69**
Ortho Xylene	1,000	**7.35**	**88.98**	**27.17**	ND	**0.43 J**	ND	**785.91**
Styrene	100	ND	**0.37 J**	ND	ND	ND	ND	**6.94**
Tert Butyl Alcohol	100	**108.06**	**106.76**	**183.71**	**33.67**	ND	ND	ND
Tetrachloroethene	1	**5.81**	ND	**0.72 J**	ND	ND	ND	ND
Toluene	600	**1.45**	**24.81**	**10.11**	ND	ND	ND	**1,338**
Trichloroethene	1	**1.24**	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	**193**	**186**	**170**	**9**	ND	**6**	**400**
Inorganics (µg/l)								
Aluminum	200	**57,300**	NA	NA	NA	NA	**5,180**	NA
Antimony	6	< 6	NA	NA	NA	NA	< 6	NA
Arsenic	3	**21.7**	NA	NA	NA	NA	< 3	NA
Barium	6,000	< 200	NA	NA	NA	NA	< 200	NA
Beryllium	1	**4.1**	NA	NA	NA	NA	**1.9**	NA
Cadmium	4	**13.7**	NA	NA	NA	NA	**6.5**	NA
Calcium	NLE	**41,100**	NA	NA	NA	NA	**58,700**	NA
Chromium	70	**86.1**	NA	NA	NA	NA	< 10	NA
Cobalt	100	**220**	NA	NA	NA	NA	< 50	NA
Copper	1,300	**64.2**	NA	NA	NA	NA	**93.2**	NA
Iron	300	**233,000**	NA	NA	NA	NA	**3,990**	NA
Lead	5	**22.9**	**6.87**	**21.8**	**9.68**	**6.02**	**10.6**	**9.22**
Magnesium	NLE	**34,100**	NA	NA	NA	NA	**21,800**	NA
Manganese	50	**676**	NA	NA	NA	NA	**1,600**	NA
Mercury	2	< 0.2	NA	NA	NA	NA	< 0.2	NA
Nickel	100	**664**	NA	NA	NA	NA	**53.8**	NA
Potassium	NLE	< 10000	NA	NA	NA	NA	**12,600**	NA
Selenium	40	< 10	NA	NA	NA	NA	< 10	NA
Silver	40	< 10	NA	NA	NA	NA	< 10	NA
Sodium	50,000	**169,000**	NA	NA	NA	NA	**308,000**	NA
Thallium	2	< 2	NA	NA	NA	NA	< 2	NA
Vanadium	NLE	**56.2**	NA	NA	NA	NA	< 50	NA
Zinc	2,000	**2,430**	NA	NA	NA	NA	**385**	NA

TABLE 4.8
DETECTED GROUND WATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699RW05						
Sample ID		FTMM53-GW-699RW05-2	FTMM53-GW-699RW05-3	FTMM53-GW-699RW05-4	FTMM53-GW-699RW05-5	FTMM53-GW-699RW05-6	FTMM53-GW-699RW05-7	FTMM53-GW-699RW05-8
Sample Date		9/29/2008	12/30/2008	6/25/2009	8/26/2009	11/16/2009	6/17/2010	9/30/2010
Sample Round		2	3	4	5	6	7	8
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	**37.06**	ND	ND	ND	ND	ND	ND
Benzene	1	**87.27**	**499.65**	**177.44 D**	**212.5 D**	**2.87**	**8.64**	**2.2**
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	**0.98 J**	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	**215.88**	**647.7**	**73.58 D**	**178.64 D**	**0.9**	**8.43**	ND
Meta/Para Xylene	1,000	**624.26**	**2,485**	**108.35 D**	**359.37 D**	**2.43**	**23.02**	ND
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	**1.94 J**	**10.37**	**43.36**	**25.01**	**2.31**	**1.01**	ND
Ortho Xylene	1,000	**269.99**	**1,111**	**60.47 D**	**197.15 D**	**2.51**	**7.78**	ND
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	**139.97**	ND	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	**1,006**	**2,611**	**55.93 D**	**235.6 D**	**1.74**	**13.16**	ND
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	**359**	**189**	**450**	**748**	ND	**69**	ND
Inorganics (µg/l)								
Aluminum	200	NA	NA	NA	NA	NA	**1,110**	**1,180**
Antimony	6	NA	NA	NA	NA	NA	**7.85 ER**	**12.8**
Arsenic	3	NA	NA	NA	NA	NA	**2.02 ER**	**23.95**
Barium	6,000	NA	NA	NA	NA	NA	**22.3**	**35**
Beryllium	1	NA	NA	NA	NA	NA	**0.069 ER**	**0.214 ER**
Cadmium	4	NA	NA	NA	NA	NA	ND	ND
Calcium	NLE	NA	NA	NA	NA	NA	**35,800**	**15,300**
Chromium	70	NA	NA	NA	NA	NA	**7.97**	**5.08**
Cobalt	100	NA	NA	NA	NA	NA	ND	ND
Copper	1,300	NA	NA	NA	NA	NA	**4.25 ER**	**15.6**
Iron	300	NA	NA	NA	NA	NA	**3,270**	**1,670**
Lead	5	**5.84**	**3.96 ER**	**45**	ND	**64.1**	ND	**4.12 ER**
Magnesium	NLE	NA	NA	NA	NA	NA	**4,150**	**20.1 ER**
Manganese	50	NA	NA	NA	NA	NA	**95.3**	**28,500**
Mercury	2	NA	NA	NA	NA	NA	**0.14 ER**	ND
Nickel	100	NA	NA	NA	NA	NA	**3.45 ER**	**3.37 ER**
Potassium	NLE	NA	NA	NA	NA	NA	**4,350**	**2,380**
Selenium	40	NA	NA	NA	NA	NA	NA	**2.68 ER**
Silver	40	NA	NA	NA	NA	NA	**1 ER**	ND
Sodium	50,000	NA	NA	NA	NA	NA	**198,000**	**28,500**
Thallium	2	NA	NA	NA	NA	NA	ND	ND
Vanadium	NLE	NA	NA	NA	NA	NA	**4.6 ER**	**5.92**
Zinc	2,000	NA	NA	NA	NA	NA	**17 ER**	**44.5 ER**

TABLE 4.8
DETECTED GROUND WATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699RW05			699RW11			
Sample ID		FTMM53-GW-699RW05-9	FTMM53-GW-699RW05-10	FTMM53-GW-699RW05-11	FTMM53-GW-699RW11-44	FTMM53-GW-699RW11-45	FTMM53-GW-699RW11-46	FTMM53-GW-699RW11-47
Sample Date		1/10/2011	3/15/2011	6/3/2011	3/30/2008	6/4/2008	9/29/2008	12/30/2008
Sample Round		9	10	11	44	45	46	47
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	**5.2**	**4.28**	ND	ND
Benzene	1	ND	**0.19 J**	ND	**0.58 J**	**158**	**2.94**	**248.4**
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	ND	ND	ND	ND
Ethyl benzene	700	**0.78**	**7.44**	ND	**0.29 J**	**224.45**	ND	**29.66**
Meta/Para Xylene	1,000	**2.47**	**34.85**	**0.95 J**	**0.38 J**	**302.59**	**0.86 J**	**34.32**
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	**1.29 J**	ND	ND
Methyl Tertbutyl Ether	70	ND	ND	ND	**7.92**	**16.33**	**4.59**	**13.4**
Ortho Xylene	1,000	**1.34**	**14.91**	**0.54**	ND	**82.49**	**0.59 J**	**16.36**
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	ND	**165.09**	ND	ND	ND
Tetrachloroethene	1	ND	ND	ND	ND	ND	ND	ND
Toluene	600	ND	**4.78**	**0.41 J**	ND	**7.53**	**0.41 J**	**16.32**
Trichloroethene	1	ND	ND	ND	ND	ND	ND	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	**15**	ND	ND	**278**	**136**	**459**
Inorganics (µg/l)								
Aluminum	200	**10,600**	**54,700**	**1,770**	NA	NA	NA	NA
Antimony	6	< 6	< 12	< 6	NA	NA	NA	NA
Arsenic	3	**7.2**	**26.8**	< 3	NA	NA	NA	NA
Barium	6,000	< 200	< 400	< 200	NA	NA	NA	NA
Beryllium	1	< 1	**4**	< 1	NA	NA	NA	NA
Cadmium	4	< 3	< 6	< 3	NA	NA	NA	NA
Calcium	NLE	**80,300**	**28,600**	**16,500**	NA	NA	NA	NA
Chromium	70	**72.2**	**424**	**14.8**	NA	NA	NA	NA
Cobalt	100	< 50	< 100	< 50	NA	NA	NA	NA
Copper	1,300	**31.2**	**122**	< 10	NA	NA	NA	NA
Iron	300	**17,700**	**120,000**	**4,090**	NA	NA	NA	NA
Lead	5	**11.2**	**82.2**	< 3	ND	**3.37 ER**	**3.54 ER**	**3 ER**
Magnesium	NLE	**6,350**	**13,200**	< 5000	NA	NA	NA	NA
Manganese	50	**113**	**980**	**27.8**	NA	NA	NA	NA
Mercury	2	ND	< 0.4	< 0.2	NA	NA	NA	NA
Nickel	100	**10.2**	**55.2**	< 10	NA	NA	NA	NA
Potassium	NLE	< 10000	**23,200**	< 10000	NA	NA	NA	NA
Selenium	40	< 10	< 20	< 10	NA	NA	NA	NA
Silver	40	< 10	< 20	< 10	NA	NA	NA	NA
Sodium	50,000	**311,000**	**96,900**	**36,000**	NA	NA	NA	NA
Thallium	2	< 2	< 4	< 2	NA	NA	NA	NA
Vanadium	NLE	< 50	**213**	< 50	NA	NA	NA	NA
Zinc	2,000	**180**	**624**	< 20	NA	NA	NA	NA

TABLE 4.8
DETECTED GROUND WATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699RW11						
Sample ID		FTMM53-GW-699RW11-48	FTMM53-GW-699RW11-49	FTMM53-GW-699RW11-50	FTMM53-GW-699RW11-51	FTMM53-GW-699RW11-52	FTMM53-GW-699RW11-53	FTMM53-GW-699RW11-54
Sample Date		3/27/2009	6/25/2009	8/26/2009	11/16/2009	3/31/2010	6/17/2010	9/27/2010
Sample Round		48	49	50	51	52	53	54
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,1,2,2-Tetrachloroethane	1	ND	ND	ND	ND	ND	ND	ND
Acetone	6,000	ND	ND	ND	ND	ND	ND	ND
Benzene	1	**0.87 J**	**8.41**	**0.25 J**	**4.06**	**0.33 J**	**6.11**	ND
Bromodichloromethane	1	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	700	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND	ND	ND	ND	ND
Chloroform	70	ND	ND	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND	**0.35 J**	ND	**2.1**	ND
Ethyl benzene	700	ND	**5.22**	ND	**1**	ND	**3.55**	ND
Meta/Para Xylene	1,000	ND	**4.78**	ND	ND	ND	ND	**0.62 J**
Methyl ethyl ketone	300	ND	ND	ND	ND	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND	ND	ND	ND	ND
Methyl Tertbutyl Ether	70	**0.44 J**	**1.8 J**	ND	**9.94**	**2.34**	**15.53**	ND
Ortho Xylene	1,000	ND	**0.68 J**	ND	ND	ND	ND	**0.43 J**
Styrene	100	ND	ND	ND	ND	ND	ND	ND
Tert Butyl Alcohol	100	**15.29**	**119.7**	ND	**185.93**	**112.41**	**237.89**	ND
Tetrachloroethene	1	ND	**0.57 J**	ND	**2.86**	ND	**13.52**	ND
Toluene	600	ND	**1.7 J**	ND	ND	ND	**0.3 J**	ND
Trichloroethene	1	ND	ND	ND	**0.83**	ND	**2.83**	ND
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	**159**	ND	**182**	**5**	**436**	ND
Inorganics (µg/l)								
Aluminum	200	NA	NA	NA	NA	**26,700**	**46,600**	**2,840**
Antimony	6	NA	NA	NA	NA	ND	**14**	**17.6**
Arsenic	3	NA	NA	NA	NA	ND	**2.34 ER**	**1.61 ER**
Barium	6,000	NA	NA	NA	NA	**48.2**	**18.2**	**66.7**
Beryllium	1	NA	NA	NA	NA	**2.46**	**3.96**	**0.585**
Cadmium	4	NA	NA	NA	NA	**17.7**	**14.4**	**4.39**
Calcium	NLE	NA	NA	NA	NA	**49,000**	**28,300**	**55,200**
Chromium	70	NA	NA	NA	NA	**3.75 ER**	**22.8**	ND
Cobalt	100	NA	NA	NA	NA	**144**	**253**	**30.5**
Copper	1,300	NA	NA	NA	NA	ND	ND	**2.66 ER**
Iron	300	NA	NA	NA	NA	**97,200**	**261,000 E**	**147 ER**
Lead	5	**2.47 ER**	**3.91 ER**	ND	**9.16**	**2.85 ER**	**24.2**	ND
Magnesium	NLE	NA	NA	NA	NA	**26,200**	**39,600**	**16,200**
Manganese	50	NA	NA	NA	NA	**402**	**570**	**601**
Mercury	2	NA	NA	NA	NA	ND	**0.12 ER**	**0.26 ER**
Nickel	100	NA	NA	NA	NA	**365**	**663**	**83.9**
Potassium	NLE	NA	NA	NA	NA	**6,540**	**5,730**	**6,990**
Selenium	40	NA	NA	NA	NA	ND	NA	ND
Silver	40	NA	NA	NA	NA	ND	**41.5**	ND
Sodium	50,000	NA	NA	NA	NA	**162,000**	**158,000**	**197,000**
Thallium	2	NA	NA	NA	NA	ND	ND	ND
Vanadium	NLE	NA	NA	NA	NA	**7.72**	ND	ND
Zinc	2,000	NA	NA	NA	NA	**1,570**	**2,810**	**432**

TABLE 4.8
DETECTED GROUND WATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699RW11		
Sample ID		FTMM53-GW-699RW11-55	FTMM53-GW-699RW11-56	FTMM53-GW-699RW11-57
Sample Date		1/10/2011	3/15/2011	6/3/2011
Sample Round		55	56	57
Filtered		Total	Total	Total
Volatile Organic Compounds (µg/l)				
1,1,2,2-Tetrachloroethane	1	ND	ND	ND
Acetone	6,000	ND	ND	ND
Benzene	1	**6.65**	**97.92**	**6.39**
Bromodichloromethane	1	ND	ND	ND
Carbon disulfide	700	ND	ND	ND
Carbon tetrachloride	1	ND	ND	ND
Chloroform	70	ND	ND	ND
Cis-1,2-Dichloroethene	70	ND	ND	ND
Ethyl benzene	700	ND	**108.63 D**	**0.99**
Meta/Para Xylene	1,000	**0.54 J**	**151.75**	**0.87 J**
Methyl ethyl ketone	300	ND	ND	ND
Methyl isobutyl ketone	100	ND	ND	ND
Methyl Tertbutyl Ether	70	**2.97**	**2.96**	**1.52**
Ortho Xylene	1,000	**0.42 J**	**25.59**	ND
Styrene	100	ND	ND	ND
Tert Butyl Alcohol	100	ND	ND	**6.87**
Tetrachloroethene	1	**0.42 J**	**0.62**	**0.3 J**
Toluene	600	**0.4 J**	**3.81**	**0.39 J**
Trichloroethene	1	ND	ND	ND
TIC VOCs (µg/l)				
Total TIC, Volatile	500	**35**	**739**	**181**
Inorganics (µg/l)				
Aluminum	200	**5,280**	**9,220**	**36,100**
Antimony	6	< 6	< 6	< 6
Arsenic	3	< 3	< 3	**6.1**
Barium	6,000	< 200	< 200	< 200
Beryllium	1	< 1	< 1	**2.8**
Cadmium	4	**3.8**	**4.9**	**8.9**
Calcium	NLE	**29,200**	**67,200**	**45,300**
Chromium	70	< 10	< 10	**30**
Cobalt	100	< 50	< 50	**136**
Copper	1,300	< 10	< 10	< 10
Iron	300	**11,700**	**27,800**	**138,000**
Lead	5	< 3	< 3	< 3
Magnesium	NLE	**7,640**	**15,500**	**24,800**
Manganese	50	**709**	**414**	**572**
Mercury	2	ND	< 0.2	< 0.2
Nickel	100	**62.4**	**93.8**	**372**
Potassium	NLE	< 10000	< 10000	< 10000
Selenium	40	< 10	< 10	< 10
Silver	40	< 10	< 10	< 10
Sodium	50,000	**118,000**	**140,000**	**185,000**
Thallium	2	< 2	< 2	< 2
Vanadium	NLE	< 50	< 50	< 50
Zinc	2,000	**239**	**367**	**1,390**

TABLE 4.8
DETECTED GROUND WATER SAMPLING RESULTS FROM MARCH 2008 TO JUNE 2011 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

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) **Bold** chemical dectection

5) 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 concentration 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.

6) 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 NJDEP Interim Specific GWQC. Available at (http://www.nj.gov/dep/wms/bwqsa/gwqs_interim_criteria_table.htm).

7) Criteria action level source document and web address.
- The NJ Ground Water Quality Criteria refers to the NJDEP Groundwater Quality Standards - Adopted July 22, 2010
http://www.state.nj.us/dep/wms/bwqsa/docs/njac79C.pdf

TABLE 4.9
DETECTED GROUNDWATER SAMPLING RESULTS
FROM AUGUST 2013 TO NOVEMBER 2015 -
COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	616MW01	699MW01							699MW01				
Sample ID		FTMM-53-GW-616MW01	FTMM-53-GW-699MW01	FTMM-53-GW-699MW01-10.55	FTMM-53-GW-699MW101-10.5	FTMM-53-GW-699MW01-12.5	FTMM-53-GW-699MW01-7.5	FTMM-53-GW-699MW01-7.5_20140701	FTMM-53-GW-699MW01-7.5_2014-Q3	FTMM-53-GW-699MW01-7.5_2014_Q4	FTMM-53-699MW01-7.5	FTMM-53-GW-699MW01-7.5_2015_Q2	FTMM-53-GW-699MW01-7.5_2015_Q3	FTMM-53-GW-699MW01-11.0_4Q2015
Sample Date		8/19/2013	8/21/2013	3/12/2014	3/12/2014	3/31/2014	3/31/2014	7/1/2014	9/30/2014	12/16/2014	3/30/2015	6/29/2015	9/30/2015	11/18/2015
Sample Round		7	7	8	8	8	8							
Filtered		Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)														
1,2,4-Trichlorobenzene	9	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-Trimethylbenzene	100	< 1	**4.6 J**	**0.31 J**	**0.26 J**	< 1	< 1	**0.3 J**	**1.3 J**	< 1	< 1	**6.4**	**0.64 J**	
1,2-Dichloropropane	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-Trimethylbenzene	100	< 1	**0.21 J**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	**0.23 J**	< 1
Acetone	6,000	**1.4 J**	< 5	< 5	< 5	< 5	< 5	**1.7 J**	**6.4 B**	< 5	**2.3 J**	**2.2 J**	**4.6 B**	< 5
Benzene	1	< 1	**0.25 J**	< 1	< 1	< 1	< 1	**0.31 J**	**0.52 J**	< 1	< 1	< 1	**0.87 J**	< 1
Chloroethane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroform	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cymene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ethyl benzene	700	< 1	**7.1**	**0.55 J**	**0.59 J**	< 1	< 1	**0.27 J**	**1.6 J**	< 1	< 1	< 1	**9.1**	**1.1 J**
Isopropylbenzene	700	< 1	**2 J**	**0.25 J**	**0.28 J**	< 1	< 1	< 1	**0.29 J**	< 1	< 1	< 1	**1.6 J**	**0.3 J**
Meta/Para Xylene	1,000	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	**1.2 J**	< 2
Methyl bromide	10	< 1	< 1	< 1	< 1	**0.32 J**	< 1	< 1	< 1	< 1 UJ	< 1	< 1 UJ	< 1	< 1
Methyl chloride	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methyl ethyl ketone	300	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methyl Tertbutyl Ether	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Naphthalene	300	< 1	**1.2 J**	< 1	< 1	< 1	< 1	**0.3 J**	**0.39 J**	< 1	< 1	< 1	**2.1 J**	**0.21 B**
n-Butylbenzene	100	< 1	**0.59 J**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ortho Xylene	1,000	< 1	**0.28 J**	< 1	< 1	< 1	< 1	< 1	**0.4 J**	< 1	< 1	< 1	**3 J**	< 1
Propylbenzene	100	< 1	**4.2 J**	**0.42 J**	**0.43 J**	< 1	< 1	< 1	**0.39 J**	< 1	< 1	< 1	**2.2 J**	**0.58 J**
sec-Butylbenzene	100	< 1	**0.71 J**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
tert-Butylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethene	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	600	< 1	< 1	< 1	< 1	< 1	< 1	< 1	**0.27 J**	< 1	< 1	< 1	**0.46 B**	< 1
Total Xylenes	1,000	< 3	**0.28 J**	< 3	< 3	< 3	< 3	< 3	**2.4 J**	< 3	< 3	< 3	**4.2 J**	NA
TIC VOCs (µg/l)														
Total TIC, Volatile	500	ND	**49.8**	ND	ND	ND	ND	ND	0 U	0 U	0 U	0 U	**25.2 JN**	NA
TIC VOCs (µg/l)														
1,2,3,5-Tetramethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetramethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dimethyl-2-ethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethenyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-3-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-4-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1H-Indane, 2,3-dihydro-4-methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-2-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-2-propylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-3-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methylindan	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-indan	NLE	NA	**5 JN**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Pentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Propenylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4-Trimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,3-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,6-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1-methyl-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-4-methyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylbutane	NLE	NA	**6 JN**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylpentane	NLE	NA	**5.3 JN**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,5-Dimethylstrene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Ethenyl-1,4-dimethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Ethyl toluene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methyl-1-Phenylpropene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylbutane	NLE	NA	**13.2 JN**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**8.5 JN**	NA
2-Methylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC VOCs (µg/l) (cont'd)														
3-Methylpentane	NLE	NA	**6.9 JN**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Ethyl-M-Xylene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Ethyltoluene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aliphatic Hydrocarbon C8 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aliphatic Hydrocarbon Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C10 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C9 Unknown	NLE	NA	**13.4 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, (2-methyl-1-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,3,4-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4,5-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethenyl-2 methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-2,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-3-methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-3-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-ethyl-1,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-propenyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 4-ethyl-1 ,2-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene,(2-methyl-2-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane, methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclopentane, 1,3-Dimethyl, cis-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hydrocarbon C6 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclopentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentane, 2,3,3-trimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**16.7 JN**	NA
TIC_108-08-7	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_1759-58-6	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_2532-58-3	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_27133-93-3	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_2870-04-4	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_3290-53-7	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_496-11-7	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_560-21-4	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_565-75-3	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_620-14-4	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_824-22-6	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_874-35-1	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_933-98-2	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Unknown Aromatics as VOA	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)														
Lead	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 4.9
DETECTED GROUNDWATER SAMPLING RESULTS
FROM AUGUST 2013 TO NOVEMBER 2015 -
COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW02	699MW04		699MW04						
Sample ID		FTMM-53-GW-699MW02	FTMM-53-GW-699MW04	FTMM-53-GW-699MW04-10.3	FTMM-53-GW-699MW04-13.85	FTMM-53-GW-699MW04-6.85	FTMM-53-GW-699MW04-6.85_20140701	FTMM-53-GW-699MW04-6.85_2014-Q3	FTMM-53-GW-699MW04-8.0_2014_Q4	FTMM-53-699MW04-8.0	FTMM-53-GW-699MW04-8.0_2015_Q2
Sample Date		8/19/2013	8/21/2013	3/12/2014	3/31/2014	3/31/2014	7/1/2014	9/30/2014	12/18/2014	3/30/2015	6/29/2015
Sample Round		7	7	8	8	8					
Filtered		Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)											
1,2,4-Trichlorobenzene	9	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-Trimethylbenzene	100	< 1	**3.3 J**	< 1	**1.9 J**	**2.3 J**	< 1	**0.25 J**	**4.6 J**	< 1	**2 J**
1,2-Dichloropropane	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-Trimethylbenzene	100	< 1	< 1	< 1	**0.78 J**	**0.99 J**	< 1	< 1	**3 J**	< 1	< 1
Acetone	6,000	**2.3 J**	< 5	**1.5 J**	< 5	< 5	**2.2 J**	**11 B**	**8.4**	**2.1 J**	< 5
Benzene	1	< 1	**0.97 J**	< 1	**0.23 J**	**0.23 J**	< 1	**0.37 J**	< 1	< 1	< 1
Chloroethane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1 UJ	< 1
Chloroform	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cymene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ethyl benzene	700	< 1	**2.7 J**	< 1	**0.87 J**	**1.1 J**	< 1	**0.28 J**	< 1	< 1	**0.9 J**
Isopropylbenzene	700	< 1	**1.4 J**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	**0.43 J**
Meta/Para Xylene	1,000	< 2	**1.3 J**	< 2	**3 J**	**3.4 J**	< 2	< 2	< 2	< 2	**0.33 J**
Methyl bromide	10	< 1	< 1	< 1	**0.33 J**	**0.47 J**	< 1	< 1	< 1 UJ	< 1 UJ	< 1
Methyl chloride	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methyl ethyl ketone	300	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methyl Tertbutyl Ether	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Naphthalene	300	< 1	**1.3 J**	< 1	**1.5 J**	**0.52 J**	< 1	< 1	**0.25 J**	< 1	**0.61 J**
n-Butylbenzene	100	< 1	**0.27 J**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ortho Xylene	1,000	< 1	**4.4 J**	< 1	**2.4 J**	**2.5 J**	< 1	**1 J**	**0.52 J**	< 1	**1.2 J**
Propylbenzene	100	< 1	**0.9 J**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	**0.52 J**
sec-Butylbenzene	100	< 1	**0.87 J**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
tert-Butylbenzene	100	< 1	**0.23 J**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethene	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	600	< 1	**0.46 J**	< 1	< 1	< 1	< 1	**0.27 J**	< 1	< 1	< 1
Total Xylenes	1,000	< 3	**5.7 J**	< 3	**5.4 J**	**5.9 J**	< 3	< 3	**2.52 J**	< 3	**1.52 J**
TIC VOCs (µg/l)											
Total TIC, Volatile	500	ND	**117.8**	ND	ND	ND	ND	0 U	0 U	0 U	**5.6 JN**
TIC VOCs (µg/l)											
1,2,3,5-Tetramethylbenzene	NLE	NA	**5.7 JN**	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetramethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dimethyl-2-ethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethenyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-3-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-4-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1H-Indane, 2,3-dihydro-4-methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-2-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-2-propylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-3-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methylindan	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-indan	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Pentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Propenylbenzene	NLE	NA	**20 JN**	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4-Trimethylpentane	NLE	NA	**6.1 JN**	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,3-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,6-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1-methyl-indene	NLE	NA	**11 JN**	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-4-methyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylbutane	NLE	NA	**9.9 JN**	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylpentane	NLE	NA	**17.8 JN**	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylpentane	NLE	NA	**5.4 JN**	NA	NA	NA	NA	NA	NA	NA	NA
2,5-Dimethylstrene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Ethenyl-1,4-dimethylbenzene	NLE	NA	**10.3 JN**	NA	NA	NA	NA	NA	NA	NA	NA
2-Ethyl toluene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methyl-1-Phenylpropene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylbutane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC VOCs (µg/l) (cont'd)											
3-Methylpentane	NLE	NA	**6.9 JN**	NA	NA	NA	NA	NA	NA	NA	NA
4-Ethyl-M-Xylene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Ethyltoluene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aliphatic Hydrocarbon C8 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aliphatic Hydrocarbon Unknown	NLE	NA	**24.7 J**	NA	NA	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C10 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C9 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, (2-methyl-1-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,3,4-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4,5-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethenyl-2 methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-2,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-3-methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-3-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-ethyl-1,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-propenyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 4-ethyl-1 ,2-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene,(2-methyl-2-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane, methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclopentane, 1,3-Dimethyl, cis-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hydrocarbon C6 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclopentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentane, 2,3,3-trimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	**5.6 JN**
TIC_108-08-7	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_1759-58-6	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_2532-58-3	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_27133-93-3	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_2870-04-4	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_3290-53-7	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_496-11-7	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_560-21-4	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_565-75-3	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_620-14-4	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_824-22-6	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_874-35-1	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_933-98-2	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Unknown Aromatics as VOA	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)											
Lead	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 4.9
DETECTED GROUNDWATER SAMPLING RESULTS
FROM AUGUST 2013 TO NOVEMBER 2015 -
COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW04			699MW05	699MW06		
Sample ID		FTMM-53-GW-699MW04-8.0_2015_Q3	FTMM-53-GW-699MW04-11.5_4Q2015	FTMM-53-GW-699MW104-11.5_4Q2015	FTMM-53-GW-699MW05	FTMM-53-GW-699MW06	FTMM-53-GW-699MW06-10	FTMM-53-GW-699MW06-10.20
Sample Date		9/30/2015	11/18/2015	11/18/2015	8/20/2013	8/20/2013	3/12/2014	3/31/2014
Sample Round					7	7	8	8
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,2,4-Trichlorobenzene	9	< 1	< 1	< 1	< 1	< 1	< 1	**0.26 J**
1,2,4-Trimethylbenzene	100	**7.5**	**4.8 J**	**6.1**	< 1	**76**	**0.8 J**	< 1
1,2-Dichloropropane	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-Trimethylbenzene	100	< 1	**0.48 J**	**0.61 J**	< 1	**10**	< 1	< 1
Acetone	6,000	**2.1 B**	**3.7 B**	**3.1 B**	< 5	< 5	< 5	**2.2 J**
Benzene	1	**2.4 J**	**1.6 J**	**1.6 J**	< 1	**1.5 J**	< 1	< 1
Chloroethane	5	< 1	**0.73 J**	**0.6 J**	< 1	< 1	< 1	< 1
Chloroform	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cymene	100	< 1	< 1	**0.24 J**	< 1	**0.25 J**	< 1	< 1
Ethyl benzene	700	**13**	**6.4**	**6.1**	< 1	**83**	**1.5 J**	< 1
Isopropylbenzene	700	**1 J**	**14**	**15**	< 1	**7.6**	**0.23 J**	< 1
Meta/Para Xylene	1,000	**0.36 J**	**2 J**	**2.3 J**	< 2	**100**	**1.2 J**	< 2
Methyl bromide	10	< 1	< 1	< 1	< 1	< 1	< 1	**0.43 J**
Methyl chloride	100	< 1	**0.42 J**	**0.41 J**	< 1	< 1	< 1	< 1
Methyl ethyl ketone	300	< 1	**3.7 J**	**3.6 J**	< 1	**2.5 J**	< 1	< 1
Methyl Tertbutyl Ether	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Naphthalene	300	**2.5 J**	**11**	**13**	**0.23 J**	**15**	**0.23 J**	< 1
n-Butylbenzene	100	< 1	**1.6 J**	**2 J**	< 1	< 1	< 1	< 1
Ortho Xylene	1,000	**4.2 J**	**2.1 J**	**2.3 J**	< 1	**5.5**	**0.31 J**	< 1
Propylbenzene	100	**1.6 J**	**19**	**21**	< 1	**12**	**0.24 J**	< 1
sec-Butylbenzene	100	< 1	**2.9 J**	**3.2 J**	< 1	**0.71 J**	< 1	< 1
tert-Butylbenzene	100	< 1	**0.56 J**	**0.57 J**	< 1	< 1	< 1	< 1
Tetrachloroethene	1	< 1	**1 J**	**0.47 J**	< 1	< 1	< 1	< 1
Toluene	600	**0.9 B**	**1 J**	**1 J**	< 1	**0.59 J**	< 1	< 1
Total Xylenes	1,000	**4.56 J**	NA	NA	< 3	**105.5**	**1.51 J**	< 3
TIC VOCs (µg/l)								
Total TIC, Volatile	500	**70.7 JN**	NA	NA	ND	**179**	ND	ND
TIC VOCs (µg/l)								
1,2,3,5-Tetramethylbenzene	NLE	NA	NA	**18.2 JN**	NA	NA	NA	NA
1,2,3-Trimethylbenzene	NLE	NA	NA	NA	NA	**22.3 JN**	NA	NA
1,2,4,5-Tetramethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1,2-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1,4-Diethylbenzene	NLE	NA	NA	NA	NA	**5.5 JN**	NA	NA
1,4-Dimethyl-2-ethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Ethenyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-2-methylbenzene	NLE	NA	NA	NA	NA	**41.6 JN**	NA	NA
1-Ethyl-3-methylbenzene	NLE	NA	NA	NA	NA	**45.5 JN**	NA	NA
1-Ethyl-4-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA
1H-Indane, 2,3-dihydro-4-methyl-	NLE	**6.1 JN**	NA	**14.9 JN**	NA	NA	NA	NA
1-Methyl-2-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Methyl-2-propylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Methyl-3-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Methylindan	NLE	NA	**16.8 JN**	NA	NA	NA	NA	NA
1-Methyl-indan	NLE	NA	NA	NA	NA	**5.6 JN**	NA	NA
1-Pentane	NLE	NA	NA	NA	NA	NA	NA	NA
1-Propenylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3,4-Trimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,3-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,6-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1-methyl-indene	NLE	NA	NA	NA	NA	**5.4 JN**	NA	NA
2,3-Dihydro-4-methyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylbutane	NLE	NA	**26.8 JN**	**29.7 JN**	NA	NA	NA	NA
2,3-Dimethylpentane	NLE	NA	**32.8 JN**	**35.2 JN**	NA	NA	NA	NA
2,4-Dimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA
2,5-Dimethylstrene	NLE	NA	NA	NA	NA	NA	NA	NA
2-Ethenyl-1,4-dimethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
2-Ethyl toluene	NLE	NA	NA	NA	NA	NA	NA	NA
2-Methyl-1-Phenylpropene	NLE	NA	NA	**19.2 JN**	NA	NA	NA	NA
2-Methylbutane	NLE	**10.8 JN**	**46.3 JN**	**48.4 JN**	NA	NA	NA	NA
2-Methylpentane	NLE	NA	NA	**22.2 JN**	NA	**6.5 JN**	NA	NA
TIC VOCs (µg/l) (cont'd)								
3-Methylpentane	NLE	NA	**38.1 JN**	**41.3 JN**	NA	NA	NA	NA
4-Ethyl-M-Xylene	NLE	NA	NA	NA	NA	NA	NA	NA
4-Ethyltoluene	NLE	NA	**5.4 JN**	NA	NA	NA	NA	NA
Aliphatic Hydrocarbon C8 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Aliphatic Hydrocarbon Unknown	NLE	NA	NA	NA	NA	**5.9 J**	NA	NA
Aromatic Hydrocarbon C10 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C9 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, (2-methyl-1-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,3,4-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4,5-tetramethyl-	NLE	NA	**14.3 JN**	NA	NA	NA	NA	NA
Benzene, 1-ethenyl-2 methyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-2,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-3-methyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-3-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl	NLE	NA	NA	**10.5 JN**	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl)-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-ethyl-1,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-propenyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 4-ethyl-1 ,2-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene,(2-methyl-2-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	100	NA	NA	**13.8 JN**	NA	NA	NA	NA
Cyclohexane, methyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Cyclopentane, 1,3-Dimethyl, cis-	NLE	NA	NA	NA	NA	NA	NA	NA
Hydrocarbon C6 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Indane	NLE	NA	NA	NA	NA	**31 JN**	NA	NA
Methylcyclopentane	NLE	NA	NA	NA	NA	**9.7 JN**	NA	NA
Pentane	NLE	NA	**8.6 JN**	**9.7 JN**	NA	NA	NA	NA
Pentane, 2,3,3-trimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
TIC Unknown	NLE	**53.8 JN**	**203.8 J**	**183.7 J**	NA	NA	NA	NA
TIC_108-08-7	NLE	NA	**13.2 JN**	NA	NA	NA	NA	NA
TIC_1759-58-6	NLE	NA	**12.5 JN**	NA	NA	NA	NA	NA
TIC_2532-58-3	NLE	NA	NA	**13.1 JN**	NA	NA	NA	NA
TIC_27133-93-3	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_2870-04-4	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_3290-53-7	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_496-11-7	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_560-21-4	NLE	NA	NA	**12.6 JN**	NA	NA	NA	NA
TIC_565-75-3	NLE	NA	NA	**9.5 JN**	NA	NA	NA	NA
TIC_620-14-4	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_824-22-6	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_874-35-1	NLE	NA	**10.9 JN**	NA	NA	NA	NA	NA
TIC_933-98-2	NLE	NA	**8.4 JN**	NA	NA	NA	NA	NA
Total Unknown Aromatics as VOA	NLE	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)								
Lead	5	NA	NA	NA	NA	NA	NA	NA

TABLE 4.9
DETECTED GROUNDWATER SAMPLING RESULTS
FROM AUGUST 2013 TO NOVEMBER 2015 -
COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW06							699MW06			
Sample ID		FTMM-53-GW-699MW06-10.2_20140701	FTMM-53-GW-699MW06-10.2_2014-Q3	FTMM-53-GW-699MW106-10.2_2014-Q3	FTMM-53-GW-699MW06-10.2_2014_Q4	FTMM-53-GW-699MW106-10.2_2014_Q4	FTMM-53-699MW06-10.2	FTMM-53-699MW106-10.2	FTMM-53-GW-699MW06-10.2_2015_Q2	FTMM-53-GW-699MW106-10.2_2015_Q2	FTMM-53-GW-699MW06-10.2_2015_Q3	FTMM-53-GW-699MW106-10.2_2015_Q3
Sample Date		7/1/2014	9/30/2014	9/30/2014	12/18/2014	12/18/2014	3/30/2015	3/30/2015	6/29/2015	6/29/2015	9/30/2015	9/30/2015
Sample Round												
Filtered		Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)												
1,2,4-Trichlorobenzene	9	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-Trimethylbenzene	100	< 1	**54**	**52**	< 1	< 1	< 1	< 1	< 1	< 1	**32**	**29**
1,2-Dichloropropane	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-Trimethylbenzene	100	< 1	**5.7**	**5.7**	< 1	< 1	< 1	< 1	< 1	< 1	**3.7 J**	**3.2 J**
Acetone	6,000	**2.6 J**	**12**	**12**	**2.2 J**	**2 J**	**1.6 J**	**1.6 J**	**1.9 J**	< 5	**2.2 B**	< 5
Benzene	1	< 1	**9**	**9.2**	< 1	< 1	< 1	< 1	< 1	< 1	**1.7 J**	**2.3 J**
Chloroethane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroform	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cymene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ethyl benzene	700	< 1	**140 J**	**150**	< 1	< 1	< 1	< 1	< 1	< 1	**37**	**31**
Isopropylbenzene	700	< 1	**14**	**14**	< 1	< 1	< 1	< 1	< 1	< 1	**4.6 J**	**4.9 J**
Meta/Para Xylene	1,000	< 2	**120 J**	**120**	< 2	< 2	< 2	< 2	< 2	< 2	**46**	**42**
Methyl bromide	10	< 1	< 1	< 1	< 1 UJ	< 1 UJ	< 1	< 1	< 1 UJ	< 1 UJ	< 1	< 1
Methyl chloride	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methyl ethyl ketone	300	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methyl Tertbutyl Ether	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Naphthalene	300	< 1	**22**	**22**	< 1	< 1	< 1	< 1	< 1	< 1	**5.3**	**5.4**
n-Butylbenzene	100	< 1	**0.27 J**	**0.25 J**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ortho Xylene	1,000	< 1	**9.3**	**9.2**	< 1	< 1	< 1	< 1	< 1	< 1	**2.9 J**	**2.4 J**
Propylbenzene	100	< 1	**11**	**11**	< 1	< 1	< 1	< 1	< 1	< 1	**4.2 J**	**4.5 J**
sec-Butylbenzene	100	< 1	**0.48 J**	**0.35 J**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
tert-Butylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethene	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	600	< 1	**1.5 J**	**1.4 J**	< 1	< 1	< 1	< 1	< 1	< 1	**0.61 B**	**0.54 B**
Total Xylenes	1,000	< 3	**129.3 J**	**129.2 J**	< 3	< 3	< 3	< 3	< 3	< 3	**48.9 J**	**44.4 J**
TIC VOCs (µg/l)												
Total TIC, Volatile	500	ND	**138 JN**	**137.5 JN**	0 U	0 U	0 U	0 U	0 U	0 U	**69.4 JN**	**67.6 JN**
TIC VOCs (µg/l)												
1,2,3,5-Tetramethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	NLE	NA	**14.3 JN**	**13.9 JN**	NA	NA	NA	NA	NA	NA	**8.3 JN**	NA
1,2,4,5-Tetramethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dimethyl-2-ethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethenyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-3-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-4-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1H-Indane, 2,3-dihydro-4-methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-2-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-2-propylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-3-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methylindan	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-indan	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Pentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Propenylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4-Trimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,3-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,6-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1-methyl-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-4-methyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylbutane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,5-Dimethylstrene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Ethenyl-1,4-dimethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Ethyl toluene	NLE	NA	**29.3 JN**	**28.9 JN**	NA	NA	NA	NA	NA	NA	**9.6 JN**	**15.8 JN**
2-Methyl-1-Phenylpropene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylbutane	NLE	NA	**12 JN**	NA	NA	NA	NA	NA	NA	NA	NA	**5 JN**
2-Methylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC VOCs (µg/l) (cont'd)												
3-Methylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Ethyl-M-Xylene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Ethyltoluene	NLE	NA	NA	**26.8 JN**	NA	NA	NA	**26.8 JN**	NA	NA	**17.3 JN**	**7.4 JN**
Aliphatic Hydrocarbon C8 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aliphatic Hydrocarbon Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C10 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C9 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, (2-methyl-1-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,3,4-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4,5-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethenyl-2 methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-2,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-3-methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-3-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-ethyl-1,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-propenyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 4-ethyl-1 ,2-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene,(2-methyl-2-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane, methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclopentane, 1,3-Dimethyl, cis-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hydrocarbon C6 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclopentane	NLE	NA	**14.4 JN**	**14.9 JN**	NA	NA	NA	NA	NA	NA	NA	NA
Pentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentane, 2,3,3-trimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC Unknown	NLE	NA	**9.6 J**	**22.7 J**	NA	NA	NA	NA	NA	NA	**34.2 J**	**39.4 J**
TIC_108-08-7	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_1759-58-6	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_2532-58-3	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_27133-93-3	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_2870-04-4	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_3290-53-7	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_496-11-7	NLE	NA	**30.9 JN**	**30.3 JN**	NA	NA	NA	NA	NA	NA	NA	NA
TIC_560-21-4	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_565-75-3	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_620-14-4	NLE	NA	**27.5 JN**	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_824-22-6	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_874-35-1	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_933-98-2	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Unknown Aromatics as VOA	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)												
Lead	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 4.9
DETECTED GROUNDWATER SAMPLING RESULTS
FROM AUGUST 2013 TO NOVEMBER 2015 -
COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria		
Sample ID		FTMM-53-GW-699MW06-8.5 DISS_4Q2015	FTMM-53-GW-699MW06-8.5_4Q2015
Sample Date		11/25/2015	11/25/2015
Sample Round			
Filtered		Filtered	Total
Volatile Organic Compounds (µg/l)			
1,2,4-Trichlorobenzene	9	NA	< 1
1,2,4-Trimethylbenzene	100	NA	**3.9 J**
1,2-Dichloropropane	1	NA	< 1
1,3,5-Trimethylbenzene	100	NA	**0.23 J**
Acetone	6,000	NA	**2.1 B**
Benzene	1	NA	< 1
Chloroethane	5	NA	< 1
Chloroform	70	NA	< 1
Cymene	100	NA	< 1
Ethyl benzene	700	NA	**4 J**
Isopropylbenzene	700	NA	**0.74 J**
Meta/Para Xylene	1,000	NA	**2.9 J**
Methyl bromide	10	NA	< 1
Methyl chloride	100	NA	< 1
Methyl ethyl ketone	300	NA	< 1
Methyl Tertbutyl Ether	70	NA	< 1
Naphthalene	300	NA	**0.64 B**
n-Butylbenzene	100	NA	< 1
Ortho Xylene	1,000	NA	**0.38 J**
Propylbenzene	100	NA	**0.81 J**
sec-Butylbenzene	100	NA	< 1
tert-Butylbenzene	100	NA	< 1
Tetrachloroethene	1	NA	< 1
Toluene	600	NA	< 1
Total Xylenes	1,000	NA	NA
TIC VOCs (µg/l)			
Total TIC, Volatile	500	NA	NA
TIC VOCs (µg/l)			
1,2,3,5-Tetramethylbenzene	NLE	NA	NA
1,2,3-Trimethylbenzene	NLE	NA	NA
1,2,4,5-Tetramethylbenzene	NLE	NA	NA
1,2-Diethylbenzene	NLE	NA	NA
1,4-Diethylbenzene	NLE	NA	NA
1,4-Dimethyl-2-ethylbenzene	NLE	NA	NA
1-Ethenyl-2-methylbenzene	NLE	NA	NA
1-Ethyl-2-methylbenzene	NLE	NA	NA
1-Ethyl-3-methylbenzene	NLE	NA	NA
1-Ethyl-4-(1-methylethyl)benzene	NLE	NA	NA
1H-Indane, 2,3-dihydro-4-methyl-	NLE	NA	NA
1-Methyl-2-(1-methylethyl)benzene	NLE	NA	NA
1-Methyl-2-propylbenzene	NLE	NA	NA
1-Methyl-3-(1-methylethyl)benzene	NLE	NA	NA
1-Methylindan	NLE	NA	NA
1-Methyl-indan	NLE	NA	NA
1-Pentane	NLE	NA	NA
1-Propenylbenzene	NLE	NA	NA
2,3,4-Trimethylpentane	NLE	NA	NA
2,3-Dihydro-1,3-dimethyl-1H-indene	NLE	NA	NA
2,3-Dihydro-1,6-dimethyl-1H-indene	NLE	NA	NA
2,3-Dihydro-1-methyl-indene	NLE	NA	NA
2,3-Dihydro-4-methyl-1H-indene	NLE	NA	NA
2,3-Dimethylbutane	NLE	NA	NA
2,3-Dimethylpentane	NLE	NA	NA
2,4-Dimethylpentane	NLE	NA	NA
2,5-Dimethylstrene	NLE	NA	NA
2-Ethenyl-1,4-dimethylbenzene	NLE	NA	NA
2-Ethyl toluene	NLE	NA	NA
2-Methyl-1-Phenylpropene	NLE	NA	NA
2-Methylbutane	NLE	NA	NA
2-Methylpentane	NLE	NA	NA
TIC VOCs (µg/l) (cont'd)			
3-Methylpentane	NLE	NA	NA
4-Ethyl-M-Xylene	NLE	NA	NA
4-Ethyltoluene	NLE	NA	NA
Aliphatic Hydrocarbon C8 Unknown	NLE	NA	NA
Aliphatic Hydrocarbon Unknown	NLE	NA	NA
Aromatic Hydrocarbon C10 Unknown	NLE	NA	NA
Aromatic Hydrocarbon C9 Unknown	NLE	NA	NA
Benzene, (2-methyl-1-propenyl)-	NLE	NA	NA
Benzene, 1,2,3,4-tetramethyl-	NLE	NA	NA
Benzene, 1,2,4,5-tetramethyl-	NLE	NA	NA
Benzene, 1-ethenyl-2 methyl-	NLE	NA	NA
Benzene, 1-ethyl-2,4-dimethyl-	NLE	NA	NA
Benzene, 1-ethyl-3-methyl-	NLE	NA	NA
Benzene, 1-methyl-3-(1-methylethyl	NLE	NA	NA
Benzene, 1-methyl-4-(1-methylethyl	NLE	NA	NA
Benzene, 1-methyl-4-(1-methylethyl)-	NLE	NA	NA
Benzene, 2-ethyl-1,4-dimethyl-	NLE	NA	NA
Benzene, 2-propenyl-	NLE	NA	NA
Benzene, 4-ethyl-1 ,2-dimethyl-	NLE	NA	NA
Benzene,(2-methyl-2-propenyl)-	NLE	NA	NA
Cyclohexane	100	NA	NA
Cyclohexane, methyl-	NLE	NA	NA
Cyclopentane, 1,3-Dimethyl, cis-	NLE	NA	NA
Hydrocarbon C6 Unknown	NLE	NA	NA
Indane	NLE	NA	NA
Methylcyclopentane	NLE	NA	NA
Pentane	NLE	NA	NA
Pentane, 2,3,3-trimethyl-	NLE	NA	NA
TIC Unknown	NLE	NA	NA
TIC_108-08-7	NLE	NA	NA
TIC_1759-58-6	NLE	NA	NA
TIC_2532-58-3	NLE	NA	NA
TIC_27133-93-3	NLE	NA	NA
TIC_2870-04-4	NLE	NA	NA
TIC_3290-53-7	NLE	NA	NA
TIC_496-11-7	NLE	NA	NA
TIC_560-21-4	NLE	NA	NA
TIC_565-75-3	NLE	NA	NA
TIC_620-14-4	NLE	NA	NA
TIC_824-22-6	NLE	NA	NA
TIC_874-35-1	NLE	NA	NA
TIC_933-98-2	NLE	NA	NA
Total Unknown Aromatics as VOA	NLE	NA	NA
Inorganics (µg/l)			
Lead	5	< 2.5	< 2.5

TABLE 4.9
DETECTED GROUNDWATER SAMPLING RESULTS
FROM AUGUST 2013 TO NOVEMBER 2015 -
COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW08		699MW09					
Sample ID		FTMM-53-GW-699MW08	FTMM-53-GW-699MW108	FTMM-53-GW-699MW09	FTMM-53-GW-699MW09-8	FTMM-53-GW-699MW09-7.70	FTMM-53-GW-699MW09-7.75_20140701	FTMM-53-GW-699MW09-7.75_2014-Q3	FTMM-53-GW-699MW09-7.75_2014_Q4
Sample Date		8/20/2013	8/20/2013	8/20/2013	3/12/2014	3/31/2014	7/1/2014	9/30/2014	12/18/2014
Sample Round		7	7	7	8	8			
Filtered		Total	Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)									
1,2,4-Trichlorobenzene	9	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-Trimethylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dichloropropane	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-Trimethylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Acetone	6,000	< 5	**4.4 J**	< 5	< 5	**1.5 J**	**1.4 J**	**6.6 B**	**1.8 J**
Benzene	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroform	70	< 1	< 1	< 1	< 1	**0.25 J**	< 1	< 1	< 1
Cymene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ethyl benzene	700	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Isopropylbenzene	700	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Meta/Para Xylene	1,000	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Methyl bromide	10	< 1	< 1	< 1	< 1	**0.34 J**	< 1	< 1	< 1 UJ
Methyl chloride	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methyl ethyl ketone	300	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methyl Tertbutyl Ether	70	< 1	< 1	**0.38 J**	< 1	< 1	< 1	**0.49 J**	**0.58 J**
Naphthalene	300	**0.49 J**	**0.56 J**	< 1	**0.26 J**	< 1	< 1	< 1	< 1
n-Butylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ortho Xylene	1,000	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Propylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
sec-Butylbenzene	100	**0.48 J**	**0.51 J**	< 1	< 1	< 1	< 1	< 1	< 1
tert-Butylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethene	1	< 1	< 1	< 1	< 1	< 1	< 1	0.33 J	< 1
Toluene	600	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Total Xylenes	1,000	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3
TIC VOCs (µg/l)									
Total TIC, Volatile	500	**8.5**	**14.1**	ND	ND	ND	ND	0 U	0 U
TIC VOCs (µg/l)									
1,2,3,5-Tetramethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetramethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dimethyl-2-ethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethenyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-3-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-4-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1H-Indane, 2,3-dihydro-4-methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-2-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-2-propylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-3-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Methylindan	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-indan	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Pentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Propenylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4-Trimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,3-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,6-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1-methyl-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-4-methyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylbutane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2,5-Dimethylstrene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2-Ethenyl-1,4-dimethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2-Ethyl toluene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2-Methyl-1-Phenylpropene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylbutane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC VOCs (µg/l) (cont'd)									
3-Methylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
4-Ethyl-M-Xylene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
4-Ethyltoluene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Aliphatic Hydrocarbon C8 Unknown	NLE	**8.5 J**	**9.1 J**	NA	NA	NA	NA	NA	NA
Aliphatic Hydrocarbon Unknown	NLE	NA	**5 J**	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C10 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C9 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, (2-methyl-1-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,3,4-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4,5-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethenyl-2 methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-2,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-3-methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-3-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-ethyl-1,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-propenyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 4-ethyl-1,2-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene,(2-methyl-2-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	100	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane, methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Cyclopentane, 1,3-Dimethyl, cis-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Hydrocarbon C6 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Indane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclopentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Pentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Pentane, 2,3,3-trimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_108-08-7	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_1759-58-6	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_2532-58-3	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_27133-93-3	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_2870-04-4	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_3290-53-7	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_496-11-7	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_560-21-4	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_565-75-3	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_620-14-4	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_824-22-6	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_874-35-1	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_933-98-2	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Total Unknown Aromatics as VOA	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)									
Lead	5	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 4.9
DETECTED GROUNDWATER SAMPLING RESULTS
FROM AUGUST 2013 TO NOVEMBER 2015 -
COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW09				699MW12	699MW15	699MW16	
Sample ID		FTMM-53-699MW09-7.75	FTMM-53-GW-699MW09-7.75_2015_Q2	FTMM-53-GW-699MW09-7.75_2015_Q3	FTMM-53-GW-699MW09-9.0_4Q2015	FTMM-53-GW-699MW12	FTMM-53-GW-699MW15	FTMM-53-GW-699MW16	FTMM-53-GW-699MW16-8.5
Sample Date		3/30/2015	6/29/2015	9/30/2015	11/25/2015	8/20/2013	8/20/2013	8/20/2013	3/12/2014
Sample Round						7	7	7	8
Filtered		Total	Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)									
1,2,4-Trichlorobenzene	9	< 1	**0.25 J**	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-Trimethylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dichloropropane	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-Trimethylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Acetone	6,000	**2.2 J**	**1.7 J**	**2.1 B**	< 5	**2.2 J**	< 5	< 5	< 5
Benzene	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroform	70	< 1	< 1	< 1	< 1	< 1	< 1	**0.47 J**	**5.2**
Cymene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ethyl benzene	700	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Isopropylbenzene	700	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Meta/Para Xylene	1,000	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Methyl bromide	10	< 1	< 1 UJ	**0.47 J**	< 1	< 1	< 1	< 1	< 1
Methyl chloride	100	< 1	< 1	**0.45 J**	< 1	< 1	< 1	< 1	< 1
Methyl ethyl ketone	300	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methyl Tertbutyl Ether	70	< 1	< 1	< 1	**1.1 J**	< 1	< 1	< 1	< 1
Naphthalene	300	< 1	< 1	< 1	< 1	**0.31 J**	< 1	< 1	< 1
n-Butylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ortho Xylene	1,000	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Propylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
sec-Butylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
tert-Butylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethene	1	< 1	< 1	**1.1 J**	**0.51 J**	< 1	< 1	**1.1 J**	**0.9 J**
Toluene	600	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Total Xylenes	1,000	< 3	< 3	< 3	NA	< 3	< 3	< 3	< 3
TIC VOCs (µg/l)									
Total TIC, Volatile	500	0 U	0 U	0 U	NA	ND	ND	ND	ND
TIC VOCs (µg/l)									
1,2,3,5-Tetramethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetramethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dimethyl-2-ethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethenyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-3-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-4-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1H-Indane, 2,3-dihydro-4-methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-2-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-2-propylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-3-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Methylindan	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-indan	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Pentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
1-Propenylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4-Trimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,3-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,6-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1-methyl-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-4-methyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylbutane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2,5-Dimethylstrene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2-Ethenyl-1,4-dimethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2-Ethyl toluene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2-Methyl-1-Phenylpropene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylbutane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC VOCs (µg/l) (cont'd)									
3-Methylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
4-Ethyl-M-Xylene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
4-Ethyltoluene	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Aliphatic Hydrocarbon C8 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Aliphatic Hydrocarbon Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C10 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C9 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, (2-methyl-1-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,3,4-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4,5-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethenyl-2 methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-2,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-3-methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-3-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-ethyl-1,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-propenyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 4-ethyl-1 ,2-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Benzene,(2-methyl-2-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	100	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane, methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Cyclopentane, 1,3-Dimethyl, cis-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Hydrocarbon C6 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Indane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclopentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Pentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Pentane, 2,3,3-trimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_108-08-7	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_1759-58-6	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_2532-58-3	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_27133-93-3	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_2870-04-4	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_3290-53-7	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_496-11-7	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_560-21-4	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_565-75-3	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_620-14-4	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_824-22-6	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_874-35-1	NLE	NA	NA	NA	NA	NA	NA	NA	NA
TIC_933-98-2	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Total Unknown Aromatics as VOA	NLE	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)									
Lead	5	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 4.9
DETECTED GROUNDWATER SAMPLING RESULTS
FROM AUGUST 2013 TO NOVEMBER 2015 -
COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW16						
Sample ID		FTMM-53-GW-699MW16-11.5	FTMM-53-GW-699MW16-6.5	FTMM-53-GW-699MW16-6.5_20140701	FTMM-53-GW-699MW16-6.5_2014-Q3	FTMM-53-GW-699MW16-7.5_2014_Q4	FTMM-53-699MW16-7.5	FTMM-53-GW-699MW16-7.5_2015_Q2
Sample Date		3/31/2014	3/31/2014	7/1/2014	9/30/2014	12/18/2014	3/30/2015	6/29/2015
Sample Round		8	8					
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,2,4-Trichlorobenzene	9	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-Trimethylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-Dichloropropane	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-Trimethylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Acetone	6,000	**1.7 J**	**1.4 J**	**2.2 J**	**6.3 B**	**2 J**	**1.4 J**	**1.8 J**
Benzene	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroform	70	**8**	**7.7**	**3.1 J**	**1.6 J**	**7.8**	**4.5 J**	**0.44 J**
Cymene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ethyl benzene	700	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Isopropylbenzene	700	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Meta/Para Xylene	1,000	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Methyl bromide	10	**0.34 J**	< 1	< 1	< 1	< 1 UJ	< 1	< 1
Methyl chloride	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methyl ethyl ketone	300	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methyl Tertbutyl Ether	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Naphthalene	300	< 1	< 1	< 1	< 1	< 1	< 1	< 1
n-Butylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ortho Xylene	1,000	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Propylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1
sec-Butylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1
tert-Butylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethene	1	**0.47 J**	**0.34 J**	**0.48 J**	**1.3 J**	**0.89 J**	**0.95 J**	**1.3 J**
Toluene	600	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Total Xylenes	1,000	< 3	< 3	< 3	< 3	< 3	< 3	< 3
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	0 U	0 U	0 U	0 U
TIC VOCs (µg/l)								
1,2,3,5-Tetramethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetramethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1,2-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1,4-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1,4-Dimethyl-2-ethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Ethenyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-3-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-4-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA
1H-Indane, 2,3-dihydro-4-methyl-	NLE	NA	NA	NA	NA	NA	NA	NA
1-Methyl-2-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Methyl-2-propylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Methyl-3-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Methylindan	NLE	NA	NA	NA	NA	NA	NA	NA
1-Methyl-indan	NLE	NA	NA	NA	NA	NA	NA	NA
1-Pentane	NLE	NA	NA	NA	NA	NA	NA	NA
1-Propenylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3,4-Trimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,3-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,6-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1-methyl-indene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-4-methyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylbutane	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA
2,5-Dimethylstrene	NLE	NA	NA	NA	NA	NA	NA	NA
2-Ethenyl-1,4-dimethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
2-Ethyl toluene	NLE	NA	NA	NA	NA	NA	NA	NA
2-Methyl-1-Phenylpropene	NLE	NA	NA	NA	NA	NA	NA	NA
2-Methylbutane	NLE	NA	NA	NA	NA	NA	NA	NA
2-Methylpentane	NLE	NA	NA	NA	NA	NA	NA	NA
TIC VOCs (µg/l) (cont'd)								
3-Methylpentane	NLE	NA	NA	NA	NA	NA	NA	NA
4-Ethyl-M-Xylene	NLE	NA	NA	NA	NA	NA	NA	NA
4-Ethyltoluene	NLE	NA	NA	NA	NA	NA	NA	NA
Aliphatic Hydrocarbon C8 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Aliphatic Hydrocarbon Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C10 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C9 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, (2-methyl-1-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,3,4-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4,5-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethenyl-2 methyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-2,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-3-methyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-3-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl)-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-ethyl-1,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-propenyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 4-ethyl-1 ,2-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene,(2-methyl-2-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	100	NA	NA	NA	NA	NA	NA	NA
Cyclohexane, methyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Cyclopentane, 1,3-Dimethyl, cis-	NLE	NA	NA	NA	NA	NA	NA	NA
Hydrocarbon C6 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Indane	NLE	NA	NA	NA	NA	NA	NA	NA
Methylcyclopentane	NLE	NA	NA	NA	NA	NA	NA	NA
Pentane	NLE	NA	NA	NA	NA	NA	NA	NA
Pentane, 2,3,3-trimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
TIC Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_108-08-7	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_1759-58-6	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_2532-58-3	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_27133-93-3	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_2870-04-4	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_3290-53-7	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_496-11-7	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_560-21-4	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_565-75-3	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_620-14-4	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_824-22-6	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_874-35-1	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_933-98-2	NLE	NA	NA	NA	NA	NA	NA	NA
Total Unknown Aromatics as VOA	NLE	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)								
Lead	5	NA	NA	NA	NA	NA	NA	NA

TABLE 4.9
DETECTED GROUNDWATER SAMPLING RESULTS
FROM AUGUST 2013 TO NOVEMBER 2015 -
COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699MW16		699RW03				
Sample ID		FTMM-53-GW-699MW16-7.5_2015_Q3	FTMM-53-GW-699MW16-9.7_4Q2015	FTMM-53-GW-699RW03	FTMM-53-GW-699RW03-11.4	FTMM-53-GW-699RW03-14.59	FTMM-53-GW-699RW03-8.20	FTMM-53-GW-699RW03-8.2_20140701
Sample Date		9/30/2015	11/23/2015	8/20/2013	3/12/2014	3/31/2014	3/31/2014	7/1/2014
Sample Round				12	13	13	13	
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,2,4-Trichlorobenzene	9	< 1	< 1	< 1	< 1	< 1	**0.27 J**	< 1
1,2,4-Trimethylbenzene	100	< 1	< 1	**170**	**130**	**120**	**110**	**42**
1,2-Dichloropropane	1	< 1	< 1	**0.39 J**	< 1	< 1	< 1	< 1
1,3,5-Trimethylbenzene	100	< 1	< 1	**11**	**32**	**17**	**16**	**3.1 J**
Acetone	6,000	**2.4 B**	< 5	< 5	< 5	< 5	< 5	< 5
Benzene	1	< 1	< 1	**2.2 J**	**4.8 J**	**3.7 J**	**3.5 J**	**0.88 J**
Chloroethane	5	< 1	< 1	< 1	**0.47 J**	< 1	< 1	< 1
Chloroform	70	**12**	**3 J**	< 1	< 1	< 1	< 1	**0.28 J**
Cymene	100	< 1	< 1	**3.2 J**	**3.2 J**	**0.91 J**	**0.8 J**	**0.59 J**
Ethyl benzene	700	< 1	< 1	**35**	**50**	**49**	**46**	**17**
Isopropylbenzene	700	< 1	< 1	**18**	**21**	**14**	**13**	**7**
Meta/Para Xylene	1,000	< 2	< 2	**15**	**71**	**62**	**59**	**9.8 J**
Methyl bromide	10	< 1	< 1	< 1	< 1	< 1	**0.33 J**	< 1
Methyl chloride	100	**0.32 J**	< 1	< 1	**0.29 J**	< 1	< 1	< 1
Methyl ethyl ketone	300	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methyl Tertbutyl Ether	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Naphthalene	300	< 1	< 1	**33**	**29**	**19**	**15**	**6.5**
n-Butylbenzene	100	< 1	< 1	**7.9**	**12**	< 1	< 1	**0.9 J**
Ortho Xylene	1,000	< 1	< 1	**42**	**90**	**78**	**76**	**14**
Propylbenzene	100	< 1	< 1	**34**	**34**	**18**	**16**	**12**
sec-Butylbenzene	100	< 1	< 1	**7.6**	**7.4**	**1.9 J**	**1.6 J**	**1.3 J**
tert-Butylbenzene	100	< 1	< 1	**0.32 J**	**0.68 J**	**0.26 J**	**0.29 J**	< 1
Tetrachloroethene	1	**1.3 J**	**1.3 J**	< 1	< 1	< 1	< 1	< 1
Toluene	600	< 1	< 1	**0.72 J**	**1.7 J**	**1.4 J**	**1.3 J**	**0.22 J**
Total Xylenes	1,000	< 3	NA	**67**	**161**	**140**	**135**	**23.8 J**
TIC VOCs (µg/l)								
Total TIC, Volatile	500	**5.9 J**	NA	**898.4**	**813**	**362**	**302**	**7.1**
TIC VOCs (µg/l)								
1,2,3,5-Tetramethylbenzene	NLE	NA	NA	**66.8 JN**	**41.5 JN**	NA	**8.5 JN**	NA
1,2,3-Trimethylbenzene	NLE	NA	NA	**111.2 JN**	**85.5 JN**	**53.5 JN**	**51.3 JN**	NA
1,2,4,5-Tetramethylbenzene	NLE	NA	NA	**73.5 JN**	NA	**8 JN**	**7.3 JN**	NA
1,2-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1,4-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1,4-Dimethyl-2-ethylbenzene	NLE	NA	NA	**40.9 JN**	**35.7 JN**	**8.9 JN**	**8 JN**	NA
1-Ethenyl-2-methylbenzene	NLE	NA	NA	NA	NA	**43.9 JN**	NA	NA
1-Ethyl-2-methylbenzene	NLE	NA	NA	**103 JN**	**63.5 JN**	**38.9 JN**	**56.6 JN**	NA
1-Ethyl-3-methylbenzene	NLE	NA	NA	NA	**35.3 JN**	NA	NA	NA
1-Ethyl-4-(1-methylethyl)benzene	NLE	NA	NA	**28.5 JN**	NA	NA	NA	NA
1H-Indane, 2,3-dihydro-4-methyl-	NLE	NA	NA	NA	NA	NA	NA	NA
1-Methyl-2-(1-methylethyl)benzene	NLE	NA	NA	NA	**22.3 JN**	NA	**6.9 JN**	NA
1-Methyl-2-propylbenzene	NLE	NA	NA	**22.4 JN**	NA	NA	NA	NA
1-Methyl-3-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	**7.7 JN**	NA	NA
1-Methylindan	NLE	NA	NA	NA	NA	NA	NA	NA
1-Methyl-indan	NLE	NA	NA	NA	NA	NA	**17.2 JN**	NA
1-Pentane	NLE	NA	NA	NA	NA	NA	NA	NA
1-Propenylbenzene	NLE	NA	NA	**85.7 JN**	NA	NA	NA	NA
2,3,4-Trimethylpentane	NLE	NA	NA	**23.1 JN**	NA	NA	NA	NA
2,3-Dihydro-1,3-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,6-dimethyl-1H-indene	NLE	NA	NA	**21.7 JN**	NA	NA	NA	NA
2,3-Dihydro-1-methyl-indene	NLE	NA	NA	NA	**47.6 JN**	**19.4 JN**	**13 JN**	NA
2,3-Dihydro-4-methyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylbutane	NLE	NA	NA	NA	NA	**7.7 JN**	NA	NA
2,3-Dimethylpentane	NLE	NA	NA	**29.5 JN**	**26.8 JN**	NA	NA	NA
2,4-Dimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA
2,5-Dimethylstrene	NLE	NA	NA	NA	NA	NA	NA	NA
2-Ethenyl-1,4-dimethylbenzene	NLE	NA	NA	NA	NA	**13.9 JN**	NA	NA
2-Ethyl toluene	NLE	NA	NA	NA	NA	NA	NA	NA
2-Methyl-1-Phenylpropene	NLE	NA	NA	NA	NA	NA	NA	NA
2-Methylbutane	NLE	NA	NA	NA	NA	**18.6 JN**	**17.4 JN**	NA
2-Methylpentane	NLE	NA	NA	**33.5 JN**	NA	NA	NA	NA
TIC VOCs (µg/l) (cont'd)								
3-Methylpentane	NLE	NA	NA	**22.6 JN**	**27.7 JN**	**9.4 JN**	**7.6 JN**	NA
4-Ethyl-M-Xylene	NLE	NA	NA	NA	NA	NA	NA	NA
4-Ethyltoluene	NLE	NA	NA	**26.9 JN**	**93 JN**	**22.5 JN**	**36.1 JN**	**7.1 JN**
Aliphatic Hydrocarbon C8 Unknown	NLE	NA	NA	**35.8 J**	NA	NA	NA	NA
Aliphatic Hydrocarbon Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C10 Unknown	NLE	NA	NA	**118.3 J**	NA	NA	NA	NA
Aromatic Hydrocarbon C9 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, (2-methyl-1-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,3,4-tetramethyl-	NLE	NA	NA	NA	**51.4 JN**	**9.2 JN**	NA	NA
Benzene, 1,2,4,5-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethenyl-2 methyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-2,4-dimethyl-	NLE	NA	NA	NA	NA	**8.3 JN**	NA	NA
Benzene, 1-ethyl-3-methyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-3-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl)-	NLE	NA	NA	NA	NA	**5.9 JN**	NA	NA
Benzene, 2-ethyl-1,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-propenyl-	NLE	NA	NA	NA	NA	NA	**41.2 JN**	NA
Benzene, 4-ethyl-1 ,2-dimethyl-	NLE	NA	NA	NA	**34.4 JN**	NA	**7.4 JN**	NA
Benzene,(2-methyl-2-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	100	NA	NA	NA	NA	NA	**16.7 JN**	NA
Cyclohexane, methyl-	NLE	NA	NA	NA	**24.7 JN**	NA	NA	NA
Cyclopentane, 1,3-Dimethyl, cis-	NLE	NA	NA	NA	**15.5 JN**	NA	NA	NA
Hydrocarbon C6 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Indane	NLE	NA	NA	NA	NA	NA	NA	NA
Methylcyclopentane	NLE	NA	NA	NA	**25.6 JN**	**19.1 JN**	NA	NA
Pentane	NLE	NA	NA	NA	NA	**5.3 JN**	NA	NA
Pentane, 2,3,3-trimethyl-	NLE	NA	NA	NA	**17.1 JN**	NA	NA	NA
TIC Unknown	NLE	**5.9 J**	NA	NA	**165.4 J**	**61.8 JN**	**6.8 J**	NA
TIC_108-08-7	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_1759-58-6	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_2532-58-3	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_27133-93-3	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_2870-04-4	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_3290-53-7	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_496-11-7	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_560-21-4	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_565-75-3	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_620-14-4	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_824-22-6	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_874-35-1	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_933-98-2	NLE	NA	NA	NA	NA	NA	NA	NA
Total Unknown Aromatics as VOA	NLE	NA	NA	**55 J**	NA	NA	NA	NA
Inorganics (µg/l)								
Lead	5	NA	NA	NA	NA	NA	NA	NA

TABLE 4.9
DETECTED GROUNDWATER SAMPLING RESULTS FROM AUGUST 2013 TO NOVEMBER 2015 - COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699RW03							699RW05				
Sample ID		FTMM-53-GW-699RW03-8.2_2014-Q3	FTMM-53-GW-699RW03-8.2_2014_Q4	FTMM-53-699RW03-8.2	FTMM-53-GW-699RW03-8.2_2015_Q2	FTMM-53-GW-699RW03-8.2_2015_Q3	FTMM-53-GW-699RW03-12.8 DISS_4Q2015	FTMM-53-GW-699RW03-12.8_4Q2015	FTMM-53-GW-699RW05	FTMM-53-GW-699RW05-8.6	FTMM-53-GW-699RW05-4.8	FTMM-53-GW-699RW05-9.80	FTMM-53-GW-699RW05-4.8_20140701
Sample Date		9/30/2014	12/18/2014	3/30/2015	6/29/2015	9/30/2015	11/23/2015	11/23/2015	8/20/2013	3/12/2014	3/31/2014	3/31/2014	7/1/2014
Sample Round									12	13	13	13	
Filtered		Total	Total	Total	Total	Total	Filtered	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)													
1,2,4-Trichlorobenzene	9	< 1	< 1	< 1	< 1	< 1	NA	< 1	< 5	< 5	< 2	< 2.5	< 1
1,2,4-Trimethylbenzene	100	**26**	**3 J**	**1.1 J**	**7.2**	**1.2 J**	NA	**10**	**610**	**790**	**150**	**130**	**7.8**
1,2-Dichloropropane	1	< 1	< 1	< 1	< 1	< 1	NA	< 1	< 5	< 5	< 2	< 2.5	< 1
1,3,5-Trimethylbenzene	100	< 1	**0.26 J**	**0.45 J**	< 1	< 1	NA	**0.44 J**	**130**	**160**	**30**	**23**	**3.9 J**
Acetone	6,000	< 5	< 5	**1.6 J**	< 5	**3.2 B**	NA	< 5	< 25	< 25	< 10	< 13	< 5
Benzene	1	**0.46 J**	< 1	< 1	< 1	**0.36 J**	NA	**0.68 J**	**7.1 J**	**7.2 J**	**2.8 J**	**3.1 J**	**0.21 J**
Chloroethane	5	< 1	< 1	< 1	< 1	< 1	NA	**0.32 J**	< 5	**1.6 J**	< 2	< 2.5	< 1
Chloroform	70	**0.29 J**	< 1	< 1	**0.53 J**	< 1	NA	< 1	< 5	< 5	< 2	< 2.5	< 1
Cymene	100	**0.63 J**	**0.29 J**	< 1	< 1	< 1	NA	**0.75 J**	**2.4 J**	**3.7 J**	< 2	< 2.5	< 1
Ethyl benzene	700	**8.4**	**0.58 J**	< 1	**0.5 J**	**1.4 J**	NA	**5**	**370**	**700**	**150**	**160**	**0.74 J**
Isopropylbenzene	700	**3.7 J**	**0.37 J**	< 1	**0.28 J**	**0.79 J**	NA	**4.5 J**	**29**	**52**	**7.4 J**	**8.1 J**	**0.45 J**
Meta/Para Xylene	1,000	**0.77 J**	**0.45 J**	< 2	**0.56 J**	< 2	NA	**0.48 J**	**840**	**1,600**	**430**	**390**	**6.3 J**
Methyl bromide	10	< 1	< 1 UJ	< 1	< 1	< 1	NA	< 1	< 5	< 5	< 2	**0.88 J**	< 1
Methyl chloride	100	< 1	< 1	< 1	< 1	< 1	NA	< 1	< 5	< 5	< 2	< 2.5	< 1
Methyl ethyl ketone	300	< 1	< 1	< 1	< 1	< 1	NA	**2.4 J**	< 5	< 5	< 2	< 2.5	< 1
Methyl Tertbutyl Ether	70	< 1	< 1	< 1	< 1	< 1	NA	< 1	< 5	< 5	< 2	< 2.5	< 1
Naphthalene	300	**2.9 J**	< 1	< 1	**0.37 J**	**0.83 J**	NA	**1.1 B**	**190**	**270**	**60**	**54**	**7.6**
n-Butylbenzene	100	**1.2 J**	< 1	< 1	< 1	< 1	NA	**1.1 J**	**3.4 J**	< 5	< 2	< 2.5	< 1
Ortho Xylene	1,000	**6.4**	**0.86 J**	**2.3 J**	**1.6 J**	**1.5 J**	NA	**2 J**	**390**	**810**	**290**	**270**	**16**
Propylbenzene	100	**6.6**	**0.38 J**	< 1	**0.45 J**	**0.88 J**	NA	**5.8**	**64**	**100**	**8.9 J**	**9.7 J**	< 1
sec-Butylbenzene	100	**1.5 J**	< 1	< 1	< 1	**0.32 J**	NA	**2.5 J**	**5.1 J**	**6.3 J**	< 2	< 2.5	< 1
tert-Butylbenzene	100	< 1	< 1	< 1	< 1	< 1	NA	**0.49 J**	< 5	< 5	< 2	< 2.5	< 1
Tetrachloroethene	1	< 1	< 1	< 1	< 1	< 1	NA	< 1	< 5	< 5	< 2	**0.8 J**	< 1
Toluene	600	**0.21 J**	< 1	< 1	< 1	< 1	NA	< 1	**50**	**23 J**	**7.1 J**	**7 J**	**0.46 J**
Total Xylenes	1,000	**7.17 J**	**1.31 J**	**4.3 J**	**2.16 J**	**3.5 J**	NA	NA	**1,230**	**2,410**	**720**	**660**	**22.3 J**
TIC VOCs (µg/l)													
Total TIC, Volatile	500	**129.7 JN**	**16 JN**	0 U	0 U	0 U	NA	NA	**1,703**	**2,338**	**417.8**	**369.4**	ND
TIC VOCs (µg/l)													
1,2,3,5-Tetramethylbenzene	NLE	**7.9 JN**	NA	NA	NA	NA	NA	NA	**63.2 JN**	**41.5 JN**	NA	NA	NA
1,2,3-Trimethylbenzene	NLE	**9.3 JN**	NA	NA	NA	NA	NA	NA	**237.1 JN**	**249.6 JN**	**67.2 JN**	**55.1 JN**	NA
1,2,4,5-Tetramethylbenzene	NLE	**10.1 JN**	NA	NA	NA	NA	NA	NA	**44.2 JN**	**44.6 JN**	NA	NA	NA
1,2-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dimethyl-2-ethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	**44.2 JN**	NA	NA	NA
1-Ethenyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	**206.8 JN**	**264.9 JN**	**60 JN**	**54.9 JN**	NA
1-Ethyl-3-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	**345.2 JN**	**365.3 JN**	**58.8 JN**	NA	NA
1-Ethyl-4-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1H-Indane, 2,3-dihydro-4-methyl-	NLE	NA	NA	NA	NA	NA	NA	**8 JN**	NA	NA	NA	NA	NA
1-Methyl-2-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	**38.9 JN**	**69 JN**	NA	NA	NA
1-Methyl-2-propylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-3-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	**60.4 JN**	NA	NA	NA	NA
1-Methylindan	NLE	**11.5 JN**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-indan	NLE	NA	NA	NA	NA	NA	NA	NA	**87.1 JN**	**77 JN**	NA	NA	NA
1-Pentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Propenylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4-Trimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,3-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,6-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1-methyl-indene	NLE	NA	NA	NA	NA	NA	NA	NA	**32.3 JN**	**32.1 JN**	**12.8 JN**	NA	NA
2,3-Dihydro-4-methyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylbutane	NLE	**7.8 JN**	**9.1 JN**	NA	NA	NA	NA	**15.3 JN**	NA	NA	NA	NA	NA
2,3-Dimethylpentane	NLE	**5.7 JN**	NA	NA	NA	NA	NA	**17.2 JN**	NA	**34.9 JN**	NA	NA	NA
2,4-Dimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,5-Dimethylstrene	NLE	**12.3 JN**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Ethenyl-1,4-dimethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Ethyl toluene	NLE	**14.2 JN**	NA	NA	NA	NA	NA	**8.7 JN**	NA	NA	NA	NA	NA
2-Methyl-1-Phenylpropene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylbutane	NLE	NA	NA	NA	NA	NA	NA	**9.9 JN**	**55 JN**	NA	NA	**33.5 JN**	NA
2-Methylpentane	NLE	NA	NA	NA	NA	NA	NA	**7.2 JN**	**76.7 JN**	**159.4 JN**	**14.6 JN**	**14.2 JN**	NA
TIC VOCs (µg/l) (cont'd)													
3-Methylpentane	NLE	**9.2 JN**	**6.9 JN**	NA	NA	NA	NA	**17.1 JN**	**46.1 JN**	**97.8 JN**	NA	NA	NA
4-Ethyl-M-Xylene	NLE	NA	NA	NA	NA	NA	NA	**5.1 JN**	NA	NA	NA	NA	NA
4-Ethyltoluene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**58.4 JN**	NA
Aliphatic Hydrocarbon C8 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aliphatic Hydrocarbon Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C10 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	**40.5 J**	NA	NA	NA	NA
Aromatic Hydrocarbon C9 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, (2-methyl-1-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	**47.9 JN**	NA	NA	NA
Benzene, 1,2,3,4-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4,5-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	**8.4 JN**	NA	NA	NA	NA	NA
Benzene, 1-ethenyl-2 methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-2,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-3-methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-3-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-ethyl-1,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-propenyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 4-ethyl-1 ,2-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	**60.8 JN**	NA	NA	NA
Benzene,(2-methyl-2-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane, methyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	**52.2 JN**	NA	NA	NA
Cyclopentane, 1,3-Dimethyl, cis-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hydrocarbon C6 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	**41.1 J**	NA	NA	NA	NA
Indane	NLE	NA	NA	NA	NA	NA	NA	NA	**215.8 JN**	NA	**83.5 JN**	**72.9 JN**	NA
Methylcyclopentane	NLE	NA	NA	NA	NA	NA	NA	**8.7 JN**	**112.1 JN**	**257.7 JN**	**48.7 JN**	**46.8 JN**	NA
Pentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	**65 JN**	**15 JN**	**13.6 JN**	NA
Pentane, 2,3,3-trimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC Unknown	NLE	**36.6 J**	NA	NA	NA	**18.3 J**	NA	**43.7 J**	NA	**374.1 J**	**57.2 J**	**20 J**	NA
TIC_108-08-7	NLE	NA	NA	NA	NA	NA	NA	**6.9 JN**	NA	NA	NA	NA	NA
TIC_1759-58-6	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_2532-58-3	NLE	NA	NA	NA	NA	NA	NA	**7.8 JN**	NA	NA	NA	NA	NA
TIC_27133-93-3	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_2870-04-4	NLE	**5.1 JN**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_3290-53-7	NLE	NA	NA	NA	NA	NA	NA	**17.9 JN**	NA	NA	NA	NA	NA
TIC_496-11-7	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_560-21-4	NLE	NA	NA	NA	NA	NA	NA	**10.5 JN**	NA	NA	NA	NA	NA
TIC_565-75-3	NLE	NA	NA	NA	NA	NA	NA	**6.9 JN**	NA	NA	NA	NA	NA
TIC_620-14-4	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_824-22-6	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_874-35-1	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_933-98-2	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Unknown Aromatics as VOA	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)													
Lead	5	NA	NA	NA	NA	NA	< 2.5	< 2.5	NA	NA	NA	NA	NA

TABLE 4.9
DETECTED GROUNDWATER SAMPLING RESULTS
FROM AUGUST 2013 TO NOVEMBER 2015 -
COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria				699RW05					699RW11	
Sample ID		FTMM-53-GW-699RW05-4.8_2014-Q3	FTMM-53-GW-699RW05-10_2014_Q4	FTMM-53-699RW05-10.0	FTMM-53-GW-699RW05-10_2015_Q2	FTMM-53-GW-699RW05-10_2015_Q3	FTMM-53-GW-699RW05-10 DISS_4Q2015	FTMM-53-GW-699RW05-10_4Q2015	FTMM-53-GW-699RW05-10_RI	FTMM-53-GW-699RW11	FTMM-53-GW-699RW11-11.1
Sample Date		9/30/2014	12/18/2014	3/30/2015	6/29/2015	9/30/2015	11/23/2015	11/23/2015	11/23/2015	8/20/2013	3/12/2014
Sample Round										58	59
Filtered		Total	Total	Total	Total	Total	Filtered	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)											
1,2,4-Trichlorobenzene	9	< 1	< 1	< 2.5	< 1	< 1	NA	< 2.5	NA	< 1	< 1
1,2,4-Trimethylbenzene	100	**1.4 J**	**200 J**	**690**	**3.9 J**	**180**	NA	**290**	NA	< 1	**0.24 J**
1,2-Dichloropropane	1	< 1	< 1	< 2.5	< 1	< 1	NA	< 2.5	NA	< 1	< 1
1,3,5-Trimethylbenzene	100	**0.22 J**	**69**	**120**	**0.58 J**	**4.6 J**	NA	**56**	NA	< 1	< 1
Acetone	6,000	**14**	< 5	< 13	< 5	**5.8 B**	NA	**5.7 B**	NA	< 5	< 5
Benzene	1	< 1	**1.9 J**	**1.2 J**	< 1	**2.8 J**	NA	**2.5 J**	NA	**3.6 J**	**11**
Chloroethane	5	< 1	< 1	< 2.5 UJ	< 1	< 1	NA	< 2.5	NA	< 1	< 1
Chloroform	70	< 1	< 1	< 2.5	< 1	< 1	NA	< 2.5	NA	< 1	< 1
Cymene	100	< 1	**1.3 J**	**2.1 J**	**0.23 J**	**0.57 J**	NA	**2.4 J**	NA	< 1	< 1
Ethyl benzene	700	**0.51 J**	**120**	**330**	**0.94 J**	**180**	NA	**190**	NA	**0.21 J**	**0.45 J**
Isopropylbenzene	700	< 1	**7.7**	**23**	< 1	**13**	NA	**15**	NA	**6.9**	**8.9**
Meta/Para Xylene	1,000	**0.88 J**	**330**	**820**	**2.9 J**	**150**	NA	**370**	NA	**0.41 J**	**0.45 J**
Methyl bromide	10	< 1	< 1 UJ	< 2.5 UJ	< 1 UJ	< 1	NA	< 2.5	NA	< 1	< 1
Methyl chloride	100	< 1	< 1	< 2.5	< 1	< 1	NA	< 2.5	NA	< 1	**0.23 J**
Methyl ethyl ketone	300	< 1	< 1	< 2.5	< 1	**0.82 J**	NA	**3.5 J**	NA	< 1	< 1
Methyl Tertbutyl Ether	70	< 1	< 1	< 2.5	< 1	< 1	NA	< 2.5	NA	< 1	< 1
Naphthalene	300	**0.33 J**	**71**	**160**	**0.81 J**	**39**	NA	**120**	NA	**1.7 J**	**1.5 J**
n-Butylbenzene	100	< 1	< 1	< 2.5	< 1	**0.67 J**	NA	**2.8 J**	NA	**0.46 J**	< 1
Ortho Xylene	1,000	**1 J**	**290**	**510**	**3.2 J**	**210**	NA	**280**	NA	< 1	< 1
Propylbenzene	100	< 1	**9.7**	**39**	**0.27 J**	**19**	NA	**24**	NA	**4.8 J**	**9.4**
sec-Butylbenzene	100	< 1	**1.2 J**	**2.7 J**	< 1	**0.98 J**	NA	**2.4 J**	NA	**2 J**	**1.6 J**
tert-Butylbenzene	100	< 1	**0.28 J**	< 2.5	< 1	**0.25 J**	NA	< 2.5	NA	**0.41 J**	**0.36 J**
Tetrachloroethene	1	< 1	< 1	< 2.5	< 1	< 1	NA	< 2.5	NA	< 1	< 1
Toluene	600	< 1	**6.8**	**7.4 J**	< 1	**9.4**	NA	**7.5 J**	NA	**0.34 J**	**0.37 J**
Total Xylenes	1,000	**1.88 J**	**620**	**1,330**	**6.1 J**	**360**	NA	NA	NA	**0.41 J**	**0.45 J**
TIC VOCs (µg/l)											
Total TIC, Volatile	500	**5.7 JN**	**1,181 JN**	**2,062 JN**	**6.5 JN**	**1,217 JN**	NA	NA	NA	**153.9**	**122.9**
TIC VOCs (µg/l)											
1,2,3,5-Tetramethylbenzene	NLE	NA	**30.7 JN**	**32.9 JN**	NA	**20 JN**	NA	**24 JN**	NA	NA	NA
1,2,3-Trimethylbenzene	NLE	NA	**156.4 JN**	**287.8 JN**	**6.5 JN**	**120.4 JN**	NA	**114.1 JN**	NA	NA	NA
1,2,4,5-Tetramethylbenzene	NLE	NA	NA	NA	NA	NA	NA	**19.7 JN**	NA	NA	**6.8 JN**
1,2-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	**22.1 JN**	NA
1,4-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dimethyl-2-ethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethenyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-3-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-4-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1H-Indane, 2,3-dihydro-4-methyl-	NLE	NA	**19.3 JN**	**35.2 JN**	NA	NA	NA	**39.5 JN**	NA	NA	NA
1-Methyl-2-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-2-propylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methyl-3-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Methylindan	NLE	NA	**24.9 JN**	NA	NA	**18.9 JN**	NA	NA	NA	NA	NA
1-Methyl-indan	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Pentane	NLE	NA	**15.7 JN**	NA	NA	NA	NA	NA	NA	NA	NA
1-Propenylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4-Trimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,3-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	**8.1 JN**	NA
2,3-Dihydro-1,6-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	**5.1 JN**
2,3-Dihydro-1-methyl-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	**35.8 JN**	**17.1 JN**
2,3-Dihydro-4-methyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	**7.3 JN**
2,3-Dimethylbutane	NLE	NA	NA	NA	NA	**29.7 JN**	NA	**28.9 JN**	NA	**12.8 JN**	**17.8 JN**
2,3-Dimethylpentane	NLE	NA	NA	NA	NA	NA	NA	**19.9 JN**	NA	**13.9 JN**	**14.3 JN**
2,4-Dimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,5-Dimethylstrene	NLE	NA	**56.1 JN**	NA	NA	NA	NA	NA	NA	NA	NA
2-Ethenyl-1,4-dimethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Ethyl toluene	NLE	NA	**127.2 JN**	**236.4 JN**	NA	**20.7 JN**	NA	**128.4 JN**	NA	NA	NA
3-Methyl-1-Phenylpropene	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylbutane	NLE	NA	**44.9 JN**	**103.3 JN**	NA	**103.9 JN**	NA	**78.7 JN**	NA	NA	NA
2-Methylpentane	NLE	NA	**41.2 JN**	**116.1 JN**	NA	**42.9 JN**	NA	**67.6 JN**	NA	NA	NA
TIC VOCs (µg/l) (cont'd)											
3-Methylpentane	NLE	NA	**26 JN**	**67.4 JN**	NA	**43.6 JN**	NA	**63 JN**	NA	**6.6 JN**	**12.3 JN**
4-Ethyl-M-Xylene	NLE	NA	NA	NA	NA	NA	NA	**36.6 JN**	NA	NA	NA
4-Ethyltoluene	NLE	NA	**52.5 JN**	**254.8 JN**	NA	**98.4 JN**	NA	**135.5 JN**	NA	NA	NA
Aliphatic Hydrocarbon C8 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	**5.6 J**	NA
Aliphatic Hydrocarbon Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	**9 J**	NA
Aromatic Hydrocarbon C10 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	**34 J**	NA
Aromatic Hydrocarbon C9 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, (2-methyl-1-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,3,4-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4,5-tetramethyl-	NLE	NA	**21.6 JN**	NA	NA	**15.8 JN**	NA	NA	NA	NA	NA
Benzene, 1-ethenyl-2 methyl-	NLE	NA	**138 JN**	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-2,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-3-methyl-	NLE	NA	**96.7 JN**	**135.7 JN**	NA	**24.2 JN**	NA	NA	NA	NA	NA
Benzene, 1-methyl-3-(1-methylethyl	NLE	NA	**19.9 JN**	NA	NA	**20.3 JN**	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl	NLE	NA	**32.7 JN**	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-ethyl-1,4-dimethyl-	NLE	NA	**17.4 JN**	**31.7 JN**	NA	NA	NA	**19.7 JN**	NA	NA	NA
Benzene, 2-propenyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene, 4-ethyl-1 ,2-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene,(2-methyl-2-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	**6 JN**	NA
Cyclohexane	100	NA	NA	NA	NA	NA	NA	**28.2 JN**	NA	NA	NA
Cyclohexane, methyl-	NLE	NA	**16.8 JN**	NA	NA	NA	NA	**32.7 JN**	NA	NA	NA
Cyclopentane, 1,3-Dimethyl, cis-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hydrocarbon C6 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indane	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclopentane	NLE	**5.7 JN**	**78.5 JN**	**189.1 JN**	NA	**140.6 JN**	NA	**148.6 JN**	NA	NA	NA
Pentane	NLE	NA	**16.1 JN**	**53.5 JN**	NA	NA	NA	**31 JN**	NA	NA	NA
Pentane, 2,3,3-trimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC Unknown	NLE	NA	**148.5 J**	**518.5 JN**	NA	**518 J**	NA	**155.7 J**	NA	NA	**42.2 J**
TIC_108-08-7	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_1759-58-6	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_2532-58-3	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_27133-93-3	NLE	NA	NA	NA	NA	NA	NA	**28.4 JN**	NA	NA	NA
TIC_2870-04-4	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_3290-53-7	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_496-11-7	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_560-21-4	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_565-75-3	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_620-14-4	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_824-22-6	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_874-35-1	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TIC_933-98-2	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Unknown Aromatics as VOA	NLE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)											
Lead	5	NA	NA	NA	NA	NA	< 2.5	NA	< 2.5	NA	NA

TABLE 4.9
DETECTED GROUNDWATER SAMPLING RESULTS
FROM AUGUST 2013 TO NOVEMBER 2015 -
COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699RW11						
Sample ID		FTMM-53-GW-699RW11-14.08	FTMM-53-GW-699RW11-8.03	FTMM-53-GW-699RW11-8.3_20140701	FTMM-53-GW-699RW11-8.3_2014-Q3	FTMM-53-GW-699RW11-5.3_2014_Q4	FTMM-53-699RW11-8.3	FTMM-53-GW-699RW11-8.3_2015_Q2
Sample Date		3/31/2014	3/31/2014	7/1/2014	9/30/2014	12/18/2014	3/30/2015	6/29/2015
Sample Round		59	59					
Filtered		Total	Total	Total	Total	Total	Total	Total
Volatile Organic Compounds (µg/l)								
1,2,4-Trichlorobenzene	9	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-Trimethylbenzene	100	< 1	< 1	**0.21 J**	< 1	< 1	< 1	< 1
1,2-Dichloropropane	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-Trimethylbenzene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Acetone	6,000	< 5	< 5	< 5	< 5	**28**	< 5 UJ	< 5
Benzene	1	**6.5**	**6.5**	**2.7 J**	**2.4 J**	**3 J**	**7.1**	**4.7 J**
Chloroethane	5	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloroform	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cymene	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Ethyl benzene	700	**0.26 J**	**0.25 J**	**0.28 J**	< 1	< 1	**0.3 J**	**0.35 J**
Isopropylbenzene	700	**1.2 J**	**1.2 J**	**4.3 J**	**6.3**	**1.3 J**	**6.1**	**12**
Meta/Para Xylene	1,000	**0.33 J**	**0.35 J**	< 2	< 2	< 2	**0.55 J**	**0.42 J**
Methyl bromide	10	**0.35 J**	**0.29 J**	< 1	< 1	< 1 UJ	< 1	< 1
Methyl chloride	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methyl ethyl ketone	300	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methyl Tertbutyl Ether	70	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Naphthalene	300	**0.61 J**	**0.75 J**	**0.74 J**	**0.59 J**	**0.98 J**	**0.96 J**	**0.28 J**
n-Butylbenzene	100	< 1	< 1	< 1	**0.29 J**	< 1	< 1	**0.32 J**
Ortho Xylene	1,000	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Propylbenzene	100	**0.71 J**	**0.68 J**	**5.1**	**3.5 J**	**0.28 J**	**4.4 J**	**11**
sec-Butylbenzene	100	< 1	< 1	**0.33 J**	**1.1 J**	**0.6 J**	**0.89 J**	**1.3 J**
tert-Butylbenzene	100	< 1	< 1	< 1	< 1	**0.3 J**	**0.37 J**	**0.23 J**
Tetrachloroethene	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	600	**0.3 J**	**0.36 J**	**0.22 J**	< 1	< 1	< 1	**0.36 J**
Total Xylenes	1,000	**0.33 J**	**0.35 J**	< 3	< 3	< 3	**1.55 J**	**1.42 J**
TIC VOCs (µg/l)								
Total TIC, Volatile	500	ND	ND	ND	**83.2 JN**	**76.9 JN**	**195 JN**	**92.7 JN**
TIC VOCs (µg/l)								
1,2,3,5-Tetramethylbenzene	NLE	NA	NA	NA	NA	NA	**6.4 JN**	NA
1,2,3-Trimethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetramethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1,2-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1,4-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1,4-Dimethyl-2-ethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Ethenyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-3-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-4-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA
1H-Indane, 2,3-dihydro-4-methyl-	NLE	NA	NA	NA	NA	**9.3 JN**	NA	NA
1-Methyl-2-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Methyl-2-propylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Methyl-3-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Methylindan	NLE	NA	NA	NA	**7.7 JN**	**13.7 JN**	**27.6 JN**	**17.7 JN**
1-Methyl-indan	NLE	NA	NA	NA	NA	NA	NA	NA
1-Pentane	NLE	NA	NA	NA	NA	NA	NA	NA
1-Propenylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3,4-Trimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,3-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,6-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1-methyl-indene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-4-methyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylbutane	NLE	NA	NA	NA	**13.8 JN**	**11.5 JN**	**27.2 JN**	**10.5 JN**
2,3-Dimethylpentane	NLE	NA	NA	NA	NA	**7.4 JN**	**10.7 JN**	NA
2,4-Dimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA
2,5-Dimethylstrene	NLE	NA	NA	NA	NA	NA	NA	NA
2-Ethenyl-1,4-dimethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
2-Ethyl toluene	NLE	NA	NA	NA	NA	NA	NA	NA
2-Methyl-1-Phenylpropene	NLE	NA	NA	NA	NA	NA	NA	NA
2-Methylbutane	NLE	NA	NA	NA	**7.1 JN**	NA	**15.6 JN**	**16.3 JN**
2-Methylpentane	NLE	NA	NA	NA	NA	NA	NA	NA
TIC VOCs (µg/l) (cont'd)								
3-Methylpentane	NLE	NA	NA	NA	NA	NA	**16.4 JN**	NA
4-Ethyl-M-Xylene	NLE	NA	NA	NA	NA	NA	NA	NA
4-Ethyltoluene	NLE	NA	NA	NA	NA	NA	NA	NA
Aliphatic Hydrocarbon C8 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Aliphatic Hydrocarbon Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C10 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C9 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, (2-methyl-1-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,3,4-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4,5-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethenyl-2 methyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-2,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-3-methyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-3-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl)-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-ethyl-1,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-propenyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 4-ethyl-1 ,2-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene,(2-methyl-2-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	100	NA	NA	NA	NA	NA	NA	NA
Cyclohexane, methyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Cyclopentane, 1,3-Dimethyl, cis-	NLE	NA	NA	NA	NA	NA	NA	NA
Hydrocarbon C6 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Indane	NLE	NA	NA	NA	NA	NA	NA	NA
Methylcyclopentane	NLE	NA	NA	NA	**6.9 JN**	NA	**20.3 JN**	NA
Pentane	NLE	NA	NA	NA	NA	NA	NA	NA
Pentane, 2,3,3-trimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
TIC Unknown	NLE	NA	NA	NA	**14.8 J**	**35 J**	**70.8 J**	**48.2 J**
TIC_108-08-7	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_1759-58-6	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_2532-58-3	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_27133-93-3	NLE	NA	NA	NA	**15.5 JN**	NA	NA	NA
TIC_2870-04-4	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_3290-53-7	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_496-11-7	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_560-21-4	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_565-75-3	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_620-14-4	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_824-22-6	NLE	NA	NA	NA	**17.4 JN**	NA	NA	NA
TIC_874-35-1	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_933-98-2	NLE	NA	NA	NA	NA	NA	NA	NA
Total Unknown Aromatics as VOA	NLE	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)								
Lead	5	NA	NA	NA	NA	NA	NA	NA

TABLE 4.9
DETECTED GROUNDWATER SAMPLING RESULTS
FROM AUGUST 2013 TO NOVEMBER 2015 -
COMPARISON TO NJDEP GROUNDWATER QUALITY STANDARDS
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Loc ID	NJ Ground Water Quality Criteria	699RW11			FTMM53-MW01			FTMM53-MW01
Sample ID		FTMM-53-GW-699RW11-8.3_2015_Q3	FTMM-53-GW-699RW11-12.8 DISS_4Q2015	FTMM-53-GW-699RW11-12.8_4Q2015	FTMM-53-GW-MW01-12.9 DISS_4Q2015	FTMM-53-GW-MW01-12.9_4Q2015	FTMM-53-GW-MW-01-8.4 DISS_4Q2015	FTMM-53-GW-MW-01-8.4_4Q2015
Sample Date		9/30/2015	11/25/2015	11/25/2015	11/23/2015	11/23/2015	11/23/2015	11/23/2015
Sample Round								
Filtered		Total	Filtered	Total	Filtered	Total	Filtered	Total
Volatile Organic Compounds (µg/l)								
1,2,4-Trichlorobenzene	9	< 1	NA	< 1	NA	< 1	NA	NA
1,2,4-Trimethylbenzene	100	< 1	NA	< 1	NA	< 1	NA	NA
1,2-Dichloropropane	1	< 1	NA	< 1	NA	< 1	NA	NA
1,3,5-Trimethylbenzene	100	< 1	NA	< 1	NA	< 1	NA	NA
Acetone	6,000	< 5	NA	**5.8 B**	NA	< 5	NA	NA
Benzene	1	**3 J**	NA	**3.3 J**	NA	< 1	NA	NA
Chloroethane	5	< 1	NA	< 1	NA	< 1	NA	NA
Chloroform	70	< 1	NA	< 1	NA	< 1	NA	NA
Cymene	100	< 1	NA	< 1	NA	< 1	NA	NA
Ethyl benzene	700	< 1	NA	< 1	NA	< 1	NA	NA
Isopropylbenzene	700	**7.1**	NA	**4.9 J**	NA	< 1	NA	NA
Meta/Para Xylene	1,000	**0.45 J**	NA	**0.44 J**	NA	< 2	NA	NA
Methyl bromide	10	**0.37 J**	NA	< 1	NA	< 1	NA	NA
Methyl chloride	100	**0.42 J**	NA	< 1	NA	< 1	NA	NA
Methyl ethyl ketone	300	< 1	NA	**4 J**	NA	< 1	NA	NA
Methyl Tertbutyl Ether	70	< 1	NA	< 1	NA	< 1	NA	NA
Naphthalene	300	**0.27 J**	NA	**1 B**	NA	< 1	NA	NA
n-Butylbenzene	100	< 1	NA	< 1	NA	< 1	NA	NA
Ortho Xylene	1,000	< 1	NA	< 1	NA	< 1	NA	NA
Propylbenzene	100	**2.7 J**	NA	**2.4 J**	NA	< 1	NA	NA
sec-Butylbenzene	100	**1.2 J**	NA	**1.6 J**	NA	< 1	NA	NA
tert-Butylbenzene	100	**0.22 J**	NA	**0.34 J**	NA	< 1	NA	NA
Tetrachloroethene	1	< 1	NA	< 1	NA	< 1	NA	NA
Toluene	600	**0.38 B**	NA	**0.23 J**	NA	< 1	NA	NA
Total Xylenes	1,000	**1.45 J**	NA	NA	NA	NA	NA	NA
TIC VOCs (µg/l)								
Total TIC, Volatile	500	**131 JN**	NA	NA	NA	NA	NA	NA
TIC VOCs (µg/l)								
1,2,3,5-Tetramethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trimethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetramethylbenzene	NLE	NA	NA	**6.9 JN**	NA	NA	NA	NA
1,2-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1,4-Diethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1,4-Dimethyl-2-ethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Ethenyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-2-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-3-methylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Ethyl-4-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA
1H-Indane, 2,3-dihydro-4-methyl-	NLE	**9.1 JN**	NA	NA	NA	NA	NA	NA
1-Methyl-2-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Methyl-2-propylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Methyl-3-(1-methylethyl)benzene	NLE	NA	NA	NA	NA	NA	NA	NA
1-Methylindan	NLE	**10.6 JN**	NA	**14 JN**	NA	NA	NA	NA
1-Methyl-indan	NLE	NA	NA	NA	NA	NA	NA	NA
1-Pentane	NLE	NA	NA	NA	NA	NA	NA	NA
1-Propenylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3,4-Trimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,3-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1,6-dimethyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-1-methyl-indene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dihydro-4-methyl-1H-indene	NLE	NA	NA	NA	NA	NA	NA	NA
2,3-Dimethylbutane	NLE	**16.8 JN**	NA	**21 JN**	NA	NA	NA	NA
2,3-Dimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylpentane	NLE	NA	NA	NA	NA	NA	NA	NA
2,5-Dimethylstrene	NLE	**22.4 JN**	NA	**5.7 JN**	NA	NA	NA	NA
2-Ethenyl-1,4-dimethylbenzene	NLE	NA	NA	NA	NA	NA	NA	NA
2-Ethyl toluene	NLE	NA	NA	NA	NA	NA	NA	NA
2-Methyl-1-Phenylpropene	NLE	NA	NA	NA	NA	NA	NA	NA
2-Methylbutane	NLE	NA	NA	**16 JN**	NA	NA	NA	NA
2-Methylpentane	NLE	NA	NA	NA	NA	NA	NA	NA
TIC VOCs (µg/l) (cont'd)								
3-Methylpentane	NLE	**13 JN**	NA	**17 JN**	NA	NA	NA	NA
4-Ethyl-M-Xylene	NLE	NA	NA	NA	NA	NA	NA	NA
4-Ethyltoluene	NLE	NA	NA	NA	NA	NA	NA	NA
Aliphatic Hydrocarbon C8 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Aliphatic Hydrocarbon Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C10 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Aromatic Hydrocarbon C9 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, (2-methyl-1-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,3,4-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1,2,4,5-tetramethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethenyl-2 methyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-2,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-ethyl-3-methyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-3-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 1-methyl-4-(1-methylethyl)-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-ethyl-1,4-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 2-propenyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene, 4-ethyl-1 ,2-dimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Benzene,(2-methyl-2-propenyl)-	NLE	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	100	**6 JN**	NA	NA	NA	NA	NA	NA
Cyclohexane, methyl-	NLE	NA	NA	NA	NA	NA	NA	NA
Cyclopentane, 1,3-Dimethyl, cis-	NLE	NA	NA	NA	NA	NA	NA	NA
Hydrocarbon C6 Unknown	NLE	NA	NA	NA	NA	NA	NA	NA
Indane	NLE	NA	NA	NA	NA	NA	NA	NA
Methylcyclopentane	NLE	NA	NA	NA	NA	NA	NA	NA
Pentane	NLE	NA	NA	NA	NA	NA	NA	NA
Pentane, 2,3,3-trimethyl-	NLE	NA	NA	NA	NA	NA	NA	NA
TIC Unknown	NLE	**53.1 J**	NA	**80 J**	NA	NA	NA	NA
TIC_108-08-7	NLE	NA	NA	**8.4 JN**	NA	NA	NA	NA
TIC_1759-58-6	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_2532-58-3	NLE	NA	NA	**6.8 JN**	NA	NA	NA	NA
TIC_27133-93-3	NLE	NA	NA	**11 JN**	NA	NA	NA	NA
TIC_2870-04-4	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_3290-53-7	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_496-11-7	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_560-21-4	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_565-75-3	NLE	NA	NA	**7.2 JN**	NA	NA	NA	NA
TIC_620-14-4	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_824-22-6	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_874-35-1	NLE	NA	NA	NA	NA	NA	NA	NA
TIC_933-98-2	NLE	NA	NA	NA	NA	NA	NA	NA
Total Unknown Aromatics as VOA	NLE	NA	NA	NA	NA	NA	NA	NA
Inorganics (µg/l)								
Lead	5	NA	< 2.5	< 2.5	< 2.5	< 2.5	**2.5 J**	< 2.5

TABLE 4.9
DETECTED GROUNDWATER SAMPLING RESULTS FROM AUGUST 2013 TO NOVEMBER 2015 - COMPARISON TO NJDEP CRITERIA
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

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) **Bold** chemical dectection

5) 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 concentration 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.

6) 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 Standard ####

7) Criteria action level source document and web address.
- The NJ Ground Water Quality Criteria refers to the NJDEP Groundwater Quality Standards - Adopted July 22, 2010
http://www.state.nj.us/dep/wms/bwqsa/docs/njac79C.pdf

TABLE 4.10
GROUNDWATER SAMPLING SUMMARY OF NJDEP GWQS EXCEEDANCES
FROM AUGUST 2013 TO NOVEMBER 2015
SITE FTMM-53
FORT MONMOUTH, NEW JERSEY

Analyte	Maximum Detected Concentration		Location of Maximum Concentration	Sample Date	Number of Samples	Number of Detections	Number of Exceedances (1)
Volatile Organic Compounds (µg/l)							
1,2,4-Trimethylbenzene	790		699RW05	3/12/2014	101	47	12
1,3,5-Trimethylbenzene	160		699RW05	3/12/2014	101	32	3
Benzene	11		699RW11	3/12/2014	101	44	31
Meta/Para Xylene	1,600		699RW05	3/12/2014	101	43	1
Tetrachloroethene	1.3	J	699MW16 699MW16 699MW16 699MW16	9/30/2014 6/29/2015 9/30/2015 11/23/2015	101	17	6
Total Xylenes	2,410		699RW05	3/12/2014	91	42	3
TIC VOCs (µg/l)							
Total TIC, Volatile	2,338		699RW05	3/12/2014	91	36	7
TIC VOCs (µg/l) (None Above Standard)							
Inorganics (µg/l) (None Above Standard)							

1) Criteria action level source document and web address.

- The NJ Ground Water Quality Criteria refers to the NJDEP Groundwater Quality Standards (GWQS) - Adopted July 22, 2010
  http://www.state.nj.us/dep/wms/bwqsa/docs/njac79C.pdf

FIGURES

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: TS	REVIEWED BY: JB
DATE: August 2014	FIGURE NUMBER: Figure 1.1
PROJECT NUMBER: 748810.02090	FILE: FTMM_RIFS_22_F1-1_Location.mxd

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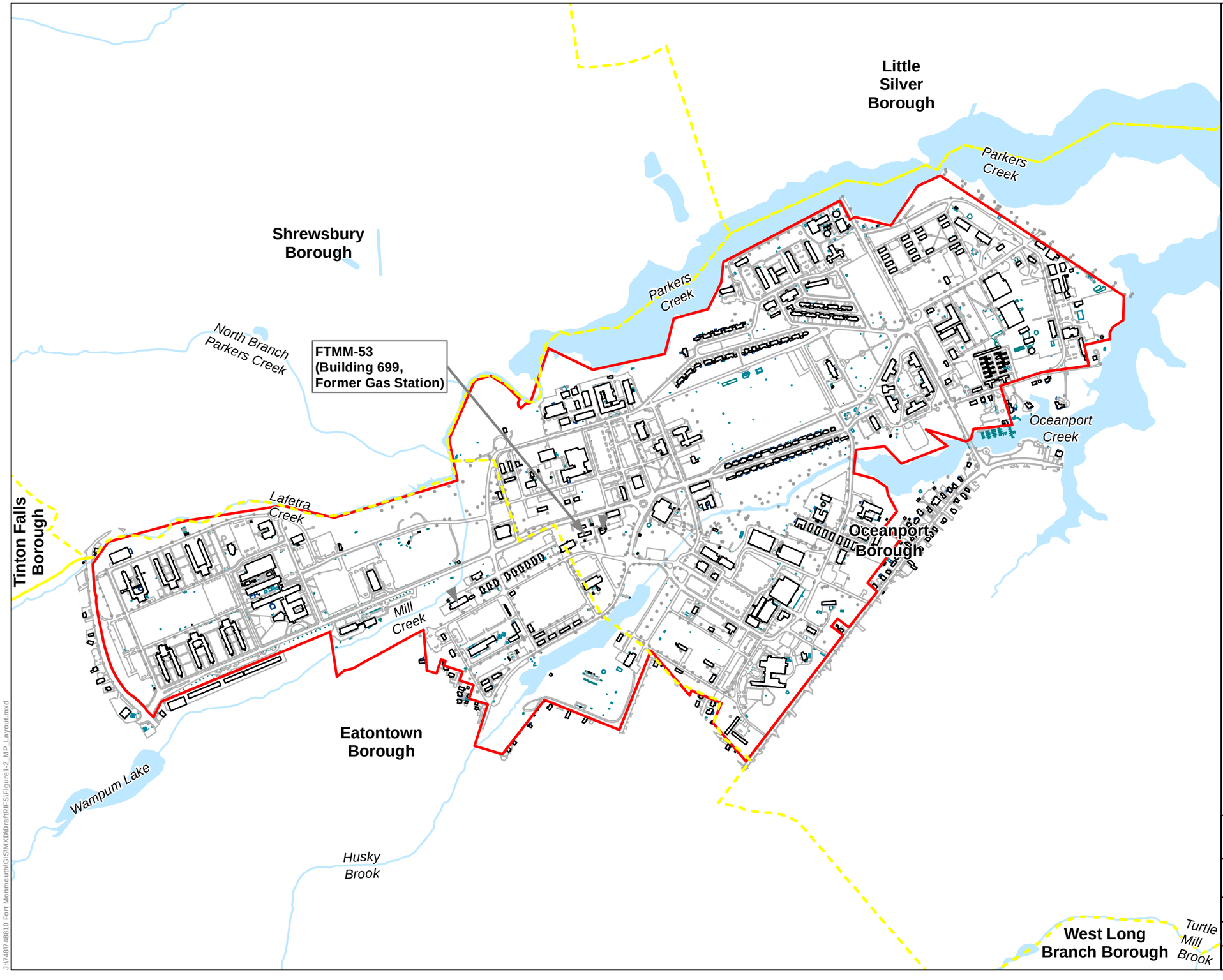

Legend

- Surface Water Feature
- Municipal Boundary
- Installation Boundary

N

1 inch = 1,000 feet

0 250 500 1,000 1,500 2,000 2,500 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 and FTMM-53 Location	
CREATED BY: TS	REVIEWED BY: JH
DATE: March 2013	FIGURE NUMBER: Figure 1.2
PROJECT NUMBER: 748810.01000	FILE: Figure1-2_MP_Layout.mxd

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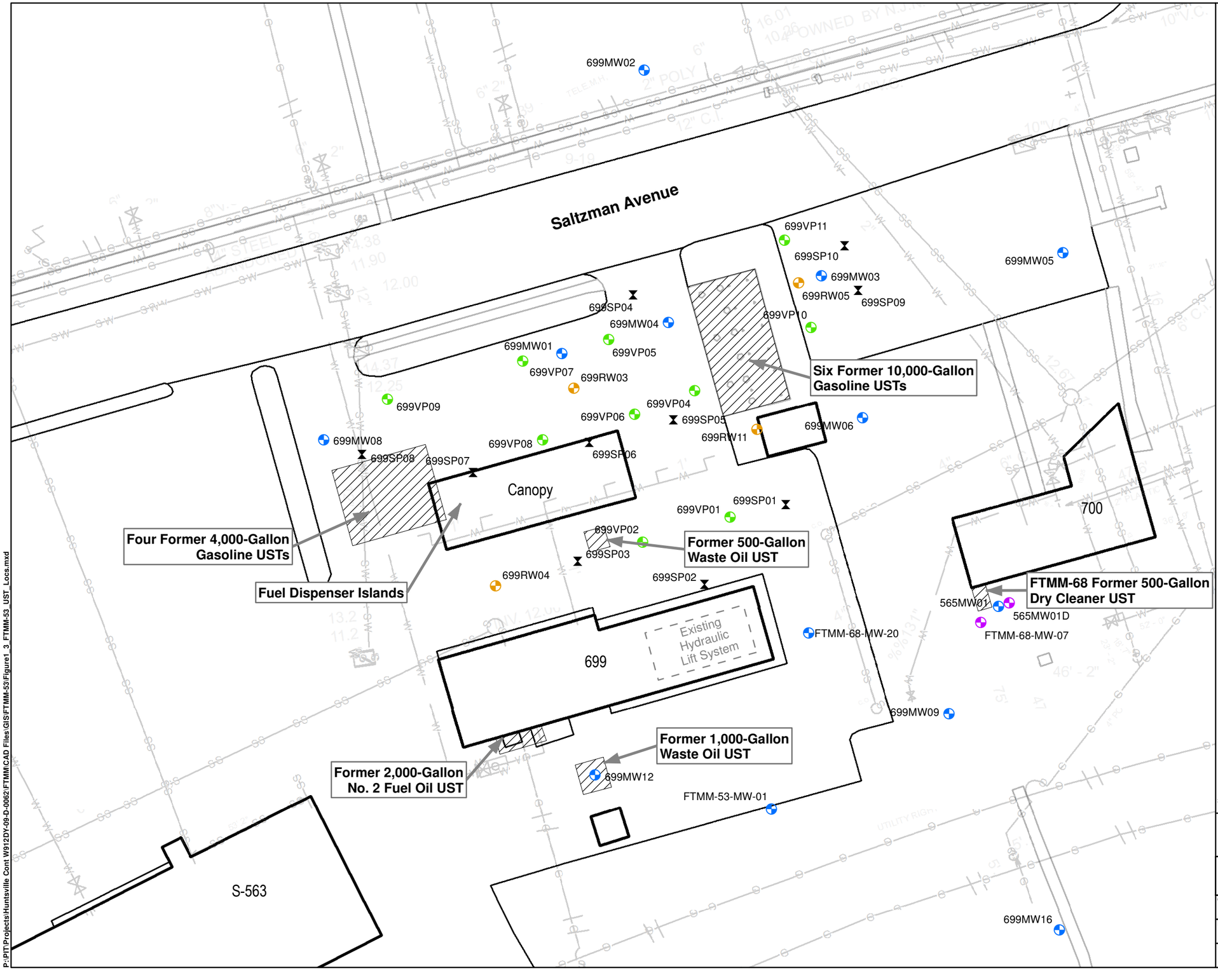

LEGEND:

- Shallow Monitoring Well
- Deep Monitoring Well
- Vapor Monitoring Well
- Recovery Well
- Air Sparge Well
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line

NOTE:

All tank locations are approximate.

N

1 inch = 40 feet

0 20 40 80 Feet

Source: FTMM Supplied CAD

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

FORMER UNDERGROUND STORAGE TANK LOCATIONS AT FTMM-53

CREATED BY: RR	REVIEWED BY: SS
DATE: OCT. 2017	FIGURE NUMBER: FIGURE 1.3
PROJECT NUMBER: 748810-02180	FILE: Figure1_3_FTMM-53_UST_Locs.mxd

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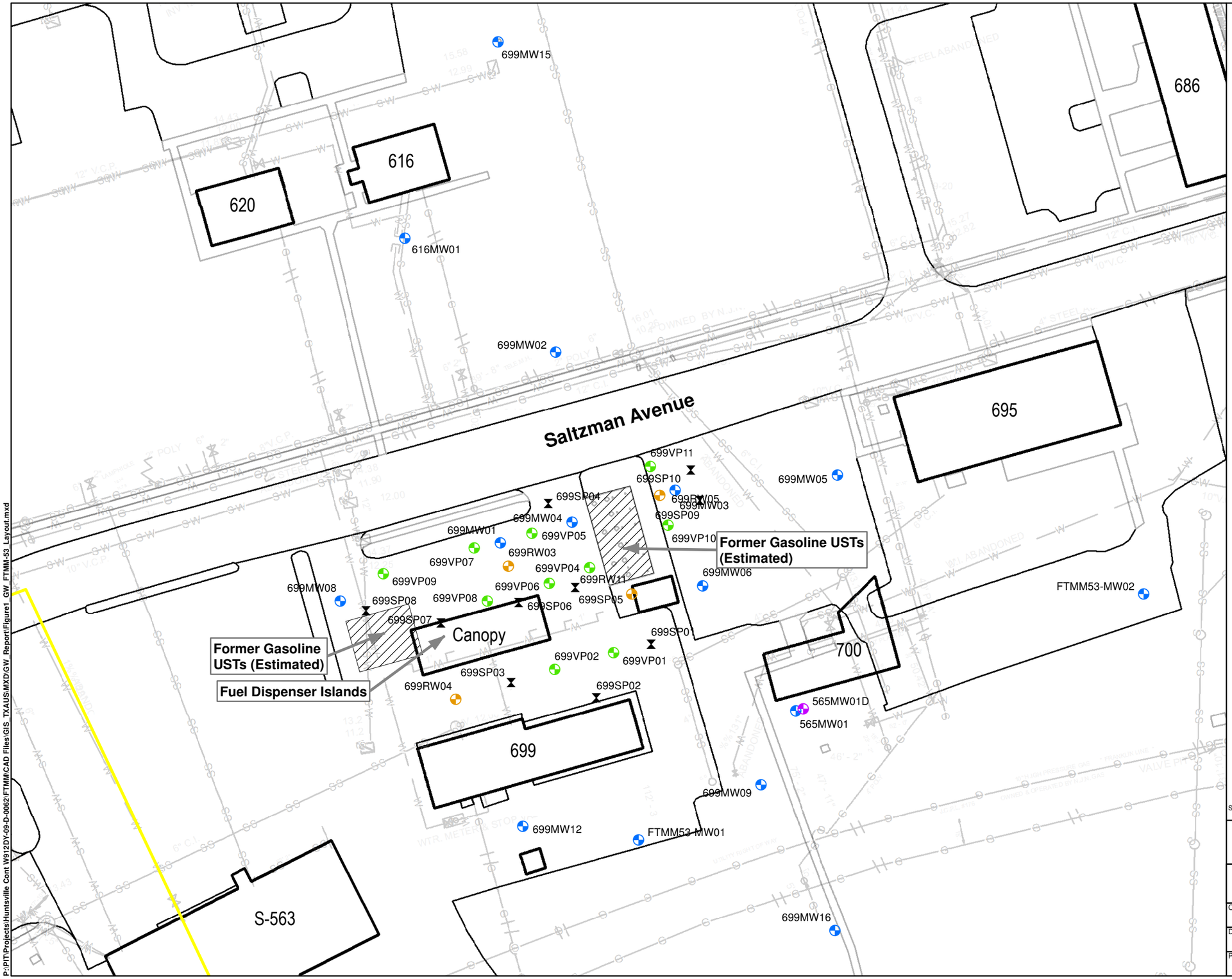


LEGEND:

- Shallow Monitoring Well
- Deep Monitoring Well
- Vapor Monitoring Well
- Recovery Well
- Air Sparge Well
- Municipal Boundary
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line

N

1 inch = 60 feet

0 30 60 120 Feet

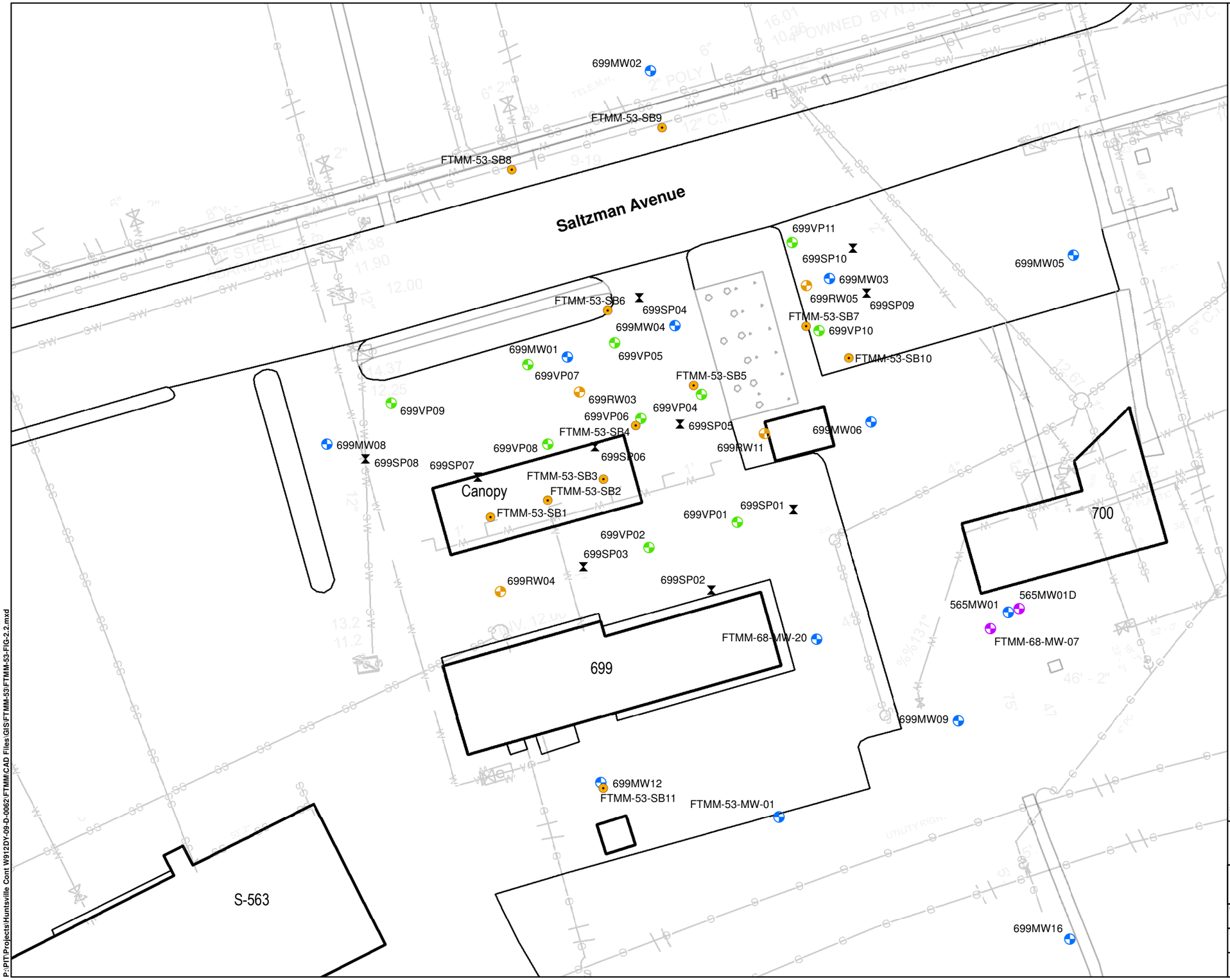
Source: FTMM Supplied CAD

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS_TXAUS\MXD\GW_Report\Figure1_GW_FTMM-53_Layout.mxd

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

LAYOUT OF FTMM-53
FORMER GAS STATION AT BUIDILING 699

CREATED BY: RR	REVIEWED BY: ME
DATE: NOV. 2015	FIGURE NUMBER: FIGURE 2.1
PROJECT NUMBER: 748810-01000	FILE: Figure1_GW_FTMM-53_Layout.mxd



LEGEND:

- Shallow Monitoring Well
- Deep Monitoring Well
- Vapor Monitoring Well
- Recovery Well
- Air Sparge Well
- Soil Boring (2015)
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line

N

1 inch = 40 feet

0 20 40 80 Feet

Source: FTMM Supplied CAD

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

2015 RI SAMPLING LOCAITONS AT FTMM-53

CREATED BY: RR	REVIEWED BY: SS
DATE: OCT. 2017	FIGURE NUMBER: FIGURE 2.2
PROJECT NUMBER: 748810-02180	FILE: FTMM-53-FIG-2.2.mxd

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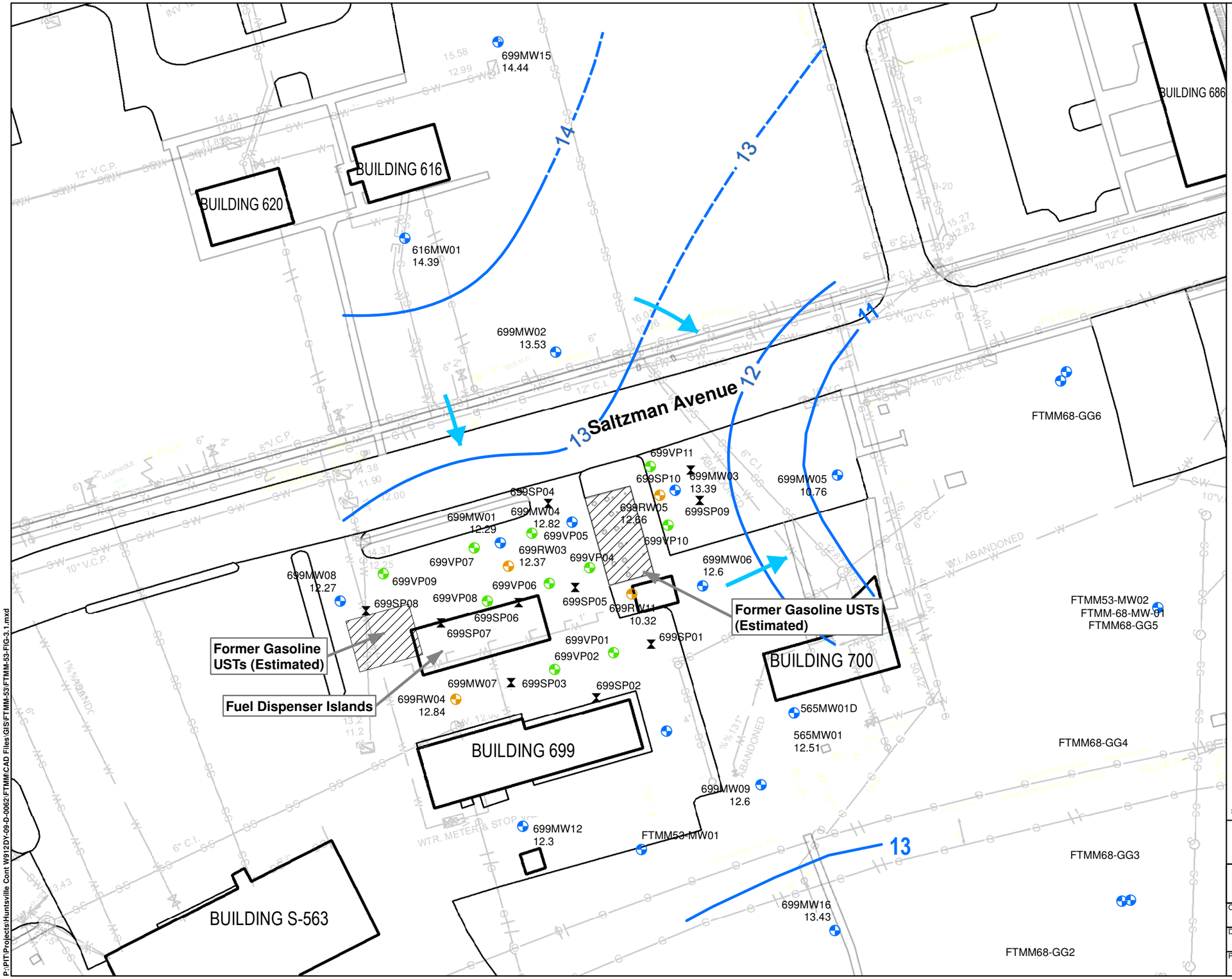

LEGEND:

- Shallow Monitoring Well
- Vapor Monitoring Well
- Recovery Well
- Air Sparge Well
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Groundwater Elevation Contour (ft. amsl)
- Inferred Groundwater Elevation Contour
- Inferred Groundwater Flow Direction

NOTE:

Groundwater elevations in monitoring wells 699MW03 and 699RW11 were considered anomalous compared to the fluid levels at neighboring wells.

N

1 inch = 60 feet

0 15 30 60 90 120 Feet

Source: FTMM Supplied CAD

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

FTMM-53 SHALLOW GROUNDWATER CONTOURS - MARCH 30, 2015

CREATED BY: RR	REVIEWED BY: ME
DATE: OCT. 2017	FIGURE NUMBER: FIGURE 3.1
PROJECT NUMBER: 748810-03000	FILE: FTMM-53-FIG-3.1.mxd

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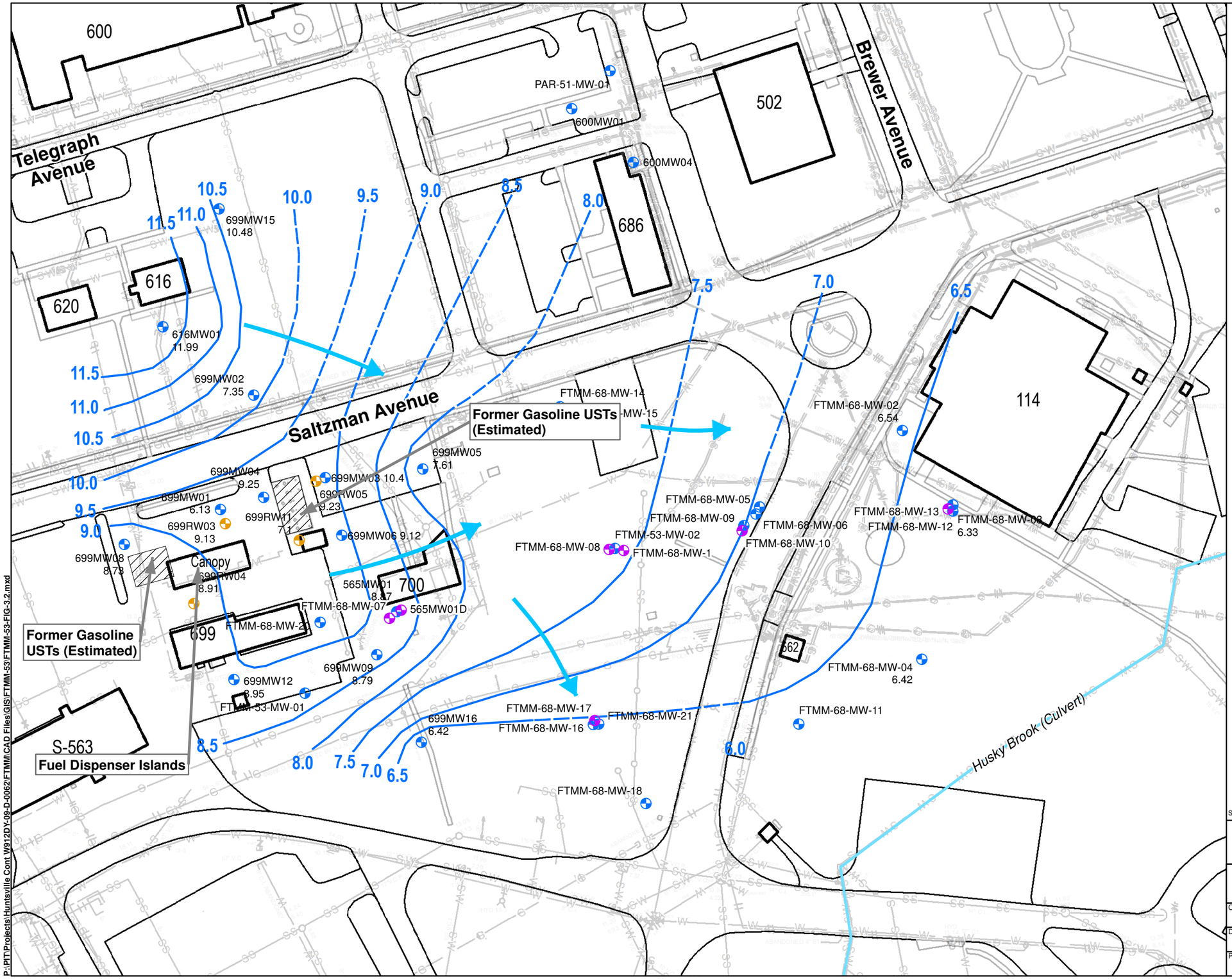

LEGEND:

- Deep Monitoring Well
- Shallow Monitoring Well
- Recovery Well
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Groundwater Elevation Contour (ft. amsl)
- Inferred Groundwater Elevation Contour
- Inferred Groundwater Flow

NOTE:

The groundwater elevations at monitoring wells 699MW01, 699MW02, 699MW03, and 699RW11 were considered anomalous compared to the elevations at neighboring wells and were not used for contouring.

DRAFT

N

1 inch = 100 feet

0 50 100 200 Feet

Source: FTMM Supplied CAD

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

FTMM-53 AND FTMM-68 SHALLOW GROUNDWATER ELEVATION CONTOURS - NOVEMBER 15, 2015

CREATED BY: RR	REVIEWED BY: ME
DATE: OCT. 2017	FIGURE NUMBER: FIGURE 3.2
PROJECT NUMBER: 748810-01000	FILE: FTMM-53-FIG-3.2.mxd

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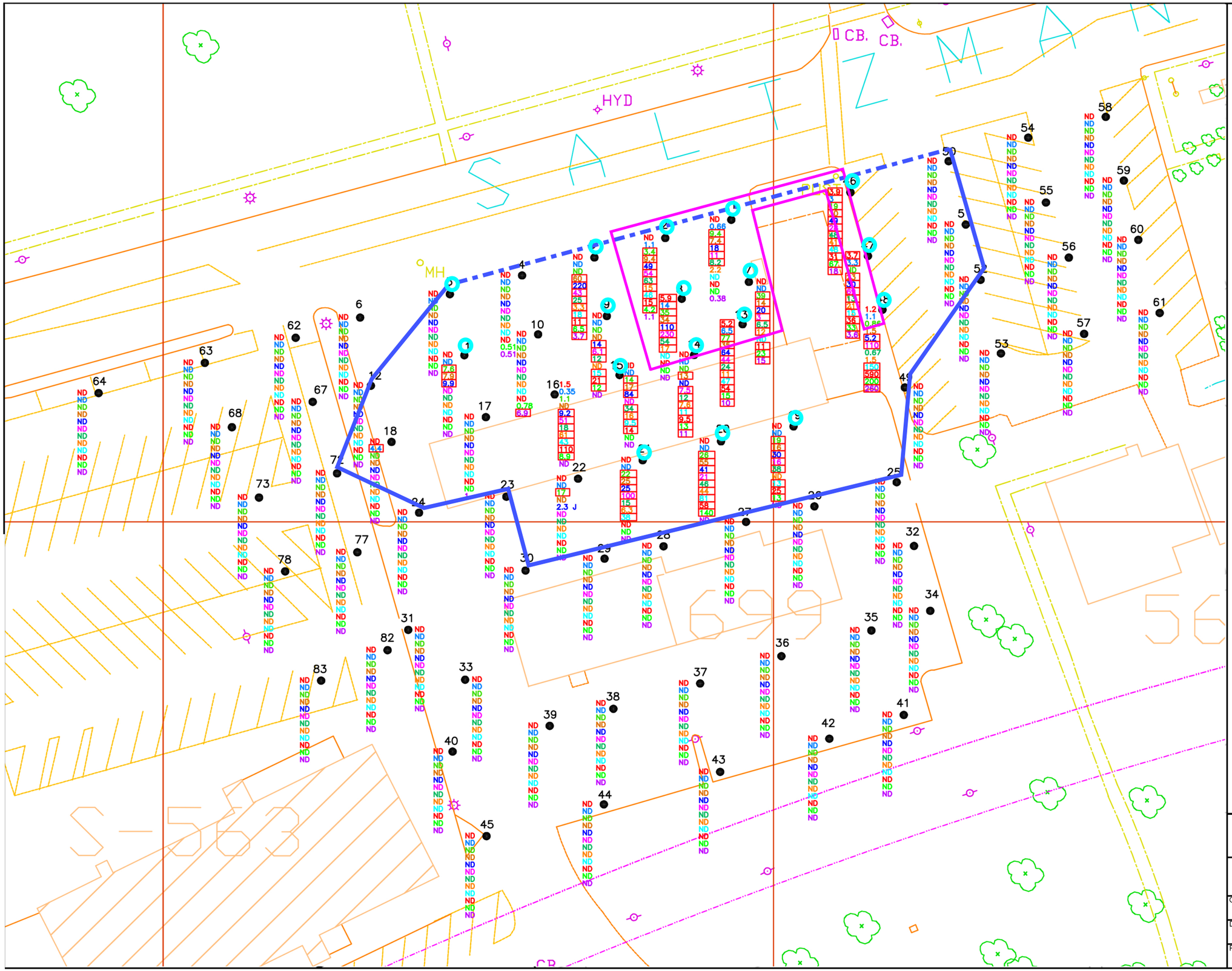


LEGEND:

NOTES:

1.) SAMPLING DEPTHS ARE FOR BENZENE ONLY.

2.) ▭ = EXCEEDS NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA

3.) THIS MAP PRESENTS DATA FOR THOSE ANALYTES THAT EXCEEDED THE NJDEP RESIDENTIAL DIRECT SOIL CLEANUP CRITERIA IN AT LEAST ONE SOIL BORING.

4.) ND=NOT DETECTED
NA=NOT ANALYZED
NST=NO SAMPLE TAKEN

Sample Depths:
- 6–12"
- 18–24"
- 30–36"
- 42–48"
- 54–60"
- 66–72"
- 78–84"
- 90–96"
- 102–108"
- 114–120"
- 126–132"
- 138–144"

Area of 27 soil samples collected by Krydon in 1993 (GES, 1999).

Extent of 2000 benzene RDCSRS exceedances in soil.

Extent of 2000 benzene RDCSRS exceedances not delineated.

Location selected for enzyme enhanced bioremediation application in 2001.

Source: Versar, 2000b

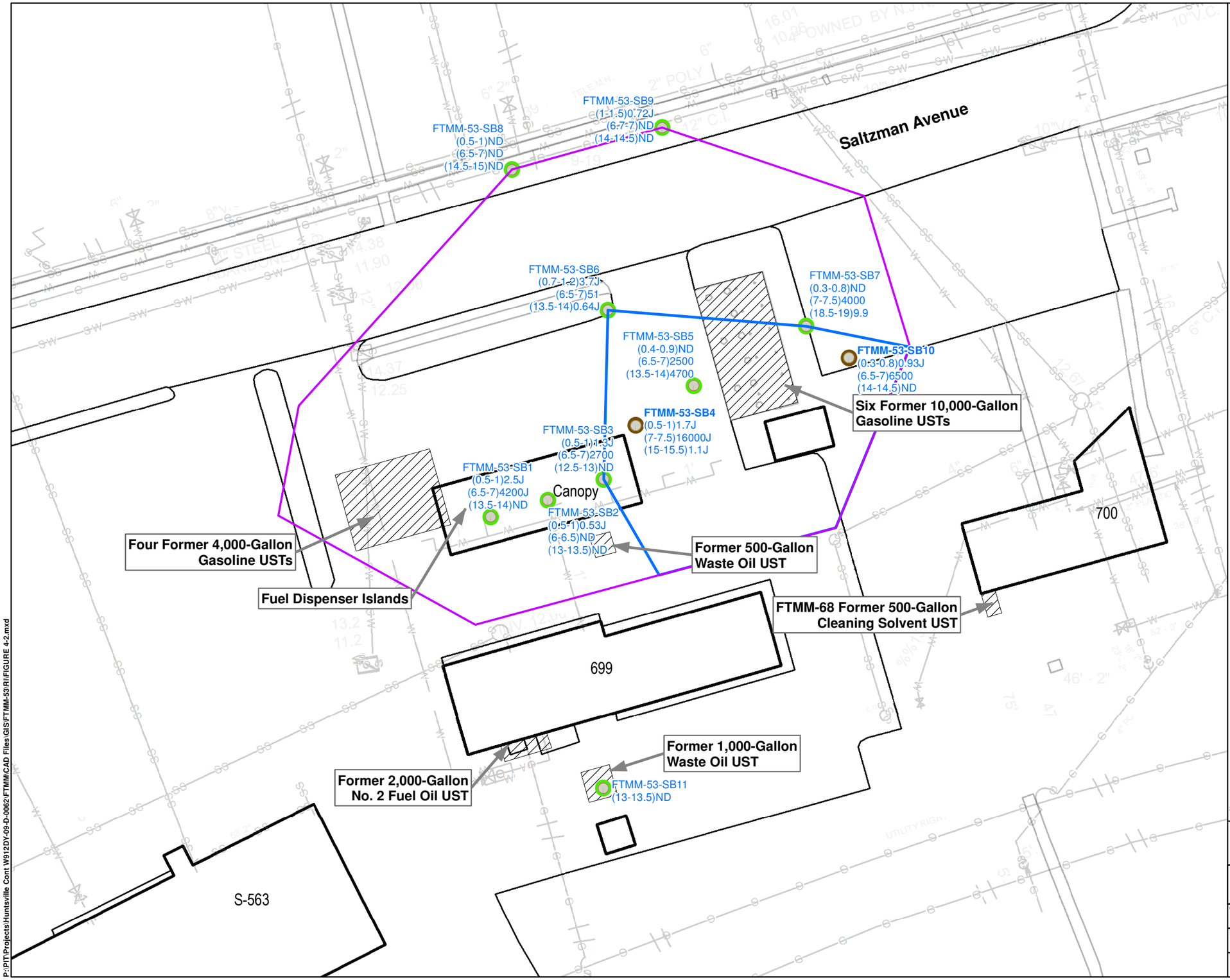
N

1 inch = 37 feet

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

Benzene Results in Soil at FTMM-53
March/April 2000

CREATED BY: SS	REVIEWED BY: JH
DATE: FEB. 2016	FIGURE NUMBER: FIGURE 4.1
PROJECT NUMBER: 748810-02180	FILE:



LEGEND:

- Soil Boring (2015)
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Extent of RDCSRS Exceedances (2015)
- Extent of Fuel Hydrocarbon Contamination in Soil Delineated based on Versar 2000 and 2015 RI Sampling Results
- Naphthalene Concentration is Less Than NJDEP RDCSRS (6,000 µg/kg) in 2015 RI Soil Sample
- Naphthalene Concentration Exceeds NJDEP RDCSRS (6,000 µg/kg) in 2015 RI Soil Sample

FTMM-53-SB-7 — Boring ID
(7-7.5)4000
- Concentration (µg/kg)
- Depth (ft. bgs)

J = Estimated Concentration
ND = Not Detected

NOTE:

1. All tank locations are approximate.

N

1 inch = 40 feet

0 20 40 80 Feet

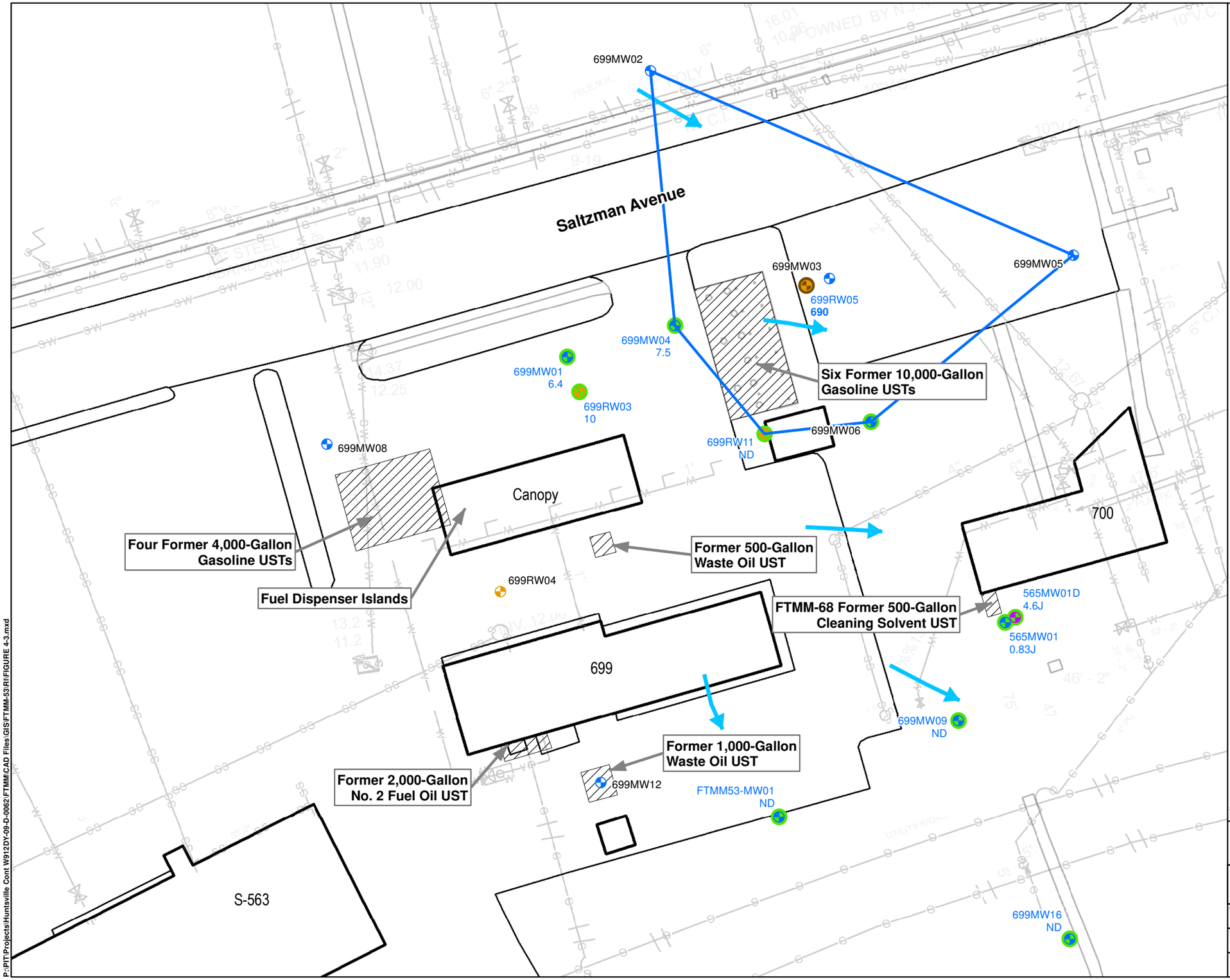
Source: FTMM Supplied CAD

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\FTMM-53\R\FIGURE 4-2.mxd

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

NAPHTHALENE CONCENTRATION IN SOIL AT FTMM-53

CREATED BY: RR	REVIEWED BY: SS
DATE: JUN. 2016	FIGURE NUMBER: FIGURE 4.2
PROJECT NUMBER: 748810-02110	FILE: FIGURE 4-2.mxd



LEGEND:

- Shallow Monitoring Well
- Deep Monitoring Well
- Recovery Well
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Extent of GWQS Exceedances
- Inferred Groundwater Flow Direction
- 1,2,4-Trimethylbenzene Concentration is Less Than NJ GWQS (100 µg/L) (March - November 2015)
- 1,2,4-Trimethylbenzene Concentration Exceeds NJ GWQS (100 µg/L) (March - November 2015)

699MW01 — Well ID
6.4 — Concentration (µg/L)

NOTE:

1. All tank locations are approximate.
2. Posted data are maximum concentrations detected between March and November 2015.

N

1 inch = 40 feet

0 20 40 80 Feet

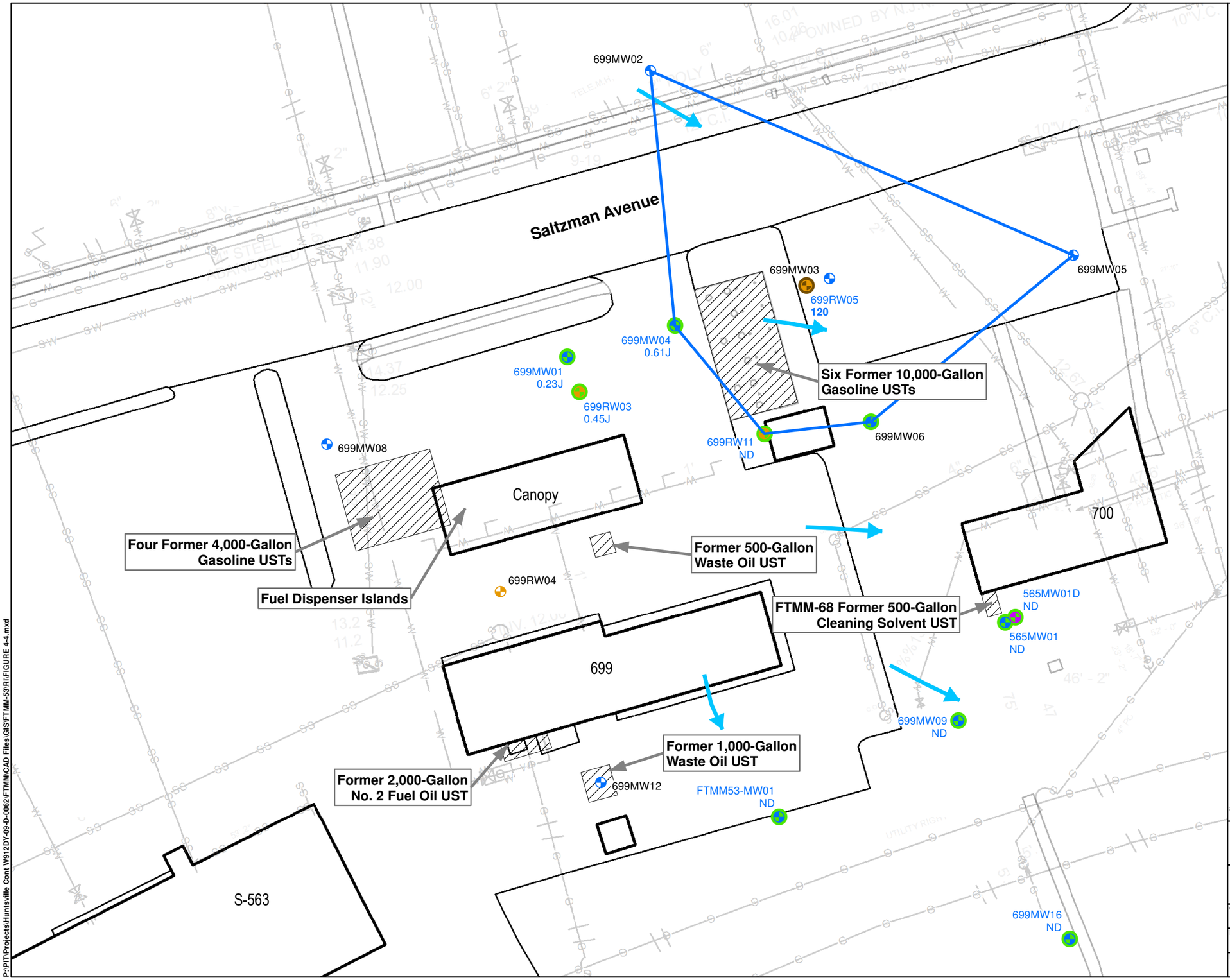
Source: FTMM Supplied CAD

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

1,2,4-TRIMETHYLBENZENE CONCENTRATIONS IN GROUNDWATER AT FTMM-53

CREATED BY: RR	REVIEWED BY: SS
DATE: JUN. 2016	FIGURE NUMBER: FIGURE 4.3
PROJECT NUMBER: 748810-02110	FILE: FIGURE 4-3.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\FTMM-53\R\FIGURE 4-3.mxd



LEGEND:

- Shallow Monitoring Well
- Deep Monitoring Well
- Recovery Well
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Extent of GWQS Exceedances
- Inferred Groundwater Flow Direction
- 1,3,5-Trimethylbenzene Concentration is Less Than NJ GWQS (100 µg/L) (March - November 2015)
- 1,3,5-Trimethylbenzene Concentration Exceeds NJ GWQS (100 µg/L) (March - November 2015)

699MW01 — Well ID
6.4 — Concentration (µg/L)

NOTE:

1. All tank locations are approximate.
2. Posted data are maximum concentrations detected between March and November 2015.

N

1 inch = 40 feet

0 20 40 80 Feet

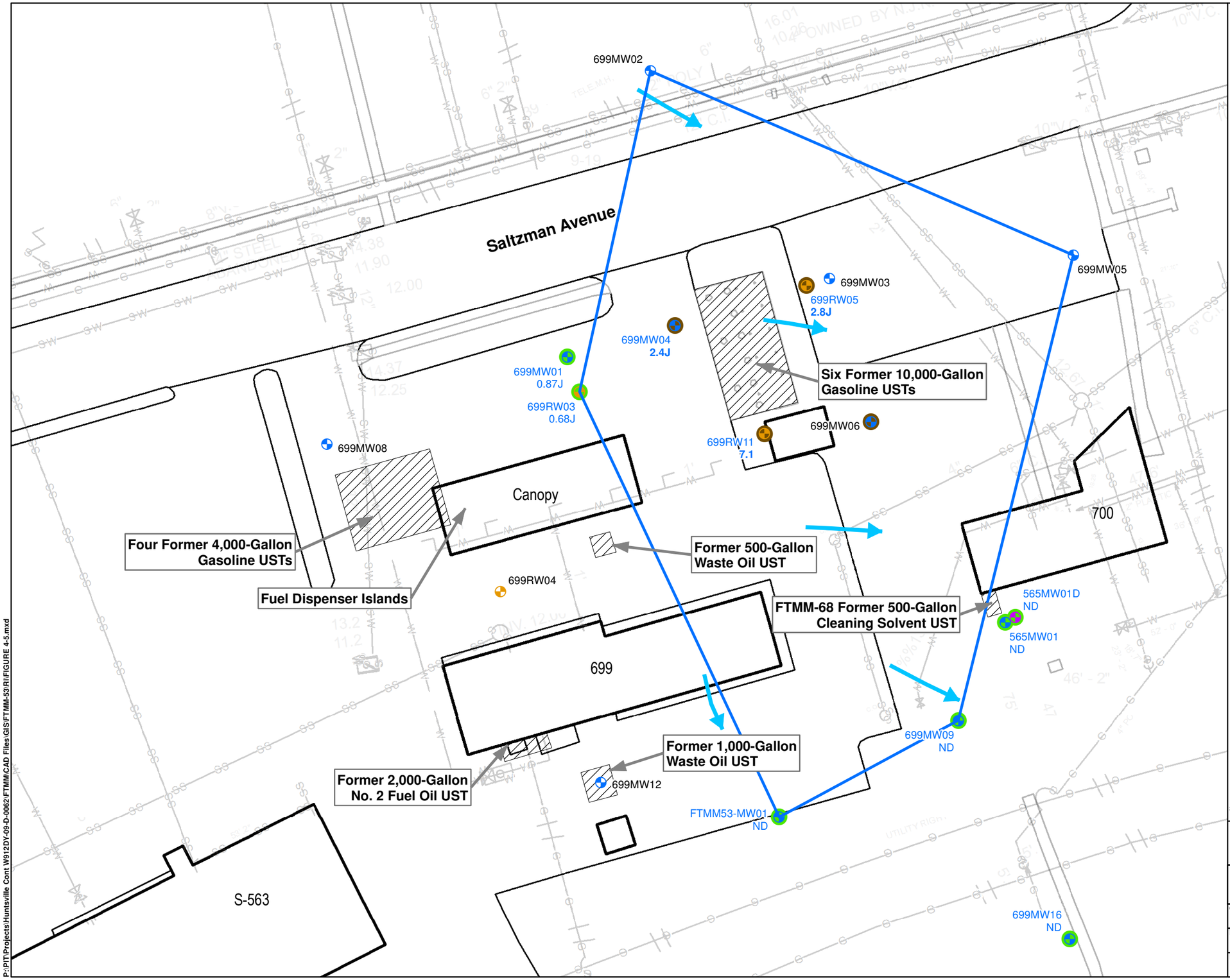
Source: FTMM Supplied CAD

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

1,3,5-TRIMETHYLBENZENE CONCENTRATIONS IN GROUNDWATER AT FTMM-53

CREATED BY: RR	REVIEWED BY: SS
DATE: JUN. 2016	FIGURE NUMBER: FIGURE 4.4
PROJECT NUMBER: 748810-02110	FILE: FIGURE 4-4.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\FTMM-53\R\FIGURE 4-4.mxd



LEGEND:

- Shallow Monitoring Well
- Deep Monitoring Well
- Recovery Well
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Extent of GWQS Exceedances
- Inferred Groundwater Flow Direction
- Benzene Concentration is Less Than NJ GWQS (1 µg/L) (March - November 2015)
- Benzene Concentration Exceeds NJ GWQS (1 µg/L) (March - November 2015)

699MW01 — Well ID
6.4 — Concentration (µg/L)

NOTE:

1. All tank locations are approximate.
2. Posted data are maximum concentrations detected between March and November 2015.

N

1 inch = 40 feet

0 20 40 80 Feet

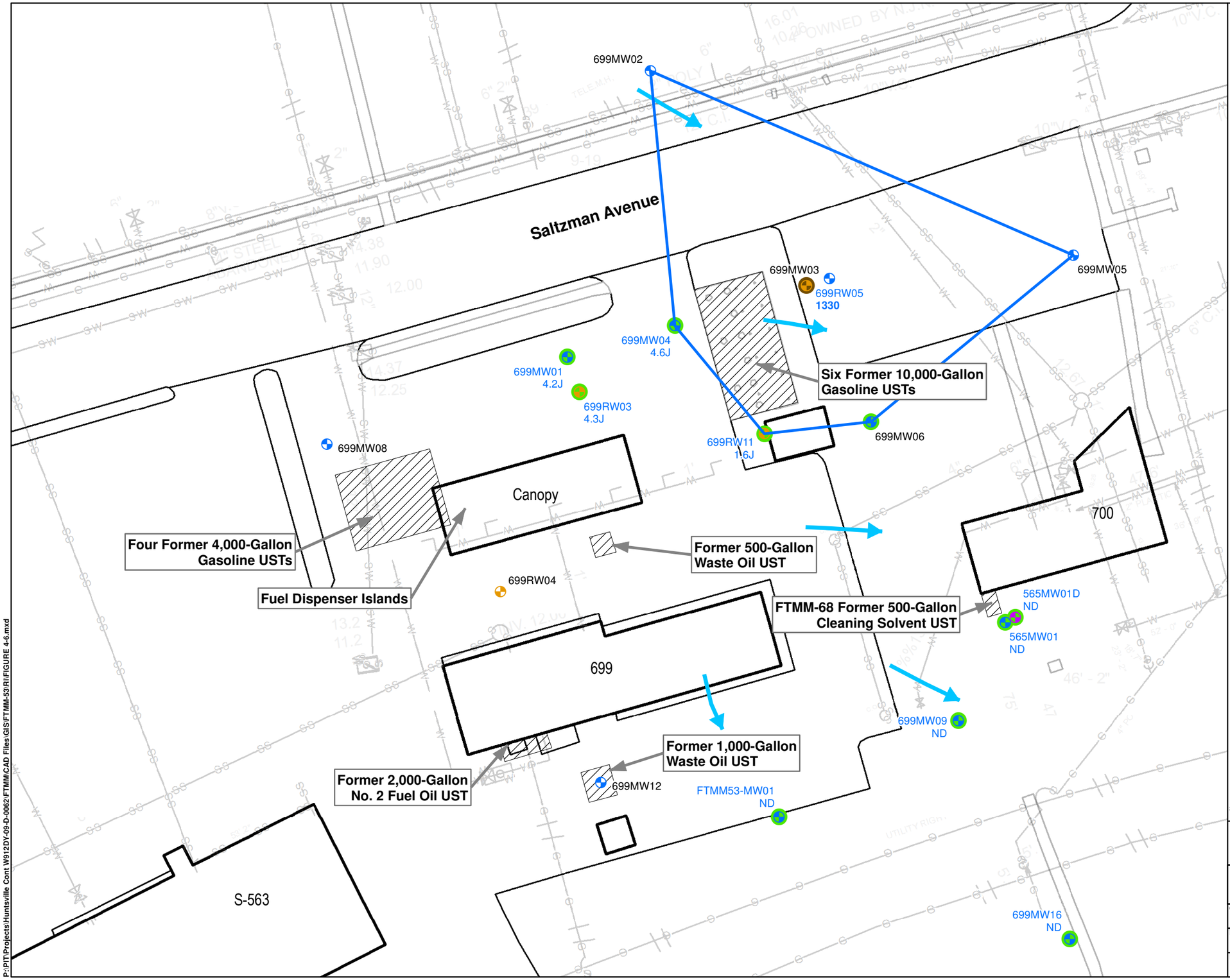
Source: FTMM Supplied CAD

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

BENZENE CONCENTRATIONS IN GROUNDWATER AT FTMM-53

CREATED BY: RR	REVIEWED BY: SS
DATE: JUN. 2016	FIGURE NUMBER: FIGURE 4.5
PROJECT NUMBER: 748810-02110	FILE: FIGURE 4-5.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\FTMM-53\R1\FIGURE 4-5.mxd



LEGEND:

- Shallow Monitoring Well
- Deep Monitoring Well
- Recovery Well
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Extent of GWQS Exceedances
- Inferred Groundwater Flow Direction
- Total Xylenes Concentration is Less Than NJ GWQS (1,000 µg/L) (March - November 2015)
- Total Xylenes Concentration Exceeds NJ GWQS (1,000 µg/L) (March - November 2015)

699MW01 — Well ID
6.4 — Concentration (µg/L)

NOTE:

1. All tank locations are approximate.
2. Posted data are maximum concentrations detected between March and November 2015.

N

1 inch = 40 feet

0 20 40 80 Feet

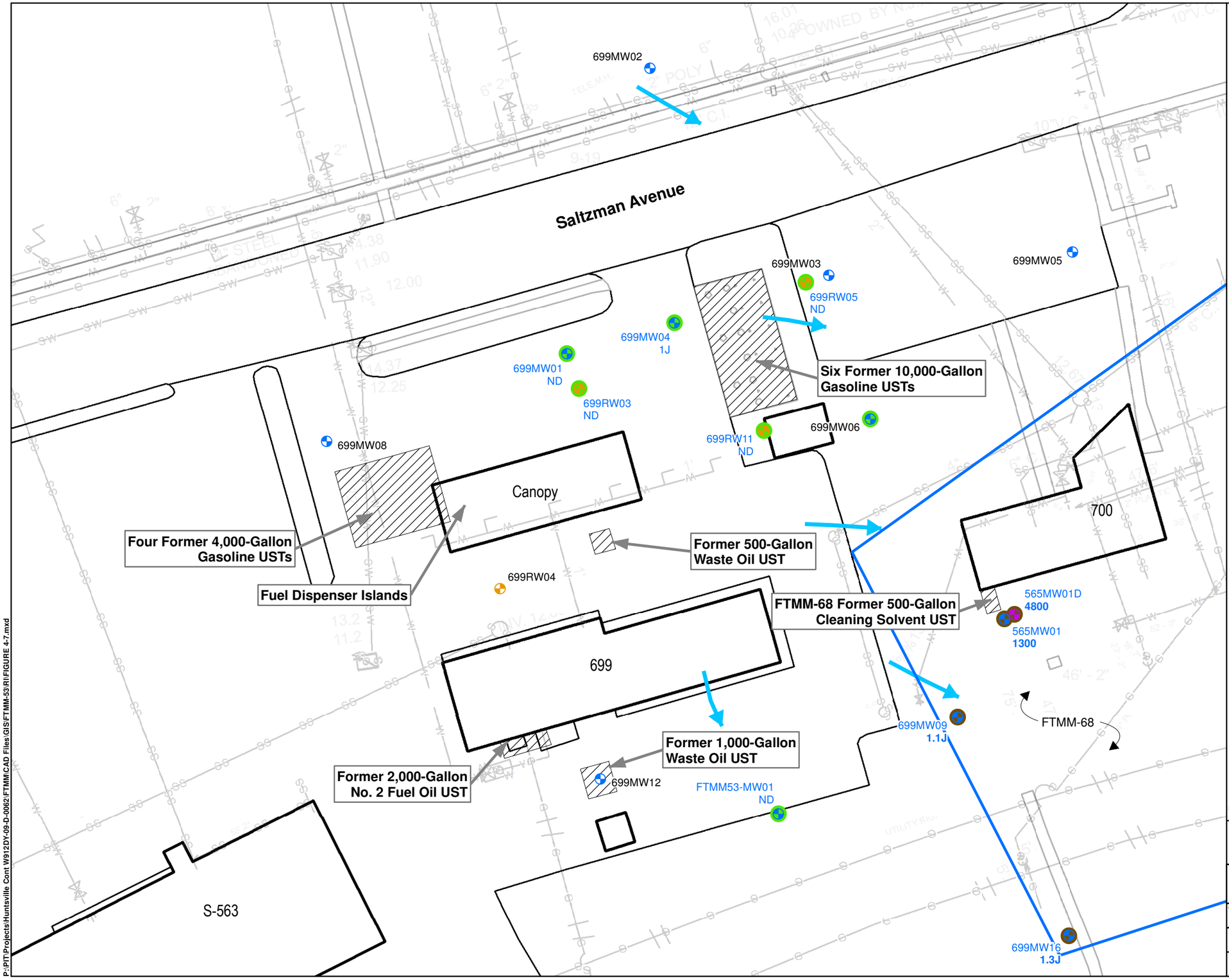
Source: FTMM Supplied CAD

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

TOTAL XYLENES CONCENTRATIONS IN GROUNDWATER AT FTMM-53

CREATED BY: RR	REVIEWED BY: SS
DATE: JUN. 2016	FIGURE NUMBER: FIGURE 4.6
PROJECT NUMBER: 748810-02110	FILE: FIGURE 4-6.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\FTMM-53\R\FIGURE 4-6.mxd



LEGEND:

- Shallow Monitoring Well
- Deep Monitoring Well
- Recovery Well
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Extent of GWQS Exceedances
- Inferred Groundwater Flow Direction
- PCE Concentration is Less Than NJ GWQS (1 µg/L) (March - November 2015)
- PCE Concentration Exceeds NJ GWQS (1 µg/L) (March - November 2015)

699MW01 — Well ID
6.4 — Concentration (µg/L)

NOTE:

1. All tank locations are approximate.
2. Posted data are maximum concentrations detected between March and November 2015.

N

1 inch = 40 feet

0 20 40 80 Feet

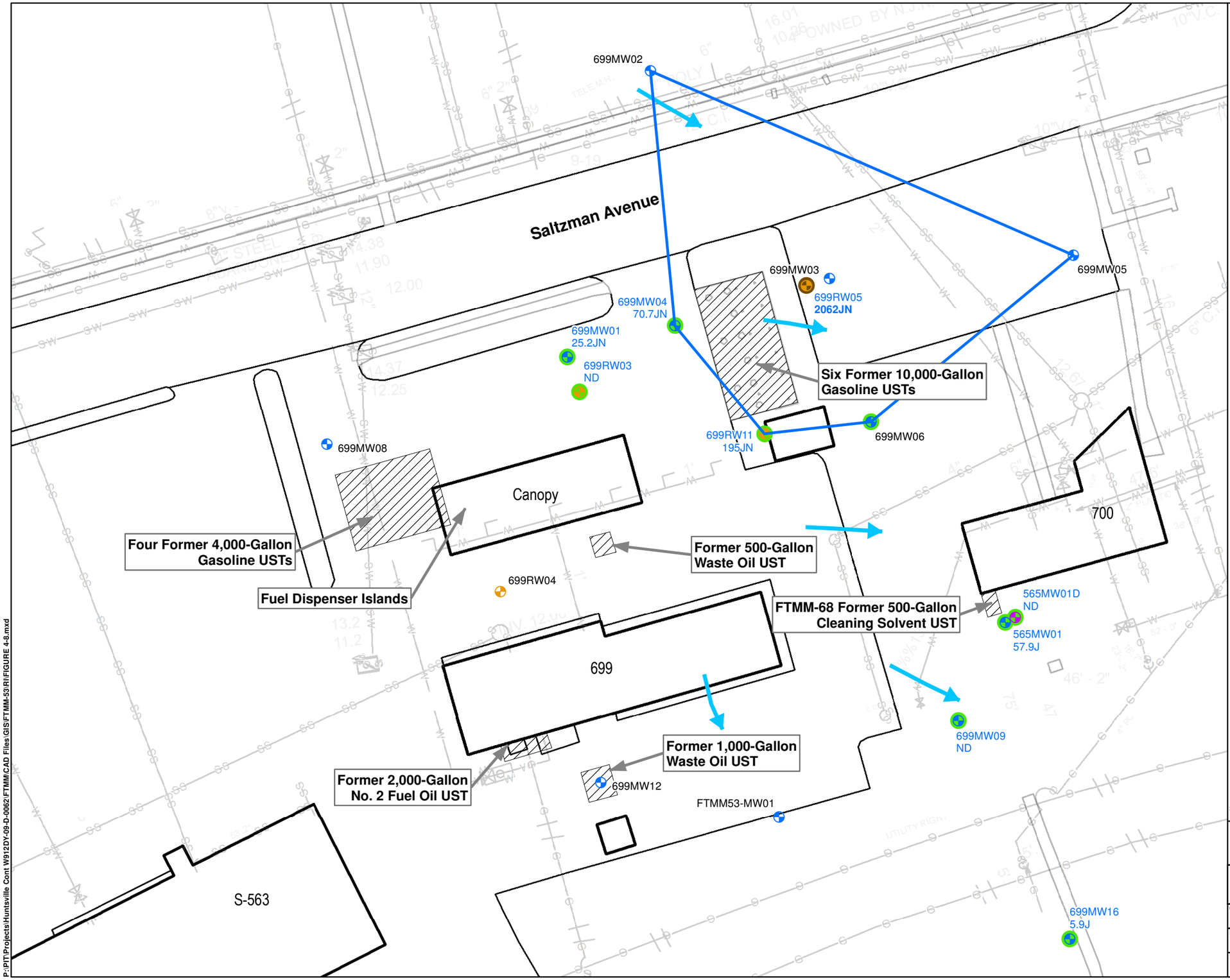
Source: FTMM Supplied CAD

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

TETRACHLOROETHENE CONCENTRATIONS IN GROUNDWATER AT FTMM-53

CREATED BY: RR	REVIEWED BY: SS
DATE: JUN. 2016	FIGURE NUMBER: FIGURE 4.7
PROJECT NUMBER: 748810-02110	FILE: FIGURE 4-7.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\FTMM-53\RI\FIGURE 4-7.mxd



LEGEND:

- Shallow Monitoring Well
- Deep Monitoring Well
- Recovery Well
- W Water Line
- S Sanitary Sewer Line
- SW Storm Sewer Line
- G Gas Line
- Extent of GWQS Exceedances
- Inferred Groundwater Flow Direction
- Total Volatile TICs Concentration is Less Than NJ GWQS (500 µg/L) (March - November 2015)
- Total Volatile TICs Concentration Exceeds NJ GWQS (500 µg/L) (March - November 2015)

699MW01 — Well ID
6.4 — Concentration (µg/L)

NOTE:

1. All tank locations are approximate.
2. Posted data are maximum concentrations detected between March and November 2015.

N

1 inch = 40 feet

0 20 40 80 Feet

Source: FTMM Supplied CAD

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

TOTAL VOLATILE TICs CONCENTRATIONS IN GROUNDWATER AT FTMM-53

CREATED BY: RR	REVIEWED BY: SS
DATE: JUN. 2016	FIGURE NUMBER: FIGURE 4.8
PROJECT NUMBER: 748810-02110	FILE: FIGURE 4-8.mxd

P:\PIT\Projects\Huntsville Cont W912DY-09-D-0062\FTMM\CAD Files\GIS\FTMM-53\R\FIGURE 4-8.mxd

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m^3)	Criteria	Criteria Value (ug/m3)
52SG-2	SG	3	PCE	241	SG Non-residential	36

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m^3)	Criteria	Criteria Value (ug/m3)
52SG-1	SG	3	PCE	151	SG Non-residential	36

LEGEND

- Soil-Gas Sample Location
- Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Building
- IRP Site Boundary
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

2 — Areas where only release or disposal of petroleum products has occurred.

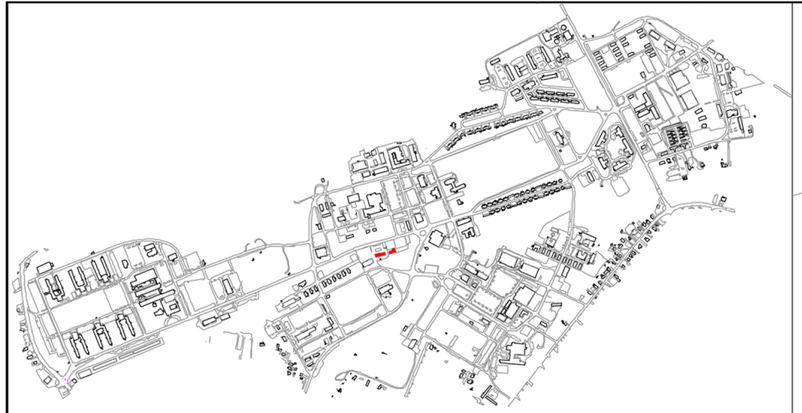
BRAC PARCEL LABEL DEFINITIONS

8(2)PS
- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE: 0 37.5 75 150 Feet

PARSONS 401 Diamond Drive NW, Huntsville AL	Fort Monmouth New Jersey
2007 Soil Gas Results Above Comparison Criteria at FTMM-53	
CREATED BY: SS	REVIEWED BY: JH
DATE: APR. 2016	FIGURE NUMBER: FIGURE 4.9
PROJECT NUMBER: 748810-02180	FILE:



Key Map
(Not To Scale)

Building 699 IA-4	µg/m³
Chloromethane	1

Building 699 SS-6	µg/m³
Tetrachloroethene	210
Trichloroethene	94

Building 699 SS-7	µg/m³
Tetrachloroethene	360

Building 699 AA-3	µg/m³
Chloromethane	1

Building 699 AA-3 DUP-1	µg/m³
Chloromethane	1

Building 699 AA-3 DUP-2	µg/m³
Chloromethane	1

Building 700 IA-6	µg/m³
Chloromethane	1

Building 700 SS-9	µg/m³
Tetrachloroethene	24

Building 700 IA-5	µg/m³
Chloromethane	1

Building 700 AA-3	µg/m³
Chloromethane	1

Building 700 AA-3 DUP-1	µg/m³
Chloromethane	1

Building 700 AA-3 DUP-2	µg/m³
Chloromethane	1

Legend

- SS-11 — Vapor Sub-slab Soil Gas Sampling Location
- IA-7-R — Indoor Air Sampling Location
- AA-4 — Ambient Air Sampling Location
- Storm Sewer with Manholes
- Inactive Utility Line
- Water Line
- Underground Electric
- MW05 — Concentration of Chlorinated VOCs above GWSL

Building 699
Auto Repair Garage Use
Bath-room
Hydraulic Lifts
Store Room
Air Comp. Room
Convenience Store Use
Vents
Bay Doors
Auto Repair Garage Use
IA-4
SS-6
SS-7
Vertical Water Pipe Penetrates Slab

Building 700
Hall
Office
Office
Office
Meeting/Conference Room
Office
Office
Adjacent Utility Room and Server Room
Bathroom
Office
IA-6
SS-9
SS-10
IA-5 and Duplicate Sample
SS-8 and Duplicate Sample

MW09

AA-3 and Duplicate Samples

100-Foot Radius from Well MW09

Notes
1) Because Buildings 699 and 700 are adjacent to one another, ambient air sample AA-3 (and the duplicate samples collected at this location) apply to the vapor intrusion (VI) investigation for both buildings.
2) Sampling locations and features inside Buildings 699 and 700 are based on field measurements.
3) Locations of wells, buildings, roads, and all other features exterior to Buildings 699 and 700 were provided by Fort Monmouth personnel.
4) Based upon the current site conceptual model, the source of chlorinated volatile organic compounds in groundwater is exterior to the office in the southeastern corner of Building 700.
5) Only detections are presented in the figure; if no data box is presented at a sample location, then no analytes were detected.

SCALE: 1" = 20'
0' 20' 40' 80'

Source: AECOM, 2012

PARSONS
401 Diamond Drive NW, Huntsville AL

Fort Monmouth New Jersey

2012 VAPOR INTRUSION INVESTIGATION RESULTS FOR BUILDINGS 699 AND 700

CREATED BY:	REVIEWED BY:
SS	JH
DATE: APR. 2016	FIGURE NUMBER: FIGURE 4.10
PROJECT NUMBER: 748810-02180	FILE:

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APPENDICES

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

Appendix B RI 2015 Data

Appendix C Draft Deed Notice (to be provided later)

APPENDIX A
KEY HISTORICAL REPORTS AND BACKGROUND INFORMATION

(also included electronically on the CD of this report)

DEPARTMENT OF THE ARMY

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

February 28, 2013

Ms. Linda Range
New Jersey Department of Environmental Protection
Case Manager
Bureau of Southern Field Operations
401 East State Street, 5th Floor
PO Box 420/Mail Code 401-05F
Trenton, NJ 08625-0028

Re: Site FTMM-53 (Building 699) Request for Discontinuing Operation of the Soil Vapor Extraction (SVE) and Groundwater Pump and Treat (GWP&T) Remediation System

Dear Ms. Range:

This letter is a request for discontinuing operation of the SVE and GWP&T remediation system at FTMM-53 (Bldg. 699). As noted in the enclosed document from PARS Environmental (who operates and maintains the FTMM-53 remediation system), current concentrations of volatile organic compounds in site groundwater warrant placing the remediation system offline.

In lieu of operating the remediation system, the Army plans to conduct monitored natural attenuation at FTMM-53, which will include continued quarterly monitoring and sampling of the groundwater monitoring and recovery wells. The Army plans to keep all remediation system hardware intact during implementation of natural attenuation.

Should you have any questions or require additional information, please contact the undersigned at (732) 380-7064 or by email at wanda.s.green2.civ@mail.mil.

Sincerely,

Wanda Green

Wanda Green
BRAC Environmental Coordinator

Encl

February 22, 2013

PARS
Environmental
Inc.

500 Horizon Drive
Suite 540
Robbinsville, NJ 08691

Tel: 609-890-7277
Fax: 609-890-9116

United States Army Corps of Engineers
New York District
Environmental Branch
26 Federal Plaza, Room 1811
New York, NY 10278

Attention: Mr. James Moore

Re: Remedial System
Fort Monmouth Army Base, Building 699
Fort Monmouth, New Jersey
Contract No. W912DR-12-P-0139
Project No. 802-04a

Dear Mr. Moore:

PARS Environmental, Inc. (PARS) is submitting this letter report to the United States Army Corps of Engineers (USACE), New York District to sumarize the recent groundwater data collected as part of operation and maintenance (O&M) activities at the remedial system located at Building 699 in Fort Monmouth Army Base, Main Post, in Fort Monmouth, New Jersey, hereinafter the "Site."

It is PARS' understanding that the current remedial system at the Site began operation circa 2001 in response to spills of gasoline to the subsurface soil and groundwater from leaking underground storage tanks. The system operated continuously until it was shut down due to Base Realignment and Closure (BRAC) activities at the Fort Monmouth Army Base circa August 2011. Prior to the shutdown, a round of groundwater samples were collected from the on-Site wells and analyzed for volatile organic compounds (VOCs).

Concentrations of VOCs in in samples collected from monitoring wells 616MW-01, 699MW-01, 699MW-02, 699MW-05, 699MW-06, 699MW-08, 699MW-09, 699MW-12, 699MW-15, and 699MW-16 were below their applicable New Jersey Department of Environmental Protection (NJDEP) Groundwater Quality Standards (GWQS). The concentration of benzene [58.6 micrograms per liter (µg/L)] in monitoring well 699MW-04 exceeded the GWQS for the compound (1 µg/L). This concentration appears to be an error since the previous and subsequent concentrations of benzene in 699MW-04 range from 1 to 3 µg/L. Concentrations of benzene in recovery wells 699RW-03, 699RW-04, 699RW-05, and 699RW-11 ranged from non-detect to 6.39 µg/L. A summary table of groundwater data collected from the Site is included as Attachment A.

PARS began O&M activities in March, 2012. Prior to starting the remedial system, groundwater samples were collected from on-Site monitoring and recovery wells, including 699MW-01, 699MW-04, 699MW-06, 699MW-09, 699MW-12, 699RW-03, 699RW-05, and 699RW-11. Benzene was detected in six of the eight samples collected at concentrations exceeding the GWQS for benzene. Concentrations of benzene ranged from 1.9 to 18 µg/L.

The most recent round of groundwater data was collected in December 2012 from on-Site monitoring and recovery wells, including 616MW-01, 699MW-01, 699MW-02, 699MW-04, 699MW-05, 699MW-06, 699MW-08, 699MW-09, 699MW-12, 699MW-15, 699MW-16, 699RW-03, 699RW-05, and 699RW-11. Benzene was detected in five of the fourteen samples at concentrations of benzene ranging from 0.12 to 18 µg/L.

Tetrachloroethene (PCE) was also detected in 699RW-11 at a concentration of 1.1 µg/L, which slightly exceeded the GWQS for that compound (1 µg/L). Figures showing the extent of the benzene and total VOC concentrations in groundwater are included as Attachment B.

Additionally, as part of O&M activities, PARS collected samples from the remedial system influent on a monthly basis. Concentrations of benzene in the influent samples have ranged from 0.13 to 12 µg/L. A summary table of the remedial system performance data is included as Attachment C.

Based on the results summarized above, PARS recommends using monitored natural attenuation (MNA) to address the low levels of VOC contaminants remaining at the Site. PARS can help establish a Classification Exception Area (CEA) at the Site and develop a plan to monitor the groundwater impacts.

Should you have any questions, please let us know.

Respectfully submitted,
PARS Environmental, Inc.

Digitally signed by Thomas Dobinson
DN: cn=Thomas Dobinson, o=PARS Environmental, ou=PARS Environmental, email=tdobinson@parsenviro.com, c=US
Date: 2013.02.22 11:06:34 -05'00'

Thomas Dobinson, PE
Project Manager

Attachment A

Table 1
GROUNDWATER MONITORING SAMPLING SUMMARY DATA
FORT MONMOUTH - MAIN POST GAS STATION
NEW JERSEY

Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					1	1,000	700	1,000	70	100	70	3	700	1	6,000	1	100/500	--	5
616MW-1	06/19/01	18.92	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	NS
616MW-1	08/30/01	18.92	8.34	10.58	ND	ND	ND	1.17	ND	ND	ND	ND	ND	ND	ND	ND	12	13.17	3.45
616MW-1	12/13/01	18.92	9.68	9.24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	3.4
616MW-1	03/27/02	18.92	3.40	15.52	ND	ND	ND	ND	ND	ND	1.14	ND	ND	ND	ND	ND	ND	1.14	ND
616MW-1	06/26/02	18.92	6.95	11.97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	10.1
616MW-1	09/19/02	18.92	7.26	11.66	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	5.75
616MW-1	11/26/02	18.92	3.57	15.35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW-1	03/17/03	18.92	3.11	15.81	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW-1	06/25/03	18.92	4.21	14.71	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW-1	09/24/03	18.92	7.77	11.15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	2.15
616MW-1	12/08/03	18.92	4.75	14.17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1.6
616MW-1	03/29/04	18.92	4.52	14.40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW-1	06/18/04	18.92	7.03	11.89	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW-1	09/16/04	18.92	8.33	10.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	6.71
616MW-1	12/06/04	18.92	4.72	14.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW-1	03/07/05	18.92	4.23	14.69	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW-1	05/26/05	18.92	4.76	14.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW-1	09/08/05	18.92	9.46	9.46	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW-1	12/14/05	18.92	3.96	14.96	ND	ND	ND	1.54	ND	ND	ND	ND	ND	ND	ND	ND	1.54	1.54	ND
616MW-1	02/24/06	18.92	4.43	14.49	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW-1	06/14/06	18.92	4.81	14.11	ND	ND	0.80	3.14	1.41	ND	ND	ND	ND	ND	ND	ND	28	33.35	ND
616MW-1	09/22/06	18.92	5.50	13.42	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW-1	11/28/06	18.92	3.48	15.44	ND	ND	ND	0.41	ND	ND	ND	ND	ND	ND	ND	ND	9	9.41	ND
616MW-1	02/21/07	18.92	4.58	14.34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12.56	12.56	ND
616MW-1	05/22/07	18.92	6.29	12.63	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW-1	08/08/07	18.92	6.79	12.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1.49
616MW-1	12/22/07	18.92	4.76	14.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW-1	03/30/08	18.92	5.22	13.70	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW-1	06/04/08	18.92	5.85	13.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW-1	09/29/08	18.92	8.19	10.73	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW-1	12/30/08	18.92	3.84	15.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	5.45
616MW-1	03/27/09	18.92	5.92	13.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.64
616MW-1	06/24/09	18.92	3.57	15.35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.13
616MW-1	08/26/09	18.92	7.40	11.52	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.33
616MW-1	11/16/09	18.92	6.07	12.85	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
616MW-1	03/25/10	18.92	3.45	15.47	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
616MW-1	06/15/10	18.92	7.27	11.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
616MW-1	09/16/10	18.92	10.61	8.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
616MW-1	01/07/11	18.92	6.78	12.14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<3.0
616MW-1	03/15/11	18.92	2.25	16.67	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.00
616MW-1 (DUP)	03/15/11	18.92	2.25	16.67	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
616MW-1	05/27/11	18.92	5.66	13.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.4
616MW-1	03/05/12	17.64	4.76	12.88	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
616MW-1	06/07/12	17.64	4.44	13.20	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
616MW-1	09/22/12	17.64	7.84	9.80	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
616MW-1	10/23/12	17.64	7.88	9.76	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
616MW-1	12/12/12	17.64	5.70	11.94	0.12J	ND	ND	ND	ND	NA	ND	ND	NA	ND	ND	ND	ND	0.12J	2.4J
699MW-1	06/19/01	15.81	5.50	10.31	21,555.26	47,603.78	5,050.83	42,246.76	1,293.83	403.62	ND	ND	ND	ND	ND	ND	741	118,895.08	NS
699MW-1	08/30/01	15.81	6.75	9.06	31,531.95	54,361.78	8,703.65	47,334.24	ND	ND	267.1	ND	ND	ND	ND	ND	38,900	181,098.72	3.57
699MW-1	12/13/01	15.81	8.75	7.06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.00	NS
699MW-1	03/27/02	15.81	7.05	8.76	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.00	NS
699MW-1	06/26/02	15.81	6.91	8.90	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.00	NS
699MW-1	09/19/02	15.81	5.93	9.88	3,849.07	19,493.66	2,687.65	23,989.23	ND	ND	ND	ND	ND	ND	ND	ND	28,360	78,379.61	6.92
699MW-1	11/26/02	15.81	4.38	11.43	459.71	4,023.42	1,960.50	14,645.80	ND	ND	ND	ND	ND	ND	ND	ND	20,510	41,599.43	3.88
699MW-1	03/17/03	15.81	4.20	11.61	127.89	1,648.18	739.45	7,477.75	ND	ND	ND	ND	ND	ND	ND	ND	4,830	14,823.27	3.63
699MW-1	06/30/03	15.81	3.81	12.00	318.96	1,864.80	637.87	7,237.32	ND	ND	ND	ND	ND	ND	ND	ND	8,181	18,239.95	6.15
699MW-1	09/24/03	15.81	7.20	8.61	206.60	1,016.66	554.50	3,207.39	ND	ND	ND	ND	ND	ND	ND	ND	2,934	7,919.15	19.5
699MW-1	12/08/03	15.81	5.15	10.66	110.32	1,310.35	680.75	4,430.84	ND	ND	ND	ND	ND	ND	ND	ND	5,541	12,073.26	16.4
699MW-1	03/29/04	15.81	4.61	11.20	156.78	1,249.62	709.41	7,322.90	ND	ND	ND	ND	ND	ND	ND	ND	15,380	24,818.71	10.7
699MW-1	06/18/04	15.81	5.35	10.46	239.86	4,064.39	2,619.62	20,330.96	ND	ND	ND	ND	ND	ND	ND	ND	22,390	49,644.83	19.2
699MW-1	09/16/04	15.81	6.42	9.39	376.82	60.22	382.60	624.31	208.91	ND	ND	ND	ND	ND	ND	ND	2,730	4,382.86	1.3
699MW-1	12/03/04	15.81	5.26	10.55	34.76	158.27	83.61	993.12	ND	ND	ND	ND	ND	ND	ND	ND	5,630	6,899.76	9.62
699MW-1	03/07/05	15.81	3.55	12.26	1,783.46	1,893.65	1,376.76	5,158.40	448.37	ND	ND	ND	ND	ND	178.66	ND	6,050	16,889.00	ND
699MW-1	05/26/05	15.81	4.46	11.35	63.14	518.85	622.78	10,628.46	ND	ND	ND	ND	ND	ND	ND	ND	33,560	45,393.23	ND

Table 1
GROUNDWATER MONITORING SAMPLING SUMMARY DATA
FORT MONMOUTH - MAIN POST GAS STATION
NEW JERSEY

Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					1	1,000	700	1,000	70	100	70	3	700	1	6,000	1	100/500	–	5
699MW-1	09/08/05	15.81	6.49	9.32	62.87	83.95	525.17	2,358.03	ND	ND	ND	ND	ND	ND	ND	ND	8,720	11,760.00	6.26
699MW-1	12/14/05	15.81	4.02	11.79	76.79	946.58	844.74	10,280.29	ND	ND	ND	ND	ND	ND	ND	ND	0	12,148.40	ND
699MW-1	02/24/06	15.81	3.82	11.99	36.60	736.86	674.30	5,006.55	ND	ND	ND	ND	ND	ND	ND	ND	2,870	9,324.31	ND
699MW-1	06/14/06	15.81	3.43	12.38	23.71	302.27	798.02	6,594.72	3.54	ND	ND	ND	ND	ND	ND	ND	5,050	12,772.26	ND
699MW-1	09/22/06	15.81	4.26	11.55	ND	80.55	937.57	6,194.51	ND	ND	ND	ND	ND	ND	ND	ND	5,957	13,169.63	1.93
699MW-1	11/28/06	15.81	3.34	12.47	16.58	118.03	254.69	1,077.87	ND	ND	ND	ND	ND	ND	ND	ND	5,590	7,057.17	ND
699MW-1	02/21/07	15.81	4.46	11.35	13.18	106.98	159.49	766.50	1.60	ND	ND	ND	0.48	ND	ND	ND	5,907	6,955.23	ND
699MW-1	05/22/07	15.81	3.81	12.00	15.18	123.07	567.09	3,154.55	ND	ND	ND	ND	7.22	ND	ND	ND	600	4,467.11	4.2
699MW-1	08/08/07	15.81	4.36	11.45	7.38	16.91	72.07	297.70	0.53	ND	ND	ND	ND	ND	1.75	ND	3,226	3,622.34	4.83
699MW-1	12/22/07	15.81	5.21	10.60	7.31	29.61	270.51	974.36	ND	ND	ND	ND	0.89	ND	6.03	ND	475	1,763.71	3.43
699MW-1	03/30/08	15.81	3.70	12.11	7.04	39.13	248.83	1,034.37	ND	ND	ND	ND	ND	ND	9.38	ND	438	1,776.75	0.914
699MW-1	06/04/08	15.81	3.88	11.93	1.16	4.06	44.45	157.09	ND	ND	ND	ND	ND	ND	1.7	ND	238	446.46	16.6
699MW-1	09/29/08	15.81	5.45	10.36	ND	7.84	146.77	230.57	ND	ND	ND	ND	ND	ND	ND	ND	477	862.18	9.2
699MW-1	12/30/08	15.81	3.47	12.34	3.61	15.06	213.43	512.19	ND	ND	ND	ND	ND	ND	ND	ND	642	1,386.29	3.72
699MW-1	03/27/09	15.81	4.31	11.50	10.37	53.67	419.87	1,814.76	ND	ND	ND	ND	ND	ND	ND	ND	1,018	3,316.80	7.3
699MW-1	06/25/09	15.81	3.15	12.66	0.70 J	0.31 J	5.68	17.30	ND	ND	ND	ND	ND	ND	ND	ND	80	102.98	5.62
699MW-1	08/26/09	15.81	4.69	11.12	7.66	23.76	587.78	1,472.89	ND	ND	ND	ND	ND	ND	ND	ND	462	2,562.58	ND
699MW-1	11/16/09	15.81	4.55	11.26	6.56	13.27	376.59	666.64	ND	ND	ND	ND	ND	ND	ND	ND	9,140	10,203.06	2.53
699MW-1	03/25/10	15.81	1.90	13.91	1.41	1.72	45.63	48.58	ND	ND	ND	ND	ND	ND	ND	ND	562	659.34	ND
699MW-1	06/16/10	15.81	4.61	11.20	0.99	ND	11.97	14.18	ND	ND	ND	ND	ND	ND	ND	ND	281	308.14	ND
699MW-1	09/17/10	15.81	6.62	9.19	9.65	9.90	186.87	137.82	ND	ND	ND	ND	ND	ND	ND	ND	1,983	2,327.24	ND
699MW-1	01/10/11	15.81	5.44	10.37	ND	0.31J	16.25	7.06	ND	ND	ND	ND	ND	ND	ND	ND	139	162.62	<3.0
699MW-1	03/15/11	15.81	2.53	13.28	ND	1.18	ND	2.42	ND	ND	ND	ND	ND	ND	ND	ND	7	10.60	6
699MW-1	06/03/11	15.81	3.80	12.01	0.35J	0.67	12.68	27.47	0.36J	ND	ND	ND	ND	ND	ND	ND	154	195.53	<3.0
699MW-1	03/05/12	14.48	3.82	10.66	1.9J	1.6J	160	99	NA	NA	ND	5.8JB	NA	ND	NA	ND	894	1,153	4.7
699MW-1	06/07/12	14.48	3.74	10.74	0.62J	ND	32	ND	NA	NA	ND	3.1JB	NA	ND	NA	ND	287.4J	323.12J	1.8J
699MW-1	09/22/12	14.48	5.35	9.13	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND
699MW-1	10/23/12	14.48	5.70	8.78	1.8	0.80J	35	4.1	ND	NA	ND	ND	NA	ND	NA	ND	258J	299.7J	NS
699MW-1	12/11/12	14.48	5.14	9.34	1.1	0.35J	ND	22.0	0.22J	NA	47J	ND	NA	ND	NA	ND	697	721	3.7
699MW-2	06/19/01	16.64	3.81	12.83	4.77	24.25	4.29	18.31	ND	ND	ND	ND	ND	ND	ND	ND	302	353.62	NS
699MW-2	08/30/01	16.64	6.73	9.91	ND	ND	ND	ND	ND	ND	ND	1.84	ND	ND	ND	ND	ND	1.84	ND
699MW-2	12/13/01	16.64	8.3	8.34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	8.4
699MW-2	03/27/02	16.64	1.58	15.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	46	46.00	9.71
699MW-2	06/26/02	16.64	5.44	11.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-2	09/19/02	16.64	5.46	11.18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.94
699MW-2	11/26/02	16.64	2.2	14.44	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-2	03/17/03	16.64	1.87	14.77	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-2	06/25/03	16.64	2.21	14.43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-2	09/24/03	16.64	6.75	9.89	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	11.7
699MW-2	12/08/03	16.64	3.55	13.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	5.00	21.4
699MW-2	03/29/04	16.64	3.45	13.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	15.8
699MW-2	06/18/04	16.64	5.35	11.29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	8.23
699MW-2	09/16/04	16.64	6.33	10.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	15.1
699MW-2	12/06/04	16.64	3.19	13.45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-2	03/07/05	16.64	2.47	14.17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-2	05/26/05	16.64	4.69	11.95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-2	09/08/05	16.64	7.56	9.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-2	12/13/05	16.64	2.38	14.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	5.85
699MW-2	02/24/06	16.64	2.96	13.68	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-2	06/13/06	16.64	2.88	13.76	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-2	09/22/06	16.64	3.68	12.96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-2	11/28/06	16.64	1.98	14.66	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-2	02/21/07	16.64	3.46	13.18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-2	05/22/07	16.64	4.33	12.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16	16.00	ND
699MW-2	08/08/07	16.64	5.14	11.50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1.74
699MW-2	12/22/07	16.64	3.28	13.36	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	3.00	ND
699MW-2	03/30/08	16.64	3.45	13.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-2	06/04/08	16.64	4.11	12.53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-2	09/29/08	16.64	5.23	11.41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	2.48
699MW-2	12/30/08	16.64	2.31	14.33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	4.18
699MW-2	03/27/09	16.64	4.29	12.35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.33
699MW-2	06/24/09	16.64	1.76	14.88	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.65
699MW-2	08/26/09	16.64	5.62	11.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-2	11/16/09	16.64	4.82	11.82	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.58

Table 1
GROUNDWATER MONITORING SAMPLING SUMMARY DATA
FORT MONMOUTH - MAIN POST GAS STATION
NEW JERSEY

Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					1	1,000	700	1,000	70	100	70	3	700	1	6,000	1	100/500	--	5
699MW-2	03/26/10	16.64	1.76	14.88	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-2	06/15/10	16.64	5.80	10.84	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.05
699MW-2	09/16/10	16.64	9.07	7.57	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-2	01/06/11	16.64	4.59	12.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<3.0
699MW-2	03/11/11	16.64	1.75	14.89	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<3.0
699MW-2	05/27/11	16.64	3.69	12.95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.3
699MW-2	03/05/12	15.13	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-2	06/07/12	15.13	2.95	12.18	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-2	09/22/12	15.13	6.51	8.62	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-2	10/23/12	15.13	6.68	8.45	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-2	12/12/12	15.13	4.51	10.62	ND	ND	ND	ND	ND	NA	ND	ND	NA	ND	NA	ND	ND	ND	22
699MW-3	06/19/01	15.80	4.97	10.83	33,224.84	38,489.48	1,693.43	14,775.44	93.34	246.45	ND	ND	ND	ND	ND	3.13	665	89,191.11	NS
699MW-3	08/30/01	15.80	6.65	9.15	26,703.62	52,102.97	4,632.23	32,157.19	ND	ND	253.51	ND	ND	ND	ND	ND	17,400	133,249.52	4.7
699MW-3	12/13/01	15.80	7.75	8.05	14,353.47	21,072.76	1,885.19	23,384.35	ND	ND	ND	ND	ND	ND	ND	ND	570	61,265.77	9.3
699MW-3	03/27/02	15.80	5.47	10.33	13,946.94	15,981.11	980.35	5,855.38	90.20	282.02	ND	ND	ND	ND	701.89	ND	6,272	44,109.89	6.13
699MW-3	06/26/02	15.80	6.36	9.44	4,399.81	3,832.32	1,055.62	3,728.84	63.08	ND	ND	ND	ND	ND	ND	ND	ND	13,079.67	1.7
699MW-3	09/19/02	15.80	5.89	9.91	6,664.83	10,186.92	1,452.67	8,003.46	ND	ND	ND	ND	ND	ND	ND	ND	9,900	36,207.88	2.88
699MW-3	11/26/02	15.80	4.08	11.72	1,817.43	3,901.24	440.76	6,032.40	ND	ND	ND	ND	ND	ND	ND	ND	4,620	16,811.83	1.53
699MW-3	03/17/03	15.80	3.41	12.39	6,018.91	11,329.00	848.98	13,156.38	ND	ND	ND	ND	ND	ND	ND	ND	7,780	39,133.27	1.37
699MW-3	06/25/03	15.80	3.35	12.45	4,801.67	13,280.92	1,300.05	10,076.68	ND	ND	ND	ND	ND	ND	ND	ND	3,320	32,779.32	7.5
699MW-3	09/24/03	15.80	5.23	10.57	1,591.30	3,276.61	487.55	4,365.72	ND	ND	ND	ND	ND	ND	ND	ND	3,222	12,943.18	9.28
699MW-3	12/08/03	15.80	4.46	11.34	174.93	359.64	23.85	468.80	ND	ND	ND	ND	ND	ND	ND	ND	547	1,574.22	7.41
699MW-3	03/29/04	15.80	4.15	11.65	1,285.76	2,676.44	320.11	3,008.80	ND	ND	ND	ND	ND	ND	ND	ND	2,320	9,611.11	7.72
699MW-3	06/18/04	15.80	5.15	10.65	4,052.45	9,939.74	1,873.95	9,190.47	3.69	ND	ND	ND	ND	ND	ND	ND	ND	25,060.30	8.17
699MW-3	09/16/04	15.80	6.30	9.50	2,442.22	9,207.20	1,687.51	11,076.35	ND	ND	ND	ND	ND	ND	ND	ND	5,700	30,113.28	19.5
699MW-3	12/03/04	15.80	4.63	11.17	1,616.64	5,430.07	340.96	4,172.96	ND	ND	ND	ND	ND	ND	ND	ND	1,520	13,080.63	7.37
699MW-3	03/04/05	15.80	3.50	12.30	26.73	97.95	194.88	1,127.68	1,341.42	ND	ND	ND	ND	ND	24.45	ND	3,339	6,152.11	ND
699MW-3	05/23/05	15.80	4.43	11.37	2,164.78	13,281.86	726.99	13,310.11	ND	ND	ND	ND	ND	ND	ND	ND	7,480	36,963.74	ND
699MW-3	09/08/05	15.80	6.84	8.96	3,784.06	10,603.12	784.08	6,224.35	ND	ND	ND	ND	ND	ND	ND	ND	13,760	35,155.61	16
699MW-3	12/13/05	15.80	3.69	12.11	4,319.42	26,811.99	838.96	11,139.09	ND	ND	ND	ND	ND	ND	ND	ND	43,109	86,218.92	5.33
699MW-3	02/24/06	15.80	3.57	12.23	4,475.03	6,192.89	935.20	10,975.78	4.98	ND	ND	ND	ND	ND	85.7	ND	6,620	29,289.58	ND
699MW-3	06/13/06	15.80	3.11	12.69	160.66	153.90	18.77	151.94	ND	ND	ND	ND	ND	ND	ND	ND	66	551.27	ND
699MW-3	09/22/06	15.80	3.98	11.82	755.41	1,656.48	115.15	1,099.62	ND	ND	ND	ND	ND	ND	ND	ND	105	3,731.66	ND
699MW-3	11/28/06	15.80	3.11	12.69	303.11	457.69	103.33	579.73	3.14	ND	ND	ND	ND	ND	19.89	ND	216	1,682.89	ND
699MW-3	02/21/07	15.80	4.21	11.59	264.49	304.31	152.75	794.20	8.94	ND	ND	ND	1.04	ND	13.02	ND	2,812	4,350.75	ND
699MW-3	05/22/07	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	08/08/07	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	12/22/07	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	03/30/08	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	06/04/08	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	09/29/08	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	12/30/08	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	03/27/09	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	06/25/09	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	08/26/09	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	11/16/09	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	03/25/10	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	06/15/10	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	09/16/10	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	01/06/11	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	03/15/11	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	06/02/11	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	03/05/12	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	06/07/12	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	09/22/12	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-3	10/23/12	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
669MW-3	12/12/12	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-4	06/19/01	15.92	5.42	10.50	36,303.01	48,404.42	6,425.13	38,765.03	97.87	ND	ND	ND	ND	ND	ND	ND	693	130,688.46	NS
699MW-4	08/30/01	15.92	7.02	8.90	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-4	12/13/01	15.92	8.03	7.89	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-4	03/27/02	15.92	7.01	8.91	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-4	06/26/02	15.92	6.91	9.01	2,170.64	17,663.04	3,784.80	28,701.21	392.81	ND	ND	ND	ND	ND	ND	ND	ND	52,712.50	8.79
699MW-4	09/19/02	15.92	6.22	9.70	952.77	9,979.40	1,251.22	20,801.87	113.05	ND	ND	ND	ND	ND	ND	ND	15,980	49,078.31	5.22

Table 1
GROUNDWATER MONITORING SAMPLING SUMMARY DATA
FORT MONMOUTH - MAIN POST GAS STATION
NEW JERSEY

Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					1	1,000	700	1,000	70	100	70	3	700	1	6,000	1	100/500	–	5
699MW-4	11/26/02	15.92	4.70	11.22	496.67	2,464.04	654.30	5,406.75	179.91	ND	ND	ND	ND	ND	ND	ND	8,580	17,781.67	3.52
699MW-4	03/17/03	15.92	4.05	11.87	192.35	1,663.88	274.67	4,233.47	2,223.21	ND	ND	ND	ND	ND	ND	ND	3,640	12,227.58	4.88
699MW-4	06/30/03	15.92	4.20	11.72	218.88	1,069.37	491.96	5,098.43	470.51	ND	ND	ND	ND	ND	ND	ND	7,530	14,879.15	4.78
699MW-4	09/24/03	15.92	7.51	8.41	ND	10.59	9.38	93.98	242.15	ND	ND	ND	ND	ND	ND	ND	282	638.10	11.6
699MW-4	12/08/03	15.92	4.46	11.46	70.34	67.37	51.04	431.42	374.95	ND	ND	ND	ND	ND	ND	ND	2,454	3,449.12	10.7
699MW-4	03/29/04	15.92	4.76	11.16	441.52	1,825.02	1,063.68	10,392.74	385.18	ND	ND	ND	ND	ND	ND	ND	8,750	22,858.14	21.4
699MW-4	06/18/04	15.92	5.77	10.15	283.45	565.18	629.50	5,105.97	176.57	ND	ND	ND	ND	ND	ND	ND	6,360	13,120.67	ND
699MW-4	09/16/04	15.92	6.92	9.00	65.02	55.95	213.57	429.78	69.13	ND	ND	ND	ND	ND	ND	ND	2,810	3,643.45	17.8
699MW-4	12/03/04	15.92	5.21	10.71	19.26	44.46	40.86	16.57	435.48	ND	ND	ND	ND	ND	ND	ND	807	1,363.63	ND
699MW-4	03/07/05	15.92	4.61	11.31	449.60	1,916.79	122.25	1,462.72	ND	ND	ND	ND	ND	ND	ND	ND	507	4,458.36	ND
699MW-4	05/26/05	15.92	5.16	10.76	10.41	5.81	21.12	63.14	216.57	ND	ND	ND	ND	ND	ND	ND	763	1,080.05	ND
699MW-4	09/08/05	15.92	7.21	8.71	21.51	5.69	23.04	60.63	431.07	ND	ND	ND	ND	ND	ND	ND	1,242	1,783.94	ND
699MW-4	12/14/05	15.92	4.42	11.50	77.53	238.65	237.40	1,378.34	464.67	ND	ND	ND	ND	ND	ND	ND	0	2,396.59	6.25
699MW-4	02/24/06	15.92	4.10	11.82	88.80	249.27	283.74	1,250.47	4,222.90	ND	ND	ND	ND	ND	ND	ND	1,451	7,546.18	ND
699MW-4	06/14/06	15.92	3.47	12.45	32.67	106.33	355.33	1,934.13	2,282.82	2,143.77	ND	ND	ND	ND	ND	ND	2,623	9,478.05	2.99
699MW-4	09/22/06	15.92	4.31	11.61	33.12	41.61	144.68	681.59	314.85	ND	ND	ND	ND	ND	ND	ND	1,412	2,627.85	1.03
699MW-4	11/28/06	15.92	3.58	12.34	26.23	40.95	91.86	241.47	225.05	ND	ND	ND	ND	ND	ND	ND	1,157	1,782.56	ND
699MW-4	02/21/07	15.92	5.02	10.90	23.72	15.11	88.23	327.95	134.54	ND	ND	ND	ND	ND	ND	ND	2,870	3,459.55	ND
699MW-4	05/22/07	15.92	4.29	11.63	39.70	26.12	334.58	715.59	370.71	253.06	ND	ND	ND	ND	ND	ND	619	2,358.76	2.84
699MW-4	08/08/07	15.92	4.95	10.97	24.55	12.14	65.51	247.84	255.85	66.02	ND	ND	ND	ND	1.29	ND	1,764	2,437.20	2.84
699MW-4	12/22/07	15.92	5.38	10.54	92.83	6.85	16.35	25.87	152.16	79.84	ND	ND	ND	ND	2.41	ND	869	1,245.31	ND
699MW-4	03/30/08	15.92	3.88	12.04	9.35	3.77	39.32	134.38	78.05	ND	ND	ND	ND	ND	1.47	ND	296	562.34	ND
699MW-4	06/04/08	15.92	4.37	11.55	32.21	2.53	36.72	88.14	48.41	ND	ND	ND	ND	ND	ND	ND	503	711.01	4.56
699MW-4	09/29/08	15.92	5.57	10.35	25.37	2.36	17.61	40.41	40.79	ND	ND	ND	ND	ND	ND	ND	747	873.54	4.69
699MW-4	12/30/08	15.92	3.76	12.16	13.31	4.20	64.61	189.30	27.62	ND	ND	ND	ND	ND	ND	ND	405	704.04	4.31
699MW-4	03/27/09	15.92	4.73	11.19	20.32	5.65	136.04	280.26	49.49	ND	ND	ND	ND	ND	ND	ND	1,302	1,793.76	6.92
699MW-4	06/25/09	15.92	3.38	12.54	21.62	16.03	196.50	732.14	47.72	ND	ND	ND	ND	ND	ND	ND	923	2,234.89	1.63
699MW-4	08/26/09	15.92	5.00	10.92	4.69	0.48 J	5.46	12.28	5.05	ND	NA	ND	ND	ND	ND	ND	778	805.48	ND
699MW-4	11/16/09	15.92	4.91	11.01	7.34	2.73	66.76	141.78	22.77	ND	ND	ND	ND	ND	ND	ND	626	867.38	ND
699MW-4	03/26/10	15.92	2.31	13.61	ND	ND	0.99	2.07	6.16	ND	ND	ND	ND	ND	ND	ND	ND	9.22	ND
699MW-4	06/16/10	15.92	5.02	10.90	ND	ND	1.71	1.34	3.03	ND	ND	ND	ND	ND	ND	ND	4	10.08	ND
699MW-4	09/17/10	15.92	6.98	8.94	9.07	10.33	93.76	67.63	25.13	19.67	ND	ND	ND	ND	ND	ND	1,219	1,444.59	ND
699MW-4	01/10/11	15.92	5.74	10.18	1.62	ND	3.83	2.44	10.87	ND	ND	ND	ND	ND	ND	ND	90	108.76	<3.0
699MW-4(DUP)	01/10/11	15.92	5.74	10.18	1.80	ND	4.04	2.37	10.06	ND	ND	ND	ND	ND	ND	ND	108	126.27	<3.0
699MW-4	03/15/11	15.92	2.95	12.97	1.62	ND	0.30 J	0.76	1.95	ND	ND	ND	ND	ND	ND	ND	ND	4.63	<3.0
699MW-4	06/02/11	15.92	–	–	58.16	7.35	85.35	164.14	12.58	8.35	ND	ND	ND	ND	ND	ND	968J	1,303.00	3.5
699MW-4	03/05/12	15.03	3.88	11.15	2.0	0.27J	8.6	4.2	NA	NA	0.29J	ND	NA	ND	NA	ND	363.8J	379.16J	16
699MW-4 (DUP)	03/05/12	15.03	3.88	11.15	2.2	0.28J	9.1	4.5	NA	NA	ND	ND	NA	ND	NA	ND	452J	468.08J	9.9
699MW-4	06/07/12	15.03	3.28	11.75	ND	ND	ND	ND	NA	NA	ND	ND	NA	ND	NA	ND	ND	ND	ND
699MW-4	09/22/12	15.03	5.10	9.93	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.0J
699MW-4	10/23/12	15.03	5.71	9.32	1.3	0.76J	9.3	6.9	1.6	NA	ND	0.73JB	NA	ND	NA	ND	155.5J	176.09J	NS
699MW-4 (DUP)	10/23/12	15.03	5.71	9.32	1.4	0.77J	10.0	7.6	1.6	NA	ND	ND	NA	ND	NA	ND	197J	74.01J	NS
669MW-4	12/11/12	15.03	5.22	9.81	2.5	0.29J	ND	27.0	3.0	NA	ND	ND	NA	ND	NA	ND	441.0	473.79	1.5
699MW-5	06/19/01	15.48	4.21	11.27	9.30	16.92	2.22	13.30	ND	ND	ND	ND	ND	ND	ND	ND	354	395.74	NS
699MW-5	08/30/01	15.48	6.25	9.23	ND	ND	ND	ND	ND	ND	5.06	1.22	ND	ND	ND	ND	ND	6.28	1.41
699MW-5	12/13/01	15.48	7.40	8.08	ND	ND	ND	ND	ND	ND	10.32	ND	ND	ND	ND	ND	ND	10.32	8.3
699MW-5	03/27/02	15.48	5.05	10.43	ND	ND	ND	ND	ND	ND	3.81	ND	ND	ND	ND	ND	ND	3.81	ND
699MW-5	06/26/02	15.48	5.34	10.14	ND	1.88	ND	5.49	ND	ND	3.99	ND	ND	ND	ND	ND	ND	11.36	ND
699MW-5	09/19/02	15.48	5.53	9.95	ND	ND	ND	ND	ND	ND	1.99	ND	ND	ND	ND	ND	ND	1.99	ND
699MW-5	11/26/02	15.48	3.23	12.25	ND	ND	ND	ND	ND	ND	0.94	ND	ND	ND	ND	ND	ND	0.94	ND
699MW-5	03/17/03	15.48	2.75	12.73	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-5	06/25/03	15.48	2.80	12.68	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	3.46
699MW-5	09/24/03	15.48	5.23	10.25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	6.04
699MW-5	12/08/03	15.48	3.90	11.58	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	5.00	6.6
699MW-5	03/29/04	15.48	3.51	11.97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	6.51
699MW-5	06/18/04	15.48	4.54	10.94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	11.2
699MW-5	09/16/04	15.48	5.70	9.78	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	5.33
699MW-5	12/03/04	15.48	3.64	11.84	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-5	03/04/05	15.48	3.03	12.45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-5	05/26/05	15.48	3.96	11.52	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-5	09/08/05	15.48	6.28	9.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	22	22.00	12.9
699MW-5	12/13/05	15.48	3.22	12.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-5	02/24/06	15.48	3.22	12.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND

Table 1
GROUNDWATER MONITORING SAMPLING SUMMARY DATA
FORT MONMOUTH - MAIN POST GAS STATION
NEW JERSEY

Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					1	1,000	700	1,000	70	100	70	3	700	1	6,000	1	100/500	–	5
699MW-5	06/13/06	15.48	2.95	12.53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-5	09/22/06	15.48	3.74	11.74	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-5	11/28/06	15.48	2.81	12.67	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-5	02/21/07	15.48	3.98	11.50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-5	05/22/07	15.48	3.90	11.58	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-5	08/08/07	15.48	4.51	10.97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-5	12/22/07	15.48	4.13	11.35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-5	03/30/08	15.48	3.49	11.99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.92	ND	ND	10.92	ND
699MW-5	06/04/08	15.48	3.51	11.97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-5	09/29/08	15.48	5.17	10.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1.99
699MW-5	12/30/08	15.48	2.82	12.66	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	2.8
699MW-5	03/27/09	15.48	4.06	11.42	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-5	06/24/09	15.48	2.45	13.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-5	08/26/09	15.48	4.59	10.89	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-5	11/16/09	15.48	3.88	11.60	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-5	03/24/10	15.48	2.18	13.30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-5	06/16/10	15.48	4.62	10.86	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-5	09/16/10	15.48	7.28	8.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-5	01/05/11	15.48	4.75	10.73	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 3.0
699MW-5	03/11/11	15.48	1.67	13.81	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 3.0
699MW-5(DUP)	03/11/11	15.48	1.67	13.81	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 3.0
699MW-5	06/01/11	15.48	4.04	11.44	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 3.0
699MW-5	03/05/12	13.22	3.55	9.67	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-5	06/07/12	13.22	3.25	9.97	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-5	09/22/12	13.22	4.98	8.24	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-5	10/23/12	13.22	5.77	7.45	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
669MW-5	12/11/12	13.22	4.08	9.14	ND	ND	ND	ND	ND	NA	ND	ND	NA	ND	NA	ND	ND	ND	ND
699MW-6	06/19/01	15.78	4.78	11.00	**761.06**	546.35	**985.71**	**1,544.89**	3.70	ND	ND	ND	ND	ND	ND	ND	177	4,018.71	NS
699MW-6	08/30/01	15.78	6.77	9.01	**1,177.19**	**1,684.62**	**1,881.59**	**4,730.19**	ND	ND	**261.44**	ND	ND	ND	ND	ND	**4,660**	14,395.03	4.89
699MW-6	12/13/01	15.78	7.77	8.01	**401.96**	360.71	366.92	964.27	ND	ND	ND	ND	ND	ND	ND	ND	**620**	2,713.86	2.7
699MW-6	03/27/02	15.78	5.21	10.57	**1.09**	2.98	3.00	12.48	ND	ND	ND	ND	ND	ND	ND	ND	44	63.55	19
699MW-6	06/26/02	15.78	6.12	9.66	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.00	NS
699MW-6	09/19/02	15.78	6.15	9.63	**10.50**	9.64	114.43	368.32	ND	ND	ND	ND	ND	ND	ND	ND	921	1,423.89	1.53
699MW-6	11/26/02	15.78	3.91	11.87	**11.72**	3.78	74.15	82.33	ND	ND	ND	ND	ND	ND	ND	ND	**540**	711.98	ND
699MW-6	03/17/03	15.78	3.11	12.67	**10.72**	11.52	95.60	212.63	ND	ND	ND	ND	ND	ND	ND	ND	**809**	1,139.47	ND
699MW-6	06/25/03	15.78	3.17	12.61	**1.48**	1.88	73.82	73.11	ND	ND	ND	ND	ND	ND	ND	ND	468	618.29	**9.87**
699MW-6	09/24/03	15.78	5.27	10.51	**23.51**	20.87	183.13	459.18	ND	ND	ND	ND	ND	ND	ND	ND	**609**	1,295.69	**9.96**
699MW-6	12/08/03	15.78	4.50	11.28	ND	0.68	6.25	13.38	ND	ND	ND	ND	ND	ND	ND	ND	43	63.31	**28**
699MW-6	03/29/04	15.78	4.01	11.77	0.51	ND	10.62	7.63	ND	ND	ND	ND	ND	ND	ND	ND	33	51.76	**19.3**
699MW-6	06/18/04	15.78	5.23	10.55	0.79	1.73	10.98	11.43	ND	ND	ND	ND	ND	ND	ND	ND	52	76.93	**12.7**
699MW-6	09/16/04	15.78	6.38	9.40	**1.63**	3.27	73.98	174.46	ND	ND	ND	ND	ND	ND	ND	ND	ND	253.34	**37.1**
699MW-6	12/03/04	15.78	4.51	11.27	**3.70**	2.74	75.31	124.38	ND	ND	ND	ND	ND	ND	ND	ND	**510**	716.00	ND
699MW-6	03/04/05	15.78	3.33	12.45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-6	05/26/05	15.78	3.96	11.82	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-6	09/08/05	15.78	7.04	8.74	**130.73**	54.38	480.49	965.61	48.89	ND	ND	ND	ND	ND	ND	ND	**1,264**	2,944.10	ND
699MW-6	12/13/05	15.78	5.73	10.05	**1.85**	0.49	12.86	14.56	0.75	ND	ND	ND	ND	ND	2.63	ND	75	108.14	ND
699MW-6	02/24/06	15.78	5.67	10.11	**2.53**	ND	6.68	10.18	ND	ND	ND	ND	ND	ND	ND	ND	105	124.39	ND
699MW-6	06/14/06	15.78	5.30	10.48	**21.31**	ND	25.51	19.07	ND	ND	ND	ND	ND	ND	ND	ND	243	308.89	ND
699MW-6	09/22/06	15.78	6.22	9.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-6	11/28/06	15.78	5.12	10.66	**6.91**	6.13	16.07	19.96	1.24	ND	ND	ND	ND	ND	ND	ND	48	98.31	ND
699MW-6	02/21/07	15.78	6.72	9.06	**34.71**	31.39	104.47	312.15	0.80	ND	ND	ND	ND	ND	ND	ND	**1,248**	1,731.52	ND
699MW-6	05/22/07	15.78	6.29	9.49	**2.49**	1.27	39.37	32.94	0.80	ND	ND	ND	ND	ND	ND	ND	202	278.87	ND
699MW-6	08/08/07	15.78	7.01	8.77	**108.01**	53.62	79.04	286.66	25.60	ND	ND	ND	ND	ND	11.98	ND	**2,253**	2,817.91	ND
699MW-6	12/22/07	15.78	6.79	8.99	**11.11**	3.23	58.14	62.64	0.28	ND	ND	ND	ND	ND	1.29	ND	117	253.69	ND
699MW-6	03/30/08	15.78	5.49	10.29	**6.27**	2.69	50.27	94.45	6.02	ND	ND	ND	22.95	ND	2.29	ND	86	270.94	ND
699MW-6	06/04/08	15.78	6.14	9.64	**34.82**	13.82	283.29	332.55	2.93	ND	ND	ND	ND	ND	ND	ND	210	877.41	**5.99**
699MW-6	09/29/08	15.78	7.49	8.29	**73.80**	5.10	333.11	202.06	0.72	ND	ND	ND	ND	ND	ND	ND	212	826.79	**3.76**
699MW-6	12/30/08	15.78	5.27	10.51	**9.24**	1.21	44.48	48.42	0.58	ND	ND	ND	ND	ND	ND	ND	123	226.93	**2.53**
699MW-6	03/27/09	15.78	6.53	9.25	**26.73**	14.15	320.24	740.96	0.70 J	ND	ND	ND	ND	ND	ND	ND	**632**	1,839.45	**6.11**
699MW-6	06/24/09	15.78	4.91	10.87	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-6	08/26/09	15.78	7.05	8.73	**14.15**	9.68	**735.48**	1,194.72	ND	ND	ND	ND	ND	ND	ND	ND	**533**	2,488.43	ND
699MW-6	11/16/09	15.78	6.44	9.34	**2.08**	0.44 J	31.39	44.55	ND	ND	ND	ND	ND	ND	ND	ND	75	153.02	ND
699MW-6	03/26/10	15.78	4.06	11.72	0.59	1.43	26.31	54.44	ND	ND	ND	ND	ND	ND	ND	ND	137	219.28	**8.68**
699MW-6	06/16/10	15.78	7.00	8.78	**1.03**	ND	11.82	7.30	ND	ND	ND	ND	ND	ND	ND	ND	56	76.15	ND

Table 1
GROUNDWATER MONITORING SAMPLING SUMMARY DATA
FORT MONMOUTH - MAIN POST GAS STATION
NEW JERSEY

Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Qunlity Standard (µg/L)					1	1,000	700	1,000	70	100	70	3	700	1	6,000	1	100/500	--	5
699MW-6	09/17/10	15.78	9.30	6.48	4.22	ND	3.02	4.52	ND	ND	ND	ND	ND	ND	ND	ND	104	115.76	ND
699MW-6	01/05/11	15.78	7.09	8.69	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<3.0
699MW-6	03/11/11	15.78	3.78	12.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.8
699MW-6	06/02/11	15.78	6.20	9.58	0.69	0.83	89.43	99.43	ND	ND	ND	ND	ND	ND	ND	ND	294J	484.38	5
699MW-6	03/05/12	16.75	5.72	11.03	18J	3.4J	200	210	NA	NA	ND	10JB	NA	ND	NA	ND	430.9J	872.3J	5.8
699MW-6	06/07/12	16.75	5.48	11.27	ND	ND	ND	ND	NA	NA	ND	ND	NA	ND	NA	ND	ND	ND	ND
699MW-6	09/22/12	16.75	7.09	9.66	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND
699MW-6	10/23/12	16.75	7.65	9.10	ND	ND	ND	ND	ND	NA	ND	0.18JB	NA	ND	NA	ND	2.6J	2.78J	NS
669MW-6	12/11/12	16.75	6.17	10.58	ND	ND	ND	ND	ND	NA	ND	ND	NA	ND	NA	ND	ND	ND	ND
699MW-8	06/19/01	16.20	5.18	11.02	1.40	3.24	1.32	3.93	ND	ND	ND	ND	ND	ND	ND	ND	57	66.89	NS
699MW-8	08/30/01	16.20	6.53	9.67	ND	ND	ND	ND	ND	ND	1.14	ND	ND	ND	ND	ND	ND	1.14	ND
699MW-8	12/13/01	16.20	8.04	8.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1.4
699MW-8	03/27/02	16.20	6.35	9.85	ND	1.39	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.39	ND
699MW-8	06/26/02	16.20	6.25	9.95	ND	2.66	ND	5.61	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.27	2.7
699MW-8	09/19/02	16.20	6.20	10.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8	8.00	0.97
699MW-8	11/26/02	16.20	4.34	11.86	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	6.00	ND
699MW-8	03/17/03	16.20	3.61	12.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	5.00	1.31
699MW-8	06/30/03	16.20	3.65	12.55	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-8	09/24/03	16.20	5.96	10.24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	7.00	ND
699MW-8	12/08/03	16.20	5.25	10.95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.9
699MW-8	03/29/04	16.20	4.33	11.87	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-8	06/18/04	16.20	5.06	11.14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-8	09/16/04	16.20	6.35	9.85	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-8	12/03/04	16.20	5.40	10.80	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-8	03/07/05	16.20	3.60	12.60	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-8	05/26/05	16.20	4.55	11.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-8	09/08/05	16.20	6.51	9.69	ND	ND	1.38	2.97	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.35	ND
699MW-8	12/14/05	16.20	3.83	12.37	ND	0.46	0.65	4.55	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.66	ND
699MW-8	02/24/06	16.20	3.55	12.65	ND	ND	ND	0.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.56	ND
699MW-8	06/14/06	16.20	3.98	12.22	ND	ND	0.28	1.11	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.39	ND
699MW-8	09/22/06	16.20	4.69	11.51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-8	11/28/06	16.20	3.55	12.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-8	02/21/07	16.20	4.65	11.55	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-8	05/22/07	16.20	3.98	12.22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-8	08/08/07	16.20	4.80	11.40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-8	12/22/07	16.20	5.33	10.87	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-8	03/30/08	16.20	3.55	12.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-8	06/04/08	16.20	4.20	12.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-8	09/29/08	16.20	6.11	10.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-8	12/30/08	16.20	3.55	12.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	4.27
699MW-8	03/27/09	16.20	4.55	11.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-8	06/24/09	16.20	3.49	12.71	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-8	08/26/09	16.20	4.88	11.32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-8	11/16/09	16.20	5.03	11.17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-8	03/24/10	16.20	2.91	13.29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-8	06/16/10	16.20	4.81	11.39	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.74
699MW-8	09/17/10	16.20	7.01	9.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-8	12/30/10	16.20	6.00	10.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<3.0
699MW-8	03/11/11	16.20	3.05	13.15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<3.0
699MW-8	06/02/11	16.20	4.08	12.12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<3.0
699MW-8	03/05/12	14.88	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-8	06/07/12	14.88	4.17	10.71	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-8	09/22/12	14.88	5.84	9.04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-8	10/23/12	14.88	5.95	8.93	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
669MW-8	12/12/12	14.88	5.41	9.47	ND	ND	0.24J	ND	ND	NA	ND	ND	NA	ND	NA	ND	ND	0.24J	3.3
699MW-9	06/19/01	15.96	4.83	11.13	ND	1.96	ND	1.27	ND	ND	ND	ND	ND	2.24	ND	ND	ND	5.47	NS
699MW-9	08/30/01	15.96	7.07	8.89	ND	ND	ND	ND	ND	ND	ND	ND	3.02	4.68	ND	ND	ND	7.70	ND
699MW-9	12/13/01	15.96	7.96	8.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.25	ND	ND	ND	2.25	ND
699MW-9	03/27/02	15.96	5.36	10.60	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.81	ND	ND	ND	1.81	ND
699MW-9	06/26/02	15.96	6.25	9.71	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.55	ND	ND	ND	2.55	0.94
699MW-9	09/19/02	15.96	6.49	9.47	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.86	ND	ND	ND	2.86	ND
699MW-9	11/26/02	15.96	3.57	12.39	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3	ND	ND	ND	1.30	ND
699MW-9	03/17/03	15.96	3.00	12.96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND

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NEW JERSEY

Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					1	1,000	700	1,000	70	100	70	3	700	1	6,000	1	100/500	--	5
699MW-9	06/30/03	15.96	4.03	11.93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-9	09/24/03	15.96	6.07	9.89	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.37	ND	ND	ND	1.37	1.84
699MW-9	12/08/03	15.96	4.74	11.22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	3.53
699MW-9	03/29/04	15.96	3.95	12.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-9	06/18/04	15.96	5.40	10.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-9	09/16/04	15.96	6.60	9.36	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.7	ND	ND	4	4.70	ND
699MW-9	12/03/04	15.96	4.42	11.54	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-9	03/04/05	15.96	3.21	12.75	ND	0.92	ND	1.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.11	ND
699MW-9	05/23/05	15.96	4.33	11.63	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-9	09/08/05	15.96	7.17	8.79	ND	ND	0.33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.33	ND
699MW-9	12/13/05	15.96	3.45	12.51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-9	02/24/06	15.96	3.43	12.53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-9	06/13/06	15.96	3.31	12.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-9	09/22/06	15.96	4.41	11.55	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-9	11/28/06	15.96	2.81	13.15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-9	02/21/07	15.96	4.69	11.27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-9	05/22/07	15.96	4.41	11.55	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-9	08/08/07	15.96	5.24	10.72	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.53	ND	ND	ND	1.53	ND
699MW-9	12/22/07	15.96	4.45	11.51	ND	ND	ND	ND	0.72	ND	ND	ND	ND	1.09	ND	ND	ND	1.81	ND
699MW-9	03/30/08	15.96	3.55	12.41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-9	06/04/08	15.96	4.26	11.70	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1.51
699MW-9	09/29/08	15.96	5.88	10.08	ND	ND	ND	ND	1.07	ND	ND	ND	ND	6.97	ND	ND	ND	8.04	6.44
699MW-9	12/30/08	15.96	2.98	12.98	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	4.34
699MW-9	03/27/09	15.96	4.58	11.38	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.25
699MW-9	06/24/09	15.96	2.78	13.18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-9	08/26/09	15.96	5.36	10.60	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.65	ND	ND	ND	1.65	ND
699MW-9	11/16/09	15.96	4.56	11.40	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.88	ND	ND	ND	1.88	ND
699MW-9	03/26/10	15.96	2.17	13.79	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-9	06/16/10	15.96	5.30	10.66	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.51	ND	ND	ND	0.51	ND
699MW-9	09/17/10	15.96	7.51	8.45	ND	ND	0.53	0.28	1.78	ND	ND	ND	ND	2.32	ND	ND	ND	4.91	ND
699MW-9	01/05/11	15.96	5.19	10.77	ND	ND	ND	ND	2.93	ND	ND	ND	ND	1.09	ND	ND	ND	ND	<3.0
699MW-9	03/11/11	15.96	1.81	14.15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<3.0
699MW-9	06/01/11	15.96	4.37	11.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<3.0
699MW-9	03/05/12	14.70	3.75	10.95	ND	ND	ND	ND	NA	NA	ND	ND	3.60J	0.15J	NA	ND	ND	3.75J	ND
699MW-9	06/07/12	14.70	3.75	10.95	ND	ND	ND	ND	ND	NA	ND	ND	ND	ND	NA	ND	ND	ND	ND
699MW-9	09/22/12	14.70	5.61	9.09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND
699MW-9	10/23/12	14.70	5.89	8.81	ND	ND	ND	ND	2.4	NA	ND	0.18JB	ND	0.58J	NA	ND	ND	3.16J	NS
669MW-9	12/11/12	14.70	4.72	9.98	ND	ND	ND	ND	1.4	NA	ND	ND	NA	0.38J	NA	ND	ND	1.78J	3.9
669MW-9(DUP)	12/11/12	14.70	4.72	9.98	ND	ND	ND	ND	1.2	NA	ND	ND	NA	0.31J	NA	ND	ND	1.61J	3.3
699MW-12	06/19/01	16.66	5.64	11.02	ND	1.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.56	NS
699MW-12	08/30/01	16.66	7.28	9.38	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	12/13/01	16.66	8.59	8.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1
699MW-12	03/27/02	16.66	6.89	9.77	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	06/26/02	16.66	6.85	9.81	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	09/19/02	16.66	6.95	9.71	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1.26
699MW-12	11/26/02	16.66	4.90	11.76	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	03/17/03	16.66	4.15	12.51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	06/30/03	16.66	4.26	12.40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	09/24/03	16.66	6.55	10.11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	12/08/03	16.66	5.80	10.86	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	03/29/04	16.66	4.90	11.76	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	06/18/04	16.66	5.72	10.94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	09/16/04	16.66	7.00	9.66	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	12/03/04	16.66	5.73	10.93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	03/04/05	16.66	4.04	12.62	ND	0.57	ND	ND	28.99	ND	ND	ND	ND	ND	ND	ND	ND	29.56	ND
699MW-12	05/23/05	16.66	5.09	11.57	ND	ND	ND	ND	4.62	ND	ND	ND	ND	ND	ND	ND	ND	4.62	ND
699MW-12	09/08/05	16.66	7.28	9.38	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	02/24/06	16.66	4.01	12.65	ND	ND	ND	ND	3.41	ND	ND	ND	ND	ND	ND	ND	ND	3.41	ND
699MW-12	06/13/06	16.66	4.44	12.22	ND	ND	ND	ND	1.90	ND	ND	ND	ND	ND	ND	ND	ND	1.90	ND
699MW-12	09/22/06	16.66	5.13	11.53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	11/28/06	16.66	4.14	12.52	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	02/21/07	16.66	5.34	11.32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	05/22/07	16.66	4.59	12.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	08/08/07	16.66	5.49	11.17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND

Table 1
GROUNDWATER MONITORING SAMPLING SUMMARY DATA
FORT MONMOUTH - MAIN POST GAS STATION
NEW JERSEY

Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					1	1,000	700	1,000	70	100	70	3	700	1	6,000	1	100/500	–	5
699MW-12	12/22/07	16.66	5.67	10.99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	03/30/08	16.66	3.95	12.71	ND	ND	ND	ND	0.51	ND	ND	ND	ND	ND	ND	ND	ND	0.51	ND
699MW-12	06/04/08	16.66	4.65	12.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	09/29/08	16.66	6.55	10.11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-12	12/30/08	16.66	4.34	12.32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	3.64
699MW-12	03/27/09	16.66	5.05	11.61	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.09
699MW-12	06/24/09	16.66	3.88	12.78	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-12	08/26/09	16.66	5.50	11.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-12	11/16/09	16.66	5.35	11.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-12	03/24/10	16.66	2.90	13.76	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-12	06/15/10	16.66	5.37	11.29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-12	09/17/10	16.66	7.65	9.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-12	12/30/11	16.66	6.59	10.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<3.0
699MW-12(DUP)	12/30/11	16.66	6.59	10.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<3.0
699MW-12	03/11/11	16.66	3.20	13.46	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<3.0
699MW-12	06/02/11	16.66	4.44	12.22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<3.0
699MW-12	03/05/12	15.50	4.25	11.25	ND	ND	ND	ND	NA	NA	ND	ND	NA	ND	NA	ND	ND	ND	1.5
699MW-12	06/07/12	15.50	4.59	10.91	ND	ND	ND	ND	NA	NA	ND	ND	NA	ND	NA	ND	ND	ND	ND
699MW-12 (DUP)	06/07/12	15.50	4.59	10.91	ND	ND	ND	ND	NA	NA	ND	ND	NA	ND	NA	ND	ND	ND	ND
699MW-12	09/22/12	15.50	6.30	9.20	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND
699MW-12 (DUP)	09/22/12	15.50	6.30	9.20	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND
699MW-12	10/23/12	15.50	6.51	8.99	ND	ND	ND	ND	ND	NA	ND	ND	NA	ND	NA	ND	ND	ND	NS
699MW-12	12/12/12	15.50	5.57	9.93	ND	ND	ND	ND	ND	NA	ND	0.24J	NA	ND	NA	ND	ND	0.24J	1.3J
699MW-15	06/19/01	17.04	3.35	13.69	1.33	1.82	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.15	NS
699MW-15	08/30/01	17.04	5.92	11.12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	5.82
699MW-15	12/13/01	17.04	7.21	9.83	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	3.9
699MW-15	03/27/02	17.04	1.73	15.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	5.61
699MW-15	06/26/02	17.04	4.71	12.33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	2.3
699MW-15	09/19/02	17.04	4.84	12.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	3.35
699MW-15	11/26/02	17.04	2.14	14.90	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-15	03/17/03	17.04	2.13	14.91	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-15	06/25/03	17.04	2.35	14.69	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	2.91
699MW-15	09/24/03	17.04	5.03	12.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	5.00	8.96
699MW-15	12/08/03	17.04	3.05	13.99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	6.74
699MW-15	03/29/04	17.04	3.05	13.99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	15.1
699MW-15	06/18/04	17.04	4.55	12.49	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-15	09/16/04	17.04	5.61	11.43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	8.41
699MW-15	12/06/04	17.04	3.09	13.95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-15	03/07/05	17.04	2.53	14.51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-15	05/26/05	17.04	3.95	13.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	8.35
699MW-15	09/08/05	17.04	6.56	10.48	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-15	12/13/05	17.04	1.98	15.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	7.99
699MW-15	02/24/06	17.04	2.99	14.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	6.62
699MW-15	06/13/06	17.04	2.86	14.18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	4.56
699MW-15	09/22/06	17.04	3.24	13.80	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1.63
699MW-15	11/28/06	17.04	1.88	15.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW-15	02/21/07	17.04	3.21	13.83	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1.23
699MW-15	05/22/07	17.04	4.45	12.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	6.69
699MW-15	08/08/07	17.04	4.38	12.66	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	3.55
699MW-15	12/22/07	17.04	2.79	14.25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1
699MW-15	03/30/08	17.04	3.78	13.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	2.29
699MW-15	06/04/08	17.04	4.06	12.98	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	7.12
699MW-15	09/29/08	17.04	3.88	13.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	5.62
699MW-15	12/30/08	17.04	2.18	14.86	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	7.16
699MW-15	03/27/09	17.04	4.21	12.83	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.79
699MW-15	06/24/09	17.04	1.25	15.79	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.85
699MW-15	08/26/09	17.04	4.91	12.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.04
699MW-15	11/16/09	17.04	3.86	13.18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.71
699MW-15	03/25/10	17.04	1.61	15.43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	31.1
699MW-15	06/15/10	17.04	5.32	11.72	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.5
699MW-15	09/16/10	17.04	7.80	9.24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-15	01/07/11	17.04	4.07	12.97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3
699MW-15(DUP)	01/07/11	17.04	4.07	12.97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.2
699MW-15	03/15/11	17.04	0.65	16.39	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.9

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FORT MONMOUTH - MAIN POST GAS STATION
NEW JERSEY

Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					1	1,000	700	1,000	70	100	70	3	700	1	6,000	1	100/500	–	5
699MW-15	05/27/11	17.04	3.37	13.67	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13.3
699MW-15	03/05/12	15.70	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-15	06/07/12	15.70	2.60	13.10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-15	09/22/12	15.70	4.91	10.79	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-15	10/23/12	15.70	5.94	9.76	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
669MW-15	12/12/12	15.70	2.81	12.89	ND	ND	ND	ND	ND	NA	ND	0.62J	NA	ND	NA	ND	1.6J	2.22	6.1
699MW-16	06/19/01	15.27	5.00	10.27	ND	ND	ND	ND	ND	ND	5.31	ND	ND	ND	ND	ND	ND	5.31	NS
699MW-16	08/30/01	15.27	7.26	8.01	ND	ND	ND	ND	ND	ND	1.02	ND	ND	ND	ND	ND	ND	1.02	ND
699MW-16	12/13/01	15.27	7.64	7.63	ND	ND	ND	ND	ND	ND	1.67	ND	ND	ND	ND	ND	ND	1.67	ND
699MW-16	03/27/02	15.27	4.92	10.35	ND	ND	ND	ND	ND	ND	10.09	ND	ND	ND	ND	ND	ND	10.09	ND
699MW-16	06/27/02	15.27	5.79	9.48	ND	ND	ND	ND	ND	ND	10.83	ND	ND	ND	ND	ND	ND	10.83	ND
699MW-16	09/19/02	15.27	7.34	7.93	ND	ND	ND	ND	ND	ND	2.64	ND	ND	ND	ND	ND	ND	2.64	ND
699MW-16	11/26/02	15.27	2.57	12.70	ND	ND	ND	ND	ND	ND	14.38	ND	ND	ND	ND	ND	ND	14.38	ND
699MW-16	06/30/03	15.27	3.96	11.31	ND	ND	ND	ND	ND	ND	19.84	ND	ND	ND	ND	ND	ND	19.84	ND
699MW-16	03/17/03	15.27	2.34	12.93	ND	ND	ND	ND	ND	ND	31.83	ND	ND	ND	ND	ND	ND	31.83	ND
699MW-16	09/24/03	15.27	6.22	9.05	ND	ND	ND	ND	ND	ND	2.91	ND	ND	ND	ND	ND	ND	2.91	ND
699MW-16	12/08/03	15.27	4.04	11.23	ND	ND	ND	ND	ND	ND	4.25	ND	ND	0.49	ND	ND	ND	4.74	ND
699MW-16	03/29/04	15.27	3.25	12.02	ND	ND	ND	ND	ND	ND	7.31	ND	ND	ND	ND	ND	ND	7.31	ND
699MW-16	06/18/04	15.27	5.23	10.04	ND	ND	ND	ND	ND	ND	3.54	ND	ND	ND	ND	ND	ND	3.54	ND
699MW-16	09/16/04	15.27	6.51	8.76	ND	ND	ND	ND	ND	ND	1.43	ND	ND	0.91	ND	ND	ND	2.34	ND
699MW-16	12/03/04	15.27	3.62	11.65	ND	ND	ND	ND	ND	ND	3.56	ND	ND	1.09	ND	ND	ND	4.65	ND
699MW-16	03/04/05	15.27	2.48	12.79	ND	0.40	ND	ND	ND	ND	26.07	ND	ND	ND	ND	ND	ND	26.47	ND
699MW-16	05/23/05	15.27	3.72	11.55	ND	ND	ND	ND	ND	ND	15.51	ND	ND	ND	ND	ND	ND	15.51	ND
699MW-16	09/08/05	15.27	7.48	7.79	ND	ND	ND	ND	ND	ND	0.83	ND	ND	1.37	ND	ND	ND	2.20	ND
699MW-16	12/13/05	15.27	2.66	12.61	ND	ND	ND	ND	ND	ND	31.39	ND	ND	0.42	ND	ND	ND	31.81	ND
699MW-16	02/24/06	15.27	2.84	12.43	ND	ND	ND	ND	ND	ND	22.71	ND	ND	ND	ND	ND	ND	22.71	ND
699MW-16	06/13/06	15.27	3.16	12.11	ND	ND	ND	ND	ND	ND	24.2	ND	ND	ND	ND	ND	ND	24.20	ND
699MW-16	09/22/06	15.27	4.40	10.87	ND	ND	ND	ND	ND	ND	5	ND	ND	ND	ND	ND	ND	5.00	ND
699MW-16	11/28/06	15.27	2.00	13.27	ND	ND	ND	ND	ND	ND	33.95	ND	ND	0.37	ND	ND	ND	34.32	ND
699MW-16	02/21/07	15.27	4.31	10.96	ND	ND	ND	ND	ND	ND	8.47	ND	ND	0.54	ND	ND	ND	9.01	ND
699MW-16	05/22/07	15.27	4.13	11.14	ND	ND	ND	ND	ND	ND	13.03	ND	ND	0.54	ND	ND	ND	13.57	ND
699MW-16	08/08/07	15.27	5.23	10.04	ND	ND	ND	ND	ND	ND	4.2	ND	ND	1.8	ND	ND	ND	6.00	ND
699MW-16	12/22/07	15.27	3.41	11.86	ND	ND	ND	ND	ND	ND	21.46	ND	ND	1.11	ND	ND	ND	22.57	ND
699MW-16	03/30/08	15.27	3.18	12.09	ND	ND	ND	ND	ND	ND	32.23	ND	ND	ND	ND	ND	ND	32.23	ND
699MW-16	06/04/08	15.27	4.03	11.24	ND	ND	ND	ND	ND	ND	39.61	ND	ND	0.72	ND	ND	ND	40.33	ND
699MW-16	09/29/08	15.27	6.16	9.11	ND	ND	ND	ND	ND	ND	4.68	ND	ND	1.93	ND	ND	ND	6.61	ND
699MW-16	12/30/08	15.27	2.25	13.02	ND	ND	ND	ND	ND	ND	23.77	ND	ND	0.51	ND	ND	ND	24.28	4
699MW-16	03/27/09	15.27	4.13	11.14	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.65 J	ND	ND	ND	ND	ND
699MW-16	06/24/09	15.27	2.18	13.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW-16	08/26/09	15.27	5.34	9.93	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.93	ND	ND	ND	0.93	ND
699MW-16	11/16/09	15.27	3.91	11.36	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.09	ND	ND	ND	1.09	ND
699MW-16	03/26/10	15.27	1.80	13.47	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.96	ND	ND	ND	0.96	ND
699MW-16	06/17/10	15.27	5.23	10.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.99	ND	ND	ND	0.99	ND
699MW-16	09/17/10	15.27	8.01	7.26	ND	ND	0.42	0.22	ND	ND	ND	ND	ND	1.71	ND	ND	ND	2.35	ND
699MW-16	01/05/11	15.27	4.43	10.84	1.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.06	<3.0
699MW-16	03/15/11	15.27	0.96	7.26	0.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.59	<3.0
699MW-16	06/01/11	15.27	4.22	10.84	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.43	ND	ND	ND	0.43	<3.0
699MW-16	03/05/12	15.27	3.43	11.84	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-16	06/07/12	15.27	3.20	12.07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-16	09/22/12	15.27	5.74	9.53	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW-16	10/23/12	15.27	5.62	9.65	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
669MW-16	12/11/12	15.27	3.32	11.95	ND	ND	ND	ND	ND	NA	0.79J	ND	NA	0.81J	NA	ND	ND	1.6J	ND
699RW-3	12/30/08	WNS	10.90	WNS	26.93	15.54	143.23	384.95	24.58	NA	ND	ND	ND	ND	ND	ND	646	1,241.23	2.61
699RW-3	03/27/09	WNS	8.15	WNS	257.57	378.26	230.43	645.61	45.32	ND	ND	ND	ND	ND	ND	ND	1,140	2,700.46	12.9
699RW-3	06/25/09	WNS	13.08	WNS	42.28	16.55	146.89	370.28	19.11	ND	ND	ND	ND	ND	ND	ND	455	1,050.75	11.3
699RW-3	08/26/09	WNS	13.56	WNS	32.01	3.77	98.17	114.58	18.89	46.89	ND	ND	ND	ND	ND	ND	348	643.10	ND
699RW-3	11/16/09	WNS	11.34	WNS	13.49	1.96	85.08	122.80	17.26	ND	ND	ND	ND	ND	ND	ND	187	427.59	7.14
699RW-3	03/31/10	WNS	WNG	WNS	ND	ND	0.96	0.87	ND	ND	ND	ND	ND	ND	ND	ND	19	21.23	ND
699RW-3	06/17/10	WNS	10.85	WNS	11.29	0.58	24.37	14.04	8.95	28.08	ND	ND	ND	ND	ND	ND	468	555.32	29.3
699RW-3	09/27/10	WNS	WNG	WNS	1.30	2.21	15.89	82.76	1.69	ND	ND	ND	ND	ND	ND	ND	313	416.85	2.82
699RW-3	01/10/11	WNS	9.28	WNS	9.75	2.39	93.59	134.07	5.57	8.81	ND	ND	ND	ND	ND	ND	858	1,112.18	<3.0
699RW-3	03/15/11	WNS	3.19	WNS	16.33	4.14	88.78	216.62	10.23	21.19	ND	ND	ND	ND	ND	ND	934	1,291.29	5.5
699RW-3	06/03/11	WNS	3.51	WNS	4.49	1.45	5.50	19.89	8.39	108.06	NA	NA	3.88	5.81	6.85	1.24	193	358.56	22.9

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FORT MONMOUTH - MAIN POST GAS STATION
NEW JERSEY

Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					1	1,000	700	1,000	70	100	70	3	700	1	6,000	1	100/500	–	5
699RW-3	03/05/12	14.87	4.13	10.74	6.2	5.0	44	400	NA	NA	ND	ND	NA	ND	NA	ND	2,279J	2734.2J	5.3
699RW-3	06/07/12	14.87	10.20	4.67	12.0	6.0	100	260	NA	NA	ND	2.8JB	NA	ND	NA	ND	1431J	1811.8J	1.8J
699RW-3	09/22/12	14.87	9.55	5.32	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND
699RW-3	10/23/12	14.87	10.12	4.75	11	1.3J	45	70	4.6	NA	0.49J	1.1JB	NA	ND	NA	ND	482J	612.49J	NS
699RW-3	12/12/12	14.87	11.51	3.36	8	0.93J	57	61	5.2	NA	ND	1.4JB	NA	ND	NA	ND	411J	544.53	ND
699RW-4	02/24/06	16.47	4.86	11.61	ND	ND	1.62	ND	0.41	ND	ND	ND	ND	ND	ND	ND	ND	2.03	ND
699RW-4	06/14/06	16.47	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699RW-4	09/22/06	16.47	5.07	11.40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699RW-4	11/28/06	16.47	3.94	12.53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699RW-4	02/21/07	16.47	12.82	3.65	5.44	ND	1.59	0.32	11.34	19.88	ND	ND	ND	3.81	ND	ND	96	138.38	ND
699RW-4	05/22/07	16.47	4.19	12.28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699RW-4	08/08/07	16.47	4.21	12.26	ND	0.70	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.70	6.14
699RW-4	12/22/07	16.47	8.54	7.93	0.48	ND	ND	ND	5.80	5.44	ND	ND	ND	0.74	6.92	ND	ND	19.38	ND
699RW-4	03/30/08	16.47	1.37	15.10	23.33	24.81	94.27	341.15	24.27	106.76	ND	ND	ND	ND	6.19	ND	186	806.78	6.87
699RW-4	06/04/08	16.47	4.91	11.56	28.19	10.11	27.78	72.04	30.85	183.71	ND	ND	ND	0.72	2.54	ND	170	525.94	21.8
699RW-4	09/29/08	16.47	4.21	12.26	0.38	ND	ND	ND	9.96	33.67	ND	ND	ND	ND	ND	ND	9	53.01	9.68
699RW-4	12/30/08	16.47	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699RW-4	03/27/09	16.47	5.01	11.46	1.43 J	ND	0.77 J	1.68	2.21	ND	ND	ND	ND	ND	ND	ND	ND	3.89	6.02
699RW-4	06/24/09	16.47	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	NS
699RW-4	08/26/09	16.47	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	NS
699RW-4	11/16/09	16.47	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	NS
699RW-4	03/25/10	16.47	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699RW-4	06/15/10	16.47	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699RW-4	09/16/10	16.47	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699RW-4	01/10/11	16.47	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699RW-4	03/15/11	16.47	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699RW-4	06/03/11	15.38	5.20	10.18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6J	6J	10.60
699RW-4	03/05/12	15.38	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699RW-4	06/07/12	15.38	7.49	7.89	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699RW-4	09/22/12	15.38	7.50	7.88	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699RW-4	10/23/12	15.38	8.94	6.44	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699RW-4	12/11/12	15.38	6.07	9.31	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699RW-5	06/04/08	WNS	8.49	WNS	878.97	1,338.47	770.76	3,177.32	38.69	ND	ND	ND	1.16	ND	34.32	ND	400	6,639.69	9.22
699RW-5	09/29/08	WNS	4.93	WNS	87.27	1,005.58	215.88	894.25	1.94	ND	ND	ND	0.98	ND	37.06	ND	359	2,601.96	5.84
699RW-5	12/30/08	WNS	3.35	WNS	499.65	2,740.50	669.45	4,250.13	10.37	ND	ND	ND	ND	ND	ND	ND	189	8,359.08	3.96
699RW-5	03/27/09	WNS	WNG	WNS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	NS
699RW-5	06/25/09	WNS	8.65	WNS	177.44	55.93	73.58	168.82	34.50	139.97	ND	ND	ND	ND	ND	ND	450	1,109.10	45
699RW-5	08/26/09	WNS	8.46	WNS	212.50	235.60	178.64	556.52	20.95	ND	ND	ND	ND	ND	ND	ND	748	1,956.27	ND
699RW-5	11/16/09	WNS	3.80	WNS	2.87	1.74	0.90	4.94	2.31	ND	ND	ND	ND	ND	ND	ND	ND	12.76	64.1
699RW-5	03/25/10	WNS	WNG	WNS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699RW-5	06/17/10	WNS	4.25	WNS	8.64	13.16	8.43	30.80	1.01	ND	ND	ND	ND	ND	ND	ND	69	131.04	ND
699RW-5	09/30/10	WNS	WNG	WNS	2.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.20	4.12
699RW-5	01/10/11	WNS	4.54	WNS	ND	ND	0.78	3.81	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.59	11.2
669RW-5	03/15/11	WNS	NA	WNS	0.19J	4.78	7.44	49.76	ND	ND	ND	ND	ND	ND	ND	ND	15.00	62.17	82.2
699RW-5	06/03/11	WNS	3.27	WNS		0.41	ND	1.49	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.90	<3.0
699RW-5	03/05/12	13.91	2.97	10.94	4.1J	12	110	ND	NA	NA	ND	7.3JB	NA	ND	NA	ND	578J	711.4J	6.9
699RW-5	06/07/12	13.91	2.37	11.54	7.5J	37	190	810	NA	NA	ND	6.5JB	NA	ND	NA	ND	1,311J	2362J	1.7J
699RW-5	09/22/12	13.91	7.08	6.83	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND
699RW-5	10/23/12	13.91	6.60	7.31	18	31	51	570	ND	NA	ND	9.6JB	NA	ND	NA	ND	959J	1638.6J	NS
699RW-5	12/12/12	13.91	6.75	7.16	18	16	61	480	ND	NA	ND	ND	NA	ND	NA	ND	832	1,407	ND
699RW-11	06/19/01	16.43	9.09	7.34	7,812.42	2,932.54	872.36	3,061.34	1,588.83	655.03	ND	ND	ND	ND	ND	ND	303	17,225.52	NS
699RW-11	08/30/01	16.43	9.23	7.20	9,061.81	2,136.97	1,567.48	4,786.87	1,564.32	ND	243.36	ND	ND	ND	ND	ND	7,740	27,100.81	ND
699RW-11	12/13/01	16.43	NA	NA	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	NS	NS	0.00	NS
699RW-11	03/27/02	16.43	7.90	8.53	8,081.71	1,897.11	913.41	4,405.86	763.15	924.29	ND	ND	ND	ND	ND	ND	8,590	25,575.53	ND
699RW-11	06/27/02	16.43	7.61	8.82	5,027.39	2,481.36	1,162.11	3,640.85	263.36	6.61	ND	ND	ND	ND	ND	ND	ND	12,581.68	ND
699RW-11	09/19/02	16.43	NA	NA	1,656.53	474.38	608.84	4,671.57	276.39	ND	ND	ND	ND	ND	ND	ND	6,660	14,347.71	ND
699RW-11	11/26/02	16.43	NA	NA	306.67	322.73	89.47	389.31	77.01	135.41	ND	ND	ND	ND	ND	ND	337	1,657.60	ND
699RW-11	03/17/03	16.43	11.28	5.15	2,241.65	3,045.43	919.82	3,797.12	424.58	ND	ND	ND	ND	ND	ND	ND	6,430	16,858.60	1.8
699RW-11	06/25/03	16.43	11.33	5.10	1,609.59	1,317.86	633.41	2,258.51	195.72	ND	ND	ND	ND	ND	ND	ND	1,630	7,645.09	1.78
699RW-11	09/24/03	16.43	9.29	7.14	210.43	114.53	103.74	385.62	278.80	ND	ND	ND	ND	ND	ND	ND	351	1,444.12	2.68
699RW-11	12/08/03	16.43	NA	WNG	587.03	323.54	237.10	620.81	231.93	ND	ND	ND	ND	ND	ND	ND	1,475	3,475.41	6.6
699RW-11	03/29/04	16.43	NA	WNG	629.17	360.37	424.61	992.38	196.50	216.08	ND	ND	ND	ND	ND	ND	2,131	4,950.11	9.27
699RW-11	06/18/04	16.43	11.30	5.13	504.50	266.76	274.75	847.26	156.90	ND	ND	ND	ND	ND	ND	ND	1,003	3,053.17	ND

Table 1
GROUNDWATER MONITORING SAMPLING SUMMARY DATA
FORT MONMOUTH - MAIN POST GAS STATION
NEW JERSEY

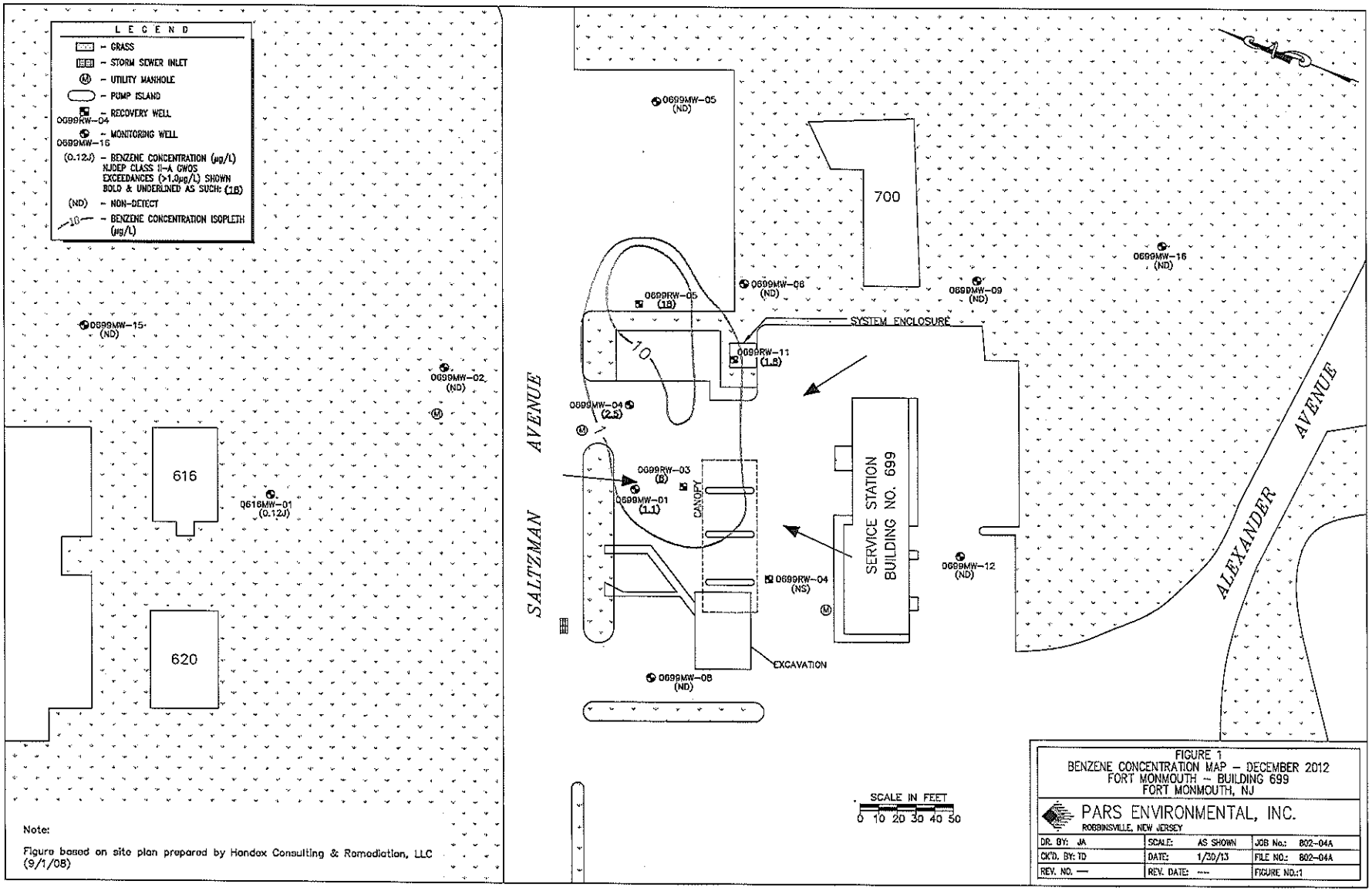
Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					1	1,000	700	1,000	70	100	70	3	700	1	6,000	1	100/500	–	5
699RW-11	09/16/04	16.43	NA	WNG	**250.53**	**3,031.86**	**2,329.45**	**11,744.18**	ND	ND	ND	ND	ND	ND	ND	ND	**19,930**	37,286.02	ND
699RW-11	12/10/04	16.43	11.30	5.13	**708.51**	102.03	545.62	826.03	**385.32**	ND	ND	ND	ND	ND	ND	ND	**1,897**	4,434.51	ND
699RW-11	03/02/05	16.43	11.20	5.23	**13.98**	201.12	124.85	**5,417.85**	ND	ND	ND	ND	ND	ND	20.31	ND	2,657	8,435.11	ND
699RW-11	05/25/05	16.43	11.67	4.76	**737.49**	440.61	636.02	**2,347.35**	**457.11**	ND	ND	ND	ND	ND	ND	ND	**3,850**	8,468.58	ND
699RW-11	09/08/05	16.43	11.68	4.75	**801.36**	368.34	383.69	**1,086.90**	**353.62**	ND	ND	ND	ND	ND	ND	ND	**5,130**	8,128.91	**6.71**
699RW-11	12/14/05	16.43	NA	NA	**572.93**	421.26	456.19	969.87	**1,395.64**	ND	ND	ND	ND	ND	ND	ND	0	3,815.89	**6.98**
699RW-11	02/24/06	16.43	12.40	4.03	**337.22**	401.53	385.81	**1,067.26**	**1,281.29**	**1,713.67**	ND	ND	ND	ND	ND	ND	**2,190**	7,376.78	ND
699RW-11	06/14/06	16.43	NA	NA	**530.72**	359.44	681.52	**2,665.97**	**9,128.57**	**7,832.26**	ND	ND	ND	ND	ND	ND	**5,670**	26,868.48	ND
699RW-11	09/22/06	16.43	4.38	12.05	**203.71**	61.84	93.13	245.31	**165.04**	**2,206.21**	ND	ND	ND	ND	44.73	ND	ND	3,019.97	ND
699RW-11	11/28/06	16.43	4.48	11.95	**242.69**	100.19	173.42	280.81	**140.86**	**978.30**	ND	ND	ND	0.68	ND	ND	729	2,645.95	ND
699RW-11	02/21/07	16.43	11.49	4.94	**158.95**	94.12	110.49	423.71	**125.64**	**430.17**	ND	ND	ND	**1.43**	ND	ND	**1,920**	3,264.51	ND
699RW-11	05/22/07	16.43	11.26	5.17	**450.86**	486.51	638.46	**2,205.07**	**82.02**	**810.52**	ND	ND	ND	ND	13	ND	484	5,170.44	**7.58**
699RW-11	08/08/07	16.43	4.24	12.19	**11.41**	1.64	12.97	22.84	4.57	**244.91**	ND	ND	ND	ND	11.51	ND	84	393.85	**1.96**
699RW-11	12/22/07	16.43	4.41	12.02	0.38	ND	1.46	4.07	5.24	40.65	ND	ND	ND	ND	ND	ND	ND	51.80	1.2
699RW-11	03/30/08	16.43	10.52	5.91	0.58	ND	0.29	0.38	7.92	**165.09**	ND	ND	ND	ND	5.2	ND	ND	179.46	ND
699RW-11	06/04/08	16.43	10.98	5.45	**158**	7.53	224.45	385.08	16.33	ND	ND	ND	ND	ND	4.28	ND	278	1,073.67	**3.37**
699RW-11	09/29/08	16.43	5.53	10.90	**2.94**	0.41	ND	1.45	4.59	ND	ND	ND	ND	ND	ND	ND	136	145.39	**3.54**
699RW-11	12/30/08	16.43	10.88	5.55	**253.16**	16.32	29.66	50.68	13.40	ND	ND	ND	ND	ND	ND	ND	459	822.22	3
699RW-11	03/27/09	16.43	3.45	12.98	0.87 J	ND	ND	ND	0.44 J	15.29	ND	ND	NA	ND	ND	ND	ND	15.29	**2.47**
699RW-11	06/25/09	16.43	3.41	13.02	**8.41**	1.70 J	5.22	5.46	1.80 J	**119.70**	ND	ND	ND	0.57 J	ND	ND	159	297.79	**3.91**
699RW-11	08/26/09	16.43	3.41	13.02	0.25 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699RW-11	11/16/09	16.43	11.28	5.15	**4.06**	ND	1.00	ND	9.94	**185.93**	ND	ND	ND	**2.86**	ND	ND	182	385.79	**9.16**
699RW-11	03/31/10	16.43	WNG	WNG	0.33	ND	ND	ND	2.34	**112.41**	ND	ND	ND	ND	ND	ND	5	120.08	**2.85**
699RW-11	06/17/10	16.43	11.50	4.93	**6.11**	0.30	3.55	ND	15.53	**237.89**	ND	ND	ND	**13.52**	ND	**2.83**	436	717.83	**24.2**
699RW-11	09/27/10	16.43	WNG	WNG	ND	ND	ND	1.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.05	ND
699RW-11	01/10/11	16.43	11.75	4.68	**6.65**	0.41	ND	0.96	2.97	ND	ND	ND	NA	0.42J	ND	ND	35	46.40	<3.0
699RW-11	03/15/11	16.43	11.65	4.78	**77.92**	2.99	108.63	135.64	2.96	14.89	ND	ND	NA	ND	ND	ND	739	1,082.03	<3.0
699RW-11	06/03/11	16.43	11.88	4.55	**6.39**	0.39	0.99	0.87	1.52	6.87	ND	ND	ND	0.3	ND	ND	181	198.33	<3.0
699RW-11	03/05/12	13.13	4.64	8.49	**8.3**	0.35J	0.40J	0.71J	NA	NA	ND	ND	NA	ND	NA	ND	374.8J	384.56J	**2.3J**
699RW-11	06/07/12	13.13	11.54	1.59	**20.0**	0.82J	9.4	7.4J	NA	NA	0.81J	3.3JB	NA	ND	NA	ND	**880J**	921.73J	**1.9J**
699RW-11	09/22/12	13.13	11.38	1.75	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND
699RW-11	10/23/12	13.13	11.64	1.49	**13.0**	0.46J	2.6	1.9J	1.20	NA	3.1	0.53JB	NA	0.82J	NA	ND	434J	457.61J	NS
699RW-11	12/12/12	16.43	10.51	5.92	**1.8**	ND	0.4	ND	2.00	NA	ND	ND	NA	**1.1**	NA	ND	46.7J	48.20	ND
Field Blank	03/05/12	NA	NA	NA	ND	ND	ND	ND	NA	NA	ND	0.37JB	NA	ND	NA	ND	0.61J	0.98J	ND
Trip Blank	03/05/12	NA	NA	NA	ND	ND	ND	ND	NA	NA	ND	0.18JB	NA	ND	NA	ND	ND	0.18J	NA
Field Blank	06/07/12	NA	NA	NA	ND	ND	ND	ND	NA	NA	ND	0.21JB	NA	ND	NA	ND	ND	0.21J	ND
Trip Blank	06/07/12	NA	NA	NA	ND	ND	ND	ND	NA	NA	ND	0.66JB	NA	ND	NA	ND	ND	0.66J	NA
Field Blank	09/22/12	NA	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND
Field Blank	10/23/12	NA	NA	NA	ND	ND	ND	ND	NA	NA	ND	0.40JB	NA	ND	NA	ND	ND	0.40J	NA
Trip Blank	10/23/12	NA	NA	NA	ND	ND	ND	ND	NA	NA	ND	0.34JB	NA	ND	NA	ND	ND	0.34J	NA
Field Blank	12/11/12	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	0.25J	ND	ND	ND	ND	3.4J	3.65J	ND
Field Blank	12/12/12	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	0.40J	ND	ND	ND	ND	ND	0.40J	ND
Trip Blank	12/12/12	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	0.23J	ND	ND	ND	ND	ND	0.23J	NA

NOTES:

All analytical results in micrograms per liter (ug/L)

NJDEP = New Jersey Department of Environmental Protection
TICs = Tentatively identified compounds
DTW = Depth to water
VOC = Volatile organic compound
ND = Not detected
NA = Data not available
TOC = Top of Collar
µg/L = Microgram per Liter
NS = Not Sampled
WNS = Well Not Surveyed
ft bgs = Feet Below Grade Surface
ft amsl = Feet Above Mean Sea Level
WNG = Well Not Gauged
PCE = Tetrachloroethene
TCE = Trichloroethene
TBA = tert-Butyl Alcohol
MTBE = Methyl-tert-Butyl Ether
BOLD = Concentration greater than applicable ground water quality standard

Attachment B



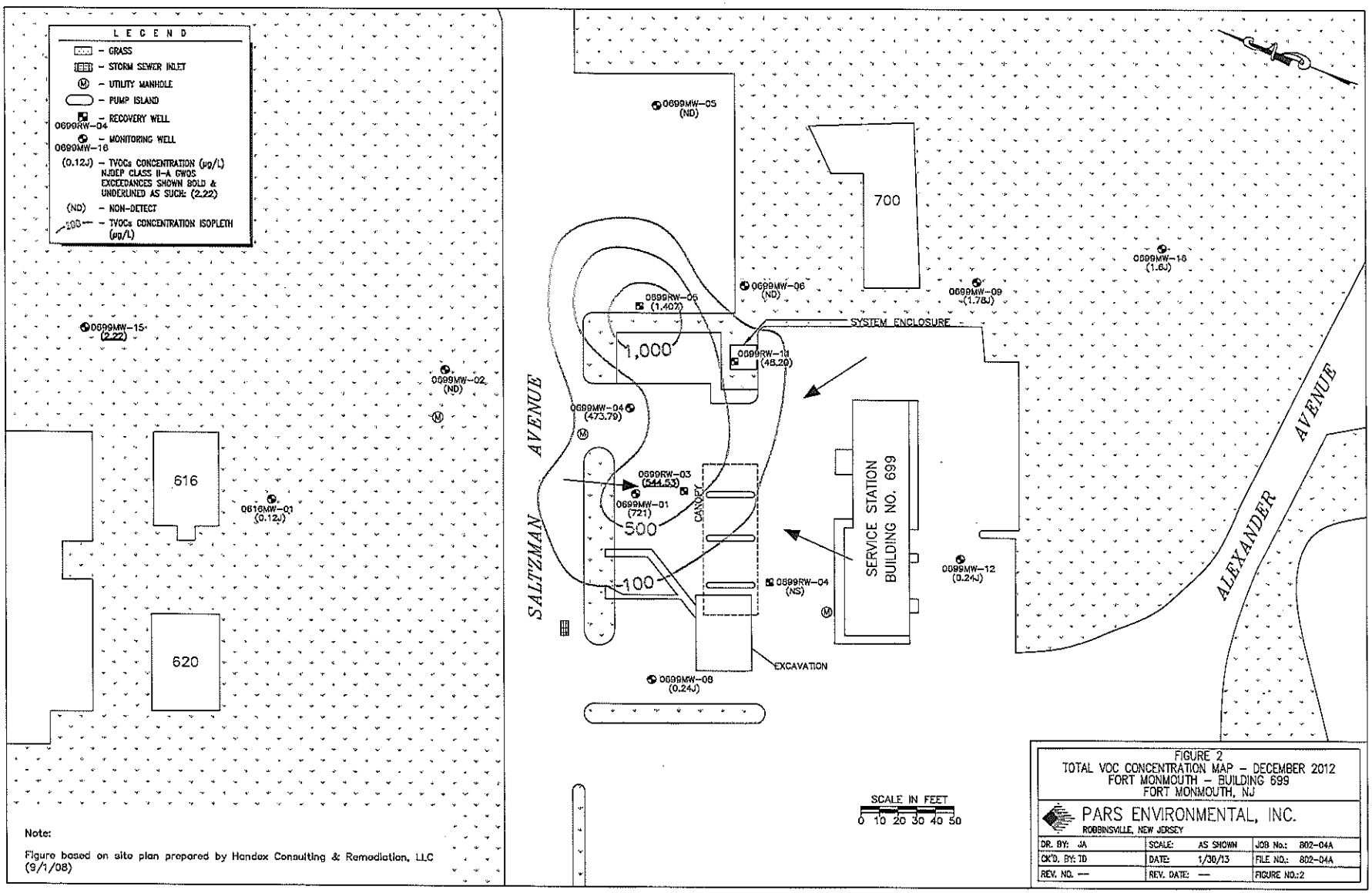
Note:

Figure based on site plan prepared by Handex Consulting & Remediation, LLC (9/1/08)

FIGURE 1
BENZENE CONCENTRATION MAP – DECEMBER 2012
FORT MONMOUTH – BUILDING 699
FORT MONMOUTH, NJ

PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY

DR. BY: JA	SCALE: AS SHOWN	JOB No.: 802–04A
CK'D. BY: TD	DATE: 1/30/13	FILE NO.: 802–04A
REV. NO. —	REV. DATE: —	FIGURE NO.:1



Note:

Figure based on site plan prepared by Handex Consulting & Remediation, LLC (9/1/08)

FIGURE 2
TOTAL VOC CONCENTRATION MAP – DECEMBER 2012
FORT MONMOUTH – BUILDING 699
FORT MONMOUTH, NJ

PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY

DR. BY: JA	SCALE: AS SHOWN	JOB No.: 802–04A
CK'D. BY: TD	DATE: 1/30/13	FILE NO.: 802–04A
REV. NO. —	REV. DATE: —	FIGURE NO.:2

Attachment C

Table 2
Groundwater Recovery System Performance Summary
Fort Monmouth Building 699 New Jersey

DATE	Uptime Percent (%)		Effluent Totalizer	Total Gallons	Influent (µg/L) and Applicable GWQS							Total BTEX MTBE	Monthly Petroleum Hydrocarbons
	Monthly	Quarterly	(gallons)	Pumped	TBA	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes, Total	Total BTEX	TBA (µg/L)	Removed (lb)
					100	70	1	1000	700	1000	-		
3/21/2012	25.00%	33.0%	0	9,833,122	NA	0.22J	0.13J	ND	ND	ND	0.13J	0.35J	0.00005
3/28/2012	50.00%	50.0%	18,721	9,851,843									NA
4/3/2012	25.00%	7.7%	11,179	9,863,022									NA
4/11/2012	50.00%	15.4%	23,917	9,886,939	NA	4.7	12	1.1	16	55	84.1	88.8	0.01052
4/19/2012	75.00%	23.1%	20,862	9,907,801									NA
4/24/2012	100.00%	30.8%	13,024	9,920,825									NA
5/2/2012	20.00%	38.5%	19,815	9,940,640									NA
5/9/2012	40.00%	46.2%	17,018	9,957,658	NA	ND	7.4	0.86	20	58	86.26	86.26	0.01347
5/16/2012	60.00%	53.9%	17,044	9,974,702									NA
5/22/2012	80.00%	61.6%	13,034	9,987,736									NA
5/31/2012	100.00%	69.3%	23,973	10,011,709									NA
6/6/2012	25.00%	77.0%	15,565	10,027,274									NA
6/13/2012	50.00%	84.7%	11,729	10,039,003	NA	3.9	2.9	0.25	6.3	30	39.45	43.35	0.00677
6/20/2012	75.00%	92.4%	11,099	10,050,102									NA
6/27/2012	100.00%	100.0%	17,061	10,067,163									NA
7/2/2012	25.00%	7.7%	18,036	10,085,199									NA
7/11/2012	25.00%	7.7%	0	10,085,199									NA
7/18/2012	25.00%	7.7%	300	10,085,499	NA	5.0	10	0.65J	10	27	47.65	52.65	0.00415
7/25/2012	50.00%	15.4%	19,301	10,104,800									NA
8/1/2012	20.00%	23.1%	2,831	10,107,631									NA
8/8/2012	40.00%	30.8%	8,371	10,116,002	NA	6.1	11	0.43J	17	39	67	73.1	0.00383
8/15/2012	60.00%	38.5%	3,925	10,119,927									NA
8/22/2012	80.00%	46.2%	12,835	10,132,762									NA
8/29/2012	100.00%	53.8%	12,061	10,144,823									NA
9/5/2012	25.00%	61.5%	28,855	10,173,678									NA
9/12/2012	25.00%	61.5%	0	10,173,678									NA
9/18/2012	50.00%	69.2%	5,815	10,179,493	NA	1.2J	5.7	2.7	10	86	104.4	105.6	0.01152
9/26/2012	75.00%	76.9%	13,618	10,193,111									NA
10/3/2012	20.00%	7.1%	1,005	10,194,116									NA
10/10/2012	40.00%	14.3%	7,226	10,201,342	NA	2.9	4.8	0.95J	2.5	24	32.25	37.05	941551.65000
10/17/2012	60.00%	21.4%	2,619	10,203,961									NA
10/24/2012	80.00%	28.6%	10,655	10,214,616									NA
10/25/2012	100.00%	35.7%	3,908	10,218,524									NA
11/7/2012	20.00%	42.8%	14,298	10,232,822									NA
11/9/2012	40.00%	50.0%	1,784	10,234,606									NA
11/14/2012	60.00%	57.2%	10,757	10,245,363	NA	1.3	1.7	ND	1.6	2.9J	6.2	7.5	290302.50000
11/21/2012	80.00%	64.3%	6,205	10,251,568									NA
11/28/2012	100.00%	71.5%	5,663	10,257,231									NA
12/5/2012	25.00%	78.7%	4,823	10,262,054									NA
12/12/2012	50.00%	85.8%	4,074	10,266,128	NA	5	8.1	1.3	18	61	88.4	93.4	3075101.60000
12/19/2012	75.00%	92.9%	12,850	10,278,978									NA
12/26/2012	100.00%	100.0%	11,177	10,290,155									NA

Notes:

TBA = tert Butyl Alcohol
MTBE = Methyl tert-Butyl Ether
µg/L = Microgram per Liter
mg/L = Milligrams per Liter
GWQS = Ground Water Quality Standard
BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
TPH = Total Petroleum Hydrocarbons
lb = Pound

State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
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BOB MARTIN
Commissioner

April 5, 2013

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

Re: FTMM-53/Building 699 Request for Discontinuing Operation of SVE/Pump & Treat Remediation System (February 28, 2013)
Fort Monmouth, New Jersey
PI G000000032

Dear Ms. Green:

The New Jersey Department of Environmental Protection (Department) has completed review of the referenced submittal and offers the following comments.

Building 699 Main Post Gas Station is the site of ground water contamination. In 1989, it was discovered that 11,000 gallons of gasoline leaked from underground storage tank piping. Ground water investigations identified free product, BTEX, MTBE, TBA and VOC-TICs as the contaminants of concern. In 2001, pump and treat and AS/SVE systems were installed to address the soil and ground water contamination. Ground water samples from site monitoring wells have been collected and analyzed from 2001 through 2012. Due to the low levels of BTEX concentrations in the most recent sampling rounds, the Army is proposing to shut down the SVE/pump and treat system and implement Monitored Natural Attenuation (MNA).

Continued operation of the pump and treat system, based on the ground water concentration levels reported in the subject document, is not required. The Army must demonstrate, however, that MNA is a viable remedial alternative for the remaining constituents of concern, via submittal of a Remedial Action Workplan. For additional information, please refer to the Department's "Monitored Natural Attenuation Technical Guidance", which can be found at http://www.state.nj.us/dep/srp/guidance. The Remedial Action Permit referenced in the guidance document is not required at this time, as Fort Monmouth is a Federal Facility. Once the property is transferred, however, a Remedial Action permit will be required..

The ground water results in the subject document show that monitoring well 699MW-3 has not been sampled since 2007, even though the 2007 results exceeded the Ground Water Quality Standards (GWQS) for benzene and VOC TICs. Please provide to this office the status of this well.

In a Remedial Action Progress Report dated June 10, 2010, the Army recommended conducting vertical delineation of ground water through the installation of 6 temporary wells in the source are and 2 temporary wells downgradient of the source area. Please indicate the status of this work, and if performed, submit the results of same.

Please contact this office if you have any questions.

Sincerely,

Linda S. Range

Linda S. Range
Bureau of Case Management

C: Daryl Clark, BGWPA
Joe Pearson, Calibre Systems
Rick Harrison, FMERA
Julie Carver, Matrix

United States Army

Fort Monmouth, New Jersey

Building 699, Main Post Gas Station

Remedial Action Progress Report

(1st Quarter 2009 through 3rd Quarter 2010)

PREPARED BY:

GROUNDWATER & ENVIRONMENTAL SERVICES, INC
MONMOUTH SHORES CORPORATE PARK
1340 CAMPUS PARKWAY, BUILDING B
NEPTUNE, NEW JERSEY 07753
800-220-3068

SEPTEMBER 2011

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EXECUTIVE SUMMARY

Groundwater & Environmental Services, Inc. (GES) was retained by the United States Army, Fort Monmouth (FTMM), Directorate of Public Works (DPW) to complete groundwater sampling and prepare a *Remedial Action Progress Report* (RAPR) for Building 699 Main Post Gas Station. This RAPR covers the reporting period from the 1st Quarter 2009 through the 3rd Quarter 2010.

Presently, a groundwater pump-and-treat (GWP&T) and air sparge/soil vapor extraction (AS/SVE) system operates onsite. The systems were proposed in the June 1999 *Remedial Action Workplan Addendum* (RAWA) and have been operational since 2001. The systems were designed for source area hydrocarbon mass removal, groundwater hydraulic control of the source area, and reduction of contaminant concentrations in soil and groundwater. In 2007, one groundwater recovery well (699RW5), two vapor extraction wells (699VL10 and 699VL11), and two air sparge points (699SP9 and 699SP10) were installed to enhance hydrocarbon recovery. Operation of the wells and sparge points began on October 1, 2007. The SVE system was the primary means of hydrocarbon mass removal during the current reporting period, and an estimated 725 pounds of hydrocarbons were recovered and destructed with the catalytic oxidizer system. The primary goals of the GWP&T system are to maintain hydraulic control of the source area, enhance SVE recovery by maintaining groundwater drawdown in the recovery wells, and prevent groundwater mounding that would otherwise be caused by the SVE system. During the current reporting period, the system treated 491,512 gallons of water, averaging approximately 784 gallons per day. Approximately 1.0 pound of dissolved-phase hydrocarbons were removed by the GWP&T system during the reporting period.

Quarterly groundwater sampling events were completed by TECOM-Vinnell Services, Inc. (TVS) in March 2009, June 2009, August 2009, November 2009, March 2010, June 2010, and September 2010. Analytical results indicate that the dissolved-phase gasoline constituents benzene, toluene, ethylbenzene, and xylenes (BTEX); methyl *tert*-butyl ether (MTBE); and *tert*-butyl alcohol (TBA) in the source-area monitoring wells have decreased with time since the system operation began

Concentrations of PCE have recently been detected in hydraulically downgradient monitoring wells 699MW9 and 699MW16 as well as recovery well 699RW11. An investigation into the source area for PCE is currently being performed and will be reported on in the next RAPR.

Continued system operation and hydrocarbon recovery will result in continued decreases in soil and groundwater concentrations. However, hydrocarbon recovery rates have decreased and leveled-off. Development of a more aggressive remedial strategy is recommended to achieve the goal of compliance with NJDEP GWQS and Non-residential Direct Contact Soil Remediation Standards.

1.0 INTRODUCTION

GES was retained by the United States (U.S.) Army, FTMM, DPW to prepare a RAPR for Building 699 Main Post Gas Station, in addition to conducting operation and maintenance of the GWP&T and AS/SVE systems. TVS conducts the groundwater sampling that is reported in the RAPR. This RAPR is being submitted in accordance with requirements of the New Jersey Department of Environmental Protection (NJDEP) Technical Requirements for Site Remediation (TRSR) as promulgated in New Jersey Administrative Code (NJAC) 7:26E *et seq*. This RAPR covers the reporting period from the 1st Quarter 2009 through the 3rd Quarter 2010 and includes the following: a site summary, an overview of the operating remediation systems and remedial progress during the reporting period, results of groundwater and vapor sampling, and proposed actions for the site.

1.1 Objectives

The objective of this RAPR is to document the implementation of the remedial action program performed at Building 699, Main Post Gas Station during the reporting period. Remedial activities included GWP&T and AS/SVE system operation, aqueous sample collection and maintenance. The remedial activities were conducted in accordance with the NJDEP TRSR, NJAC 7:26E *et seq*.

The preparation of this RAPR encompassed the following:

- Conducting quarterly rounds of groundwater sampling and comparing the analytical results with the NJDEP GWQS to determine compliance with these standards and the effectiveness of the remedial activity;

- Comparing vapor intrusion data with the NJDEP Ground Water Screening Levels (GWSL) to determine if additional investigation is warranted and,

- Documenting remedial activities as required by the NJDEP TRSR.

1.2 Report Organization

Section 2.0 discusses the site history and background information for Building 699, Main Post Gas Station. **Section 3.0** describes and summarizes the remedial activities conducted. **Section 4.0** discusses the *Baseline Ecological Evaluation* (BEE). **Section 5.0** discusses the *Base-wide Glauconitic Soil Sampling Report*. **Section 6.0** outlines the *Base-wide MODFLOW Report* completed by Brinkerhoff Environmental Services, Inc. (Brinkerhoff). **Section 7.0** discusses groundwater monitoring and sampling activities. **Section 8.0** presents the analytical results of groundwater sampling. **Section 9.0** presents the results of a Vapor Intrusion Investigation (VII) previously performed. **Section 10.0** discusses the remedial action progress. **Section 11.0** identifies the references used in the generation of this report.

2.0 SITE BACKGROUND

The following sections describe the site background of Building 699, Main Post Gas Station Site. Included is a description of the site location, history, background investigations, and previous RAPRs.

2.1 Site Location and Description

FTMM is located in the central-eastern portion of New Jersey in Monmouth County, approximately 45 miles south of New York City and 70 miles northeast of Philadelphia (**Figure 1**). The site serves as the only Main Post location for non-military vehicles to obtain fuel. A Site Map illustrating the site layout is included as **Figure 2**.

2.2 Site History and Background Investigations

Historically, 14 underground storage tanks (USTs) were present on-site. The majority of the USTs were installed in 1974 and removed in 1999 and 2007. A leak from one of the on-site USTs was discovered during routine inventory control and was reported to NJDEP on October 19, 1989 and Incident Number 89-10-19-1329 was assigned. Subsequent pressure testing identified a product piping leak, located between the USTs and the dispenser pump islands. The gasoline release amount was estimated at 11,000 gallons (Krydon, 1993). The faulty product piping was replaced and a separate-phase product (SPP) recovery system was installed. A history of remedial activities at the site is presented below.

December 1989: Single-point dual-phase pumping system installed.

March 1990: A second recovery well with dual-phase pumping system activated.

August 1990: 6,733 gallons of SPP were recovered by the summer of 1990 (Krydon, 1993).

July 1990: A *Discharge Investigation and Corrective Action Report* was submitted.

October 1993: A *Remedial Action Workplan* (RAW) was submitted by The Krydon Group, Inc.

June 1999: A *Remedial Action Workplan Addendum* (RAWA) was submitted proposing the currently operating GWP&T and AS/SVE systems.

March and June 2000: Soil borings were conducted

October 2000: Versar, Inc. (Versar) submitted a RAWA to conduct enzyme-enhanced bioremediation (EEB) of soils in addition to the planned GPW&T and AS/SVE treatment systems.

November 2000: The application of EEB of soils was conducted.

April 2001: Start-up of GWP&T system.

May 2001: Post-bioremediation soil borings were conducted – concentration decreases were documented.

September 2001: Start-up of SVE system.

December 2002: A RAPR was submitted by Versar.

2002 to Present: The GWP&T and SVE systems continue to operate.

June 2007: USTs are removed and monitoring well 699MW3 is abandoned.

September 2007: Groundwater recovery well (699RW5) is installed plus two new vapor extraction wells (699VL10 and 699VL11) and two new air sparge points (699SP9 and 699SP10).

December 2007 and April 2010: Vapor intrusion and indoor air sampling was performed.

October 2008: A RAPR was submitted for the period October 2005 through September 2006 by Handex Consulting & Remediation-Northeast, LLC.

June 2010: A RAPR was submitted by GES for the period 4th Quarter 2006 through 4th Quarter 2008.

September 2010: RegenOx® chemical oxidation request for Permit by Rule was submitted to the NJDEP.

3.0 REMEDIAL ACTIVITIES

The GWP&T and AS/SVE systems proposed in the June 1999 RAWA were installed in 2001 and continued to operate during the current reporting period. The systems were designed primarily for source-area hydrocarbon mass removal, groundwater hydraulic control of the source area, and reduction of hydrocarbons in both soil and groundwater. In September 2007, one groundwater recovery well (699RW5), two vapor extraction wells (699VL10 and 699VL11), and two air sparge points (699SP9 and 699SP10) were installed to enhance the hydrocarbon recovery effort. Operation of these wells and sparge points started on October 1, 2007.

3.1 Permits

The remedial treatment system operates under the following permits:

- Discharge of treated groundwater to publicly-owned treatment works (POTW) – Two Rivers Reclamation Authority Permit Number 01-0020.

- Air discharge – NJDEP Air Permit Number 20013-010001. The NJDEP approved this permit on July 20, 2001 for discharge of treated air from the SVE treatment system. This permit was renewed on July 17, 2006 and expires on July 19, 2011. NJDEP recently indicated that the air permit is due to expire. The renewal application and applicable fees have been submitted to NJDEP and at the time of this report submittal, final approval for renewal had not been received.

3.2 SVE/AS System

The SVE system was the primary means of hydrocarbon mass removal during the reporting period. From the 1st Quarter 2009 through the 3rd Quarter 2010, approximately 725 pounds of hydrocarbons were recovered and destructed with the catalytic oxidizer system. The basic system operating parameters including vacuums, flow rates and concentrations for the reporting period are included on **Table 1**. **Figure 3** illustrates the cumulative system influent concentrations and the cumulative hydrocarbon mass recovery.

The SVE system extracts soil vapor from three recovery wells (699RW3, 699RW4, and 699RW11); nine vapor laterals (699VL1 to 699VL9); and two SVE wells (699VL10 and 699VL11). The vapor laterals were installed approximately five to six feet below grade surface (bgs) and consist of two, five-foot long sections of four-inch diameter, polyvinyl chloride (PVC) well screen connected to a PVC vertical riser. The vapor lateral screens were bedded in sand, and bentonite was used to seal the trenches and vertical risers. The vapor wells are approximately 13 feet deep with a 10-foot long, four-inch diameter well screen. An as-built survey that was generated by Handex in 2001 of the recovery system layout showing the locations of the recovery wells, vapor laterals, and air sparge points is included as **Figure 4**. Process and Instrumentation Diagrams for GWP&T and catalytic oxidation systems are included as **Figures 5A** and **5B**, respectively.

The AS system consists of an air sparge compressor and ten sparge wells. Operation of the air sparge system began in April 2003 in response to the observed decrease in soil-gas concentrations entering the SVE system. The sparge system typically provides between one and six actual cubic feet per minute (acfm) of air at three to six pounds per square inch per individual sparge well.

The SVE treatment system operated between 123 and 214 acfm at 0.3 to 4.5 inches of mercury. The air discharge is permitted (#20013-010001) and the system operated in compliance with the effluent discharge limitations throughout the reporting period.

3.3 SPP Recovery

SPP did not accumulate in the operating recovery wells 699RW3, 699RW4, 699RW5 and 699RW11 during the reporting period. SPP or product films have not been recorded in the recovery wells since August 2002.

3.4 GWP&T System

On April 20, 2001, the GWP&T system operations were initiated. The treatment system continued to operate through the current reporting period. The primary goals of the GWP&T system are to maintain hydraulic control of the source area, enhance SVE recovery by maintaining groundwater drawdown in the recovery wells, and prevent groundwater mounding that would otherwise be caused by the SVE system.

The GWP&T system consists of four recovery wells (699RW3, 699RW4, 699RW5 and 699RW11) equipped with down-hole electric submersible pumps controlled by conductivity probes. The four recovery wells are set to maintain approximately three to five feet of groundwater drawdown. This drawdown promotes gravity drainage of SPP (if present), establishes hydraulic control to the recovery wells, and facilitates SVE recovery by eliminating water table upwelling in the dual purpose groundwater recovery/SVE wells. Recovery well 699RW11 was noted as up and running during the 1st through 3rd Quarter 2009, however, it was not functioning properly. The groundwater pump was replaced in recovery well 699RW11 in October 2009.

Groundwater pumped from the recovery wells is directed to a groundwater treatment system that includes an air stripper and three granular activated carbon (GAC) units to remove volatile organic compounds (VOCs) from the water prior to discharge to the local POTW. Due to treatment system effluent pH being reported as less than the permitted limit of 6.0 Standard Units, an automated pH adjustment and control system was installed in December 2008. An illustration of the system components is shown in the process and instrumentation diagram, included as **Figure 5B**. A table of the monthly flow meter readings and cumulative gallons of groundwater pumped is included in **Table 2**. During the reporting period, the system treated 491,512 gallons of water, averaging approximately 784 gallons per day. **Table 2** also includes the monthly system influent concentrations of total BTEX/MTBE/TBA concentrations and the calculated hydrocarbon mass recovery. Approximately 1.02 pounds of dissolved-phase

hydrocarbons were removed by the GWP&T system during the reporting period. The effluent was monitored via collection of GAC midpoint and effluent samples.

The system operated in compliance with the water discharge limitations set by the Two Rivers Reclamation Authority (Permit# 01-0020) and the air discharge limitations for the air stripper (NJDEP Air Permit #20013-010001). The laboratory analytical reports for the monthly system samples are included in **Appendices A** through **G**.

4.0 BEE

Shaw Environmental, Inc. was contracted by the U.S. Army to conduct a BEE for Fort Monmouth's Main Post and Charles Wood Areas. Sampling of multiple media was conducted in 2010, the results of which are not available for discussion herein. The final BEE will be submitted to the NJDEP under separate cover in 2011.

5.0 BASE-WIDE GLAUCONITIC SOIL SAMPLING

On October 13, 2010, the U.S. Army FTMM, DPW submitted a *Base-Wide Glauconitic Soil Sampling Plan* to the NJDEP to determine if selected Target Analyte List (TAL) metals detected in groundwater on the Main Post at concentrations exceeding the NJDEP GWQS are naturally-occurring in soils containing high amounts of glauconite. On October 29, 2010, the sampling plan was approved by the NJDEP and subsequent soil and groundwater sampling commenced. Below are the summary, conclusions, and recommendations sections taken from the DPW *Base-Wide Glauconitic Soil Sampling Report* dated March 9, 2011. A full copy of the *Base-Wide Glauconitic Soil Sampling Report* is included as **Appendix H** for review.

Summary

- Arsenic was detected in groundwater at concentrations exceeding the GWQS of 3 µg/L in three of six samples (50%).
- Lead was detected in groundwater at concentrations exceeding the GWQS of 5 µg/L in four of six samples (67%).
- The greatest concentrations of arsenic and lead in groundwater were detected adjacent to the glauconite-rich soil layer at monitoring well 108MW04 (7.5 feet bgs).
- Similarly, the greatest concentrations of arsenic [15 milligrams per kilogram (mg/kg)] and lead (16 mg/kg) in soil were detected in a sample collected from the glauconitic-rich soil layer proximate to monitoring well 108MW04 (15 mg/kg at 7.0-8.0 feet bgs). Lead was also detected at the same concentration in the shallower soil sample depth (6.5-7.0 feet bgs).
- The greatest concentrations of arsenic in soil were identified at Site 108 where underground storage tanks used to store petroleum products were removed. Arsenic is not associated with refined petroleum products.
- A comparison of TAL metals concentrations in soil and groundwater was completed and no relationship or correlation could be established.

Conclusions

- Given that arsenic was detected at concentrations exceeding the GWQS, this confirms DPW's conclusion in Versar's *Remedial Investigation Report* (2004) that "…arsenic is likely attributable to the native soil characteristics or a non-point source distributed throughout the subsurface soils at Site 108."
- Based on a general knowledge of historical operation and geology of the Fort Monmouth area, the presence of arsenic and lead co-exist as naturally-occurring TAL metals that are unrelated to anthropogenic activities at the three sites that were investigated.

- It appears arsenic and lead co-exist as naturally occurring TAL metals, i.e. neither metal has been detected and confirmed or documented from a source at any site.

- It appears that the source of arsenic in groundwater is due to natural conditions rather than man-made/anthropogenic sources. Vowinkel et al. (2001) reported that arsenic concentrations greater than 50 µg/L are typically associated with known contaminated sites. The greatest concentration of arsenic identified in this study is 8.77 µg/L.

Recommendations

- To determine if suspended particles (turbidity) is proportional to detectable concentrations of metals in aqueous samples, filtered and unfiltered samples should be collected and analyzed for TAL metals by a NJ certified laboratory. Filtered samples should provide more consistent analytical results and be more representative of the water quality moving within a water-bearing zone.

- Samples of the glauconite should be collected and chemically analyzed by a certified laboratory for TAL metals to determine if arsenic and other TAL metals are present in its chemical makeup (source material).

6.0 MODFLOW GROUNDWATER MODELING

A site-wide groundwater flow model has been completed for the FTTM Main Post and Charles Wood (CW-1) areas by Brinkerhoff using Visual MODFLOW and is documented in a report dated June 10, 2010. Visual MODFLOW is a three-dimensional groundwater flow simulation software package developed by the United States Geological Survey (USGS). Development of the models supports the Fort Monmouth's internal efforts in understanding groundwater flow across the Main Post and CW-1 areas and aids planning for future monitoring well installations and delineation of groundwater contaminant plumes. As the groundwater models simulate groundwater flow conditions in these areas, they will also be used for contaminant transport modeling and thereby provide greater understanding of the factors affecting groundwater contamination migration and support for the development of groundwater Classification Exception Areas (CEAs).

According to the groundwater model, the Main Post area can be characterized as having a small hydraulic gradient. When combined with the low hydraulic conductivity of the aquifer materials, this translates into small groundwater migration rates. Particle markers, which represent typical travel paths and speeds for water molecules in the system, indicate extremely long travel times. In several areas of the Main Post, representative markers did not reach the nearest surface water "sink" within the 200-year travel time shown.

As a result of the slow groundwater velocity, recharge to the aquifer from rainfall (although very limited) has the effect of adding a downward component to the groundwater flow.

When applied to the understanding of contaminated areas, the net result of these physical conditions would likely be groundwater contaminant plumes without a dominant elongation in a hydraulically downgradient direction and vertical contaminant migration would typically be heavily retarded by the fine-grained aquifer materials present at depth. Groundwater contour maps indicating gradients and flow direction were produced by Brinkerhoff and are included as **Appendix I**.

7.0 GROUNDWATER SAMPLING ACTIVITIES

Quarterly groundwater sampling events were completed by TVS on the following dates: March 27, 2009; June 24 & 25, 2009; August 26, 2009; November 16, 2009; March 24, 25, 26, & 31, 2010; June 15, 16, & 17, 2010; and September 16, 17, 27, & 30, 2010. Groundwater sampling was conducted in accordance with NJDEP TRSR, NJDEP's *Field Sampling Procedures Manual* (August 2005), and TVS' Standard Operating Procedures. Groundwater samples were analyzed by Fort Monmouth's Environmental Testing Laboratory (FMETL) (NJDEP Certification #13461). Groundwater analytical sampling results are summarized in **Table 3**. Field sampling data sheets and the laboratory analytical reports are included in **Appendices J** through **P**. Monitoring well records and logs are included in **Appendix Q**.

Groundwater samples were collected from the following wells: 699MW1, 699MW2, 699MW4 through 699MW6, 699MW8, 699MW9, 699MW12, 699MW15, 699MW16, 699RW3, 699RW4, 699RW5, 699RW11, and 616MW1. The samples were analyzed for VOCs and lead via U.S. Environmental Protection Agency approved test methods 624 and 3120B, respectively.

8.0 SAMPLING ANALYTICAL RESULTS

This section includes a summary discussion of the chemical characterization of the site based on the samples collected and analyzed for the current reporting period, including seven quarterly rounds of groundwater monitoring well samples. Refer to **Figures 6** through **31** for isopleth maps of contaminants of concern (COC) greater than the NJDEP Class II-A GWQS for the reporting period.

8.1 VOC Analytical Results

Concentrations of VOCs in the following wells were less than NJDEP GWQS during the seven sampling rounds:

- 616MW1 (hydraulically upgradient)
- 699MW2 (hydraulically upgradient)
- 699MW5 (hydraulically sidegradient)
- 699MW8 (hydraulically sidegradient)
- 699MW12 (hydraulically downgradient)
- 699MW15 (hydraulically upgradiente)
- 699RW4 (source area recovery well)

The concentrations of one or more VOCs in eight sampled source area wells included in the sampling program were greater than the GWQS:

- 699MW1 (source area)
- 699MW4 (source area)
- 699MW6 (source area/hydraulically downgradient compliance)
- 699MW9 (hydraulically downgradient)
- 699MW16 (hydraulically downgradient)
- 699RW3 (source area recovery well)
- 699RW5 (source area recovery well)
- 699RW11 (source area recovery well)

Concentration graphs for each monitoring well and COC since 1995 are included as part of the laboratory data packages in **Appendices A** through **G**. Referring to these graphs, concentrations of VOCs have decreased in all source area wells since the current remediation systems went online in 2001.

Tetrachloroethene (PCE) is not associated with the UST fuel release and NJDEP case number 89-10-19-1329; however, PCE was detected at concentrations greater than the NJDEP GWQS of 1 µg/L in hydraulically downgradient monitoring well 699MW9 on August 26, 2009 (1.65 µg/L), November 16, 2009 (1.88 µg/L), and September 17, 2010 (2.32 µg/L) and in hydraulically sidegradient monitoring well 699MW16 on November 16, 2009 (1.09 µg/L) and September 17,

2010 (1.71 µg/L). PCE was also detected at concentrations greater than NJDEP GWQS in recovery well 699RW11 on November 16, 2009 (2.86 µg/L) and June 17, 2010 (13.52 µg/L). It is noted that the PCE concentrations in 699RW11 have increased with time. PCE is discussed further in Section 10.3.

Fort Monmouth compiled a map in January 2011 titled *Figure 5-1A Groundwater Contaminants of Concern Distribution Map Site 699 (FTMM-53) – Main Post, Fort Monmouth New Jersey* (**Appendix R**) which details monitoring well locations along with detected concentrations of VOCs and metals for the current reporting period. The map serves as an evaluation tool and can be used along with the other figures included in this RAPR.

8.2 Lead Analytical Results

In addition to VOCs, the groundwater samples were analyzed for lead. The lead analytical results are included in **Table 3**, and the results are summarized below:

The following monitoring wells contained lead at concentrations greater than NJDEP GWQS:

- 699MW1 (source area): 7.30 and 5.62 µg/L on March 27, 2009 and June 25, 2009, respectively.
- 699MW2 (hydraulically upgradient): 6.58 µg/L on November 16, 2009.
- 699MW4 (source area): 6.92 µg/L on March 27, 2009.
- 699MW6 (source area/hydraulically downgradient compliance monitoring well): 6.11 and 8.68 µg/L on March 27, 2009 and March 26, 2010 respectively.
- 699MW15 (hydraulically upgradient): 31.10 µg/L on March 25, 2010.
- 699RW3 (source area): 12.90, 11.30, 7.14, and 29.30 µg/L on March 27, 2009, June 25, 2009, November 16, 2009, and June 17, 2010, respectively.
- 699RW4: 6.02 µg/L on March 27, 2009.
- 699RW5: 45.00 and 64.10 µg/L on June 25, 2009 and November 16, 2009, respectively.
- 699RW11 (source area): 9.16 and 24.20 µg/L on November 16, 2009 and June 17, 2010, respectively.

8.3 Quality Assurance/Quality Control (QA/QC)

In order to verify the reliability of the analytical results, GES reviewed the holding times for each sample and the results of the analysis of method blanks, trip blanks, field blanks, and field duplicate samples. All samples were analyzed by the FMETL within the prescribed holding time requirements for each analytical method.

8.3.1 Method Blanks

A laboratory method blank accompanied each round of samples collected at the Building 699 site. These method blanks consist of laboratory-grade water that is processed identically to the samples and analyzed with the sample batch. At least one method blank was analyzed with each

of the 16 sampling rounds. The method blanks were analyzed for VOCs plus a library search for tentatively identified compounds (TICs).

In addition to VOCs, the laboratory method blanks were analyzed for lead. The method blank samples were non-detect for VOCs and lead during all seven groundwater sampling events.

8.3.2 Trip Blanks

A trip blank accompanied each round of samples collected at the Building 699 site to document that VOCs were not introduced into the samples during the handling process. The trip blanks were prepared by the FMETL and consisted of sample bottles filled with laboratory deionized water. The trip blanks remained with the sample bottles in coolers and were returned to the laboratory for analysis with the groundwater samples.

8.3.3 Field Blanks

One field blank sample was obtained during each day's sampling activities to document equipment decontamination procedures. The field blanks were collected by rinsing deionized water, supplied by the laboratory, over the sampling equipment used for each day's activities. The water was collected in clean laboratory-supplied sample jars and submitted for analysis along with the groundwater samples. The primary COCs for the Building 699 site, BTEX and MTBE, were not detected in any of the field blank samples.

8.3.4 Duplicate Samples

One field duplicate sample was also collected during each day of sampling to verify the consistency of the entire sampling and analytical procedure. A total of twelve duplicate samples were collected during the reporting period. The duplicate sample results were compared to the results of those obtained for the referenced wells and evaluated in the data validation report (see Section 8.3.5).

8.3.5 Data Validation

Tetra Tech EM Inc. performed data validation of the analytical results for samples collected during the 4th Quarter 2009 sampling event (November 16) and the 2nd Quarter 2010 sampling event (June 15-17). Analytical data were evaluated in general accordance with applicable data validation guidance documents, including the *EPA Contract Laboratory Program* (CLP) *National Functional Guidelines* (NFG) *for Superfund Organic Methods Data Review* (June 2008) and the *EPA CLP NFG for Inorganic Superfund Data Review* (January 2010). The overall quality of each data package was accepted and can be used as qualified. An electronic version of the *Data Validation Report* is included in **Appendix S**.

9.0 VAPOR INTRUSION INVESTIGATION SUMMARY

FTMM has evaluated the requirements for a vapor intrusion assessment, in accordance with the NJDEP *Vapor Intrusion Guidance* (VIG) document and the NJDEP TRSR, NJAC 7:26E *et seq*. FTMM utilized the three-stage assessment criteria as detailed in the VIG decision framework to determine the applicability of vapor intrusion regulations. Site-specific groundwater data for PCE from the seven latest quarterly groundwater sampling events were compared to the NJDEP vapor intrusion Ground Water Screening Level (GWSL) of 1 µg/L is presented below.

Monitoring Well	Date Sampled	PCE Concentration in Groundwater (µg/L)
699MW9	8/26/09	1.65
	11/16/09	1.88
	9/17/10	2.32
699MW16	11/16/09	1.09
	9/17/10	1.71
699RW11	11/16/09	2.86
	6/17/09	13.52

Onsite groundwater contamination was observed in excess of the generic GWSL presented in Table 1 of the NJDEP *Vapor Intrusion Guidance* within 100 feet of onsite structures. According to the decision flow chart for vapor intrusion, a vapor intrusion evaluation is warranted at this parcel. PCE concentrations in groundwater from the most recent sampling event (September 2010) and distances relative to Buildings 699 and 700 are depicted in a figure included in **Appendix T**.

During preliminary site investigation activities, a soil gas/indoor air evaluation was performed in December 2007, and follow-up indoor air evaluation was performed in April 2010. Findings from the December 2007 sampling event were presented under a report entitled U.S. Army BRAC 2005 Site Investigation Report Fort Monmouth Final 21-July 2008. No conclusive information concerning vapor intrusion pathways could be drawn from the April 2010 indoor air evaluation. Findings from this sampling event are presented in **Appendix S** (includes text, tables and figures). The data above indicates that a vapor intrusion investigation will be required for Building 699 as well as Building 700 to the east. A Vapor Intrusion Workplan will be included in the next RAPR.

10.0 REMEDIAL ACTION PROGRESS

This section addresses the following items in reference to the ongoing remedial activities at the Building 699 site: remediation costs; the most recent NJDEP response; conclusions; recommendations; and remedial action schedule.

10.1 Cost of Remediation Incurred To-Date

The total cost-to-date as of the 3rd Quarter 2010 for the annual implementation of the remedial actions performed at the Building 699 site is $2,040,427.52. These costs were determined based on the U.S. Army Obligation List prepared October 29, 2008, and additional costs incurred during the current reporting period. Costs include the preliminary assessment, site investigation, remedial investigation/feasibility study, remedial design, and long-term monitoring phases, as well as reporting.

10.2 NJDEP Comments and Response

In a letter dated February 23, 2011, the NJDEP stated that they completed review of the RAPR dated June 2010, for Building 699, Main Post Gas Station. The NJDEP included comments regarding the RAPR to be addressed in all future submittals and the U.S. Army provided a response. The NJDEP letter and U.S. Army responses are included in **Appendix U**.

In its letter, the NJDEP approved the U.S. Army's request to begin sampling monitoring wells 699MW2, 699MW5, 699MW8, 699MW15, and 616MW1 annually with all other wells continuing to be sampled on a quarterly basis. The NJDEP letter indicated that monitoring well 699MW16 be included in the wells which are to switch to an annual schedule. This may have been an error and this is not recommended by GES. Monitoring well 699MW16 has shown increasing concentrations of PCE with the most recent sampling event showing a concentration exceeding the NJDEP GWQS. Monitoring well 699MW16 should continue to be sampled on a quarterly basis.

10.3 Conclusions

The data support the conclusion that the chosen remedial strategy is successfully remediating the subsurface contamination:

- Hydrocarbons are being recovered by the remediation systems.
- The SVE system recovered approximately 725 pounds of hydrocarbon or approximately 86.9 equivalent gallons of hydrocarbons during the reporting period.
- Since start-up of the SVE system in September 2001, approximately 600 equivalent gallons of hydrocarbons have been recovered through the end of the reporting period.

- Approximately 1 pound of dissolved-phase hydrocarbons were recovered during the reporting period with the groundwater pump and treatment system.

- SPP is no longer present in the site wells. Measurable quantities of SPP were last recorded during the June 26, 2002 groundwater sampling event (0.16 feet in 699MW1), and SPP films were last recorded in the recovery wells in August 2002 (699RW3).

- There has been a reduction in the dissolved-phase gasoline constituents BTEX, MTBE, and TBA observed in the source-area monitoring wells since system operation began. Concentrations are less than the NJDEP Class II-A GWQS for toluene, MTBE and TBA in all source area monitoring wells during the reporting period. However, TBA was detected at concentrations greater than the GWQSs in recovery well 699RW5 and 699RW11 during the reporting period. Concentrations of toluene, ethylbenzene, xylenes, and MTBE were less than GWQS in all recovery wells during the reporting period. Benzene was greater than the GWQS in source area monitoring and recovery wells, however, concentrations are decreasing and range from non-detect to 257.57 µg/L. The GWP&T system continues to maintain source area hydraulic control.

- Concentrations of benzene, toluene, and TBA have remained less than the detection limit in hydraulically downgradient monitoring wells 699MW9 and 699MW16. Concentrations of ethylbenzene, xylenes, and MTBE have been detected in the hydraulically downgradient monitoring wells at concentrations less than their respective GWQS.

- Concentrations of PCE have recently been detected in hydraulically downgradient monitoring wells 699MW9 and 699MW16 as well as recovery well 699RW11. An investigation into the source area for PCE is currently being performed and will be reported on in the next RAPR.

- Continued system operation and hydrocarbon recovery will result in continued decreases in soil and groundwater concentrations, however, hydrocarbon recovery rates have decreased and leveled-off. Development of a more aggressive remedial strategy is needed to achieve the goal of compliance with NJDEP GWQS.

10.4 Recommendations

These actions are recommended:

- Develop a workplan and obtain approval from NJDEP for implementation of an alternate remedial strategy (e.g. soil excavation, *in-situ* remediation, etc.).

- Continue operation of the remediation systems until an alternate remedial strategy is approved by the NJDEP.

- Continue sampling all monitoring wells on a quarterly basis with the exception of the monitoring wells approved by NJDEP to change to an annual sampling schedule.

- Continue sampling monitoring well 699MW16 on a quarterly basis.
- Continued groundwater sampling will be performed on hydraulically upgradient monitoring wells to assess lead concentrations.
- Prepare and submit the next RAPR to include information from the 4th Quarter 2010 through the 4th Quarter 2011.
- Draft a Vapor Intrusion Investigation RAW for Buildings 699 and 700 and submit to NJDEP.
- Continue to investigate discovery and attempt to locate source of PCE in groundwater.

10.5 Remedial Action Schedule

The table below provides a proposed future groundwater sampling program for Building 699. Alterations involving laboratory analyses and sampling frequency of certain wells in the program are based on the distribution of the COCs over time. Proposed changes will be implemented unless otherwise directed by the NJDEP.

Additionally, a RAPR will be prepared and submitted annually and will include groundwater sampling results, system operational parameters and progress on remediation.

Groundwater Sampling Program

Monitoring Well	Proposed Future Analysis	Proposed Future Sampling	Reasoning
616MW1	VOCs, lead	Semiannual	Upgradient well; VOCs < GWQS for 38 rounds.
699MW1	VOCs, lead	Semiannual	Monitor source area concentrations.
699MW2	None	Discontinue	Upgradient well; concentrations of VOCs in compliance with GWQS.
699MW3	None	None	Well is abandoned.
699MW4	VOCs, lead	Semiannual	Monitor source area concentrations
699MW5	VOCs, lead	Semiannual	Side-gradient well; Concentrations of VOCs and lead < GWQS for 20 rounds
699MW6	VOCs, lead	Semiannual	Monitor source area concentrations
699MW7	None	None	Well is abandoned.
699MW8	VOCs, lead	Semiannual	Sidegradient well; VOCs and lead < GWQS for 37 rounds
699MW9	VOCs, lead	Semiannual	Monitor downgradient concentrations.
699MW10	None	None	Well is abandoned.
699MW13	None	None	Well is abandoned.
699MW14	None	None	Well is abandoned.

Monitoring Well	Proposed Future Analysis	Proposed Future Sampling	Reasoning
699MW15	None	Discontinue	Upgradient well; concentrations of VOCs in compliance with GWQS.
699MW16	VOCs, lead	Semiannual	Monitor downgradient concentrations; BTEX and lead < GWQS for 38 rounds; PCE detected during 19 of 38 rounds of sampling
699RW3	VOCs, lead	Semiannual	Monitor source area concentrations. Serves as recovery well in source area.
699RW4	None	None	Recovery well has not been sampled since 1st Quarter 2009.
699RW5	VOCs, lead	Semiannual	Monitor source area concentrations. Serves as recovery well in source area.
699RW11	VOCs, lead	Semiannual	Monitor source area concentrations. Serves as recovery well in source area.

11.0 REFERENCES

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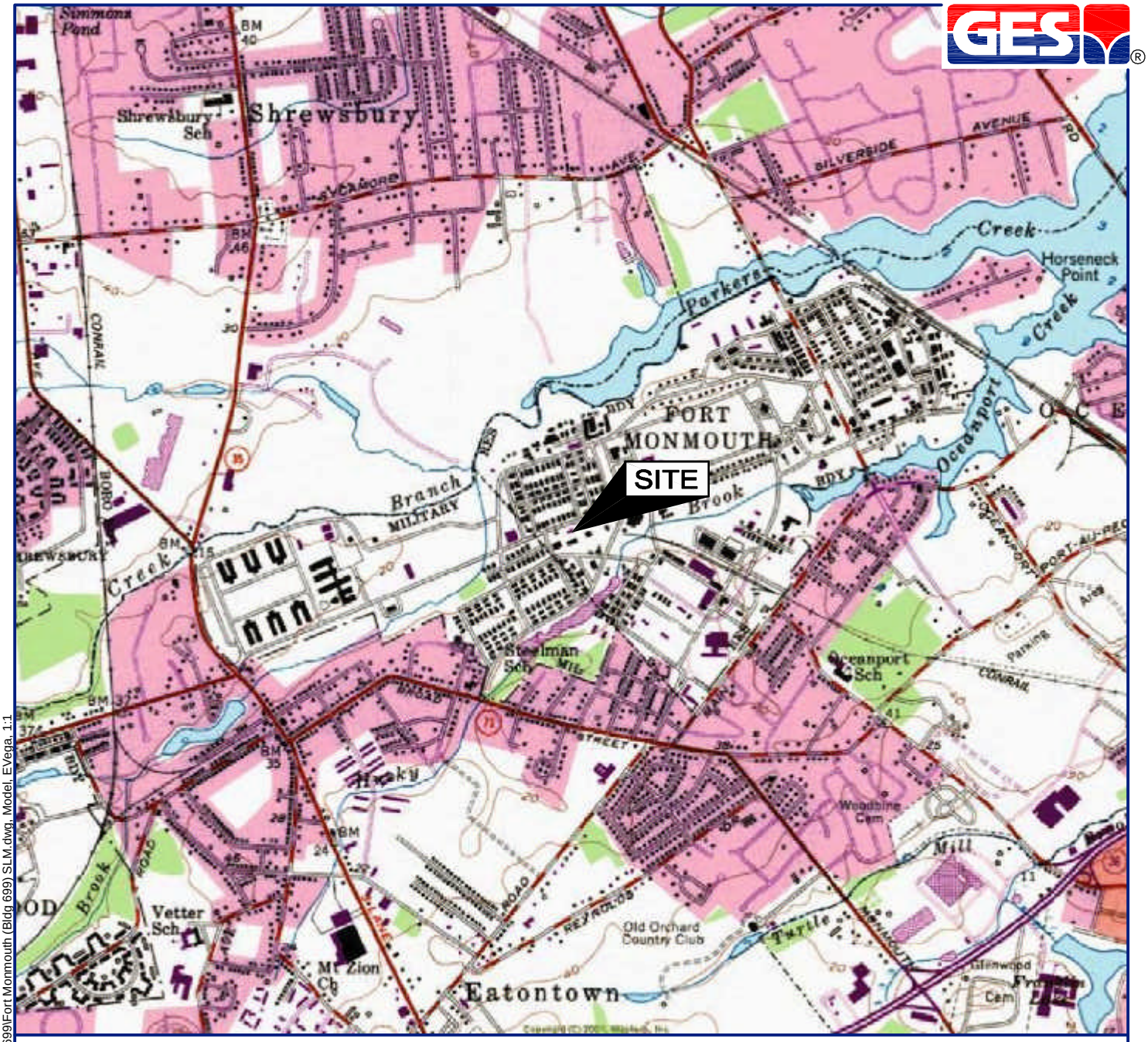
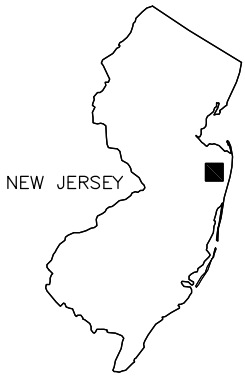
U.S. Army, March 2011. U.S. Army, Fort Monmouth, New Jersey, *Base-Wide Glauconitic Soil Sampling Report*, Department of the Army, Headquarters, U.S. Army Garrison Fort Monmouth, Fort Monmouth, NJ.

FIGURES



SOURCE: USGS 7.5 MINUTE SERIES
TOPOGRAPHIC QUADRANGLE 1981
LONG BRANCH, NEW JERSEY
CONTOUR INTERVAL = 20'



QUADRANGLE LOCATION

DRAFTED BY: E.V. (N.J.)	SITE LOCATION MAP
CHECKED BY:	U.S. ARMY BUILDING 699 FORT MONMOUTH OCEANPORT, NEW JERSEY
REVIEWED BY:	
NORTH	Groundwater & Environmental Services, Inc. 1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET	DATE	FIGURE
0 2000	8-23-11	1

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LEGEND

- TREES/SHRUBS
- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SPARGE POINT
- SOIL VAPOR EXTRACTION WELL

DRAFTED BY: E.V. (N.J.)	SITE MAP
CHECKED BY:	U.S. ARMY BUILDING 699 FORT MONMOUTH OCEANPORT, NEW JERSEY
REVIEWED BY:	Groundwater & Environmental Services, Inc. 1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753
NORTH	SCALE IN FEET: 0 APPROXIMATE 80 / DATE: 8-23-11 / FIGURE: 2

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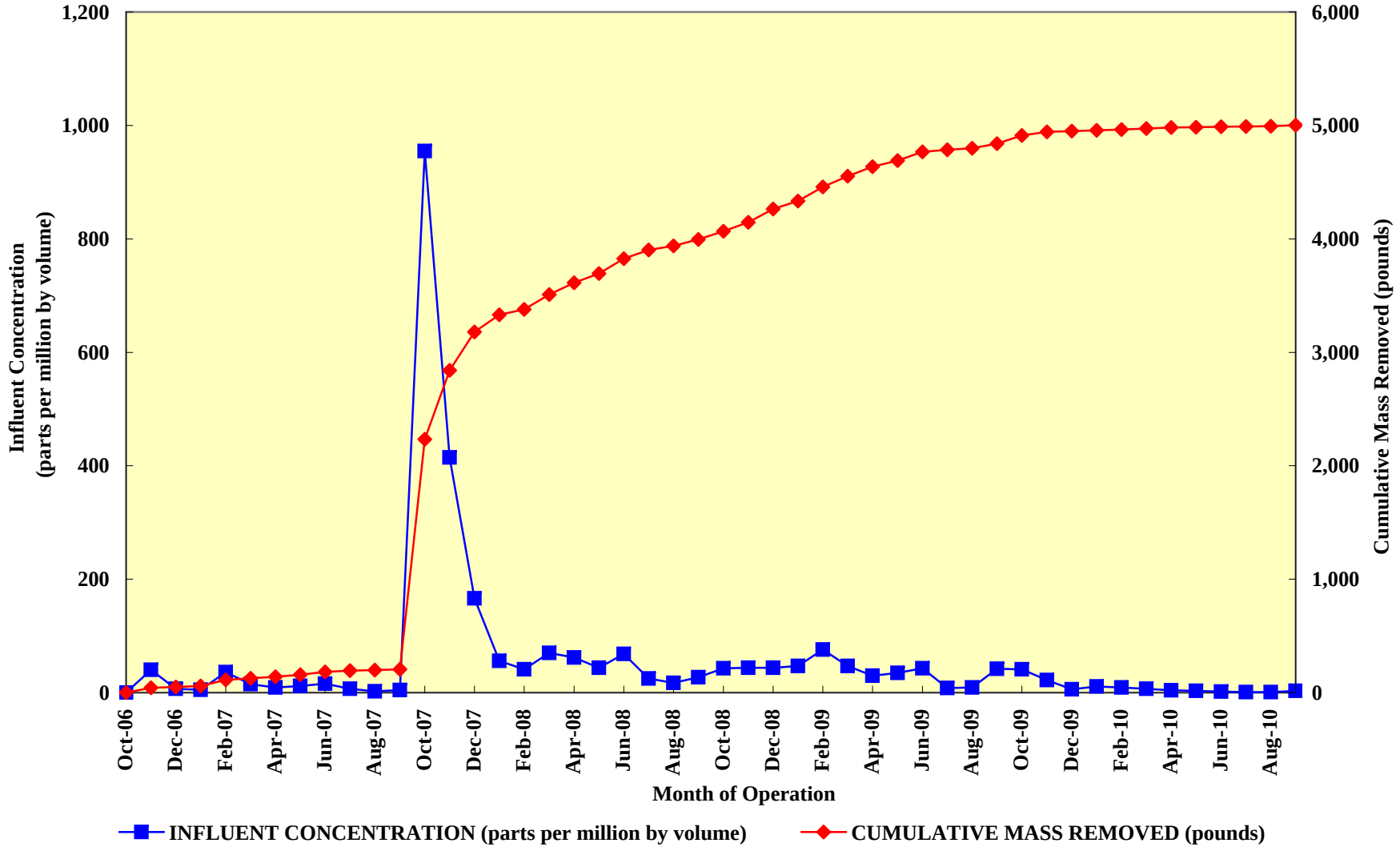
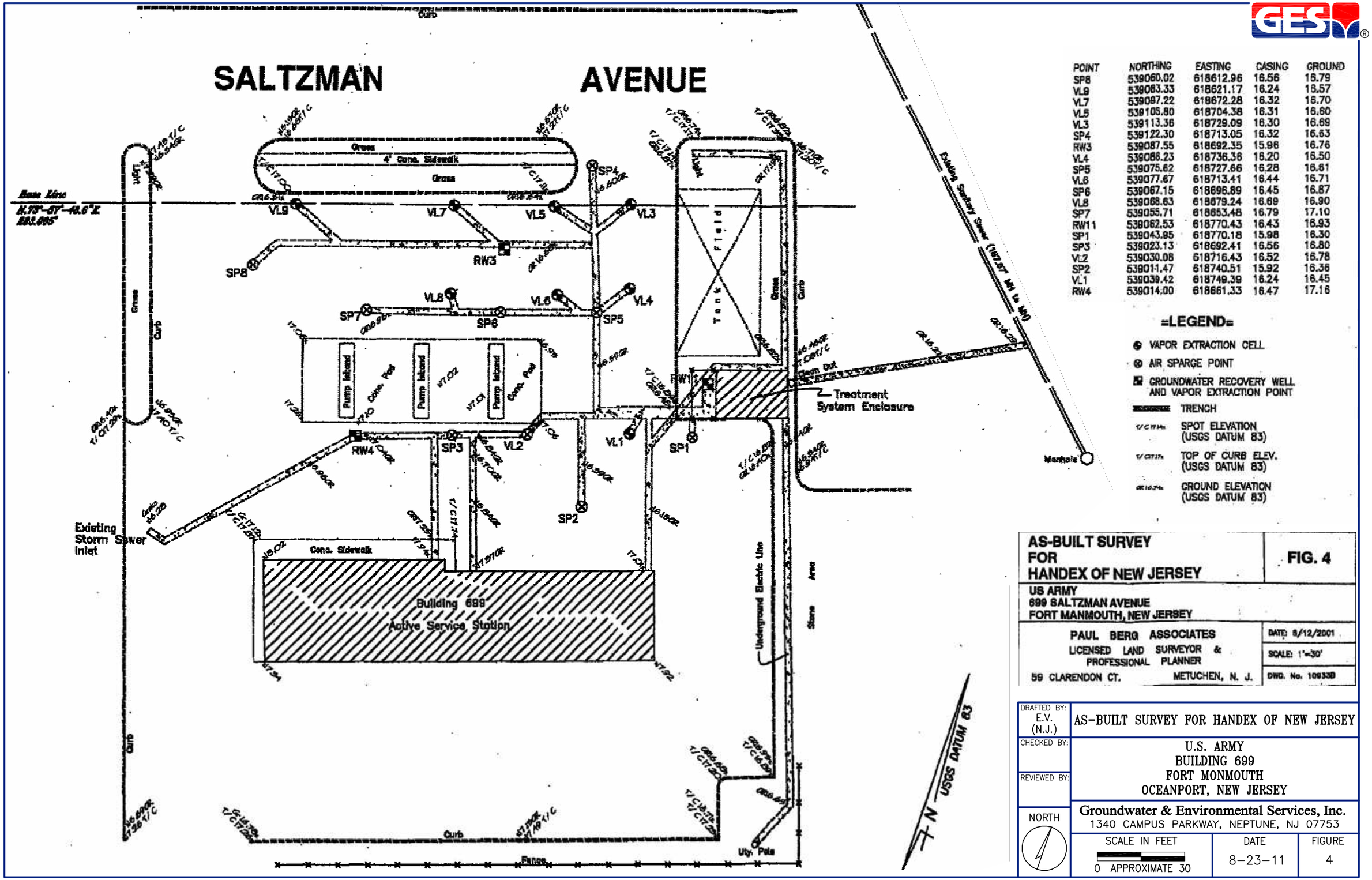
Figure 3. Soil Vapor Extraction System Influent Non-Methane Volitile Organic Compound Concentration and Cumulative Mass Removed With Time
Building 699, Main Post Gas Station
Fort Monmouth, New Jersey





POINT	NORTHING	EASTING	CASING	GROUND
SP8	539060.02	618612.96	16.56	16.79
VL9	539083.33	618621.17	16.24	16.57
VL7	539097.22	618672.28	16.32	16.70
VL5	539105.80	618704.38	16.31	16.60
VL3	539113.36	618729.09	16.30	16.69
SP4	539122.30	618713.05	16.32	16.63
RW3	539087.55	618692.35	15.98	16.76
VL4	539086.23	618736.36	16.20	16.50
SP5	539075.62	618727.66	16.28	16.61
VL8	539077.67	618713.41	16.44	16.71
SP6	539067.15	618696.89	16.45	16.87
VL6	539068.63	618679.24	16.69	16.90
SP7	539055.71	618653.48	16.79	17.10
RW11	539062.53	618770.43	16.43	16.93
SP1	539043.85	618770.18	15.98	16.30
SP3	539023.13	618692.41	16.56	16.80
VL2	539030.08	618716.43	16.52	16.78
SP2	539011.47	618740.51	15.92	16.36
VL1	539039.42	618749.39	16.24	16.45
RW4	539014.00	618661.33	16.47	17.16

=LEGEND=

- VAPOR EXTRACTION CELL
- AIR SPARGE POINT
- GROUNDWATER RECOVERY WELL AND VAPOR EXTRACTION POINT
- TRENCH
- SPOT ELEVATION (USGS DATUM 83)
- TOP OF CURB ELEV. (USGS DATUM 83)
- GROUND ELEVATION (USGS DATUM 83)

AS-BUILT SURVEY FOR HANDEX OF NEW JERSEY — **FIG. 4**

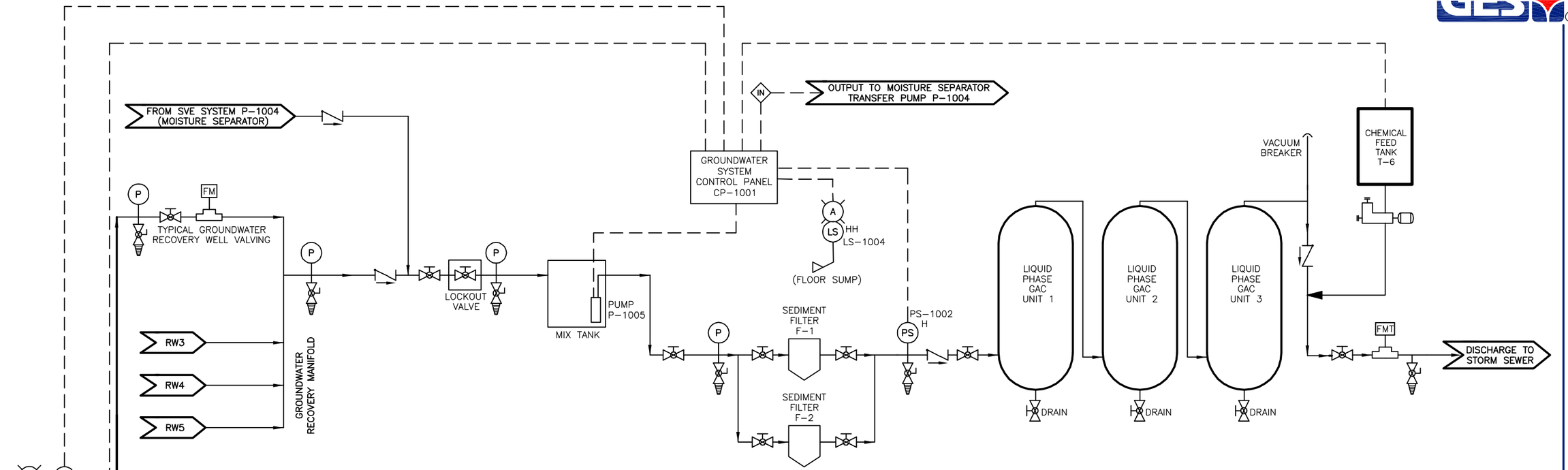
US ARMY
699 SALTZMAN AVENUE
FORT MANMOUTH, NEW JERSEY

PAUL BERG ASSOCIATES
LICENSED LAND SURVEYOR & PROFESSIONAL PLANNER
59 CLARENDON CT. METUCHEN, N. J.

DATE: 8/12/2001
SCALE: 1"=30'
DWG. No. 10933B

DRAFTED BY: E.V. (N.J.)	AS-BUILT SURVEY FOR HANDEX OF NEW JERSEY
CHECKED BY:	U.S. ARMY BUILDING 699 FORT MONMOUTH OCEANPORT, NEW JERSEY
REVIEWED BY:	Groundwater & Environmental Services, Inc. 1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753
NORTH	SCALE IN FEET: 0 APPROXIMATE 30 / DATE: 8-23-11 / FIGURE: 4

M:\Graphics\0300-Wall\Misc\Industrial\Fort Monmouth\Building 699\Fort Monmouth (Bldg 699) Survey for Handex.dwg, B-30, EVega, 1:1



CONTROL SUMMARY CONTROL PANEL CP-1001

		Outputs (1)			
Input (1)	Input No.	P-1001	B-1002	P-1005	P-1004 (3)
LSH-1001	1	ON	–	–	–
LSL-1001	1	OFF	–	–	–
LSLL-1001 (2)	1	OFF	–	–	–
PSL-1001 (2)	2	OFF	OFF	–	OFF
PSH-1002 (2)	3	OFF	OFF	OFF	OFF
LSHH-1004 (2)	4	OFF	OFF	OFF	OFF
LSHH-1005 (2)	5	OFF	OFF	ON	OFF
LSH-1005	5	–	–	ON	–
LSL-1005	5	–	–	OFF	–

(1) LS-1002 and LS-1003 and their corresponding pumps P-1002 and P-1003 which are not shown on the P&ID, have the same control configuration as shown above for LS-1001 and P-1001.

(2) Output shown in alarm mode

(3) Interlock to panel CP-1002.

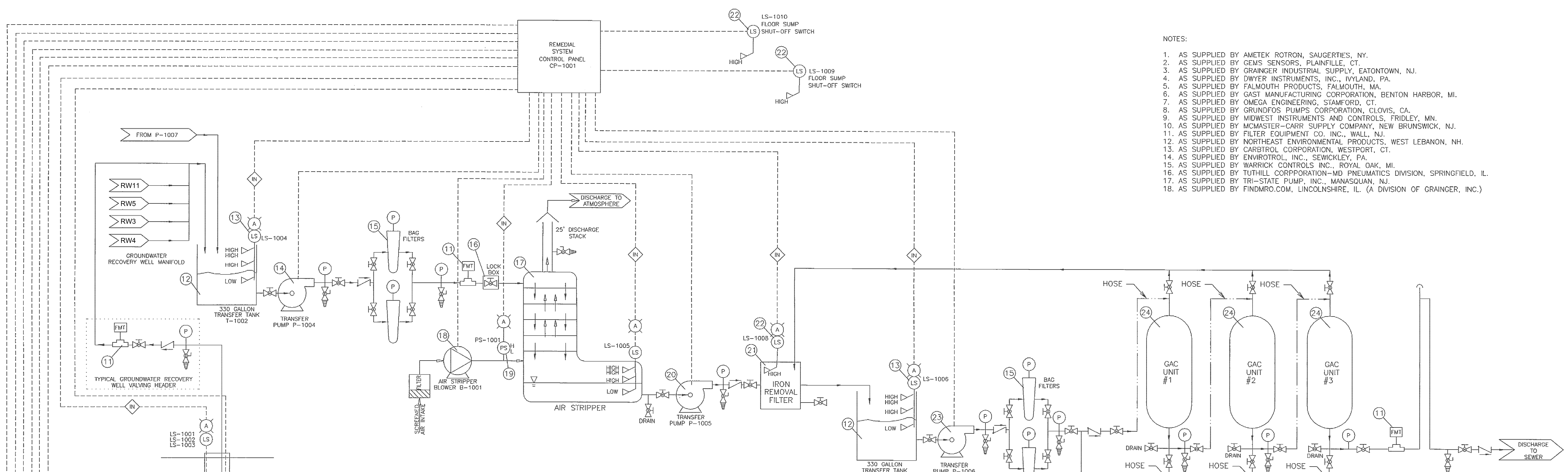
LEGEND

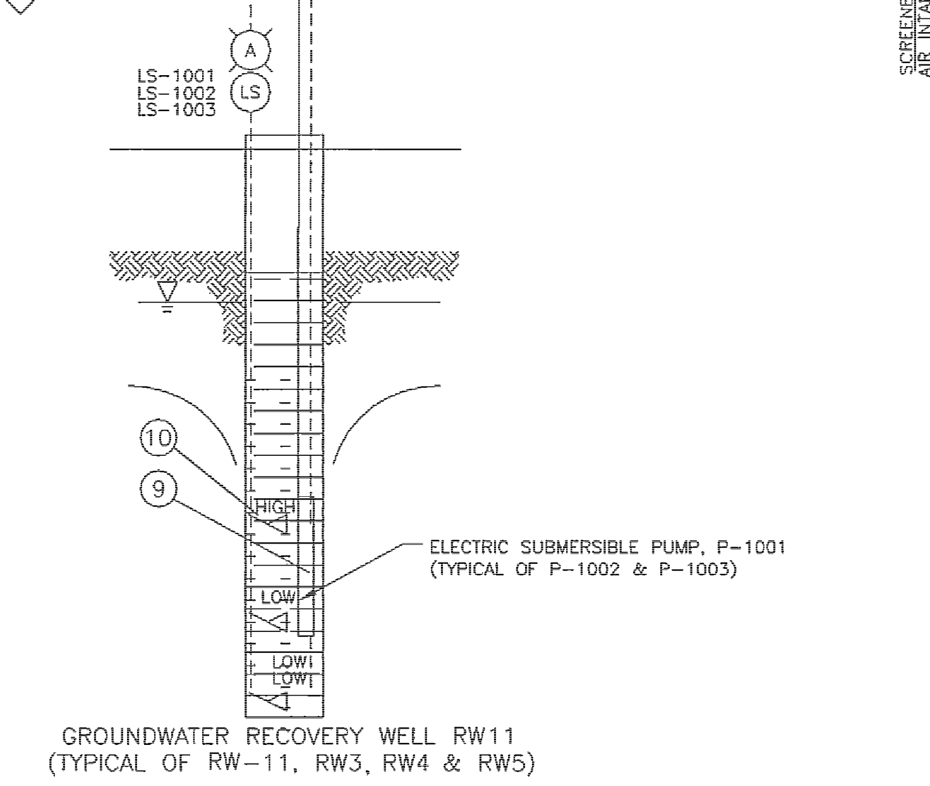
- BALL VALVE
- CHECK VALVE
- STATIC WATER LEVEL
- FMT FLOW METER-TOTALIZER
- FM FLOW METER
- SAMPLE PORT
- VACUUM BREAKER
- LEVEL SENSOR
- DIRECTION OF FLOW
- PROPORTIONING PUMP
- IN ELECTRICAL/CONTROL INTERLOCK
- P PRESSURE GAUGE
- PS PRESSURE SWITCH
- LS LEVEL SWITCH
- A ALARM
- H HIGH
- HH HIGH HIGH

DRAFTED BY: E.V. (N.J.)	PROCESS & INSTRUMENTATION DIAGRAM (GROUNDWATER TREATMENT SYSTEM)
CHECKED BY:	U.S. ARMY BUILDING 699 FORT MONMOUTH OCEANPORT, NEW JERSEY
REVIEWED BY:	Groundwater & Environmental Services, Inc. 1340 CAMPUS PARKWAY, BLDG. B4, NEPTUNE, NJ 07753
NOT TO SCALE	DATE 8-23-11 / FIGURE 5A

M:\Graphics\0300-Wall\Misc\Industrial\Fort Monmouth\Building 699\ENG\Fort Monmouth (Bldg 699) PID gw.dwg, B-PID, EVega, 1:1

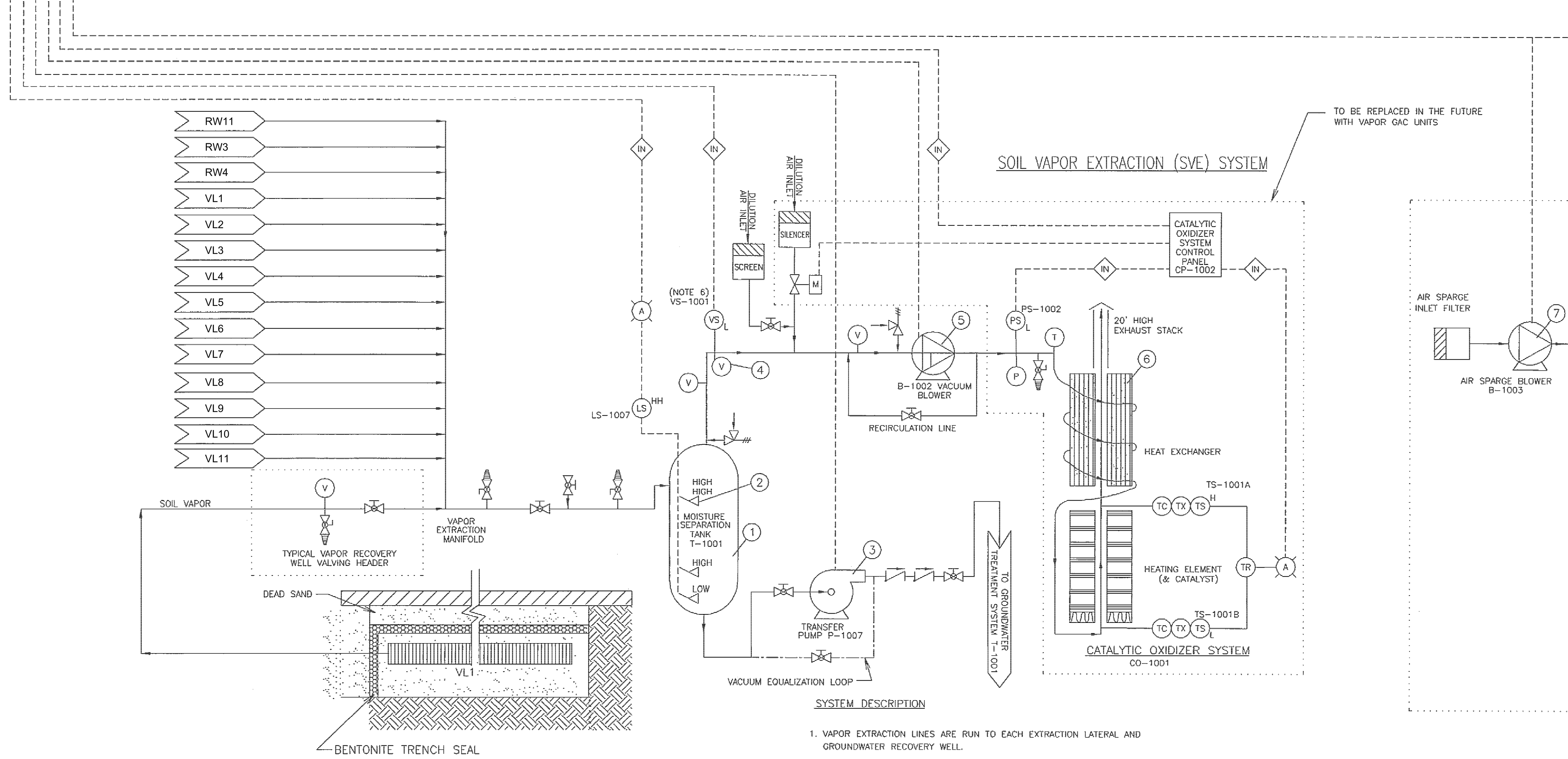
GES®



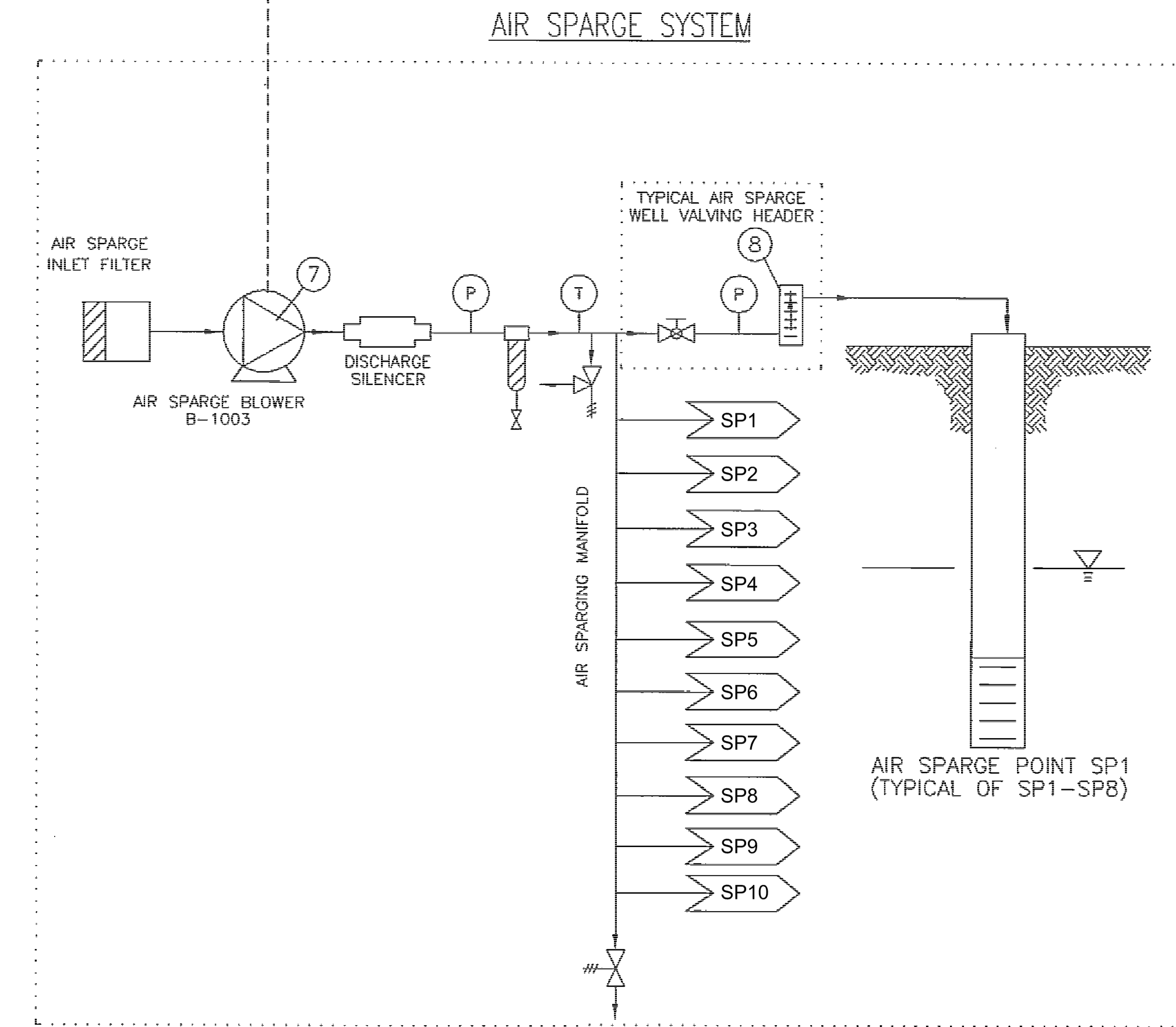


SYSTEM DESCRIPTION

1. EXTRACTION LINES ARE RUN TO EACH RECOVERY WELL.
2. GROUNDWATER RECOVERY RATES ARE CONTROLLED BY INDIVIDUAL VALVES.
3. GROUNDWATER FLOW RATES ARE MEASURED FOR EACH INDIVIDUAL RECOVERY WELL. COMBINED INFLUENT TO THE AIR STRIPPER, AND THE EFFLUENT AFTER THE CARBON UNITS.
4. BAG FILTERS AND IRON REMOVAL FILTER ARE UTILIZED TO REMOVE SUSPENDED SOLIDS FROM GROUNDWATER.
5. PRIMARY REMOVAL OF VOC'S SHALL BE ACCOMPLISHED UTILIZING A LOW PROFILE AIR STRIPPER.
6. GRANULAR ACTIVATED CARBON (GAC) SHALL BE UTILIZED TO PROVIDE SECONDARY TREATMENT AND POLISHING OF THE EFFLUENT.
7. TREATED GROUNDWATER SHALL BE DISCHARGED TO NORTHEAST MONMOUTH COUNTY REGIONAL SEWERAGE AUTHORITY IN ACCORDANCE WITH APPLICABLE NMCRSA DISCHARGE PERMITS.
8. AIR STRIPPER OFF GAS SHALL BE DISCHARGED TO ATMOSPHERE WITHOUT TREATMENT IN ACCORDANCE WITH THE APPLICABLE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL (NJDEP) AIR DISCHARGE PERMIT.
9. CONTROL PANEL CP-1001 INCLUDES ALL NECESSARY MOTOR STARTERS, RELAYS, AND CONTROLLERS TO OPERATE GROUNDWATER SYSTEM.
10. PRESSURE GAUGES ON GROUNDWATER SYSTEM WERE CONSTRUCTED OF LIQUID-FILLED COPPER-ALLOY BOURDON TUBE CONSTRUCTION.
11. ALL GROUNDWATER RECOVERY SYSTEM PIPING INSTALLED WAS 2" PVC PIPE.
12. ALL PVC PIPING IS SCH. 40 ABOVE GROUND & SCH. 80 UNDER GROUND, WITH THE EXCEPTION OF THE HORIZONTAL EXTRACTION CELL PIPING



TYPICAL SOIL VAPOR EXTRACTION DETAIL, PIPING & VALVING



SYSTEM DESCRIPTION

1. VAPOR EXTRACTION LINES ARE RUN TO EACH EXTRACTION LATERAL AND GROUNDWATER RECOVERY WELL.
2. VAPOR EXTRACTION RATES FROM THE LATERALS AND WELLS ARE CONTROLLED BY INDIVIDUAL VALVES.
3. CONDENSATION IS REMOVED FROM THE VAPOR PHASE IN THE SEPARATION TANK.
4. CONDENSATE FROM MOISTURE SEPARATOR TO BE AUTOMATICALLY PUMPED TO GROUNDWATER TREATMENT SYSTEM.
5. A 2-CHANNEL RECORDER WAS INSTALLED BY FALMOUTH PRODUCTS THE MANUFACTURER OF THE CATALYTIC OXIDIZER TO RECORD THE INFLUENT AND EFFLUENT TEMPERATURES.
6. VACUUM SENSOR/SWITCH TO BE INSTALLED IF REQUIRED BY NJDEP AIR DISCHARGE PERMIT.
7. CONTROL PANEL CP-1002 WAS PROVIDED BY FALMOUTH PRODUCTS THE EQUIPMENT MANUFACTURER OF CATALYTIC OXIDIZER.
8. PRESSURE VACUUM GAUGES FOR SOIL VAPOR EXTRACTION/SPARGE SYSTEM ARE CONSTRUCTED OF COPPER-ALLOY BOURDON TUBE CONSTRUCTION.
9. ALL SOIL VAPOR EXTRACTION PIPING INSTALLED FOLLOWING THE HEADER IS 3" PVC SCH. 40 PIPE WITH THE EXCEPTION OF 3" STEEL PIPE ON SUCTION END SOIL VAPOR EXTRACTION BLOWER AND THE RECIRCULATION LOOP AROUND THE BLOWER WHICH IS 2" SCH. 40 STEEL PIPE.
10. ALL PIPING WAS CONSTRUCTED OF SCH. 40 ABOVE GROUND AND SCH. 80 UNDER GROUND.

NOTES:

1. AS SUPPLIED BY AMETEK ROTRON, SAUGERTIES, NY.
2. AS SUPPLIED BY GEMS SENSORS, PLAINFILLE, CT.
3. AS SUPPLIED BY GRAINGER INDUSTRIAL SUPPLY, EATONTOWN, NJ.
4. AS SUPPLIED BY DWYER INSTRUMENTS, INC., IVYLAND, PA.
5. AS SUPPLIED BY FALMOUTH PRODUCTS, FALMOUTH, MA.
6. AS SUPPLIED BY GAST MANUFACTURING CORPORATION, BENTON HARBOR, MI.
7. AS SUPPLIED BY OMEGA ENGINEERING, STAMFORD, CT.
8. AS SUPPLIED BY GRUNDFOS PUMPS CORPORATION, CLOVIS, CA.
9. AS SUPPLIED BY MIDWEST INSTRUMENTS AND CONTROLS, FRIDLEY, MN.
10. AS SUPPLIED BY MCMASTER-CARR SUPPLY COMPANY, NEW BRUNSWICK, NJ.
11. AS SUPPLIED BY FILTER EQUIPMENT CO. INC., WALL, NJ.
12. AS SUPPLIED BY NORTHEAST ENVIRONMENTAL PRODUCTS, WEST LEBANON, NH.
13. AS SUPPLIED BY CARBTROL CORPORATION, WESTPORT, CT.
14. AS SUPPLIED BY ENVIROTROL, INC., SEWICKLEY, PA.
15. AS SUPPLIED BY WARRICK CONTROLS INC., ROYAL OAK, MI.
16. AS SUPPLIED BY TUTHILL CORPPORATION-MD PNEUMATICS DIVISION, SPRINGFIELD, IL.
17. AS SUPPLIED BY TRI-STATE PUMP, INC., MANASQUAN, NJ.
18. AS SUPPLIED BY FINDMRO.COM, LINCOLNSHIRE, IL. (A DIVISION OF GRAINGER, INC.)

LEGEND

- BALL VALVE W/ SECURITY LOCK BOX
- BALL VALVE
- CHECK VALVE
- SAMPLE PORT
- CONTROL/ELECTRICAL INTERLOCK
- FLOW METER-TOTALIZER
- LEVEL SENSOR
- VACUUM RELIEF VALVE
- PRESSURE RELIEF VALVE
- MANUAL PRESSURE RELIEF VALVE
- PRESSURE GAUGE
- VACUUM BREAK
- TEMPERATURE GAUGE
- VACUUM GAUGE
- ALARM
- LEVEL SWITCH
- VACUUM SWITCH
- THERMAL COUPLE
- TEMPERATURE SWITCH
- TEMPERATURE RECORDER
- TEMPERATURE SENSOR
- PROCESS FLOW LINE
- ELECTRIC/CONTROL LINE
- HOSE WITH QUICK DISCONNECTS
- AIR/FILTER COALESCER
- ROTAMETER FLOWMETER
- MOTOR ACTIVATED VALVE

CONTROL PANEL CP-1002 CONTROL SUMMARY
(AS SUPPLIED BY FALMOUTH PRODUCTS)

	Outputs				
Input	Input No.	B-1002	P-1007	CO-1001	B-1003
LSHH-1007 (1)	1	OFF	OFF	OFF	OFF
LSH-1007	1	–	ON	–	–
LSL-1007	1	–	OFF	–	–
VSL-1007 (1)	2	OFF	–	OFF	OFF
PSL-1002 (1)	3	OFF	–	OFF	OFF
TSH-1001A (1)	4	OFF	–	OFF	OFF
TSL-1001B (1)	5	OFF	–	OFF	OFF

(1) Output shown in alarm mode

CONTROL PANEL CP-1001 CONTROL SUMMARY

		OUTPUTS							
INPUT	INPUT #	B1001	P1001	P1002	P1003	P1004	P1005	P1006	P1007
LSH-1001	1	–	ON	–	–	–	–	–	–
LSL-1001	1	–	OFF	–	–	–	–	–	–
LSLL-1001	1	–	OFF	–	–	–	–	–	–
LSH-1002	2	–	–	ON	–	–	–	–	–
LSL-1002	2	–	–	OFF	–	–	–	–	–
LSLL-1002	2	–	–	OFF	–	–	–	–	–
LSH-1003	3	–	–	–	ON	–	–	–	–
LSL-1003	3	–	–	–	OFF	–	–	–	–
LSLL-1003	3	–	–	–	OFF	–	–	–	–
LSHH-1004 (1)	4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
LSH-1004	4	–	–	–	–	ON	–	–	–
LSL-1004	4	–	–	–	–	OFF	–	–	–
LSHH-1005 (1)	5	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
LSH-1005	5	–	–	–	–	–	ON	–	–
LSL-1005	5	–	–	–	–	–	OFF	–	–
PSH-1001 (1)	6	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
PSL-1001	6	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
LSHH-1006 (1)	7	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
LSH-1006	7	–	–	–	–	–	–	ON	–
LSL-1006	7	–	–	–	–	–	–	OFF	–
LSH-1008 (1)	8	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
LSH-1009 (1)	9	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
LSH-1010 (1)	10	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

(1) OUTPUTS IN ALARM MODE.

ITEM	QTY	PART #	DESCRIPTION	NOTES
24	3	LP-185P	POLYGLASS LIQUID PHASE GRANULAR ACTIVATED CARBON ADSORBER UNIT (500 LBS EACH)	14
23	1	CJ101B208/TEFC	HIGH-VOLUME PRESSURE BOOSTER PUMP 2 HP 208-230/60/3	18
22	3	35651	HIGH LEVEL FLOAT SWITCH	2
21	1	–	IRON REMOVAL FILTER 40 GPM MAX.	13
20	1	1BF20534	CENTRIFUGAL TRANSFER PUMP 1/2 HP 208-230/60/3	17
19	1	–	HIGH/LOW AIR PRESSURE PRESSURE SWITCH	12
18	1	AF15	CENTRIFUGAL PRESSURE BLOWER 5 HP 208-230/60/3	12
17	1	2341-P	POLYETHYLENE LOW-PROFILE AIR STRIPPER W/ SUMP LEVEL FLOAT SWITCHES	12
16	1	ST821	BALL VALVE WITH LOCKOUT BOX	3
15	4	NC-122	CARBON STEEL BAG FILTER HOUSING	11
14	1	CJ101B208/TEFC	HIGH-VOLUME PRESSURE BOOSTER PUMP 2 HP 208-230/60/3	18
13	2	SERIES 3E	TRANSFER PUMP LEVEL CONTROLLERS	15
12	2	3662K17	330 GALLON TRANSFER TANK	10
11	5	–	INLINE FLOWMETER TOTALIZER 3/4" BODY	9
10	3	SERIES 3W	DOWNWELL LEVEL CONTROLLERS	15
9	3	10E5	ELECTRIC SUBMERSIBLE GROUNDWATER PUMP 1/2 HP 230/60/1	8
8	8	FL7411	ROTAMETER	7
7	1	6066-PI22A-T909	SPARGE COMPRESSOR 7-1/2 HP 208-230/60/3	6
6	1	FALCO 300	CATALYTIC OXIDIZER 20.3 KW 208-230/60/3	5
5	1	COMPETITORS 4005	ROOTS BLOWER 15 HP 208-230/60/3	16
4	1	3000-A3100	VACUUM SWITCH	4
3	1	1BF20534	CENTRIFUGAL TRANSFER PUMP 1/2 HP 208-230/60/3	17
2	1	30288	LIQUID LEVEL FLOAT SWITCHES	2
1	1	MS350BS	MOISTURE SEPARATOR W/INTEGRAL HIGH LEVEL SWITCH	1

DRAFTED BY: E.V. (N.J.)	Process & Instrumentation Diagram (Catalytic Oxidation System)
CHECKED BY:	U.S. ARMY BUILDING 699 FORT MONMOUTH OCEANPORT, NEW JERSEY
REVIEWED BY:	
	Groundwater & Environmental Services, Inc. 1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753
	DATE: 8-23-11 / FIGURE: 5B

LEGEND

- TREES/SHRUBS
- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SPARGE POINT
- SOIL VAPOR EXTRACTION WELL
- GWQS — GROUND WATER QUALITY STANDARD
- (10.50) — BENZENE CONCENTRATION (µg/L)
- BENZENE CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
- (µg/L) — MICROGRAMS PER LITER
- J — ESTIMATED CONCENTRATION
- ND — NOT DETECTED
- NS — NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	10.50
699-MW2	ND
699-MW3	NS
699-MW4	20.32
699-MW5	ND
699-MW6	26.73
699-MW8	ND
699-MW9	ND
699-MW12	ND
699-MW15	ND
699-MW16	ND
699-RW3	257.57
699-RW4	1.43 J
699-RW5	NS
699-RW11	0.87 J

NOTE:

NJDEP CLASS II-A GWQS FOR BENZENE IS 1 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

BENZENE ISOPLETH MAP
MARCH 2009

U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET
0 APPROXIMATE 80

DATE: 8-23-11

FIGURE: 6

LEGEND

- TREES/SHRUBS
- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SPARGE POINT
- SOIL VAPOR EXTRACTION WELL
- GWQS — GROUND WATER QUALITY STANDARD
- (280.26) — XYLENES CONCENTRATION (µg/L)
- XYLENES CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
- (µg/L) — MICROGRAMS PER LITER
- ND — NOT DETECTED
- NS — NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	1814.76
699-MW2	ND
699-MW3	NS
699-MW4	280.26
699-MW5	ND
699-MW6	738.94
699-MW8	ND
699-MW9	ND
699-MW12	ND
699-MW15	ND
699-MW16	ND
699-RW3	645.61
699-RW4	1.68
699-RW5	NS
699-RW11	ND

NOTE:

NJDEP CLASS II-A GWQS FOR XYLENES IS 1,000 µg/L.

DRAFTED BY: E.V. (N.J.)	XYLENES ISOPLETH MAP MARCH 2009
CHECKED BY:	U.S. ARMY BUILDING 699 FORT MONMOUTH OCEANPORT, NEW JERSEY
REVIEWED BY:	Groundwater & Environmental Services, Inc. 1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753
NORTH	SCALE IN FEET: 0 APPROXIMATE 80 / DATE: 8-23-11 / FIGURE: 7

M:\Graphics\0300-WallMisc\Industrial\Fort Monmouth\Building 699\Fort Monmouth (Bldg 699) SM.dwg, B-80 SM, EVega, 1:1

LEGEND

	TREES/SHRUBS
	ABANDONED MONITORING WELL
	MONITORING WELL
	RECOVERY WELL
	SPARGE POINT
	SOIL VAPOR EXTRACTION WELL
GWQS	GROUND WATER QUALITY STANDARD
(2.64)	LEAD CONCENTRATION (µg/L)
	LEAD CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
(µg/L)	MICROGRAMS PER LITER
ND	NOT DETECTED
NS	NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	2.64 ER
699-MW1	7.30
699-MW2	2.33 ER
699-MW3	NS
699-MW4	6.92
699-MW5	ND
699-MW6	6.11
699-MW8	ND
699-MW9	2.25 ER
699-MW12	2.09 ER
699-MW15	1.79 ER
699-MW16	ND
699-RW3	12.90
699-RW4	6.02
699-RW5	NS
699-RW11	2.47 ER

NOTE:

NJDEP CLASS II-A GWQS FOR LEAD IS 5 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

LEAD ISOPLETH MAP
MARCH 2009

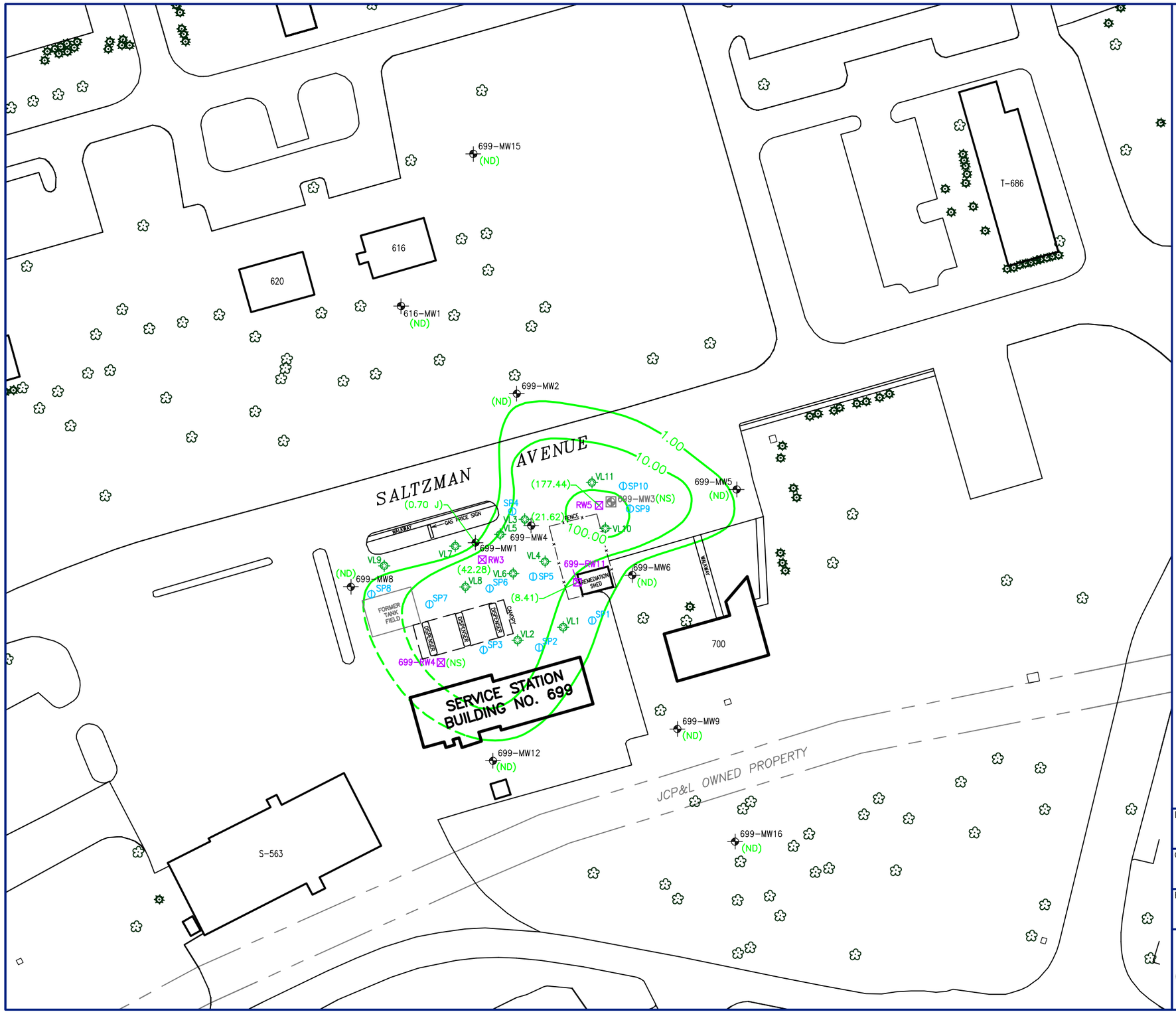
U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET
0 APPROXIMATE 80

DATE: 8-23-11

FIGURE: 8



LEGEND

- TREES/SHRUBS
- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SPARGE POINT
- SOIL VAPOR EXTRACTION WELL
- GWQS — GROUND WATER QUALITY STANDARD
- (21.62) — BENZENE CONCENTRATION (µg/L)
- BENZENE CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
- (µg/L) — MICROGRAMS PER LITER
- J — ESTIMATED CONCENTRATION
- ND — NOT DETECTED
- NS — NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	0.70 J
699-MW2	ND
699-MW3	NS
699-MW4	21.62
699-MW5	ND
699-MW6	ND
699-MW8	ND
699-MW9	ND
699-MW12	ND
699-MW15	ND
699-MW16	ND
699-RW3	42.28
699-RW4	NS
699-RW5	177.44
699-RW11	8.41

NOTE:

NJDEP CLASS II-A GWQS FOR BENZENE IS 1 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

BENZENE ISOPLETH MAP
JUNE 2009

U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET
0 APPROXIMATE 80

DATE: 8-23-11

FIGURE: 9

LEGEND

- TREES/SHRUBS
- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SPARGE POINT
- SOIL VAPOR EXTRACTION WELL
- GWQS — GROUND WATER QUALITY STANDARD
- (119.70) — TBA CONCENTRATION (µg/L)
- TBA CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
- TBA — *tert*–BUTYL ALCOHOL
- (µg/L) — MICROGRAMS PER LITER
- ND — NOT DETECTED
- NS — NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	ND
699-MW2	ND
699-MW3	NS
699-MW4	ND
699-MW5	ND
699-MW6	ND
699-MW8	ND
699-MW9	ND
699-MW12	ND
699-MW15	ND
699-MW16	ND
699-RW3	ND
699-RW4	NS
699-RW5	139.97
699-RW11	119.70

NOTE:

NJDEP CLASS II–A GWQS FOR TBA IS 100 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

TBA ISOPLETH MAP
JUNE 2009

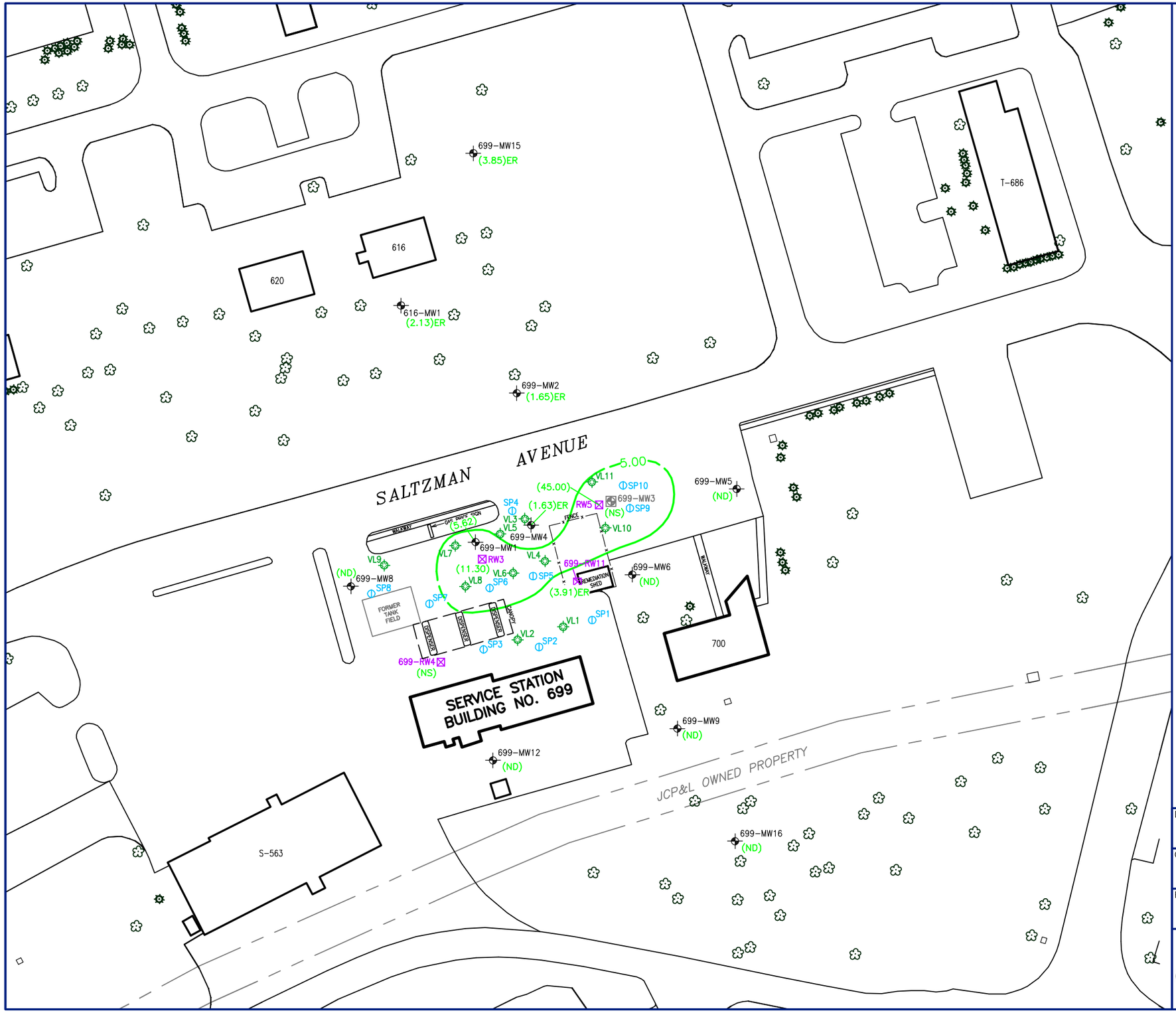
U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET
0 APPROXIMATE 80

DATE: 8–23–11

FIGURE: 10



LEGEND

	TREES/SHRUBS
	ABANDONED MONITORING WELL
	MONITORING WELL
	RECOVERY WELL
	SPARGE POINT
	SOIL VAPOR EXTRACTION WELL
GWQS	GROUND WATER QUALITY STANDARD
(2.13)	LEAD CONCENTRATION (µg/L)
	LEAD CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
(µg/L)	MICROGRAMS PER LITER
ER	ESTIMATED RESULT
ND	NOT DETECTED
NS	NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	2.13 ER
699-MW1	5.62
699-MW2	1.65 ER
699-MW3	NS
699-MW4	1.63 ER
699-MW5	ND
699-MW6	ND
699-MW8	ND
699-MW9	ND
699-MW12	ND
699-MW15	3.85 ER
699-MW16	ND
699-RW3	11.30
699-RW4	NS
699-RW5	45.00
699-RW11	3.91 ER

NOTE:

NJDEP CLASS II-A GWQS FOR LEAD IS 5 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

LEAD ISOPLETH MAP
JUNE 2009

U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET
0 APPROXIMATE 80

DATE: 8-23-11

FIGURE: 11

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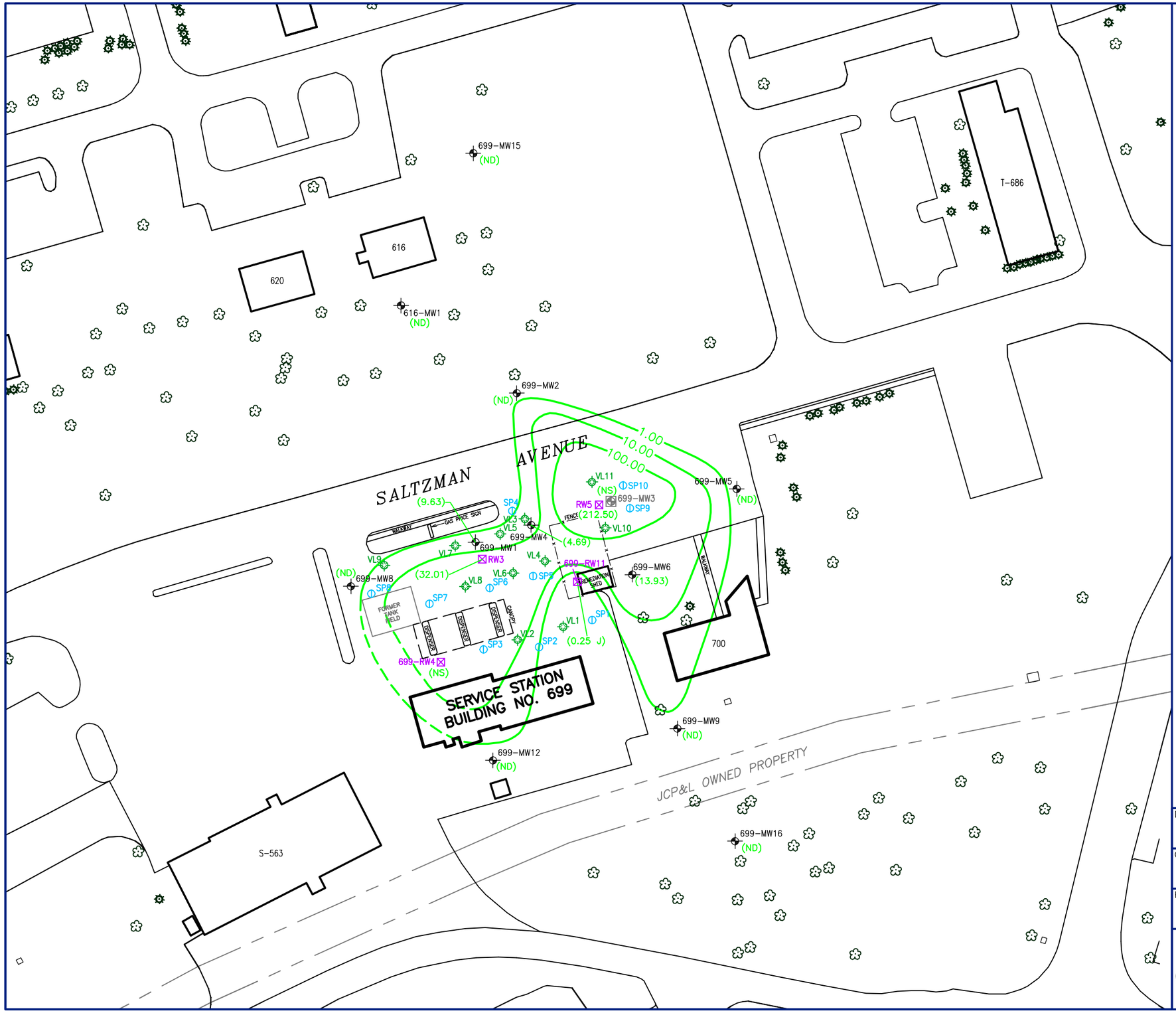

LEGEND

- TREES/SHRUBS
- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SPARGE POINT
- SOIL VAPOR EXTRACTION WELL
- GWQS — GROUND WATER QUALITY STANDARD
- (7.66) — BENZENE CONCENTRATION (µg/L)
- BENZENE CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
- (µg/L) — MICROGRAMS PER LITER
- J — ESTIMATED CONCENTRATION
- ND — NOT DETECTED
- NS — NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	9.63
699-MW2	ND
699-MW3	NS
699-MW4	4.69
699-MW5	ND
699-MW6	13.93
699-MW8	ND
699-MW9	ND
699-MW12	ND
699-MW15	ND
699-MW16	ND
699-RW3	32.01
699-RW4	NS
699-RW5	212.50
699-RW11	0.25 J

NOTE:

NJDEP CLASS II-A GWQS FOR BENZENE IS 1 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

BENZENE ISOPLETH MAP
AUGUST 2009

U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET
0 APPROXIMATE 80

DATE: 8-23-11

FIGURE: 12

LEGEND

- TREES/SHRUBS
- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SPARGE POINT
- SOIL VAPOR EXTRACTION WELL
- GWQS — GROUND WATER QUALITY STANDARD
- (6.56) — ETHYLBENZENE CONCENTRATION (µg/L)
- ETHYLBENZENE CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
- (µg/L) — MICROGRAMS PER LITER
- ND — NOT DETECTED
- NS — NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	587.78
699-MW2	ND
699-MW3	NS
699-MW4	5.46
699-MW5	ND
699-MW6	735.48
699-MW8	ND
699-MW9	ND
699-MW12	ND
699-MW15	ND
699-MW16	ND
699-RW3	78.96
699-RW4	NS
699-RW5	178.64
699-RW11	ND

NOTE:

NJDEP CLASS II-A GWQS FOR ETHYLBENZENE IS 700 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

ETHYLBENZENE ISOPLETH MAP
AUGUST 2009

U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET	DATE	FIGURE
0 APPROXIMATE 80	8-23-11	13

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LEGEND

	TREES/SHRUBS
	ABANDONED MONITORING WELL
	MONITORING WELL
	RECOVERY WELL
	SPARGE POINT
	SOIL VAPOR EXTRACTION WELL
GWQS	GROUND WATER QUALITY STANDARD
(556.52)	XYLENES CONCENTRATION (µg/L)
	XYLENES CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
(µg/L)	MICROGRAMS PER LITER
ND	NOT DETECTED
NS	NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	1472.89
699-MW2	ND
699-MW3	NS
699-MW4	12.28
699-MW5	ND
699-MW6	1194.72
699-MW8	ND
699-MW9	ND
699-MW12	ND
699-MW15	ND
699-MW16	ND
699-RW3	114.58
699-RW4	NS
699-RW5	556.52
699-RW11	ND

NOTE:

NJDEP CLASS II-A GWQS FOR XYLENES IS 1,000 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

XYLENES ISOPLETH MAP
AUGUST 2009

U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET	DATE	FIGURE
0 APPROXIMATE 80	8-23-11	14

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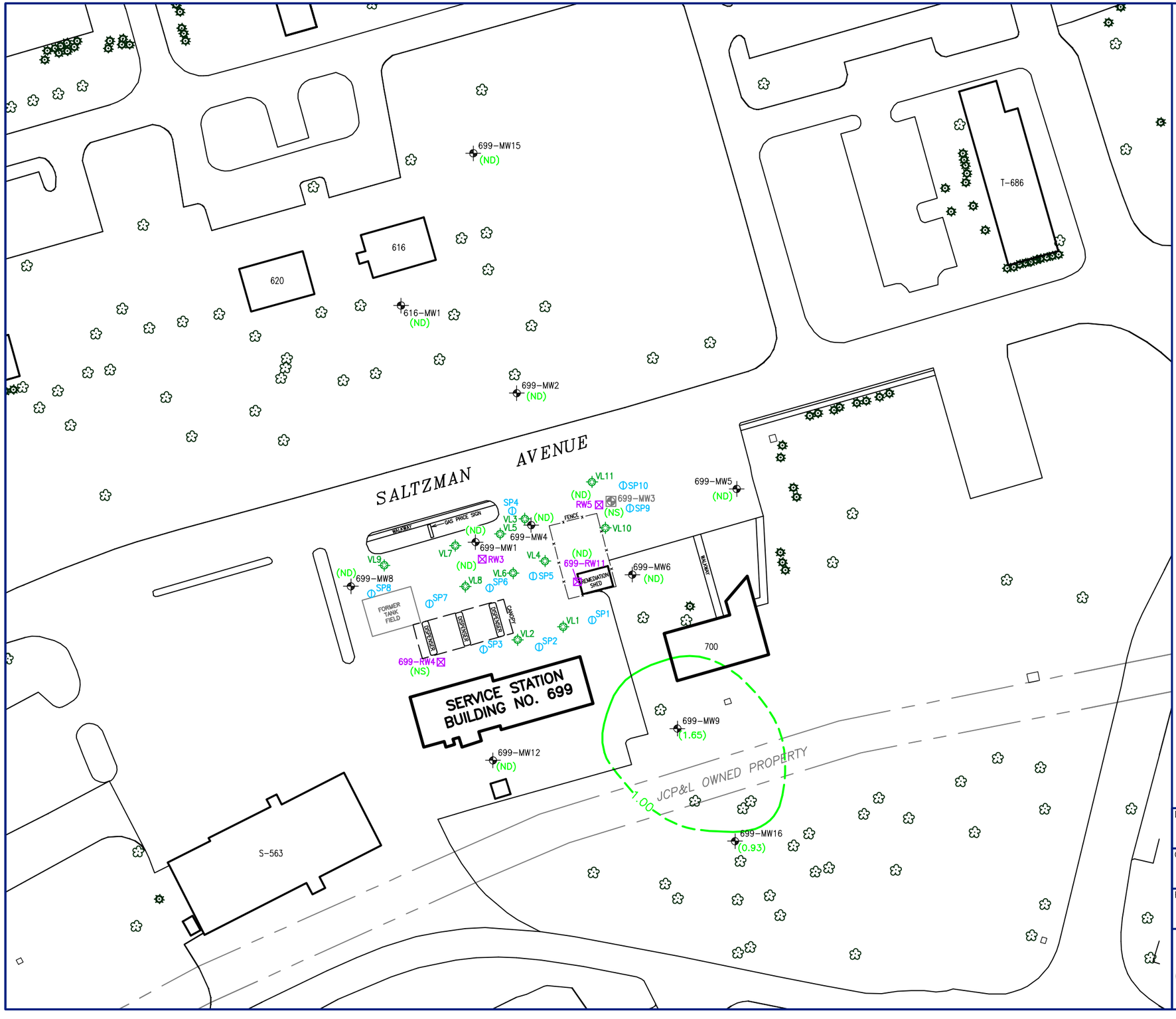


LEGEND

	TREES/SHRUBS
	ABANDONED MONITORING WELL
	MONITORING WELL
	RECOVERY WELL
	SPARGE POINT
	SOIL VAPOR EXTRACTION WELL
GWQS	GROUND WATER QUALITY STANDARD
(1.65)	PCE CONCENTRATION (µg/L)
	PCE CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
PCE	TETRACHLOROETHYLENE
(µg/L)	MICROGRAMS PER LITER
ND	NOT DETECTED
NS	NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	ND
699-MW2	ND
699-MW3	NS
699-MW4	ND
699-MW5	ND
699-MW6	ND
699-MW8	ND
699-MW9	1.65
699-MW12	ND
699-MW15	ND
699-MW16	0.93
699-RW3	ND
699-RW4	NS
699-RW5	ND
699-RW11	ND

NOTE:

NJDEP CLASS II-A GWQS FOR PCE IS 1 µg/L.

DRAFTED BY: E.V. (N.J.)	PCE ISOPLETH MAP AUGUST 2009
CHECKED BY:	U.S. ARMY BUILDING 699 FORT MONMOUTH OCEANPORT, NEW JERSEY
REVIEWED BY:	Groundwater & Environmental Services, Inc. 1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753
NORTH	SCALE IN FEET: 0 APPROXIMATE 80 / DATE: 8-23-11 / FIGURE: 15

M:\Graphics\0300-WallMisc\Industrial\Fort Monmouth\Building 699\Fort Monmouth (Bldg 699) SM.dwg, B-80 SM, EVega, 1:1

LEGEND

- TREES/SHRUBS
- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SPARGE POINT
- SOIL VAPOR EXTRACTION WELL
- GWQS — GROUND WATER QUALITY STANDARD
- (6.56) — BENZENE CONCENTRATION (µg/L)
- BENZENE CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
- (µg/L) — MICROGRAMS PER LITER
- ND — NOT DETECTED
- NS — NOT SAMPLED
- J — ESTIMATED CONCENTRATION

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	6.56
699-MW2	ND
699-MW3	NS
699-MW4	7.34
699-MW5	ND
699-MW6	2.08
699-MW8	ND
699-MW9	ND
699-MW12	ND
699-MW15	ND
699-MW16	ND
699-RW3	13.49
699-RW4	NS
699-RW5	2.87
699-RW11	4.06

NOTE:

NJDEP CLASS II-A GWQS FOR BENZENE IS 1 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

BENZENE ISOPLETH MAP
NOVEMBER 2009

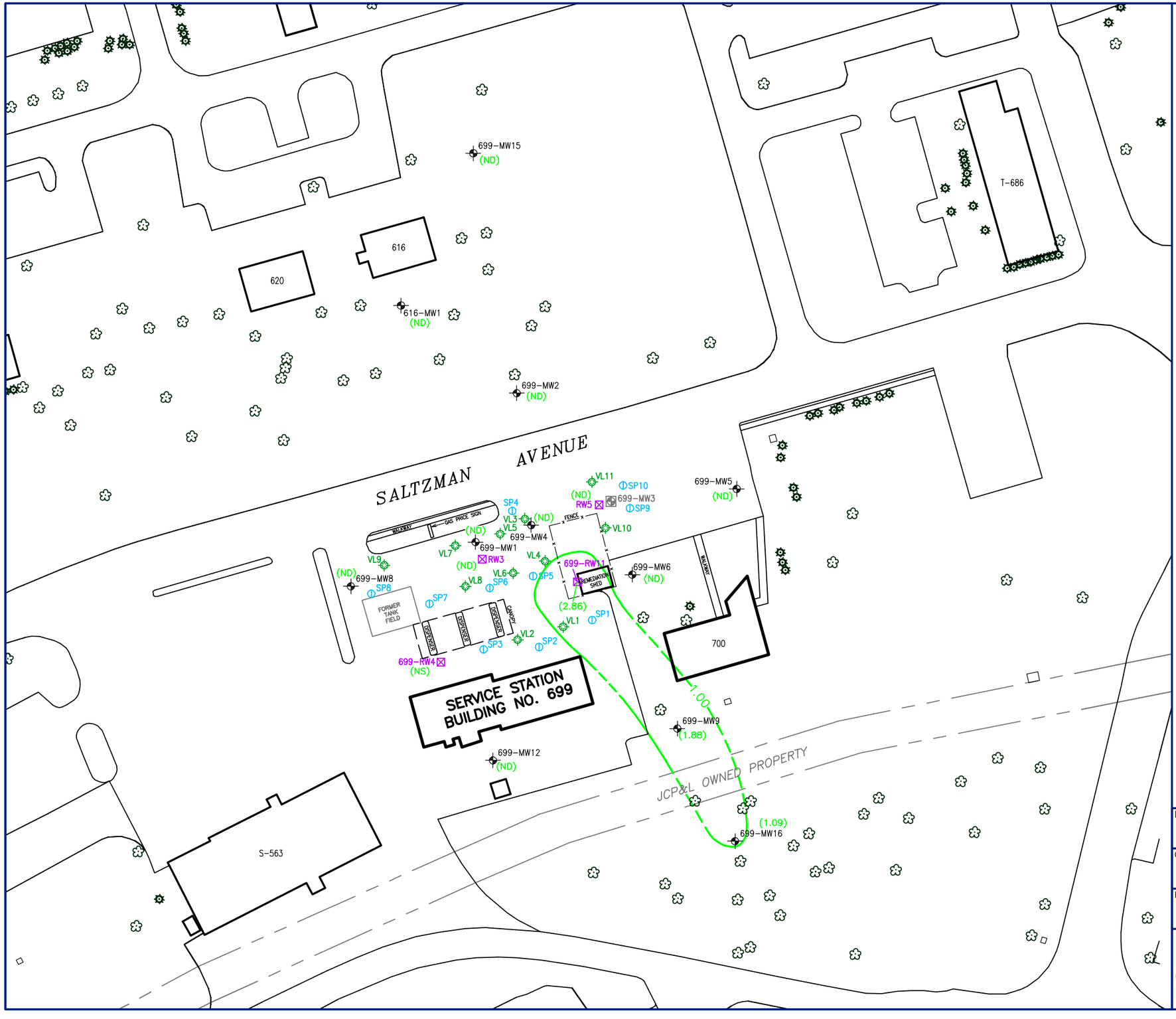
U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET
0 APPROXIMATE 80

DATE: 8-23-11

FIGURE: 16



LEGEND

	TREES/SHRUBS
	ABANDONED MONITORING WELL
	MONITORING WELL
	RECOVERY WELL
	SPARGE POINT
	SOIL VAPOR EXTRACTION WELL
GWQS	GROUND WATER QUALITY STANDARD
(1.88)	PCE CONCENTRATION (µg/L)
	PCE CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
PCE	TETRACHLOROETHYLENE
(µg/L)	MICROGRAMS PER LITER
ND	NOT DETECTED
NS	NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	ND
699-MW2	ND
699-MW3	NS
699-MW4	ND
699-MW5	ND
699-MW6	ND
699-MW8	ND
699-MW9	1.88
699-MW12	ND
699-MW15	ND
699-MW16	1.09
699-RW3	ND
699-RW4	NS
699-RW5	ND
699-RW11	2.86

NOTE:

NJDEP CLASS II-A GWQS FOR PCE IS 1 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

PCE ISOPLETH MAP
NOVEMBER 2009

U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET	DATE	FIGURE
0 APPROXIMATE 80	8-23-11	17

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LEGEND

- TREES/SHRUBS
- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SPARGE POINT
- SOIL VAPOR EXTRACTION WELL
- GWQS — GROUND WATER QUALITY STANDARD
- (185.93) — TBA CONCENTRATION (µg/L)
- TBA CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
- TBA — *tert*–BUTYL ALCOHOL
- (µg/L) — MICROGRAMS PER LITER
- ND — NOT DETECTED
- NS — NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	ND
699-MW2	ND
699-MW3	NS
699-MW4	ND
699-MW5	ND
699-MW6	ND
699-MW8	ND
699-MW9	ND
699-MW12	ND
699-MW15	ND
699-MW16	ND
699-RW3	ND
699-RW4	NS
699-RW5	ND
699-RW11	185.93

NOTE:

NJDEP CLASS II–A GWQS FOR TBA IS 100 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

TBA ISOPLETH MAP
NOVEMBER 2009

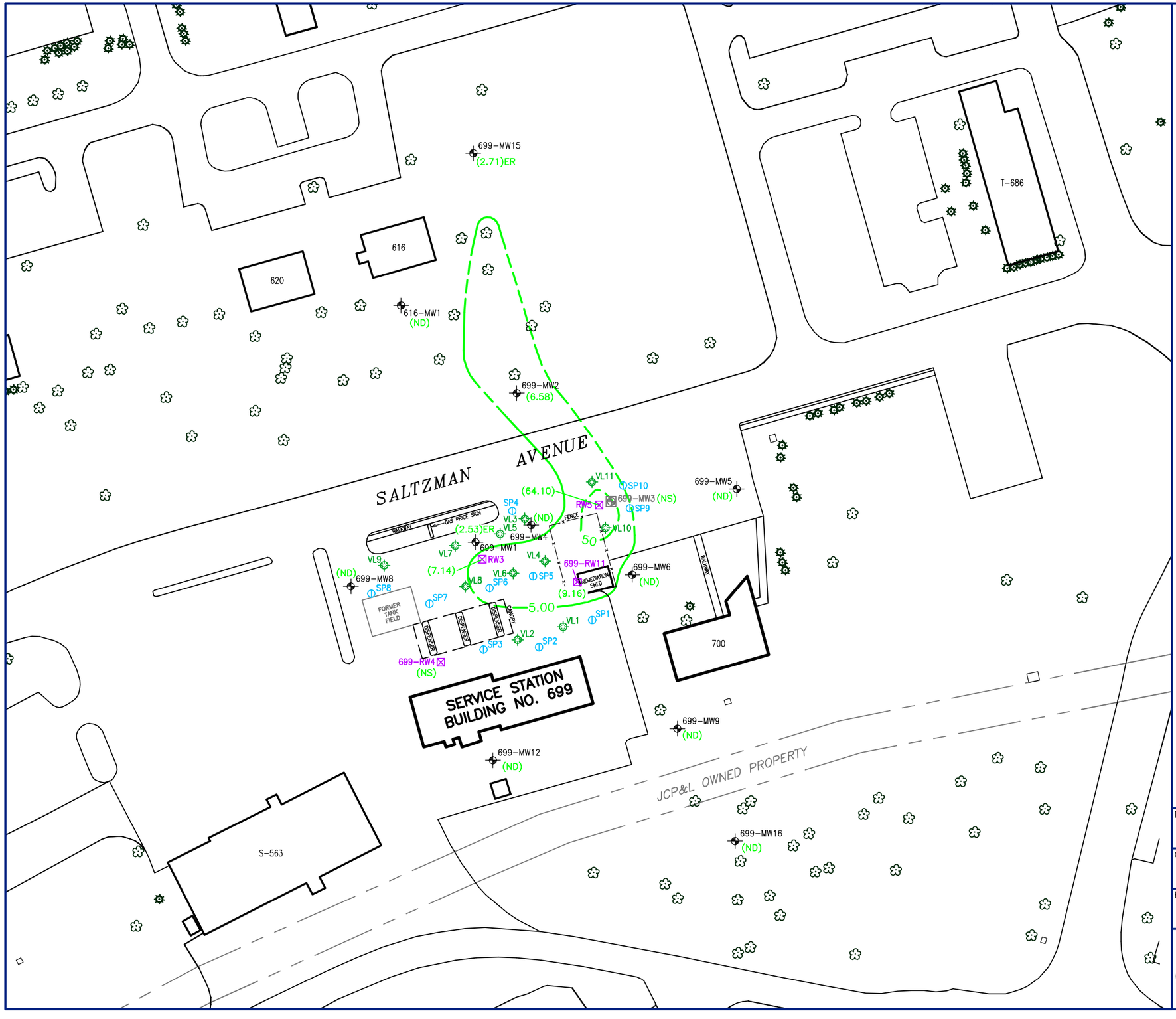
U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET
0 APPROXIMATE 80

DATE: 8–23–11

FIGURE: 18



LEGEND

- TREES/SHRUBS
- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SPARGE POINT
- SOIL VAPOR EXTRACTION WELL
- GWQS — GROUND WATER QUALITY STANDARD
- (2.53) — LEAD CONCENTRATION (µg/L)
- LEAD CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
- (µg/L) — MICROGRAMS PER LITER
- ER — ESTIMATED RESULT
- ND — NOT DETECTED
- NS — NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	2.53 ER
699-MW2	6.58
699-MW3	NS
699-MW4	ND
699-MW5	ND
699-MW6	ND
699-MW8	ND
699-MW9	ND
699-MW12	ND
699-MW15	2.71 ER
699-MW16	ND
699-RW3	7.14
699-RW4	NS
699-RW5	64.10
699-RW11	9.16

NOTE:

NJDEP CLASS II-A GWQS FOR LEAD IS 5 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

LEAD ISOPLETH MAP
NOVEMBER 2009

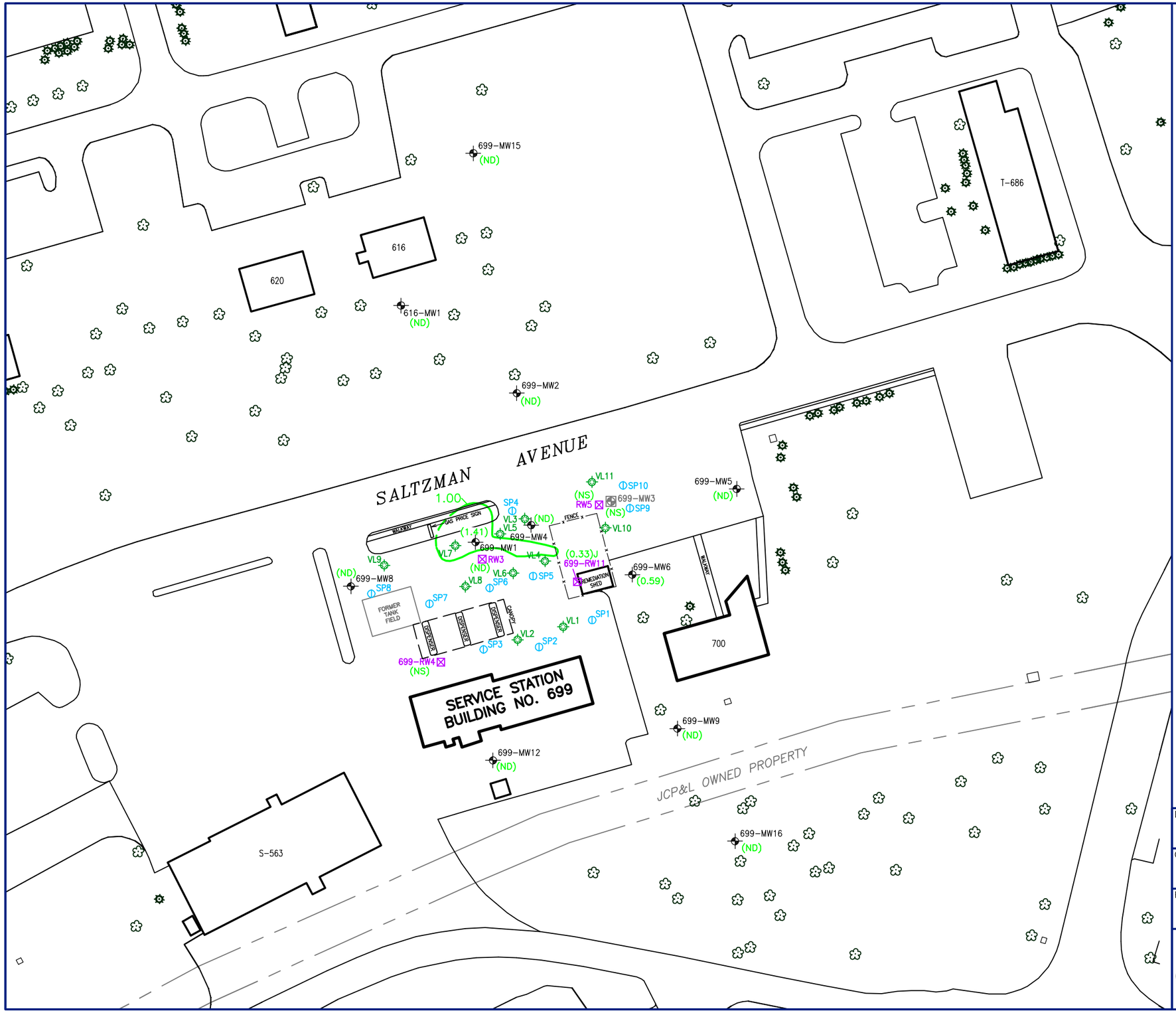
U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET: 0 APPROXIMATE 80

DATE: 8-23-11

FIGURE: 19



LEGEND

- TREES/SHRUBS
- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SPARGE POINT
- SOIL VAPOR EXTRACTION WELL
- GWQS — GROUND WATER QUALITY STANDARD
- (1.41) — BENZENE CONCENTRATION (µg/L)
- BENZENE CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
- (µg/L) — MICROGRAMS PER LITER
- J — ESTIMATED CONCENTRATION
- ND — NOT DETECTED
- NS — NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	1.41
699-MW2	ND
699-MW3	NS
699-MW4	ND
699-MW5	ND
699-MW6	0.59
699-MW8	ND
699-MW9	ND
699-MW12	ND
699-MW15	ND
699-MW16	ND
699-RW3	ND
699-RW4	NS
699-RW5	NS
699-RW11	0.33 J

NOTE:

NJDEP CLASS II-A GWQS FOR BENZENE IS 1 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

BENZENE ISOPLETH MAP
MARCH 2010

U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

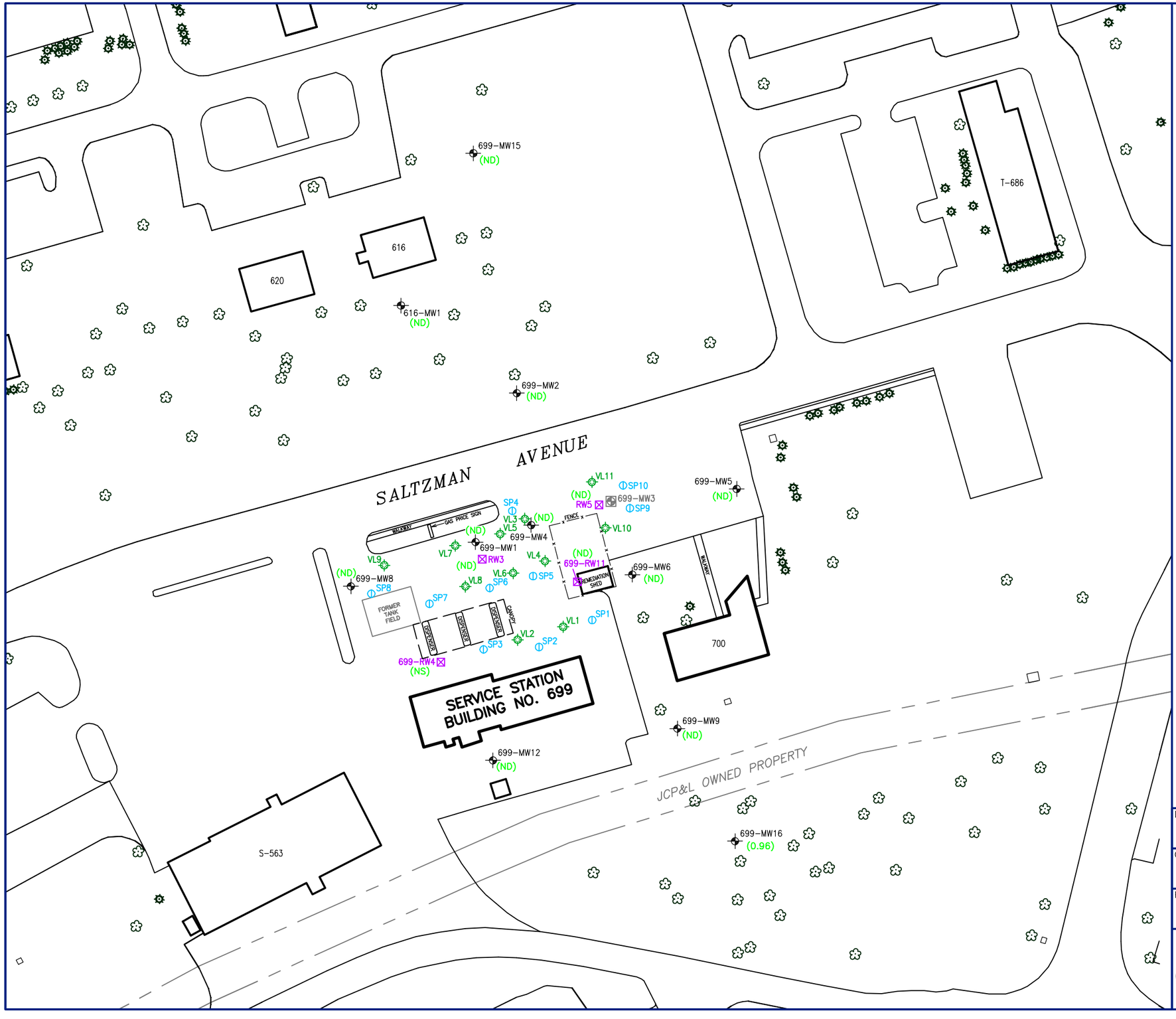
Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET
0 APPROXIMATE 80

DATE: 8-23-11

FIGURE: 20

M:\Graphics\0300-WallMisc\Industrial\Fort Monmouth\Building 699\Fort Monmouth (Bldg 699) SM.dwg, B-80 SM, EVega, 1:1



LEGEND

	TREES/SHRUBS
	ABANDONED MONITORING WELL
	MONITORING WELL
	RECOVERY WELL
	SPARGE POINT
	SOIL VAPOR EXTRACTION WELL
GWQS	GROUND WATER QUALITY STANDARD
(0.96)	PCE CONCENTRATION (µg/L)
PCE	TETRACHLOROETHYLENE
(µg/L)	MICROGRAMS PER LITER
ND	NOT DETECTED
NS	NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	ND
699-MW2	ND
699-MW3	NS
699-MW4	ND
699-MW5	ND
699-MW6	ND
699-MW8	ND
699-MW9	ND
699-MW12	ND
699-MW15	ND
699-MW16	0.96
699-RW3	ND
699-RW4	NS
699-RW5	NS
699-RW11	ND

NOTE:

NJDEP CLASS II-A GWQS FOR PCE IS 1 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

PCE ISOPLETH MAP
MARCH 2010

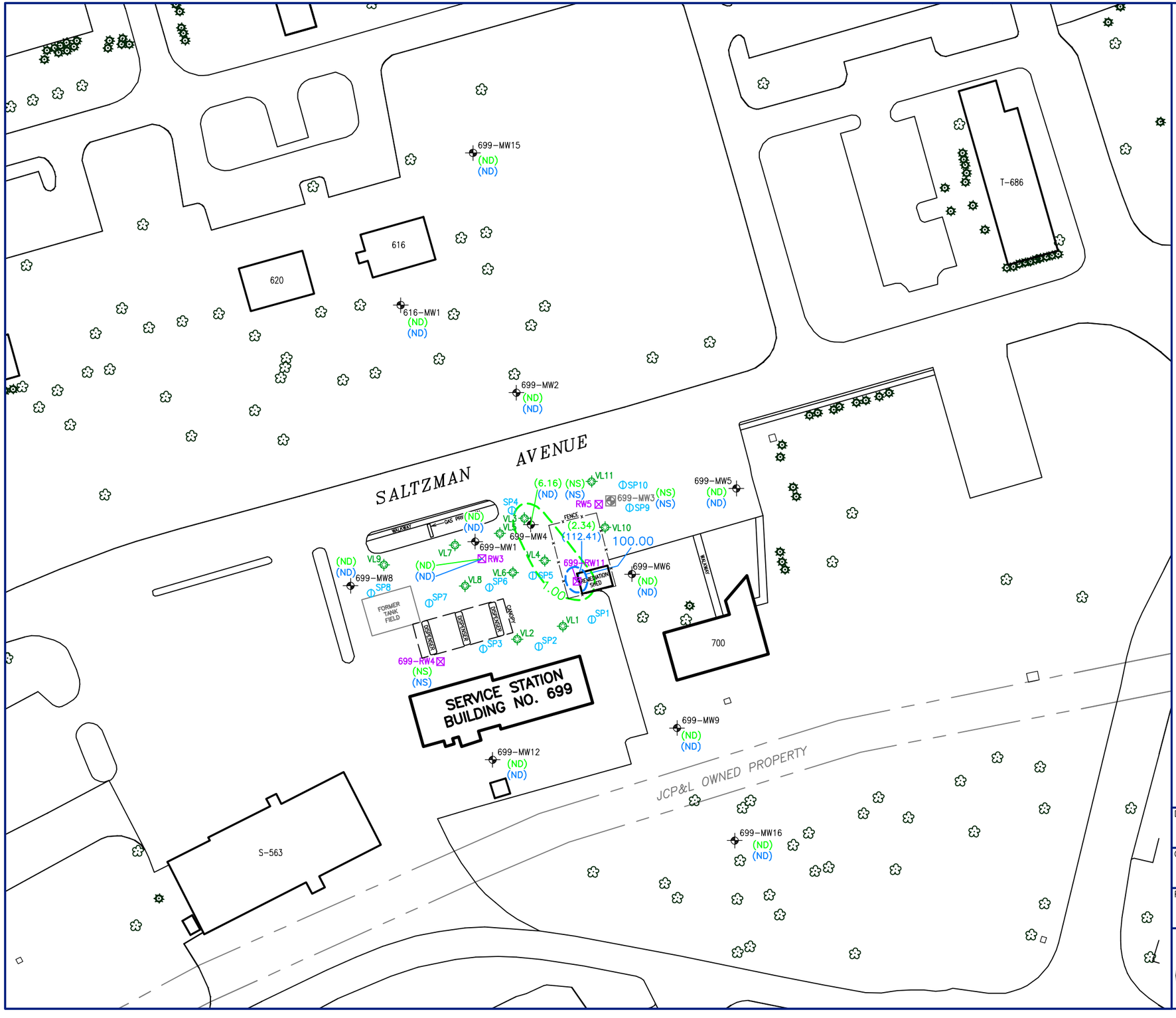
U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET
0 APPROXIMATE 80

DATE
8-23-11

FIGURE
21



LEGEND

	TREES/SHRUBS
	ABANDONED MONITORING WELL
	MONITORING WELL
	RECOVERY WELL
	SPARGE POINT
	SOIL VAPOR EXTRACTION WELL
GWQS	GROUND WATER QUALITY STANDARD
(6.16)	MTBE CONCENTRATION (µg/L)
(112.41)	TBA CONCENTRATION (µg/L)
	MTBE CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
	TBA CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
MTBE	METHYL *tert*-BUTYL ETHER
TBA	*tert*-BUTYL ALCOHOL
(µg/L)	MICROGRAMS PER LITER
ND	NOT DETECTED
NS	NOT SAMPLED

Well ID	Concentration MTBE µg/L	Concentration TBA µg/L
616-MW1	ND	ND
699-MW1	ND	ND
699-MW2	ND	ND
699-MW3	NS	NS
699-MW4	6.16	ND
699-MW5	ND	ND
699-MW6	ND	ND
699-MW8	ND	ND
699-MW9	ND	ND
699-MW12	ND	ND
699-MW15	ND	ND
699-MW16	ND	ND
699-RW3	ND	ND
699-RW4	NS	NS
699-RW5	NS	NS
699-RW11	2.34	112.41

NOTES:

NJDEP CLASS II-A GWQS FOR MTBE IS 70 µg/L.

NJDEP CLASS II-A GWQS FOR TBA IS 100 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

MTBE & TBA ISOPLETH MAP
MARCH 2010

U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

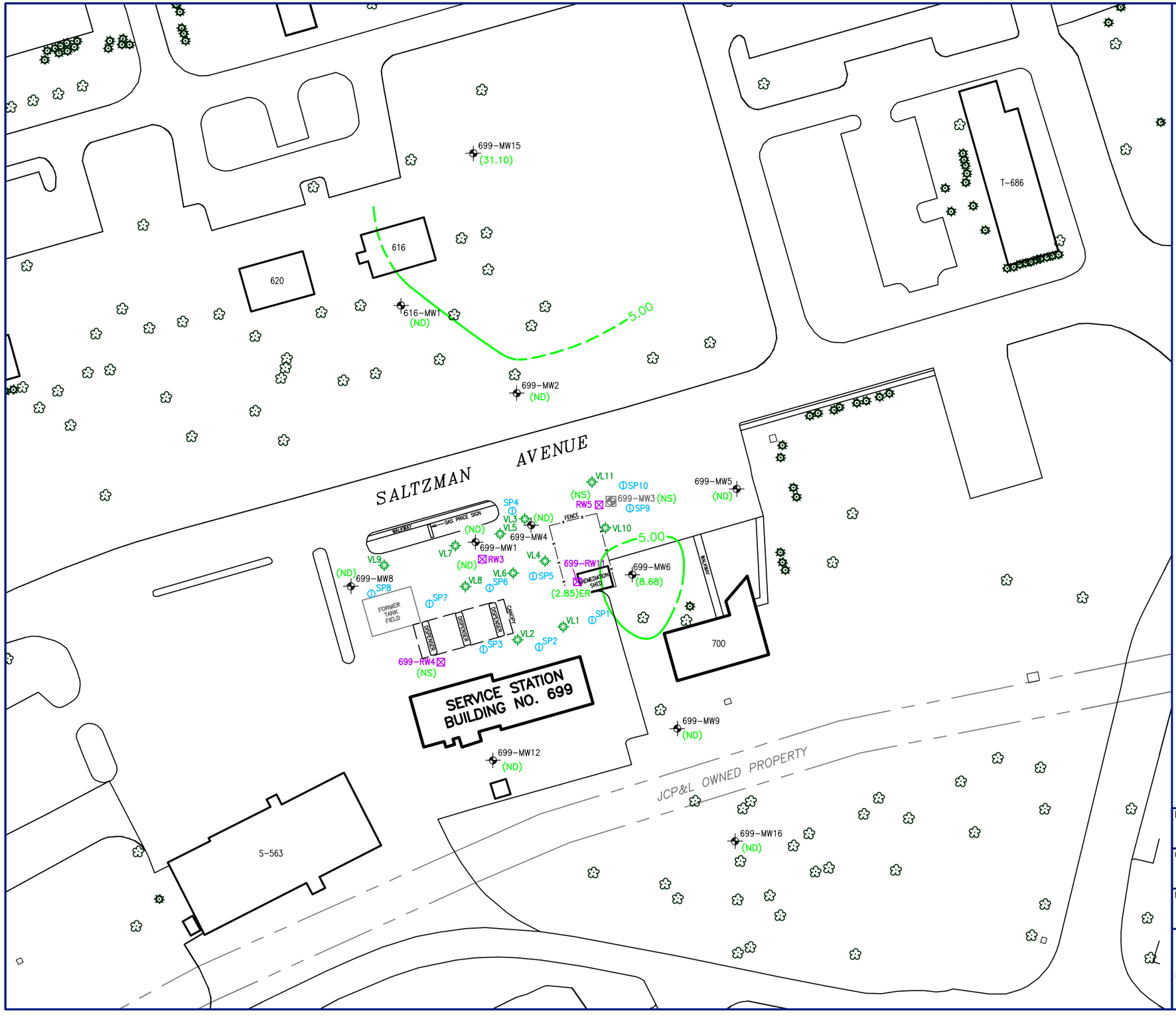
Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

NORTH

SCALE IN FEET
0 APPROXIMATE 80

DATE
8-23-11

FIGURE
22



LEGEND

	TREES/SHRUBS
	ABANDONED MONITORING WELL
	MONITORING WELL
	RECOVERY WELL
	SPARGE POINT
	SOIL VAPOR EXTRACTION WELL
GWQS	GROUND WATER QUALITY STANDARD
(8.68)	LEAD CONCENTRATION (µg/L)
	LEAD CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
(µg/L)	MICROGRAMS PER LITER
ER	ESTIMATED RESULT
ND	NOT DETECTED
NS	NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	ND
699-MW2	ND
699-MW3	NS
699-MW4	ND
699-MW5	ND
699-MW6	8.68
699-MW8	ND
699-MW9	ND
699-MW12	ND
699-MW15	31.10
699-MW16	ND
699-RW3	ND
699-RW4	NS
699-RW5	NS
699-RW11	2.85 ER

NOTE:

NJDEP CLASS II-A GWQS FOR LEAD IS 5 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

LEAD ISOPLETH MAP
MARCH 2010

U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET
0 APPROXIMATE 80

DATE: 8-23-11

FIGURE: 23

LEGEND

- TREES/SHRUBS
- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SPARGE POINT
- SOIL VAPOR EXTRACTION WELL
- GWQS — GROUND WATER QUALITY STANDARD
- (1.03) — BENZENE CONCENTRATION (µg/L)
- BENZENE CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
- (µg/L) — MICROGRAMS PER LITER
- ND — NOT DETECTED
- NS — NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	0.99
699-MW2	ND
699-MW3	NS
699-MW4	ND
699-MW5	ND
699-MW6	1.03
699-MW8	ND
699-MW9	ND
699-MW12	ND
699-MW15	ND
699-MW16	ND
699-RW3	11.29
699-RW4	NS
699-RW5	8.64
699-RW11	6.11

NOTE:

NJDEP CLASS II-A GWQS FOR BENZENE IS 1 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

BENZENE ISOPLETH MAP
JUNE 2010

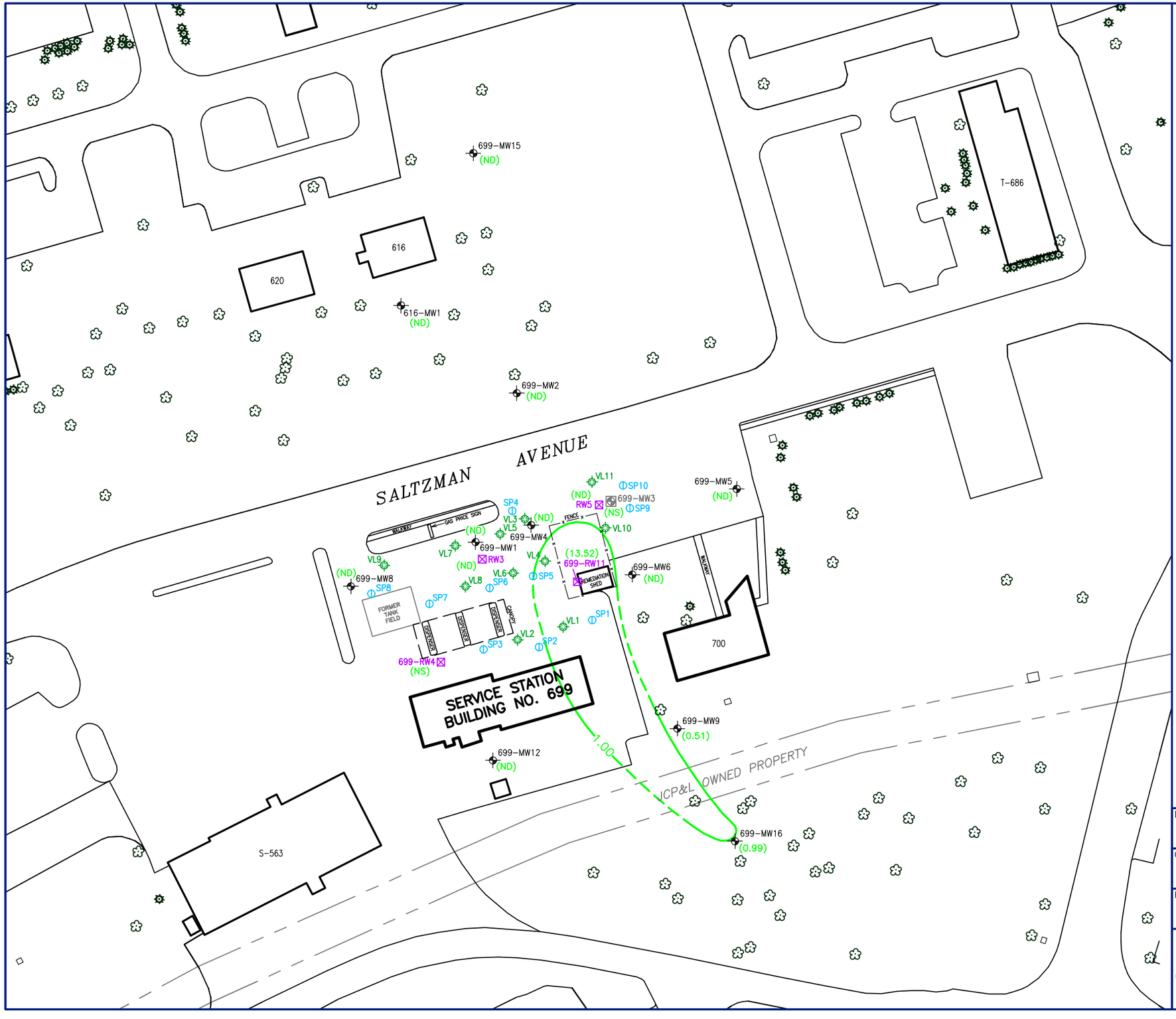
U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET
0 APPROXIMATE 80

DATE: 8-23-11

FIGURE: 24



LEGEND

	TREES/SHRUBS
	ABANDONED MONITORING WELL
	MONITORING WELL
	RECOVERY WELL
	SPARGE POINT
	SOIL VAPOR EXTRACTION WELL
GWQS	GROUND WATER QUALITY STANDARD
(13.52)	PCE CONCENTRATION (µg/L)
	PCE CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
PCE	TETRACHLOROETHYLENE
(µg/L)	MICROGRAMS PER LITER
ND	NOT DETECTED
NS	NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	ND
699-MW2	ND
699-MW3	NS
699-MW4	ND
699-MW5	ND
699-MW6	ND
699-MW8	ND
699-MW9	0.51
699-MW12	ND
699-MW15	ND
699-MW16	0.99
699-RW3	ND
699-RW4	NS
699-RW5	ND
699-RW11	13.52

NOTE:

NJDEP CLASS II-A GWQS FOR PCE IS 1 µg/L.

DRAFTED BY: E.V. (N.J.)	PCE ISOPLETH MAP JUNE 2010
CHECKED BY:	U.S. ARMY BUILDING 699 FORT MONMOUTH OCEANPORT, NEW JERSEY
REVIEWED BY:	Groundwater & Environmental Services, Inc. 1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753
NORTH	SCALE IN FEET: 0 APPROXIMATE 80 / DATE: 8-23-11 / FIGURE: 25

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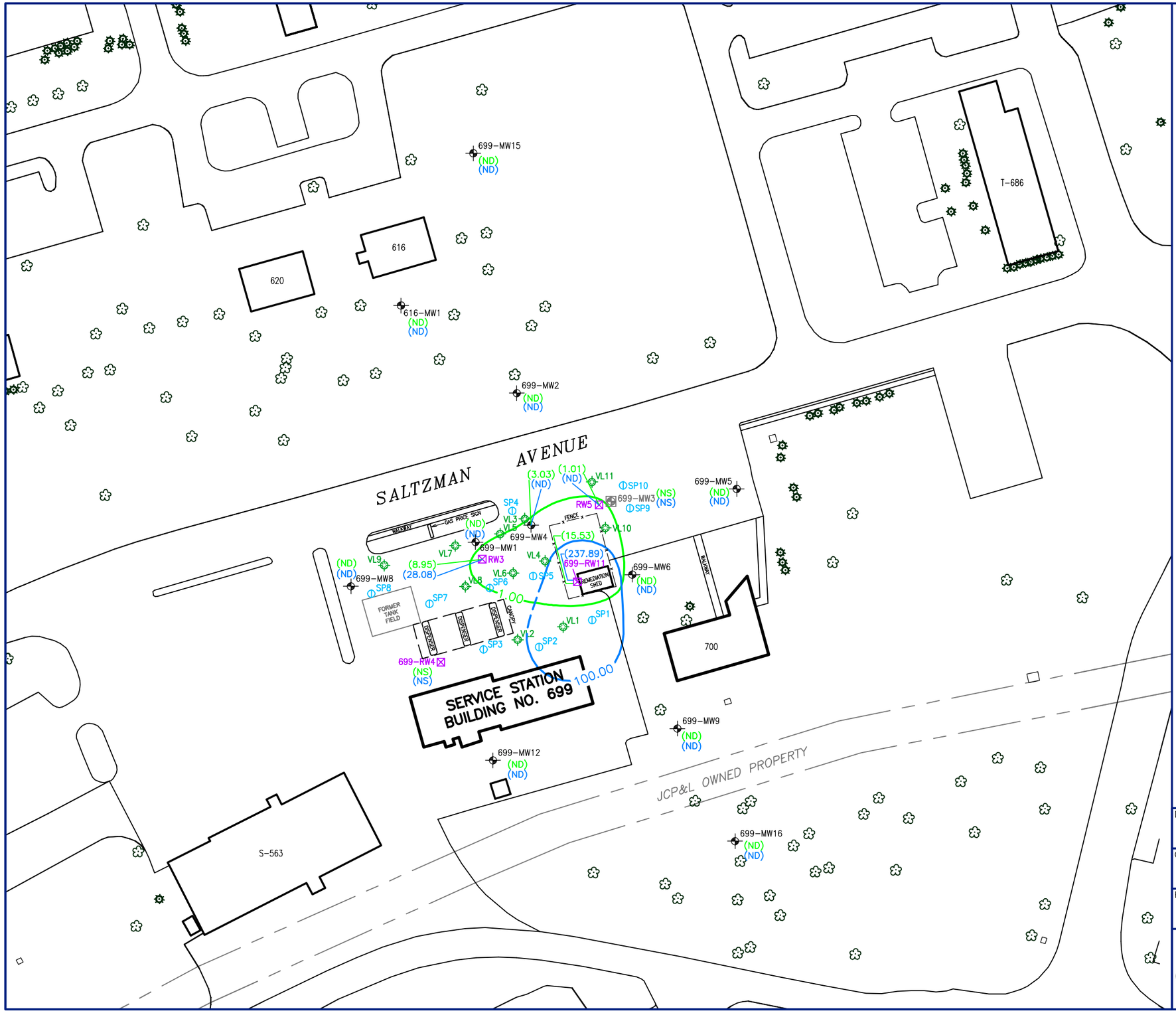


LEGEND

- TREES/SHRUBS
- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SPARGE POINT
- SOIL VAPOR EXTRACTION WELL
- GWQS — GROUND WATER QUALITY STANDARD
- (3.03) — MTBE CONCENTRATION (µg/L)
- (28.08) — TBA CONCENTRATION (µg/L)
- MTBE CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
- TBA CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
- MTBE — METHYL *tert*–BUTYL ETHER
- TBA — *tert*–BUTYL ALCOHOL
- (µg/L) — MICROGRAMS PER LITER
- ND — NOT DETECTED
- NS — NOT SAMPLED

Well ID	Concentration MTBE µg/L	Concentration TBA µg/L
616-MW1	ND	ND
699-MW1	ND	ND
699-MW2	ND	ND
699-MW3	NS	NS
699-MW4	3.03	ND
699-MW5	ND	ND
699-MW6	ND	ND
699-MW8	ND	ND
699-MW9	ND	ND
699-MW12	ND	ND
699-MW15	ND	ND
699-MW16	ND	ND
699-RW3	8.95	28.08
699-RW4	NS	NS
699-RW5	1.01	ND
699-RW11	15.53	237.89

NOTE:

NJDEP CLASS II–A GWQS FOR MTBE IS 70 µg/L.

NJDEP CLASS II–A GWQS FOR TBA IS 100 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

MTBE & TBA ISOPLETH MAP
JUNE 2010

U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

NORTH

SCALE IN FEET
0 APPROXIMATE 80

DATE
8–23–11

FIGURE
26

M:\Graphics\0300-WallMisc\Industrial\Fort Monmouth\Building 699\Fort Monmouth (Bldg 699) SM.dwg, B-80 SM, EVega, 1:1

LEGEND

- TREES/SHRUBS
- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SPARGE POINT
- SOIL VAPOR EXTRACTION WELL
- GWQS — GROUND WATER QUALITY STANDARD
- (2.74) — LEAD CONCENTRATION (µg/L)
- LEAD CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
- (µg/L) — MICROGRAMS PER LITER
- ER — ESTIMATED RESULT
- ND — NOT DETECTED
- NS — NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	ND
699-MW2	3.05 ER
699-MW3	NS
699-MW4	ND
699-MW5	ND
699-MW6	ND
699-MW8	2.74 ER
699-MW9	ND
699-MW12	ND
699-MW15	3.5 ER
699-MW16	ND
699-RW3	29.30
699-RW4	NS
699-RW5	ND
699-RW11	24.20

NOTE:

NJDEP CLASS II-A GWQS FOR LEAD IS 5 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

LEAD ISOPLETH MAP
JUNE 2010

U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET
0 APPROXIMATE 80

DATE: 8-23-11

FIGURE: 27

M:\Graphics\0300-WallMisc\Industrial\Fort Monmouth\Building 699\Fort Monmouth (Bldg 699) SM.dwg, B-80 SM, EVega, 1:1

LEGEND

- TREES/SHRUBS
- ABANDONED MONITORING WELL
- MONITORING WELL
- RECOVERY WELL
- SPARGE POINT
- SOIL VAPOR EXTRACTION WELL
- GWQS — GROUND WATER QUALITY STANDARD
- (1.03) — BENZENE CONCENTRATION (µg/L)
- BENZENE CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
- (µg/L) — MICROGRAMS PER LITER
- ND — NOT DETECTED
- NS — NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	9.65
699-MW2	ND
699-MW3	NS
699-MW4	9.07
699-MW5	ND
699-MW6	4.22
699-MW8	ND
699-MW9	ND
699-MW12	ND
699-MW15	ND
699-MW16	ND
699-RW3	1.30
699-RW4	NS
699-RW5	2.20
699-RW11	ND

NOTE:

NJDEP CLASS II-A GWQS FOR BENZENE IS 1 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

BENZENE ISOPLETH MAP SEPTEMBER 2010

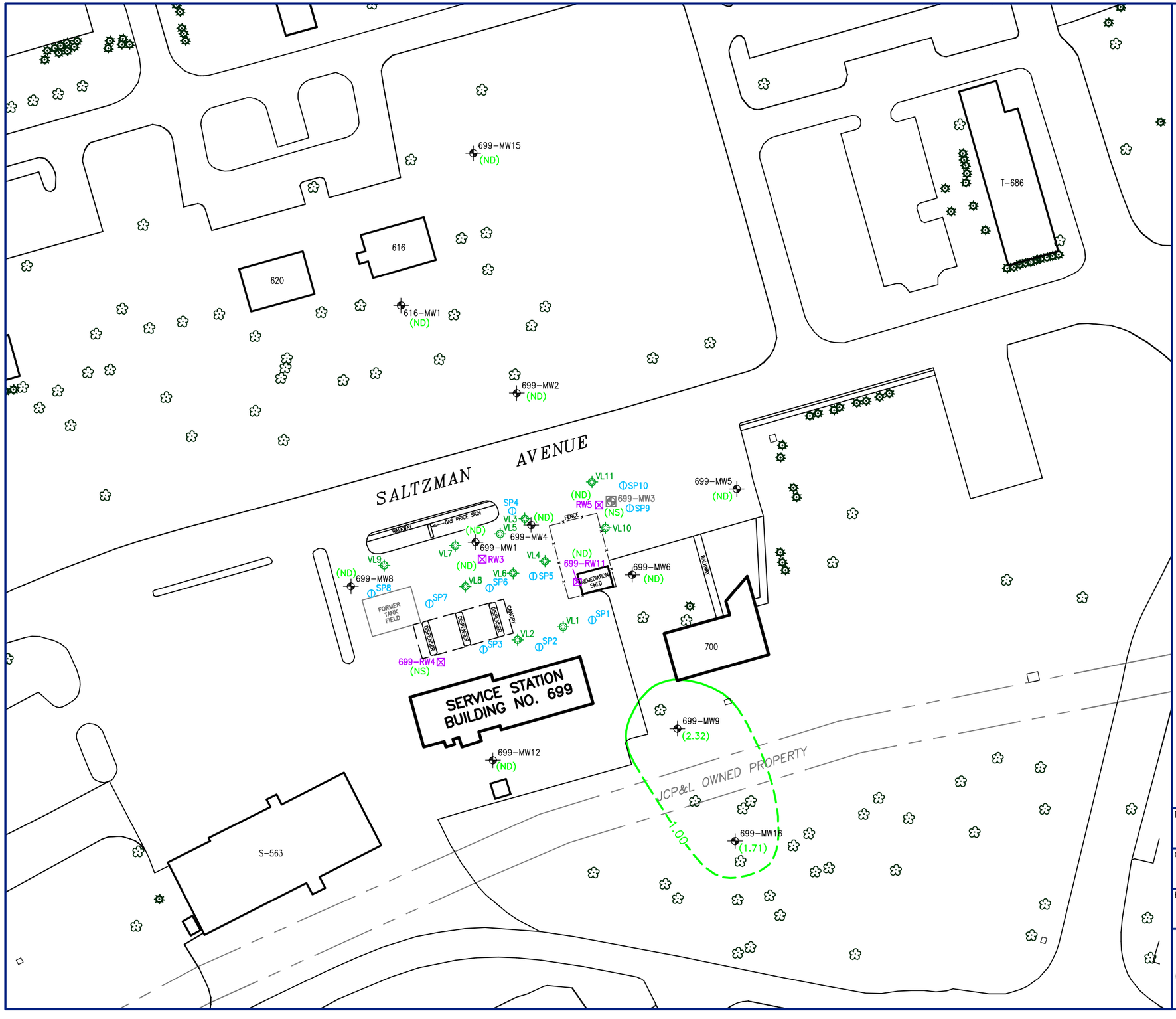
U.S. ARMY BUILDING 699 FORT MONMOUTH OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET: 0 APPROXIMATE 80

DATE: 8-23-11

FIGURE: 28



LEGEND

	TREES/SHRUBS
	ABANDONED MONITORING WELL
	MONITORING WELL
	RECOVERY WELL
	SPARGE POINT
	SOIL VAPOR EXTRACTION WELL
GWQS	GROUND WATER QUALITY STANDARD
(13.52)	PCE CONCENTRATION (µg/L)
	PCE CONCENTRATION CONTOUR (µg/L) (DASHED WHERE INFERRED)
PCE	TETRACHLOROETHYLENE
(µg/L)	MICROGRAMS PER LITER
ND	NOT DETECTED
NS	NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	ND
699-MW2	ND
699-MW3	NS
699-MW4	ND
699-MW5	ND
699-MW6	ND
699-MW8	ND
699-MW9	2.32
699-MW12	ND
699-MW15	ND
699-MW16	1.71
699-RW3	ND
699-RW4	NS
699-RW5	ND
699-RW11	ND

NOTE:

NJDEP CLASS II-A GWQS FOR PCE IS 1 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

PCE ISOPLETH MAP
SEPTEMBER 2010

U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

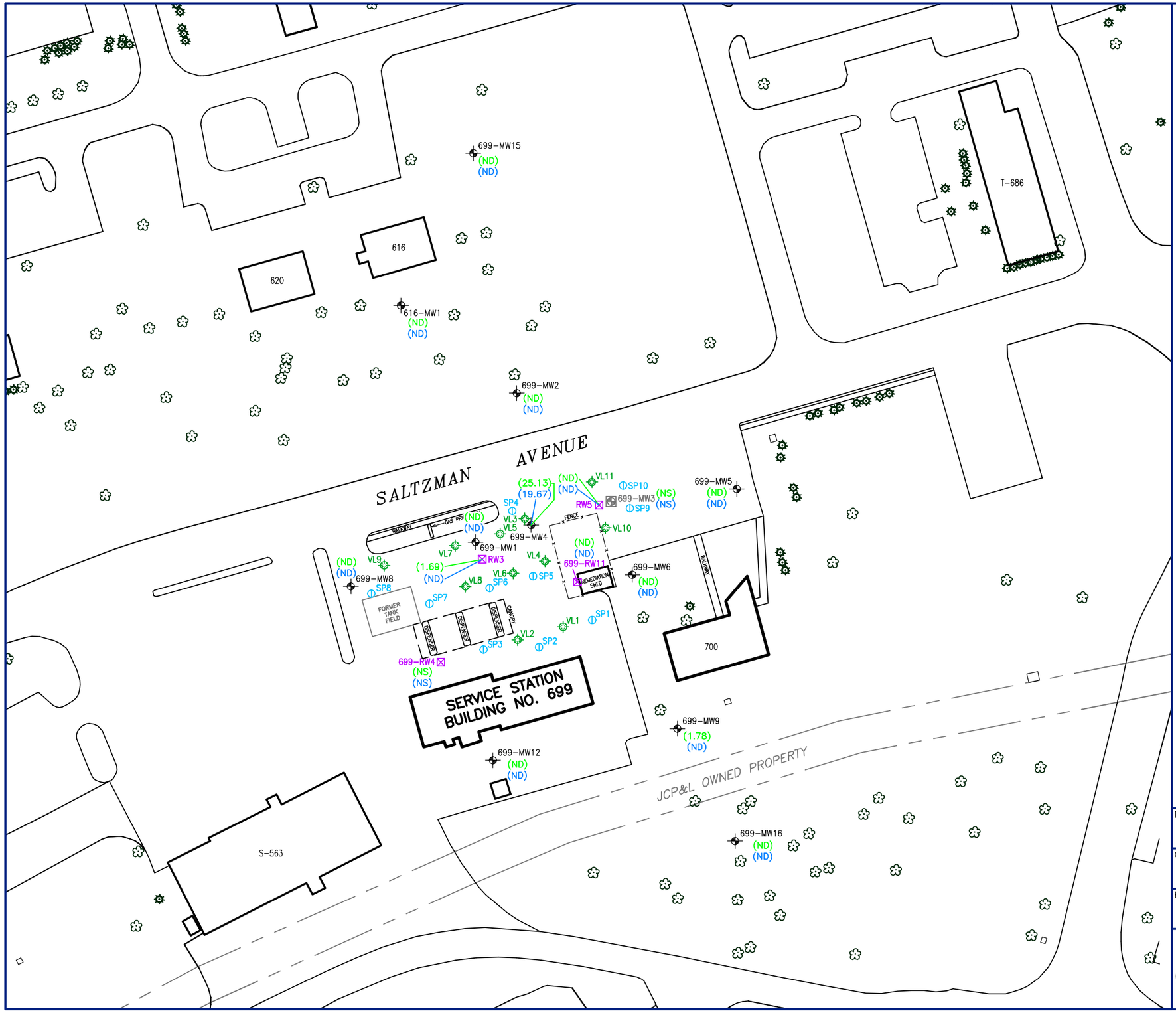
Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET
0 APPROXIMATE 80

DATE
8-23-11

FIGURE
29

M:\Graphics\0300-WallMisc\Industrial\Fort Monmouth\Building 699\Fort Monmouth (Bldg 699) SM.dwg, B-80 SM, EVega, 1:1



M:\Graphics\0300-WallMisc\Industrial\Fort Monmouth\Building 699\Fort Monmouth (Bldg 699) SM.dwg, B-80 SM, EVega, 1:1

LEGEND

	TREES/SHRUBS
	ABANDONED MONITORING WELL
	MONITORING WELL
	RECOVERY WELL
	SPARGE POINT
	SOIL VAPOR EXTRACTION WELL
GWQS	GROUND WATER QUALITY STANDARD
(25.13)	MTBE CONCENTRATION (µg/L)
(19.67)	TBA CONCENTRATION (µg/L)
MTBE	METHYL *tert*–BUTYL ETHER
TBA	*tert*–BUTYL ALCOHOL
(µg/L)	MICROGRAMS PER LITER
ND	NOT DETECTED
NS	NOT SAMPLED

Well ID	Concentration MTBE µg/L	Concentration TBA µg/L
616-MW1	ND	ND
699-MW1	ND	ND
699-MW2	ND	ND
699-MW3	NS	NS
699-MW4	25.13	19.67
699-MW5	ND	ND
699-MW6	ND	ND
699-MW8	ND	ND
699-MW9	1.78	ND
699-MW12	ND	ND
699-MW15	ND	ND
699-MW16	ND	ND
699-RW3	1.69	ND
699-RW4	NS	NS
699-RW5	ND	ND
699-RW11	ND	ND

NOTE:

NJDEP CLASS II–A GWQS FOR MTBE IS 70 µg/L.

NJDEP CLASS II–A GWQS FOR TBA IS 100 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

MTBE & TBA ISOPLETH MAP SEPTEMBER 2010

U.S. ARMY BUILDING 699 FORT MONMOUTH OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET
0 APPROXIMATE 80

DATE
8–23–11

FIGURE
30

LEGEND

	TREES/SHRUBS
	ABANDONED MONITORING WELL
	MONITORING WELL
	RECOVERY WELL
	SPARGE POINT
	SOIL VAPOR EXTRACTION WELL
GWQS	GROUND WATER QUALITY STANDARD
(2.74)	LEAD CONCENTRATION (µg/L)
(µg/L)	MICROGRAMS PER LITER
ER	ESTIMATED RESULT
ND	NOT DETECTED
NS	NOT SAMPLED

Well ID	Concentration µg/L
616-MW1	ND
699-MW1	ND
699-MW2	ND
699-MW3	NS
699-MW4	ND
699-MW5	ND
699-MW6	ND
699-MW8	ND
699-MW9	ND
699-MW12	ND
699-MW15	ND
699-MW16	ND
699-RW3	2.82 ER
699-RW4	NS
699-RW5	4.12 ER
699-RW11	ND

NOTE:

NJDEP CLASS II-A GWQS FOR LEAD IS 5 µg/L.

DRAFTED BY: E.V. (N.J.)

CHECKED BY:

REVIEWED BY:

NORTH

LEAD ISOPLETH MAP
SEPTEMBER 2010

U.S. ARMY
BUILDING 699
FORT MONMOUTH
OCEANPORT, NEW JERSEY

Groundwater & Environmental Services, Inc.
1340 CAMPUS PARKWAY, NEPTUNE, NJ 07753

SCALE IN FEET
0 APPROXIMATE 80

DATE: 8-23-11

FIGURE: 31

M:\Graphics\0300-WallMisc\Industrial\Fort Monmouth\Building 699\Fort Monmouth (Bldg 699) SM.dwg, B-80 SM, EVega, 1:1

TABLES

Table 1. Soil Vapor Extraction / Treatment System Performance Summary
Building 699, Main Post Gas Station
Fort Monmouth, New Jersey

DATE	System Status		Percent Uptime		Vacuum (inches of Hg)	Air Flow Rate (acfm)		Total Non-Methane VOCs (ppm)		DATE	Destruction Efficiency	Mass Removal Rate (lb/hr)	Mass Removal Rate (gpd)	Total Volume Recovered (lb)	Cumulative Mass Removed (lb)	Percent Oxygen		Percent Lower Explosive Limit	
	Arrival	Departure	Monthly	Quarterly	Influent	Effluent	Dilution flow	Influent	Effluent							Influent	Effluent	Influent	Effluent
01/09/09	D	U	50.00%	50.00%	4.5	212	N/A	66	1.1	01/09/09	98%	0.109	0.424	13.428	4,276	20.7	20.7	0	0
01/15/09	U	U	68.75%	68.75%	4.5	214	N/A	37	0.6	01/15/09	98%	0.153	0.595	22.036	4,298	20.7	20.7	0	0
01/22/09	U	U	78.26%	78.26%	3.5	207	N/A	37	1.1	01/22/09	97%	0.109	0.422	18.253	4,317	20.7	20.7	0	0
01/27/09	U	U	82.14%	82.14%	3.5	207	N/A	37	1.1	01/27/09	97%	0.107	0.415	12.821	4,330	20.7	20.7	0	0
01/28/09	U	U	82.76%	82.76%	3.5	210	N/A	60	3.7	01/28/09	94%	0.141	0.548	3.386	4,333	20.6	20.6	0	0
02/04/09	D	U	50.00%	76.39%	3.75	212	N/A	101	0.9	02/04/09	99%	0.237	0.921	19.904	4,353	20.6	20.6	0	0
02/06/09	U	U	61.11%	77.63%	N/A	N/A	N/A	N/A	N/A	02/06/09	N/A	0.255	0.992	12.247	4,365	N/A	N/A	N/A	N/A
02/12/09	U	U	76.67%	80.68%	3.5	199	N/A	77	1.7	02/12/09	98%	0.255	0.992	36.740	4,402	20.7	20.7	0	0
02/19/09	U	U	84.09%	83.33%	3.5	210	N/A	51	1.7	02/19/09	97%	0.183	0.710	30.673	4,432	20.8	20.7	0	0
02/25/09	U	U	87.50%	85.09%	3.5	202	N/A	73	3.1	02/25/09	96%	0.178	0.692	25.656	4,458	20.7	20.7	0	0
03/05/09	U	U	100.00%	86.92%	3.5	208	N/A	31	0.7	03/05/09	98%	0.149	0.578	28.552	4,487	20.7	20.7	0	0
03/10/09	U	U	100.00%	87.86%	N/A	N/A	N/A	N/A	N/A	03/10/09	N/A	0.131	0.507	15.669	4,502	N/A	N/A	N/A	N/A
03/11/09	U	U	100.00%	88.03%	3.5	208	N/A	59	2.3	03/11/09	96%	0.131	0.507	3.134	4,505	20.7	20.7	0	0
03/17/09	U	U	100.00%	88.96%	3.5	211	N/A	33	0.3	03/17/09	99%	0.134	0.523	19.359	4,525	20.8	20.8	0	0
03/25/09	U	U	100.00%	90.00%	3.5	202	N/A	66	1.1	03/25/09	98%	0.143	0.554	27.378	4,552	20.7	20.7	0	0
04/02/09	U	U	100.00%	100.00%	4	201	N/A	64.7	0	04/02/09	100%	0.184	0.714	35.269	4,588	20.7	20.6	0	0
04/09/09	U	U	100.00%	100.00%	4	195	N/A	10	0	04/09/09	100%	0.103	0.401	17.332	4,605	20.9	20.8	0	0
04/15/09	U	U	100.00%	100.00%	3.5	201	N/A	13	0	04/15/09	100%	0.032	0.123	4.574	4,609	20.8	20.8	0	0
04/23/09	U	U	100.00%	100.00%	3.5	200	N/A	41	0.7	04/23/09	98%	0.076	0.294	14.500	4,624	20.8	20.8	0	0
04/24/09	U	U	100.00%	100.00%	N/A	N/A	N/A	N/A	N	04/24/09	N/A	0.082	0.317	1.959	4,626	N/A	N/A	N/A	N/A
04/29/09	U	U	100.00%	100.00%	3.5	190	N/A	19	0	04/29/09	100%	0.082	0.317	9.793	4,636	20.8	20.8	0	0
05/06/09	U	U	100.00%	100.00%	3.5	190	N/A	44	0.3	05/06/09	99%	0.083	0.324	14.026	4,650	20.7	20.7	0	0
05/14/09	D	U	73.33%	92.00%	4	202	N/A	40	0.7	05/14/09	98%	0.115	0.446	11.024	4,661	20.8	20.8	0	0
05/20/09	U	U	80.95%	92.86%	4	197	N/A	30	0.5	05/20/09	98%	0.097	0.379	14.026	4,675	20.8	20.8	0	0
05/28/09	U	U	86.21%	93.75%	4.1	207	N/A	27	0.3	05/28/09	99%	0.080	0.312	15.420	4,690	20.8	20.8	0	0
06/05/09	U	U	100.00%	94.44%	4	193	N/A	40	0.7	06/05/09	98%	0.093	0.363	17.945	4,708	20.7	20.7	0	0
06/09/09	D	U	97.92%	94.41%	3.5	190	N/A	38	0.5	06/09/09	99%	0.104	0.405	9.377	4,717	20.8	20.8	0	0
06/19/09	D	U	78.41%	89.83%	3.5	193	N/A	67	2.8	06/19/09	96%	0.140	0.545	18.513	4,736	20.8	20.8	0	0
06/24/09	U	U	82.41%	90.38%	3.5	191	N/A	30	0.2	06/24/09	99%	0.130	0.505	15.588	4,752	20.8	20.8	0	0
06/30/09	U	U	85.61%	90.98%	3.5	202	N/A	41	0.7	06/30/09	98%	0.097	0.378	14.013	4,766	20.8	20.8	0	0
07/07/09	U	U	100.00%	100.00%	4	210	N/A	12	0	07/07/09	100%	0.076	0.296	12.794	4,778	20.8	20.8	0	0
07/15/09	D	U	48.33%	48.33%	4	207	N/A	8	0	07/15/09	100%	0.029	0.113	0.175	4,779	20.8	20.8	0	0
07/16/09	U	U	51.56%	51.56%	N/A	N/A	N/A	N/A	N/A	07/16/09	N/A	0.019	0.072	0.445	4,779	N/A	N/A	N/A	N/A
07/22/09	U	U	64.77%	64.77%	4	202	N/A	5	0	07/22/09	100%	0.019	0.072	2.670	4,782	20.8	20.8	0	0
07/29/09	U	U	73.28%	73.28%	4	200	N/A	7.8	0	07/29/09	100%	0.018	0.070	3.015	4,785	20.8	20.8	0	0
08/05/09	U	U	100.00%	78.47%	4	200	N/A	5.8	0	08/05/09	100%	0.019	0.074	3.187	4,788	20.8	20.8	0	0
08/12/09	U	U	100.00%	81.98%	4	207	N/A	9.7	0	08/12/09	100%	0.022	0.086	3.696	4,792	20.8	20.8	0	0
08/19/09	D	U	69.05%	71.50%	4	203	N/A	8.7	0	08/19/09	100%	0.026	0.102	0.316	4,792	20.8	20.8	0	0
08/28/09	U	U	78.33%	75.85%	4	200	N/A	12.7	0	08/28/09	100%	0.030	0.117	6.497	4,798	20.8	20.8	0	0
09/03/09	D	U	16.67%	70.38%	4	200	N/A	10	0	09/03/09	100%	0.032	0.123	0.760	4,799	20.8	20.8	0	0
09/09/09	U	U	58.33%	72.89%	3.5	212	N/A	13.7	0.2	09/09/09	99%	0.034	0.132	4.904	4,804	20.8	20.8	0	0
09/16/09	U	U	73.68%	75.32%	3.5	202	N/A	8.1	0	09/16/09	100%	0.031	0.122	5.288	4,809	20.9	20.9	0	0
09/25/09	U	U	82.14%	77.87%	3.5	196	N/A	11.7	0.3	09/25/09	97%	0.027	0.107	5.936	4,815	20.8	20.8	0	0
09/30/09	U	U	84.85%	79.08%	2.5	130	N/A	168	4.7	09/30/09	97%	0.204	0.794	24.517	4,840	20.5	20.4	1	0
10/07/09	U	U	100.00%	100.00%	3	150	N/A	69	1.3	10/07/09	98%	0.231	0.899	38.880	4,879	20.8	20.8	0	0
10/14/09	U	U	100.00%	100.00%	2.5	138	N/A	37	1.1	10/14/09	97%	0.106	0.414	17.886	4,897	20.8	20.8	0	0
10/22/09	U	O	100.00%	100.00%	3	130	N/A	27	0.4	10/22/09	99%	0.060	0.232	11.485	4,908	20.8	20.8	0	0
10/23/09	O	U	100.00%	100.00%	N/A	N/A	N/A	N/A	N/A	10/23/09	N/A	0.053	0.207	0.000	4,908	N/A	N/A	N/A	N/A
10/28/09	D	U	90.74%	90.74%	3	138	N/A	30	0.2	10/28/09	99%	0.053	0.207	3.197	4,911	20.8	20.8	0	0
10/29/09	U	U	91.07%	91.07%	N/A	N/A	N/A	N/A	N/A	10/29/09	N/A	N/A	0.000	0.000	4,911	N/A	N/A	N/A	N/A
11/05/09	D	U	50.00%	82.86%	3	128	N/A	30	0	11/05/09	100%	0.056	0.216	4.675	4,916	20.8	20.6	0	0
11/11/09	D	U	67.31%	83.54%	3	144	N/A	32	0.4	11/11/09	99%	0.059	0.229	7.410	4,923	20.8	20.8	0	0
11/20/09	U	U	80.68%	86.50%	3	150	N/A	28	0	11/20/09	100%	0.062	0.239	13.288	4,937	20.8	20.8	0	0
11/24/09	U	U	83.65%	87.50%	2.5	139	N/A	12	0	11/24/09	100%	0.040	0.157	3.870	4,940	20.8	20.7	0	0
11/30/09	U	U	86.72%	88.75%	2.5	140	N/A	8.6	0	11/30/09	100%	0.020	0.078	2.886	4,943	20.8	20.7	0	0
12/09/09	O	U	100.00%	90.00%	2.5	147	N/A	8.7	0	12/09/09	100%	0.017	0.067	3.117	4,946	20.8	20.8	0	0
12/17/09	U	U	100.00%	91.06%	2.5	137	N/A	6.1	0	12/17/09	100%	0.015	0.057	2.814	4,949	20.8	20.8	0	0
12/21/09	U	U	100.00%	91.51%	2	145	N/A	3	0	12/21/09	100%	0.009	0.035	0.859	4,950	20.8	20.7	0	0
12/23/09	D	U	97.67%	91.10%	N/A	N/A	N/A	N/A	N/A	12/23/09	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A
12/30/09	D	U	82.46%	86.72%	2.5	148	N/A	7	0	12/30/09	100%	0.010	0.040	0.613	4,951	20.8	20.8	0	0
1/7/2010	U	U	100.00%	100.00%	2.5	140	N/A	18.0	0.0	1/7/2010	100%	0.025	0.025	4.821	4,956	20.8	20.8	0	0
1/13/2010	O	O	100.00%	100.00%	N/A	N/A	N/A	N/A	N/A	1/13/2010	N/A	N/A	N/A	0.000	4,956	N/A	N/A	N/A	N/A
1/20/2010	O	U	100.00%	100.00%	2.0	202	N/A	4.8	0.0	1/20/2010	100%	0.027	0.027	0.000	4,956	20.8	20.8	0	0

Table 1. Soil Vapor Extraction / Treatment System Performance Summary
Building 699, Main Post Gas Station
Fort Monmouth, New Jersey

DATE	System Status		Percent Uptime		Vacuum (inches of Hg)	Air Flow Rate (acfm)		Total Non-Methane VOCs (ppm)		DATE	Destruction Efficiency	Mass Removal Rate (lb/hr)	Mass Removal Rate (gpd)	Total Volume Recovered (lb)	Cumulative Mass Removed (lb)	Percent Oxygen		Percent Lower Explosive Limit	
	Arrival	Departure	Monthly	Quarterly	Influent	Effluent	Dilution flow	Influent	Effluent							Influent	Effluent	Influent	Effluent
1/27/2010	D	O	74.00%	74.00%	N/A	N/A	N/A	N/A	N	1/27/2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2/3/2010	O	U	100.00%	74.00%	2.5	193	N/A	12.3	0.2	2/3/2010	98%	0.024	0.024	0.000	4,956	20.8	20.8	0	0
2/8/2010	U	U	100.00%	79.00%	3.5	169	N/A	7.4	0.0	2/8/2010	100%	0.025	0.025	2.984	4,959	20.9	20.9	0	0
2/18/2010	U	U	99.00%	85.00%	3.0	123	N/A	9.6	0.2	2/18/2010	98%	0.017	0.017	4.113	4,963	20.9	20.9	0	0
2/23/2010	U	U	74.00%	87.00%	3.0	130	N/A	4.7	0.0	2/23/2010	100%	0.013	0.013	1.514	4,964	20.8	20.8	0	0
3/3/2010	U	U	100.00%	89.00%	2.5	153	N/A	2.1	0.0	3/3/2010	100%	0.007	0.007	1.289	4,965	20.8	20.8	0	0
3/10/2010	U	U	100.00%	91.00%	3.0	158	N/A	9.6	0.2	3/10/2010	98%	0.013	0.013	2.132	4,968	20.9	20.8	0	0
3/18/2010	U	U	100.00%	92.00%	3.0	160	N/A	6.2	0.0	3/18/2010	100%	0.018	0.018	3.364	4,971	20.8	20.8	0	0
3/24/2010	U	U	100.00%	93.00%	3.0	171	N/A	8.2	0.0	3/24/2010	100%	0.017	0.017	2.394	4,973	20.8	20.8	0	0
4/2/2010	U	U	100.00%	100.00%	3.5	161	N/A	3.1	0.0	4/2/2010	100%	0.013	0.013	2.826	4,976	20.8	20.8	0	0
4/7/2010	U	U	100.00%	100.00%	3.0	187	N/A	4.1	0.0	4/7/2010	100%	0.009	0.009	1.049	4,977	20.8	20.8	0	0
4/14/2010	D	U	93.00%	93.00%	2.5	153	N/A	4.1	0.0	4/14/2010	100%	0.010	0.010	1.283	4,979	20.8	20.8	0	0
4/21/2010	D	D	95.00%	95.00%	2.5	157	N/A	2.9	0.0	4/21/2010	100%	0.008	0.008	1.271	4,980	20.8	20.8	0	0
4/29/2010	D	D	96.00%	96.00%	2.5	160	N/A	4.0	0.0	4/29/2010	100%	0.008	0.008	1.465	4,981	20.8	20.8	0	0
5/5/2010	D	U	17.00%	85.00%	2.5	160	N/A	4.7	0.0	5/5/2010	100%	0.010	0.010	0.233	4,982	20.8	20.8	0	0
5/12/2010	U	U	62.00%	87.00%	2.5	153	N/A	3.1	0.0	5/12/2010	100%	0.009	0.009	1.430	4,983	20.8	20.7	0	0
5/19/2010	U	U	75.00%	88.00%	2.5	153	N/A	1.7	0.0	5/19/2010	100%	0.005	0.005	0.861	4,984	20.9	20.9	0	0
5/26/2010	U	U	81.00%	90.00%	2.5	150	N/A	0.7	0.0	5/26/2010	100%	0.003	0.003	0.426	4,984	20.9	20.9	0	0
6/1/2010	U	U	100.00%	91.00%	2.5	163	N/A	1.1	0.0	6/1/2010	100%	0.002	0.002	0.283	4,985	20.8	20.8	0	0
6/8/2010	U	U	100.00%	91.00%	2.5	161	N/A	2.7	0.0	6/8/2010	100%	0.004	0.004	0.721	4,985	20.8	20.8	0	0
6/17/2010	U	U	100.00%	92.00%	2.5	158	N/A	1.9	0.0	6/17/2010	100%	0.005	0.005	1.105	4,986	20.8	20.8	0	0
6/23/2010	U	U	100.00%	93.00%	2.5	163	N/A	2.0	0.0	6/23/2010	100%	0.004	0.004	0.629	4,987	20.8	20.8	0	0
6/30/2010	U	U	100.00%	93.00%	2.5	160	N/A	1.7	0.0	6/30/2010	100%	0.004	0.004	0.700	4,988	20.8	20.8	0	0
7/9/2010	U	U	100.00%	100.00%	2.5	171	N/A	3.1	0.0	7/9/2010	100%	0.006	0.006	1.197	4,989	20.9	20.9	0	0
7/14/2010	D	D	82.00%	82.00%	2.5	158	N/A	0.9	0.0	7/14/2010	100%	0.005	0.005	0.275	4,989	20.9	20.9	0	0
7/19/2010	D	U	87.00%	87.00%	NR	NR	N/A	NR	NR	7/19/2010	NR	NR	NR	NR	NR	NR	NR	NR	NR
7/21/2010	U	U	88.00%	88.00%	2.5	160	N/A	0.7	0.0	7/21/2010	100%	0.002	0.002	0.298	4,989	20.9	20.9	0	0
7/30/2010	U	U	92.00%	92.00%	2.5	160	N/A	1.1	0.0	7/30/2010	100%	0.002	0.002	0.530	4,990	20.9	20.9	0	0
8/5/2010	U	U	100.00%	93.00%	2.5	153	N/A	0.7	0.0	8/5/2010	100%	0.002	0.002	0.707	4,991	20.9	20.9	0	0
8/11/2010	U	U	100.00%	94.00%	3.5	154	N/A	1.9	0.0	8/11/2010	100%	0.003	0.003	0.802	4,991	20.9	20.9	0	0
8/18/2010	U	U	100.00%	95.00%	2.5	169	N/A	0.8	0.0	8/18/2010	100%	0.003	0.003	0.949	4,992	20.9	20.9	0	0
8/26/2010	U	U	100.00%	96.00%	2.5	150	N/A	0.7	0.0	8/26/2010	100%	0.002	0.002	0.601	4,993	20.8	20.8	0	0
8/31/2010	Power	failure	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8/31/2010	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
9/1/2010	D	U	100.00%	94.00%	2.5	163	N/A	11.2	0.0	9/1/2010	100%	0.013	0.013	2.806	4,996	20.7	20.7	0	0
9/8/2010	U	U	100.00%	94.00%	2.5	157	N/A	1.9	0.0	9/8/2010	100%	0.015	0.015	3.684	5,000	20.8	20.8	0	0
9/14/2010	D	O	57.00%	87.00%	N/A	N/A	N/A	N/A		9/14/2010	N/A	N/A	N/A	0.000	5,000	N/A	N/A	N/A	N/A
9/30/2010	O	U	80.00%	89.00%	0.3	162	N/A	0.7	0.0	9/30/2010	100%	0.003	0.003	1.111	5,001	20.9	20.9	0	0

Notes:
U = System Up
D = System Down
O = System Off
Hg = Mercury
acfm = Standard Cubic Feet per Minute
ppm = Parts Per Million
VOC = Volatile Organic Compound
N/A = Not Applicable
NR = No Recovery
lb/hr = Pounds per Hour
gpd = Gallons Per Day

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Table 2. Groundwater Recovery System Performance Summary
Building 699, Main Post Gas Station
Fort Monmouth, New Jersey

DATE	Uptime Percent (%)		Effluent Totalizer	Total Gallons	Influent (µg/L) and Applicable GWQS								Total BTEX MTBE	Monthly Petroleum Hydrocarbons
					TBA	MTBE	Benzene	Toluene	Ethylbenzene	m+p Xylene	o-Xylene	Total BTEX		
	Monthly	Quarterly	(gallons)	Pumped	100	70	1	1000	700	1000		-	TBA (µg/L)	Removed (lb)
1/28/2009	100.00%	100.00%	113,181	9,363,239	ND	9	40	118	67.84	185.08	99.62	510.31	519.20	4.86
2/12/2009	76.67%	91.03%	125,141	9,375,199	66	14	48	73	43.94	102.88	44.99	312.42	393.21	NA
3/5/2009	100.00%	94.17%	NR	9,400,005	45	12	13	6	36.49	72.72	40.99	169.78	226.71	NA
4/29/2009	100.00%	100.00%	211,009	9,461,067	ND	16	43	29	47.19	104.87	40.65	264.35	280.46	5.01
5/14/2009	50.00%	84.69%	223,813	9,473,871	81	20	44	32	30.78	61.66	26.39	194.19	295.36	NA
6/9/2009	64.58%	84.33%	257,725	9,507,783	68	20	30	16	40.30	93.81	50.33	230.40	319.17	NA
7/29/2009	100.00%	100.00%	317,463	9,567,521	55	21	47	30	62.82	114.36	64.07	318.76	395.02	5.24
8/19/2009	69.05%	86.73%	337,654	9,587,712	23	4	8	2	10.02	17.83	10.6	48.97	75.97	NA
9/16/2009	71.05%	78.57%	365,009	9,615,067	75	19	38	6	46.15	65.51	39.25	195.01	289.12	NA
10/14/2009	100.00%	100.00%	397,089	9,647,147	60	13	13	2	18.19	15.36	10.38	58.30	131.70	NA
11/20/2009	96.59%	91.50%	426,610	9,676,668	90	14	14	1	25.87	18.42	14.21	73.41	177.34	NA
12/9/2009	100.00%	93.84%	Dead Battery	9,694,829	319	12	12	2	3.46	2.48	1.11	20.93	351.88	NA
12/17/2009	100.00%	94.00%	2,840	9,697,897										NA
12/21/2009	100.00%	95.00%	4,960	9,700,190										NA
12/23/2009	97.00%	94.00%	5,017	9,700,265										NA
12/30/2009	79.00%	88.00%	7,601	9,702,849										5.35
1/7/2010	100.00%	100.00%	10,184	9,705,432	312	17	54	2	18.39	26.05	8.19	109.18	438.98	NA
1/13/2010	100.00%	100.00%	15,394	9,710,642										NA
1/20/2010	100.00%	100.00%	15,394	9,710,642										NA
1/27/2010	74.00%	74.00%	17,982	9,713,230										5.36
2/3/2010	0.00%	74.00%	18,000	9,713,248										NA
2/8/2010	100.00%	79.00%	24,095	9,719,343	ND	15	111	443	285.13	1069.48	497.17	2405.52	2420.86	NA
2/18/2010	100.00%	85.00%	29,681	9,724,929										NA
2/23/2010	100.00%	87.00%	32,701	9,727,949										5.66
3/3/2010	100.00%	89.00%	N/A	N/A										NA
3/10/2010	100.00%	91.00%	43,141	9,738,389										NA
3/18/2010	100.00%	92.00%	48,318	9,743,566										NA
3/24/2010	100.00%	93.00%	51,071	9,746,319										NA
4/2/2010	100.00%	100.00%	51,131	9,746,379										NA
4/7/2010	100.00%	100.00%	51,250	9,746,498	67	4	5	14	8.87	44.24	19.57	91.57	162.61	NA
4/14/2010	93.00%	93.00%	54,261	9,749,509										NA
4/21/2010	89.00%	89.00%	57,471	9,752,719										NA
4/29/2010	69.00%	69.00%	57,471	9,752,719										5.67
5/5/2010	0.00%	60.00%	57,471	9,752,719										NA
5/12/2010	54.00%	65.00%	61,581	9,756,829	39	8	9	3	58.29	68.47	38.86	176.92	223.85	NA
5/19/2010	70.00%	70.00%	66,859	9,762,107										NA
5/26/2010	78.00%	73.00%	75,654	9,770,902										5.71
6/1/2010	100.00%	75.00%	82,629	9,777,877										NA
6/8/2010	100.00%	78.00%	89,362	9,784,610	69	11	9	1	41.94	17.66	10.12	78.97	158.91	NA
6/17/2010	100.00%	80.00%	99,215	9,794,463										NA
6/23/2010	100.00%	81.00%	104,480	9,799,728										NA
6/30/2010	100.00%	83.00%	110,050	9,805,298										5.75
7/9/2010	100.00%	100.00%	116,802	9,812,050										NA
7/14/2010	82.00%	82.00%	117,982	9,813,230										NA
7/19/2010	61.00%	61.00%	118,168	9,813,416										NA
7/21/2010	64.00%	64.00%	119,047	9,814,295	15	8	15	1	58.27	20.23	15.65	109.91	132.68	NA
7/30/2010	75.00%	75.00%	122,703	9,817,951										5.75
8/5/2010	100.00%	79.00%	125,016	9,820,264										NA
8/11/2010	100.00%	82.00%	126,938	9,822,186										NA
8/18/2010	100.00%	85.00%	129,137	9,824,385	19	10	14	0	14.48	8.16	9.70	46.89	76.10	NA
8/26/2010	100.00%	87.00%	130,721	9,825,969										5.76
9/1/2010	95.00%	86.00%	131,072	9,826,320										NA
9/8/2010	96.00%	87.00%	136,601	9,831,849										NA
9/14/2010	57.00%	80.00%	136,601	9,831,849	70	8	6	0	4.18	4.91	4.83	20.23	98.83	NA
9/30/2010	27.00%	66.00%	137,874	9,833,122										5.76

Notes:

TBA = *tert*- Butyl Alcohol
MTBE = Methyl *tert* -Butyl Ether
µg/L = Microgram per Liter
mg/L = Milligrams per Liter
BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
TPH = Total Petroleum Hydrocarbons
lb = Pound
GWQS = Ground Water Quality Standard

Table 3. Groundwater Monitoring & Sampling Summary Data
Building 699, Main Post Gas Station
Fort Monmouth, New Jersey

Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft amsl)	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					**1**	**1,000**	**700**	**1,000**	**70**	**100**	**70**	**3**	**700**	**1**	**6,000**	**1**	**100/500**	--	**5**
616MW1	06/19/01	18.92	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	NS
616MW1	08/30/01	18.92	8.34	10.58	ND	ND	ND	1.17	ND	ND	ND	ND	ND	ND	ND	ND	12	13.17	3.45
616MW1	12/13/01	18.92	9.68	9.24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	3.4
616MW1	03/27/02	18.92	3.40	15.52	ND	ND	ND	ND	ND	ND	1.14	ND	ND	ND	ND	ND	ND	1.14	ND
616MW1	06/26/02	18.92	6.95	11.97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**10.1**
616MW1	09/19/02	18.92	7.26	11.66	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**5.75**
616MW1	11/26/02	18.92	3.57	15.35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW1	03/17/03	18.92	3.11	15.81	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW1	06/25/03	18.92	4.21	14.71	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW1	09/24/03	18.92	7.77	11.15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	2.15
616MW1	12/08/03	18.92	4.75	14.17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1.6
616MW1	03/29/04	18.92	4.52	14.40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW1	06/18/04	18.92	7.03	11.89	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW1	09/16/04	18.92	8.33	10.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**6.71**
616MW1	12/06/04	18.92	4.72	14.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW1	03/07/05	18.92	4.23	14.69	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW1	05/26/05	18.92	4.76	14.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW1	09/08/05	18.92	9.46	9.46	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW1	12/14/05	18.92	3.96	14.96	ND	ND	ND	1.54	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.54	ND
616MW1	02/24/06	18.92	4.43	14.49	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW1	06/14/06	18.92	4.81	14.11	ND	ND	0.80	3.14	1.41	ND	ND	ND	ND	ND	ND	ND	28	33.35	ND
616MW1	09/22/06	18.92	5.50	13.42	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW1	11/28/06	18.92	3.48	15.44	ND	ND	ND	0.41	ND	ND	ND	ND	ND	ND	ND	ND	9	9.41	ND
616MW1	02/21/07	18.92	4.58	14.34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12.56	ND	ND	12.56	ND
616MW1	05/22/07	18.92	6.29	12.63	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW1	08/08/07	18.92	6.79	12.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1.49
616MW1	12/22/07	18.92	4.76	14.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW1	03/30/08	18.92	5.22	13.70	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW1	06/04/08	18.92	5.85	13.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW1	09/29/08	18.92	8.19	10.73	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
616MW1	12/30/08	18.92	3.84	15.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**5.45**
616MW1	03/27/09	18.92	5.92	13.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.64
616MW1	06/24/09	18.92	3.57	15.35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.13
616MW1	08/26/09	18.92	7.40	11.52	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.33
616MW1	11/16/09	18.92	6.07	12.85	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
616MW1	03/25/10	18.92	3.45	15.47	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
616MW1	06/15/10	18.92	7.27	11.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
616MW1	09/16/10	18.92	10.61	8.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
616MW1																			
616MW1	06/19/01	15.81	5.50	10.31	**21,555.26**	**47,603.78**	**5,050.83**	**42,246.76**	**1,293.83**	**403.62**	ND	ND	ND	ND	ND	ND	**741**	118,895.08	NS
616MW1	08/30/01	15.81	6.75	9.06	**31,531.95**	**54,361.78**	**8,703.65**	**47,334.24**	ND	ND	**267.1**	ND	ND	ND	ND	ND	**38,900**	181,098.72	3.57
616MW1	12/13/01	15.81	8.75	7.06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.00	NS
616MW1	03/27/02	15.81	7.05	8.76	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.00	NS
616MW1	06/26/02	15.81	6.91	8.90	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.00	NS
616MW1	09/19/02	15.81	5.93	9.88	**3,849.07**	**19,493.66**	**2,687.65**	**23,989.23**	ND	ND	ND	ND	ND	ND	ND	ND	**28,360**	78,379.61	**6.92**
616MW1	11/26/02	15.81	4.38	11.43	**459.71**	**4,023.42**	**1,960.50**	**14,645.80**	ND	ND	ND	ND	ND	ND	ND	ND	**20,510**	41,599.43	3.88
616MW1	03/17/03	15.81	4.20	11.61	**127.89**	**1,648.18**	**739.45**	**7,477.75**	ND	ND	ND	ND	ND	ND	ND	ND	**4,830**	14,823.27	3.63
616MW1	06/30/03	15.81	3.81	12.00	**318.96**	**1,864.80**	637.87	**7,237.32**	ND	ND	ND	ND	ND	ND	ND	ND	**8,181**	18,239.95	**6.15**
616MW1	09/24/03	15.81	7.20	8.61	**206.60**	**1,016.66**	554.50	**3,207.39**	ND	ND	ND	ND	ND	ND	ND	ND	**2,934**	7,919.15	**19.5**
616MW1	12/08/03	15.81	5.15	10.66	**110.32**	**1,310.35**	680.75	**4,430.84**	ND	ND	ND	ND	ND	ND	ND	ND	**5,541**	12,073.26	**16.4**
616MW1	03/29/04	15.81	4.61	11.20	**156.78**	**1,249.62**	**709.41**	**7,322.90**	ND	ND	ND	ND	ND	ND	ND	ND	**15,380**	24,818.71	**10.7**

Table 3. Groundwater Monitoring & Sampling Summary Data
Building 699, Main Post Gas Station
Fort Monmouth, New Jersey

Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft amsl)	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					**1**	**1,000**	**700**	**1,000**	**70**	**100**	**70**	**3**	**700**	**1**	**6,000**	**1**	**100/500**	--	**5**
616MW1	06/18/04	15.81	5.35	10.46	**239.86**	**4,064.39**	**2,619.62**	**20,330.96**	ND	ND	ND	ND	ND	ND	ND	ND	**22,390**	49,644.83	**19.2**
616MW1	09/16/04	15.81	6.42	9.39	**376.82**	60.22	382.60	624.31	**208.91**	ND	ND	ND	ND	ND	ND	ND	**2,730**	4,382.86	1.3
616MW1	12/03/04	15.81	5.26	10.55	**34.76**	158.27	83.61	993.12	ND	ND	ND	ND	ND	ND	ND	ND	**5,630**	6,899.76	**9.62**
616MW1	03/07/05	15.81	3.55	12.26	**1,783.46**	**1,893.65**	**1,376.76**	**5,158.40**	**448.37**	ND	ND	ND	ND	ND	178.66	ND	**6,050**	16,889.00	ND
616MW1	05/26/05	15.81	4.46	11.35	**63.14**	518.85	622.78	**10,628.46**	ND	ND	ND	ND	ND	ND	ND	ND	**33,560**	45,393.23	ND
616MW1	09/08/05	15.81	6.49	9.32	**62.87**	83.95	525.17	**2,358.03**	ND	ND	ND	ND	ND	ND	ND	ND	**8,720**	11,760.00	**6.26**
616MW1	12/14/05	15.81	4.02	11.79	**76.79**	946.58	**844.74**	**10,280.29**	ND	ND	ND	ND	ND	ND	ND	ND	0	12,148.40	ND
616MW1	02/24/06	15.81	3.82	11.99	**36.60**	736.86	674.30	**5,006.55**	ND	ND	ND	ND	ND	ND	ND	ND	**2,870**	9,324.31	ND
616MW1	06/14/06	15.81	3.43	12.38	**23.71**	302.27	**798.02**	**6,594.72**	3.54	ND	ND	ND	ND	ND	ND	ND	**5,050**	12,772.26	ND
616MW1	09/22/06	15.81	4.26	11.55	ND	80.55	**937.57**	**6,194.51**	ND	ND	ND	ND	ND	ND	ND	ND	**5,957**	13,169.63	1.93
616MW1	11/28/06	15.81	3.34	12.47	**16.58**	118.03	254.69	**1,077.87**	ND	ND	ND	ND	ND	ND	ND	ND	**5,590**	7,057.17	ND
616MW1	02/21/07	15.81	4.46	11.35	**13.18**	106.98	159.49	766.50	1.60	ND	ND	ND	0.48	ND	ND	ND	**5,907**	6,955.23	ND
616MW1	05/22/07	15.81	3.81	12.00	**15.18**	123.07	567.09	**3,154.55**	ND	ND	ND	ND	7.22	ND	ND	ND	**600**	4,467.11	4.2
616MW1	08/08/07	15.81	4.36	11.45	**7.38**	16.91	72.07	297.70	0.53	ND	ND	ND	ND	ND	1.75	ND	**3,226**	3,622.34	4.83
616MW1	12/22/07	15.81	5.21	10.60	**7.31**	29.61	270.51	974.36	ND	ND	ND	ND	0.89	ND	6.03	ND	475	1,763.71	3.43
616MW1	03/30/08	15.81	3.70	12.11	**7.04**	39.13	248.83	**1,034.37**	ND	ND	ND	ND	ND	ND	9.38	ND	438	1,776.75	0.914
616MW1	06/04/08	15.81	3.88	11.93	**1.16**	4.06	44.45	157.09	ND	ND	ND	ND	ND	ND	1.7	ND	238	446.46	**16.6**
616MW1	09/29/08	15.81	5.45	10.36	ND	7.84	146.77	230.57	ND	ND	ND	ND	ND	ND	ND	ND	477	862.18	**9.2**
616MW1	12/30/08	15.81	3.47	12.34	**3.61**	15.06	213.43	512.19	ND	ND	ND	ND	ND	ND	ND	ND	**642**	1,386.29	3.72
616MW1	03/27/09	15.81	4.31	11.50	**10.37**	53.67	419.87	**1,814.76**	ND	ND	ND	ND	ND	ND	ND	ND	**1,018**	3,316.80	**7.3**
616MW1	06/25/09	15.81	3.15	12.66	0.70 J	0.31 J	5.68	17.30	ND	ND	ND	ND	ND	ND	ND	ND	80	102.98	**5.62**
616MW1	08/26/09	15.81	4.69	11.12	**7.66**	23.76	587.78	**1,472.89**	ND	ND	ND	ND	ND	ND	ND	ND	462	2,562.58	ND
616MW1	11/16/09	15.81	4.55	11.26	**6.56**	13.27	376.59	666.64	ND	ND	ND	ND	ND	ND	ND	ND	**9,140**	10,203.06	2.53
616MW1	03/25/10	15.81	1.90	13.91	**1.41**	1.72	45.63	48.58	ND	ND	ND	ND	ND	ND	ND	ND	**562**	659.34	ND
616MW1	06/16/10	15.81	4.61	11.20	0.99	ND	11.97	14.18	ND	ND	ND	ND	ND	ND	ND	ND	281	308.14	ND
616MW1	09/17/10	15.81	6.62	9.19	**9.65**	9.90	186.87	137.82	ND	ND	ND	ND	ND	ND	ND	ND	**1,983**	2,327.24	ND
699MW2	06/19/01	16.64	3.81	12.83	**4.77**	24.25	4.29	18.31	ND	ND	ND	ND	ND	ND	ND	ND	302	353.62	NS
699MW2	08/30/01	16.64	6.73	9.91	ND	ND	ND	ND	ND	ND	ND	1.84	ND	ND	ND	ND	ND	1.84	ND
699MW2	12/13/01	16.64	8.3	8.34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**8.4**
699MW2	03/27/02	16.64	1.58	15.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	46	46.00	**9.71**
699MW2	06/26/02	16.64	5.44	11.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW2	09/19/02	16.64	5.46	11.18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.94
699MW2	11/26/02	16.64	2.2	14.44	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW2	03/17/03	16.64	1.87	14.77	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW2	06/25/03	16.64	2.21	14.43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW2	09/24/03	16.64	6.75	9.89	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**11.7**
699MW2	12/08/03	16.64	3.55	13.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	5.00	**21.4**
699MW2	03/29/04	16.64	3.45	13.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**15.8**
699MW2	06/18/04	16.64	5.35	11.29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**8.23**
699MW2	09/16/04	16.64	6.33	10.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**15.1**
699MW2	12/06/04	16.64	3.19	13.45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW2	03/07/05	16.64	2.47	14.17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW2	05/26/05	16.64	4.69	11.95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW2	09/08/05	16.64	7.56	9.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW2	12/13/05	16.64	2.38	14.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**5.85**
699MW2	02/24/06	16.64	2.96	13.68	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW2	06/13/06	16.64	2.88	13.76	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW2	09/22/06	16.64	3.68	12.96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW2	11/28/06	16.64	1.98	14.66	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW2	02/21/07	16.64	3.46	13.18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND

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Fort Monmouth, New Jersey

Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft amsl)	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					**1**	**1,000**	**700**	**1,000**	**70**	**100**	**70**	**3**	**700**	**1**	**6,000**	**1**	**100/500**	--	**5**
699MW2	05/22/07	16.64	4.33	12.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16	16.00	ND
699MW2	08/08/07	16.64	5.14	11.50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1.74
699MW2	12/22/07	16.64	3.28	13.36	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	3.00	ND
699MW2	03/30/08	16.64	3.45	13.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW2	06/04/08	16.64	4.11	12.53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW2	09/29/08	16.64	5.23	11.41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	2.48
699MW2	12/30/08	16.64	2.31	14.33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	4.18
699MW2	03/27/09	16.64	4.29	12.35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.33
699MW2	06/24/09	16.64	1.76	14.88	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.65
699MW2	08/26/09	16.64	5.62	11.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW2	11/16/09	16.64	4.82	11.82	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**6.58**
699MW2	03/26/10	16.64	1.76	14.88	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW2	06/15/10	16.64	5.80	10.84	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.05
699MW2	09/16/10	16.64	9.07	7.57	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW3	06/19/01	15.80	4.97	10.83	**33,224.84**	**38,489.48**	**1,693.43**	**14,775.44**	**93.34**	**246.45**	ND	ND	ND	ND	ND	**3.13**	**665**	89,191.11	NS
699MW3	08/30/01	15.80	6.65	9.15	**26,703.62**	**52,102.97**	**4,632.23**	**32,157.19**	ND	ND	**253.51**	ND	ND	ND	ND	ND	**17,400**	133,249.52	4.7
699MW3	12/13/01	15.80	7.75	8.05	**14,353.47**	**21,072.76**	**1,885.19**	**23,384.35**	ND	ND	ND	ND	ND	ND	ND	ND	**570**	61,265.77	**9.3**
699MW3	03/27/02	15.80	5.47	10.33	**13,946.94**	**15,981.11**	**980.35**	**5,855.38**	**90.20**	**282.02**	ND	ND	ND	ND	701.89	ND	**6,272**	44,109.89	**6.13**
699MW3	06/26/02	15.80	6.36	9.44	**4,399.81**	**3,832.32**	**1,055.62**	**3,728.84**	63.08	ND	ND	ND	ND	ND	ND	ND	ND	13,079.67	1.7
699MW3	09/19/02	15.80	5.89	9.91	**6,664.83**	**10,186.92**	**1,452.67**	**8,003.46**	ND	ND	ND	ND	ND	ND	ND	ND	**9,900**	36,207.88	2.88
699MW3	11/26/02	15.80	4.08	11.72	**1,817.43**	**3,901.24**	440.76	**6,032.40**	ND	ND	ND	ND	ND	ND	ND	ND	**4,620**	16,811.83	1.53
699MW3	03/17/03	15.80	3.41	12.39	**6,018.91**	**11,329.00**	**848.98**	**13,156.38**	ND	ND	ND	ND	ND	ND	ND	ND	**7,780**	39,133.27	1.37
699MW3	06/25/03	15.80	3.35	12.45	**4,801.67**	**13,280.92**	**1,300.05**	**10,076.68**	ND	ND	ND	ND	ND	ND	ND	ND	**3,320**	32,779.32	**7.5**
699MW3	09/24/03	15.80	5.23	10.57	**1,591.30**	**3,276.61**	487.55	**4,365.72**	ND	ND	ND	ND	ND	ND	ND	ND	**3,222**	12,943.18	**9.28**
699MW3	12/08/03	15.80	4.46	11.34	**174.93**	359.64	23.85	468.80	ND	ND	ND	ND	ND	ND	ND	ND	**547**	1,574.22	**7.41**
699MW3	03/29/04	15.80	4.15	11.65	**1,285.76**	**2,676.44**	320.11	**3,008.80**	ND	ND	ND	ND	ND	ND	ND	ND	**2,320**	9,611.11	**7.72**
699MW3	06/18/04	15.80	5.15	10.65	**4,052.45**	**9,939.74**	**1,873.95**	**9,190.47**	3.69	ND	ND	ND	ND	ND	ND	ND	ND	25,060.30	**8.17**
699MW3	09/16/04	15.80	6.30	9.50	**2,442.22**	**9,207.20**	**1,687.51**	**11,076.35**	ND	ND	ND	ND	ND	ND	ND	ND	**5,700**	30,113.28	**19.5**
699MW3	12/03/04	15.80	4.63	11.17	**1,616.64**	**5,430.07**	340.96	**4,172.96**	ND	ND	ND	ND	ND	ND	ND	ND	**1,520**	13,080.63	**7.37**
699MW3	03/04/05	15.80	3.50	12.30	**26.73**	97.95	194.88	**1,127.68**	**1,341.42**	ND	ND	ND	ND	ND	24.45	ND	**3,339**	6,152.11	ND
699MW3	05/23/05	15.80	4.43	11.37	**2,164.78**	**13,281.86**	**726.99**	**13,310.11**	ND	ND	ND	ND	ND	ND	ND	ND	**7,480**	36,963.74	ND
699MW3	09/08/05	15.80	6.84	8.96	**3,784.06**	**10,603.12**	**784.08**	**6,224.35**	ND	ND	ND	ND	ND	ND	ND	ND	**13,760**	35,155.61	**16**
699MW3	12/13/05	15.80	3.69	12.11	**4,319.42**	**26,811.99**	**838.96**	**11,139.09**	ND	ND	ND	ND	ND	ND	ND	ND	**43,109**	86,218.92	**5.33**
699MW3	02/24/06	15.80	3.57	12.23	**4,475.03**	**6,192.89**	**935.20**	**10,975.78**	4.98	ND	ND	ND	ND	ND	85.7	ND	**6,620**	29,289.58	ND
699MW3	06/13/06	15.80	3.11	12.69	**160.66**	153.90	18.77	151.94	ND	ND	ND	ND	ND	ND	ND	ND	66	551.27	ND
699MW3	09/22/06	15.80	3.98	11.82	**755.41**	**1,656.48**	115.15	**1,099.62**	ND	ND	ND	ND	ND	ND	ND	ND	105	3,731.66	ND
699MW3	11/28/06	15.80	3.11	12.69	**303.11**	457.69	103.33	579.73	3.14	ND	ND	ND	ND	ND	19.89	ND	216	1,682.89	ND
699MW3	02/21/07	15.80	4.21	11.59	**264.49**	304.31	152.75	794.20	8.94	ND	ND	ND	1.04	ND	13.02	ND	**2,812**	4,350.75	ND
699MW3	05/22/07	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW3	08/08/07	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW3	12/22/07	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW3	03/30/08	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW3	06/04/08	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW3	09/29/08	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW3	12/30/08	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW3	03/27/09	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW3	06/25/09	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW3	08/26/09	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW3	11/16/09	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW3	03/25/10	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

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Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft amsl)	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					**1**	**1,000**	**700**	**1,000**	**70**	**100**	**70**	**3**	**700**	**1**	**6,000**	**1**	**100/500**	**--**	**5**
699MW3	06/15/10	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW3	09/16/10	15.80	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW4	06/19/01	15.92	5.42	10.50	**36,303.01**	**48,404.42**	**6,425.13**	**38,765.03**	**97.87**	ND	ND	ND	ND	ND	ND	ND	**693**	130,688.46	NS
699MW4	08/30/01	15.92	7.02	8.90	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW4	12/13/01	15.92	8.03	7.89	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW4	03/27/02	15.92	7.01	8.91	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699MW4	06/26/02	15.92	6.91	9.01	**2,170.64**	**17,663.04**	**3,784.80**	**28,701.21**	**392.81**	ND	ND	ND	ND	ND	ND	ND	ND	52,712.50	**8.79**
699MW4	09/19/02	15.92	6.22	9.70	**952.77**	**9,979.40**	**1,251.22**	**20,801.87**	**113.05**	ND	ND	ND	ND	ND	ND	ND	**15,980**	49,078.31	**5.22**
699MW4	11/26/02	15.92	4.70	11.22	**496.67**	**2,464.04**	654.30	**5,406.75**	**179.91**	ND	ND	ND	ND	ND	ND	ND	**8,580**	17,781.67	3.52
699MW4	03/17/03	15.92	4.05	11.87	**192.35**	**1,663.88**	274.67	**4,233.47**	**2,223.21**	ND	ND	ND	ND	ND	ND	ND	**3,640**	12,227.58	4.88
699MW4	06/30/03	15.92	4.20	11.72	**218.88**	**1,069.37**	491.96	**5,098.43**	**470.51**	ND	ND	ND	ND	ND	ND	ND	**7,530**	14,879.15	4.78
699MW4	09/24/03	15.92	7.51	8.41	ND	10.59	9.38	93.98	**242.15**	ND	ND	ND	ND	ND	ND	ND	282	638.10	**11.6**
699MW4	12/08/03	15.92	4.46	11.46	**70.34**	67.37	51.04	431.42	**374.95**	ND	ND	ND	ND	ND	ND	ND	**2,454**	3,449.12	**10.7**
699MW4	03/29/04	15.92	4.76	11.16	**441.52**	**1,825.02**	**1,063.68**	**10,392.74**	**385.18**	ND	ND	ND	ND	ND	ND	ND	**8,750**	22,858.14	**21.4**
699MW4	06/18/04	15.92	5.77	10.15	**283.45**	565.18	629.50	**5,105.97**	**176.57**	ND	ND	ND	ND	ND	ND	ND	**6,360**	13,120.67	ND
699MW4	09/16/04	15.92	6.92	9.00	**65.02**	55.95	213.57	429.78	69.13	ND	ND	ND	ND	ND	ND	ND	**2,810**	3,643.45	**17.8**
699MW4	12/03/04	15.92	5.21	10.71	**19.26**	44.46	40.86	16.57	**435.48**	ND	ND	ND	ND	ND	ND	ND	**807**	1,363.63	ND
699MW4	03/07/05	15.92	4.61	11.31	**449.60**	**1,916.79**	122.25	**1,462.72**	ND	ND	ND	ND	ND	ND	ND	ND	**507**	4,458.36	ND
699MW4	05/26/05	15.92	5.16	10.76	**10.41**	5.81	21.12	63.14	**216.57**	ND	ND	ND	ND	ND	ND	ND	**763**	1,080.05	ND
699MW4	09/08/05	15.92	7.21	8.71	**21.51**	5.69	23.04	60.63	**431.07**	ND	ND	ND	ND	ND	ND	ND	**1,242**	1,783.94	ND
699MW4	12/14/05	15.92	4.42	11.50	**77.53**	238.65	237.40	**1,378.34**	**464.67**	ND	ND	ND	ND	ND	ND	ND	0	2,396.59	**6.25**
699MW4	02/24/06	15.92	4.10	11.82	**88.80**	249.27	283.74	**1,250.47**	**4,222.90**	ND	ND	ND	ND	ND	ND	ND	**1,451**	7,546.18	ND
699MW4	06/14/06	15.92	3.47	12.45	**32.67**	106.33	355.33	**1,934.13**	**2,282.82**	**2,143.77**	ND	ND	ND	ND	ND	ND	**2,623**	9,478.05	2.99
699MW4	09/22/06	15.92	4.31	11.61	**33.12**	41.61	144.68	681.59	**314.85**	ND	ND	ND	ND	ND	ND	ND	**1,412**	2,627.85	1.03
699MW4	11/28/06	15.92	3.58	12.34	**26.23**	40.95	91.86	241.47	**225.05**	ND	ND	ND	ND	ND	ND	ND	**1,157**	1,782.56	ND
699MW4	02/21/07	15.92	5.02	10.90	**23.72**	15.11	88.23	327.95	**134.54**	ND	ND	ND	ND	ND	ND	ND	**2,870**	3,459.55	ND
699MW4	05/22/07	15.92	4.29	11.63	**39.70**	26.12	334.58	715.59	**370.71**	**253.06**	ND	ND	ND	ND	ND	ND	**619**	2,358.76	2.84
699MW4	08/08/07	15.92	4.95	10.97	**24.55**	12.14	65.51	247.84	**255.85**	66.02	ND	ND	ND	ND	1.29	ND	**1,764**	2,437.20	2.84
699MW4	12/22/07	15.92	5.38	10.54	**92.83**	6.85	16.35	25.87	**152.16**	79.84	ND	ND	ND	ND	2.41	ND	**869**	1,245.31	ND
699MW4	03/30/08	15.92	3.88	12.04	**9.35**	3.77	39.32	134.38	**78.05**	ND	ND	ND	ND	ND	1.47	ND	296	562.34	ND
699MW4	06/04/08	15.92	4.37	11.55	**32.21**	2.53	36.72	88.14	48.41	ND	ND	ND	ND	ND	ND	ND	**503**	711.01	4.56
699MW4	09/29/08	15.92	5.57	10.35	**25.37**	2.36	17.61	40.41	40.79	ND	ND	ND	ND	ND	ND	ND	**747**	873.54	4.69
699MW4	12/30/08	15.92	3.76	12.16	**13.31**	4.20	64.61	189.30	27.62	ND	ND	ND	ND	ND	ND	ND	405	704.04	4.31
699MW4	03/27/09	15.92	4.73	11.19	**20.32**	5.65	136.04	280.26	49.49	ND	ND	ND	ND	ND	ND	ND	**1,302**	1,793.76	**6.92**
699MW4	06/25/09	15.92	3.38	12.54	**21.62**	16.03	196.50	732.14	47.72	ND	ND	ND	ND	ND	ND	ND	**923**	2,234.89	1.63
699MW4	08/26/09	15.92	5.00	10.92	**4.69**	0.48 J	5.46	12.28	5.05	ND	NA	ND	ND	ND	ND	ND	**778**	805.48	ND
699MW4	11/16/09	15.92	4.91	11.01	**7.34**	2.73	66.76	141.78	22.77	ND	ND	ND	ND	ND	ND	ND	**626**	867.38	ND
699MW4	03/26/10	15.92	2.31	13.61	ND	ND	0.99	2.07	6.16	ND	ND	ND	ND	ND	ND	ND	ND	9.22	ND
699MW4	06/16/10	15.92	5.02	10.90	ND	ND	1.71	1.34	3.03	ND	ND	ND	ND	ND	ND	ND	4	10.08	ND
699MW4	09/17/10	15.92	6.98	8.94	**9.07**	10.33	93.76	67.63	25.13	19.67	ND	ND	ND	ND	ND	ND	**1,219**	1,444.59	ND
699MW5	06/19/01	15.48	4.21	11.27	**9.30**	16.92	2.22	13.30	ND	ND	ND	ND	ND	ND	ND	ND	354	395.74	NS
699MW5	08/30/01	15.48	6.25	9.23	ND	ND	ND	ND	ND	ND	5.06	1.22	ND	ND	ND	ND	ND	6.28	1.41
699MW5	12/13/01	15.48	7.40	8.08	ND	ND	ND	ND	ND	ND	10.32	ND	ND	ND	ND	ND	ND	10.32	**8.3**
699MW5	03/27/02	15.48	5.05	10.43	ND	ND	ND	ND	ND	ND	3.81	ND	ND	ND	ND	ND	ND	3.81	ND
699MW5	06/26/02	15.48	5.34	10.14	ND	1.88	ND	5.49	ND	ND	3.99	ND	ND	ND	ND	ND	ND	11.36	ND
699MW5	09/19/02	15.48	5.53	9.95	ND	ND	ND	ND	ND	ND	1.99	ND	ND	ND	ND	ND	ND	1.99	ND
699MW5	11/26/02	15.48	3.23	12.25	ND	ND	ND	ND	ND	ND	0.94	ND	ND	ND	ND	ND	ND	0.94	ND
699MW5	03/17/03	15.48	2.75	12.73	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW5	06/25/03	15.48	2.80	12.68	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	3.46
699MW5	09/24/03	15.48	5.23	10.25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**6.04**

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Building 699, Main Post Gas Station
Fort Monmouth, New Jersey

Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft amsl)	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					**1**	**1,000**	**700**	**1,000**	**70**	**100**	**70**	**3**	**700**	**1**	**6,000**	**1**	**100/500**	--	**5**
699MW5	12/08/03	15.48	3.90	11.58	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	5.00	**6.6**
699MW5	03/29/04	15.48	3.51	11.97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**6.51**
699MW5	06/18/04	15.48	4.54	10.94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**11.2**
699MW5	09/16/04	15.48	5.70	9.78	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**5.33**
699MW5	12/03/04	15.48	3.64	11.84	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW5	03/04/05	15.48	3.03	12.45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW5	05/26/05	15.48	3.96	11.52	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW5	09/08/05	15.48	6.28	9.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	22	22.00	**12.9**
699MW5	12/13/05	15.48	3.22	12.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW5	02/24/06	15.48	3.22	12.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW5	06/13/06	15.48	2.95	12.53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW5	09/22/06	15.48	3.74	11.74	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW5	11/28/06	15.48	2.81	12.67	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW5	02/21/07	15.48	3.98	11.50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW5	05/22/07	15.48	3.90	11.58	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW5	08/08/07	15.48	4.51	10.97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW5	12/22/07	15.48	4.13	11.35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW5	03/30/08	15.48	3.49	11.99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.92	ND	ND	10.92	ND
699MW5	06/04/08	15.48	3.51	11.97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW5	09/29/08	15.48	5.17	10.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1.99
699MW5	12/30/08	15.48	2.82	12.66	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	2.8
699MW5	03/27/09	15.48	4.06	11.42	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW5	06/24/09	15.48	2.45	13.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW5	08/26/09	15.48	4.59	10.89	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW5	11/16/09	15.48	3.88	11.60	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW5	03/24/10	15.48	2.18	13.30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW5	06/16/10	15.48	4.62	10.86	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW5	09/16/10	15.48	7.28	8.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW6	06/19/01	15.78	4.78	11.00	**761.06**	546.35	**985.71**	**1,544.89**	3.70	ND	ND	ND	ND	ND	ND	ND	177	4,018.71	NS
699MW6	08/30/01	15.78	6.77	9.01	**1,177.19**	**1,684.62**	**1,881.59**	**4,730.19**	ND	ND	**261.44**	ND	ND	ND	ND	ND	**4,660**	14,395.03	4.89
699MW6	12/13/01	15.78	7.77	8.01	**401.96**	360.71	366.92	964.27	ND	ND	ND	ND	ND	ND	ND	ND	**620**	2,713.86	2.7
699MW6	03/27/02	15.78	5.21	10.57	**1.09**	2.98	3.00	12.48	ND	ND	ND	ND	ND	ND	ND	ND	44	63.55	**19**
699MW6	06/26/02	15.78	6.12	9.66	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.00	NS
699MW6	09/19/02	15.78	6.15	9.63	**10.50**	9.64	114.43	368.32	ND	ND	ND	ND	ND	ND	ND	ND	**921**	1,423.89	1.53
699MW6	11/26/02	15.78	3.91	11.87	**11.72**	3.78	74.15	82.33	ND	ND	ND	ND	ND	ND	ND	ND	**540**	711.98	ND
699MW6	03/17/03	15.78	3.11	12.67	**10.72**	11.52	95.60	212.63	ND	ND	ND	ND	ND	ND	ND	ND	**809**	1,139.47	ND
699MW6	06/25/03	15.78	3.17	12.61	**1.48**	1.88	73.82	73.11	ND	ND	ND	ND	ND	ND	ND	ND	468	618.29	**9.87**
699MW6	09/24/03	15.78	5.27	10.51	**23.51**	20.87	183.13	459.18	ND	ND	ND	ND	ND	ND	ND	ND	**609**	1,295.69	**9.96**
699MW6	12/08/03	15.78	4.50	11.28	ND	0.68	6.25	13.38	ND	ND	ND	ND	ND	ND	ND	ND	43	63.31	**28**
699MW6	03/29/04	15.78	4.01	11.77	0.51	ND	10.62	7.63	ND	ND	ND	ND	ND	ND	ND	ND	33	51.76	**19.3**
699MW6	06/18/04	15.78	5.23	10.55	0.79	1.73	10.98	11.43	ND	ND	ND	ND	ND	ND	ND	ND	52	76.93	**12.7**
699MW6	09/16/04	15.78	6.38	9.40	**1.63**	3.27	73.98	174.46	ND	ND	ND	ND	ND	ND	ND	ND	ND	253.34	**37.1**
699MW6	12/03/04	15.78	4.51	11.27	**3.70**	2.74	75.31	124.38	ND	ND	ND	ND	ND	ND	ND	ND	**510**	716.00	ND
699MW6	03/04/05	15.78	3.33	12.45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW6	05/26/05	15.78	3.96	11.82	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW6	09/08/05	15.78	7.04	8.74	**130.73**	54.38	480.49	965.61	48.89	ND	ND	ND	ND	ND	ND	ND	**1,264**	2,944.10	ND
699MW6	12/13/05	15.78	5.73	10.05	**1.85**	0.49	12.86	14.56	0.75	ND	ND	ND	ND	ND	2.63	ND	75	108.14	ND
699MW6	02/24/06	15.78	5.67	10.11	**2.53**	ND	6.68	10.18	ND	ND	ND	ND	ND	ND	ND	ND	105	124.39	ND
699MW6	06/14/06	15.78	5.30	10.48	**21.31**	ND	25.51	19.07	ND	ND	ND	ND	ND	ND	ND	ND	243	308.89	ND
699MW6	09/22/06	15.78	6.22	9.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND

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Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft amsl)	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					**1**	**1,000**	**700**	**1,000**	**70**	**100**	**70**	**3**	**700**	**1**	**6,000**	**1**	**100/500**	**--**	**5**
699MW6	11/28/06	15.78	5.12	10.66	**6.91**	6.13	16.07	19.96	1.24	ND	ND	ND	ND	ND	ND	ND	48	98.31	ND
699MW6	02/21/07	15.78	6.72	9.06	**34.71**	31.39	104.47	312.15	0.80	ND	ND	ND	ND	ND	ND	ND	**1,248**	1,731.52	ND
699MW6	05/22/07	15.78	6.29	9.49	**2.49**	1.27	39.37	32.94	0.80	ND	ND	ND	ND	ND	ND	ND	202	278.87	ND
699MW6	08/08/07	15.78	7.01	8.77	**108.01**	53.62	79.04	286.66	25.60	ND	ND	ND	ND	ND	11.98	ND	**2,253**	2,817.91	ND
699MW6	12/22/07	15.78	6.79	8.99	**11.11**	3.23	58.14	62.64	0.28	ND	ND	ND	ND	ND	1.29	ND	117	253.69	ND
699MW6	03/30/08	15.78	5.49	10.29	**6.27**	2.69	50.27	94.45	6.02	ND	ND	ND	22.95	ND	2.29	ND	86	270.94	ND
699MW6	06/04/08	15.78	6.14	9.64	**34.82**	13.82	283.29	332.55	2.93	ND	ND	ND	ND	ND	ND	ND	210	877.41	**5.99**
699MW6	09/29/08	15.78	7.49	8.29	**73.80**	5.10	333.11	202.06	0.72	ND	ND	ND	ND	ND	ND	ND	212	826.79	3.76
699MW6	12/30/08	15.78	5.27	10.51	**9.24**	1.21	44.48	48.42	0.58	ND	ND	ND	ND	ND	ND	ND	123	226.93	2.53
699MW6	03/27/09	15.78	6.53	9.25	**26.73**	14.15	320.24	740.96	0.70 J	ND	ND	ND	ND	ND	ND	ND	**632**	1,839.45	**6.11**
699MW6	06/24/09	15.78	4.91	10.87	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW6	08/26/09	15.78	7.05	8.73	**14.15**	9.68	**735.48**	**1,194.72**	ND	ND	ND	ND	ND	ND	ND	ND	**533**	2,488.43	ND
699MW6	11/16/09	15.78	6.44	9.34	**2.08**	0.44 J	31.39	44.55	ND	ND	ND	ND	ND	ND	ND	ND	75	153.02	ND
699MW6	03/26/10	15.78	4.06	11.72	0.59	1.43	26.31	54.44	ND	ND	ND	ND	ND	ND	ND	ND	137	219.28	**8.68**
699MW6	06/16/10	15.78	7.00	8.78	**1.03**	ND	11.82	7.30	ND	ND	ND	ND	ND	ND	ND	ND	56	76.15	ND
699MW6	09/17/10	15.78	9.30	6.48	**4.22**	ND	3.02	4.52	ND	ND	ND	ND	ND	ND	ND	ND	104	115.76	ND
699MW8	06/19/01	16.20	5.18	11.02	**1.40**	3.24	1.32	3.93	ND	ND	ND	ND	ND	ND	ND	ND	57	66.89	NS
699MW8	08/30/01	16.20	6.53	9.67	ND	ND	ND	ND	ND	ND	1.14	ND	ND	ND	ND	ND	ND	1.14	ND
699MW8	12/13/01	16.20	8.04	8.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1.4
699MW8	03/27/02	16.20	6.35	9.85	ND	1.39	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.39	ND
699MW8	06/26/02	16.20	6.25	9.95	ND	2.66	ND	5.61	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.27	2.7
699MW8	09/19/02	16.20	6.20	10.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8	8.00	0.97
699MW8	11/26/02	16.20	4.34	11.86	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	6.00	ND
699MW8	03/17/03	16.20	3.61	12.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	5.00	1.31
699MW8	06/30/03	16.20	3.65	12.55	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW8	09/24/03	16.20	5.96	10.24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	7.00	ND
699MW8	12/08/03	16.20	5.25	10.95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.9
699MW8	03/29/04	16.20	4.33	11.87	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW8	06/18/04	16.20	5.06	11.14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW8	09/16/04	16.20	6.35	9.85	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW8	12/03/04	16.20	5.40	10.80	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW8	03/07/05	16.20	3.60	12.60	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW8	05/26/05	16.20	4.55	11.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW8	09/08/05	16.20	6.51	9.69	ND	ND	1.38	2.97	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.35	ND
699MW8	12/14/05	16.20	3.83	12.37	ND	0.46	0.65	4.55	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.66	ND
699MW8	02/24/06	16.20	3.55	12.65	ND	ND	ND	0.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.56	ND
699MW8	06/14/06	16.20	3.98	12.22	ND	ND	0.28	1.11	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.39	ND
699MW8	09/22/06	16.20	4.69	11.51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW8	11/28/06	16.20	3.55	12.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW8	02/21/07	16.20	4.65	11.55	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW8	05/22/07	16.20	3.98	12.22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW8	08/08/07	16.20	4.80	11.40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW8	12/22/07	16.20	5.33	10.87	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW8	03/30/08	16.20	3.55	12.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW8	06/04/08	16.20	4.20	12.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW8	09/29/08	16.20	6.11	10.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW8	12/30/08	16.20	3.55	12.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	4.27
699MW8	03/27/09	16.20	4.55	11.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW8	06/24/09	16.20	3.49	12.71	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW8	08/26/09	16.20	4.88	11.32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW8	11/16/09	16.20	5.03	11.17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

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Building 699, Main Post Gas Station
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Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft amsl)	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					**1**	**1,000**	**700**	**1,000**	**70**	**100**	**70**	**3**	**700**	**1**	**6,000**	**1**	**100/500**	**--**	**5**
699MW8	03/24/10	16.20	2.91	13.29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW8	06/16/10	16.20	4.81	11.39	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.74
699MW8	09/17/10	16.20	7.01	9.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW9	06/19/01	15.96	4.83	11.13	ND	1.96	ND	1.27	ND	ND	ND	ND	ND	**2.24**	ND	ND	ND	5.47	NS
699MW9	08/30/01	15.96	7.07	8.89	ND	ND	ND	ND	ND	ND	ND	ND	3.02	**4.68**	ND	ND	ND	7.70	ND
699MW9	12/13/01	15.96	7.96	8.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.25**	ND	ND	ND	2.25	ND
699MW9	03/27/02	15.96	5.36	10.60	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.81**	ND	ND	ND	1.81	ND
699MW9	06/26/02	15.96	6.25	9.71	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.55**	ND	ND	ND	2.55	0.94
699MW9	09/19/02	15.96	6.49	9.47	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.86**	ND	ND	ND	2.86	ND
699MW9	11/26/02	15.96	3.57	12.39	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.3**	ND	ND	ND	1.30	ND
699MW9	03/17/03	15.96	3.00	12.96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW9	06/30/03	15.96	4.03	11.93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW9	09/24/03	15.96	6.07	9.89	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.37**	ND	ND	ND	1.37	1.84
699MW9	12/08/03	15.96	4.74	11.22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	3.53
699MW9	03/29/04	15.96	3.95	12.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW9	06/18/04	15.96	5.40	10.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW9	09/16/04	15.96	6.60	9.36	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.7	ND	ND	4	4.70	ND
699MW9	12/03/04	15.96	4.42	11.54	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW9	03/04/05	15.96	3.21	12.75	ND	0.92	ND	1.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.11	ND
699MW9	05/23/05	15.96	4.33	11.63	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW9	09/08/05	15.96	7.17	8.79	ND	ND	0.33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.33	ND
699MW9	12/13/05	15.96	3.45	12.51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW9	02/24/06	15.96	3.43	12.53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW9	06/13/06	15.96	3.31	12.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW9	09/22/06	15.96	4.41	11.55	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW9	11/28/06	15.96	2.81	13.15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW9	02/21/07	15.96	4.69	11.27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW9	05/22/07	15.96	4.41	11.55	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW9	08/08/07	15.96	5.24	10.72	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.53**	ND	ND	ND	1.53	ND
699MW9	12/22/07	15.96	4.45	11.51	ND	ND	ND	ND	0.72	ND	ND	ND	ND	**1.09**	ND	ND	ND	1.81	ND
699MW9	03/30/08	15.96	3.55	12.41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW9	06/04/08	15.96	4.26	11.70	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1.51
699MW9	09/29/08	15.96	5.88	10.08	ND	ND	ND	ND	1.07	ND	ND	ND	ND	**6.97**	ND	ND	ND	8.04	**6.44**
699MW9	12/30/08	15.96	2.98	12.98	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	4.34
699MW9	03/27/09	15.96	4.58	11.38	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.25
699MW9	06/24/09	15.96	2.78	13.18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW9	08/26/09	15.96	5.36	10.60	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.65**	ND	ND	ND	1.65	ND
699MW9	11/16/09	15.96	4.56	11.40	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.88**	ND	ND	ND	1.88	ND
699MW9	03/26/10	15.96	2.17	13.79	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW9	06/16/10	15.96	5.30	10.66	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.51	ND	ND	ND	0.51	ND
699MW9	09/17/10	15.96	7.51	8.45	ND	ND	0.53	0.28	1.78	ND	ND	ND	ND	**2.32**	ND	ND	ND	4.91	ND
699MW12	06/19/01	16.66	5.64	11.02	ND	1.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.56	NS
699MW12	08/30/01	16.66	7.28	9.38	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	12/13/01	16.66	8.59	8.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1
699MW12	03/27/02	16.66	6.89	9.77	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	06/26/02	16.66	6.85	9.81	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	09/19/02	16.66	6.95	9.71	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1.26
699MW12	11/26/02	16.66	4.90	11.76	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	03/17/03	16.66	4.15	12.51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	06/30/03	16.66	4.26	12.40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND

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Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft amsl)	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					**1**	**1,000**	**700**	**1,000**	**70**	**100**	**70**	**3**	**700**	**1**	**6,000**	**1**	**100/500**	**--**	**5**
699MW12	09/24/03	16.66	6.55	10.11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	12/08/03	16.66	5.80	10.86	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	03/29/04	16.66	4.90	11.76	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	06/18/04	16.66	5.72	10.94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	09/16/04	16.66	7.00	9.66	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	12/03/04	16.66	5.73	10.93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	03/04/05	16.66	4.04	12.62	ND	0.57	ND	ND	28.99	ND	ND	ND	ND	ND	ND	ND	ND	29.56	ND
699MW12	05/23/05	16.66	5.09	11.57	ND	ND	ND	ND	4.62	ND	ND	ND	ND	ND	ND	ND	ND	4.62	ND
699MW12	09/08/05	16.66	7.28	9.38	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	12/13/05	16.66	4.39	12.27	ND	ND	ND	ND	1.15	ND	ND	ND	ND	ND	ND	ND	ND	1.15	ND
699MW12	02/24/06	16.66	4.01	12.65	ND	ND	ND	ND	3.41	ND	ND	ND	ND	ND	ND	ND	ND	3.41	ND
699MW12	06/13/06	16.66	4.44	12.22	ND	ND	ND	ND	1.90	ND	ND	ND	ND	ND	ND	ND	ND	1.90	ND
699MW12	09/22/06	16.66	5.13	11.53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	11/28/06	16.66	4.14	12.52	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	02/21/07	16.66	5.34	11.32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	05/22/07	16.66	4.59	12.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	08/08/07	16.66	5.49	11.17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	12/22/07	16.66	5.67	10.99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	03/30/08	16.66	3.95	12.71	ND	ND	ND	ND	0.51	ND	ND	ND	ND	ND	ND	ND	ND	0.51	ND
699MW12	06/04/08	16.66	4.65	12.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	09/29/08	16.66	6.55	10.11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW12	12/30/08	16.66	4.34	12.32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	3.64
699MW12	03/27/09	16.66	5.05	11.61	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.09
699MW12	06/24/09	16.66	3.88	12.78	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW12	08/26/09	16.66	5.50	11.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW12	11/16/09	16.66	5.35	11.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW12	03/24/10	16.66	2.90	13.76	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW12	06/15/10	16.66	5.37	11.29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW12	09/17/10	16.66	7.65	9.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW15	06/19/01	17.04	3.35	13.69	**1.33**	1.82	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.15	NS
699MW15	08/30/01	17.04	5.92	11.12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**5.82**
699MW15	12/13/01	17.04	7.21	9.83	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	3.9
699MW15	03/27/02	17.04	1.73	15.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**5.51**
699MW15	06/26/02	17.04	4.71	12.33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	2.3
699MW15	09/19/02	17.04	4.84	12.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	3.35
699MW15	11/26/02	17.04	2.14	14.90	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW15	03/17/03	17.04	2.13	14.91	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW15	06/25/03	17.04	2.35	14.69	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	2.91
699MW15	09/24/03	17.04	5.03	12.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	5.00	**8.96**
699MW15	12/08/03	17.04	3.05	13.99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**6.74**
699MW15	03/29/04	17.04	3.05	13.99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**15.1**
699MW15	06/18/04	17.04	4.55	12.49	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW15	09/16/04	17.04	5.61	11.43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**8.41**
699MW15	12/06/04	17.04	3.09	13.95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW15	03/07/05	17.04	2.53	14.51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW15	05/26/05	17.04	3.95	13.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**8.35**
699MW15	09/08/05	17.04	6.56	10.48	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW15	12/13/05	17.04	1.98	15.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**7.99**
699MW15	02/24/06	17.04	2.99	14.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**6.62**
699MW15	06/13/06	17.04	2.86	14.18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	4.56
699MW15	09/22/06	17.04	3.24	13.80	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1.63

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Fort Monmouth, New Jersey

Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft amsl)	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					**1**	**1,000**	**700**	**1,000**	**70**	**100**	**70**	**3**	**700**	**1**	**6,000**	**1**	**100/500**	**--**	**5**
699MW15	11/28/06	17.04	1.88	15.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699MW15	02/21/07	17.04	3.21	13.83	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1.23
699MW15	05/22/07	17.04	4.45	12.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**6.69**
699MW15	08/08/07	17.04	4.38	12.66	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	3.55
699MW15	12/22/07	17.04	2.79	14.25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	1
699MW15	03/30/08	17.04	3.78	13.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	2.29
699MW15	06/04/08	17.04	4.06	12.98	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**7.12**
699MW15	09/29/08	17.04	3.88	13.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**5.62**
699MW15	12/30/08	17.04	2.18	14.86	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	**7.16**
699MW15	03/27/09	17.04	4.21	12.83	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.79
699MW15	06/24/09	17.04	1.25	15.79	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.85
699MW15	08/26/09	17.04	4.91	12.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.04
699MW15	11/16/09	17.04	3.86	13.18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.71
699MW15	03/25/10	17.04	1.61	15.43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**31.1**
699MW15	06/15/10	17.04	5.32	11.72	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.5
699MW15	09/16/10	17.04	7.80	9.24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW16	06/19/01	15.27	5.00	10.27	ND	ND	ND	ND	ND	ND	5.31	ND	ND	ND	ND	ND	ND	5.31	NS
699MW16	08/30/01	15.27	7.26	8.01	ND	ND	ND	ND	ND	ND	1.02	ND	ND	ND	ND	ND	ND	1.02	ND
699MW16	12/13/01	15.27	7.64	7.63	ND	ND	ND	ND	ND	ND	1.67	ND	ND	ND	ND	ND	ND	1.67	ND
699MW16	03/27/02	15.27	4.92	10.35	ND	ND	ND	ND	ND	ND	10.09	ND	ND	ND	ND	ND	ND	10.09	ND
699MW16	06/27/02	15.27	5.79	9.48	ND	ND	ND	ND	ND	ND	10.83	ND	ND	ND	ND	ND	ND	10.83	ND
699MW16	09/19/02	15.27	7.34	7.93	ND	ND	ND	ND	ND	ND	2.64	ND	ND	ND	ND	ND	ND	2.64	ND
699MW16	11/26/02	15.27	2.57	12.70	ND	ND	ND	ND	ND	ND	14.38	ND	ND	ND	ND	ND	ND	14.38	ND
699MW16	06/30/03	15.27	3.96	11.31	ND	ND	ND	ND	ND	ND	19.84	ND	ND	ND	ND	ND	ND	19.84	ND
699MW16	03/17/03	15.27	2.34	12.93	ND	ND	ND	ND	ND	ND	31.83	ND	ND	ND	ND	ND	ND	31.83	ND
699MW16	09/24/03	15.27	6.22	9.05	ND	ND	ND	ND	ND	ND	2.91	ND	ND	ND	ND	ND	ND	2.91	ND
699MW16	12/08/03	15.27	4.04	11.23	ND	ND	ND	ND	ND	ND	4.25	ND	ND	0.49	ND	ND	ND	4.74	ND
699MW16	03/29/04	15.27	3.25	12.02	ND	ND	ND	ND	ND	ND	7.31	ND	ND	ND	ND	ND	ND	7.31	ND
699MW16	06/18/04	15.27	5.23	10.04	ND	ND	ND	ND	ND	ND	3.54	ND	ND	ND	ND	ND	ND	3.54	ND
699MW16	09/16/04	15.27	6.51	8.76	ND	ND	ND	ND	ND	ND	1.43	ND	ND	0.91	ND	ND	ND	2.34	ND
699MW16	12/03/04	15.27	3.62	11.65	ND	ND	ND	ND	ND	ND	3.56	ND	ND	**1.09**	ND	ND	ND	4.65	ND
699MW16	03/04/05	15.27	2.48	12.79	ND	0.40	ND	ND	ND	ND	26.07	ND	ND	ND	ND	ND	ND	26.47	ND
699MW16	05/23/05	15.27	3.72	11.55	ND	ND	ND	ND	ND	ND	15.51	ND	ND	ND	ND	ND	ND	15.51	ND
699MW16	09/08/05	15.27	7.48	7.79	ND	ND	ND	ND	ND	ND	0.83	ND	ND	**1.37**	ND	ND	ND	2.20	ND
699MW16	12/13/05	15.27	2.66	12.61	ND	ND	ND	ND	ND	ND	31.39	ND	ND	0.42	ND	ND	ND	31.81	ND
699MW16	02/24/06	15.27	2.84	12.43	ND	ND	ND	ND	ND	ND	22.71	ND	ND	ND	ND	ND	ND	22.71	ND
699MW16	06/13/06	15.27	3.16	12.11	ND	ND	ND	ND	ND	ND	24.2	ND	ND	ND	ND	ND	ND	24.20	ND
699MW16	09/22/06	15.27	4.40	10.87	ND	ND	ND	ND	ND	ND	5	ND	ND	ND	ND	ND	ND	5.00	ND
699MW16	11/28/06	15.27	2.00	13.27	ND	ND	ND	ND	ND	ND	33.95	ND	ND	0.37	ND	ND	ND	34.32	ND
699MW16	02/21/07	15.27	4.31	10.96	ND	ND	ND	ND	ND	ND	8.47	ND	ND	0.54	ND	ND	ND	9.01	ND
699MW16	05/22/07	15.27	4.13	11.14	ND	ND	ND	ND	ND	ND	13.03	ND	ND	0.54	ND	ND	ND	13.57	ND
699MW16	08/08/07	15.27	5.23	10.04	ND	ND	ND	ND	ND	ND	4.2	ND	ND	**1.8**	ND	ND	ND	6.00	ND
699MW16	12/22/07	15.27	3.41	11.86	ND	ND	ND	ND	ND	ND	21.46	ND	ND	**1.11**	ND	ND	ND	22.57	ND
699MW16	03/30/08	15.27	3.18	12.09	ND	ND	ND	ND	ND	ND	32.23	ND	ND	ND	ND	ND	ND	32.23	ND
699MW16	06/04/08	15.27	4.03	11.24	ND	ND	ND	ND	ND	ND	39.61	ND	ND	0.72	ND	ND	ND	40.33	ND
699MW16	09/29/08	15.27	6.16	9.11	ND	ND	ND	ND	ND	ND	4.68	ND	ND	**1.93**	ND	ND	ND	6.61	ND
699MW16	12/30/08	15.27	2.25	13.02	ND	ND	ND	ND	ND	ND	23.77	ND	ND	0.51	ND	ND	ND	24.28	4
699MW16	03/27/09	15.27	4.13	11.14	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.65 J	ND	ND	ND	ND	ND
699MW16	06/24/09	15.27	2.18	13.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699MW16	08/26/09	15.27	5.34	9.93	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.93	ND	ND	ND	0.93	ND

Table 3. Groundwater Monitoring & Sampling Summary Data
Building 699, Main Post Gas Station
Fort Monmouth, New Jersey

Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft amsl)	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					**1**	**1,000**	**700**	**1,000**	**70**	**100**	**70**	**3**	**700**	**1**	**6,000**	**1**	**100/500**	--	**5**
699MW16	11/16/09	15.27	3.91	11.36	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.09**	ND	ND	ND	1.09	ND
699MW16	03/26/10	15.27	1.80	13.47	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.96	ND	ND	ND	0.96	ND
699MW16	06/17/10	15.27	5.23	10.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.99	ND	ND	ND	0.99	ND
699MW16	09/17/10	15.27	8.01	7.26	ND	ND	0.42	0.22	ND	ND	ND	ND	ND	**1.71**	ND	ND	ND	2.35	ND
699RW3	12/30/08	WNS	10.90	WNS	**26.93**	15.54	143.23	384.95	24.58	NA	ND	ND	ND	ND	ND	ND	**646**	1,241.23	2.61
699RW3	03/27/09	WNS	8.15	WNS	**257.57**	378.26	230.43	645.61	45.32	ND	ND	ND	ND	ND	ND	ND	**1,140**	2,700.46	**12.9**
699RW3	06/25/09	WNS	13.08	WNS	**42.28**	16.55	146.89	370.28	19.11	ND	ND	ND	ND	ND	ND	ND	455	1,050.75	**11.3**
699RW3	08/26/09	WNS	13.56	WNS	**32.01**	3.77	98.17	114.58	18.89	46.89	ND	ND	ND	ND	ND	ND	348	643.10	ND
699RW3	11/16/09	WNS	11.34	WNS	**13.49**	1.96	85.08	122.80	17.26	ND	ND	ND	ND	ND	ND	ND	187	427.59	**7.14**
699RW3	03/31/10	WNS	WNG	WNS	ND	ND	0.96	0.87	ND	ND	ND	ND	ND	ND	ND	ND	19	21.23	ND
699RW3	06/17/10	WNS	10.85	WNS	**11.29**	0.58	24.37	14.04	8.95	28.08	ND	ND	ND	ND	ND	ND	468	555.32	**29.3**
699RW3	09/27/10	WNS	WNG	WNS	**1.30**	2.21	15.89	82.76	1.69	ND	ND	ND	ND	ND	ND	ND	313	416.85	2.82
699RW4	02/24/06	16.47	4.86	11.61	ND	ND	1.62	ND	0.41	ND	ND	ND	ND	ND	ND	ND	ND	2.03	ND
699RW4	06/14/06	16.47	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699RW4	09/22/06	16.47	5.07	11.40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699RW4	11/28/06	16.47	3.94	12.53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699RW4	02/21/07	16.47	12.82	3.65	**5.44**	ND	1.59	0.32	11.34	19.88	ND	ND	ND	**3.81**	ND	ND	96	138.38	ND
699RW4	05/22/07	16.47	4.19	12.28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND
699RW4	08/08/07	16.47	4.21	12.26	ND	0.70	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.70	**6.14**
699RW4	12/22/07	16.47	8.54	7.93	0.48	ND	ND	ND	5.80	5.44	ND	ND	ND	0.74	6.92	ND	ND	19.38	ND
699RW4	03/30/08	16.47	1.37	15.10	**23.33**	24.81	94.27	341.15	24.27	**106.76**	ND	ND	ND	ND	6.19	ND	186	806.78	**6.87**
699RW4	06/04/08	16.47	4.91	11.56	**28.19**	10.11	27.78	72.04	30.85	**183.71**	ND	ND	ND	0.72	2.54	ND	170	525.94	**21.8**
699RW4	09/29/08	16.47	4.21	12.26	0.38	ND	ND	ND	9.96	33.67	ND	ND	ND	ND	ND	ND	9	53.01	**9.68**
699RW4	12/30/08	16.47	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699RW4	03/27/09	16.47	5.01	11.46	1.43 J	ND	0.77 J	1.68	2.21	ND	ND	ND	ND	ND	ND	ND	ND	3.89	**6.02**
699RW4	06/24/09	16.47	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	NS
699RW4	08/26/09	16.47	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	NS
699RW4	11/16/09	16.47	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	NS
699RW4	03/25/10	16.47	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699RW4	06/15/10	16.47	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699RW4	09/16/10	16.47	WNG	WNG	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699RW5	06/04/08	WNS	8.49	WNS	**878.97**	**1,338.47**	**770.76**	**3,177.32**	38.69	ND	ND	ND	1.16	ND	34.32	ND	400	6,639.69	**9.22**
699RW5	09/29/08	WNS	4.93	WNS	**87.27**	**1,005.58**	215.88	894.25	1.94	ND	ND	ND	0.98	ND	37.06	ND	359	2,601.96	**5.84**
699RW5	12/30/08	WNS	3.35	WNS	**499.65**	**2,740.50**	669.43	**4,250.13**	10.37	ND	ND	ND	ND	ND	ND	ND	189	8,359.08	3.96
699RW5	03/27/09	WNS	WNG	WNS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	NS
699RW5	06/25/09	WNS	8.65	WNS	**177.44**	55.93	73.58	168.82	34.50	**139.97**	ND	ND	ND	ND	ND	ND	450	1,109.10	**45**
699RW5	08/26/09	WNS	8.46	WNS	**212.50**	235.60	178.64	556.52	20.95	ND	ND	ND	ND	ND	ND	ND	**748**	1,956.27	ND
699RW5	11/16/09	WNS	3.80	WNS	**2.87**	1.74	0.90	4.94	2.31	ND	ND	ND	ND	ND	ND	ND	ND	12.76	**64.1**
699RW5	03/25/10	WNS	WNG	WNS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
699RW5	06/17/10	WNS	4.25	WNS	**8.64**	13.16	8.43	30.80	1.01	ND	ND	ND	ND	ND	ND	ND	69	131.04	ND
699RW5	09/30/10	WNS	WNG	WNS	**2.20**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.20	4.12
699RW11	06/19/01	16.43	9.09	7.34	**7,812.42**	**2,932.54**	**872.36**	**3,061.34**	**1,588.83**	**655.03**	ND	ND	ND	ND	ND	ND	303	17,225.52	NS
699RW11	08/30/01	16.43	9.23	7.20	**9,061.81**	**2,136.97**	**1,567.48**	**4,786.87**	**1,564.32**	ND	**243.36**	ND	ND	ND	ND	ND	**7,740**	27,100.81	ND
699RW11	12/13/01	16.43	NA	NA	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	NS	NS	0.00	NS
699RW11	03/27/02	16.43	7.90	8.53	**8,081.71**	**1,897.11**	**913.41**	**4,405.86**	**763.15**	**924.29**	ND	ND	ND	ND	ND	ND	**8,590**	25,575.53	ND
699RW11	06/27/02	16.43	7.61	8.82	**5,027.39**	**2,481.36**	**1,162.11**	**3,640.85**	**263.36**	6.61	ND	ND	ND	ND	ND	ND	ND	12,581.68	ND
699RW11	09/19/02	16.43	NA	NA	**1,656.53**	474.38	608.84	**4,671.57**	**276.39**	ND	ND	ND	ND	ND	ND	ND	**6,660**	14,347.71	ND
699RW11	11/26/02	16.43	NA	NA	**306.67**	322.73	89.47	389.31	**77.01**	**135.41**	ND	ND	ND	ND	ND	ND	337	1,657.60	ND
699RW11	03/17/03	16.43	11.28	5.15	**2,241.65**	**3,045.43**	**919.82**	**3,797.12**	**424.58**	ND	ND	ND	ND	ND	ND	ND	**6,430**	16,858.60	1.8

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Monitoring Well	Date	Top of Casing (ft amsl)	Depth to Water (ft below TOC)	Corrected GW Elevation (ft amsl)	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TBA	Chloro-form	Methylene Chloride	Carbon Disulfide	PCE	Acetone	TCE	VOC TICs	Total VOCs	Total Lead
NJDEP Class II-A Ground Water Quality Standard (µg/L)					**1**	**1,000**	**700**	**1,000**	**70**	**100**	**70**	**3**	**700**	**1**	**6,000**	**1**	**100/500**	--	**5**
699RW11	06/25/03	16.43	11.33	5.10	**1,609.59**	**1,317.86**	633.41	**2,258.51**	**195.72**	ND	ND	ND	ND	ND	ND	ND	**1,630**	7,645.09	1.78
699RW11	09/24/03	16.43	9.29	7.14	**210.43**	114.53	103.74	385.62	**278.80**	ND	ND	ND	ND	ND	ND	ND	351	1,444.12	2.68
699RW11	12/08/03	16.43	NA	WNG	**587.03**	323.54	237.10	620.81	**231.93**	ND	ND	ND	ND	ND	ND	ND	**1,475**	3,475.41	**6.6**
699RW11	03/29/04	16.43	NA	WNG	**629.17**	360.37	424.61	992.38	**196.50**	**216.08**	ND	ND	ND	ND	ND	ND	**2,131**	4,950.11	**9.27**
699RW11	06/18/04	16.43	11.30	5.13	**504.50**	266.76	274.75	847.26	**156.90**	ND	ND	ND	ND	ND	ND	ND	**1,003**	3,053.17	ND
699RW11	09/16/04	16.43	NA	WNG	**250.53**	**3,031.86**	**2,329.45**	**11,744.18**	ND	ND	ND	ND	ND	ND	ND	ND	**19,930**	37,286.02	ND
699RW11	12/10/04	16.43	11.30	5.13	**708.51**	102.03	545.62	826.03	**355.32**	ND	ND	ND	ND	ND	ND	ND	**1,897**	4,434.51	ND
699RW11	03/02/05	16.43	11.20	5.23	**13.98**	201.12	124.85	**5,417.85**	ND	ND	ND	ND	ND	ND	20.31	ND	**2,657**	8,435.11	ND
699RW11	05/25/05	16.43	11.67	4.76	**737.49**	440.61	636.02	**2,347.35**	**457.11**	ND	ND	ND	ND	ND	ND	ND	**3,850**	8,468.58	ND
699RW11	09/08/05	16.43	11.68	4.75	**801.36**	368.34	388.69	**1,086.90**	**353.62**	ND	ND	ND	ND	ND	ND	ND	**5,130**	8,128.91	**6.71**
699RW11	12/14/05	16.43	NA	NA	**572.93**	421.26	456.19	969.87	**1,395.64**	ND	ND	ND	ND	ND	ND	ND	0	3,815.89	**6.98**
699RW11	02/24/06	16.43	12.40	4.03	**337.22**	401.53	385.81	**1,067.26**	**1,281.29**	**1,713.67**	ND	ND	ND	ND	ND	ND	**2,190**	7,376.78	ND
699RW11	06/14/06	16.43	NA	NA	**530.72**	359.44	681.52	**2,665.97**	**9,128.57**	**7,832.26**	ND	ND	ND	ND	ND	ND	**5,670**	26,868.48	ND
699RW11	09/22/06	16.43	4.38	12.05	**203.71**	61.84	93.13	245.31	**165.04**	**2,206.21**	ND	ND	ND	ND	44.73	ND	ND	3,019.97	ND
699RW11	11/28/06	16.43	4.48	11.95	**242.69**	100.19	173.42	280.81	**140.86**	**978.30**	ND	ND	ND	0.68	ND	ND	**729**	2,645.95	ND
699RW11	02/21/07	16.43	11.49	4.94	**158.95**	94.12	110.49	423.71	**125.64**	**430.17**	ND	ND	ND	**1.43**	ND	ND	**1,920**	3,264.51	ND
699RW11	05/22/07	16.43	11.26	5.17	**450.86**	486.51	638.46	**2,205.07**	**82.02**	**810.52**	ND	ND	ND	ND	13	ND	484	5,170.44	**7.58**
699RW11	08/08/07	16.43	4.24	12.19	**11.41**	1.64	12.97	22.84	4.57	**244.91**	ND	ND	ND	ND	11.51	ND	84	393.85	1.96
699RW11	12/22/07	16.43	4.41	12.02	0.38	ND	1.46	4.07	5.24	40.65	ND	ND	ND	ND	ND	ND	ND	51.80	1.2
699RW11	03/30/08	16.43	10.52	5.91	0.58	ND	0.29	0.38	7.92	**165.09**	ND	ND	ND	ND	5.2	ND	ND	179.46	ND
699RW11	06/04/08	16.43	10.98	5.45	**158**	7.53	224.45	385.08	16.33	ND	ND	ND	ND	ND	4.28	ND	278	1,073.67	3.37
699RW11	09/29/08	16.43	5.53	10.90	**2.94**	0.41	ND	1.45	4.59	ND	ND	ND	ND	ND	ND	ND	136	145.39	3.54
699RW11	12/30/08	16.43	10.88	5.55	**253.16**	16.32	29.66	50.68	13.40	ND	ND	ND	ND	ND	ND	ND	459	822.22	3
699RW11	03/27/09	16.43	3.45	12.98	0.87 J	ND	ND	ND	0.44 J	15.29	ND	ND	NA	ND	ND	ND	ND	15.29	2.47
699RW11	06/25/09	16.43	3.41	13.02	**8.41**	1.70 J	5.22	5.46	1.80 J	**119.70**	ND	ND	ND	0.57 J	ND	ND	159	297.79	3.91
699RW11	08/26/09	16.43	3.41	13.02	0.25 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
699RW11	11/16/09	16.43	11.28	5.15	**4.06**	ND	1.00	ND	9.94	**185.93**	ND	ND	ND	**2.86**	ND	ND	182	385.79	**9.16**
699RW11	03/31/10	16.43	WNG	WNG	0.33	ND	ND	ND	2.34	**112.41**	ND	ND	ND	ND	ND	ND	5	120.08	2.85
699RW11	06/17/10	16.43	11.50	4.93	**6.11**	0.30	3.55	ND	15.53	**237.89**	ND	ND	ND	**13.52**	ND	**2.83**	436	717.83	**24.2**
699RW11	09/27/10	16.43	WNG	WNG	ND	ND	ND	1.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.05	ND

NOTES:

All analytical results in micrograms per liter (ug/L)
NJDEP = New Jersey Department of Environmental Protection
TICs = Tentatively identified compounds
DTW = Depth to water
VOC = Volatile organic compound
ND = Not detected
NA = Data not available
TOC = Top of Casing
µg/L = Microgram per Liter
NS = Not Sampled
WNS = Well Not Surveyed
ft bgs = Feet Below Grade Surface
ft amsl = Feet Above Mean Sea Level
WNG = Well Not Gauged
PCE = Tetrachloroethylene
TCE = Trichloroethene
TBA = *tert* -Butyl Alcohol
MTBE = Methyl *tert* -Butyl Ether
BOLD = Concentration greater than applicable ground water quality standard

SANITARY MANHOLE

EXISTING 10" SANITARY MAIN

SALTZMAN AVENUE

North

TIE-IN TO EXISTING UNDERGROUND ELECTRICAL CONDUIT

AREA LIGHT/BASE

PAVED LOT

GRASS PLANTER

GRASS PLANTER

VL9 VL7 VL5 VL3

SP4

RW3

SP8

SEALED HORIZONTAL VAPOR EXTRACTION TRENCH TYP. OF 9

VL8 VL6 VL4

SP6

SP7

SP5

CONCRETE PAD

CANOPY FOOTER/STEEL BASE PLATE TYP. OF 6

PUMP ISLAND TYP. OF 3

RW4

SP3

VL2

VL1

SP1

SP2

CANOPY DRAINS TIE-IN TO EXISTING STORM SEWER

EXISTING UNDERGROUND ELECTRIC PUMP DISPENSERS

CANOPY LIGHTS/OUTLETS UNDERGROUND ELECTRIC TRENCH RUN

EXISTING UNDERGROUND ELECTRIC TRENCH RUN

OUTLET, SPARES AIR POWER

BUILDING 699
ACTIVE SERVICE STATION

AREA LIGHT/BASE

UST

FIELD

UNDERGROUND ELECTRIC TRENCH RUN TO AREA LIGHT

EXISTING 6" SANITARY LATERAL

PAVED LOT

SPARE ELECTRICAL OUTLET

RW11

4" PVC DISCHARGE PIPE

TREATMENT SYSTEM ENCLOSURE

SANITARY MANHOLE

UNDERGROUND ELECTRIC TRENCH RUN MAIN SYSTEM POWER

3" DIAMETER STEEL ELECTRICAL CONDUIT

TELEPHONE POLE

0 15 30 60

SCALE EQUALS : 1 INCH = 30 FEET

LEGEND:

- = VAPOR EXTRACTION CELL
- = GROUNDWATER RECOVERY WELL AND VAPOR EXTRACTION POINT
- = AIR SPARGE POINT

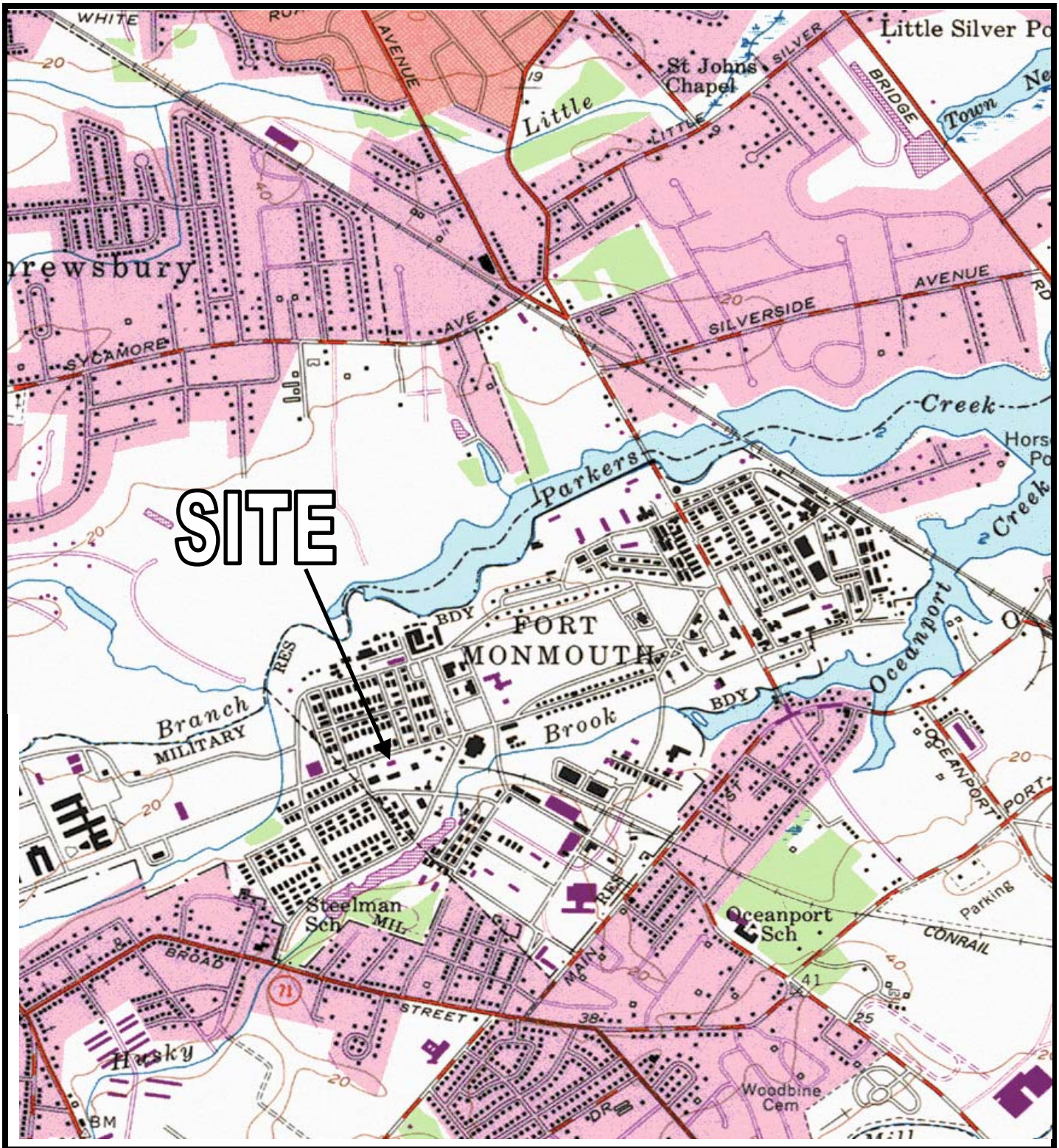
HANDEX

REMEDIATION SYSTEM AND NEW CONSTRUCTION

AS-BUILT GENERAL SITE PLAN

US ARMY
699 SALTZMAN AVENUE
FORT MONMOUTH, NEW JERSEY

SCALE-	1" = 30'	DATE-	02/12/01
DRAWN BY-	ED H.	JOB No.-	121739.001
DWG NAME-	S:\INDUSTRY\INDUSTRL\FTMONMTH\FORTYVA.DWG		



USGS Quadrangle: Long Branch, NJ

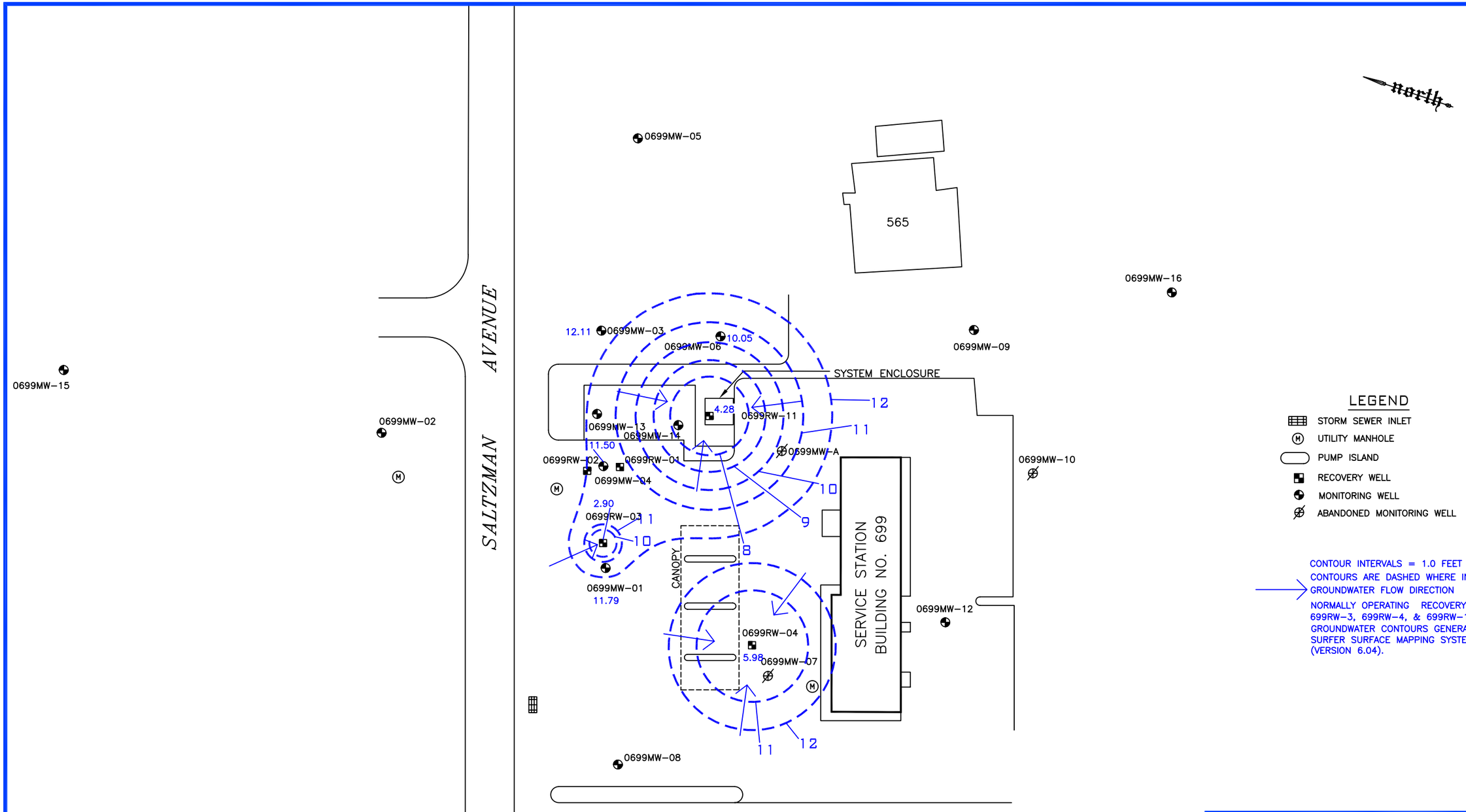
N
W E
S

HCR HANDEX CONSULTING & REMEDIATION, LLC

Northeast, LLC
24 Abeel Rd., Monroe, NJ 08831

FIGURE 1
SITE LOCATION MAP

LOCATION	US Army-Building 699
	Fort Monmouth
	Eatontown, New Jersey
JOB NO.	121739
SCALE	1" = 2000'



HCR HANDEX CONSULTING & REMEDIATION, LLC
24 ABEEL ROAD
MONROE, NJ 08831

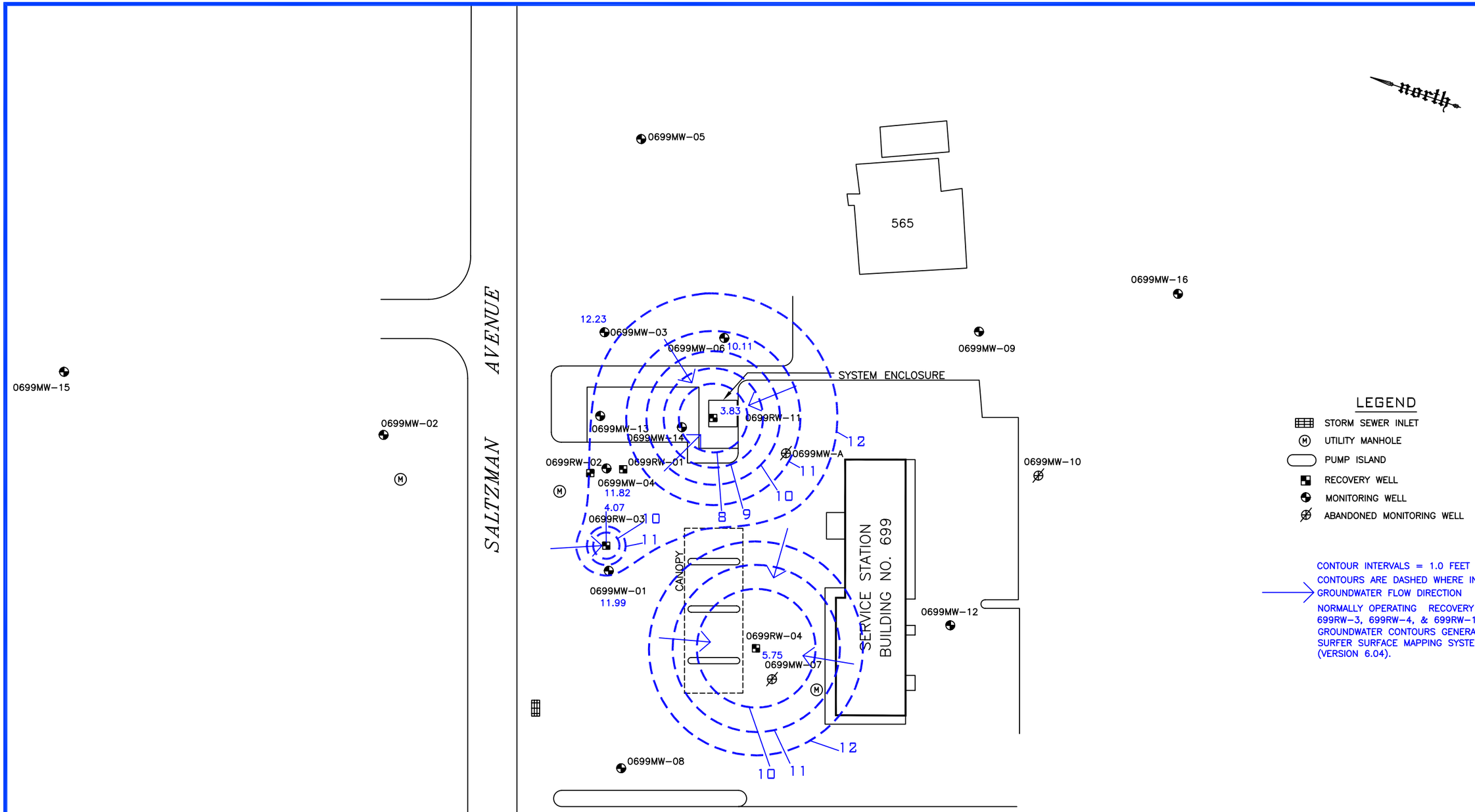
FIGURE 10

GROUNDWATER RECOVERY SYSTEM MAP

DATA COLLECTED: DECEMBER 16, 2005

US ARMY – FORT MONMOUTH
BUILDING No. 699
EATONTOWN, NEW JERSEY

SCALE-	1" = 50'	DATE-	09/01/08
DRAWN BY-	V.S.B.	JOB No.-	121739
DWG NAME-	S:\PROJ\FTMON\RPT\RAPR\10-06\FIGS.DWG		



HCR HANDEX CONSULTING & REMEDIATION, LLC

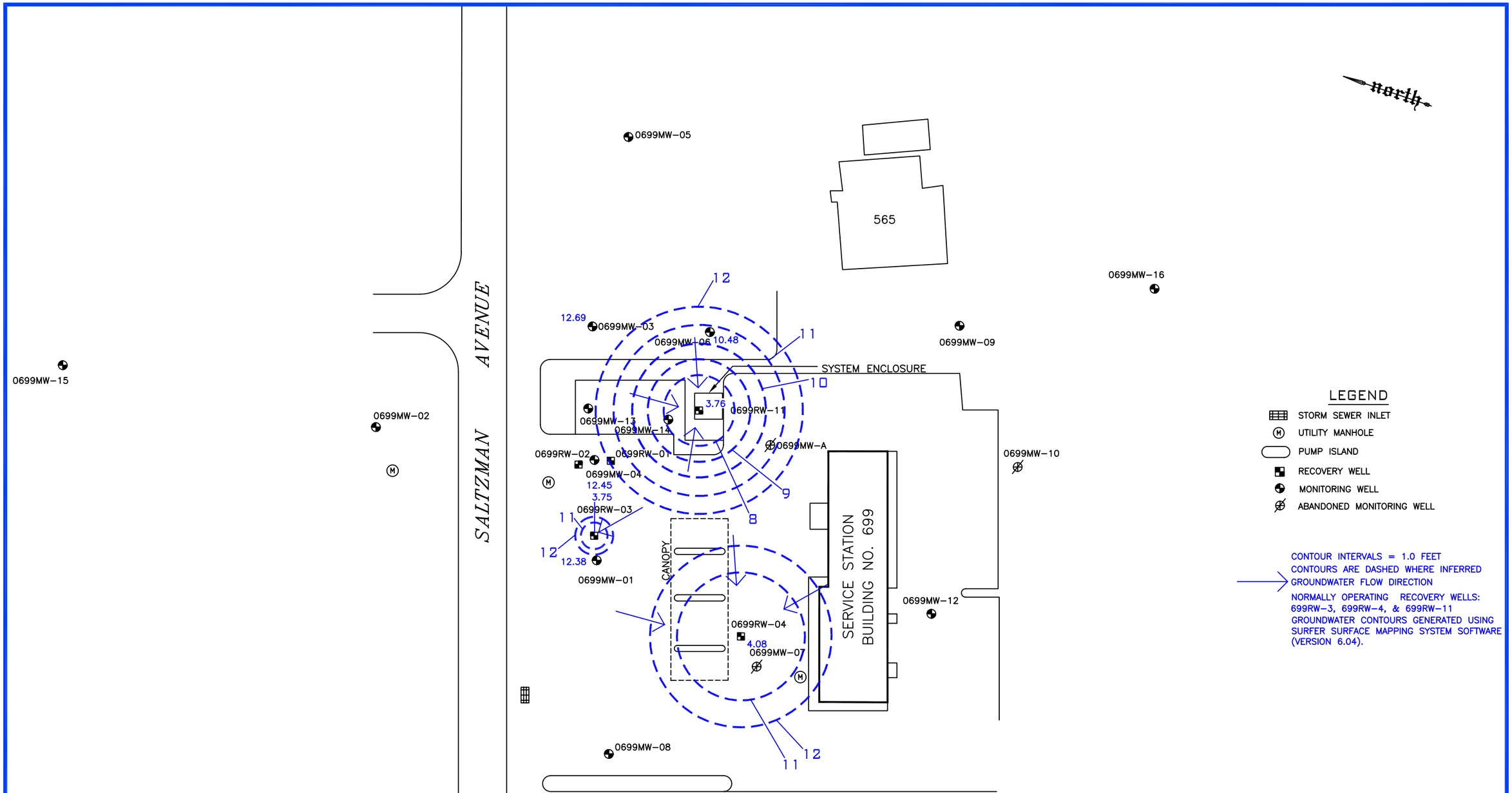
24 ABEEL ROAD
MONROE, NJ 08831

FIGURE 11

GROUNDWATER RECOVERY SYSTEM MAP

DATA COLLECTED: FEBRUARY 21, 2006
US ARMY - FORT MONMOUTH
BUILDING No. 699
EATONTOWN, NEW JERSEY

SCALE-	1" = 50'	DATE-	09/01/08
DRAWN BY-	V.S.B.	JOB No.-	121739
DWG NAME-	S:\PROJ\FTMON\RPT\RAPR\10-06\FIGS.DWG		



HCR HANDEX CONSULTING & REMEDIATION, LLC

24 ABEEL ROAD
MONROE, NJ 08831

FIGURE 12

GROUNDWATER RECOVERY SYSTEM MAP

DATA COLLECTED: JUNE 16, 2006

US ARMY – FORT MONMOUTH
BUILDING No. 699
EATONTOWN, NEW JERSEY

SCALE-	1" = 50'	DATE-	09/01/08
DRAWN BY-	V.S.B.	JOB No.-	121739
DWG NAME-	S:\PROJ\FTMON\RPT\RAPR\10-06\FIGS.DWG		

north

SALTZMAN AVENUE

0699MW-15

0699MW-02

0699MW-05

565

0699MW-16

0699MW-03
11.82

0699MW-06
9.56

0699MW-09

SYSTEM ENCLOSURE

11
10
9
8
7

3.64
0699RW-11

0699MW-13
0699MW-14

0699RW-02
0699RW-01
0699MW-A

0699MW-10

0699MW-04
11.61
3.64
0699RW-03

10
11
11.55
0699MW-01

CANOPY

SERVICE STATION BUILDING NO. 699

0699MW-12

0699RW-04
4.93
0699MW-07

0699MW-08

9
10
11

LEGEND

- STORM SEWER INLET
- UTILITY MANHOLE
- PUMP ISLAND
- RECOVERY WELL
- MONITORING WELL
- ABANDONED MONITORING WELL

CONTOUR INTERVALS = 1.0 FEET

CONTOURS ARE DASHED WHERE INFERRED

GROUNDWATER FLOW DIRECTION

NORMALLY OPERATING RECOVERY WELLS: 699RW-3, 699RW-4, & 699RW-11

GROUNDWATER CONTOURS GENERATED USING SURFER SURFACE MAPPING SYSTEM SOFTWARE (VERSION 6.04).

0 10 20 30 40 50 100

SCALE EQUALS : 1 INCH = 50 FEET

HCR HANDEX CONSULTING & REMEDIATION, LLC

24 ABEEL ROAD
MONROE, NJ 08831

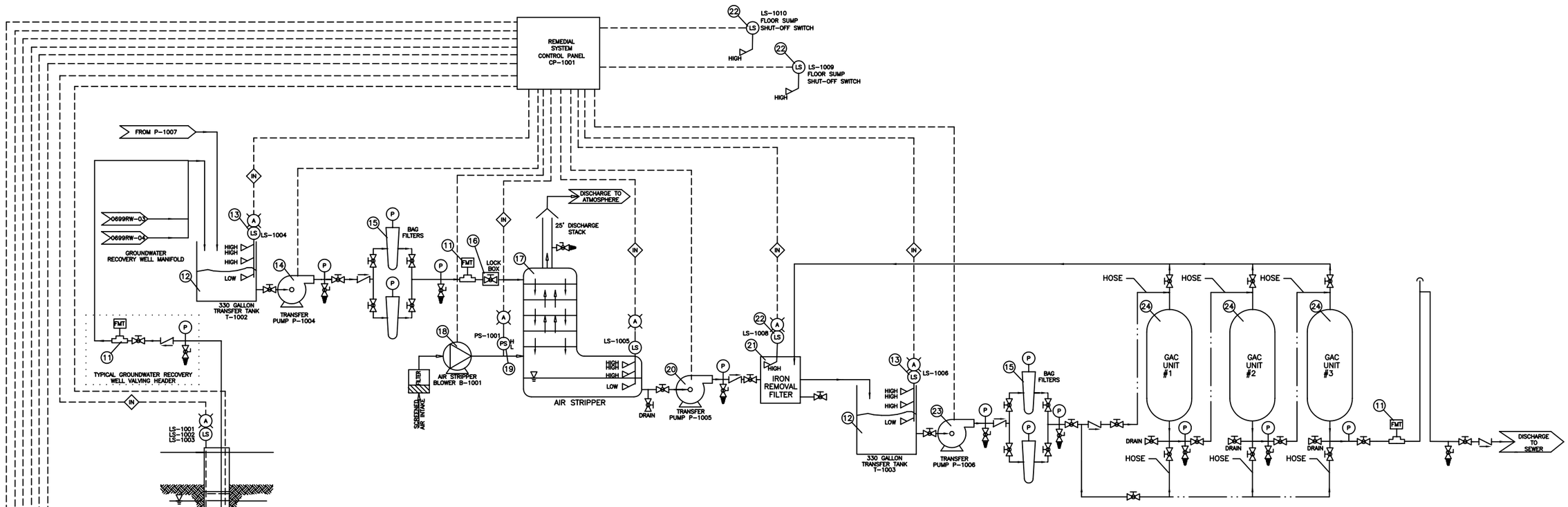
FIGURE 13

GROUNDWATER RECOVERY SYSTEM MAP

DATA COLLECTED: SEPTEMBER 29, 2006

US ARMY - FORT MONMOUTH
BUILDING No. 699
EATONTOWN, NEW JERSEY

SCALE-	1" = 50'	DATE-	09/01/08
DRAWN BY-	V.S.B.	JOB No.-	121739
DWG NAME-	S:\PROJ\FTMON\RPT\RAPR\10-06\FIGS.DWG		



SYSTEM DESCRIPTION

1. EXTRACTION LINES ARE RUN TO EACH RECOVERY WELL.
2. GROUNDWATER RECOVERY RATES ARE CONTROLLED BY INDIVIDUAL VALVES.
3. GROUNDWATER FLOW RATES ARE MEASURED FOR EACH INDIVIDUAL RECOVERY WELL, COMBINED INFLUENT TO THE AIR STRIPPER, AND THE EFFLUENT AFTER THE CARBON UNITS.
4. BAG FILTERS AND IRON REMOVAL FILTER ARE UTILIZED TO REMOVE SUSPENDED SOLIDS FROM GROUNDWATER.
5. PRIMARY REMOVAL OF VOC'S SHALL BE ACCOMPLISHED UTILIZING A LOW PROFILE AIR STRIPPER.
6. GRANULAR ACTIVATED CARBON (GAC) SHALL BE UTILIZED TO PROVIDE SECONDARY TREATMENT AND POLISHING OF THE EFFLUENT.
7. TREATED GROUNDWATER SHALL BE DISCHARGED TO NORTHEAST MONMOUTH COUNTY REGIONAL SEWERAGE AUTHORITY IN ACCORDANCE WITH APPLICABLE NMCRSA DISCHARGE PERMITS.
8. AIR STRIPPER OFF GAS SHALL BE DISCHARGED TO ATMOSPHERE WITHOUT TREATMENT IN ACCORDANCE WITH THE APPLICABLE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL (NJDEP) AIR DISCHARGE PERMIT.
9. CONTROL PANEL CP-1001 INCLUDES ALL NECESSARY MOTOR STARTERS, RELAYS, AND CONTROLLERS TO OPERATE GROUNDWATER SYSTEM.
10. PRESSURE GAUGES ON GROUNDWATER SYSTEM WERE CONSTRUCTED OF LIQUID-FILLED COPPER-ALLOY BOURDON TUBE CONSTRUCTION.
11. ALL GROUNDWATER RECOVERY SYSTEM PIPING INSTALLED WAS 2" PVC PIPE.
12. ALL PVC PIPING IS SCH. 40 ABOVE GROUND & SCH. 80 UNDER GROUND, WITH THE EXCEPTION OF THE HORIZONTAL EXTRACTION CELL PIPING

LEGEND

- BALL VALVE W/ SECURITY LOCK BOX
- BALL VALVE
- CHECK VALVE
- SAMPLE PORT
- CONTROL/ELECTRICAL INTERLOCK
- FLOW METER-TOTALIZER
- LEVEL SENSOR
- VACUUM RELIEF VALVE
- PRESSURE RELIEF VALVE
- MANUAL PRESSURE RELIEF VALVE
- PRESSURE GAUGE
- VACUUM BREAK
- TEMPERATURE GAUGE
- VACUUM GAUGE
- ALARM
- LEVEL SWITCH
- VACUUM SWITCH
- THERMAL COUPLE
- TEMPERATURE SWITCH
- TEMPERATURE RECORDER
- TEMPERATURE SENSOR
- PROCESS FLOW LINE
- ELECTRIC/CONTROL LINE
- HOSE WITH QUICK DISCONNECTS
- AIR/FILTER COALESCER
- ROTAMETER FLOWMETER
- MOTOR ACTIVATED VALVE

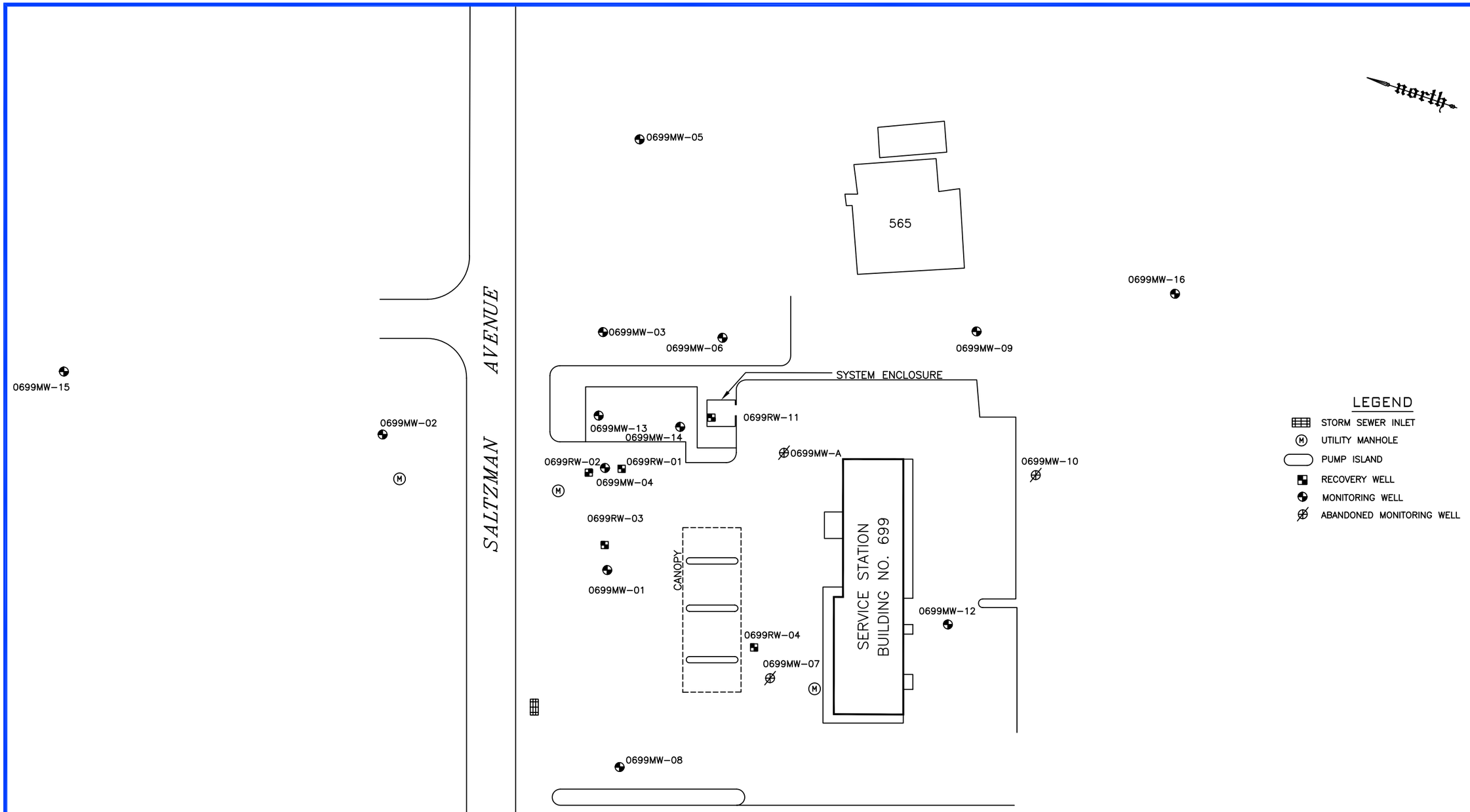
HANDEX CONSULTING & REMEDIATION, LLC
24 ABEEL ROAD
MONROE, NJ 08831

FIGURE 14

GROUNDWATER TREATMENT SYSTEM P&ID

US ARMY - FORT MONMOUTH
BUILDING No. 699
EATONTOWN, NEW JERSEY

SCALE-	1" = 50'	DATE-	8/20/04
DRAWN BY-	B.J.S.	JOB No.-	121759
DWG NAME-	S:\CADDATA\DRAFTING\MAXX2\121759.pid		



HCR HANDEX CONSULTING & REMEDIATION, LLC

24 ABEEL ROAD
MONROE, NJ 08831

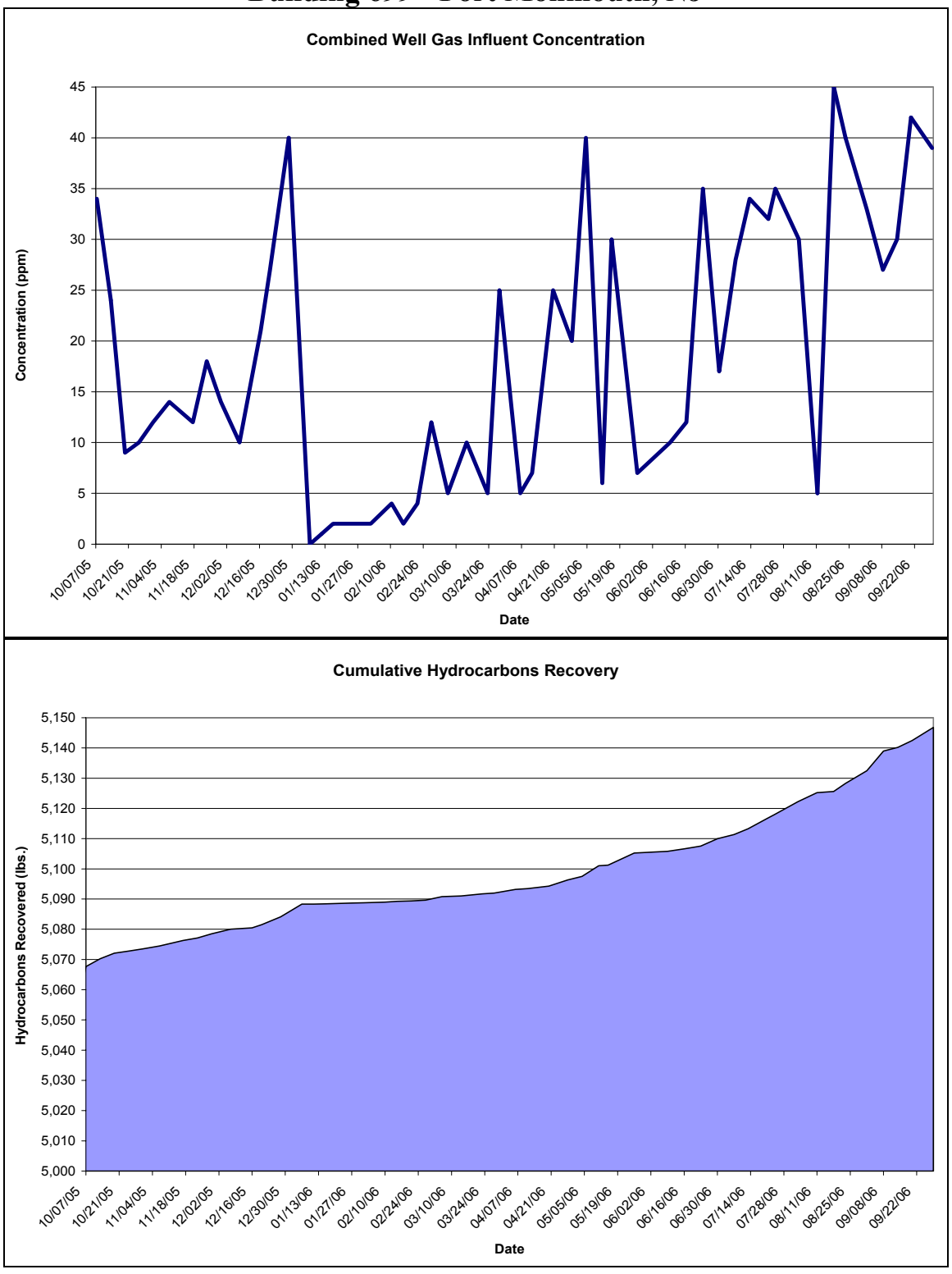
FIGURE 2
SITE PLAN

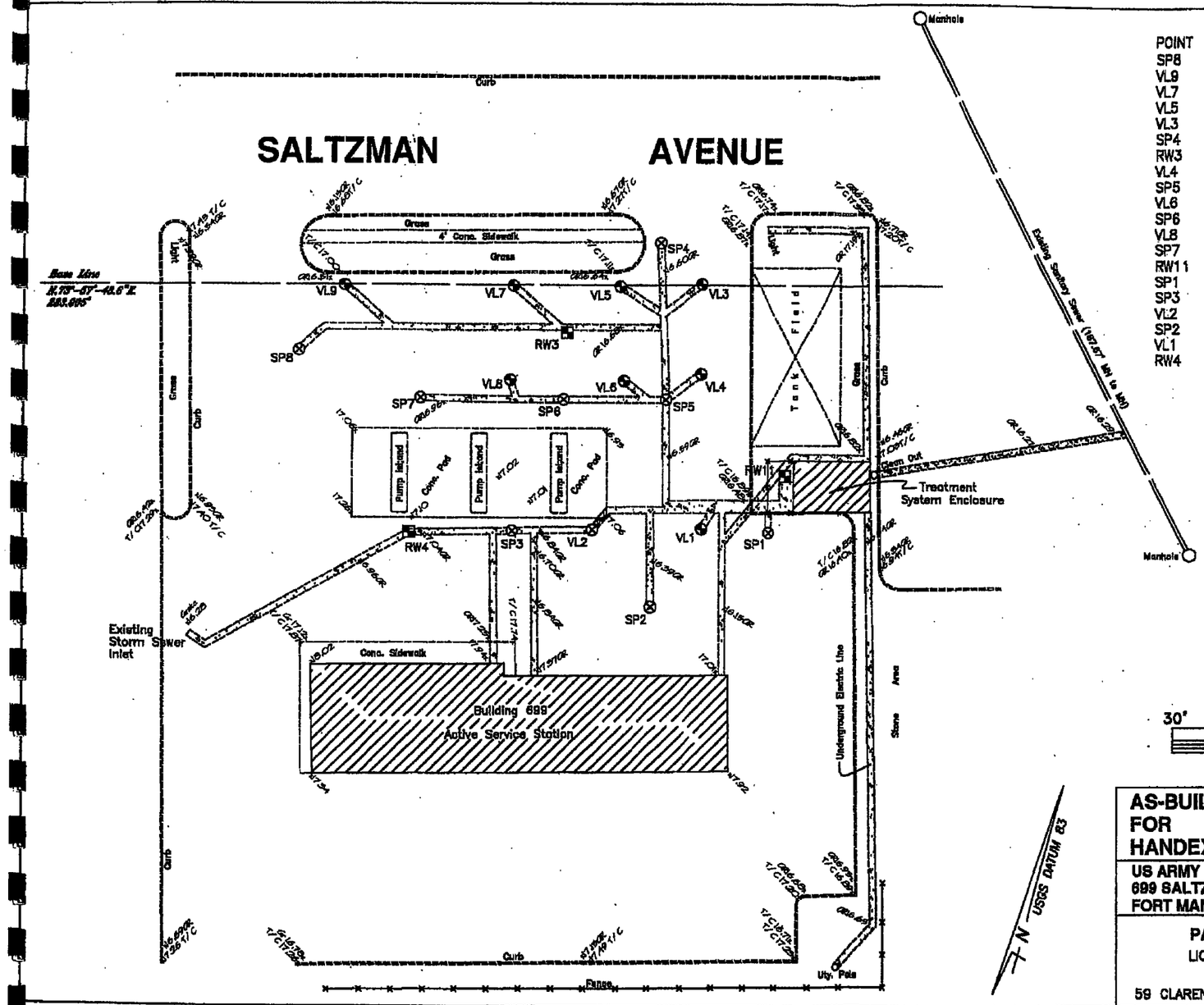
US ARMY – FORT MONMOUTH
BUILDING No. 699
EATONTOWN, NEW JERSEY

SCALE-	1" = 50'	DATE-	09/01/08
DRAWN BY-	V.S.B.	JOB No.-	121739
DWG NAME-	S:\PROJ\FTMON\RPT\RAPR\10-06\FIGS.DWG		

Figure 3

Soil Vapor Extraction Influent Concentrations & Recovery Graphs
Building 699 - Fort Monmouth, NJ





POINT	NORTHING	EASTING	CASING	GROUND
SP8	539060.02	618612.96	16.56	16.79
VL9	539083.33	618621.17	16.24	16.57
VL7	539097.22	618672.28	16.32	16.70
VL5	539105.80	618704.38	16.31	16.60
VL3	539113.36	618729.09	16.30	16.69
SP4	539122.30	618713.05	16.32	16.63
RW3	539087.55	618692.35	15.96	16.76
VL4	539086.23	618736.36	16.20	16.50
SP5	539075.62	618727.66	16.28	16.61
VL6	539077.67	618713.41	16.44	16.71
SP6	539067.15	618696.89	16.45	16.87
VL8	539068.63	618679.24	16.69	16.90
SP7	539055.71	618653.48	16.79	17.10
RW11	539062.53	618770.43	16.43	16.93
SP1	539043.85	618770.18	15.98	16.30
SP3	539023.13	618692.41	16.56	16.80
VL2	539030.08	618716.43	16.52	16.78
SP2	539011.47	618740.51	15.92	16.36
VL1	539039.42	618749.39	16.24	16.45
RW4	539014.00	618661.33	16.47	17.16

=LEGEND=

- VAPOR EXTRACTION CELL
- AIR SPARGE POINT
- GROUNDWATER RECOVERY WELL AND VAPOR EXTRACTION POINT
- TRENCH
- T/C 17.14± SPOT ELEVATION (USGS DATUM 83)
- T/ CURB 17.17± TOP OF CURB ELEV. (USGS DATUM 83)
- GR 16.74± GROUND ELEVATION (USGS DATUM 83)

30' 15' 0' 30' 60' 90'

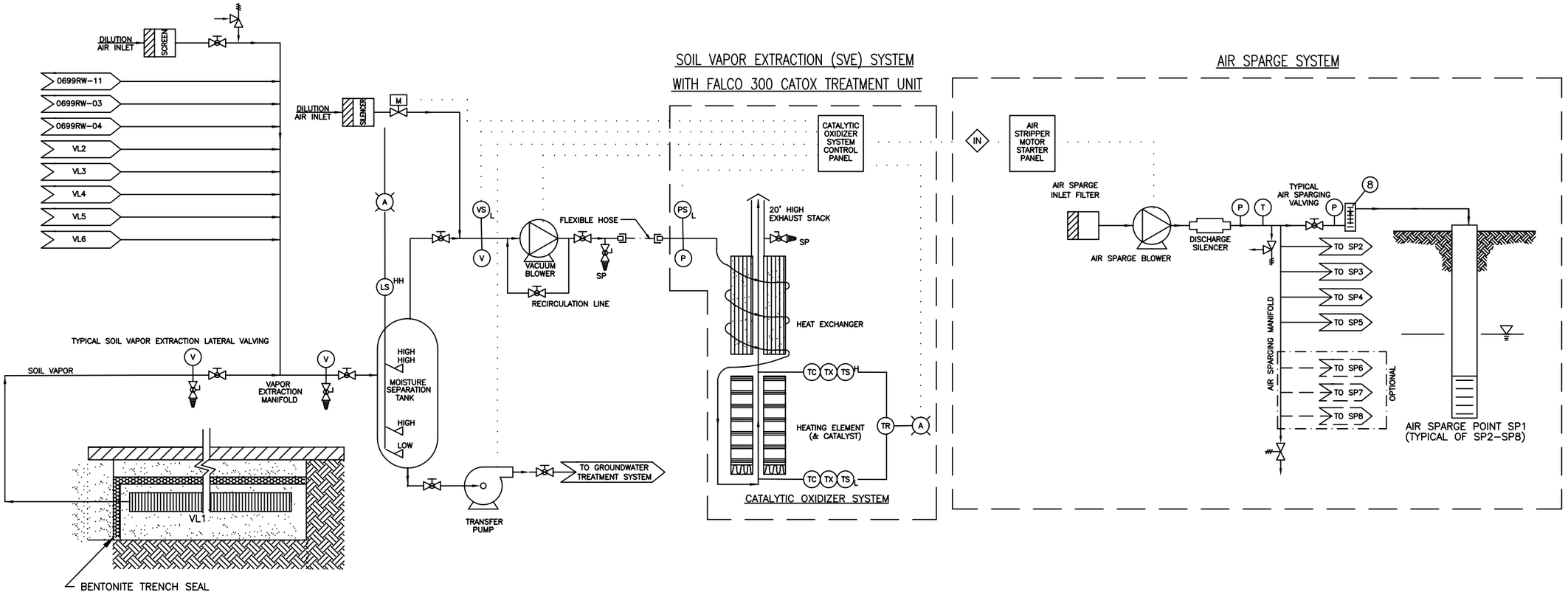
SCALE: 1" = 30'

AS-BUILT SURVEY FOR HANDEX OF NEW JERSEY — **FIG. 4**

US ARMY
699 SALTZMAN AVENUE
FORT MANMOUTH, NEW JERSEY

PAUL BERG ASSOCIATES
LICENSED LAND SURVEYOR & PROFESSIONAL PLANNER
59 CLARENDON CT. METUCHEN, N. J.

DATE: 8/12/2001
SCALE: 1"=30'
DWG. No. 10933B



LEGEND

- BALL VALVE
- (V) VACUUM GAUGE
- SAMPLE PORT
- LEVEL SENSOR
- VACUUM RELIEF VALVE
- PRESSURE RELIEF VALVE
- (P) PRESSURE GAUGE
- (T) TEMPERATURE GAUGE
- (A) ALARM
- (VS) VACUUM SWITCH
- (TC) THERMAL COUPLE
- (TR) TEMPERATURE RECORDER
- (TS) TEMPERATURE SENSOR
- PROCESS FLOW LINE
- ELECTRIC/CONTROL LINE
- ROTAMETER FLOWMETER
- (M) MOTOR ACTIVATED VALVE

HCR HANDEX CONSULTING & REMEDIATION, LLC

HANDEX CONSULTING & REMEDIATION
24 ABEEL ROAD
MONROE, NJ 08831

FIGURE 5
SVE/AIR SPARGE TREATMENT SYSTEM P&ID
US ARMY BASE
MAIN POST GAS STATION, BUILDING 699
FORT MONMOUTH, NEW JERSEY

DRAWN BY	DER	JOB NO.	121739
DATE	8/3/04	DISK NO.	S:\CADDATA\...\MAXX2\
REV. BY	VSB	DWG. NAME	121739SVE-PID

north

SALTZMAN AVENUE

565

SERVICE STATION BUILDING NO. 699

CANOPY

SYSTEM ENCLOSURE

0699MW-15 15.06

0699MW-02 14.26

0699MW-03

0699MW-06

0699MW-05 12.26

0699MW-09 12.51

0699MW-16 12.61

0699MW-10

0699MW-12 12.27

0699MW-13

0699MW-14

0699RW-11

0699RW-02

0699RW-01

0699MW-04

0699MW-A

0699RW-03

0699MW-01

0699RW-04

0699MW-07

0699MW-08 12.37

12.5 13.0 13.5 14.0 14.5 15.0

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
TICs=	ND
LEAD=	5.85

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
TICs=	ND
LEAD=	7.99

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
TICs=	ND
LEAD=	ND

BENZENE=	4,319.42
TOLUENE=	26,811.99
ETHYLBENZENE=	838.96
XYLENES=	11,139.09
MTBE=	ND
TICs=	62,000
LEAD=	5.33

BENZENE=	1.85
TOLUENE=	0.49
ETHYLBENZENE=	12.86
XYLENES=	14.56
MTBE=	0.75
TICs=	75
LEAD=	ND

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
TICs=	ND
LEAD=	ND

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
TICs=	ND
CHLOROFORM=	31.39
TETRACHLOROETHENE=	0.42
BROMODICHLOROMETHANE=	0.39
LEAD=	ND

BENZENE=	572.93
TOLUENE=	421.26
ETHYLBENZENE=	456.19
XYLENES=	969.87
MTBE=	1,395.64
TICs=	ND
LEAD=	6.98

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	1.15
TICs=	ND
LEAD=	ND

BENZENE=	77.53
TOLUENE=	238.65
ETHYLBENZENE=	237.40
XYLENES=	1,378.34
MTBE=	464.67
TICs=	ND
LEAD=	6.25

BENZENE=	76.79
TOLUENE=	946.58
ETHYLBENZENE=	844.74
XYLENES=	10,280.29
MTBE=	ND
TICs=	ND
LEAD=	ND

BENZENE=	ND
TOLUENE=	0.46
ETHYLBENZENE=	0.65
XYLENES=	4.55
MTBE=	ND
TICs=	ND
LEAD=	ND

GROUNDWATER QUALITY STANDRDS	
BENZENE=	1 PPB
TOLUENE=	600 PPB
ETHYLBENZENE=	700 PPB
XYLENES=	1,000 PPB
MTBE=	70 PPB
TBA=	100 PPB
CHLOROFORM=	70 PPB
TETRACHLOROETHENE=	1 PPB
BROMODICHLOROMETHANE=	1 PPB
LEAD=	5 PPB
1,2 DICHLOROETHANE=	2 PPB
TICs=	NA

LEGEND

- STORM SEWER INLET
- UTILITY MANHOLE
- PUMP ISLAND
- RECOVERY WELL
- MONITORING WELL
- ABANDONED MONITORING WELL

CONTOUR INTERVALS = 0.5 FEET

CONTOURS ARE DASHED WHERE INFERRED

GROUNDWATER FLOW DIRECTION

NORMALLY OPERATING RECOVERY WELLS: 699RW-3, 699RW-4, & 699RW-11

GROUNDWATER CONTOURS GENERATED USING SURFER SURFACE MAPPING SYSTEM SOFTWARE (VERSION 6.04).

ND= NOT DETECTED
NS= NOT SAMPLED
NA= NOT APPLICABLE
ALL CONCENTRATIONS ARE IN UG/L (ppb)

0 10 20 30 40 50 100

SCALE EQUALS : 1 INCH = 50 FEET

HCR HANCOCK CONSULTING & REMEDIATION, LLC

24 ABEEL ROAD
MONROE, NJ 08831

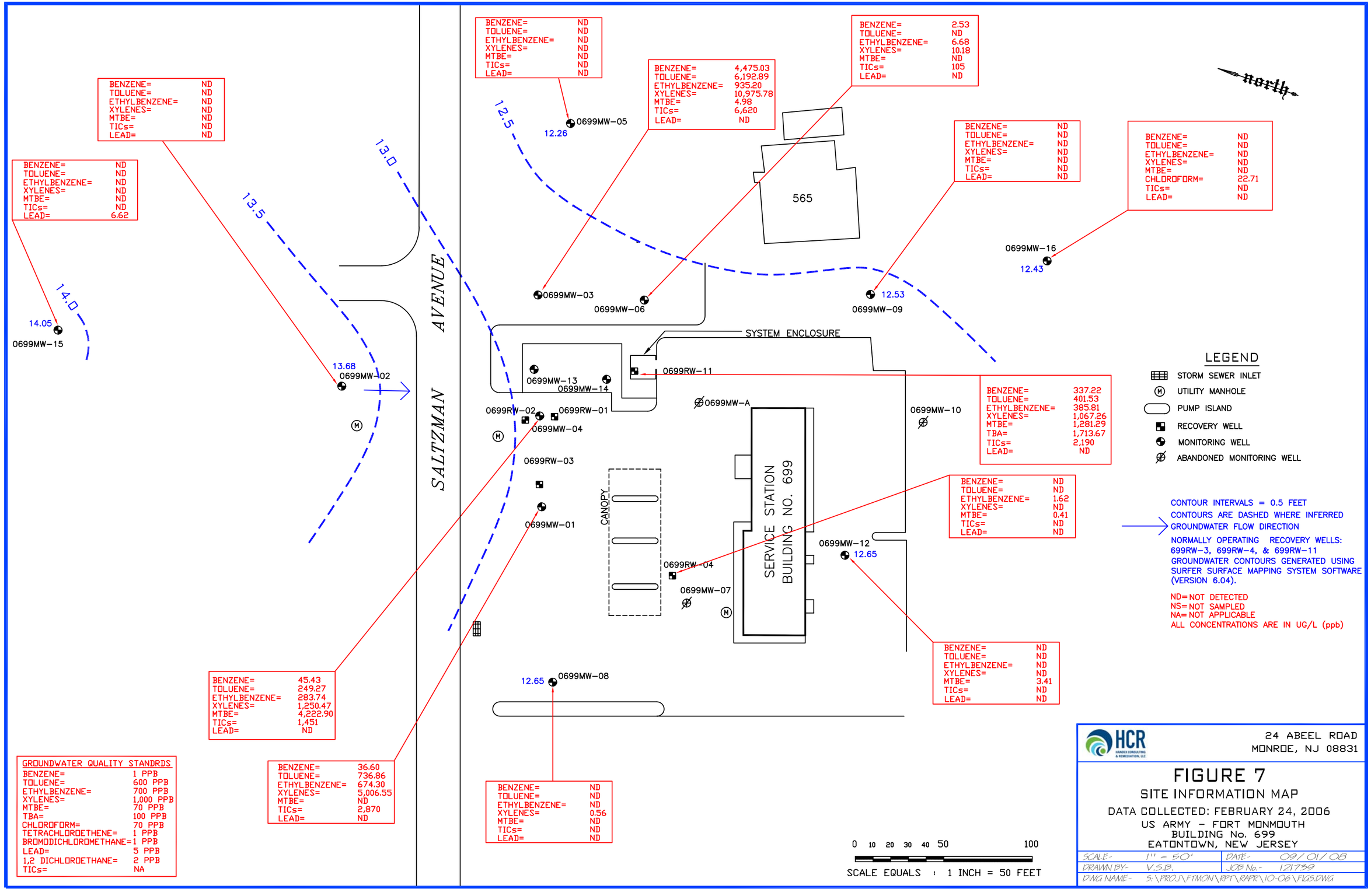
FIGURE 6

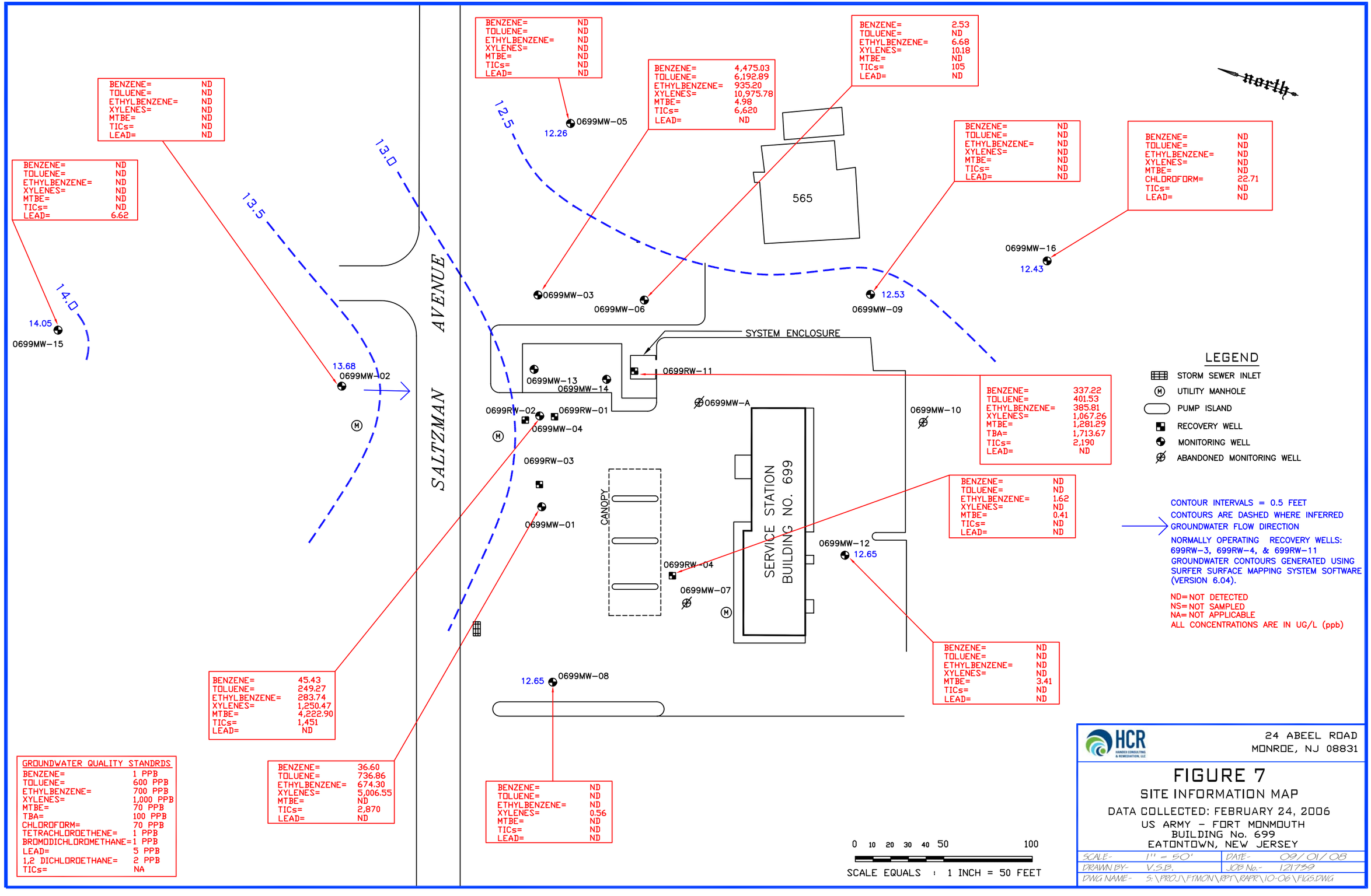
SITE INFORMATION MAP

DATA COLLECTED: DECEMBER 13 & 14, 2005

US ARMY - FORT MONMOUTH
BUILDING No. 699
EATONTOWN, NEW JERSEY

SCALE-	1" = 50'	DATE-	09/01/08
DRAWN BY-	V.S.B.	JOB No.-	121739
DWG NAME-	S:\PROJ\FTMON\RPT\RAPR\10-06\FIGS.DWG		


BENZENE= ND
TOLUENE= ND
ETHYLBENZENE= ND
XYLENES= ND
MTBE= ND
TICs= ND
LEAD= ND
0699MW-05
12.26
BENZENE= 4,475.03
TOLUENE= 6,192.89
ETHYLBENZENE= 935.20
XYLENES= 10,975.78
MTBE= 4.98
TICs= 6,620
LEAD= ND
BENZENE= 2.53
TOLUENE= ND
ETHYLBENZENE= 6.68
XYLENES= 10.18
MTBE= ND
TICs= 105
LEAD= ND
north
12.5
13.0
13.5
14.0
565
BENZENE= ND
TOLUENE= ND
ETHYLBENZENE= ND
XYLENES= ND
MTBE= ND
TICs= ND
LEAD= ND
BENZENE= ND
TOLUENE= ND
ETHYLBENZENE= ND
XYLENES= ND
MTBE= ND
CHLOROFORM= 22.71
TICs= ND
LEAD= ND
0699MW-16
12.43
0699MW-03
0699MW-06
12.53
0699MW-09
SYSTEM ENCLOSURE
0699MW-11
0699MW-13
0699MW-14
0699RW-02
0699RW-01
0699MW-04
0699MW-A
0699MW-10
BENZENE= 337.22
TOLUENE= 401.53
ETHYLBENZENE= 385.81
XYLENES= 1,067.26
MTBE= 1,281.29
TBA= 1,713.67
TICs= 2,190
LEAD= ND
BENZENE= ND
TOLUENE= ND
ETHYLBENZENE= 1.62
XYLENES= ND
MTBE= 0.41
TICs= ND
LEAD= ND
0699RW-03
0699MW-01
CANOPY
0699RW-04
0699MW-07
SERVICE STATION BUILDING NO. 699
0699MW-12
12.65
BENZENE= ND
TOLUENE= ND
ETHYLBENZENE= ND
XYLENES= ND
MTBE= 3.41
TICs= ND
LEAD= ND
BENZENE= ND
TOLUENE= ND
ETHYLBENZENE= ND
XYLENES= ND
MTBE= ND
TICs= ND
LEAD= 6.62
14.05
0699MW-15
13.68
0699MW-02
SALTZMAN AVENUE
BENZENE= 45.43
TOLUENE= 249.27
ETHYLBENZENE= 283.74
XYLENES= 1,250.47
MTBE= 4,222.90
TICs= 1,451
LEAD= ND
BENZENE= 36.60
TOLUENE= 736.86
ETHYLBENZENE= 674.30
XYLENES= 5,006.55
MTBE= ND
TICs= 2,870
LEAD= ND
12.65
0699MW-08
BENZENE= ND
TOLUENE= ND
ETHYLBENZENE= ND
XYLENES= 0.56
MTBE= ND
TICs= ND
LEAD= ND
GROUNDWATER QUALITY STANDRDS
BENZENE= 1 PPB
TOLUENE= 600 PPB
ETHYLBENZENE= 700 PPB
XYLENES= 1,000 PPB
MTBE= 70 PPB
TBA= 100 PPB
CHLOROFORM= 70 PPB
TETRACHLORDETHENE= 1 PPB
BROMODICHLOROMETHANE= 1 PPB
LEAD= 5 PPB
1,2 DICHLORDETHANE= 2 PPB
TICs= NA
LEGEND
STORM SEWER INLET
UTILITY MANHOLE
PUMP ISLAND
RECOVERY WELL
MONITORING WELL
ABANDONED MONITORING WELL
CONTOUR INTERVALS = 0.5 FEET
CONTOURS ARE DASHED WHERE INFERRED
GROUNDWATER FLOW DIRECTION
NORMALLY OPERATING RECOVERY WELLS:
699RW-3, 699RW-4, & 699RW-11
GROUNDWATER CONTOURS GENERATED USING SURFER SURFACE MAPPING SYSTEM SOFTWARE (VERSION 6.04).
ND= NOT DETECTED
NS= NOT SAMPLED
NA= NOT APPLICABLE
ALL CONCENTRATIONS ARE IN UG/L (ppb)
0 10 20 30 40 50 100
SCALE EQUALS : 1 INCH = 50 FEET
HCR HANDEX CONSULTING & REMEDIATION, LLC
24 ABEEL ROAD
MONROE, NJ 08831
FIGURE 7
SITE INFORMATION MAP
DATA COLLECTED: FEBRUARY 24, 2006
US ARMY - FORT MONMOUTH
BUILDING No. 699
EATONTOWN, NEW JERSEY
SCALE- 1" = 50'
DATE- 09/01/08
DRAWN BY- V.S.B.
JOB No.- 121739
DWG NAME- S:\PROJ\FTMON\RPT\RAPR\10-06\FIGS.DWG


BENZENE= ND
TOLUENE= ND
ETHYLBENZENE= ND
XYLENES= ND
MTBE= ND
TICs= ND
LEAD= ND
0699MW-05
12.26
BENZENE= 4,475.03
TOLUENE= 6,192.89
ETHYLBENZENE= 935.20
XYLENES= 10,975.78
MTBE= 4.98
TICs= 6,620
LEAD= ND
BENZENE= 2.53
TOLUENE= ND
ETHYLBENZENE= 6.68
XYLENES= 10.18
MTBE= ND
TICs= 105
LEAD= ND
north
12.5
13.0
13.5
14.0
565
BENZENE= ND
TOLUENE= ND
ETHYLBENZENE= ND
XYLENES= ND
MTBE= ND
TICs= ND
LEAD= ND
BENZENE= ND
TOLUENE= ND
ETHYLBENZENE= ND
XYLENES= ND
MTBE= ND
CHLOROFORM= 22.71
TICs= ND
LEAD= ND
0699MW-16
12.43
0699MW-03
0699MW-06
12.53
0699MW-09
SYSTEM ENCLOSURE
0699MW-11
0699MW-13
0699MW-14
0699RW-02
0699RW-01
0699MW-04
0699MW-A
0699MW-10
BENZENE= 337.22
TOLUENE= 401.53
ETHYLBENZENE= 385.81
XYLENES= 1,067.26
MTBE= 1,281.29
TBA= 1,713.67
TICs= 2,190
LEAD= ND
BENZENE= ND
TOLUENE= ND
ETHYLBENZENE= 1.62
XYLENES= ND
MTBE= 0.41
TICs= ND
LEAD= ND
0699RW-03
0699MW-01
CANOPY
0699RW-04
0699MW-07
SERVICE STATION BUILDING NO. 699
0699MW-12
12.65
BENZENE= ND
TOLUENE= ND
ETHYLBENZENE= ND
XYLENES= ND
MTBE= 3.41
TICs= ND
LEAD= ND
BENZENE= ND
TOLUENE= ND
ETHYLBENZENE= ND
XYLENES= ND
MTBE= ND
TICs= ND
LEAD= 6.62
14.05
0699MW-15
13.68
0699MW-02
SALTZMAN AVENUE
BENZENE= 45.43
TOLUENE= 249.27
ETHYLBENZENE= 283.74
XYLENES= 1,250.47
MTBE= 4,222.90
TICs= 1,451
LEAD= ND
BENZENE= 36.60
TOLUENE= 736.86
ETHYLBENZENE= 674.30
XYLENES= 5,006.55
MTBE= ND
TICs= 2,870
LEAD= ND
12.65
0699MW-08
BENZENE= ND
TOLUENE= ND
ETHYLBENZENE= ND
XYLENES= 0.56
MTBE= ND
TICs= ND
LEAD= ND
GROUNDWATER QUALITY STANDRDS
BENZENE= 1 PPB
TOLUENE= 600 PPB
ETHYLBENZENE= 700 PPB
XYLENES= 1,000 PPB
MTBE= 70 PPB
TBA= 100 PPB
CHLOROFORM= 70 PPB
TETRACHLORDETHENE= 1 PPB
BROMODICHLOROMETHANE= 1 PPB
LEAD= 5 PPB
1,2 DICHLORDETHANE= 2 PPB
TICs= NA
LEGEND
STORM SEWER INLET
UTILITY MANHOLE
PUMP ISLAND
RECOVERY WELL
MONITORING WELL
ABANDONED MONITORING WELL
CONTOUR INTERVALS = 0.5 FEET
CONTOURS ARE DASHED WHERE INFERRED
GROUNDWATER FLOW DIRECTION
NORMALLY OPERATING RECOVERY WELLS:
699RW-3, 699RW-4, & 699RW-11
GROUNDWATER CONTOURS GENERATED USING SURFER SURFACE MAPPING SYSTEM SOFTWARE (VERSION 6.04).
ND= NOT DETECTED
NS= NOT SAMPLED
NA= NOT APPLICABLE
ALL CONCENTRATIONS ARE IN UG/L (ppb)
0 10 20 30 40 50 100
SCALE EQUALS : 1 INCH = 50 FEET
HCR HANDEX CONSULTING & REMEDIATION, LLC
24 ABEEL ROAD
MONROE, NJ 08831
FIGURE 7
SITE INFORMATION MAP
DATA COLLECTED: FEBRUARY 24, 2006
US ARMY - FORT MONMOUTH
BUILDING No. 699
EATONTOWN, NEW JERSEY
SCALE- 1" = 50'
DATE- 09/01/08
DRAWN BY- V.S.B.
JOB No.- 121739
DWG NAME- S:\PROJ\FTMON\RPT\RAPR\10-06\FIGS.DWG

north

SALTZMAN AVENUE

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
TICs=	ND
LEAD=	ND

0699MW-05
12.53

BENZENE=	160.66
TOLUENE=	153.90
ETHYLBENZENE=	18.77
XYLENES=	151.94
MTBE=	ND
TICs=	66
LEAD=	ND

BENZENE=	21.31
TOLUENE=	ND
ETHYLBENZENE=	25.51
XYLENES=	19.07
MTBE=	ND
TICs=	243
LEAD=	ND

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
TICs=	ND
LEAD=	ND

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
CHLOROFORM=	24.20
TICs=	ND
LEAD=	ND

0699MW-16
12.11

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
TICs=	ND
LEAD=	4.56

14.18
0699MW-15

13.0
13.5
14.0
12.5

565

0699MW-03
0699MW-06
12.65
0699MW-09

SYSTEM ENCLOSURE

0699MW-13
0699MW-14
0699RW-11
0699RW-02
0699RW-01
0699MW-04
0699MW-A
0699MW-10

BENZENE=	530.72
TOLUENE=	359.44
ETHYLBENZENE=	681.52
XYLENES=	2,665.97
MTBE=	9,128.57
TBA=	7,832.26
TICs=	5,670
LEAD=	ND

0699MW-02
13.76

0699RW-03
0699MW-01

CANOPY

SERVICE STATION BUILDING NO. 699

0699RW-04
0699MW-07

0699MW-12
12.22

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
TICs=	ND
LEAD=	ND

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	1.90
TICs=	ND
LEAD=	ND

BENZENE=	32.67
TOLUENE=	106.33
ETHYLBENZENE=	355.33
XYLENES=	1,934.13
MTBE=	2,282.82
TBA=	2,143.77
TICs=	2,623
LEAD=	2.99

BENZENE=	23.71
TOLUENE=	302.27
ETHYLBENZENE=	798.02
XYLENES=	6,594.72
MTBE=	3.54
TICs=	5,050
LEAD=	ND

12.22
0699MW-08

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	0.28
XYLENES=	1.11
MTBE=	ND
TICs=	ND
LEAD=	ND

GROUNDWATER QUALITY STANDRDS	
BENZENE=	1 PPB
TOLUENE=	600 PPB
ETHYLBENZENE=	700 PPB
XYLENES=	1,000 PPB
MTBE=	70 PPB
TBA=	100 PPB
CHLOROFORM=	70 PPB
TETRACHLORDETHENE=	1 PPB
BROMODICHLOROMETHANE=	1 PPB
LEAD=	5 PPB
1,2 DICHLORDETHANE=	2 PPB
TICs=	NA

0 10 20 30 40 50 100

SCALE EQUALS : 1 INCH = 50 FEET

LEGEND

- STORM SEWER INLET
- UTILITY MANHOLE
- PUMP ISLAND
- RECOVERY WELL
- MONITORING WELL
- ABANDONED MONITORING WELL

CONTOUR INTERVALS = 0.5 FEET

CONTOURS ARE DASHED WHERE INFERRED

GROUNDWATER FLOW DIRECTION

NORMALLY OPERATING RECOVERY WELLS: 699RW-3, 699RW-4, & 699RW-11

GROUNDWATER CONTOURS GENERATED USING SURFER SURFACE MAPPING SYSTEM SOFTWARE (VERSION 6.04).

ND= NOT DETECTED
NS= NOT SAMPLED
NA= NOT APPLICABLE
ALL CONCENTRATIONS ARE IN UG/L (ppb)

HCR HANDEX CONSULTING & REMEDIATION, LLC

24 ABEEL ROAD
MONROE, NJ 08831

FIGURE 8

SITE INFORMATION MAP

DATA COLLECTED: JUNE 13 & 14, 2006

US ARMY - FORT MONMOUTH
BUILDING No. 699
EATONTOWN, NEW JERSEY

SCALE-	1" = 50'	DATE-	09/01/08
DRAWN BY-	V.S.B.	JOB No.-	121739
DWG NAME-	S:\PROJ\FTMON\RPT\RAPR\10-06\FIG5.DWG		

north

SALTZMAN AVENUE

565

SERVICE STATION BUILDING NO. 699

CANOPY

SYSTEM ENCLOSURE

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
TICs=	ND
LEAD=	ND

0699MW-05
11.74

BENZENE=	755.41
TOLUENE=	1,656.48
ETHYLBENZENE=	115.15
XYLENES=	1,099.62
MTBE=	ND
TICs=	105
LEAD=	ND

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
TICs=	ND
LEAD=	ND

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
TICs=	ND
LEAD=	ND

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
CHLOROFORM=	5.00
TICs=	ND
LEAD=	ND

0699MW-16
10.87

0699MW-03

0699MW-06

11.55
0699MW-09

0699MW-13
0699MW-14
0699RW-11
0699RW-02
0699RW-01
0699MW-04
0699RW-03
0699MW-01
0699MW-A
0699MW-10

BENZENE=	203.71
TOLUENE=	61.84
ETHYLBENZENE=	93.13
XYLENES=	245.31
MTBE=	165.04
TBA=	2,206.21
1,2 DICHLORDETHANE=	4.14
TICs=	ND
LEAD=	ND

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
TICs=	ND
LEAD=	ND

0699MW-12
11.53

0699RW-04
0699MW-07

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
TICs=	ND
LEAD=	ND

0699MW-08
11.51

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
TICs=	ND
LEAD=	ND

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
TICs=	ND
LEAD=	1.63

BENZENE=	ND
TOLUENE=	ND
ETHYLBENZENE=	ND
XYLENES=	ND
MTBE=	ND
TICs=	ND
LEAD=	ND

13.80
0699MW-15

0699MW-02
12.96

BENZENE=	33.12
TOLUENE=	41.61
ETHYLBENZENE=	144.68
XYLENES=	681.59
MTBE=	314.85
TICs=	1,412
LEAD=	1.03

BENZENE=	ND
TOLUENE=	80.55
ETHYLBENZENE=	937.57
XYLENES=	6,194.51
MTBE=	ND
TICs=	5957
LEAD=	1.93

12.0
11.5
11.0
13.0
12.5
13.5

LEGEND

- STORM SEWER INLET
- UTILITY MANHOLE
- PUMP ISLAND
- RECOVERY WELL
- MONITORING WELL
- ABANDONED MONITORING WELL

CONTOUR INTERVALS = 0.5 FEET
CONTOURS ARE DASHED WHERE INFERRED
GROUNDWATER FLOW DIRECTION
NORMALLY OPERATING RECOVERY WELLS: 699RW-3, 699RW-4, & 699RW-11
GROUNDWATER CONTOURS GENERATED USING SURFER SURFACE MAPPING SYSTEM SOFTWARE (VERSION 6.04).

ND= NOT DETECTED
NS= NOT SAMPLED
NA= NOT APPLICABLE
ALL CONCENTRATIONS ARE IN UG/L (ppb)

GROUNDWATER QUALITY STANDRDS	
BENZENE=	1 PPB
TOLUENE=	600 PPB
ETHYLBENZENE=	700 PPB
XYLENES=	1,000 PPB
MTBE=	70 PPB
TBA=	100 PPB
CHLOROFORM=	70 PPB
TETRACHLORDETHENE=	1 PPB
BROMODICHLOROMETHANE=	1 PPB
LEAD=	5 PPB
1,2 DICHLORDETHANE=	2 PPB
TICs=	NA

0 10 20 30 40 50 100

SCALE EQUALS : 1 INCH = 50 FEET

HCR HANDEX CONSULTING & REMEDIATION, LLC

24 ABEEL ROAD
MONROE, NJ 08831

FIGURE 9

SITE INFORMATION MAP

DATA COLLECTED: SEPTEMBER 22, 2006

US ARMY - FORT MONMOUTH
BUILDING No. 699
EATONTOWN, NEW JERSEY

SCALE-	1" = 50'	DATE-	09/01/08
DRAWN BY-	V.S.B.	JOB No.-	121739
DWG NAME-	S:\PROJ\FTMON\RPT\RAPR\10-06\FIG5.DWG		

REMEDIAL ACTION PROGRESS REPORT
October 2005 through September 2006
U.S. Army Fort Monmouth
Building 699, Main Post Gas Station (Site ID: FTMM-53)
Fort Monmouth, Monmouth County, New Jersey
NJDEP Incident No.: 89-10-19-1329
NJDEP UST Registration No.: 0081533

October 2008

Prepared for:

Mr. Joseph Fallon
U.S. Army Fort Monmouth
Directorate of Public Works
Building 173, Attention IMNE-MON-PWE
Fort Monmouth, New Jersey 07703

Prepared by:

_____
Vincent S. Barra
Senior Hydrogeologist
NJDEP UST License No. 423339

Reviewed by:

_____
Andrew Drake
Principal Hydrogeologist
NJDEP UST License No. 0010019

Handex Consulting & Remediation-Northeast, LLC
24 Abeel Road, Monroe, NJ 08831
NJDEP Certification #US00145

TABLE 1
SOIL VAPOR EXTRACTION SYSTEM DATA SUMMARY
BUILDING 699
FORT MONMOUTH, NJ

DATE	SYSTEM UP/DOWN	SOIL CONCENTRATION (ppm)*	APPLIED VACUUM ("H20)	AIR FLOW (cfm)	SYSTEM INFLUENT CONCENTRATION (ppm)*	EQUIVALENT HYDROCARBONS RECOVERED (gal/day)
-	-	-	-	-	-	-
09/27/2005	Up	19.0	250.0	284.0	3.8	5029.0
10/07/2005	Up	20.0	246.0	34.0	0.4	5067.7
10/13/2005	Up	NA	241.0	24.0	0.3	5070.3
10/19/2005	Up	25.0	236.0	9.0	0.1	5072.1
10/25/2005	Up	25.0	236.0	10.0	0.1	5072.7
10/31/2005	Up	24.0	231.0	12.0	0.1	5073.5
11/07/2005	Up	23.0	231.0	14.0	0.2	5074.5
11/17/2005	Up	23.0	241.0	12.0	0.2	5076.3
11/23/2005	Up	23.0	246.0	18.0	0.2	5077.1
11/29/2005	Up	22.0	241.0	14.0	0.2	5078.5
12/07/2005	Up	NA	106.0	10.0	0.1	5080.0
12/16/2005	Down	24.0	232.0	21.0	0.3	5080.4
12/20/2005	Up	24.0	231.0	27.0	0.3	5081.5
12/28/2005	Up	26.0	221.0	40.0	0.5	5084.1
01/06/2006	Up	26.0	236.0	0.0	0.0	5088.3
01/11/2006	Up	26.0	231.0	1.0	0.0	5088.3
01/16/2006	Up	26.0	226.0	2.0	0.0	5088.4
01/27/2006	Up	26.0	232.0	2.0	0.0	5088.7
02/01/2006	Up	24.0	246.0	2.0	0.0	5088.8
02/10/2006	Up	26.0	246.0	4.0	0.1	5089.0
02/15/2006	Up	26.0	253.0	2.0	0.0	5089.3
02/21/2006	Down	26.0	221.0	4.0	0.0	5089.3
02/27/2006	Up	NA	269.0	12.0	0.2	5089.6
03/06/2006	Up	NA	221.0	5.0	0.1	5090.8
03/14/2006	Down	NA	236.0	10.0	0.1	5091.0
03/23/2006	Down	26.0	228.0	5.0	0.1	5091.7
03/28/2006	Up	26.0	196.0	25.0	0.3	5092.0
04/06/2006	Down	NA	225.0	5.0	0.1	5093.2
04/11/2006	Up	NA	230.0	7.0	0.1	5093.5
04/20/2006	Up	26.0	207.0	25.0	0.3	5094.3
04/28/2006	Up	24.0	177.0	20.0	0.2	5096.3
05/04/2006	Up	NA	235.0	40.0	0.5	5097.5
05/11/2006	Up	26.0	176.0	6.0	0.1	5101.0
05/15/2006	Up	NA	229.0	30.0	0.4	5101.2
05/26/2006	Up	26.0	221.0	7.0	0.1	5105.2
06/09/2006	Up	28.0	219.0	10.0	0.1	5105.8
06/16/2006	Up	26.0	206.0	12.0	0.1	5106.6
06/23/2006	Up	NA	190.0	35.0	0.4	5107.5
06/30/2006	Up	26.0	221.0	17.0	0.2	5110.0
07/07/2006	Up	27.0	221.0	28.0	0.3	5111.3
07/13/2006	Up	28.0	236.0	34.0	0.4	5113.3
07/21/2006	Up	27.0	233.0	32.0	0.4	5116.7
07/24/2006	Up	27.0	236.0	35.0	0.4	5117.9
08/03/2006	Up	26.0	233.0	30.0	0.4	5122.2
08/11/2006	Up	26.0	231.0	5.0	0.1	5125.2
08/18/2006	Up	26.0	236.0	45.0	0.6	5125.6
08/23/2006	Up	NA	216.0	40.0	0.5	5128.3
09/01/2006	Up	NA	211.0	33.0	0.4	5132.5
09/08/2006	Up	NA	216.0	27.0	0.3	5138.9
09/14/2006	Up	NA	220.0	30.0	0.3	5140.2
09/20/2006	Up	NA	211.0	42.0	0.5	5142.4
09/29/2006	Up	28.0	194.0	39.0	0.4	5146.8

NOTES:
Down = System down upon arrival, but restarted by Technician
NA = Not Available due to OVA meter flameout.
* Concentration data are from field measurements recorded with a organic vapor analyzer (
ppm - parts per million gal - gallons
cfm - cubic feet per minute

Table 2
Bldg. 699, Fort Monmouth, NJ
Groundwater System Hydrocarbon Recovery

Monitoring Date	Total BTEX/MTBE/TBA Influent Conc. (ug/l)	Total BTEX/MTBE/TBA Influent Conc. (mg/l)	Total Flow meter reading (gal.)	Total flow for each sampling period (gal.)	Total Flow for each sampling period (liters)	Unit Conversion Factor	Petroleum Hydrocarbons Removed (Lbs.)	Total Petroleum Hydrocarbons Recovered (Lbs.)
09/21/2005	219.0	0.219	7,409,686	98,364	25,987.16	1 lb. /453,600	0.0125	**19.17**
10/25/2006	400.1	0.400	7,442,994	33,308	8,799.77	1 lb. /453,600	0.0078	**19.18**
11/17/2005	291.5	0.291	7,501,359	58,365	15,419.67	1 lb. /453,600	0.0099	**19.19**
12/20/2005	632.7	0.633	7,564,021	62,662	16,554.91	1 lb. /453,600	0.0231	**19.21**
01/11/2006	2,048.4	2.048	7,602,965	38,944	10,288.76	1 lb. /453,600	0.0465	**19.26**
02/21/2006	786.7	0.787	7,658,272	55,307	14,611.77	1 lb. /453,600	0.0253	**19.29**
03/28/2006	2,201.4	2.201	7,724,544	66,272	17,508.65	1 lb. /453,600	0.0850	**19.37**
04/14/2006	2,182.1	2.182	7,740,752	16,208	4,282.05	1 lb. /453,600	0.0206	**19.39**
05/04/2006	3,173.7	3.174	7,767,230	26,478	6,995.32	1 lb. /453,600	0.0489	**19.44**
06/26/2006	2,640.7	2.641	7,829,784	62,554	16,526.38	1 lb. /453,600	0.0962	**19.54**
07/24/2006	1,463.7	1.464	7,875,876	46,092	12,177.22	1 lb. /453,600	0.0393	**19.58**
08/23/2006	103.5	0.104	7,931,027	55,151	14,570.55	1 lb. /453,600	0.0033	**19.58**
09/29/2006	319.1	0.319	8,010,506	79,479	20,997.86	1 lb. /453,600	0.0148	**19.59**

NOTES:
Hydrocarbons include Benzene, Toluene, Ethylbenzene, Xylenes (BTEX); Methyl-tert-butyl-ether (MTBE); tert-Butyl alcohol (TBA).
Influent concentrations are assumed to be constant over period of groundwater flow readings.
Recovery calculations assume influent concentrations remain constant since previous monthly sampling event.
gal. - gallons; Lbs. - pounds; ug/l - micrograms per liter; mg/l - milligrams per liter.
TOTAL Hydrocarbons Recovered (Lbs.) = influent concentration x volume of water extracted x unit conversion factors

TABLE 3
GROUNDWATER MONITORING & SAMPLING - VOC RESULTS SUMMARY
FORT MONMOUTH - MAIN POST GAS STATION
EATONTOWN, NEW JERSEY
All analytical results in micrograms per liter (ug/L)

Sampling Date	DTW (feet)	Water Elevation (feet)	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA	Chloroform	Methylene Chloride	Carbon Disulfide	Tetra-chloroethene	Ace-tone	Bromo-dichloro-methane	1,2-Dichloro ethane	1,1,1- Tri chloroethane	VOC TICs	Total VOCs
			1 (1)	**600 (1)**	**700 (1)**	**1,000 (1)**	**70 (1)**	**100 (1)**	**70(1)**	**3 (1)**	**700(1)**	**1 (1)**	**6000 (1)**	**1 (1)**	**2 (1)**	**30 (1)**	**--**	**--**
Well ID		**0699MW-01**			**Casing Elevation**	**15.81**												
06/19/01	5.50	10.31	21,555.26	47,603.78	5,050.83	42,246.76	1,293.83	403.62	ND	ND	ND	ND	ND	NA	NA	ND	741	118,895
08/30/01	6.75	9.06	31,531.95	54,361.78	8,703.65	47,334.24	ND	ND	267.10	ND	ND	ND	ND	NA	NA	ND	38,900	181,099
12/13/01	8.75	7.06	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA	NS	NS	0
03/27/02	7.05	8.76	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA	NS	NS	0
06/26/02	6.91	8.90	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA	NS	NS	0
09/19/02	5.93	9.88	3,849.07	19,493.66	2,687.65	23,989.23	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	28360	78,380
11/26/02	4.38	11.43	459.71	4,023.42	1,960.50	14,645.80	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	20510	41,599
03/17/03	4.20	11.61	127.89	1,648.18	739.45	7,477.75	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	4830	14,823
06/30/03	3.81	12.00	318.96	1,864.80	637.87	7,237.32	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	8181	18,240
09/24/03	7.20	8.61	206.60	1,016.66	554.50	3,207.39	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	2934	7,919
12/08/03	5.15	10.66	110.32	1,310.35	680.75	4,430.84	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	5541	12,073
03/29/04	4.61	11.20	156.78	1,249.62	709.41	7,322.90	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	15380	24,819
06/18/04	5.35	10.46	239.86	4,064.39	2,619.62	20,330.96	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	22390	49,645
09/16/04	6.42	9.39	376.82	60.22	382.60	624.31	208.91	ND	ND	ND	ND	ND	ND	NA	NA	ND	2730	4,383
12/03/04	5.26	10.55	34.76	158.27	83.61	993.12	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	5630	6,900
03/07/05	3.55	12.26	1,783.46	1,893.65	1,376.76	5,158.40	448.37	ND	ND	ND	ND	ND	178.66	NA	NA	ND	6050	16,889
05/26/05	4.46	11.35	63.14	518.85	622.78	10,628.46	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	33560	45,393
09/08/05	6.49	9.32	62.87	83.95	525.17	2,358.03	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	8720	11,760
12/14/05	4.02	11.79	76.79	946.58	844.74	10,280.29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	12,148
02/24/06	3.82	11.99	36.60	736.86	674.30	5,006.55	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2870	9,324
06/14/06	3.43	12.38	23.71	302.27	798.02	6,594.72	3.54	ND	ND	ND	ND	ND	ND	ND	ND	ND	5050	12,772
09/22/06	4.26	11.55	ND	80.55	937.57	6,194.51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5957	13,170
Well ID		**0699MW-02**			**Casing Elevation**	**16.64**												
06/19/01	3.81	12.83	4.77	24.25	4.29	18.31	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	302	354
08/30/01	6.73	9.91	ND	ND	ND	ND	ND	ND	ND	1.84	ND	ND	ND	NA	NA	ND	ND	2
12/13/01	8.3	8.34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
03/27/02	1.58	15.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	46	46
06/26/02	5.44	11.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/19/02	5.46	11.18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
11/26/02	2.2	14.44	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
03/17/03	1.87	14.77	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
06/25/03	2.21	14.43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/24/03	6.75	9.89	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
12/08/03	3.55	13.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	5	5
03/29/04	3.45	13.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
06/18/04	5.35	11.29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/16/04	6.33	10.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
12/06/04	3.19	13.45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
03/07/05	2.47	14.17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
05/26/05	4.69	11.95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/08/05	7.56	9.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
12/13/05	2.38	14.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
02/24/06	2.96	13.68	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0

TABLE 3
GROUNDWATER MONITORING & SAMPLING - VOC RESULTS SUMMARY
FORT MONMOUTH - MAIN POST GAS STATION
EATONTOWN, NEW JERSEY
All analytical results in micrograms per liter (ug/L)

Sampling Date	DTW (feet)	Water Elevation (feet)	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA	Chloroform	Methylene Chloride	Carbon Disulfide	Tetra-chloroethene	Ace-tone	Bromo-dichloro-methane	1,2-Dichloro ethane	1,1,1- Tri chloroethane	VOC TICs	Total VOCs
			1 (1)	**600 (1)**	**700 (1)**	**1,000 (1)**	**70 (1)**	**100 (1)**	**70(1)**	**3 (1)**	**700(1)**	**1 (1)**	**6000 (1)**	**1 (1)**	**2 (1)**	**30 (1)**	**--**	**--**
06/13/06	2.88	13.76	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
09/22/06	3.68	12.96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
Well ID:		**0699MW-03**			**Casing Elevation**	**15.80**												
06/19/01	4.97	10.83	33,224.84	38,489.48	1,693.43	14,775.44	93.34	246.45	ND	ND	ND	ND	ND	NA	NA	3.13	665	89,191
08/30/01	6.65	9.15	26,703.62	52,102.97	4,632.23	32,157.19	ND	ND	253.51	ND	ND	ND	ND	NA	NA	ND	17,400	133,250
12/13/01	7.75	8.05	14,353.47	21,072.76	1,885.19	23,384.35	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	570	61,266
03/27/02	5.47	10.33	13,946.94	15,981.11	980.35	5,855.38	90.20	282.02	ND	ND	ND	ND	701.89	NA	NA	ND	6,272	44,110
06/26/02	6.36	9.44	4,399.81	3,832.32	1,055.62	3,728.84	63.08	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	13,080
09/19/02	5.89	9.91	6,664.83	10,186.92	1,452.67	8,003.46	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	9,900	36,208
11/26/02	4.08	11.72	1,817.43	3,901.24	440.76	6,032.40	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	4,620	16,812
03/17/03	3.41	12.39	6,018.91	11,329.00	848.98	13,156.38	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	7,780	39,133
06/25/03	3.35	12.45	4,801.67	13,280.92	1,300.05	10,076.68	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	3,320	32,779
09/24/03	5.23	10.57	1,591.30	3,276.61	487.55	4,365.72	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	3,222	12,943
12/08/03	4.46	11.34	174.93	359.64	23.85	468.80	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	547	1,574
03/29/04	4.15	11.65	1,285.76	2,676.44	320.11	3,008.80	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	2,320	9,611
06/18/04	5.15	10.65	4,052.45	9,939.74	1,873.95	9,190.47	3.69	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	25,060
09/16/04	6.30	9.50	2,442.22	9,207.20	1,687.51	11,076.35	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	5,700	30,113
12/03/04	4.63	11.17	1,616.64	5,430.07	340.96	4,172.96	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	1,520	13,081
03/04/05	3.50	12.30	26.73	97.95	194.88	1,127.68	1,341.42	ND	ND	ND	ND	ND	24.45	NA	NA	ND	3,339	6,152
05/23/05	4.43	11.37	2,164.78	13,281.86	726.99	13,310.11	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	7,480	36,964
09/08/05	6.84	8.96	3,784.06	10,603.12	784.08	6,224.35	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	13,760	35,156
12/13/05	3.69	12.11	4,319.42	26,811.99	838.96	11,139.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	62,000	105,109
02/24/06	3.57	12.23	4,475.03	6,192.89	935.20	10,975.78	4.98	ND	ND	ND	ND	ND	85.70	ND	ND	ND	6,620	29,290
06/13/06	3.11	12.69	160.66	153.90	18.77	151.94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	66	551
09/22/06	3.98	11.82	755.41	1,656.48	115.15	1,099.62	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	105	3,732
Well ID:		**0699MW-04**			**Casing Elevation**	**15.92**												
06/19/01	5.42	10.50	36,303.01	48,404.42	6,425.13	38,765.03	97.87	ND	ND	ND	ND	ND	ND	NA	NA	ND	693	130,688
08/30/01	7.02	8.90	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA	NS	NS	NS
12/13/01	8.03	7.89	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA	NS	NS	NS
03/27/02	7.01	8.91	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA	NS	NS	NS
06/26/02	6.91	9.01	2,170.64	17,663.04	3,784.80	28,701.21	392.81	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	52,713
09/19/02	6.22	9.70	952.77	9,979.40	1,251.22	20,801.87	113.05	ND	ND	ND	ND	ND	ND	NA	NA	ND	15980	49,078
11/26/02	4.70	11.22	496.67	2,464.04	654.30	5,406.75	179.91	ND	ND	ND	ND	ND	ND	NA	NA	ND	8580	17,782
03/17/03	4.05	11.87	192.35	1,663.88	274.67	4,233.47	2,223.21	ND	ND	ND	ND	ND	ND	NA	NA	ND	3640	12,228
06/30/03	4.20	11.72	218.88	1,069.37	491.96	5,098.43	470.51	ND	ND	ND	ND	ND	ND	NA	NA	ND	7530	14,879
09/24/03	7.51	8.41	ND	10.59	9.38	93.98	242.15	ND	ND	ND	ND	ND	ND	NA	NA	ND	282	638
12/08/03	4.46	11.46	70.34	67.37	51.04	431.42	374.95	ND	ND	ND	ND	ND	ND	NA	NA	ND	2454	3,449
03/29/04	4.76	11.16	441.52	1,825.02	1,063.68	10,392.74	385.18	ND	ND	ND	ND	ND	ND	NA	NA	ND	8750	22,858
06/18/04	5.77	10.15	283.45	565.18	629.50	5,105.97	176.57	ND	ND	ND	ND	ND	ND	NA	NA	ND	6360	13,121
09/16/04	6.92	9.00	65.02	55.95	213.57	429.78	69.13	ND	ND	ND	ND	ND	ND	NA	NA	ND	2810	3,643
12/03/04	5.21	10.71	19.26	44.46	40.86	16.57	435.48	ND	ND	ND	ND	ND	ND	NA	NA	ND	807	1,364
03/07/05	4.61	11.31	449.60	1,916.79	122.25	1,462.72	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	507	4,458
05/26/05	5.16	10.76	10.41	5.81	21.12	63.14	216.57	ND	ND	ND	ND	ND	ND	NA	NA	ND	763	1,080

TABLE 3
GROUNDWATER MONITORING & SAMPLING - VOC RESULTS SUMMARY
FORT MONMOUTH - MAIN POST GAS STATION
EATONTOWN, NEW JERSEY
All analytical results in micrograms per liter (ug/L)

Sampling Date	DTW (feet)	Water Elevation (feet)	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA	Chloroform	Methylene Chloride	Carbon Disulfide	Tetra-chloroethene	Ace-tone	Bromo-dichloro-methane	1,2-Dichloro ethane	1,1,1- Tri chloroethane	VOC TICs	Total VOCs
			1 (1)	**600 (1)**	**700 (1)**	**1,000 (1)**	**70 (1)**	**100 (1)**	**70 (1)**	**3 (1)**	**700 (1)**	**1 (1)**	**6000 (1)**	**1 (1)**	**2 (1)**	**30 (1)**	**--**	**--**
09/08/05	7.21	8.71	21.51	5.69	23.04	60.63	431.07	ND	ND	ND	ND	ND	ND	NA	NA	ND	1242	1,784
12/14/05	4.42	11.50	77.53	238.65	237.40	1,378.34	464.67	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	2,397
02/24/06	4.10	11.82	45.43	249.27	283.74	1,250.47	4,222.90	ND	ND	ND	ND	ND	ND	ND	ND	ND	1451	7,503
06/14/06	3.47	12.45	32.67	106.33	355.33	1,934.13	2,282.82	2,143.77	ND	ND	ND	ND	ND	ND	ND	ND	2623	9,478
09/22/06	4.31	11.61	33.12	41.61	144.68	681.59	314.85	ND	ND	ND	ND	ND	ND	ND	ND	ND	1412	2,628
Well ID:		**0699MW-05**			**Casing Elevation**	**15.48**												
06/19/01	4.21	11.27	9.30	16.92	2.22	13.30	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	354	396
08/30/01	6.25	9.23	ND	ND	ND	ND	ND	ND	5.06	1.22	ND	ND	ND	NA	NA	ND	ND	6
12/13/01	7.40	8.08	ND	ND	ND	ND	ND	ND	10.32	ND	ND	ND	ND	NA	NA	ND	ND	10
03/27/02	5.05	10.43	ND	ND	ND	ND	ND	ND	3.81	ND	ND	ND	ND	NA	NA	ND	ND	4
06/26/02	5.34	10.14	ND	1.88	ND	5.49	ND	ND	3.99	ND	ND	ND	ND	NA	NA	ND	ND	11
09/19/02	5.53	9.95	ND	ND	ND	ND	ND	ND	1.99	ND	ND	ND	ND	NA	NA	ND	ND	2
11/26/02	3.23	12.25	ND	ND	ND	ND	ND	ND	0.94	ND	ND	ND	ND	NA	NA	ND	ND	1
03/17/03	2.75	12.73	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
06/25/03	2.80	12.68	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/24/03	5.23	10.25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
12/08/03	3.90	11.58	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	5	5
03/29/04	3.51	11.97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
06/18/04	4.54	10.94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/16/04	5.70	9.78	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
12/03/04	3.64	11.84	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
03/04/05	3.03	12.45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
05/26/05	3.96	11.52	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/08/05	6.28	9.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	22	22
12/13/05	3.22	12.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
02/24/06	3.22	12.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
06/13/06	2.95	12.53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
09/22/06	3.74	11.74	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
Well ID:		**0699MW-06**			**Casing Elevation**	**15.78**												
06/19/01	4.78	11.00	761.06	546.35	985.71	1,544.89	3.70	ND	ND	ND	ND	ND	ND	NA	NA	ND	177	4,019
08/30/01	6.77	9.01	1,177.19	1,684.62	1,881.59	4,730.19	ND	ND	261.44	ND	ND	ND	ND	NA	NA	ND	4,660	14,395
12/13/01	7.77	8.01	401.96	360.71	366.92	964.27	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	620	2,714
03/27/02	5.21	10.57	1.09	2.98	3.00	12.48	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	44	64
06/26/02	6.12	9.66	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA	NS	NS	0
09/19/02	6.15	9.63	10.50	9.64	114.43	368.32	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	921	1,424
11/26/02	3.91	11.87	11.72	3.78	74.15	82.33	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	540	712
03/17/03	3.11	12.67	10.72	11.52	95.60	212.63	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	809	1,139
06/25/03	3.17	12.61	1.48	1.88	73.82	73.11	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	468	618
09/24/03	5.27	10.51	23.51	20.87	183.13	459.18	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	609	1,296
12/08/03	4.50	11.28	ND	0.68	6.25	13.38	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	43	63
03/29/04	4.01	11.77	0.51	ND	10.62	7.63	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	33	52
06/18/04	5.23	10.55	0.79	1.73	10.98	11.43	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	52	77
09/16/04	6.38	9.40	1.63	3.27	73.98	174.46	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	253

TABLE 3
GROUNDWATER MONITORING & SAMPLING - VOC RESULTS SUMMARY
FORT MONMOUTH - MAIN POST GAS STATION
EATONTOWN, NEW JERSEY
All analytical results in micrograms per liter (ug/L)

Sampling Date	DTW (feet)	Water Elevation (feet)	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA	Chloroform	Methylene Chloride	Carbon Disulfide	Tetra-chloroethene	Ace-tone	Bromo-dichloro-methane	1,2-Dichloro ethane	1,1,1- Tri chloroethane	VOC TICs	Total VOCs
			1 (1)	**600 (1)**	**700 (1)**	**1,000 (1)**	**70 (1)**	**100 (1)**	**70(1)**	**3 (1)**	**700(1)**	**1 (1)**	**6000 (1)**	**1 (1)**	**2 (1)**	**30 (1)**	**--**	**--**
12/03/04	4.51	11.27	3.70	2.74	75.31	124.38	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	510	716
03/04/05	3.33	12.45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
05/26/05	3.96	11.82	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/08/05	7.04	8.74	130.73	54.38	480.49	965.61	48.89	ND	ND	ND	ND	ND	ND	NA	NA	ND	1,264	2,944
12/13/05	5.73	10.05	1.85	0.49	12.86	14.56	0.75	ND	ND	ND	ND	ND	2.63	ND	ND	ND	75	108
02/24/06	5.67	10.11	2.53	ND	6.68	10.18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	105	124
06/14/06	5.30	10.48	21.31	ND	25.51	19.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	243	309
09/22/06	6.22	9.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
Well ID:		**0699MW-08**			**Casing Elevation**	**16.20**												
06/19/01	5.18	11.02	1.40	3.24	1.32	3.93	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	57	67
08/30/01	6.53	9.67	ND	ND	ND	ND	ND	ND	1.14	ND	ND	ND	ND	NA	NA	ND	ND	1
12/13/01	8.04	8.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
03/27/02	6.35	9.85	ND	1.39	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	1
06/26/02	6.25	9.95	ND	2.66	ND	5.61	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	8
09/19/02	6.20	10.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	8	8
11/26/02	4.34	11.86	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	6	6
03/17/03	3.61	12.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	5	5
06/30/03	3.65	12.55	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/24/03	5.96	10.24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	7	7
12/08/03	5.25	10.95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
03/29/04	4.33	11.87	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
06/18/04	5.06	11.14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/16/04	6.35	9.85	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
12/03/04	5.40	10.80	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
03/07/05	3.60	12.60	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
05/26/05	4.55	11.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/08/05	6.51	9.69	ND	ND	1.38	2.97	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	4
12/14/05	3.83	12.37	ND	0.46	0.65	4.55	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6
02/24/06	3.55	12.65	ND	ND	ND	0.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
06/14/06	3.98	12.22	ND	ND	0.28	1.11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
09/22/06	4.69	11.51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
Well ID:		**0699MW-09**			**Casing Elevation**	**15.96**												
06/19/01	4.83	11.13	ND	1.96	ND	1.27	ND	ND	ND	ND	ND	2.24	ND	NA	NA	ND	ND	5
08/30/01	7.07	8.89	ND	ND	ND	ND	ND	ND	ND	ND	3.02	4.68	ND	NA	NA	ND	ND	8
12/13/01	7.96	8.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.25	ND	NA	NA	ND	ND	2
03/27/02	5.36	10.60	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.81	ND	NA	NA	ND	ND	2
06/26/02	6.25	9.71	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.55	ND	NA	NA	ND	ND	3
09/19/02	6.49	9.47	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.86	ND	NA	NA	ND	ND	3
11/26/02	3.57	12.39	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.30	ND	NA	NA	ND	ND	1
03/17/03	3.00	12.96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
06/30/03	4.03	11.93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/24/03	6.07	9.89	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.37	ND	NA	NA	ND	ND	1
12/08/03	4.74	11.22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0

TABLE 3
GROUNDWATER MONITORING & SAMPLING - VOC RESULTS SUMMARY
FORT MONMOUTH - MAIN POST GAS STATION
EATONTOWN, NEW JERSEY
All analytical results in micrograms per liter (ug/L)

Sampling Date	DTW (feet)	Water Elevation (feet)	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA	Chloroform	Methylene Chloride	Carbon Disulfide	Tetra-chloroethene	Ace-tone	Bromo-dichloro-methane	1,2-Dichloro ethane	1,1,1- Tri chloroethane	VOC TICs	Total VOCs
			1 (1)	**600 (1)**	**700 (1)**	**1,000 (1)**	**70 (1)**	**100 (1)**	**70(1)**	**3 (1)**	**700(1)**	**1 (1)**	**6000 (1)**	**1 (1)**	**2 (1)**	**30 (1)**	**--**	**--**
03/29/04	3.95	12.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
06/18/04	5.40	10.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/16/04	6.60	9.36	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.70	ND	NA	NA	ND	4	5
12/03/04	4.42	11.54	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
03/04/05	3.21	12.75	ND	0.92	ND	1.19	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	2
05/23/05	4.33	11.63	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/08/05	7.17	8.79	ND	ND	0.33	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
12/13/05	3.45	12.51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
02/24/06	3.43	12.53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
06/13/06	3.31	12.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
09/22/06	4.41	11.55	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
Well ID:		**0699MW-12**			**Casing Elevation**	**16.66**												
06/19/01	5.64	11.02	ND	1.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	2
08/30/01	7.28	9.38	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
12/13/01	8.59	8.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
03/27/02	6.89	9.77	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
06/26/02	6.85	9.81	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/19/02	6.95	9.71	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
11/26/02	4.90	11.76	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
03/17/03	4.15	12.51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
06/30/03	4.26	12.40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/24/03	6.55	10.11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
12/08/03	5.80	10.86	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
03/29/04	4.90	11.76	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
06/18/04	5.72	10.94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/16/04	7.00	9.66	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
12/03/04	5.73	10.93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
03/04/05	4.04	12.62	ND	0.57	ND	ND	28.99	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	30
05/23/05	5.09	11.57	ND	ND	ND	ND	4.62	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	5
09/08/05	7.28	9.38	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
12/13/05	4.39	12.27	ND	ND	ND	ND	1.15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
02/24/06	4.01	12.65	ND	ND	ND	ND	3.41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3
06/13/06	4.44	12.22	ND	ND	ND	ND	1.90	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2
09/22/06	5.13	11.53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
Well ID:		**0699MW-15**			**Casing Elevation**	**17.04**												
06/19/01	3.35	13.69	1.33	1.82	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	3
08/30/01	5.92	11.12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
12/13/01	7.21	9.83	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
03/27/02	1.73	15.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
06/26/02	4.71	12.33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/19/02	4.84	12.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
11/26/02	2.14	14.90	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
03/17/03	2.13	14.91	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0

TABLE 3
GROUNDWATER MONITORING & SAMPLING - VOC RESULTS SUMMARY
FORT MONMOUTH - MAIN POST GAS STATION
EATONTOWN, NEW JERSEY
All analytical results in micrograms per liter (ug/L)

Sampling Date	DTW (feet)	Water Elevation (feet)	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA	Chloroform	Methylene Chloride	Carbon Disulfide	Tetra-chloroethene	Ace-tone	Bromo-dichloro-methane	1,2-Dichloro ethane	1,1,1- Tri chloroethane	VOC TICs	Total VOCs
			1 (1)	**600 (1)**	**700 (1)**	**1,000 (1)**	**70 (1)**	**100 (1)**	**70(1)**	**3 (1)**	**700(1)**	**1 (1)**	**6000 (1)**	**1 (1)**	**2 (1)**	**30 (1)**	**--**	**--**
06/25/03	2.35	14.69	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/24/03	5.03	12.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	5	5
12/08/03	3.05	13.99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
03/29/04	3.05	13.99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
06/18/04	4.55	12.49	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/16/04	5.61	11.43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
12/06/04	3.09	13.95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
03/07/05	2.53	14.51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
05/26/05	3.95	13.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
09/08/05	6.56	10.48	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	0
12/13/05	1.98	15.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
02/24/06	2.99	14.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
06/13/06	2.86	14.18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
09/22/06	3.24	13.80	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
Well ID:		**0699MW-16**			**Casing Elevation**	**15.27**												
06/19/01	5.00	10.27	ND	ND	ND	ND	ND	ND	5.31	ND	ND	ND	ND	NA	NA	ND	ND	5
08/30/01	7.26	8.01	ND	ND	ND	ND	ND	ND	1.02	ND	ND	ND	ND	NA	NA	ND	ND	1
12/13/01	7.64	7.63	ND	ND	ND	ND	ND	ND	1.67	ND	ND	ND	ND	NA	NA	ND	ND	2
03/27/02	4.92	10.35	ND	ND	ND	ND	ND	ND	10.09	ND	ND	ND	ND	NA	NA	ND	ND	10
06/27/02	5.79	9.48	ND	ND	ND	ND	ND	ND	10.83	ND	ND	ND	ND	NA	NA	ND	ND	11
09/19/02	7.34	7.93	ND	ND	ND	ND	ND	ND	2.64	ND	ND	ND	ND	NA	NA	ND	ND	3
11/26/02	2.57	12.70	ND	ND	ND	ND	ND	ND	14.38	ND	ND	ND	ND	NA	NA	ND	ND	14
06/30/03	3.96	11.31	ND	ND	ND	ND	ND	ND	19.84	ND	ND	ND	ND	NA	NA	ND	ND	20
03/17/03	2.34	12.93	ND	ND	ND	ND	ND	ND	31.83	ND	ND	ND	ND	NA	NA	ND	ND	32
09/24/03	6.22	9.05	ND	ND	ND	ND	ND	ND	2.91	ND	ND	ND	ND	NA	NA	ND	ND	3
12/08/03	4.04	11.23	ND	ND	ND	ND	ND	ND	4.25	ND	ND	0.49	ND	NA	NA	ND	ND	5
03/29/04	3.25	12.02	ND	ND	ND	ND	ND	ND	7.31	ND	ND	ND	ND	NA	NA	ND	ND	7
06/18/04	5.23	10.04	ND	ND	ND	ND	ND	ND	3.54	ND	ND	ND	ND	NA	NA	ND	ND	4
09/16/04	6.51	8.76	ND	ND	ND	ND	ND	ND	1.43	ND	ND	0.91	ND	NA	NA	ND	ND	2
12/03/04	3.62	11.65	ND	ND	ND	ND	ND	ND	3.56	ND	ND	1.09	ND	NA	NA	ND	ND	5
03/04/05	2.48	12.79	ND	0.40	ND	ND	ND	ND	26.07	ND	ND	ND	ND	NA	NA	ND	ND	26
05/23/05	3.72	11.55	ND	ND	ND	ND	ND	ND	15.51	ND	ND	ND	ND	NA	NA	ND	ND	16
09/08/05	7.48	7.79	ND	ND	ND	ND	ND	ND	0.83	ND	ND	1.37	ND	NA	NA	ND	ND	2
12/13/05	2.66	12.61	ND	ND	ND	ND	ND	ND	31.39	ND	ND	0.42	ND	0.39	ND	ND	ND	32
02/24/06	2.84	12.43	ND	ND	ND	ND	ND	ND	22.71	ND	ND	ND	ND	ND	ND	ND	ND	23
06/13/06	3.16	12.11	ND	ND	ND	ND	ND	ND	24.20	ND	ND	ND	ND	ND	ND	ND	ND	24
09/22/06	4.40	10.87	ND	ND	ND	ND	ND	ND	5.00	ND	ND	ND	ND	ND	ND	ND	ND	5
Well ID:		**0699RW-04**			**Casing Elevation:**	**16.47**												
02/24/06	4.86	11.61	ND	ND	1.62	ND	0.41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2
06/14/06	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
09/22/06	5.07	11.40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0

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GROUNDWATER MONITORING & SAMPLING - VOC RESULTS SUMMARY
FORT MONMOUTH - MAIN POST GAS STATION
EATONTOWN, NEW JERSEY
All analytical results in micrograms per liter (ug/L)

Sampling Date	DTW (feet)	Water Elevation (feet)	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA	Chloroform	Methylene Chloride	Carbon Disulfide	Tetra-chloroethene	Ace-tone	Bromo-dichloro-methane	1,2-Dichloro ethane	1,1,1- Tri chloroethane	VOC TICs	Total VOCs
			1 (1)	**600 (1)**	**700 (1)**	**1,000 (1)**	**70 (1)**	**100 (1)**	**70 (1)**	**3 (1)**	**700 (1)**	**1 (1)**	**6000 (1)**	**1 (1)**	**2 (1)**	**30 (1)**	**--**	**--**
Well ID:		**0699RW-11**			**Casing Elevation:**	**15.27**												
06/19/01	9.09	6.18	7,812.42	2,932.54	872.36	3,061.34	1,588.83	655.03	ND	ND	ND	ND	ND	NA	NA	ND	303	17,226
08/30/01	9.23	6.04	9,061.81	2,136.97	1,567.48	4,786.87	1,564.32	ND	243.36	ND	ND	ND	ND	NA	NA	ND	7,740	27,101
12/13/01	NA	NA	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	NA	NA	NS	NS	0
03/27/02	7.90	7.37	8,081.71	1,897.11	913.41	4,405.86	763.15	924.29	ND	ND	ND	ND	ND	NA	NA	ND	8,590	25,576
06/27/02	7.61	7.66	5,027.39	2,481.36	1,162.11	3,640.85	263.36	6.61	ND	ND	ND	ND	ND	NA	NA	ND	ND	12,582
09/19/02	NA	NA	1,656.53	474.38	608.84	4,671.57	276.39	ND	ND	ND	ND	ND	ND	NA	NA	ND	6,660	14,348
11/26/02	NA	NA	306.67	322.73	89.47	389.31	77.01	135.41	ND	ND	ND	ND	ND	NA	NA	ND	337	1,658
03/17/03	11.28	3.99	2,241.65	3,045.43	919.82	3,797.12	424.58	ND	ND	ND	ND	ND	ND	NA	NA	ND	6,430	16,859
06/25/03	11.33	3.94	1,609.59	1,317.86	633.41	2,258.51	195.72	ND	ND	ND	ND	ND	ND	NA	NA	ND	1,630	7,645
09/24/03	9.29	5.98	210.43	114.53	103.74	385.62	278.80	ND	ND	ND	ND	ND	ND	NA	NA	ND	351	1,444
12/08/03	NA	-	587.03	323.54	237.10	620.81	231.93	ND	ND	ND	ND	ND	ND	NA	NA	ND	1,475	3,475
03/29/04	NA	-	629.17	360.37	424.61	992.38	196.50	216.08	ND	ND	ND	ND	ND	NA	NA	ND	2,131	4,950
06/18/04	11.30	3.97	504.50	266.76	274.75	847.26	156.90	ND	ND	ND	ND	ND	ND	NA	NA	ND	1,003	3,053
09/16/04	NA	-	250.53	3,031.86	2,329.45	11,744.18	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	19,930	37,286
12/10/04	11.30	3.97	708.51	102.03	545.62	826.03	355.32	ND	ND	ND	ND	ND	ND	NA	NA	ND	1,897	4,435
03/02/05	11.20	4.07	13.98	201.12	124.85	5,417.85	ND	ND	ND	ND	ND	ND	20.31	NA	NA	ND	2,657	8,435
05/25/05	11.67	3.60	737.49	440.61	636.02	2,347.35	457.11	ND	ND	ND	ND	ND	ND	NA	NA	ND	3,850	8,469
09/08/05	11.68	3.59	801.36	368.34	388.69	1,086.90	353.62	ND	ND	ND	ND	ND	ND	NA	NA	ND	5,130	8,129
12/14/05	NA	NA	572.93	421.26	456.19	969.87	1,395.64	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	3,816
02/24/06	12.40	2.87	337.22	401.53	385.81	1,067.26	1,281.29	1,713.67	ND	ND	ND	ND	ND	ND	ND	ND	2,190	7,377
06/14/06	NA	NA	530.72	359.44	681.52	2,665.97	9,128.57	7,832.26	ND	ND	ND	ND	ND	ND	ND	ND	5,670	26,868
09/22/06	4.38	10.89	203.71	61.84	93.13	245.31	165.04	2,206.21	ND	ND	ND	ND	8.50	ND	4.14	ND	ND	2,988

NOTES:

(1) = July 2007 Groundwater Quality Standard pursuant to N.J.A.C. 7:9C
TICs = Tentatively identified compounds
(#) = Number of TICs identified
VOC = Volatile organic compound
ND = Not detected
NA = Data not available
NS = Not Sampled (due to free product)

WELL SPECIFICATIONS
FORT MONMOUTH - MAIN POST GAS STATION BUILDING 699
EATONTOWN, NEW JERSEY

Well ID	Permit #	Date of Installation	Total Depth (feet bg)	Screen Length (feet)	Well Diameter (inches)	TOC (feet)
0699MW-01	29-23677	11/02/1989	15	13	4	15.81
0699MW-02	29-23678	11/02/1989	17	15	4	16.64
0699MW-03	29-2367	11/02/1989	15	13	4	15.80
0699MW-04	29-23680	11/02/1989	20	18	4	15.92
0699MW-05	29-23808	11/30/1989	15	12	4	15.48
0699MW-06	29-23809	12/01/1989	15	13	4	15.78
0699MW-07	29-23810	12/01/1989	15	12	4	--
0699MW-08	29-23811	12/01/1989	15	13	4	16.20
0699MW-09	29-24639	05/01/1990	15	13	4	15.96
0699MW-10	29-24640	05/01/1990	--	--	4	--
0699MW-12	29-28907	10/14/1992	13.5	10	4	16.66
0699MW-15	29-33753	08/17/1995	13.5	10	4	17.04
0699MW-16	29-33757	08/17/1995	14.5	10	4	15.27
0699RW-04	29-43892	10/26/2000	20	15	4	16.47
0699RW-11	29-28031	05/20/1992	20	15	4	15.27

Notes: TOC - Elevation above sea level of top of casing;
bg - below grade;
"--" - not available.

WELL GAUGE REPORT
DECEMBER 2005 GROUNDWATER SAMPLING EVENT

FORT MONMOUTH - MAIN POST GAS STATION BUILDING 699
EATONTOWN, NEW JERSEY

MONITORING DATE	WELL ID	DEPTH TO GROUNDWATER (feet)	GW ELEV. (feet)
12/14/2005	0699MW-01	4.02	11.79
12/13/2005	0699MW-02	2.38	14.26
12/13/2005	0699MW-03	3.69	12.11
12/14/2005	0699MW-04	4.42	11.50
12/13/2005	0699MW-05	3.22	12.26
12/13/2005	0699MW-06	5.73	10.05
12/14/2005	0699MW-08	3.83	12.37
12/13/2005	0699MW-09	3.45	12.51
12/13/2005	0699MW-12	4.39	12.27
12/13/2005	0699MW-15	1.98	15.06
12/13/2005	0699MW-16	2.66	12.61
12/13/2005	0699RW-04	NG	NG
12/13/2005	0699RW-11	NG	NG

NOTE:
NG - Not Gauged
GW - Groundwater

WELL GAUGE REPORT
FEBRUARY 2006 GROUNDWATER SAMPLING EVENT

FORT MONMOUTH - MAIN POST GAS STATION BUILDING 699
EATONTOWN, NEW JERSEY

MONITORING DATE	WELL ID	DEPTH TO GROUNDWATER (feet)	GW ELEV. (feet)
02/24/2006	0699MW-01	3.82	11.99
02/24/2006	0699MW-02	2.96	13.68
02/24/2006	0699MW-03	3.57	12.23
02/24/2006	0699MW-04	4.10	11.82
02/24/2006	0699MW-05	3.22	12.26
02/24/2006	0699MW-06	5.67	10.11
02/24/2006	0699MW-08	3.55	12.65
02/24/2006	0699MW-09	3.43	12.53
02/24/2006	0699MW-12	4.01	12.65
02/24/2006	0699MW-15	2.99	14.05
02/24/2006	0699MW-16	2.84	12.43
02/24/2006	0699RW-04	4.86	11.61
02/24/2006	0699RW-11	12.40	2.87

NOTE:
NG - Not Gauged
GW - Groundwater

WELL GAUGE REPORT
JUNE 2006 GROUNDWATER SAMPLING EVENT

FORT MONMOUTH - MAIN POST GAS STATION BUILDING 699
EATONTOWN, NEW JERSEY

MONITORING DATE	WELL ID	DEPTH TO GROUNDWATER (feet)	GW ELEV. (feet)
06/14/2006	0699MW-01	3.43	12.38
06/13/2006	0699MW-02	2.88	13.76
06/13/2006	0699MW-03	3.11	12.69
06/14/2006	0699MW-04	3.47	12.45
06/13/2006	0699MW-05	2.95	12.53
06/14/2006	0699MW-06	5.30	10.48
06/14/2006	0699MW-08	3.98	12.22
06/13/2006	0699MW-09	3.31	12.65
06/13/2006	0699MW-12	4.44	12.22
06/13/2006	0699MW-15	2.86	14.18
06/13/2006	0699MW-16	3.16	12.11
06/13/2006	0699RW-04	NG	NG
06/13/2006	0699RW-11	NG	NG

NOTE:
NG - Not Gauged
GW - Groundwater

WELL GAUGE REPORT
SEPTEMBER 2006 GROUNDWATER SAMPLING EVENT

FORT MONMOUTH - MAIN POST GAS STATION BUILDING 699
EATONTOWN, NEW JERSEY

MONITORING DATE	WELL ID	DEPTH TO GROUNDWATER (feet)	GW ELEV. (feet)
09/22/2006	0699MW-01	4.26	11.55
09/22/2006	0699MW-02	3.68	12.96
09/22/2006	0699MW-03	3.98	11.82
09/22/2006	0699MW-04	4.31	11.61
09/22/2006	0699MW-05	3.74	11.74
09/22/2006	0699MW-06	6.22	9.56
09/22/2006	0699MW-08	4.69	11.51
09/22/2006	0699MW-09	4.41	11.55
09/22/2006	0699MW-12	5.13	11.53
09/22/2006	0699MW-15	3.24	13.80
09/22/2006	0699MW-16	4.40	10.87
09/22/2006	0699RW-04	5.07	11.40
09/22/2006	0699RW-11	4.38	10.89

NOTE:
NG - Not Gauged
GW - Groundwater

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1.0 INTRODUCTION

The following Remedial Action Progress Report (RAPR) has been prepared by Handex Consulting and Remediation – Northeast, LLC (HCR) on behalf of the United States Army Fort Monmouth, Directorate of Public Works (DPW), in accordance with the New Jersey Department of Environmental Protection (NJDEP) *Technical Requirements for Site Remediation* (*TRSR*) N.J.A.C. 7:26E. This RAPR was prepared pursuant to N.J.A.C. 7:26E-6.5 and 6.6, respectively, covering the time period of October 2005 through September 2006.

2.0 SITE SUMMARY:

NJDEP Case Manager:	Mr. Larry Quinn NJDEP Bureau of Case Management
Report Submitted by:	Joseph Fallon
Reporting Period:	October 2005 through September 2006
NJDEP Case No.:	89-10-19-1329
USTs Registration No.:	81533-235 through 238; 81533-112; 81533-197 and 81533-185 through 190
Site Use:	Site is located on Saltzman Avenue, a thoroughfare through Fort Monmouth (Figure 1). Site is approximately one acre in size and consists of a service station building (building 699) and serves as the only on-base Main Post gasoline dispensing facility for non-military vehicles. Site was utilized as an automotive service garage. There are four bays located at the eastern side of the building, where limited auto servicing is still performed. Site is mostly covered by impervious surface (Figure 2).
Remedial Status:	On October 19, 1989 the Main Post gasoline station reported to the NJDEP for an evident release of gasoline from the piping system associated with six (6) 10,000 gallons underground storage tanks (USTs), for which an incident number 89-10-19-1329 was assigned to the Site. On June 15, 1990 the Discharge Investigation Corrective Action Report (DICAR) was submitted to the NJDEP. Since 1989 remedial actions including the groundwater pump and treat and air sparge/soil vapor extraction (AS/SVE) systems have been operating at the Site. In addition to AS/SVE, in October 2000, an enzyme-enhanced bioremediation product was injected into the ground at Site. In 2007, six 10,000 gallons USTs (Registration No. 81533-185 through 190) were removed from the subsurface in accordance with the N.J.A.C 7:14B and N.J.A.C. 7:26E, respectively.

Contaminants of Concern Benzene, toluene, ethylbenzene, xylenes (BTEX), methyl tertiary butyl ether (MTBE), tertiary butyl alcohol (TBA), tetrachloroethene (PCE), tentatively identified compounds (TICs), and lead.

Sampling Frequency: Quarterly groundwater samples are being collected and analyzed and results are reported in the RAPR.

Topography/Surface Water: Site is located approximately 15 feet above sea level. The closest surface water is Husky Brook located approximately 750 feet southeast (downgradient). Site area is generally flat with a gentle slope to the southeast.

Site Geology: Regionally, the Site is located in the Coastal Plains physiographic province (NJDEP i-Map, 2008). Locally, the Site is located in the Hornerstown formation (NJDEP i-Map, 2008). Previous site investigations have revealed the sediments to be predominately fine to medium grained sand with varying percentages of silt and clay with occasional gravel and silt/clay lenses.

Hydrogeology: In general, depth to groundwater observed during sampling activities at the Site has been approximately 2.0 to 12.5 feet below grade (fbg). Groundwater flow across the Site is generally to the east. Composite Confining Unit (NJDEP i-Map, 2008) underlies at the Site, which ranges approximately from 20 to 350 fbg. The estimated groundwater recharge for the Site area is approximately 11.22 inches per year (NJDEP i-Map, 2008).

Site History :

- Oct 1989 A leak from the UST piping system was discovered during routine inventory control and was reported to NJDEP on October 19, 1989; Incident Number 89-10-19-1329 was assigned to the Site.
- Dec 1989: Single-point dual-phase pumping system installed.
- Mar 1990: Second recovery well with dual-phase pumping system activated.
- Aug 1990: A total of 6,733 gallons of separate-phase product was recovered by the summer of 1990.
- Jul 1990: DICAR submitted to the NJDEP by The Krydon Group.
- Oct 1993: Remedial Action Workplan (RAW) submitted to the NJDEP by The Krydon Group, Inc.
- Jun 1999: RAW Addendum (RAWA) submitted to the NJDEP by Groundwater & Environmental Services, Inc. (GES) proposing the currently operating groundwater pump and treat and SVE systems.
- 1999: Four (4) gasoline USTs and one (1) waste oil UST removed.
- Oct 2000: A second RAWA submitted to the NJDEP by Versar Inc. proposing enzyme-enhanced bioremediation product injection into

subsurface soil in addition to the planned groundwater pump and treat and SVE systems.

- Nov 2000-Dec 2000: Application of enzyme enhancements for bioremediation of soil.
- Apr 2001: Start-up of currently operating pump and treat system.
- May 2001: Post-bioremediation soil borings conducted.
- Sep 2001: Start-up of currently operating SVE system.
- April 2003: Operation of AS system began.
- 2003 to Present: Groundwater system and SVE system continue to operate. Continued collecting quarterly groundwater samples and presenting analyzed results in RAPRs.
- 2007: Six (6) USTs contained gasoline removed.

3.0 REMEDIATION STATUS

According to proposed remedial actions in RAWA (June 1999), groundwater pump and treat AS/SVE system were installed in 2001, and continued to operate during the reporting period (October 2005 through September 2006). The systems were designed primarily for source-area hydrocarbon mass removal and reduction of soil and groundwater concentrations.

3.1 Soil Vapor Extraction/Air Sparge System

The SVE system was primary means of hydrocarbon mass removal during the reporting period (October 2005 through September 2006). Between September 27, 2005 and September 29, 2006 approximately 118 gallons of hydrocarbons were recovered and treated with the catalytic oxidizer treatment system. Basic system operating parameters, including vacuums, flow rates and concentrations for the reporting period (October 2005 through September 2006) are presented in Table 1. Figure 3 illustrates the system influent concentrations, as well as the cumulative recovery during the reporting period (October 2005 through September 2006).

The SVE system extracts soil vapor from three recovery wells, 0699RW-03, 0699RW-04, and 0699RW-11, and nine vapor laterals (VL1 – VL9), respectively. The vapor laterals were installed approximately 5-6 fbg and consist of two (2) 5-foot long sections of 4-inch diameter well screen connected to a vertical riser pipe. The vapor lateral screens were bedded in sand, and bentonite was used to seal the trenches and vertical risers. Figure 4 shows an as-built survey of the recovery system layout, including locations of the recovery wells, vapor laterals, and air sparge points. Figure 5 is a process and instrumentation diagram that shows the system components.

Operation of the air sparge system began in April 2003, following the observed drop-off in soil gas concentrations entering the SVE system. The sparge system typically provides between 5 to 9 pounds per square inch (psi) to the individual sparge wells, and air flow rates recorded for the individual sparge wells were typically between 4 and 10 cubic feet per minute (cfm). The air sparge system operated intermittently during the reporting period from October 2005 through September 2006.

The SVE treatment system operates between 230 and 290 cubic feet per minute (cfm). The air discharge is permitted (#20013-010001) and the system operated in compliance with the discharge limitations throughout the reporting period from October 2005 through September 2006.

3.2 Separate-Phase Product Recovery

Separate-phase product did not accumulate in the operating recovery wells 0699RW-03, 0699RW-04 and 0699RW-11 during the reporting period (October 2005 through September 2006). Separate-phase product or product film has not been recorded in the recovery wells since

August 2002. Appendix A includes the recovery well gauging data for the reporting period from October 2005 through September 2006.

3.3 Pump and Treat Groundwater System

On April 20, 2001 the pump and treat system began operating at the Site and continued to operate during the reporting period (October 2005 through September 2006). The primary goals of the pump and treat system are to facilitate the collection of separate-phase product (if present), maintain hydraulic control of the source area, and aid SVE recovery by maintaining drawdown in the recovery wells and preventing groundwater mounding that would otherwise be caused by the SVE system.

The groundwater pump and treat system includes three recovery wells, 0699RW-03, 0699RW-04, and 0699RW-11, equipped with down-hole electric submersible pumps controlled by conductivity probes. Three recovery wells are set to maintain approximately 5 to 8 feet of drawdown. This drawdown promotes gravity drainage of separate-phase product (if present) to the recovery wells and facilitates SVE recovery by eliminating water table upwelling in the dual purpose groundwater recovery/SVE wells. Figures 6 through 9 depict groundwater flow towards south and southeast direction at the Site without influence of the groundwater treatment system. Figures 10 through 13 show the recovery well drawdown and hydraulic influence of the pumping wells on the water table for the four groundwater sampling events conducted during the reporting period from October 2005 through September 2006 with influence of the treatment system. Groundwater contour maps for the reporting period from October 2005 through September 2006 were generated using Surfer Surface Mapping System software (version 6.04).

Groundwater pumped from the recovery wells is directed to a groundwater treatment system that includes a filter bag, an air stripper and three granular activated carbon (GAC) units to remove the volatile organic compounds (VOCs) from the water prior to discharge to the local Publicly Owned Treatment Works (POTW). Figure 14 is a process and instrumentation diagram illustrating the system components of the groundwater treatment system. Table 2 shows the monthly flow meter readings and cumulative gallons pumped during the reporting period (October 2005 through September 2006). During this reporting period (October 2005 through September 2006), the system treated approximately 600,820 gallons of water, averaging approximately 1,611 gallons per day. Table 2 also includes the monthly system influent concentrations of total BTEX/MTBE/TBA concentrations and the calculated hydrocarbon mass recovery. Table 2 shows approximately 0.42 pounds of dissolved-phase hydrocarbons were removed by the groundwater pump and treat system during the reporting period from October 2005 through September 2006.

The system operated in compliance with the water discharge limitations set by the Two Rivers Reclamation Authority (Permit# 01-0020) and the air discharge limitations for the air stripper (NJDEP Air Permit #20013-010001). Appendix B includes the laboratory analytical reports for the monthly system samples.

4.0 GROUNDWATER SAMPLING

Four quarterly groundwater sampling events were conducted during the reporting period from October 2005 through September 2006 on the following dates: December 13 & 14, 2005; February 24, 2006; June 13 & 14, 2006; and September 22, 2006. Groundwater sampling was conducted in accordance with NJDEP's TRSR, N.J.A.C. 7:26E and the *Field Sampling Procedures Manual* (FSPM, August 2005). Groundwater sampling was completed by TECOM-Vinnell Services, Inc. (TVS), and the samples were analyzed by the Fort Monmouth Environmental Testing Laboratory (NJDEP Certification #13461). Tables 3 and 4 summarizes the VOCs and metals results, respectively. Table 3 also includes specifications for wells at the Site and well gauging reports for the four sampling events conducted during the reporting period from October 2005 through September 2006. Figures 6 through 9 depict the VOC and metals contaminants concentration results at the Site Map. Appendices C through F contain the field sampling data sheets and the laboratory analytical reports for the December 13 & 14, 2005, February 24, 2006, June 13 & 14, 2006, and September 22, 2006 groundwater sampling events, respectively.

Groundwater samples were collected from the following twelve (12) monitoring wells on all four (4) sampling dates in this reporting period (October 2005 through September 2006): 0699MW-01, 0699MW-02, 0699MW-03, 0699MW-04, 0699MW-05, 0699MW-06, 0699MW-08, 0699MW-09, 0699MW-12, 0699MW-15, 0699MW-16, and 0699RW-11. Beginning with the February 2006 quarterly sampling event, monitoring well 0699RW-04 was added to the quarterly sampling schedule. Groundwater samples were analyzed for VOCs plus a library search (VOCs+15) via Environmental Protection Agency (EPA) Method 624 and lead via EPA Method 3113B.

4.1 Volatile Organic Analytical Results

Monitoring wells that contained VOC concentrations below the groundwater quality criteria (GWQC) on one or more date during this reporting period (October 2005 through September 2006) are summarized in Table 5 below:

Table 5
Summary of Non-Exceeded VOCs

Well ID	**NJDEP GWQS Class IIA (ppb)**	**Sample Date: December 13 & 14, 2005**	**Sample Date: February 24, 2006**	**Sample Date: June 13 & 14, 2006**	**Sample Date: September 22, 2006**
0699MW-02 (upgradient)	NA	ND	ND	ND	ND
0699MW-05 (sidegradient)	NA	ND	ND	ND	ND
0699MW-08 (sidegradient)	Toluene: 600 Ethylbenzene: 700 Xylenes (total): 1000	Toluene: 0.46 ppb Ethylbenzene: 0.65 ppb Xylenes: 4.55 ppb	Xylenes: 0.56 ppb	Ethylbenzene: 0.28 ppb Xylenes: 1.11 ppb	ND
0699MW-09 (downgradient)		ND	ND	ND	ND
0699MW-12 (downgradient)	MTBE: 70	MTBE = 1.15 ppb	MTBE = 3.41 ppb	MTBE = 1.90 ppb	ND
0699MW-15 (upgradient)		ND	ND	ND	ND
0699MW-16 (downgradient)	Chloroform: 70 PCE: 1 BCM: 1	Chloroform: 31.39 ppb PCE: 0.42 ppb BCM: 0.39 ppb	Chloroform: 22.71 ppb	Chloroform: 24.20 ppb	Chloroform: 5.00 ppb
0699-RW-04 (recovery well)	Ethylbenzene: 700 MTBE: 70	NS	Ethylbenzene: 1.62 ppb MTBE = 0.41 ppb	ND	ND

Notes: Location or use of well relative to source area is noted in parenthesis below Well ID;
GWQS – Groundwater quality standard (October, 4, 2005);
ND – Not Detected above method detection limit;
NS – Not Sampled;
NA- Not Applicable;
Well Specifications are included on Table 3;
PCE – Tetrachloroethene;
BCM – Bromodichloromethane;
MTBE – Methyl tertiary butyl ether.

All eight (8) wells listed above have been non-detect or below the GWQS for VOCs during specified sampling events since 2001, with the following two exceptions: 0699MW-09 has been non-detect or below the GWQS since August 2003, and 0699MW-16 has been non-detect or below the GWQS since 2001 except for one detection of PCE above the GWQS in September 2005 with concentration of 1.37 ppb..

Concentrations that exceeded the GWQS in monitoring wells for VOCs during the October 2005 through September 2006 reporting period are summarized in Table 6 below:

Table 6
Summary of Exceeded VOCs

Well ID	Sample Date: December 13 & 14, 2005	Sample Date: February 24, 2006	Sample Date: June 13 & 14, 2006	Sample Date: September 22, 2006
GWQC	Benzene = 1 ppb Toluene = 600 ppb Ethylbenzene = 700 ppb Xylenes = 1,000 ppb	MTBE = 70 ppb Acetone = 6,000 ppb TBA = 100 ppb 1,2 DCA = 2 ppb TICs = 500 ppb	NA	NA
0699MW-01	Benzene = 76.79 ppb Toluene = 946.58 ppb Ethylbenzene = 844.74 ppb Xylenes = 10,280.29 ppb TICs=ND	Benzene = 36.60 ppb Toluene = 736.86 ppb Ethylbenzene = 674.30 ppb Xylenes = 5,006.55 ppb TICs = 2,870 ppb	Benzene = 23.71 ppb Toluene = 302.27 ppb Ethylbenzene = 798.02 ppb Xylenes = 6,594.72 ppb MTBE = 3.54 ppb TICs = 5,050 ppb	Benzene=ND Toluene = 80.55 ppb Ethylbenzene = 937.57 ppb Xylenes = 6,194.51 ppb MTBE=ND TICs = 5,957 ppb
0699MW-03	Benzene = 4,319.42 ppb Toluene = 26,811.99 ppb Ethylbenzene = 838.96 ppb Xylenes = 11,139.09 ppb TICs = 62,000 ppb	Benzene = 4,475.03 ppb Toluene = 6,192.89 ppb Ethylbenzene = 935.20 ppb Xylenes = 10,975.78 ppb MTBE = 4.98 ppb Acetone = 85.70 ppb TICs = 6,620 ppb	Benzene = 160.66 ppb Toluene = 153.90 ppb Ethylbenzene = 18.77 ppb Xylenes = 151.94 ppb TICs = 66 ppb	Benzene = 755.41 ppb Toluene = 1,656.48 ppb Ethylbenzene = 115.15 ppb Xylenes = 1,099.62 ppb MTBE=ND TICs = 105 ppb
0699MW-04	Benzene = 77.53 ppb Toluene = 238.65 ppb Ethylbenzene = 237.40 ppb Xylenes = 1,378.34 ppb MTBE = 464.67 ppb TICs=ND	Benzene = 45.43 ppb Toluene = 249.27 ppb Ethylbenzene = 283.74 ppb Xylenes = 1,250.47 ppb MTBE = 4,222.90 ppb TICs = 1,451 ppb	Benzene = 32.67 ppb Toluene = 106.33 ppb Ethylbenzene = 355.33 ppb Xylenes = 1,934.13 ppb MTBE = 2,282.82 ppb TBA = 2,143.77 ppb TICs = 2,623 ppb	Benzene = 33.12 ppb Toluene = 41.61 ppb Ethylbenzene = 144.68 ppb Xylenes = 681.59 ppb MTBE = 314.85 ppb TICs = 1,412 ppb
0699MW-06	Benzene = 1.85 ppb Toluene = 0.49 ppb Ethylbenzene = 12.86 ppb Xylenes = 14.56 ppb MTBE = 0.75 ppb Acetone = 2.63 ppb TICs = 75 ppb	Benzene = 2.53 ppb Tolune=ND Ethylbenzene = 6.68 ppb Xylenes = 10.18 ppb MTBE=ND TICs = 105 ppb	Benzene = 21.31 ppb Toluene=ND Ethylbenzene = 25.51 ppb Xylenes = 19.07 ppb MTBE=ND TICs = 243 ppb	Benzene=ND Tolene=ND Ethylbenzene=ND Xylenes=ND TICs=ND
0699RW-11	Benzene = 572.93 ppb Toluene = 421.26 ppb Ethylbenzene = 456.19 ppb Xylenes = 969.87 ppb MTBE = 1,395.64 ppb TICs=ND	Benzene = 337.22 ppb Toluene = 401.53 ppb Ethylbenzene = 385.81 ppb Xylenes = 1,067.26 ppb MTBE = 1,281.29 ppb TBA = 1,713.67 ppb TICs = 2,190 ppb	Benzene = 530.72 ppb Toluene = 359.44 ppb Ethylbenzene = 681.52 ppb Xylenes = 2,665.97 ppb MTBE = 9,128.57 ppb TBA = 7,832.26 ppb TICs = 5,670 ppb	Benzene = 203.71 ppb Toluene = 61.84 ppb Ethylbenzene = 93.13 ppb Xylenes = 245.31 ppb MTBE = 165.04 ppb TBA = 2,206.21 ppb Acetone = 8.50 ppb 1,2 DCA = 4.14 ppb TICs=ND

Notes: Well Specifications are included on Table 3;
ND – Not detected above method detection limit; NA-Not applicable; 1,2 DCA = 1,2 Dichloroethane;
TICs – Tentatively identified compounds; GWQC- Groundwater Quality Criteria

Source area well 0699RW-04, which was added to the quarterly sampling plan beginning in February 2006 quarterly sampling event, was non-detect or below the GWQS for VOCs during the February 2006, June 2006, and September 2006 groundwater sampling events.

Appendices C through F include historical concentration graphs of 0699MW-01, 0699MW-03, 0699MW-04, 0699MW-06, and 0699RW-11. These graphs show a decrease trend for BTEX contaminant concentrations in the source area wells since the remediation systems went online in 2001.

The MTBE and TBA contaminants in monitoring wells 0699MW-04 and 0699RW-11, exhibited apparent concentration spikes during this reporting period. In 0699MW-04, MTBE contaminant concentrations increased from 464.67 ppb in December 2005 to 4,222.90 ppb in February 2006. During the two subsequent quarters, MTBE contaminant concentrations in 0699MW-04 decreased to 2,282.82 ppb in June 2006 and to 314.85 ppb in September 2006 from 4,222.90 ppb.

No TBA contaminant was detected in monitoring well 0699MW-04 since groundwater sampling began in June 2001. In June 2006 TBA contaminant was detected in monitoring well 0699MW-04 with concentration 2,143.77 ppb, and non-detected in September 2006.

The MTBE and TBA contaminants concentration in monitoring well 0699MW-04 are summarized in Table 7 below:

Table 7
Summary of MTBE and TBA Concentration Levels
Monitoring Well 0699MW-04

NJDEP GWQS (ppb)	**Sample Date: December 13 & 14, 2005**	**Sample Date: February 24, 2006**	**Sample Date: June 13 & 14, 2006**	**Sample Date: September 22, 2006**
MTBE: 70 TBA: 100	MTBE = 464.67 ppb TBA = ND	MTBE = 4,222.90 ppb TBA = ND	MTBE = 2,282.82 ppb TBA = 2,143.77 ppb	MTBE = 314.85 ppb TBA = ND

Prior to June 2002, the MTBE contaminant concentration in the recovery well 0699RW-11 was below 500 ppb, however, in December 2005, concentrations increased to 1,395.64 ppb. In February 2006, MTBE contaminant concentrations in the recovery well 0699RW-11 dropped slightly to 1,281.29 ppb, but once again increased to 9,128.57 ppb in June 2006, before dropping back to 165.04 ppb in September 2006.

Prior to December 2005, TBA contaminant was not detected in recovery well 0699RW-11. However, TBA contaminant was detected in 0699RW-11 with concentrations of 1,713.67 ppb in

February 2006 and 7,832.26 ppb in June 2006. In September 2006, TBA contaminant concentrations in 0699RW-11 dropped to 2,206.21 ppb from 7,832.26 ppb. The MTBE and TBA contaminants concentration are summarized in Table 8 below:

Table 8
Summary of MTBE and TBA Concentration Levels
Monitoring Well 0699RW-11

NJDEP GWQS (ppb)	Sample Date: December 13 & 14, 2005	Sample Date: February 24, 2006	Sample Date: June 13 & 14, 2006	Sample Date: September 22, 2006
MTBE: 70 TBA: 100	MTBE = 1,395.64 ppb TBA = ND	MTBE = 1,281.29 ppb TBA = 1,713.67 ppb	MTBE = 9,128.57 ppb TBA = 7,832.26 ppb	MTBE = 165.04 ppb TBA = 2,206.21 ppb

4.2 Lead Analytical Results

In addition to the VOC analysis, quarterly groundwater samples were also analyzed for lead. Laboratory results are included in Table 4.

Non-detected monitoring wells for lead contaminant during October 2005 through September 2006 reporting period are summarized in Table 9 below:

Table 9
Summary of Monitoring Wells Non-Detected for Lead Contaminant

Well ID	Sample Date: December 13 & 14, 2005	Sample Date: February 24, 2006	Sample Date: June 13 & 14, 2006	Sample Date: September 22, 2006
0699MW-01	ND	ND	ND	1.93 ppb
0699MW-05	ND	ND	ND	ND
0699MW-06	ND	ND	ND	ND
0699MW-08	ND	ND	ND	ND
0699MW-09	ND	ND	ND	ND
0699MW-12	ND	ND	ND	ND
0699MW-16	ND	ND	ND	ND
0699RW-04	NS	ND	ND	ND

Notes: ND – Not Detected above method detection limit;
NS – Not Sampled;
Well Specifications are included on Table 3.

Lead contaminant was detected in four (4) monitoring wells and one recovery well during the October 2005 through September 2006 reporting period. Summarized monitoring wells detected for lead contaminant concentrations are presented in Table 10 below:

Table 10
Summary of Monitoring Wells Detected for Lead Contaminant

Well ID	**Sample Date: December 13 & 14, 2005**	**Sample Date: February 24, 2006**	**Sample Date: June 13 & 14, 2006**	**Sample Date: September 22, 2006**
GWQS	**1 ppb**	**1 ppb**	**1 ppb**	**1 ppb**
0699MW-01	ND	ND	ND	1.93 ppb
0699MW-02	5.85 ppb	ND	ND	ND
0699MW-03	5.33 ppb	ND	ND	ND
0699MW-04	6.25 ppb	ND	2.99 ppb	1.03 ppb
0699MW-15	7.99 ppb	6.62 ppb	4.56 ppb	1.63 ppb
0699RW-11	6.98 ppb	ND	ND	ND

It should be noted that sampling wells for metals was accomplished using a traditional three to five volumes well purge technique and not a slow purge/low-flow sampling technique. The DPW has used the low-flow sampling methodology at other sites to reduce the suspended solids in the samples that resulted in significantly lower analytical results for metals. Employing a low-flow sampling methodology at this Site may result in lower lead analytical results.

5.0 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) REVIEW

In order to verify the reliability of the analytical results, HCR reviewed the holding times for each sample and the results of the analysis of method blanks, trip blanks, field blanks, and field duplicate samples, respectively. All samples were analyzed by the Fort Monmouth Environmental Testing Laboratory, a NJDEP certified laboratory, within the prescribed holding time requirements for each analytical method.

Chloroform and acetone are common laboratory contaminants, and their detection in blanks indicates that the sample handling procedures, including the sample glassware, may have introduced contamination into the sampling and analysis process. Thus, the reported concentrations of acetone and/or chloroform in the monitoring well samples should not be considered as an accurate reflection of the actual groundwater concentrations for acetone and chloroform. However, the primary contaminants of concern (BTEX, MTBE, TBA and lead) were not detected in any of the blank samples.

Method Blanks

Laboratory method blank accompanied each round of samples collected at the Site. Method blanks consisted of laboratory-grade water that was processed identically to the samples and analyzed with the sample batch. One method blank was analyzed with each groundwater sampling event. The method blanks were analyzed for VOCs plus a library search for tentatively identified compounds (TICs).

Acetone was detected in a single method blank on the February 24, 2006 groundwater sampling event at a concentration of 2.08 ppb, which was below the NJDEP GWQS.

In addition to VOCs, the laboratory method blanks were also analyzed for lead. Lead was detected in a single method blank on the June 13 & 14, 2006 groundwater sampling event with a concentration of 8.20 ppb. However, none of the monitoring wells sampled in June 2006 exceeded the GWQS of 5 ppb.

Trip Blanks

A trip blank accompanied each round of samples collected at the Site to document that VOCs were not introduced into the samples during the handling process. The trip blanks were prepared by the Monmouth Environmental Testing Laboratory and consisted of sample bottles filled with laboratory deionized water. The trip blanks remained with the sample bottles in coolers and were returned to the laboratory for analysis with the groundwater samples.

Chloroform was detected in a single trip blank on the February 14, 2006 sampling event at a concentration of 0.41 ppb, which was below the NJDEP GWQS of 70 ppb.

Field Blanks

One field blank sample was collected during each day's sampling activities to document equipment decontamination procedures. The field blanks were collected by rinsing deionized water, supplied by the laboratory, over the sampling equipment (e.g. bailers) that was used for each day's activities. Water was collected in clean laboratory-supplied sample jars and submitted along with the groundwater samples to the Fort Monmouth Environmental Testing Laboratory for analysis.

Chloroform was detected in a single field blank on the February 24, 2006 groundwater sampling event at a concentration of 0.36 ppb, which was below the NJDEP GWQS of 70 ppb.

In addition to VOCs, the field blanks were also analyzed for lead. All field blank samples were non-detect for lead during all four groundwater sampling events during the October 2005 through September 2006 reporting period.

Duplicate Samples

One field duplicate sample was collected during each day of sampling to verify the consistency of the entire sampling and analytical procedure. For the four sampling events in the October 2005 through September 2006 reporting period, concentrations were detected in both the original well sample and the duplicate well sample in the December 2005, February 2006, June 2006, and September 2006 sampling events.

The original samples and duplicate samples were collected from the following wells:

- December 13, 2005: (Well Not Identified In Field Report)
- December 14, 2005: 0699MW-04
- February 24, 2006: 0699MW-03
- June 13, 2006: 0699MW-03
- June 14, 2006: 0699MW-04
- September 22, 2006: 0699MW-01

Relative percentage differences (RPDs) for VOCs detected in the groundwater sample and duplicate sample during October 2005 through September 2006 reporting period are summarized in Table 11 below:

Table 11
Summary of RPDs for VOCs in Groundwater Samples

Sampling Date	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	TBA	Acetone
12/14/05	34.1%	38.4%	10.0%	11.9%	32.1%	--	ND
02/24/06	8.5%	4.6%	40.0%	6.7%	15.7%	ND	22.0%
06/13/06	6.5%	2.4%	11.0%	14.5%	ND	ND	ND
06/14/06	12.7%	22.1%	20.0%	18.2%	13.0%	5.1%	ND
09/22/06	--	11.0%	0.8%	15.9%	--	ND	--

Notes: "--" – RPD could not be calculated, see explanation below; ND – Compound not detected

In addition to VOCs, the duplicate samples were analyzed for lead. Table 12 below summarizes the RPDs for lead detected in the original groundwater sample and the duplicate sample collected and analyzed during the October 2005 through September 2006 reporting period:

Table 12
Summary of RPDs for Lead in Groundwater Samples

Sampling Date	Lead
12/14/05	14.1%
02/24/06	ND
06/13/06	ND
06/14/06	55.0%
09/22/06	--

Notes: "--" – RPD could not be calculated, see explanation below.
ND – Compound not detected in monitoring well sample or duplicate sample.

6.0 CONCLUSIONS

The data supports the conclusion that the chosen remedial strategy is working.

- Hydrocarbons are being recovered by the remediation systems.
  - The SVE system recovered approximately 118 equivalent gallons of hydrocarbons during the reporting period from October 2005 through September 2006. Since start-up of the SVE system in September 2001, approximately 5,147 equivalent gallons of hydrocarbons have been recovered.
  - Approximately 0.42 pounds of dissolved-phase hydrocarbons were recovered during the reporting period from October 2005 through September 2006 with the groundwater pump and treat system.
- Liquid-phase hydrocarbons are no longer present in the Site wells. Measurable quantities of liquid-phase hydrocarbons were last recorded during the June 26, 2002 groundwater sampling event (0.16 feet in 0699MW-01), and liquid-phase hydrocarbon films were last recorded in the recovery wells in August 2002 (0699RW-03).
- In general, there has been a significant reduction in the dissolved-phase gasoline constituents (BTEX/MTBE/TBA) observed in the source-area monitoring wells between the pre-SVE system operation (2001) time period, and the sampling results collected after mid-2002.
- Detection of lead contaminant concentration in groundwater samples may be for not utilizing low-flow sampling method.
- The groundwater pump and treat system continues to maintain hydraulic control of the source area.
  - Figures 10 through 13 shown the hydraulic influence of the three pumping wells.
  - Downgradient monitoring wells 0699MW-09 and -0699MW-16 remain non-detect or below the GWQS for BTEX, MTBE, and TBA.
- Continued system operation and hydrocarbon recovery should result in continued decreases in soil and groundwater concentrations. However, given the significant hydrocarbon recovery that has already occurred and the associated drop-off in observed hydrocarbon concentrations, future rates of recovery are expected to be less than previously recovered.
- Field and laboratory Quality Assurance and Quality Control is adequate

7.0 RECOMMENDATIONS

The following actions are recommended:

- Continue operation of the remediation systems.
- Continue quarterly groundwater sampling.
- DPW will review the possibility of connecting 0699MW-03 to the SVE/groundwater pump and treat system due to high concentrations of BTEX in the well which appears to be outside of any sufficient recovery well influence.
- Prepare and submit the next RAPR to include information from the fourth quarter of 2006 through the third quarter of 2007.
- Low flow sampling to control lead contaminant concentration.
- Complete Contour Map Reporting Form; and
- Update groundwater sampling Standard Operating Procedure (SOP) to reflect NJDEP FSPM (August, 2005).

8.0 SCHEDULE OF SITE ACTIVITIES

RAPR covering the next reporting period from October 2006 through September 2007 will be submitted to the NJDEP following review of the sampling results of that reporting period. Quarterly groundwater monitoring will be conducted for the Site to evaluate the detected contaminants concentration levels. Groundwater samples that will be collected and analyzed from each monitoring well during each quarter are summarized in Table 13 below:

Table 13
Summary of Quarterly Monitoring Wells and Analysis

Monitoring Well	Analyzed for	Future Sampling Status	Reason
0699MW-01	VOCs, lead	Continue Quarterly	Monitor source area concentrations
0699MW-02	VOCs, lead	Continue Quarterly	Monitor background concentrations
0699MW-03	VOCs, lead	Continue Quarterly	Monitor source area concentrations
0699MW-04	VOCs, lead	Continue Quarterly	Monitor source area concentrations
0699MW-05	VOCs, lead	Continue Quarterly	Sidegradient well; VOCs below criteria for 19 rounds
0699MW-06	VOCs, lead	Continue Quarterly	Monitor source area concentrations
0699MW-07	-----	-----	Abandoned
0699MW-08	VOCs, lead	Continue Quarterly	Sidegradient well; VOCs and lead below criteria for 21 rounds
0699MW-09	VOCs, lead	Continue Quarterly	Monitor down-gradient concentrations; Lead below criteria for 21 rounds
0699MW-10	-----	-----	Abandoned
0699MW-12	VOCs, lead	Continue Quarterly	Monitor down-gradient concentrations; Lead below criteria for 21 rounds
0699MW-13	-----	-----	UST pit well
0699MW-14	-----	-----	UST pit well
0699MW-15	VOCs, lead	Continue Quarterly	Upgradient well; VOCs below criteria for 21 rounds
0699MW-16	VOCs, lead	Continue Quarterly	Monitor down-gradient concentrations; BTEX below criteria for 22 rounds; Lead ND for 21 rounds. Down-gradient concentrations monitored by MW-9 and MW-12
0699RW-04	VOCs, lead	Continue Quarterly	Monitor source area concentrations; No other nearby well
0699RW-11	VOCs, lead	Continue Quarterly	Monitor source area concentrations

9.0 COST OF REMEDIAL ACTION

From 2001 through the end of the reporting period (September 2006), the cost for remedial activities at the Site provided by HCR (and its predecessor Handex Environmental) has totaled $2,283,096.88. A breakdown of this total is provided below.

2000:	$290,647.31
2001:	$1,793,647.37
2002:	$26,340.00
2003:	$32,579.73
2004:	$32,965.00
2005:	Operation and Maintenance for pump and treat system: $24,350.00 System Carbon Changes: $15,762.63 Well development: $210.00 Air Stripper Cleaning: $750.00 RAPRs: $5,800.00 Quarterly Reporting: $6,900.00 Repair/Replace Transfer Pump: $3,201.84 Replace GAC Laterals: $957.00 Replace Blower Belts: $421.00 Miscellaneous Equipment Replacement: $7,950.00 Pump and Meter Removal: $237.00 Plumbing Materials: $475.00 Project Coordination: $350.00 Surveyor: $950.00
2006:	Operation and Maintenance for pump and treat system: $19,000.00 Air Stripper Cleaning: $750.00 System Carbon Changes: $13,016.00 System Belt Replacement: $76.57 System Pump Cleaning: $2,350.00 Preparation of Operation and Maintenance RFP Binders: $200.00 Air Permit Report: $3,003.13 Incident Response: $207.30

10.0 REFERENCES

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2) Krydon, October 1993. U.S. Army, Fort Monmouth, New Jersey, Remedial Action Work; The Krydon Group, Inc. New Jersey.
3) Versar, June 1999. U.S. Army, Fort Monmouth, New Jersey, Remedial Action Workplan Addendum; Versar, Inc. One North MacDonald, Suite 301, Mesa, Arizona.
4) Versar, October 2000. U.S. Army, Fort Monmouth, New Jersey, Remedial Action Workplan, 2nd Addendum, Enzyme-Enhanced Bioremediation; Versar, Inc., One North MacDonald, Suite 301, Mesa, Arizona.
5) Versar, December 2002. U.S. Army, Fort Monmouth, New Jersey, Remedial Action Progress Report; Versar, Inc., One North MacDonald, Suite 301, Mesa, Arizona.
6) Maptech Terrain Navigator, U.S.G.S Topographic, 2001.
7) NJDEP i-Map, 2008, http://www.nj.gov/dep/gis/newmapping.htm.
8) N.J.A.C. 7:9C, Groundwater Quality Standards, October 4, 2005.

TABLE 4
GROUNDWATER MONITORING & SAMPLING - METALS RESULTS
FORT MONMOUTH - MAIN POST GAS STATION
EATONTOWN, NEW JERSEY
All analytical results in micrograms per liter (ug/L)

Sampling Date	DTW (feet)	Water Elevation (feet)	Total Lead
			5 (1)
Well ID		**0699MW-01**	
06/19/01	5.50	10.31	NS
08/30/01	6.75	9.06	3.57
12/13/01	8.75	7.06	NS
03/27/02	7.05	8.76	NS
06/26/02	6.91	8.90	NS
09/19/02	5.93	9.88	6.92
11/26/02	4.38	11.43	3.88
03/17/03	4.20	11.61	3.63
06/30/03	3.81	12.00	6.15
09/24/03	7.20	8.61	19.50
12/08/03	5.15	10.66	16.40
03/29/04	4.61	11.20	10.70
06/18/04	5.35	10.46	19.20
09/16/04	6.42	9.39	1.30
12/03/04	5.26	10.55	9.62
03/07/05	3.55	12.26	ND
05/26/05	4.46	11.35	ND
09/08/05	6.49	9.32	6.26
12/14/05	4.02	11.79	ND
02/24/06	3.82	11.99	ND
06/14/06	3.43	12.38	ND
09/22/06	4.26	11.55	1.93
Well ID:		**0699MW-04**	
06/19/01	5.42	10.50	NS
08/30/01	7.02	8.90	NS
12/13/01	8.03	7.89	NS
03/27/02	7.01	8.91	NS
06/26/02	6.91	9.01	8.79
09/19/02	6.22	9.70	5.22
11/26/02	4.70	11.22	3.52
03/17/03	4.05	11.87	4.88
06/30/03	4.20	11.72	4.78
09/24/03	7.51	8.41	11.60
12/08/03	4.46	11.46	10.70
03/29/04	4.76	11.16	21.40
06/18/04	5.77	10.15	ND
09/16/04	6.92	9.00	17.80
12/03/04	5.21	10.71	ND
03/07/05	4.61	11.31	ND
05/26/05	5.16	10.76	ND
09/08/05	7.21	8.71	ND
12/14/05	4.42	11.50	6.25
02/24/06	4.10	11.82	ND
06/14/06	3.47	12.45	2.99
09/22/06	4.31	11.61	1.03

Sampling Date	DTW (feet)	Water Elevation (feet)	Total Lead
			5 (1)
Well ID		**0699MW-02**	
06/19/01	3.81	12.83	NS
08/30/01	6.73	9.91	ND
12/13/01	8.3	8.34	8.40
03/27/02	1.58	15.06	9.71
06/26/02	5.44	11.20	ND
09/19/02	5.46	11.18	0.94
11/26/02	2.2	14.44	ND
03/17/03	1.87	14.77	ND
06/25/03	2.21	14.43	ND
09/24/03	6.75	9.89	11.70
12/08/03	3.55	13.09	21.40
03/29/04	3.45	13.19	15.80
06/18/04	5.35	11.29	8.23
09/16/04	6.33	10.31	15.10
12/06/04	3.19	13.45	ND
03/07/05	2.47	14.17	ND
05/26/05	4.69	11.95	ND
09/08/05	7.56	9.08	ND
12/13/05	2.38	14.26	5.85
02/24/06	2.96	13.68	ND
06/13/06	2.88	13.76	ND
09/22/06	3.68	12.96	ND
Well ID:		**0699MW-05**	
06/19/01	4.21	11.27	NS
08/30/01	6.25	9.23	1.41
12/13/01	7.40	8.08	8.30
03/27/02	5.05	10.43	ND
06/26/02	5.34	10.14	ND
09/19/02	5.53	9.95	ND
11/26/02	3.23	12.25	ND
03/17/03	2.75	12.73	ND
06/25/03	2.80	12.68	3.46
09/24/03	5.23	10.25	6.04
12/08/03	3.90	11.58	6.60
03/29/04	3.51	11.97	6.51
06/18/04	4.54	10.94	11.20
09/16/04	5.70	9.78	5.33
12/03/04	3.64	11.84	ND
03/04/05	3.03	12.45	ND
05/26/05	3.96	11.52	ND
09/08/05	6.28	9.20	12.90
12/13/05	3.22	12.26	ND
02/24/06	3.22	12.26	ND
06/13/06	2.95	12.53	ND
09/22/06	3.74	11.74	ND

Sampling Date	DTW (feet)	Water Elevation (feet)	Total Lead
			5 (1)
Well ID:		**0699MW-03**	
06/19/01	4.97	10.83	NS
08/30/01	6.65	9.15	4.70
12/13/01	7.75	8.05	9.30
03/27/02	5.47	10.33	6.13
06/26/02	6.36	9.44	1.70
09/19/02	5.89	9.91	2.88
11/26/02	4.08	11.72	1.53
03/17/03	3.41	12.39	1.37
06/25/03	3.35	12.45	7.50
09/24/03	5.23	10.57	9.28
12/08/03	4.46	11.34	7.41
03/29/04	4.15	11.65	7.72
06/18/04	5.15	10.65	8.17
09/16/04	6.30	9.50	19.50
12/03/04	4.63	11.17	7.37
03/04/05	3.50	12.30	ND
05/23/05	4.43	11.37	ND
09/08/05	6.84	8.96	16.00
12/13/05	3.69	12.11	5.33
02/24/06	3.57	12.23	ND
06/13/06	3.11	12.69	ND
09/22/06	3.98	11.82	ND
Well ID:		**0699MW-06**	
06/19/01	4.78	11.00	NS
08/30/01	6.77	9.01	4.89
12/13/01	7.77	8.01	2.70
03/27/02	5.21	10.57	19.00
06/26/02	6.12	9.66	NS
09/19/02	6.15	9.63	1.53
11/26/02	3.91	11.87	ND
03/17/03	3.11	12.67	ND
06/25/03	3.17	12.61	9.87
09/24/03	5.27	10.51	9.96
12/08/03	4.50	11.28	28.00
03/29/04	4.01	11.77	19.30
06/18/04	5.23	10.55	12.70
09/16/04	6.38	9.40	37.10
12/03/04	4.51	11.27	ND
03/04/05	3.33	12.45	ND
05/26/05	3.96	11.82	ND
09/08/05	7.04	8.74	ND
12/13/05	5.73	10.05	ND
02/24/06	5.67	10.11	ND
06/14/06	5.30	10.48	ND
09/22/06	6.22	9.56	ND

TABLE 4
GROUNDWATER MONITORING & SAMPLING - METALS RESULTS
FORT MONMOUTH - MAIN POST GAS STATION
EATONTOWN, NEW JERSEY
All analytical results in micrograms per liter (ug/L)

Sampling Date	DTW (feet)	Water Elevation (feet)	Total Lead
			5 (1)
Well ID:		**0699MW-08**	
06/19/01	5.18	11.02	NS
08/30/01	6.53	9.67	ND
12/13/01	8.04	8.16	1.40
03/27/02	6.35	9.85	ND
06/26/02	6.25	9.95	2.70
09/19/02	6.20	10.00	0.97
11/26/02	4.34	11.86	ND
03/17/03	3.61	12.59	1.31
06/30/03	3.65	12.55	ND
09/24/03	5.96	10.24	ND
12/08/03	5.25	10.95	0.90
03/29/04	4.33	11.87	ND
06/18/04	5.06	11.14	ND
09/16/04	6.35	9.85	ND
12/03/04	5.40	10.80	ND
03/07/05	3.60	12.60	ND
05/26/05	4.55	11.65	ND
09/08/05	6.51	9.69	ND
12/14/05	3.83	12.37	ND
02/24/06	3.55	12.65	ND
06/14/06	3.98	12.22	ND
09/22/06	4.69	11.51	ND
Well ID:		**0699MW-15**	
06/19/01	3.35	13.69	NS
08/30/01	5.92	11.12	5.82
12/13/01	7.21	9.83	3.90
03/27/02	1.73	15.31	5.51
06/26/02	4.71	12.33	2.30
09/19/02	4.84	12.20	3.35
11/26/02	2.14	14.90	ND
03/17/03	2.13	14.91	ND
06/25/03	2.35	14.69	2.91
09/24/03	5.03	12.01	8.96
12/08/03	3.05	13.99	6.74
03/29/04	3.05	13.99	15.10
06/18/04	4.55	12.49	ND
09/16/04	5.61	11.43	8.41
12/06/04	3.09	13.95	ND
03/07/05	2.53	14.51	ND
05/26/05	3.95	13.09	8.35
09/08/05	6.56	10.48	ND
12/13/05	1.98	15.06	7.99
02/24/06	2.99	14.05	6.62
06/13/06	2.86	14.18	4.56
09/22/06	3.24	13.80	1.63

Sampling Date	DTW (feet)	Water Elevation (feet)	Total Lead
			5 (1)
Well ID:		**0699MW-09**	
06/19/01	4.83	11.13	NS
08/30/01	7.07	8.89	ND
12/13/01	7.96	8.00	ND
03/27/02	5.36	10.60	ND
06/26/02	6.25	9.71	0.94
09/19/02	6.49	9.47	ND
11/26/02	3.57	12.39	ND
03/17/03	3.00	12.96	ND
06/30/03	4.03	11.93	ND
09/24/03	6.07	9.89	1.84
12/08/03	4.74	11.22	3.53
03/29/04	3.95	12.01	ND
06/18/04	5.40	10.56	ND
09/16/04	6.60	9.36	ND
12/03/04	4.42	11.54	ND
03/04/05	3.21	12.75	ND
05/23/05	4.33	11.63	ND
09/08/05	7.17	8.79	ND
12/13/05	3.45	12.51	ND
02/24/06	3.43	12.53	ND
06/13/06	3.31	12.65	ND
09/22/06	4.41	11.55	ND
Well ID:		**0699MW-16**	
06/19/01	5.00	10.27	NS
08/30/01	7.26	8.01	ND
12/13/01	7.64	7.63	ND
03/27/02	4.92	10.35	ND
06/27/02	5.79	9.48	ND
09/19/02	7.34	7.93	ND
11/26/02	2.57	12.70	ND
06/30/03	3.96	11.31	ND
03/17/03	2.34	12.93	ND
09/24/03	6.22	9.05	ND
12/08/03	4.04	11.23	ND
03/29/04	3.25	12.02	ND
06/18/04	5.23	10.04	ND
09/16/04	6.51	8.76	ND
12/03/04	3.62	11.65	ND
03/04/05	2.48	12.79	ND
05/23/05	3.72	11.55	ND
09/08/05	7.48	7.79	ND
12/13/05	2.66	12.61	ND
02/24/06	2.84	12.43	ND
06/13/06	3.16	12.11	ND
09/22/06	4.40	10.87	ND

Sampling Date	DTW (feet)	Water Elevation (feet)	Total Lead
			5 (1)
Well ID:		**0699MW-12**	
06/19/01	5.64	11.02	NS
08/30/01	7.28	9.38	ND
12/13/01	8.59	8.07	1.00
03/27/02	6.89	9.77	ND
06/26/02	6.85	9.81	ND
09/19/02	6.95	9.71	1.26
11/26/02	4.90	11.76	ND
03/17/03	4.15	12.51	ND
06/30/03	4.26	12.40	ND
09/24/03	6.55	10.11	ND
12/08/03	5.80	10.86	ND
03/29/04	4.90	11.76	ND
06/18/04	5.72	10.94	ND
09/16/04	7.00	9.66	ND
12/03/04	5.73	10.93	ND
03/04/05	4.04	12.62	ND
05/23/05	5.09	11.57	ND
09/08/05	7.28	9.38	ND
12/13/05	4.39	12.27	ND
02/24/06	4.01	12.65	ND
06/13/06	4.44	12.22	ND
09/22/06	5.13	11.53	ND
Well ID:		**0699RW-04**	
06/19/01	NG	NG	NS
08/30/01	NG	NG	NS
12/13/01	NG	NG	NS
03/27/02	NG	NG	NS
06/27/02	NG	NG	NS
09/19/02	NG	NG	NS
11/26/02	NG	NG	NS
03/17/03	NG	NG	NS
06/25/03	NG	NG	NS
09/24/03	NG	NG	NS
12/08/03	NG	NG	NS
03/29/04	NG	NG	NS
06/18/04	NG	NG	NS
09/16/04	NG	NG	NS
12/10/04	NG	NG	NS
03/02/05	NG	NG	NS
05/25/05	NG	NG	NS
09/08/05	NG	NG	NS
12/14/05	NG	NG	NS
02/24/06	4.86	11.61	ND
06/14/06	NA	NA	ND
09/22/06	5.07	11.40	ND

TABLE 4
GROUNDWATER MONITORING & SAMPLING - METALS RESULTS
FORT MONMOUTH - MAIN POST GAS STATION
EATONTOWN, NEW JERSEY
All analytical results in micrograms per liter (ug/L)

Sampling Date	DTW (feet)	Water Elevation (feet)	Total Lead
			5 (1)
Well ID:		**0699RW-11**	
06/19/01	9.09	7.34	NS
08/30/01	9.23	7.20	ND
12/13/01	NA	NA	NS
03/27/02	7.90	8.53	ND
06/27/02	7.61	8.82	ND
09/19/02	NA	NA	ND
11/26/02	NA	NA	ND
03/17/03	11.28	5.15	1.80
06/25/03	11.33	5.10	1.78
09/24/03	9.29	7.14	2.68
12/08/03	NA	-	6.60
03/29/04	NA	-	9.27
06/18/04	11.30	5.13	ND
09/16/04	NA	-	ND
12/10/04	11.30	5.13	ND
03/02/05	11.20	5.23	ND
05/25/05	11.67	4.76	ND
09/08/05	11.68	4.75	6.71
12/14/05	NA	NA	6.98
02/24/06	12.40	4.03	ND
06/14/06	NA	NA	ND
09/22/06	4.38	12.05	ND

Sampling Date	DTW (feet)	Water Elevation (feet)	Total Lead
			5 (1)

Sampling Date	DTW (feet)	Water Elevation (feet)	Total Lead
			5 (1)

NOTES:

(1) = July 2007 Groundwater Quality Standard pursuant to N.J.A.C. 7:9C
TICs = Tentatively identified compounds
(#) = Number of TICs identified
DTW = Depth to water

NG = Not Gauged
NS = Not Sampled

State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
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401 East State Street
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BOB MARTIN
Commissioner

August 27, 2012

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

Re: Revised Baseline Ecological Evaluation Report, Dated May 2012, Fort Monmouth Main Post and Charles Wood Area
Fort Monmouth, New Jersey
PI G000000032

Dear Ms. Green:

The New Jersey Department of Environmental Protection (Department) has completed review of the referenced submittal. The revised Baseline Ecological Evaluation (BEE) submittal adequately addresses the comments and concerns previously noted. All exceedences have been sufficiently evaluated and addressed for ecological receptor considerations. It is agreed no additional ecological evaluation or assessment is necessary for the Main Post and Charles Wood Area.

Please contact this office if you have any questions.

Sincerely,

Linda S. Range

Linda S. Range
Bureau of Case Management

C: Joe Pearson, Calibre Systems
Rick Harrison, FMERA
Julie Carver, Matrix

DEPARTMENT OF THE ARMY

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

April 22, 2014

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

Subject: **State of New Jersey Department of Environmental Protection Comments on the Final Remedial Investigation/Feasibility Study Work Plan for Sites FTMM-22, FTMM-53, FTMM-59 and FTMM-68 Main Post & Charles Wood Area Fort Monmouth, New Jersey. PI G000000032**

Enclosure: **Letter from NJDEP date January 8, 2014, regarding response to comments for the RI/FS Work Plan for Sites FTMM-22, FTMM-53, FTMM-59 and FTMM-68**

Dear Ms. Range,

Fort Monmouth and Parsons have reviewed the New Jersey Department of Environmental Protection (NJDEP) comments on the Remedial Investigation / Feasibility Study Work Plan for Site FTMM-22, FTMM-53, FTMM-59, and FTMM-68 as documented in your letter dated January 8, 2014. Responses to your comments are provided below in the order in which they were presented in the comment letter. We trust these responses are sufficient to allow field work to be conducted on these Sites.

A. GENERAL COMMENT/STATEMENT:
The New Jersey Department of Environmental Protection (Department) has completed review of the referenced report, dated September 2013, received on October 22, 2013. The report was prepared by Parsons Government Services Inc. (Parsons), on behalf of the U.S. Anny Engineering and Support Center, Huntsville (USAESCH). As indicated in the report, activities are to be performed with the goal of Decision Document acceptance in compliance with the Comprehensive Environmental Response, Compensation, and Liability act (CERCLA), the National Contingency Plan (NCP), 40 CRF part 300 and "to the extent possible to meet the requirements of New Jersey Administrative Code (NJAC) 7:26E Technical Requirement for Site Remediation".
The work plan describes RI/FS activities to be performed at FTMM-22 (former CW-l Wastewater Treatment Lime Pit at Building 2700), FTMM-53 (Building 699/former gas station), FTMM-59 (Building 1122/former auto repair shop), and FTMM-68 (Building 700/former dry cleaners). The following comments and questions are offered:
A. RESPONSE: Acknowledged.

State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
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BOB MARTIN
Commissioner

July 3, 2014

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

Re: Final Baseline Groundwater Sampling Report (August 2013)
Remedial Investigation/Feasibility Study/Decision Documents
Fort Monmouth
Oceanport, Monmouth County
PI G000000032

Dear Ms. Green:

The New Jersey Department of Environmental Protection (Department) has completed review of the referenced report, dated March 2014, received on April 7, 2014. The report was prepared by Parsons Government Services Inc. (Parsons), in support of the Remedial Investigation (RI), Feasibility Study (FS), and Decision Documents project at Fort Monmouth.

A baseline ground water sampling event was conducted at 21 "sites" at the Fort Monmouth property in August 2013. The purpose of the sampling event was to re-establish baseline conditions following suspension of ground water sampling in late 2011, as well as to evaluate Fort Monmouth's long-term ground water sampling program, and the current analytical conditions of the ground water at each site. Sampling methodologies used included low-flow and passive diffusion bag samplers (PDBS). At four sites (FTMM-14, 18, 59, 68), only PDBS sampling was conducted. At three sites (FTMM-05, 22, 58) both low-flow and PDBS samples were obtained for comparison purposes. Fourteen (14) sites were only sampled using low-flow. The report states that PDBS concentrations were consistently biased somewhat low compared to the low-flow concentrations. The report concludes, however, that the PDBS results were still similar to the low-flow results and are considered representative of ground water conditions at the sites. Based on this conclusion, the report states that for future ground water sampling, PDBS will be used for all sites where volatile organic compounds (VOCs) are the sole contaminants of concern. Comments are presented below.

Section 3.1; Table 6; Appendices & associated Tables - *The "background concentrations" submitted in the 1995 Weston report were not accepted by the Department as representative of background conditions for Fort Monmouth. The study was not performed in accordance with Departmental protocol and is not a consideration in our evaluations/determinations. As indicated in Section 3.1, background concentrations are evaluated on a site by site basis.*

FTMM-02 Landfill

Historic sampling at this parcel indicated levels of VOCs above the Ground Water Quality Standard (GWQS); metals were previously determined to be reflective of naturally occurring conditions. The August 2013 sampling of wells using low-flow confirmed the continued exceedance of the GWQS for VOCs. The report recommends VOC sampling of wells M2MW03, M2MW11, M2MW21, M2MW22 and M2MW24 for two additional rounds using PDBS. Well M2MW10 will be monitored as a downgradient sentinel well. Although the proposal is acceptable, for wells in which the saturated screen length exceeds 10 feet, the deployment of multiple PDBS will be required. At any point where a decision is made to terminate ground water sampling at this site, confirmatory sampling using low-flow due to PDBS biasing low as compared to low-flow results at the Fort Monmouth site will be required.

FTMM-03 Landfill

Historic sampling at this parcel revealed GWQS exceedances of vinyl chloride and metals. The August 2013 sampling of wells using low-flow confirmed the continued exceedance of the GWQS for vinyl chloride in well 3MW07. Well 3MW02 was not sampled due to low water column and silty conditions, however, Table 4 of Appendix B recommends sampling of 3MW02 for VOCs and metals. The report attributes the presence of vinyl chloride to leaching of PVC piping from well 3MW07. A temporary well point investigation was conducted in 2009 to delineate the vinyl chloride, the results were non-detect, and abandonment of 3MW07 is recommended. The recommendations are acceptable. However, a figure presenting the locations and sampling results from the 2009 temporary well point investigation must be provided to the Department.

FTMM-04 Landfill

Historic sampling at this parcel revealed GWQS exceedances of various metals. The August 2013 sampling of wells using low-flow confirmed the continued exceedance of the GWQS for metals. The metals are attributed to background conditions, and cessation of ground water sampling is recommended. The recommendation is acceptable. Monitoring wells at this parcel shall be properly abandoned if they are no longer subject to sampling or gaging for water elevation data.

FTMM-05 Landfill

Historic sampling at this parcel revealed GWQS exceedances of PCE, TCE and vinyl chloride, which the August 2013 sampling, using low-flow and PDBS, confirmed. The report recommends annual VOC sampling of wells M5MW11, M5MW16, M5MW20 and M5MW23 using PDBS. The Department finds the proposal to be acceptable. At any point where a decision is made to terminate ground water sampling at this parcel, the Department will require confirmatory sampling using low-flow due to PDBS results at this parcel biased low compared to the low-flow results.

FTMM-08 Landfill

Historic sampling at this parcel revealed GWQS exceedances of pesticides, benzene, PCE and lead. The August 2013 sampling of wells using low-flow confirmed the exceedance of the GWQS for PCE and lead. The well with historic pesticide exceedances (697MW01) could not be located and was not sampled. The report recommends annual ground water sampling of well M8MW11 for VOCs and lead, M8MW12, 15, 16 and 24 for VOCs and M8MW17 and 21 for lead only. Monitoring well 697MW01 will be located and sampled for pesticides, lead and VOCs. The recommendation is acceptable.

FTMM-12 Landfill

Historic sampling at this parcel revealed GWQS exceedances of various metals, including arsenic and lead. Historic exceedances of metals except for lead are attributed to background quality. The August 2013 sampling was conducted for lead analysis only. Lead was not detected. The report recommends discontinuing ground water sampling at this parcel. The Department finds the recommendation to be acceptable. Monitoring wells at this parcel shall be properly abandoned if they are no longer subject to sampling or gaging for water elevation data.

FTMM-14 Landfill

Historic sampling at this parcel revealed no GWQS exceedances of VOCs. The August 2013 sampling of wells using PDBS confirmed that there was no exceedance of the GWQS. The report recommends discontinuing ground water sampling at this parcel. The Department finds the recommendation to be acceptable. Monitoring wells at this parcel shall be properly abandoned if they are no longer subject to sampling or gaging for water elevation data. The Department also notes that on Table 1, well M14MW19 is listed as having 10 feet of total screen length. However, the table also lists the saturated screen length as 13.35 feet. This discrepancy should be clarified.

FTMM-18 Landfill

Historic sampling at this parcel revealed GWQS exceedances of benzene and 1,2-DCA. The August 2013 sampling results of wells using PDBS showed the exceedance of the GWQS for 1,2-DCA in well M18MW22. Well M18MW23 could not be located and was not sampled. The report recommends annual ground water sampling using PDBS for M18MW22 and M18MW23 if it can be located. Every reasonable effort, such as reviewing the NJ State Plane Coordinates of the well, must be made to locate M18MW23. The use of M18MW22 as the sole monitoring well at this parcel will not be acceptable due to the vast difference in historical concentrations between M18MW22 and M18MW23. Historic 2011 benzene concentrations for M18MW23 were 775 ppb and 664 ppb while 2011 concentrations for M18MW22 were 1.81 ppb and 1.65 ppb. The Department cannot approve the use of PDBS sampling only for this parcel. Once M18MW23 is located, the Department can approve the use of both PDBS and low-flow sampling for comparison purposes.

FTMM-22 Former Wastewater Treatment Lime Pit

Historic sampling at this parcel revealed GWQS exceedances of TCE. The August 2013 sampling of wells using low-flow and PDBS confirmed the continued exceedance of the GWQS for TCE in ground water. The report recommends quarterly VOC sampling of wells CW1MW27, CW1MW29, CW1MW31 and CW1MW281 using PDBS. The Department finds the proposal to be acceptable. At any point where a decision is made to terminate ground water sampling at this parcel, the Department will require confirmatory sampling using low-flow due to PDBS results biasing low compared to low-flow results at the Fort Monmouth site.

FTMM-25 Landfill

Historic sampling at this parcel revealed GWQS exceedances of various metals. The August 2013 sampling of wells using low-flow confirmed the continued exceedance of the GWQS for metals. The metals are attributed to background conditions. The report recommends discontinuing ground water sampling at this parcel. The Department finds the recommendation to be acceptable. Monitoring wells at this parcel shall be properly abandoned if they are no longer subject to sampling or gaging for water elevation data.

FTMM-53 Building 699

Historic sampling at this parcel revealed GWQS exceedances of benzene, PCE, TCE, TBA, VOC TICs and lead. The August 2013 sampling of wells using low-flow showed the exceedance of the GWQS for benzene, xylenes, PCE, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene and VOC TICs. The report recommends quarterly VOC sampling of wells 699MW01, 699MW04, 699MW06, 699MW09, 699MW16, 699RW03, 699RW05 and 699RW11 using PDBS. The Department finds the proposal to be acceptable. For wells in which the saturated screen length exceeds 10 feet, the deployment of multiple PDBS will be required. At any point where a

decision is made to terminate ground water sampling at this parcel, the Department will require confirmatory sampling using low-flow due to PDBS biasing low compared to low-flow at the Fort Monmouth site.

FTMM-54 Building 296

Historic sampling at this parcel revealed GWQS exceedances of benzene, lead and arsenic. The metals are attributed to background conditions. The August 2013 sampling of wells using low-flow showed an exceedance of the GWQS for benzene. The report recommends annual VOC sampling of wells 269MW04 and 296MW06 using PDBS. The Department finds the proposal to be acceptable. For wells in which the saturated screen length exceeds 10 feet, the deployment of multiple PDBS will be required. At any point where a decision is made to terminate ground water sampling at this parcel, the Department will require confirmatory sampling using low-flow due to PDBS biasing low compared to low-flow at the Fort Monmouth site.

FTMM-55 Building 290

Historic sampling at this parcel revealed GWQS exceedances of arsenic and lead. The August 2013 sampling of wells using low-flow confirmed the continued exceedance of the GWQS for lead. The metals are attributed to background conditions. The report recommends discontinuing ground water sampling at this parcel. The Department finds the recommendation to be acceptable. Monitoring wells at this parcel shall be properly abandoned if they are no longer subject to sampling or gaging for water elevation data.

FTMM-56 Building 80

Historic sampling at this parcel revealed GWQS exceedances of chlordane, arsenic, lead and cadmium. The August 2013 sampling of wells was conducted for lead only using low-flow. There were no exceedances of lead. The report recommends one additional sampling round of well 80MW02 for chlordane and 80MW05 for lead. The Department finds the recommendation for well 80MW02 to be acceptable. The Department disagrees with the recommendation to sample well 80MW05 for lead only. The last low-flow sampling event in August 2011 had lead, arsenic and cadmium exceeding both the GWQS and background concentrations. Well 80MW05 shall be sampled during the next round for TAL metals.

FTMM-57 Building 108

Historic sampling at this parcel revealed GWQS exceedances of lead. In the August 2013 sampling event, there were no exceedances of lead in ground water. The report recommends two additional sampling rounds of well 108MW04 for lead. The Department finds the recommendation acceptable.

FTMM-58 Building 2567

Historic sampling at this parcel revealed GWQS exceedances of TBA in wells 2567MW01 and 2567MW03. The August 2013 sampling results using low-flow and PDBS were below the GWQS for TBA. The report recommends two annual sampling events for TBA analyses of wells 2567MW01 and 2567MW03 using low-flow. The Department finds the proposal to be acceptable.

FTMM-59 Building 1122

Historic sampling at this parcel revealed no GWQS exceedances for VOCs. The August 2013 sampling results of wells using PDBS showed no exceedance of VOCs. The text of the report recommends VOC sampling of well 1122MW07 for one additional sampling round to confirm the 2013 results because August 2013 was the first time this well was sampled. The Department finds the proposal to be acceptable. The Department also notes that there is a discrepancy between the recommendation in the text and the recommendation in Table 7. Table 7 recommends that sampling at this parcel be discontinued. Table 7 shall be amended to indicate well 1122MW07 will be sampled for VOCs using PDBS methodology.

FTMM-61 Building 283

Historic sampling at this parcel revealed GWQS exceedances of metals, benzene and VOC TICs in 283MW02. The August 2013 sampling of wells using low-flow for VOCs and lead showed no exceedances. The report recommends VOC sampling of well 283MW02 for one additional sampling round using PDBS methodology to confirm the 2013 results. The Department finds the proposal to be conditionally acceptable. If the saturated screen length exceeds 10 feet, the deployment of multiple PDBS will be required. If a decision is made to terminate ground water sampling at this parcel based on PDBS results, the Department will require confirmatory sampling using low-flow due to PDBS biasing low compared to low-flow at the Fort Monmouth site.

FTMM-64 Building 812

Historic sampling at this parcel revealed GWQS exceedances of benzene, vinyl chloride and metals. The August 2013 sampling of wells using low-flow for VOCs and lead showed no exceedances. The report recommends VOC sampling of well 812MW04 for one additional sampling round using PDBS methodology to confirm the 2013 results (however Section 5.0 recommends sampling be continued on an annual basis). The Department finds the proposal to be conditionally acceptable. If the saturated screen length exceeds 10 feet, the deployment of multiple PDBS will be required. If a decision is made to terminate ground water sampling at this

parcel based on PDBS results, the Department will require confirmatory sampling using low-flow due to PDBS biasing low compared to low-flow at the Fort Monmouth site.

FTMM-66 Building 886

Historic sampling at this parcel revealed GWQS exceedances of benzene, VOC TICs, arsenic and lead. The August 2013 sampling results from wells using low-flow showed the exceedance of the GWQS for SVOC TICs. The report recommends that sampling at this parcel be discontinued. The Department finds the recommendation unacceptable. Total SVOC TICs exceeded the GWQS of 500 ppb in wells 886RW01 and 886RW06. Ground water monitoring of wells 886RW01, 886RW06 and 886RW08 shall continue for SVOC+TICs using low-flow methodology.

FTMM-68 Building 700

There are no historic sampling results for this parcel. The August 2013 sampling results of wells using PDBS showed the exceedance of the GWQS for PCE, TCE, cis-1,2-DCE and vinyl chloride in wells 565MW01 and 565MW01D. The report recommends quarterly ground water sampling for VOC+TICs using PDBS for these 2 wells. The Department agrees with the recommendation of quarterly sampling, however, has concerns regarding the use of PDBS for long-term monitoring at this parcel. Unlike the other Fort Monmouth parcels, there are no historical ground water sampling data for comparison with the PDBS results. The DEP's Field Sampling Procedures Manual states that "the intended application of Passive Diffusion Bag Samplers (PDBS) is for long-term monitoring of volatile organic compounds (VOCs) in ground water at well-characterized sites." The Department would find long-term sampling of the wells using PDBS acceptable if low-flow sampling is conducted concurrently once or twice for comparison.

Finally, each of the above comments speak only to the ground water findings and recommendations included in the referenced submittal, rather than to the ground water at the entire site.

Please contact this office if you have any questions.

Sincerely,

Linda S. Range

Linda S. Range

C: Joe Pearson, Calibre
Rick Harrison, FMERA
Julie Carver, Matrix
Frank Barricelli
Daryl Clark, BGWPA

B. FTMM-22/CW-1 -Former Lime Pit at Building 2700

B1. COMMENT: *Chlorinated solvents remain of concern in this area. Although Section 1.8.1.4 reports data indicate the source has been entirely removed, the Department is not yet in agreement. The Department does agree with Section 3.1.3, which states "additional data regarding VOC concentrations in soil near the former lime pit should be collected because the historical data set is limited and dated." As indicated in the submittal, three borings are to be performed, along three edges of the pit, to a depth of 20'; two to three samples are to be collected from each. Although this is acceptable, additional sampling is recommended. There has been speculation source material remains located under/trapped by the lime pit's concrete slab base. Has consideration been given to accessing/evaluating beneath the base/slab itself via angled or horizontal sampling to allow for possible determination of same associated with this feature?*

B1. RESPONSE: The footprint of the former lime pit is 7x13 feet, which is not a large enough area to harbor a localized high-concentration area beneath the slab that has not also impacted the area immediately adjacent to the slab. Therefore, the borings completed in January 2014 in accordance with the work plan are sufficient to evaluate the subsurface for the following reasons, and no changes to the sampling strategy for this site are proposed:

(a) If dissolved-phase TCE migrated through the concrete bottom of the pit (which is approximately 10 feet below ground surface (bgs) and just beneath the water table present at approximately 8 feet bgs) then it would migrate laterally with the adjective groundwater flow beneath the pit and would have impacted soil concentrations adjacent to the pit;

(b) If pure-phase TCE migrated through the concrete bottom of the pit then it would continue to sink through the aquifer until an aquitard was encountered, followed by lateral movement along the top of the aquitard, causing it to be detectable in borings immediately adjacent to the pit. Based on a review of the existing data for the site, there is no evidence for a source of pure-phase TCE beneath or near the pit;

(c) Soil boring results adjacent to the three crossgradient/downgradient sides of the pit from January 2014 indicate low to non-detectable chlorinated VOC concentrations that do not exceed any applicable soil quality criteria. This highest TCE concentration detected in soil samples was 0.0022 mg/kg. Two samples from each boring were collected – just above the water table and just above the aquitard encountered at approximately 18 feet bgs; and

(d) Given the relatively small area of the pit, and all the existing soil and groundwater chemistry data from around the pit (including the 2014 data), the use of angled or horizontal borings is not needed to adequately characterize the area for the RI. In this instance, angled/horizontal borings would not provide significantly better coverage for the RI than that which is already provided by the borings immediately adjacent to the pit.

B2. COMMENT: *The location of the Former Lime Pit in relation to monitor wells as denoted on Figures 1.4 and 3.5 does not correspond to its location as denoted on Figures C-12 and C-13. Please clarify which figures are accurate.*

B2. RESPONSE: Based on review of historical documents, the Former CW1 Lime Pit is correctly located on the site maps in our work plan. Maps in some historical documents that show the former lime pit in a different location are incorrect. These maps in historical documents appear to show the location of the treatment system and incorrectly identify it as the former lime pit. Therefore, the location of the lime pit shown on the TCE isopleths maps in Appendix C of

the work plan (pages C-12 and C-13) is inaccurate. The work plan text will be revised to note this fact, and a note will be added to the legend of the Appendix C figures indicating that the location of the Former Lime Pit is incorrect.

B3. COMMENT: *Groundwater has been found to continue to exhibit elevated levels of several metals as well as TCE. The Department previously agreed the elevated levels of antimony, arsenic and lead found in groundwater at this area of concern were reflective of naturally occurring conditions, and required no further action for metals in the groundwater. TCE contamination remains documented in groundwater samples taken from wells MW-28, MW-29 and MW-281. The Army proposes to resample these wells for VOCs using low-flow purging and sampling methodology to assess current groundwater quality. Slug tests will also be performed on wells MW-29, MW-40, MW-281 and MW-291. The proposals are acceptable. Low flow purging and sampling must be consistent with the guidelines detailed in the Department's 2005 edition of the NJDEP Field Sampling Procedures Manual.*

B3. RESPONSE: Concur. Low flow sampling will comply with the 2005 edition of the NJDEP Field Sampling Procedures Manual.

B4. COMMENT: *It has recently been determined 1,4-dioxane is frequently found as a co-contaminant with trichloroethene (TCE). To address concerns regarding the possible presence of 1,4-dioxane, review of the groundwater analytical data previously generated is required. If 1,4-dioxane was not included in previous sampling efforts, evaluation for same must be included in future sampling episodes. The Interim Specific Ground Water Quality Standard is 10 ppb; any exceedences of same must be addressed.*

B4. RESPONSE: Historically 1,4-dioxane has not been included in the groundwater analysis. TCE was detected in site groundwater samples collected in January 2014. The maximum TCE concentration was 8.9 µg/L in groundwater from deep source area well CW1MW281. Therefore, 1,4-dioxane will be targeted for analysis in selected source area and downgradient wells (shallow and deep) during the next groundwater sampling event at the site.

C. <u>FTMM-53/Building 699 -Former Gasoline/Service Station</u>

C1. COMMENT: *Previous assessments performed in the area of this former gas station had identified elevated levels of volatile organics (benzene) and TPH in soil, but had not adequately defined the vertical extent of the contamination (Borings 3, 7, 10, 13, 14,46,47 & 48), nor the horizontal extent of the contamination to the north. The two borings proposed on the north side of Saltzman Avenue are acceptable for the necessary delineation of soil contamination in that direction, as are the three borings proposed beneath the canopy in the vicinity of the fueling islands (previously not specifically investigated).*

C1. RESPONSE: Concur.

C2. COMMENT: *As regarding the four proposed borings at areas previously noted as contaminated (Borings 2, 13, 14 & 47), it is agreed an assessment of current conditions in these locations is appropriate. The area of Boring 48, however, remains in question. Figure 3.6, which appears to represent certain pre-and post-injection soil sample results, does not provide the findings for the full vertical extent of the '00 sampling, reporting only to the 66-72" interval for both the March '00 and the corresponding May '01 post-sampling. It is not known if the May '01 sampling included intervals beyond that depth.*

C2. RESPONSE: Although pre-injection (enzyme-enhanced bioremediation [EEB]) soil sampling extended to 12 feet bgs, the May '01 post-injection soil sampling event only went to a depth of 66-72 inches. The EEB injection occurred between the ground surface and a depth of 3-

4 ft bgs because the objective was to more effectively remediate clayey soils observed at shallow depths that would not be effectively remediated by the planned SVE system.
No changes to the work plan are proposed based on this comment. The area of Boring 48 is addressed in the response to the next comment.

C3. COMMENT: *It is of interest, however, as in certain borings the March '00 results as shown on page C-17 indicate levels of contamination increased below that depth. For instance, in Boring 48, benzene was found at 110 ppm in the 66-72" interval in March '00, and at 260 ppm in the 138-141" interval. As it appears there is no correlating post-treatment value indicating completion of either vertical or horizontal delineation at Boring 48, contamination is considered to (horizontally) extend to Borings 49 & 52.*

C3. RESPONSE: Boring location 52 was non-detect for BTEX and TPH for the entire 12-ft length of the boring in 2000. Therefore, there is no reason to suspect that contamination has extended to that location. The work plan will be revised to add one new soil boring adjacent to former Boring 48 due to the detection of elevated contaminant concentrations at the completion depth of that boring (12 feet bgs). The objective of this boring will be to determine current magnitude and vertical extent of soil contamination at this location.
Review of the pre-EEB injection soil quality maps that depict soil sampling results down to 144 inches shows that BTEX contamination in soil to a depth of 12 ft bgs is bounded laterally on all sides except to the north, which our work plan addresses with two additional soil borings along Saltzman Avenue. These pre-injection borings were sufficiently deep to detect any smear zone contamination bordering the water table given a water table depth of approximately 9 feet bgs. Given that the lateral extent is bounded except to the north, the primary objective of the eight soil borings to be drilled in the previously-defined contaminated area south of Saltzman Avenue is to determine the current magnitude and vertical extent of contaminants in soil. Five of the borings (including the new one at Boring 48) are located in the areas that had relatively high BTEX concentrations during the 2000 and 2001 sampling events, and three are located in a previously uninvestigated area beneath the canopy to further delineate this area based on Geoprobe soil boring results obtained north and south of the canopy. The soil borings will be advanced through any fuel hydrocarbon smear zone bordering the water table, to a maximum depth of 20 feet bgs, thereby obtaining current vertical extent data. The combination of historical data collected by Versar in 2000 and 2001 and new data (geographically distributed and targeting previously identified higher concentration areas) collected per this work plan is expected to adequately define the current magnitude and lateral/vertical extent of concentrations exceeding NJDEP cleanup criteria.

C4. COMMENT: *The former waste oil tank post excavation samples indicated TPH remained at 6,090 ppm and 11,600 ppm. Although Section 1.8.2 of the submittal indicates no further sampling is proposed as part of this Remedial Investigation, it is not clear why delineation is considered adequate. Are results from the geoprobe effort noted on page C-18 being utilized for same? If so, please indicate which borings are considered proximate to the former tank.*

C4. RESPONSE: Geoprobe borings 38 and 39 were drilled near the former waste oil tank location in 2000. Boring 39 was drilled near the SW corner of the former tank excavation and boring 38 was drilled approximately 15-20 ft east of the excavation. Soil sample results for these two borings from the 2000 sampling event showed relatively low TPH concentrations ranging up to 252 mg/kg. The 2013 groundwater sample from MW12, installed within the UST excavation footprint, was non-detect for VOCs, and lead concentrations in groundwater from this well have

historically been less than the GWQS. Available data indicate that the elevated TPH concentrations detected during tank removal in 1992 were localized. The work plan will be revised to add one new soil boring at the location of former tank excavation sidewall sample SP-2, where the highest soil TPH concentration was detected in 1992 (11,600 mg/kg); this boring will allow current soil quality to be evaluated. The boring will be advanced through any fuel hydrocarbon smear zone bordering the water table, to a maximum potential depth of 20 feet bgs, the same as planned for the soil borings north of Building 699.

Neither the depth of the elevated TPH concentration detected during waste oil UST removal in 1992 nor the depth of the excavation were documented in the Weston (1993) tank removal report. It appears to have been an excavation sidewall sample. The report stated that there were no visual or flame ionization detector evidence of contamination during excavation. Three samples will be collected from the soil boring based on field observations of contamination and PID headspace screening. If there is no indication of contamination at the boring location, then samples will be collected from midway between the ground surface and the water table (approximately 4-5 feet bgs), just above the water table (approximately 7-9 feet bgs), and the bottom of the boring (15 feet bgs if there is no evidence of contamination at total depth, or up to 20 feet bgs if there is evidence of contamination at 15 ft). If there is field evidence of contamination, then one of the three samples will be collected from the most contaminated interval encountered based on field screening and the other two samples will be collected to determine the vertical extent of the contaminated interval. However, one of the three samples will be collected from just above the water table.

Soil samples will be analyzed for EPH. Based on EPH results one sample containing the highest concentration will also be analyzed for VOCs+TICS, SVOCs+TICS, PCBs, and TAL metals. The intent for the laboratory analyses is to be consistent with NJDEP's current analytical requirements for investigating waste oil tanks, recognizing that the new soil data will be combined with historical data collected under previous regulatory requirements to complete the RI.

C5. COMMENT: *The PCE and TCE detected in groundwater beneath the site are reported as suspected of being related to discharges from a former waste oil UST and/or from the former dry cleaners at adjacent site FTMM-68. The Army proposes to install two shallow wells to delineate the extent of the chlorinated VOCs. Groundwater samples will be analyzed for VOC+TICs and lead. The proposal is acceptable.*

C5. RESPONSE: Concur.

C6. COMMENT: *The Army states that "selected existing wells" will also be sampled for site-related contaminants. This proposal does not specify the name of the wells to be sampled or the basis for selecting the wells. Without same, the Department cannot comment on nor approve the work plan. Our April 5, 2013 letter specifically referenced monitoring well 699MW-3 as not having been sampled since 2007, though the '07 results exceeded the Ground Water quality Standards for benzene and VOC TICs; inclusion of same in the anticipated sampling, or an explanation for its omission is required.*

C6. RESPONSE: This text was referring to the August 2013 baseline groundwater sampling event that was performed at numerous sites across FTMM. At the time of work plan preparation the scope of that sampling event had not been finalized. The intent was to use the August 2013 sampling data for the RI to the extent practical. Fourteen wells at FTMM-53 (listed below) were sampled for VOCs and TICs in August 2013.

616MW01	699MW06	699MW16
699MW01	699MW08	699RW03
699MW02	699MW09	699RW05
699MW04	699MW12	699RW11
699MW05	699MW15	

Well 699MW03 (a.k.a. 699MW-3) was omitted from the groundwater sampling plan because this well was abandoned in 2007. However, adjacent well 699RW05 was sampled seven times from 2008-2010 and again in August 2013. The 2013 data are sufficient to characterize the current extent and magnitude of VOC contamination in groundwater; however, groundwater samples collected in 2013 were not analyzed for lead. Therefore, in addition to sampling of the two new downgradient wells as outlined in the RI/FS Work Plan, the work plan will be revised to add sampling of the four wells having volatile fuel hydrocarbon concentrations exceeding GWQS in August 2013 for total and dissolved lead during the RI. These wells include 699MW03, 699MW06, 699RW11, and 699RW03. Three of these wells (699MW06, 699RW03, and 699RW11) had total lead concentrations exceeding the GWQS in 2010.

C7. COMMENT: *Groundwater samples will be collected using low-flow purging and sampling methodology. Low flow sampling must be consistent with the guidelines detailed in the Department's 2005 edition of the NJDEP Field Sampling Procedures Manual.*

C7. RESPONSE: Concur. Groundwater sampling will comply with the 2005 edition of the NJDEP Field Sampling Procedures Manual.

C8. COMMENT: *As regarding concentrations of various metals found in groundwater throughout Fort Monmouth, the "maximum MP background concentrations" -referenced in Section 3.2.1.2.5 -as presented in the historic Weston report/s, was not accepted by the Department. Although it is possible elevated levels of certain metals are reflective of naturally occurring conditions and sample turbidity (and which determination has been made by the Department at certain areas of concern, as above), that decision is not applied to the entire site, but is made on an area of concern specific basis only.*

C8. RESPONSE: The determination of background metals will be made on an area-specific basis in the RI report to the extent that it is technically defensible given the available data. In addition, the work plan will be updated to support limiting groundwater metals analysis for FTMM-53 to lead.

C9. COMMENT: *Slug tests will be performed on wells 699RW-4 and 699RW-11. This proposal is acceptable.*

C9. RESPONSE: Concur.

D. <u>FTMM-59/Building 1122 -Former Vehicle Maintenance Shop</u>

D1. COMMENT: *Section 3.1.5 indicates the site has been adequately characterized and that the RI may be completed following some minor additional sampling. Previous comments from the Department concerning FTMM-59, however, do not appear to have been addressed. An August 27, 2008 letter from the Department outlined deficiencies in a 2005 RI report for this site. The Army provided a response to the Department letter in a Remedial Action Progress Report (RAPR) dated June 2010, however, the Army's response for certain of the comments indicated the Department's concerns would be addressed in a future RAPR. A subsequent RAPR for this*

site has not been received. The two main issues of concern noted in the August '08 letter are as follows:

(a) BEX contaminated soils were identified in the vicinity of the No. 2 fuel oil UST excavation. The Department requested delineation of the soil contamination as well as installation of a monitoring well within or hydraulically down gradient of the excavation to assess groundwater quality. See further comments regarding GW21, below.

(b) *Free product was identified in certain geoprobe samples. Additional information is necessary, including a figure showing the location of the impacted geoprobes and lateral extent of the product.*

Geoprobe boring GW21 (not shown on Figure 3.8 of the submittal, but noted in Appendix C on page C-32 -both the paper and electronic copy of which are almost illegible, page C-31 is only slightly more legible), located just north of Building 1122, exhibited levels of benzene, ethylbenzene and xylene above the residential and/or Default Impact to Ground Water Soil Screening Levels (Table 1) at 10' below grade. The submittal stipulates that as the exceedences are below the water table, they "do not require an additional investigation to meet the objectives of the RI/FS. Soil in this area was previously excavated to a depth of 8' ... " (the depth to groundwater). However, as per the Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil document, sampling below the groundwater table is appropriate to determine if exceedences to the Direct Contact Soil Remediation Standard are present, or if the source of the contamination (e.g. an underground storage tank) is/was located below the groundwater table. Based upon information submitted, delineation remains incomplete for this area of concern (AOC).

D1. RESPONSE: Concur. The delineation of this area of concern is incomplete. The original Geoprobe investigation report by Versar stated that free product had been observed but no specifics were provided regarding the location of the product except that it was estimated to be contained within an approximately 15-foot-long area based on TPHC results for soil and groundwater, and was not migrating toward Mill Creek. It is possible that free product was either observed or inferred at Geoprobe boring GW21 given that that was the only Geoprobe boring location where a groundwater sample was not collected and where a deeper soil sample from 10 ft bgs (below the water table and the 1995 excavation depth of 8 ft bgs) was collected for laboratory analysis. Three sumps were installed at unidentified locations 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. There is no evidence that recoverable free product remained at the site after 2004.

The elevated BEX concentrations detected in soil at Geoprobe boring GW21 indicate a volatile fuel such as gasoline, although there are no gasoline tanks at the site. A 1,500-gallon No. 2 Fuel Oil UST and associated piping were located in the vicinity, but post-removal soil sampling did not detect more than 117 mg/kg TPHC and no holes or potentially contaminated soils were observed during UST removal. A historical site map indicates waste storage (oil/antifreeze) in the northern portion of Bldg 1122 but there is no historical evidence of releases.

Two new primary soil borings will be added to the work plan to further evaluate the soil at and near former Geoprobe boring GW21, where benzene and xylene concentrations exceeding NJDEP RDCSRS were detected in soil below the water table and the 8-foot-bgs base of the 1995 soil excavation. One boring will be installed adjacent to GW21 to determine current contaminant

concentrations and their vertical extent in soil, and the other boring will be installed approximately 40 ft downgradient (to the north-northeast) near former Geoprobe boring GW23. Similar to FTMM-53, soil borings will be advanced to a minimum depth of 15 ft bgs, and to a maximum depth of 20 ft bgs if field screening indicates contamination at 15 ft bgs. Given that soil in this area was excavated to 8 ft bgs, a minimum of two soil samples will be collected from each boring below a depth of 8 ft, one from the most contaminated interval (assumed to be approximately 9-10 feet bgs) and a deeper sample at the bottom of the boring to determine vertical extent. Soil samples will not be collected above a depth of 8 ft unless field observations/screening indicate that contamination is present.

Given the potential for multiple sources of petroleum contamination in this area, soil samples will be analyzed for target analytes associated with leaded gasoline and No. 2 fuel oil (i.e., VOCs+TICs including 1,2-dibromoethane and 1,2-dichloroethane, lead, and EPH). Twenty-five percent of samples where EPH is detected over 1,000 mg/kg will also be analyzed for 2-methylnaphthalene and naphthalene. The intent for the laboratory analyses is to be consistent with NJDEP's current analytical requirements for investigating these types of petroleum, recognizing that the new soil data will be combined with historical data collected under previous regulatory requirements to complete the RI.

The new boring at GW21 will also be converted to a permanent monitoring well screened approximately 2 feet above and 8 feet below the water table. In addition, a groundwater grab sample will be collected from the downgradient boring. Groundwater from the new well and the downgradient grab sample will be analyzed for VOCs+TICs including 1,2-dibromoethene and 1,2-dichloroethane, and SVOCs+TICs.. The new well will also be checked for the presence of free product. If visual observation and field screening indicate the presence of soil contamination at either of the two primary soil borings, up to two optional soil borings will be advanced to assess lateral extent. The work plan will be revised to describe the additional investigation work described above. In addition, better quality historical figures that provide supporting information will be provided in Appendix C.

D2. COMMENT: *Service Bays #10 & 12 – elevated TPH -Section 1.8.3.4 (Hydraulic Lift Bay #12) references post excavation sample results above criteria, and Section 1.8.3.7 (Hydraulic Lift Bay #10) references TPHC to 21,619 ppm. Section 1.8.3.8 references sampling performed in March '10 which reportedly delineated contamination, however, it does not appear the locations or actual findings were included in the submittal. Although the Work Plan indicates the contamination "appears localized and additional soil sampling is not required during the RI to support the FS", insufficient information has been submitted to allow for comment (or support approval of adequate delineation).*

D2. RESPONSE: The information on the March 2010 sampling was unintentionally omitted from the work plan. Based on historical sampling results it appears that the contamination is localized and additional soil sampling during the RI is not required to support the risk assessment and FS. The supporting information will be added to the Final Work Plan.

D3. COMMENT: *Chemical Storage & Paint Booth Sheds – Elevated levels of SVOCs/PAHs, and lead have been found in the surface soil adjacent to the sheds. Vanadium has been found in shallow and deeper intervals. The sampling proposed for delineation of the PAH exceedences is acceptable. The vanadium, found to 82.1 ppm, is "not believed to be site-related". Although this may be accurate, the referenced maximum background concentration at FTMM of 94 as per the '95 Weston report was never accepted by the Department as establishing*

"background" concentrations for the site. Further information in support of the assertion vanadium is representative of naturally occurring conditions is necessary.

D3. RESPONSE: Further information in support of the assertion that vanadium is representative of naturally occurring conditions is summarized below, and will be added to the work plan.

- The elevated concentrations of vanadium (79-82 mg/kg) that slightly exceeded the residential DCSRS were detected in three soil samples collected at a depth of 60-72 inches bgs at the sheds. Vanadium concentrations in near-surface soil samples (0-6 inches) at the sheds were much lower (11.7-17.2 mg/kg). Chemical releases from these sheds would be expected to have occurred at the ground surface, and contaminant concentrations in near surface soil should be higher than at 5-6 feet bgs (as is evidenced by PAH and lead concentrations which are higher near the ground surface than at depth), especially given the typical limited mobility of metals in soil.
- In addition to the Weston (1995) maximum background concentration, the 2001 New Jersey Geological Survey Investigation Report *Baseline Concentrations of Arsenic, Beryllium and Associated Elements in Glauconite and Glauconitic Soils in the New Jersey Coastal Plain* presents background concentrations for vanadium in soil that are greater than 82 mg/kg (and in some cases substantially greater). For example, 14 samples of whole soils from five glauconite-rich soil series were analyzed for total metals, and vanadium concentrations in all 14 samples exceeded the NJDEP RDCSRS, with concentrations ranging from 81 to 411 mg/kg. The Weston and NJGS reports support the occurrence of naturally occurring concentrations of vanadium exceeding the RDCSRS in soils similar to those present at the facility.

Based on the above information, the work plan will not be modified to include further investigation of metals in the area of the chemical storage and paint booth sheds (above and beyond what is already proposed to fill other data gaps).

D4. COMMENT: *The Army proposes the collection of groundwater samples from two recently installed monitoring wells near the Chemical Storage Shed and Paint Booth/Shed. The document indicates the specific locations of these two wells is currently unknown, and is to be determined during a subsequent site visit. Comments regarding the locations of the wells are therefore pending.*

D4. RESPONSE: During the most recent sampling (August 2013), monitoring well 1122MW07 was located off the northeast corner of shed 1 and it was sampled as part of the baseline monitoring event. The second well was not located during that sampling round. The work plan will be modified to include the sampling of 1122MW07 and a more in-depth field search for the missing groundwater well.

D5. COMMENT: *Additionally, the Department's August 13, 2013 letter responding to the March 2013 Sampling and Analysis Plan for Remedial Investigation/Feasibility Study/Decision Documents indicated further concerns remained relative to this parcel.*

(a) Questions regarding adequate investigation of the floor drains, hydraulic lifts and two oil water separators in the area of Building 1122 have not yet been resolved. Delineation requirements are therefore not resolved.

(b) Although the monitor well analytical results did not trigger an evaluation of the vapor intrusion (VI) pathway during the recent VI evaluation, data reported in the July '08 Site Investigation (SI) Report (Section 3.9) indicated elevated levels of TCE in subslab soil gas analytical results, which itself is a trigger for further VI evaluation as it may indicate

levels of contamination of concern in the area soils or possibly beneath the building. Additional evaluation is necessary. This may include soil sampling to evaluate current soil conditions in the immediate area and/or additional vapor intrusion investigation, as was recommended in the July '08 SI Report.

(c) *To address concerns regarding the possible presence of l,4-dioxane, frequently found as a co-contaminant with trichloroethene (TCE), a review of the groundwater analytical data previously generated is required. If 1,4-diozane was not included in previous sampling efforts, evaluation for same must be included in future sampling episodes. The Interim Specific Ground Water Quality Standard is 10 ppb; any exceedences must be addressed.*

D5. RESPONSE:

(a) All areas that have been impacted by documented or suspected releases have been investigated to some degree. Based on the response to the comment above concerning service bays #10 and #12 we believe there is sufficient information to support no further soil sampling necessary during the RI. Additional supporting historical findings will be added to the work plan and subsequent RI to support no further investigation in this area.

(b) Two subslab soil samples were collected beneath the eastern half of Bldg 1122 in December 2007, near the northern wall. The sample locations were biased to the northeast corner of the building due to historical detections of PCE in groundwater north and northeast of the building. Because this facility was utilized for auto repair, sub-slab soil gas was selected for analysis in lieu of indoor air (IA), presumably due to the potential for facility activities and operations to bias indoor air sample results. PCE and TCE concentrations ranged from 135 to 285 $\mu g/m^3$ and 44 to 763 $\mu g/m^3$, respectively. The current NJDEP soil gas screening levels (SGSLs) for PCE are 470 $\mu g/m^3$ (residential) and 2,400 $\mu g/m^3$ (non-residential). Screening levels for TCE are 27 $\mu g/m^3$ (residential) and 150 $\mu g/m^3$ (non-residential). Therefore, TCE in one of the sub-slab soil gas samples exceeded the non-residential SGSL. In addition, a near-slab soil gas sample collected just north of the building near one of the sub-slab sample locations contained 1,130 $\mu g/m^3$ TCE, which also exceeds the non-residential SGSL.

The work plan will be revised to include collection of three sub-slab soil gas samples for VOC analysis to determine the current sub-slab soil gas conditions. One sample will be collected at the location of the 2007 exceedance of the SGSL for TCE (at the NE corner of the building). A second sample will be collected approximately 30 ft west of the initial sample, midway between the two 2007 sub-slab sample locations. A third sample will be collected approximately 25 ft southwest of the initial sample, approximately midway between the north and south edges of the building. If VOC concentrations in these samples do not exceed SGSLs then no additional VI evaluation will be recommended. If SGSL exceedances are detected, then IA sampling will be performed.

(c) Historically 1,4-dioxane has not been included in the groundwater analysis. This compound will be targeted for analysis during the next groundwater sampling event at the site.

D6. COMMENT: *Due to the unanswered concerns of the Department, approval of the RI proposal cannot be granted at this time.*

D6. RESPONSE: Acknowledged.

E. <u>FTMM-68/Building 700 -Former Dry Cleaners</u>

E1. COMMENT: *A leaking solvent UST was previously located outside the southwest corner of Building 700. Although 450 drums of impacted water and soil were excavated during tank removal, post excavation sampling indicated the excavation bottom (7.5') exhibited 23,889 ppm PCE in the Spring of '11, while a sidewall sample exhibited 20.4 ppm (Section 1.8.4.1 line 15 states the exceedence is on the western sidewall, while the sketch in Appendix C-5 shows the exceedence on the eastern sidewall; please clarify). Piping run sampling analytical results were unavailable. The Army proposes to collect up to 15 soil samples from up to five soil borings located near the former UST and piping run, as well as groundwater samples from two wells reportedly located in the southwest comer; analyses will include VOC+ TICs. Six direct push points will be installed downgradient of Building 700 and grab groundwater samples will be analyzed for VOCs. Based on sampling results from the monitoring wells and the push points, up to 6 additional direct push points will be installed to further define the horizontal and vertical extent of the chlorinated VOCs. Results from the groundwater sampling will be utilized to determine placement of up to four monitoring wells which will be sampled for VOC+TICs. The proposal is acceptable.*

E1. RESPONSE: Concur. One point of clarification: the PCE concentration of 20.4 ppm was collected from sample 565F which was depicted as a piping sample in the northeast corner of the excavation. The text in Section 1.8.4.1 will be revised to indicate the northeast corner near the piping.

E2. COMMENT: *Slug tests will be performed on two shallow monitoring wells and two deep monitoring wells. This is acceptable.*

E2. RESPONSE: Concur.

E3. COMMENT: *The proposal indicates groundwater samples obtained from monitoring wells will be collected using low-flow purging and sampling methodology. Low flow sampling must be consistent with the guidelines detailed in the Department's 2005 edition of the NJDEP Field Sampling Procedures Manual.*

E3. RESPONSE: Concur. Low flow sampling will comply with the 2005 NJDEP Field Sampling Procedures Manual.

F. <u>Miscellaneous</u>

F1. COMMENT: *It was unclear in some instances that the intended sampling interval was to be in the standard 6" increments. Although this is likely understood, please ensure sampling increments are in accordance with standard protocol, with an explanation provided if more or less than a six-inch increment is sampled because of poor sample recovery or other field logistical problems.*

F1. RESPONSE: The intended sampling interval will be the standard 6" increments. If sample recovery is poor an explanation will be recorded in the field and included in the sampling report. The Field Sampling Plan (FSP) will be revised as needed to reflect this directive.

F2. COMMENT: *As indicated above, the scale and/or clarity of the maps was at times problematic, in both the paper as well as the electronic version. Although this applies to several of the maps, predominantly those of Appendix C, it particularly may be said of the maps/figures included in Appendix C as pages C-31 and 32. These were of insufficient clarity to withstand enlargement electronically, and insufficient scale to be legible on the paper version, and could therefore not be properly evaluated or considered.*

F2. RESPONSE: Electronic copies of the historical documents are now available and will be used for the RI/FS Reports for each Site. The quality of maps and tables provided in

Appendix C of the work plan will be improved as needed and to the extent possible to make them more functional.

F3. COMMENT: *As indicated above, "background" levels of metals, or the determination that elevated levels of specific metals are reflective of naturally occurring conditions, are to be made on an area specific basis. Those areas at which that determination has previously been made have been issued a formal letter including a statement of same.*

F3. RESPONSE: The determination of background metals will be made on an area-specific basis in the RI report to the extent that it is technically defensible given the available data. In addition, the work plan will be updated to support the scope of metals analysis proposed.

F4. COMMENT: *Section 3.2.1.3.1 – line 36 - a typo appears to have inadvertently listed FTMM-59 as FTMM-53.*

F4. RESPONSE: Concur. The reference has been changed to FTMM-59.

F5. COMMENT: *Figure 3.4 – Preliminary Conceptual Site Model Diagram for FTMM-68, appears to have inadvertently used "Former Lime Pit" in the primary source box, rather than FTMM-68's former dry cleaning operations.*

F5. RESPONSE: Concur. The Preliminary Conceptual Site Model Diagram has been modified to list the primary source as the Former Dry Cleaning Operations.

Please contact me at (732) 380-7064 or by email at wanda.s.green2.civ@mail.mil, if you have any questions.

Regards,

Wanda Green

Wanda Green
BRAC Environmental Coordinator
OACSIM – U.S. Army Fort Monmouth

Encl

C: Joe Pearson, Calibre Systems
Rich Harrison, FMERA
Julie Carver, Matrix

State of New Jersey

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Governor

KIM GUADAGNO
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BOB MARTIN
Commissioner

January 8, 2014

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

Re: Remedial Investigation/Feasibility Study Work Plan for Sites FTMM-22, FTMM-53, FTMM-59 and FTMM-68
Main Post & Charles Wood Area
Fort Monmouth, New Jersey
PI G000000032

Dear Ms. Green:

The New Jersey Department of Environmental Protection (Department) has completed review of the referenced report, dated September 2013, received on October 22, 2013. The report was prepared by Parsons Government Services Inc. (Parsons), on behalf of the U.S. Army Engineering and Support Center, Huntsville (USAESCH). As indicated in the report, activities are to be performed with the goal of Decision Document acceptance in compliance with the Comprehensive Environmental Response, Compensation, and Liability act (CERCLA), the National Contingency Plan (NCP), 40 CRF part 300 and "to the extent possible to meet the requirements of New Jersey Administrative Code (NJAC) 7:26E Technical Requirement for Site Remediation".

The work plan describes RI/FS activities to be performed at FTMM-22 (former CW-1 Wastewater Treatment Lime Pit at Building 2700), FTMM-53 (Building 699/former gas station), FTMM-59 (Building 1122/former auto repair shop), and FTMM-68 (Building 700/former dry cleaners). The following comments and questions are offered:

FTMM-22/CW-1 – Former Lime Pit at Building 2700

Chlorinated solvents remain of concern in this area. Although Section 1.8.1.4 reports data indicate the source has been entirely removed, the Department is not yet in agreement. The

Department does agree with Section 3.1.3, which states "additional data regarding VOC concentrations in soil near the former lime pit should be collected because the historical data set is limited and dated." As indicated in the submittal, three borings are to be performed, along three edges of the pit, to a depth of 20'; two to three samples are to be collected from each. Although this is acceptable, additional sampling is recommended. There has been speculation source material remains located under/trapped by the lime pit's concrete slab base. Has consideration been given to accessing/evaluating beneath the base/slab itself via angled or horizontal sampling to allow for possible determination of same associated with this feature?

The location of the Former Lime Pit in relation to monitor wells as denoted on Figures 1.4 and 3.5 does not correspond to its location as denoted on Figures C-12 and C-13. Please clarify which figures are accurate.

Ground water has been found to continue to exhibit elevated levels of several metals as well as TCE. The Department previously agreed the elevated levels of antimony, arsenic and lead found in ground water at this area of concern were reflective of naturally occurring conditions, and required no further action for metals in the ground water. TCE contamination remains documented in ground water samples taken from wells MW-28, MW-29 and MW-281. The Army proposes to resample these wells for VOCs using low-flow purging and sampling methodology to assess current ground water quality. Slug tests will also be performed on wells MW-29, MW-40, MW-281 and MW-291. The proposals are acceptable. Low flow purging and sampling must be consistent with the guidelines detailed in the Department's 2005 edition of the NJDEP Field Sampling Procedures Manual.

It has recently been determined 1,4-dioxane is frequently found as a co-contaminant with trichloroethene (TCE). To address concerns regarding the possible presence of 1,4-dioxane, review of the ground water analytical data previously generated is required. If 1,4-dioxane was not included in previous sampling efforts, evaluation for same must be included in future sampling episodes. The Interim Specific Ground Water Quality Standard is 10 ppb; any exceedences of same must be addressed.

FTMM-53/Building 699 – Former Gasoline/Service Station

Previous assessments performed in the area of this former gas station had identified elevated levels of volatile organics (benzene) and TPH in soil, but had not adequately defined the vertical extent of the contamination (Borings 3, 7, 10, 13, 14, 46, 47 & 48), nor the horizontal extent of the contamination to the north. The two borings proposed on the north side of Saltzman Avenue are acceptable for the necessary delineation of soil contamination in that direction, as are the three borings proposed beneath the canopy in the vicinity of the fueling islands (previously not specifically investigated).

As regarding the four proposed borings at areas previously noted as contaminated (Borings 2, 13, 14 & 47), it is agreed an assessment of current conditions in these locations is appropriate. The area of Boring 48, however, remains in question. Figure 3.6, which appears to represent certain pre-and post-injection soil sample results, does not provide the findings for the full vertical

extent of the '00 sampling, reporting only to the 66-72" interval for both the March '00 and the corresponding May '01 post-sampling. It is not known if the May '01 sampling included intervals beyond that depth. It is of interest, however, as in certain borings the March '00 results as shown on page C-17 indicate levels of contamination increased below that depth. For instance, in Boring 48, benzene was found at 110 ppm in the 66-72" interval in March '00, and at 260 ppm in the 138-141" interval. As it appears there is no correlating post-treatment value indicating completion of either vertical or horizontal delineation at Boring 48, contamination is considered to (horizontally) extend to Borings 49 & 52.

The former waste oil tank post excavation samples indicated TPH remained at 6,090 ppm and 11,600 ppm. Although Section 1.8.2 of the submittal indicates no further sampling is proposed as part of this Remedial Investigation, it is not clear why delineation is considered adequate. Are results from the geoprobe effort noted on page C-18 being utilized for same? If so, please indicate which borings are considered proximate to the former tank.

The PCE and TCE detected in ground water beneath the site are reported as suspected of being related to discharges from a former waste oil UST and/or from the former dry cleaners at adjacent site FTMM-68. The Army proposes to install two shallow wells to delineate the extent of the chlorinated VOCs. Ground water samples will be analyzed for VOC+TICs and lead. The proposal is acceptable.

The Army states that "selected existing wells" will also be sampled for site-related contaminants. This proposal does not specify the name of the wells to be sampled or the basis for selecting the wells. Without same, the Department cannot comment on nor approve the work plan. Our April 5, 2013 letter specifically referenced monitoring well 699MW-3 as not having been sampled since 2007, though the '07 results exceeded the Ground Water quality Standards for benzene and VOC TICs; inclusion of same in the anticipated sampling, or an explanation for its omission is required.

Ground water samples will be collected using low-flow purging and sampling methodology. Low flow sampling must be consistent with the guidelines detailed in the Department's 2005 edition of the NJDEP Field Sampling Procedures Manual.

As regarding concentrations of various metals found in ground water throughout Fort Monmouth, the "maximum MP background concentrations" – referenced in Section 3.2.1.2.5 – as presented in the historic Weston report/s, was not accepted by the Department. Although it is possible elevated levels of certain metals are reflective of naturally occurring conditions and sample turbidity (and which determination has been made by the Department at certain areas of concern, as above), that decision is not applied to the entire site, but is made on an area of concern specific basis only.

Slug tests will be performed on wells 699RW-4 and 699RW-11. This proposal is acceptable.

FTMM-59/Building 1122 – Former Vehicle Maintenance Shop

Section 3.1.5 indicates the site has been adequately characterized and that the RI may be completed following some minor additional sampling. Previous comments from the Department concerning FTMM-59, however, do not appear to have been addressed. An August 27, 2008 letter from the Department outlined deficiencies in a 2005 RI report for this site. The Army provided a response to the Department letter in a Remedial Action Progress Report (RAPR) dated June 2010, however, the Army's response for certain of the comments indicated the Department's concerns would be addressed in a future RAPR. A subsequent RAPR for this site has not been received. The two main issues of concern noted in the August '08 letter are as follows:

(a) BEX contaminated soils were identified in the vicinity of the No. 2 fuel oil UST excavation. The Department requested delineation of the soil contamination as well as installation of a monitoring well within or hydraulically downgradient of the excavation to assess ground water quality. See further comments regarding GW21, below.

(b) Free product was identified in certain geoprobe samples. Additional information is necessary, including a figure showing the location of the impacted geoprobes and lateral extent of the product.

Geoprobe boring GW21 (not shown on Figure 3.8 of the submittal, but noted in Appendix C on page C-32 – both the paper and electronic copy of which are almost illegible, page C-31 is only slightly more legible), located just north of Building 1122, exhibited levels of benzene, ethylbenzene and xylene above the residential and/or Default Impact to Ground Water Soil Screening Levels (Table 1) at 10' below grade. The submittal stipulates that as the exceedences are below the water table, they "do not require an additional investigation to meet the objectives of the RI/FS. Soil in this area was previously excavated to a depth of 8'…" (the depth to ground water). However, as per the *Technical Guidance for Site Investigation of Soil, Remedial Investigation of Soil, and Remedial Action Verification Sampling for Soil* document, sampling below the ground water table is appropriate to determine if exceedences to the Direct Contact Soil Remediation Standard are present, or if the source of the contamination (e.g. an underground storage tank) is/was located below the ground water table. Based upon information submitted, delineation remains incomplete for this area of concern (AOC).

Service Bays #10 & 12 – elevated TPH – Section 1.8.3.4 (Hydraulic Lift Bay #12) references post excavation sample results above criteria, and Section 1.8.3.7 (Hydraulic Lift Bay #10) references TPHC to 21,619 ppm. Section 1.8.3.8 references sampling performed in March '10 which reportedly delineated contamination, however, it does not appear the locations or actual findings were included in the submittal. Although the Work Plan indicates the contamination "appears localized and additional soil sampling is not required during the RI to support the FS", insufficient information has been submitted to allow for comment (or support approval of adequate delineation).

Chemical Storage & Paint Booth Sheds – Elevated levels of SVOCs/PAHs, and lead have been found in the surface soil adjacent to the sheds. Vanadium has been found in shallow and deeper

intervals. The sampling proposed for delineation of the PAH exceedences is acceptable. The vanadium, found to 82.1 ppm, is "not believed to be site-related". Although this may be accurate, the referenced maximum background concentration at FTMM of 94 as per the '95 Weston report was never accepted by the Department as establishing "background" concentrations for the site. Further information in support of the assertion vanadium is representative of naturally occurring conditions is necessary.

The Army proposes the collection of ground water samples from two recently installed monitoring wells near the Chemical Storage Shed and Paint Booth/Shed. The document indicates the specific locations of these two wells is currently unknown, and is to be determined during a subsequent site visit. Comments regarding the locations of the wells are therefore pending.

Additionally, the Department's August 13, 2013 letter responding to the March 2013 Sampling and Analysis Plan for Remedial Investigation/Feasibility Study/Decision Documents indicated further concerns remained relative to this parcel.

(a) Questions regarding adequate investigation of the floor drains, hydraulic lifts and two oil water separators in the area of Building 1122 have not yet been resolved. Delineation requirements are therefore not resolved.

(b) Although the monitor well analytical results did not trigger an evaluation of the vapor intrusion (VI) pathway during the recent VI evaluation, data reported in the July '08 Site Investigation (SI) Report (Section 3.9) indicated elevated levels of TCE in subslab soil gas analytical results, which itself is a trigger for further VI evaluation as it may indicate levels of contamination of concern in the area soils or possibly beneath the building. Additional evaluation is necessary. This may include soil sampling to evaluate current soil conditions in the immediate area and/or additional vapor intrusion investigation, as was recommended in the July '08 SI Report.

(c) To address concerns regarding the possible presence of 1,4-dioxane, frequently found as a co-contaminant with trichloroethene (TCE), a review of the ground water analytical data previously generated is required. If 1,4-diozane was not included in previous sampling efforts, evaluation for same must be included in future sampling episodes. The Interim Specific Ground Water Quality Standard is 10 ppb; any exceedences must be addressed.

Due to the unanswered concerns of the Department, approval of the RI proposal cannot be granted at this time.

FTMM-68/Building 700 – Former Dry Cleaners

A leaking solvent UST was previously located outside the southwest corner of Building 700. Although 450 drums of impacted water and soil were excavated during tank removal, post excavation sampling indicated the excavation bottom (7.5') exhibited 23,889 ppm PCE in the Spring of '11, while a sidewall sample exhibited 20.4 ppm (Section 1.8.4.1 line 15 states the exceedence is on the western sidewall, while the sketch in Appendix C-5 shows the exceedence on the eastern sidewall; please clarify). Piping run sampling analytical results were unavailable.

The Army proposes to collect up to 15 soil samples from up to five soil borings located near the former UST and piping run, as well as ground water samples from two wells reportedly located in the southwest corner; analyses will include VOC+TICs. Six direct push points will be installed downgradient of Building 700 and grab ground water samples will be analyzed for VOCs. Based on sampling results from the monitoring wells and the push points, up to 6 additional direct push points will be installed to further define the horizontal and vertical extent of the chlorinated VOCs. Results from the ground water sampling will be utilized to determine placement of up to four monitoring wells which will be sampled for VOC+TICs. The proposal is acceptable.

Slug tests will be performed on two shallow monitoring wells and two deep monitoring wells. This is acceptable.

The proposal indicates ground water samples obtained from monitoring wells will be collected using low-flow purging and sampling methodology. Low flow sampling must be consistent with the guidelines detailed in the Department's 2005 edition of the NJDEP Field Sampling Procedures Manual.

Miscellaneous

It was unclear in some instances that the intended sampling interval was to be in the standard 6" increments. Although this is likely understood, please ensure sampling increments are in accordance with standard protocol, with an explanation provided if more or less than a six-inch increment is sampled because of poor sample recovery or other field logistical problems.

As indicated above, the scale and/or clarity of the maps was at times problematic, in both the paper as well as the electronic version. Although this applies to several of the maps, predominantly those of Appendix C, it particularly may be said of the maps/figures included in Appendix C as pages C-31 and 32. These were of insufficient clarity to withstand enlargement electronically, and insufficient scale to be legible on the paper version, and could therefore not be properly evaluated or considered.

As indicated above, "background" levels of metals, or the determination that elevated levels of specific metals are reflective of naturally occurring conditions, are to be made on an area specific basis. Those areas at which that determination has previously been made have been issued a formal letter including a statement of same.

Section 3.2.1.3.1 – line 36 – a typo appears to have inadvertently listed FTMM-59 as FTMM-53.

Figure 3.4 – Preliminary Conceptual Site Model Diagram for FTMM-68, appears to have inadvertently used "Former Lime Pit" in the primary source box, rather than FTMM-68's former dry cleaning operations.

Please contact this office if you have any questions.

Sincerely,

Linda S. Range
Bureau of Case Management

C: Joe Pearson, Calibre Systems
Rich Harrsion, FMERA
Julie Carver, Matrix

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BOB MARTIN
Commissioner

February 5, 2015

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

Approval

Re: *November 26, 2014 Response to Comments –on the Final Baseline Ground Water Sampling Report (August 2013)*
Fort Monmouth
Monmouth County
PI # G000000032
Activity Number: RPC000001

Dear Ms. Green:

The New Jersey Department of Environmental Protection (Department) has completed a review of the referenced Response to Comments dated November 26, 2014, submitted in response to the Department's comment letter dated July 3, 2014 regarding the Final Baseline Ground Water Sampling Report.

The *Response to Comments* agrees with or acknowledges the Department's comments for areas FTMM-03, FTMM-04, FTMM-05, FTMM-08, FTMM-12, FTMM-14, FTMM-22, FTMM-25, FTMM-53, FTMM-54, FTMM-55, FTMM-56, FTMM-57, FTMM-58, FTMM-59, FTMM-61, FTMM-64, and FTMM-66.

FTMM-18
The Department had indicated low-flow sampling must also be performed if Passive Diffusion Bag Sampling (PDBS) is conducted, for comparison purposes. The *Response to Comments* submittal contends as low-flow sampling has been historically conducted at this area, PDBS sampling only is appropriate. Based upon this reasoning, the Department agrees the performance via PDBS only is acceptable for the ensuing round of ground water sampling. The PDBS results are to be compared to the previous low-flow sampling results and presented in the forthcoming sampling report.

FTMM-68
The Department had expressed concern regarding the use of PDBS for long-term monitoring. FTMM-68 has not been fully characterized, and the use of PDBS for longer term monitoring is acceptable only for well characterized sites, as per the DEP's Field Sampling Procedures

Manual. As per information provided in the *Response to Comments* submittal, a Remedial Investigation to fully characterize the area is to be conducted in the near future using low-flow sampling methodology, and request approval for the use of PDBS to characterize contaminant concentrations in the interim. This is acceptable based on the stipulation that a full remedial investigation is to be performed. The November '14 *Response to Comments* (Section V), however, indicated the Remedial Investigation Workplan for FTMM-68 was awaiting DEP approval. Although some clarification was requested, the proposed remedial activities, soil and ground water, were approved for the FTMM-68 area via letter dated *January 8, 2014*, which addressed the RI/FS Workplan for FTMM-22, FTMM-53, FTMM-59 & FTMM-68.

If you have any questions, please contact me at (609)984-6606, or via email at Linda.Range@dep.nj.gov.

Sincerely,

Linda Range

Linda Range
Bureau of Case Management

cc: Joe Pearson, Calibre
Rick Harrison, FMERA
Joe Fallon, FMERA
Frank Barricelli, RAB

State of New Jersey

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BOB MARTIN
Commissioner

March 16, 2016

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

Re: *Temporary Suspension of Long Term Monitoring Program for Ground Water at Sites FTMM-22, FTMM-53, FTMM-59 and FTMM-68,* dated *February 18, 2016*
Fort Monmouth
Oceanport, Monmouth County
PI G000000032

Dear Mr. Colvin:

The New Jersey Department of Environmental Protection (NJDEP) has completed review of the referenced submittal. The Army submitted an RI/FS Work Plan for sites FTMM-22, FTMM-53, FTMM-59 and FTMM-68 in September 2013. The work plan, approved by the Department in correspondence dated January 8, 2014, proposed ground water investigations to characterize and delineate ground water contamination for each individual site. It is agreed the proposal to temporarily suspend long-term monitoring while the RI/FS work is completed is appropriate. A revised Long Term Monitoring Program is to be reinstated once the RI/FS process in completed.

Please contact this office if you have any questions.

Sincerely,

Linda S. Range

Linda S. Range

C: Joe Pearson, Calibre
Rick Harrison, FMERA
Joe Fallon, FMERA
James Moore, USACE
Cris Grill, Parsons,
Frank Barricelli, RAB
Daryl Clark, BGWPA

United States Army
Fort Monmouth, New Jersey

BACKGROUND METALS EVALUATION

U.S. Army Garrison Fort Monmouth, Main Post
Fort Monmouth, New Jersey

Prepared by

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Brinkerhoff Project No. 09BR116

May 2011

Fort Monmouth Reuse and Redevelopment Plan
Final Plan

Prepared for:
Fort Monmouth Economic Revitalization Planning Authority

Prepared by:
EDAW, Inc.

22 August, 2008

(Incorporates Technical Corrections Adopted by FMERPA Board on October 15, 2008)

August 22, 2008

Mr. Frank C. Cosentino, Executive Director
Fort Monmouth Economic Revitalization Planning Authority
2-12 Corbett Way, Suite C
Eatontown, New Jersey 07724

Dear Mr. Cosentino,

On April 28, 2006 the Fort Monmouth Economic Revitalization Planning Authority (FMERPA) was formed to develop a reuse and redevelopment plan that meets State, Monmouth County, community, societal, and land owner needs and create a flexible framework for sustainable redevelopment of the post. During the ensuing months, FMERPA and its consulting team has coalesced the Reuse Plan around a vision for a Sustainable Technology Community at Fort Monmouth.

The vision presented herein first and foremost sets a framework for the attraction of technology driven companies that will provide the greatest opportunity for the replacement of highly skilled jobs left behind by the mission's move to Aberdeen, Maryland. Attracting these companies who specialize in biotechnology, nanotechnology, stem cell research, information technology, communication technology, and renewable/ alternative energy research and development will require a multifaceted strategy. The emerging technology economy will seek sustainable environments with diverse housing to meet their workforce needs; a location capable of delivering support infrastructure; competitive business operational costs; a location supported by university research; and the provision of a high quality of life.

The framework presented herein proposes the development of a technology community that provides an integrated lifestyle where residents can choose to work, live, learn, and take their leisure at Fort Monmouth. The plan proposes the development of five mixed-use development clusters set within a greenbelt network of nearly 500-acres. Sustainability is promoted through the adaptive reuse of existing buildings, the protection of ecological resources, the provision of mobility options, and the recommendation that renewable and alternative energy fuel the redevelopment of Fort Monmouth.

This report documents the redevelopment planning work undertaken to date by EDAW, Inc. and our consulting team. We view the plan as a "living and learning" document that has grown more comprehensive and garnered broader support from project stakeholders with each presentation and review. We look forward to working with the Fort Monmouth Economic Revitalization Planning Authority (FMERPA), the communities of Tinton Falls, Eatontown, and Oceanport, Monmouth County, the State, and many more interested stakeholders in shaping the future of one of the State of New Jersey's most valuable economic resources.

Sincerely,

Timothy N. Delorm, ASLA
Vice President
EDAW|AECOM

Fort Monmouth Reuse and Redevelopment Plan

was created by

FMERPA Board

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Jack Donnelly, Governor's Policy Advisor, State Advisor

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Jennifer Velez, Commissioner, Dept. of Human Services

Angie McGuire, Acting Chief, Office of Economic Growth

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Hon. Gerald J. Tarantolo, Mayor, Borough of Eatontown

Hon. Michael J. Mahon, Mayor, Borough of Oceanport

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1.0 INTRODUCTION

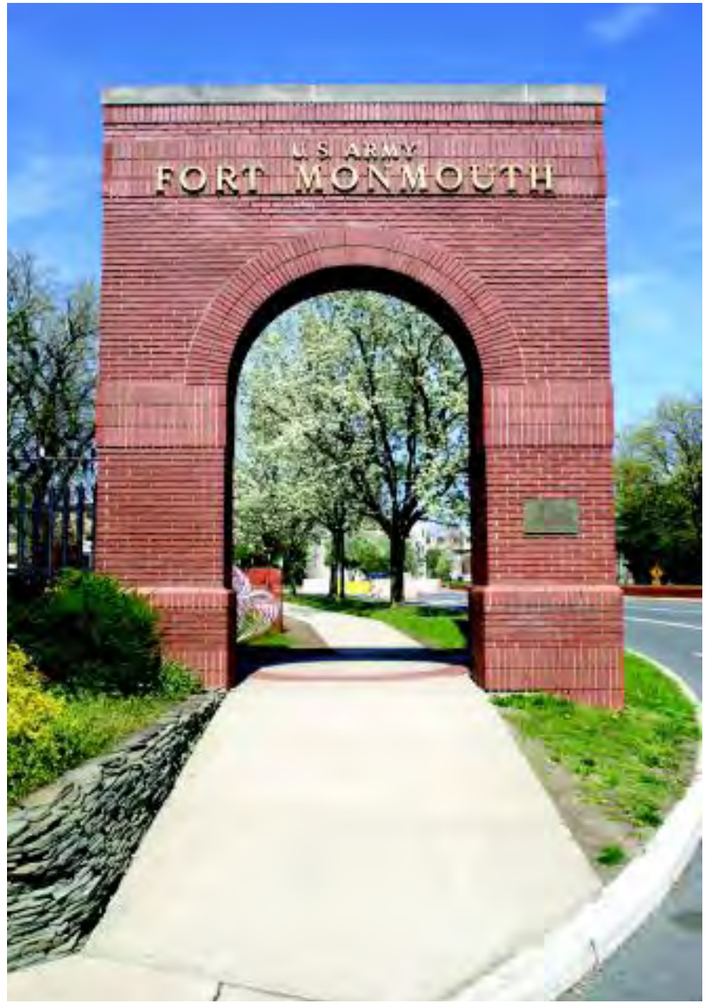
1.0 Introduction to the Plan

1.1 Introduction

Fort Monmouth is located near the eastern shore of New Jersey, within the Coastal Region of Monmouth County. With its location between Manhattan, New York (to the north) and Philadelphia, Pennsylvania (to the southwest), Fort Monmouth is afforded easy access to two major metropolitan areas as well as the State's capital, Trenton, New Jersey (to the west). The installation occupies approximately 1,127 acres of land and is contained within three municipalities, the Boroughs of Tinton Falls, Eatontown, and Oceanport, and is located adjacent to the Boroughs of Shrewsbury and Little Silver.

Fort Monmouth has been a significant presence in Monmouth County, New Jersey since its establishment in 1917. Prior to this time, the site was home to Monmouth Park Race Track from 1870 to 1917. After being abandoned due to New Jersey's ban on horse betting, the Army began leasing the land from a private owner in 1917 and purchased the land in 1919. The original name of Fort Monmouth was Camp Little Silver in 1917, then renamed Camp Alfred Vail. The Fort was originally established as a temporary facility for training the 1st and 2nd Reserve Signal Battalions, in anticipation of the United States' involvement in World War I. The Chief Signal Officer authorized the purchase of Camp Alfred Vail in 1919 when the Signal Corps School relocated to Camp Vail from Fort Leavenworth that year. In 1925, the installation was granted permanent status and renamed Fort Monmouth, in honor of the soldiers of the American Revolution who died in the Battle of Monmouth.

The primary mission of Fort Monmouth is to provide command, administrative, and logistical support for Headquarters, United States Army, Communications - Electronics Command (CECOM). CECOM is a major subordinate command of the United States Army Material Command (AMC) and is the host activity. Fort Monmouth currently serves as the center for the development of the Army's Command and Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) systems, the primary tenants of the Fort. Much of the Army's research and development of high-tech systems is done at Fort Monmouth, thus various specialized technical facilities are located throughout the Fort. Additional tenant



activities that occur on the Fort include the performance of research, development, procurement, and production of electronic material for use by the United States Armed Forces. Other missions include the provision of administrative training and logistical and related support necessary to transition selected reserve component units into the active force structure in the event of a national emergency.

Fort Monmouth is separated into two distinct areas, the Main Post (637 acres) and Charles Wood (489 acres). The Main Post is contained within the Boroughs of Oceanport (419 acres) and Eatontown (219 acres), and the Charles Wood Area is contained within the Boroughs of Tinton Falls (254 acres) and Eatontown (235 acres). The Fort's acreage by borough is summarized below:

Tinton Falls	454 acres
Eatontown	419 acres
Oceanport	254 acres
Total	1,127 acres

There are a total of 434 buildings and 663 housing units located on Fort Monmouth. An additional 251 lodging units and 71 dormitory rooms (United States Military Academy Preparatory) are located at Fort Monmouth.

The Main Post currently contains a variety of uses within approximately five million square feet of building space. The major land uses identified on Fort Monmouth include seven major use groups: Administration/Research Development, Test, and Evaluation (Admin/RDT&E); Commercial; Housing; Medical; Open Space/Natural Areas; Public Works/Supply/Utilities; and Recreation/Community Facilities. The facilities at Fort Monmouth serve the families and service members at Fort Monmouth as well as those from Naval Weapons Station Earle in Colts Neck, NJ and the Coast Guard at Sandy Hook, NJ with the commissary, Post Exchange, and Patterson Army Health Clinic. Additional information and associated graphics are provided in the Technical Memoranda: Existing Conditions (September 2007).

1.2 From "Fort Monmouth" to A "Reuse Area"

The Fort Monmouth military installation is scheduled to be closed as a result of the 2005 Base Realignment and Closure (BRAC) decision and the land would be disposed of in coordination with the Local Redevelopment Authority, Fort Monmouth Economic Revitalization Planning Authority (FMERPA), and its adopted zoning, as of September 15, 2011. FMERPA was created in response to this BRAC decision and for the purpose of preparing for the Fort's closure and planning for its reuse.

The Fort Monmouth Reuse and Redevelopment Plan (the Plan) was the second written piece produced as part of the planning effort, following the Technical Memoranda: Existing Conditions (September 2007). The Technical Memoranda described the current conditions of the Reuse Area and adjacent communities. The Memoranda were prepared for the purpose of informing the planning team and FMERPA of the opportunities and challenges associated with the reuse of the property. Understanding the existing conditions of Fort Monmouth is a critical first step in laying the framework for planning the reuse components.

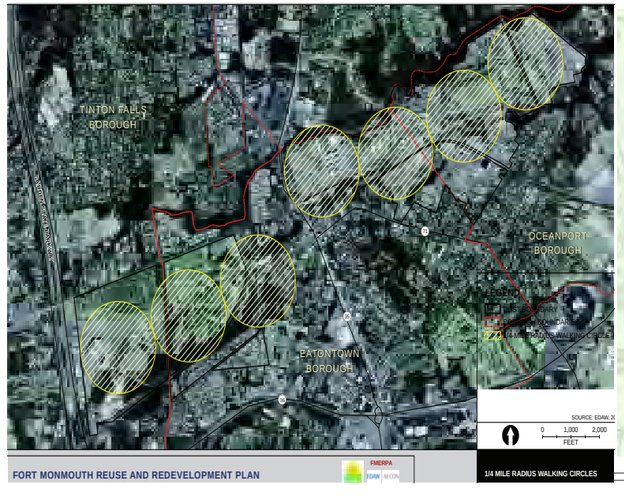
This Plan begins by summarizing the Planning Methodology and Community Outreach Process, previously discussed in the Technical Memoranda (September 2007). The planning process began in May 2007, with the community and stakeholder engagement process beginning simultaneously.

A major piece of any plan is the Land Use Elements. The analysis of Land Use Elements sets a baseline for the remaining pieces of the Plan; Chapter 3 of this document illustrates and describes this component. A second significant piece outlined in Chapter 3 is the proposed circulation and access plan. In order to function properly, a community must accommodate and manage economic growth and vitality with proper access and circulation plans. Chapter 3: Land Use and Circulation Plan discusses the plan for land use and facilities plan as well as the transportation and circulation plan that supports it.

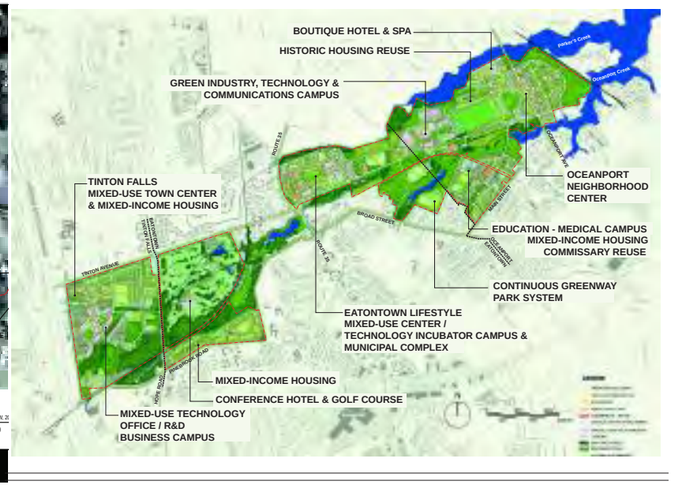
Additional detail on the redevelopment of Fort Monmouth is provided in Chapter 4: Key Area Plans and Sustainability. Redevelopment of the site includes a variety of uses such as reuse of existing facilities for high-tech office, research and development functions, and mixed-use and mixed-income communities that would take advantage of, and expand upon, the historic character of particular areas of the Fort.

An Infrastructure Plan is provided in Chapter 5 and identifies the potential need for improvements necessary to support the redevelopment of the site. Environmental Remediation Guidelines and Historic Preservation Guidelines are presented in Chapter 6 and 7, respectively. Chapter 8 identifies fiscal impacts and economic opportunities that help support and explain the rationale for the proposed redevelopment program.

Chapter 9: Zoning and Land Use Impacts identifies existing policies that have helped guide the planning process as well as provides zoning approach recommendations. A housing strategy is also presented in this chapter, an important part of which is the strategy for providing homeless and low income housing to meet the Council on Affordable Housing (COAH) requirements. Finally, the suggested Next Steps are presented in Chapter 10.



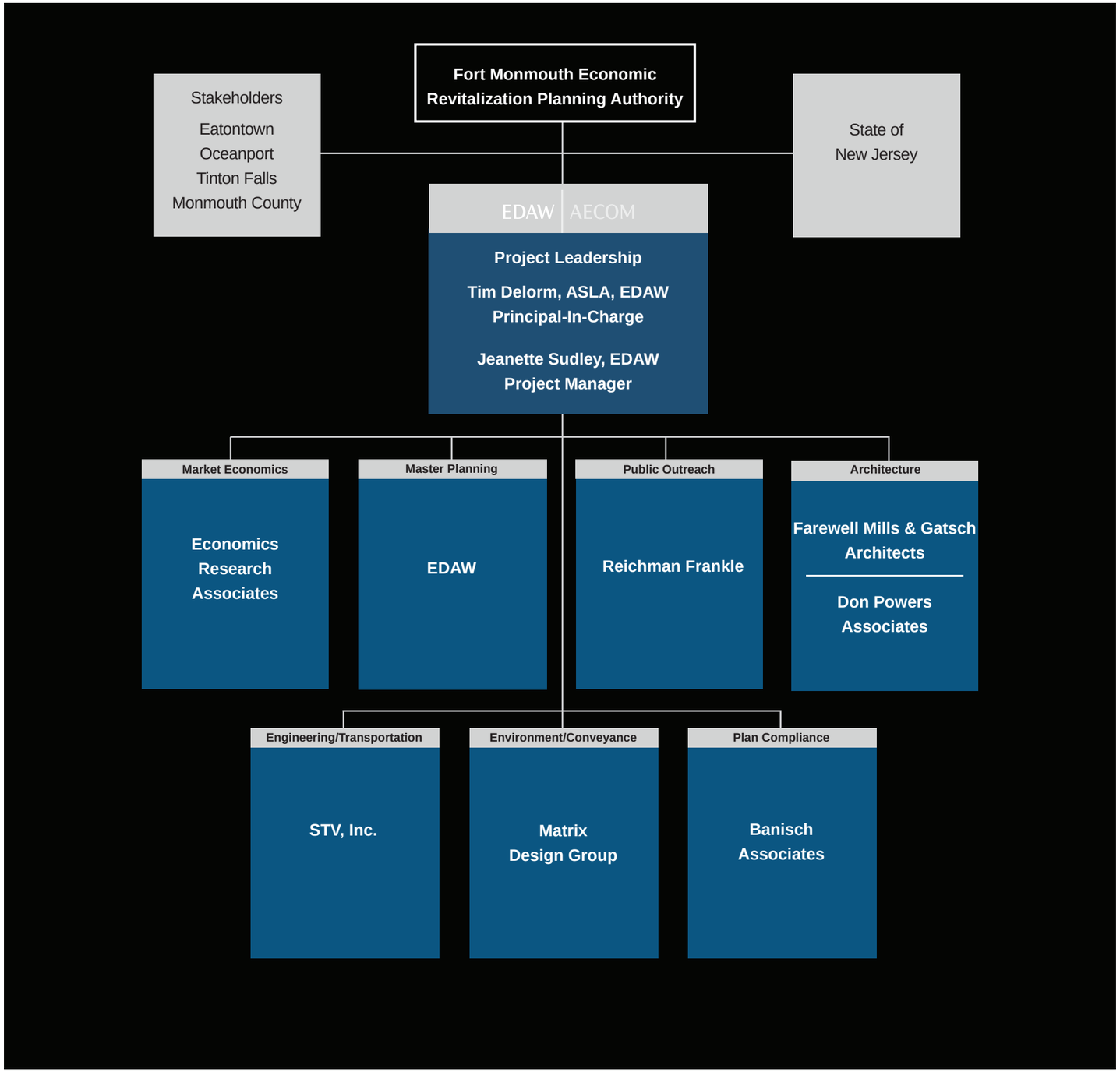
Walking Circles - a consideration in the planning analysis and process



The 20 Year Plan

1.3 The Planning Team

This Plan was prepared by a multi-disciplinary team of professionals, including planners, landscape architects, architects, environmental scientists and engineers, economic analysts, cultural resource specialists, and transportation planners and engineers. Guidance was provided to the planning team by FMERPA, FMERPA's advisory committees, Monmouth County, Municipal representatives and members of the State of New Jersey's Interagency Team (IAT). Valuable input was obtained from Army representatives, the local municipalities, and the public.



The Planning Team

2.0 PLANNING METHODOLOGY & COMMUNITY OUTREACH

2.0 Planning Methodology & Community Outreach

2.1 Introduction

Although a very simplified explanation of the planning process, the methodology implemented to create this Plan involved the following major steps:

1. Project Initiation

2. Regional Economic Profiles and Market Analysis

3. Site Inventory and Analysis

4. Development of Planning Principles and Alternatives

5. Completion of Preliminary, Draft, and Final Reuse Plans

Project Initiation

The Project Initiation stage involved the project kick-off and data gathering and documentation for the purposes of understanding existing site conditions. The project was initiated with a formal kick-off meeting involving FMERPA, State representatives, and the EDAW planning team. The main purpose of this meeting was to define the scope and purpose of the project: to create a redevelopment and Reuse Plan that is economically sustainable and provides new and exciting opportunities for the host communities, the region, and the State.

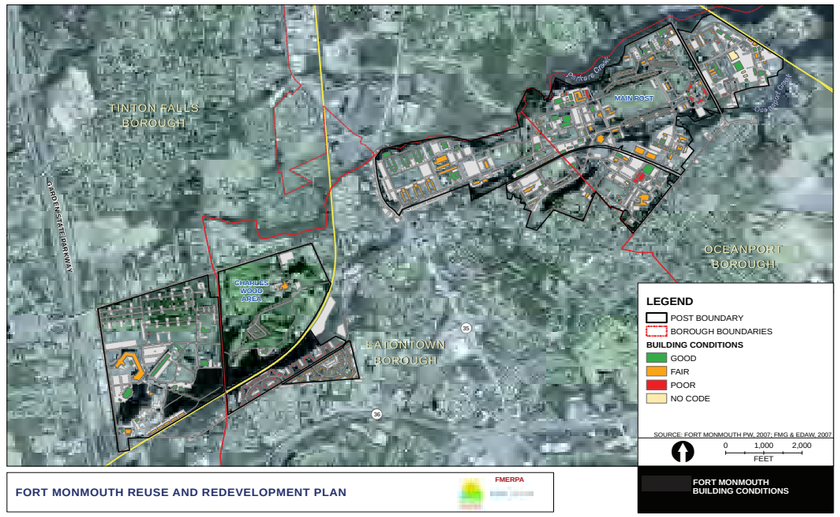
Project Initiation also involved a tour of the 1,127 acre post followed by stakeholder meetings with local municipalities, the Boroughs of Tinton Falls, Eatontown and Oceanport, and Monmouth County; the Army Garrison; and the local BRAC office. The overall planning approach and process is documented in the Technical Memorandum: Project Schedule and Methodology (September 2007).

Regional Economic Profiles and Market Analysis

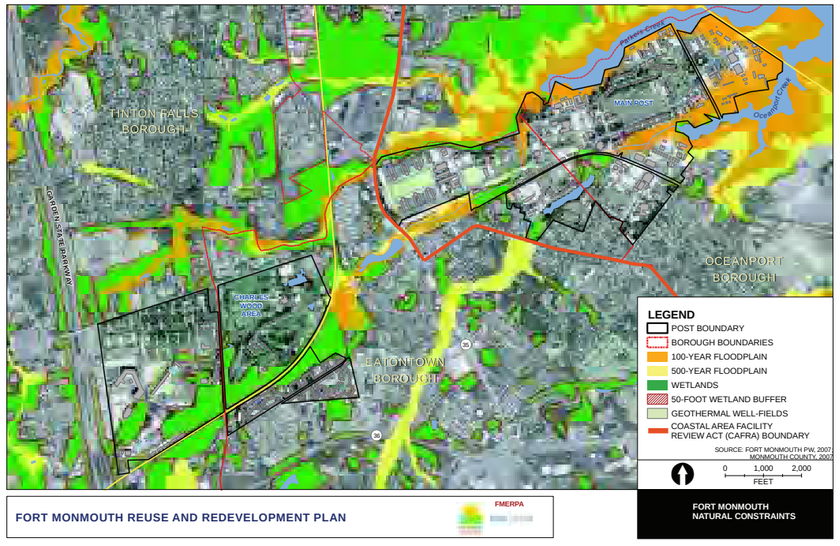
The purpose of providing Regional Economic Profiles and a Market Analysis was to obtain an initial understanding of market trends, both past and present. Analyses included in this report include a Demographic/Socio-Economic Analysis, Market Analysis, Institutional and Government Uses Analysis, and Short Term and Enhanced Use Leasing Analysis. In addition, a market conditions report was submitted to FMERPA in September 2007, with the Existing Conditions Technical Memorandum.

June 12th Public Presentation

Public Workshop



Facilities and Conditions **Source: EDAW, 2007**



Environmental Conditions **Source: EDAW, 2007**

Site Inventory and Analysis

The Site Inventory and Analysis stage included a review of existing technical reports, architectural and utility infrastructure plans, and environmental issues. Primary and secondary research supplemented by field reconnaissance and interviews with fort personnel were the tools employed to complete this task. Various components reviewed include facilities and existing land use patterns and cultural and historic resources.

The existing conditions of the transportation resources were documented within the Technical Memoranda (September 2007). An understanding of these baseline conditions was necessary to determine a Transportation Plan, as exhibited in this document.

Overview

The business recruitment strategy identifies target industry clusters within Governor Corzine's strategic focus on biotechnology, nanotechnology, information and communications, and "clean tech" that best fit the strengths of the Fort Monmouth region, and identifies specific marketing, regulatory, and development initiatives that can be undertaken in order to attract new businesses to the Fort Monmouth site. In the long-run, the strategic plan aims to create a diverse and robust technology center at Fort Monmouth that creates jobs in high-growth industries within a mixed-use campus that serves both employees and new residents. This report is summarized in Chapter 8 of this Plan and is available separately as the full report "Fort Monmouth Economic Revitalization Strategy", dated August 12, 2008.

Methodology

The business recruitment strategy was informed by stakeholder interviews, analysis of economic and business trends in the region, and prior studies conducted by the State. Several key areas received specific focus and attention to a few key categories that support industry development.

Investment Capital

New Jersey venture capital investment was concentrated predominantly in Information Communications Technologies (ICT) and Bioscience companies. Venture capital investment in New Jersey was split amongst 19 deals, with 63 percent of the deals and 40 percent of the funding allocated to ICT companies, primarily represented by software and IT services companies. Bioscience companies, which include biotechnology and medical device and equipment companies, represented 32 percent of the deals and 56 percent of the venture capital funding distributed within New Jersey during 2Q 08.

Human Capital

Labor data identified industry sectors for which New Jersey's labor force displays a comparative advantage relative to the US. The ICT sectors have a significant concentration of employees and capture a large share of venture capital investment. As such, ICT companies would form a strong basis for a tech park at Fort Monmouth. Ancillary sectors such as biotechnology, medical devices and equipment, and industrial/ energy companies could support the ICT core.

Institutional Capital

Institutional capital refers to the key research institutions and the geographic dispersion of venture capital investment to identify potential opportunities for the redevelopment of Fort Monmouth to complement strengths of existing clusters. Investment capital for target industries and state research institutions are clustered around New Brunswick, NYC, and Philadelphia/Camden. The Garden State Parkway is an important corridor for Fort Monmouth, providing connections to New Brunswick to the west and the Federal Aviation Administration's William Hughes Technology Center to the south.

Strategy

A Tech Center at Fort Monmouth should have ICT at its core with ancillary bioscience and energy companies that specialize in applications that cross-over with ICT. The ICT sector includes software, telecommunications, networking equipment, IT services, media / entertainment, and computers / peripherals companies. Moreover, in order to build a technology center that encompasses a diverse range of industry sectors, Fort Monmouth should attract companies within ancillary industries that converge with ICT. For example:

- Bioscience companies that converge with ICT could include biomedical informatics, systems biology, biomedical imaging, and online health services.

- Energy companies that converge with ICT would primarily focus on improving efficiency of energy use, as opposed to energy production, and could include environmental modeling and software, environmental control systems, power grid management, and more energy-efficient ICT systems.

Site Requirements

Stakeholder interviews and industry research suggests that, in order to develop a ICT-focused technology park at Fort Monmouth, conditions must be met, including broadband or fiber telecom infrastructure, flexible office and common spaces, networking and educational sessions (i.e. lunch and learns), sophisticated labs (including wetlab), 24-hour access and security. Additionally, the following amenities are provided by some of the leading technology parks: mixed-uses on-site, cultural and educational amenities, space for post-incubator companies, clean room, alternative energy source, and strong public transportation options.

Recommendations

Seven principles will help guide the strategic business recruitment initiatives at Fort Monmouth, with supporting short, medium, and long-term suggested actions:

- Cultivate cross-industry collaboration -- Target a diversity of ICT-convergent companies while building scale so that in the future the region can have the capacity to become an ICT cluster.

- Short term: Identify and reach out to early-stage companies at intersection of ICT, bioscience and energy.

- Mid-term: Coordinate with geothermal and biomass energy experts locally to create university-private sector energy partnership.

- Long-term: Create mixed-use tech center with office, retail, housing, and hospitality; build-out geothermal and biomass R&D and generation capabilities.

- State-level Commitment: The State should support development with a Governor's office-level commitment and support all components of the ICT industry life-cycle, including higher education, incubation facilities, and companies of all sizes.

- Short-term: Make Fort Monmouth ICT Center part of the Governor's Economic Growth Strategy.

- Mid-term: Establish "Governors Action Team" that acts as a sales force for New Jersey; Ensure ICT Center director reports directly to Governors office.

- Long-term: Increase state investment in higher education, especially in programs that support core and target sectors.

- Streamline Regulations: Development permits should be reviewed and approved within a prioritized and consistent time frame.

- Short-term: Implement process that allows for concurrent as opposed to sequential permitting at Fort Monmouth.

- Mid-term: Guarantee permit approval within as little as 30 days for high value targeted companies

- Long-term: Create statewide plan for expediting permitting process that builds on Fort Monmouth model.

- Marketing: Tech center leadership should include individuals that are skilled in industry research, business strategy, networking, and political strategy.

- Short-term: Be active in ICT-related professional societies; Engage ICT anchors to recruit small firms.

- Mid-term: Program university tech transfer and commercialization offices on-site.

- Long-term: Work with universities to develop relationships with international universities with strong technical programs in targeted industries.

- Strategic Business Recruitment: Target companies at all scales and include the largest companies that are easy to identify yet hard to move, to start-ups that are more nimble but hard to find.

- Short-term: Track VC investment trends (VenturXpert, Venture Source) & meet regularly with investors.

- Mid-term: Designate Tech Center leadership with strong political, business, networking, and research skills.

- Long-term: Monitor VC investment trends in and around New Jersey on on-going basis; Adjust business recruitment strategy to take into account investment trends.

- Sustainability: The Tech Park should strive to achieve efficiencies in materials re-use, energy use, water management, and operations.

- Short-term: Incorporate sustainability into urban design plan for Fort Monmouth.

- Mid-term: Recycle construction waste, building and road materials.

- Long-term: Require LEED-certification for new buildings; Create renewable energy sources on site (potentially geothermal).

- Incentives: Incentives need to be strong enough to overcome regulatory challenges and should assist companies of all sizes, from start-up to multi-national.

- Short-term: Hold focus groups with targeted companies; Use applications of targeted companies in public sector operations.

- Mid-term: Tax credits for angel investors; Structured financing for strategic projects; Refundable or transferable investment tax credits.

- Long-term: Designate Fort Monmouth an Innovation Zone; Create discretionary budget allocation for business recruitment.

The business recruitment strategy identifies target industry clusters within Governor Corzine's strategic focus on biotechnology, nanotechnology, information and communications, and "clean tech" that best fit the strengths of the Fort Monmouth region, and identifies specific marketing, regulatory, and development initiatives that can be undertaken in order to attract new businesses to the Fort Monmouth site. In the long-run, the strategic plan aims to create a diverse and robust technology center at Fort Monmouth that creates jobs in high-growth industries within a mixed-use campus that serves both employees and new residents. This report is summarized in the Chapter 8 of this Plan and available separately as the full report "Fort Monmouth Economic Revitalization Strategy", dated August 12, 2008.

Development of Alternatives

After the planning team had the opportunity to listen and learn from the public, four Land Use Concepts were produced and presented to FMERPA in September 2007. These concepts were then formulated into two Preliminary Concepts that were presented to FMERPA in November 2007. After much feedback and discussion, the Preliminary Plan was completed and presented to the public in May 2008 and the Draft Plan was released and presented to the public in July 2007.

Public Outreach

The public outreach process is a continuous and iterative process that started with the initiation of the project and does not end until 2011, when the Army vacates Fort Monmouth and the land is transferred to FMERPA or another entity. Although continuous and ever evolving, the major steps of the public outreach process included the various public meetings held throughout the planning effort. The first public meeting occurred on June 12, 2007, where the planning team and overall planning process and purpose were presented. The second public outreach milestone involved a series of meetings held in each of the host communities, Tinton Falls, Eatontown, Oceanport, and Monmouth County. These meetings were led by A. Nelessen and Associates, who implemented their Visual Preference Survey (VPS) and led interactive charrettes where the public used a hands-on approach to providing their input on what they would like to see happen at Fort Monmouth. After all of the data was compiled and synthesized, the VPS results were presented to the public in October 2007.

The results of this process are detailed in the Fort Monmouth Visioning Report.

An additional public meeting was held after the Draft Final Plan was released. The Final Plan will be announced and presented at the August 27 FMERPA Board meeting. A final public presentation is also being contemplated.

2.2 Community Engagement Process

The Community Engagement Process was guided by a Public Participation and Public Outreach Strategy developed by the EDAW planning team. The public outreach strategy for Fort Monmouth comprises four main topics, including the following:

- Branding/ Image Development
- Media Relations
- Public Meetings and Outreach
- FMERPA Website

The overall intent of the public outreach strategy is three-fold: (1) to maximize public exposure to the Fort Monmouth redevelopment planning effort, (2) to encourage input at all levels and throughout the planning process, and (3) to enhance both internal and external communication in an open and transparent process that meets all State and local regulations for public input and participation for community-based planning projects in the State of New Jersey.

Branding/Image Development

To establish consistency in communication and to promote and enhance public awareness about Fort Monmouth, a logo (at right) and tag line were developed that could be used on all documents and materials associated with the Redevelopment Plan.

Media Relations

Involvement by local, state and national media in the reuse planning effort is critical to furthering exposure of the Fort, its considerable assets and the long-term potential for reuse. Media involvement included: editors at local (Monmouth County) and state (New Jersey, New York, Pennsylvania) newspapers, TV (commercial and cable) and radio stations.

A press briefing was held in order to capture media attendance at the outset of the project and engage specific editors to follow and report on the project over its lifetime. This briefing was held as a breakfast event at Gibbs Hall on June 4, 2007 from 9:00 to 11:00 A.M. During this event, FMERPA and EDAW presented project specifics including qualifications of the EDAW team, goals and objectives, and schedule and emphasized the importance of obtaining input from the public.

Public Meetings and Outreach

A third critical aspect of the public relations strategy for the Plan is the opportunity through community meetings and workshops for the planning team to share planning information and to allow public input as the Plan develops. This public input process was established initially in the proposal process by the EDAW team and subsequently refined by FMERPA, Reichman Frankle, Inc., and other key stakeholders at the early stages of the project. Formal public meetings were conducted at Plan milestone completion and included: a formal Kick-Off meeting (June 12, 2007), community charrettes (June 18, 19, 21, and 25, 2007), VPS results presentation (October 16, 2007), Existing Conditions and Preliminary Plan presentation (March 2008), Community Planning Board Presentations (April 21, 23, and 30, 2008), Draft Plan presentations to each Tinton Falls, Eatontown, and Oceanport (July 21, 23, and 29, 2008), FMERPA Board Briefing (August 20, 2008) and a Final Plan presentation (August 27, 2008).

VPS and Visioning Process

Significant public input was obtained early in the planning process through a unique visioning process led by A. Nelessen Associates. Over the course of four meetings in June 2007, a series of community workshops/charettes were held in Eatontown, Oceanport, Tinton Falls, and Freehold. A variety of information was collected using Visual Preference Surveys (VPS), questionnaires, and "hands on" drawing exercises.

The results of the visioning process were analyzed by (1) studying the highest rated images of the VPS, (2) synthesizing the Vision Translation exercises into a series of maps, and (3) highlighting responses to critical questions asked in the survey across municipalities. The results of the visioning process served a central role in moving the planning process forward with public input providing the key information for formulating a baseline Plan.

Additional Public Meetings

In addition to the public meetings held to convey results of the Plan as developed, FMERPA has held monthly board meetings open to the public to discuss the other ongoing planning and redevelopment issues as they arise throughout the redevelopment process. In addition, a number of Advisory Committees have been formed to address specific planning and redevelopment subjects through and continuing beyond the planning timeframe. These regularly scheduled committee meetings are also open to the public and allow for comment and public input in the planning project on a specific topic-by-topic basis.

The Advisory Committees established by FMERPA include:

- Commercial Industry
- Education Consortium
- Emergency Services
- Environmental
- Historical
- Infrastructure
- Planning/Development
- Public Input
- Social Services
- Transportation
- Veteran Affairs

Eatontown Charrette

June 12 public meeting

FMERPA Website

A particularly important aspect of a public outreach strategy in today's digital age is the project website. This website provides a number of helpful outreach features including:

- descriptive information on the project in general;
- advertisements and public notices of all project meetings and events;
- access to survey forms, questionnaires, comment forms and other information solicited from the public during the planning period;
- a repository for all planning products and reports, presentations, or other documentation developed over the course of the project by FMERPA, the consultant team, and other key stakeholders involved; and
- an easily accessible forum that allows the public to ask questions and allows FMERPA to post responses for others to view.

2.3 Plan Objectives and Planning Principles

The objective of the planning process is to create a framework model for a Reuse and Redevelopment Plan that creates a sustainable technology community and promotes Governor Corzine's Economic Initiatives (GEI). Seven criteria that must be met in order to promote this objective have been identified. As such, it has been determined that the Reuse Plan must:

- Promote the Technology Corridor Initiative;
- Be consistent with State, County, and Municipal planning policies;
- Focus on business retention and attraction, job replacement, and employee training;
- Be founded on market and economic analysis;
- Address homeless, COAH, and workforce housing needs;
- Leverage Fort assets (people, infrastructure, location); and
- Be a green community model.

After obtaining the bulk of community input via workshops and charrettes and conducting the majority of stakeholder interviews and site conditions research and analysis, seven basic planning principles were identified and implemented to guide the development of the Reuse Plan.

The Planning Principles from which the Preliminary Concepts were developed are:

Principle # 1:
Decreasing Density West to East & Create Mixed-Use Live/Work/Leisure Centers

Principle # 2:
Link centers & increase mobility with connected transit infrastructure serving the region and the Fort

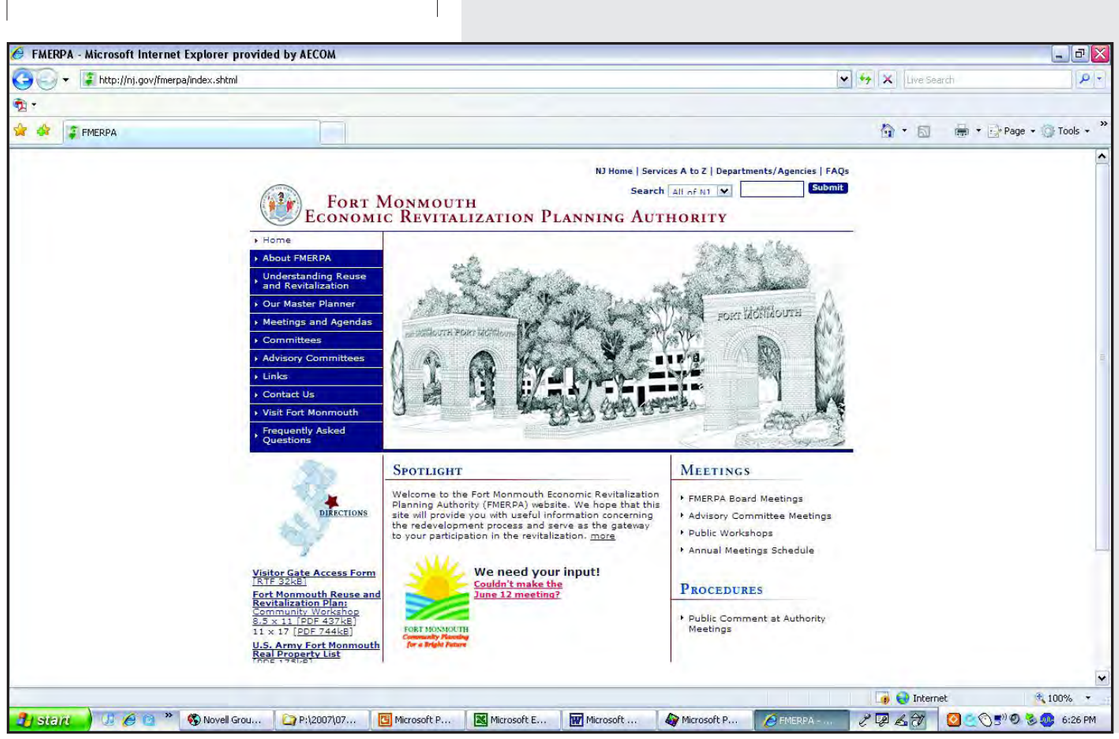
Principle # 3:
Enhance auto mobility and redevelopment capacity with targeted roadway infrastructure improvements

Principle # 4:
Combine open space, habitat, and water resources to establish a continuous Blue – Green belt

Principle # 5:
Utilize the Blue – Green belt as an armature for enhanced bicycle and pedestrian mobility throughout the Fort

Principle # 6:
Remove Fort boundaries & extend existing land uses to reconnect the Fort to the communities

Principle # 7:
Leverage existing Fort Monmouth assets (People, Buildings, Technology, and Infrastructure)



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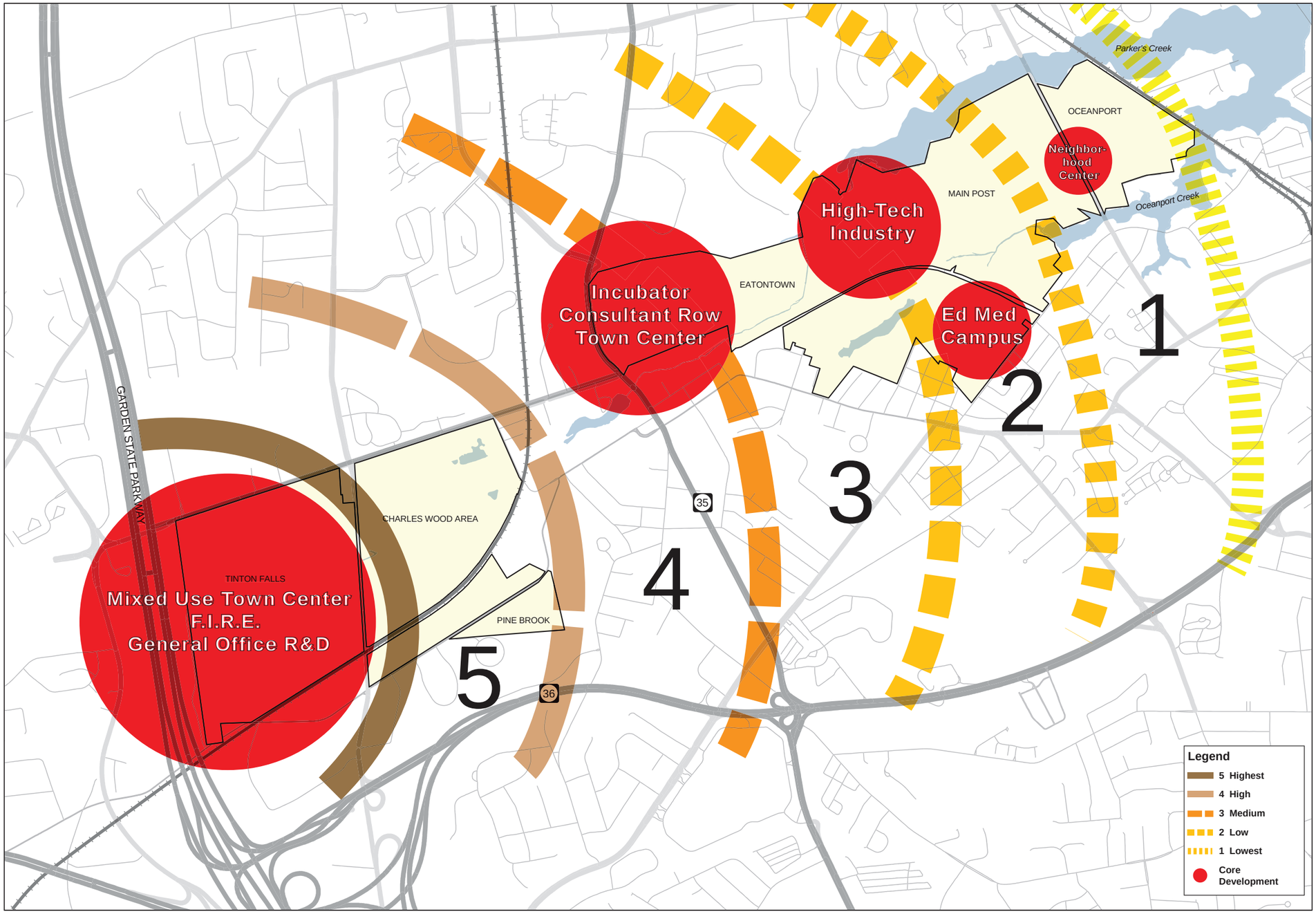


FORT MONMOUTH CONCEPT DIAGRAM : DENSITY TRANSECT

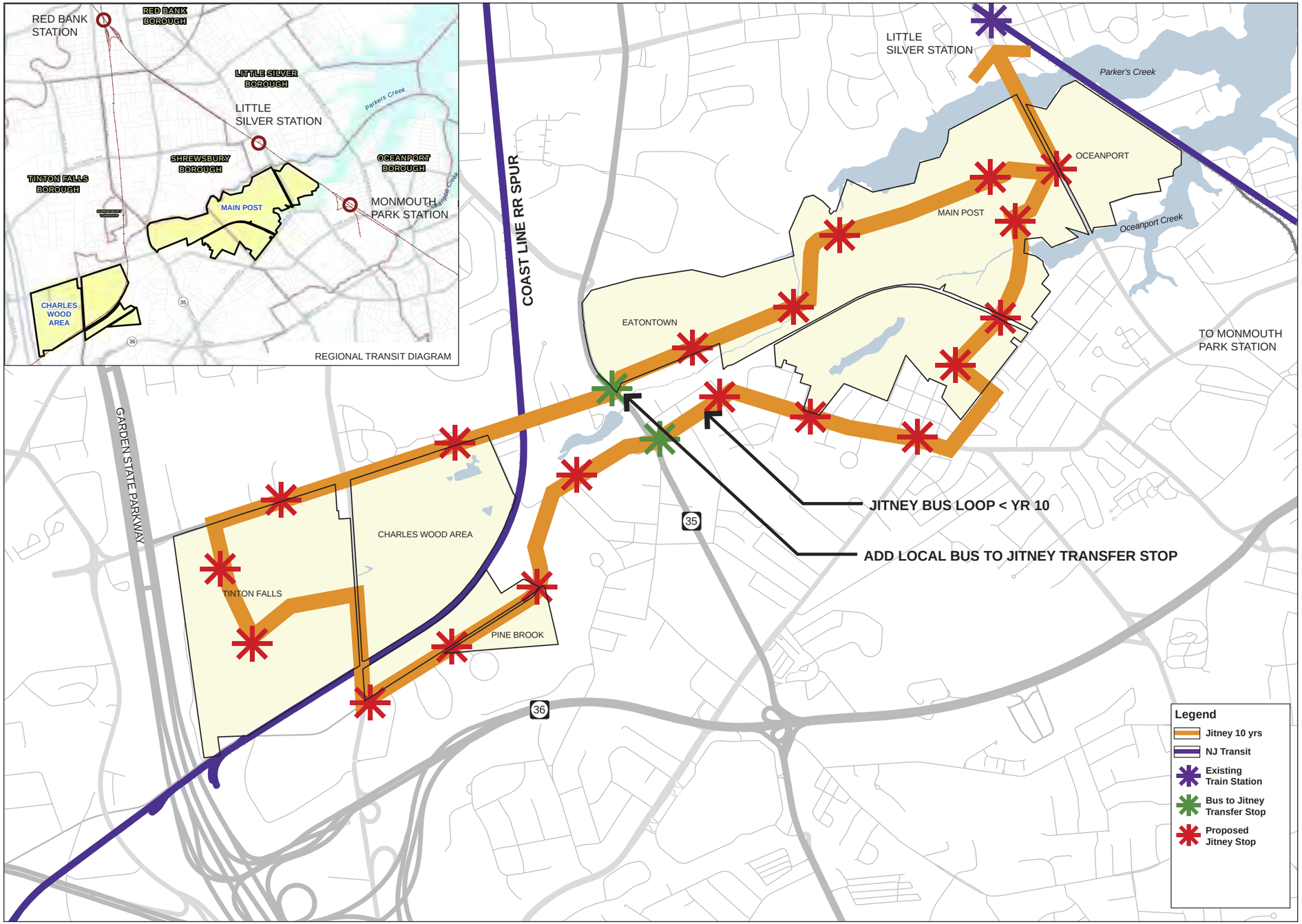
Principle # 1: Decreasing Density West to East & Create Mixed-Use Live/Work/ Leisure Centers

A review of the current support network revealed that existing roadway capacity and infrastructure best support higher density reuse and redevelopment adjacent to the Garden State Parkway (GSP). Taken in conjunction with the increasing sensitivity of environmental resources progressing eastward from the Charles Wood Area to the Main Post, a reduction in overall net density from the west to the east was deemed most appropriate.

Analysis of the property, existing structures, susceptibility to change, and the real estate market further suggest that up to five "centers" decreasing in density from west to east are appropriate. Each of the five centers is recommended to contain a mix of uses and be configured as clusters with higher density than conventional development that currently exists around the Fort. The highest density development, likely to include a major employment and mixed-use center, is most appropriate adjacent to the GSP in Tinton Falls. A medium density regional mixed-use "Municipal Incubator Town Center" located at the intersection of Route 35 and Tinton Avenue in Eatontown provides the opportunity to create the redevelopment's "lifestyle" center.

Located around the reuse of the McAfee Center, a High Technology-Green Industry Cluster is proposed. The "flex-space" should be designed to meet the needs of nano-technology, biotechnology, and emerging renewable and alternative energy companies.

A small mixed-use waterfront, municipal center catering to residents and tourists is an appropriate use for the lowest density node flanking Oceanport Boulevard in Oceanport. The final cluster of development fronts Main Street and is proposed as a mixed-use neighborhood anchored by the reuse of the Patterson Army Health Clinic or construction of a new medical clinic. Approximately 15 acres are reserved for future municipal educational needs.



FORT MONMOUTH CONCEPT DIAGRAM : PROPOSED MASS TRANSIT

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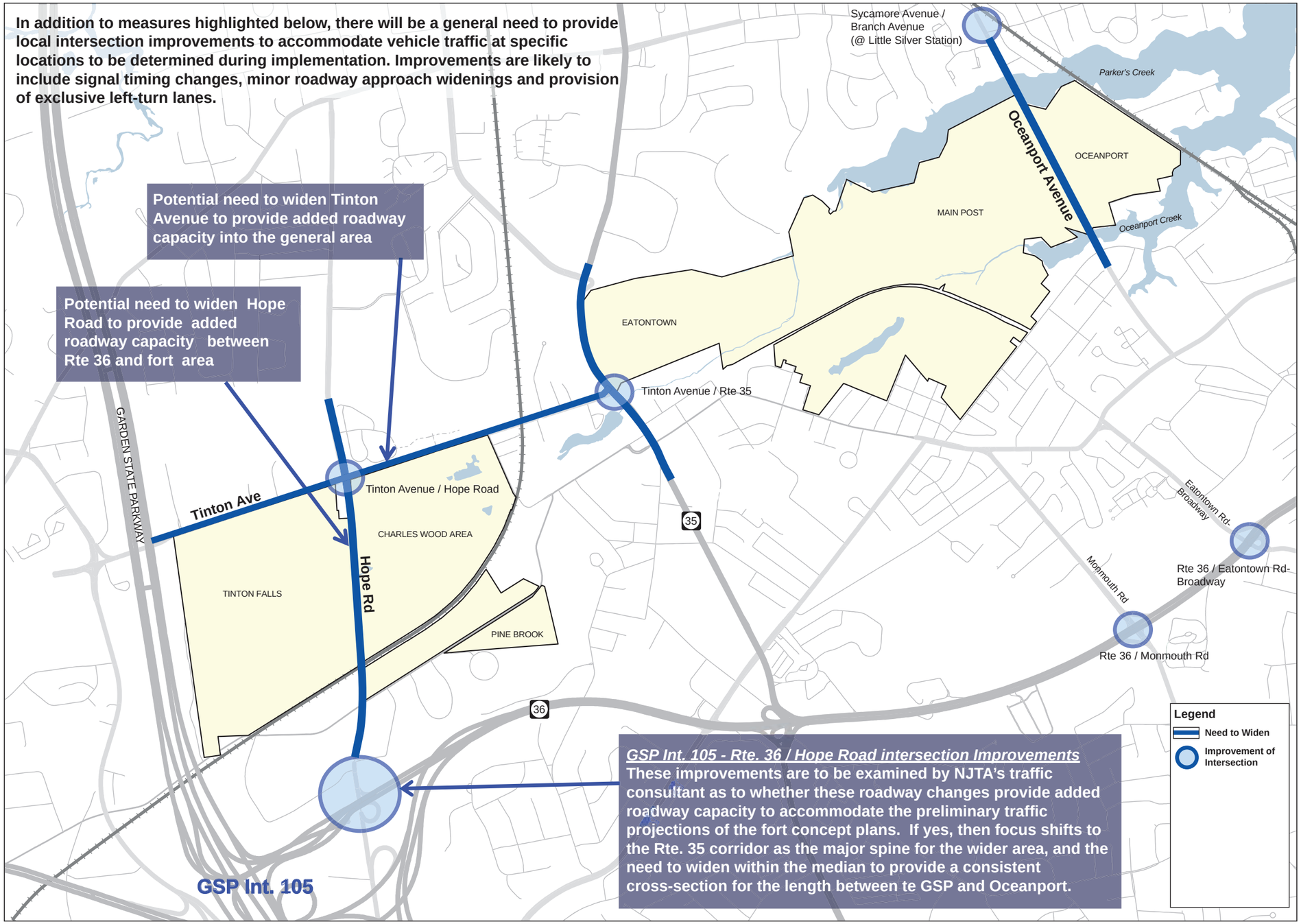
Principle # 2: Link centers & increase mobility with connected transit infrastructure serving the region and the Fort

The addition of alternative modes of transportation including bus, jitney, bicycle and pedestrian modes are cited as a significant enhancement to redevelopment by developers and the public during the Visual Preference Survey. The provision of alternative modes of transportation is a basic principle of Smart Growth and Transit Oriented Development (TOD). A transit loop for jitney buses or bus rapid transit would provide a valuable connection to both the proposed redevelopment "centers" and adjacent existing municipal centers, further stimulating the redevelopment area's vitality. A redevelopment pattern that promotes live, learn, work and play should be supplemented by an extensive system of bikeways, pedestrian trails, and sidewalks to enhance walkability and reduce automobile dependence for short trips.



FORT MONMOUTH CONCEPT DIAGRAM : PRELIMINARY TRAFFIC IMPROVEMENT

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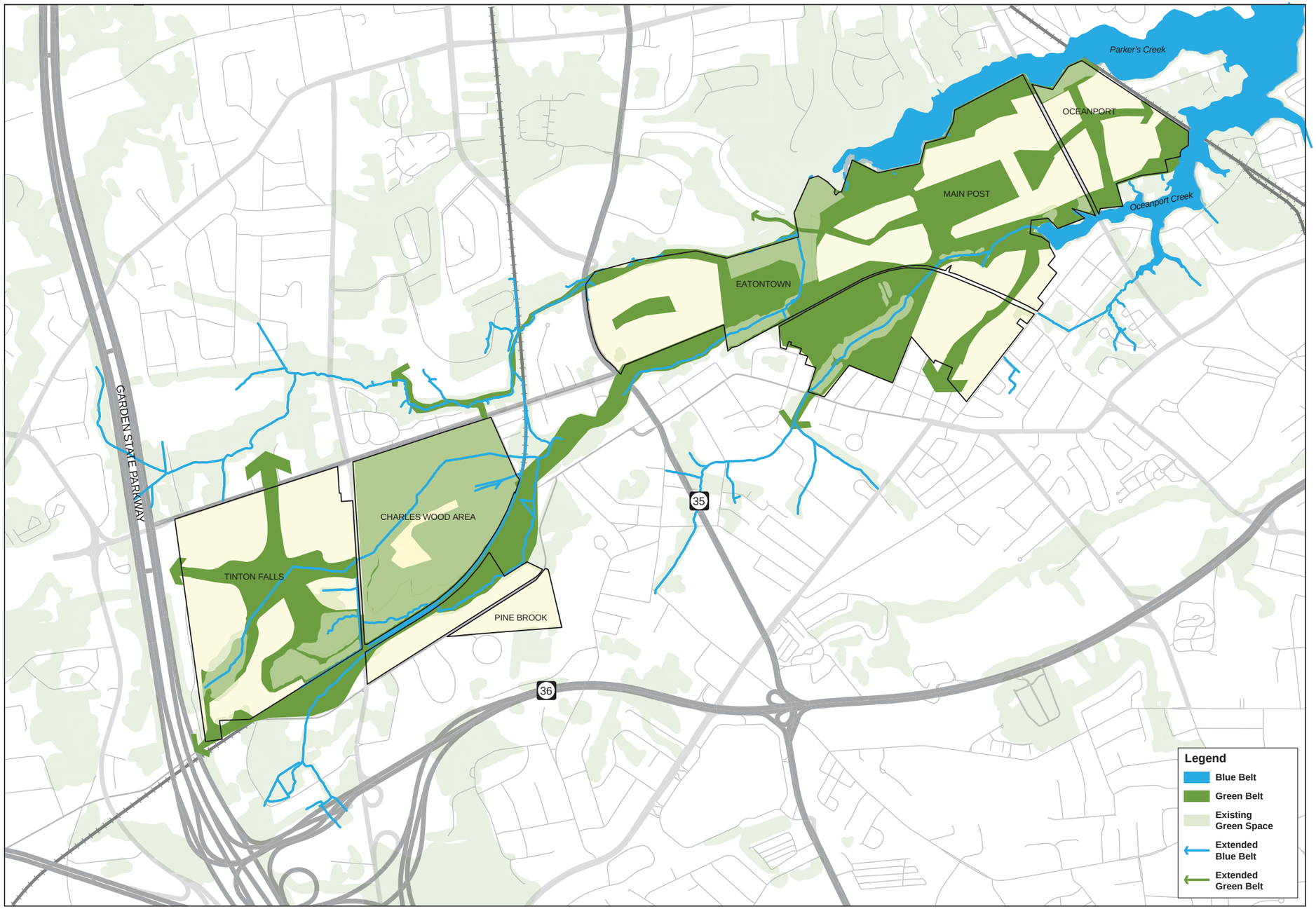
Principle # 3: Enhance auto mobility and redevelopment capacity with targeted roadway infrastructure improvements

The current internal roadway system is sufficient for its current purpose, to support the on-base population; however, once the base is opened to the public and new uses and communities are introduced, the roadway system would require improvement to support the proposed redevelopment.

Auto mobility can be enhanced through the improvement of roadways and better roadway connections. A simple and necessary improvement includes taking down the gates and security barriers, which would immediately open up streets that dead end at the Fort's perimeter. Not only would this provide internal roadway improvement, but it would improve external movement as well.

Offsite roadways currently operate at poor levels of service during the morning and evening peak hours. Significant intersection improvements, including at Hope Road and Route 36, would be required to facilitate full redevelopment at Fort Monmouth. Refer to Section 3.5 for additional information.



FORT MONMOUTH CONCEPT DIAGRAM : BLUE / GREEN BELT

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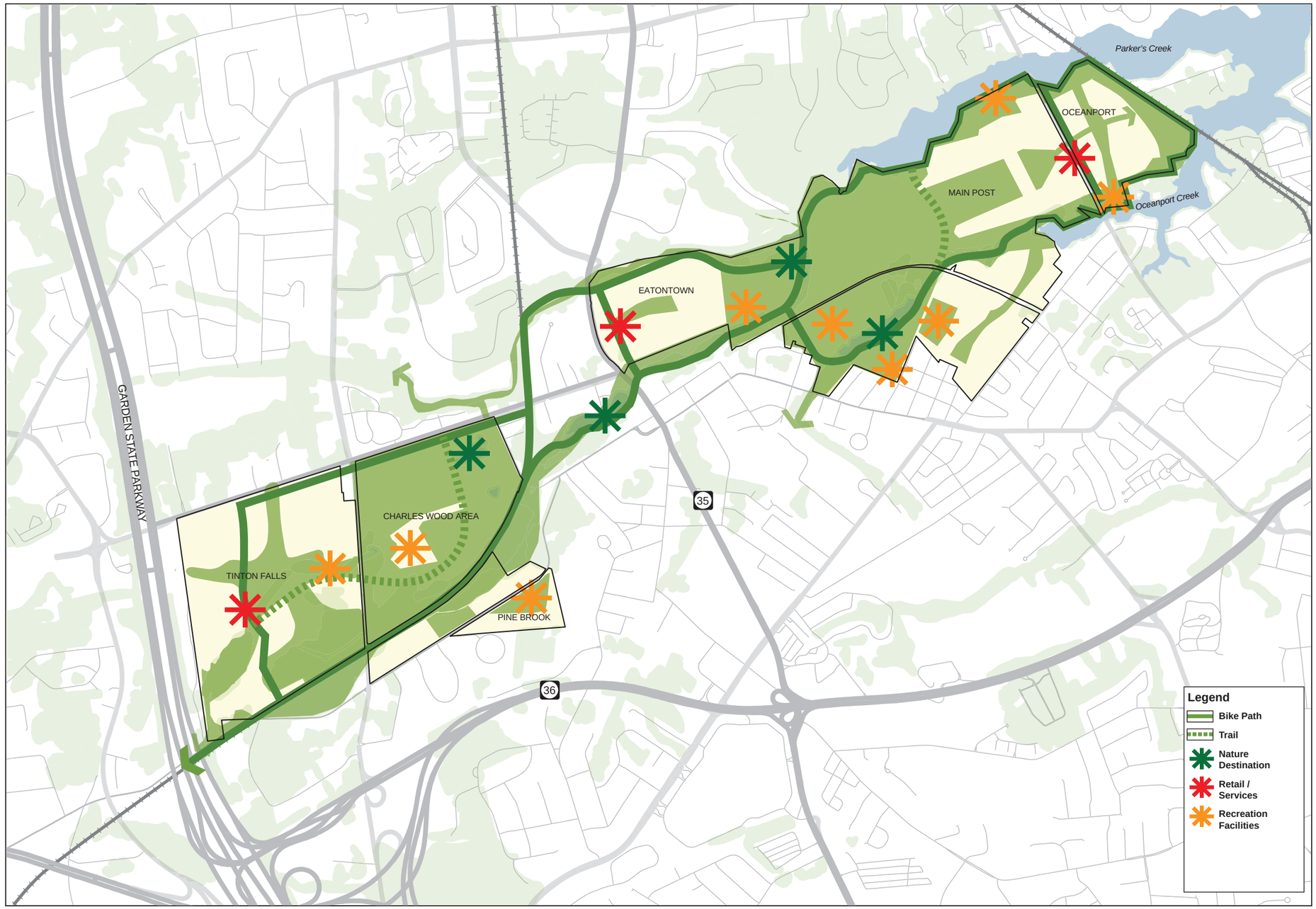
Principle # 4: Combine open space, habitat, and water resources to establish a continuous Blue-Green Belt

The redevelopment of Fort Monmouth would be undertaken in a manner that establishes the Fort as a model for sustainable development: economic, social, and environmental. Essential to this outcome is the protection and enhancement of environmentally sensitive areas of the site including wetlands, watercourses, and habitats. A "Blue-Green" Belt is proposed to establish regulatory buffers; interconnect Parker's Creek and Oceanport Creek hydrology and habitats; provide for green infrastructure; and establish a system of interconnected bicycle/pedestrian trails linking all open space, recreation areas, and development centers.



FORT MONMOUTH CONCEPT DIAGRAM : BIKE AND PEDESTRIAN PATH

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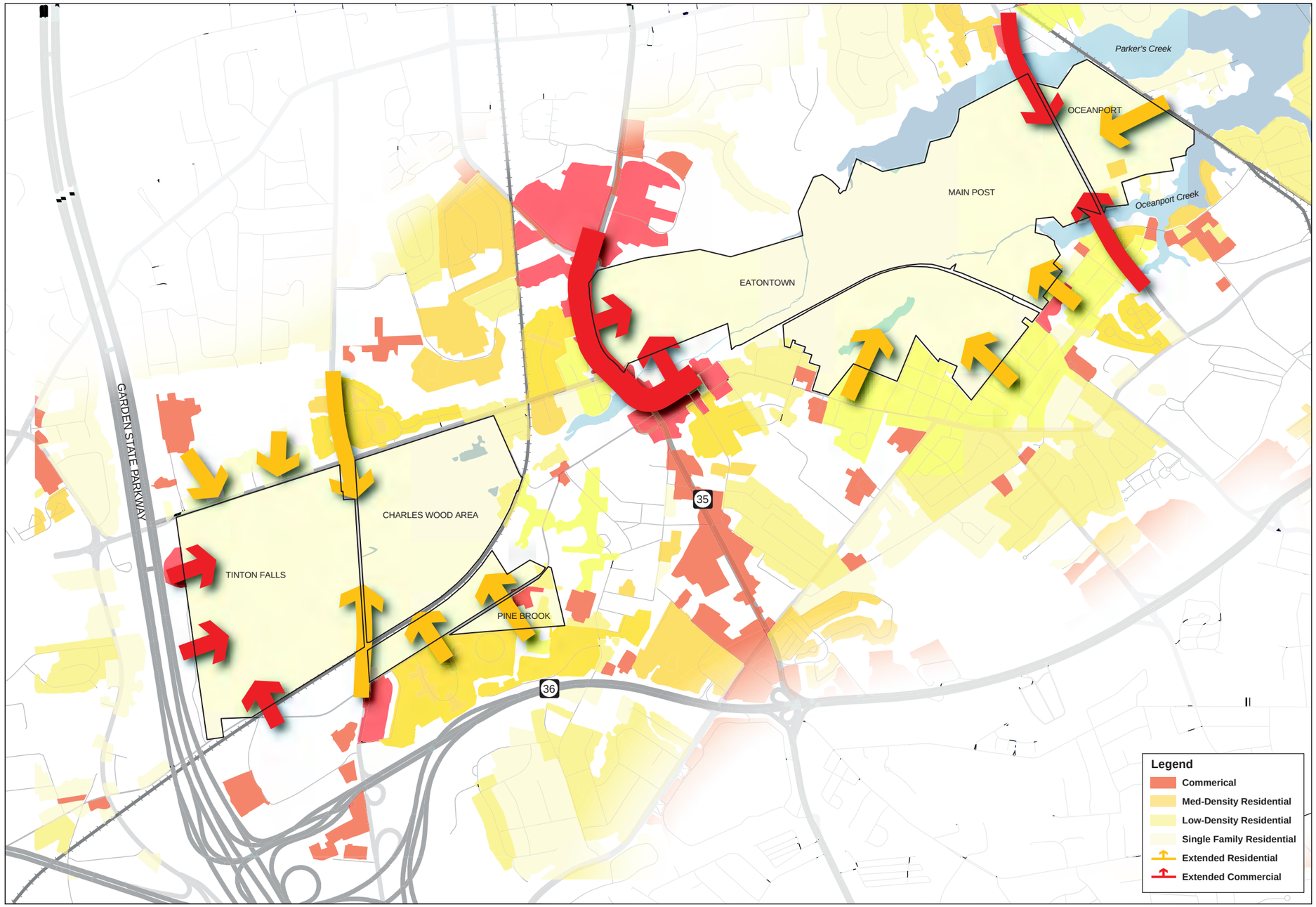
Principle # 5: Utilize the Blue-Green Belt as an armature for enhanced bicycle and pedestrian mobility throughout the Fort

Essential to any community founded on sustainable development principles is the integration of environmental resources into everyday life, making them readily accessible to the public. Building on and improving the Blue-Green belt concept, this system should include trails and open areas for use by the public as both a commuting option and an everyday amenity.

Although several trails are located throughout Fort Monmouth, they are not connected, both internally and externally. Providing proper connections and access points would enable both residents and employees of the area to use this resource as a transportation alternative, significantly enhancing mobility and promoting the live-work-play way of life. Redevelopment of Fort Monmouth should be exemplary in regard to creating vibrant neighborhoods where residents and visitors are encouraged to walk or bicycle between home and work and work and entertainment.



FORT MONMOUTH CONCEPT DIAGRAM : BLUR BOUNDARY/ EXTEND LAND USE

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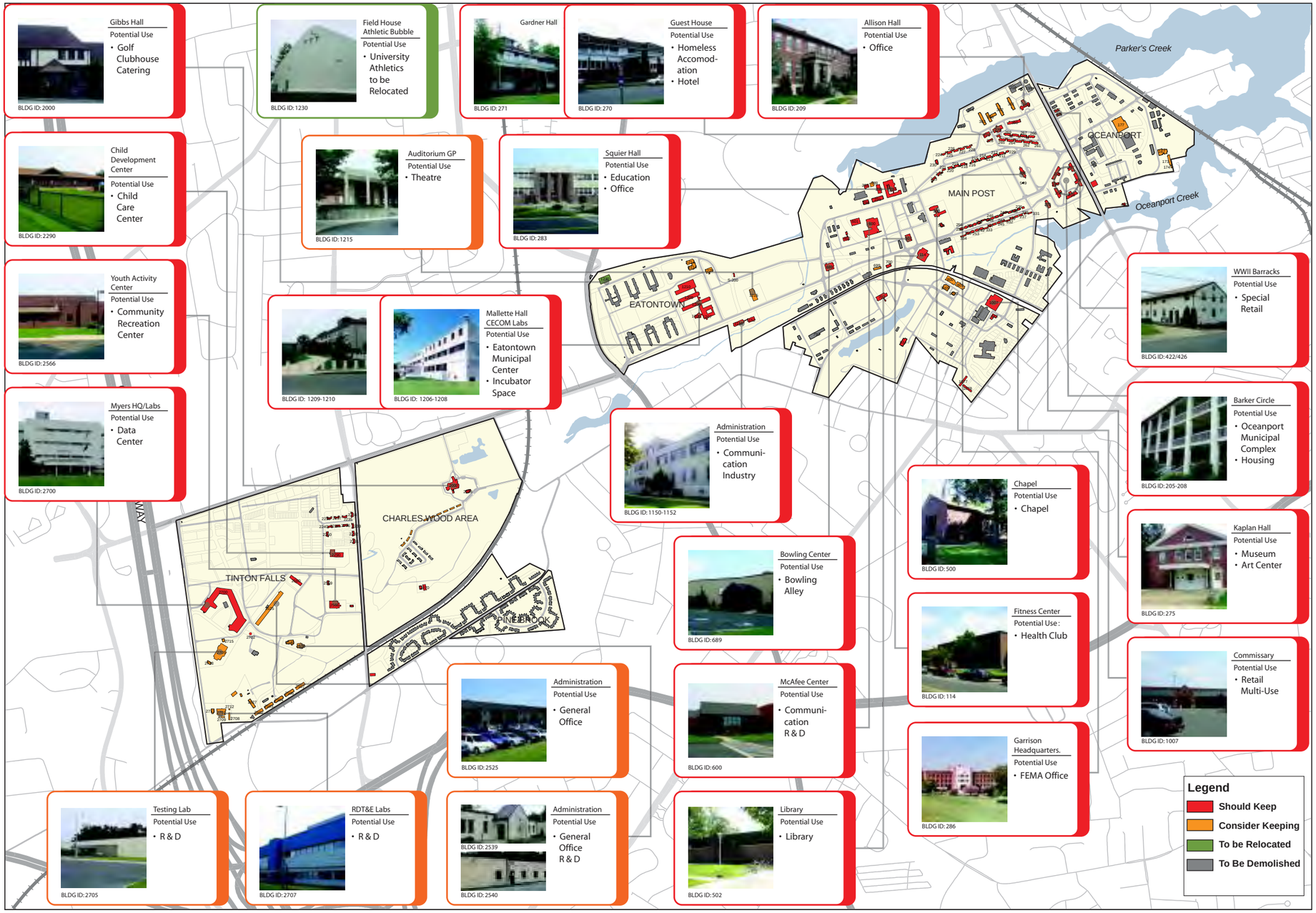
Principle # 6: Remove Fort boundaries & extend existing land uses to reconnect the Fort to the communities

The gated and fenced Fort has presented barriers to movement in all directions. All gates and fences should be removed and the Fort opened to the public. Early in the redevelopment process, existing streets and adjacent land uses should be extended into the Fort to reconnect the host communities of Tinton Falls, Eatontown, and Oceanport and the adjacent communities of Shrewsbury and Little Silver.

Creating a seamless land use integration between the community and the Fort is of primary importance. The proposed extension of adjacent land uses and existing streets into the Fort would improve mobility while providing public access to the Fort's amenities.



FORT MONMOUTH CONCEPT DIAGRAM : BUILDING RE-USE PLAN

FMERPA

Principle # 7: Leverage existing Fort Monmouth assets (People, Buildings, Technology, and Infrastructure)

Many valuable assets already exist at Fort Monmouth and their retention and enhancement should be leveraged to promote successful redevelopment. Many existing facilities possess cultural value, such as historic structures and memorials, or physical value, such as high-tech systems that should be retained. Several buildings and housing areas show a unique historic character and, although not all historic facilities are suitable for reuse. Their significance should be retold in some form of mitigation such as educational showpieces.

As a result of Fort Monmouth's communications mission, many of the facilities contain high tech infrastructure and spaces that are too valuable to simply dispose of them. These facilities possess great value to the redevelopment market, specifically high tech industry, research and development companies, or flexible incubator space that provides excellent connectivity. Additionally, the skilled workforce that powered Fort Monmouth should be leveraged to the greatest extent possible. Although many would move with the mission to Aberdeen, many would stay behind as a result of retirement or personal choice.

Extensive infrastructure extends throughout the reuse areas, including typical utility connections as well as fiber and valuable geothermal wellfields and associated connections. Additional assets include the variety of monuments and memorials located throughout the Fort. These structures serve as a reminder of the base's and country's history and have the potential to serve as placemakers and cultural and educational showpieces.

3.0 LAND USE & CIRCULATION

3.0 Land Use and Circulation

3.1 Land Use Element

The Land Use Element presented here promotes a balanced and functional mix of land uses consistent with the State Development and Redevelopment Plan (SDRP), the Principles of Smart Growth, and the community values interpreted from community charrettes and public meetings. The Technical Memoranda (September 2007) provided a discussion of existing land use patterns, constraints, and opportunities; identified existing facilities; their condition and reuse potential; and identified specific resources worthy of preservation or enhancement, such as natural resources including wetlands. The layout of land uses builds on our previous analysis and is based on land use issues identified in the analysis process, as well as constraints and opportunities.

The Land Use groups that are illustrated on figure (page 3-5) are organized by: Low Density Residential; Medium Density Residential; Mixed/Multi-Use; Commercial, Lodging; Office/R&D; Institutional; and Open Space. The organization of these planned uses was determined by a multitude of factors including data obtained through public outreach, stakeholder interviews, existing conditions research, applicable policies, market demand and feasibility, and consideration for the surrounding use patterns. The Land Use map provides a general overview of planned uses; however, the Plan as a whole illustrates more in-depth detail on planned uses and designations. Although some detail regarding planned uses is provided in the following discussions, this Land Use Element is intended to provide a more general overview of the Plan's flexibility. Additional detail such as specific uses and development intensities is provided in the Plan and Key Area Plans discussion presented in Chapter 4.

The land use patterns laid out in the Plan are intended to guide future growth and development of the Reuse Area. As such, land use areas, extents, and intensities are identified but remain flexible. The Land Use Plan anticipates a phased redevelopment over the next 20 years to 2028. Thus two Plans are presented: a 10-year Plan and a 20-year Plan. Applicable policy conformance and recommendations are discussed separately, in Chapter 9: Zoning and Land Use Implications.

3.2 Existing Land Uses

For ease of discussion purposes, land use summaries are organized by Reuse Area, based on the municipal boundaries.

Tinton Falls Reuse Area

The Tinton Falls Reuse Area covers the properties extending from the western-most border of Fort Monmouth to Hope Road. The Reuse Plan for this node envisions a Mixed-Use, High-tech Business Center with a multi-use town center containing store-front retail with the potential for mixed-income housing or professional offices above, institutional uses such as a library, and professional office space. The main corridor of the area extends from the existing Tinton Falls Municipal Complex. Additional civic uses are focused on education and development and include reuse of the existing child development center, teen center, and community center and pool. Open space amenities define the areas and are interspersed throughout in the form of a civic green, small neighborhood parks, connecting trails, and a central park with active recreation linked to the Fort-wide Blue-Greenbelt.

Residential

The Residential component of the Land Use Plan takes advantage of the valuable historic housing units already existing on the base and plans for the reuse of the 22 unit Hemphill Housing units located along Hope Road. The entire northeast corner of the Tinton Falls Reuse Area along Tinton Avenue is planned for mixed income residential use, with a mixture of low and medium density housing. These units are envisioned to become a part of a larger residential area, containing low and medium density units in the form of garden apartments, townhouses, and detached residences. This area was historically a residential zone at Fort Monmouth; however, all of the units have already been removed with the exception of the Hemphill housing along Hope Road.

Moving northwest of this area, a series of large lot detached housing units are planned along the south side of Tinton Avenue, within Tinton Falls. Given the scenic nature of Tinton Avenue, a 30 foot landscape buffer is recommended between the roadway and proposed development. The area of housing units between these two residential sections provides a mix of small lot detached housing, townhouse/rowhouses, and garden apartments. Providing residential units at a slightly higher density in these areas would allow for a more cost effective means of providing mixed-income housing units, introducing housing opportunities to a wide range of income levels. The 22 existing detached housing units, Hemphill Housing, located along Hope Road would be preserved due to their historic preservation value and marketability in the current housing market. A total of 288 residential units are planned for the Tinton Falls Reuse Area of what is now Fort Monmouth.

A notable feature of the Residential pockets in this area is the presence of small community parks interspersed throughout. At the center of the residential neighborhood is a central park with a community center and active recreation amenities. As identified later in this Plan, trails and pathways also encircle the area, promoting an active lifestyle and alternative transportation modes. Additionally, residential areas are co-located with employment centers and services as appropriate to encourage a sustainable live-work-play environment.

Institutional/Civic Use

Several municipal facilities are dispersed throughout the Tinton Falls Reuse Area. These functions include the previously mentioned child and teen development facilities (converted to a community recreation center), as well as the library located in proximity to the Municipal Complex and mixed-use Town Center. The fire training facility located in the southeastern corner of the Tinton Falls Reuse Area is also a proposed Institutional Use. The existing fire station would also be reused.

An area of civic uses, classified as Institutional on the Land Use Plan, is situated to the south of the residential zone near the existing Hope Road gate. The area identified for these civic uses includes the existing community center, child development center, and pool and teen center. This use is appropriately positioned in an easily accessible location, as entrance to the area would be more readily accessible once the dead end roadways are extended and security gates removed in 2011 (or earlier depending on phasing).

The existing fire and police training center is planned for reuse by the local academies. FMERPA's Emergency Services Advisory Committee has determined that the reuse of these facilities is appropriate to provide equipment and technology not currently available to them. The training facilities would allow not only the Tinton Falls emergency services branch to train here but would be shared amongst the other municipalities in the area, the County, and the State.

Mixed/Multi-Use

A mixed-use retail center is planned for the northwest corner of the Tinton Falls Reuse Area. This area is intended to become a Neighborhood Retail Center that includes neighborhood convenience, food and beverage, and specialty retail totaling (80,000 square feet) and a 27,000 square foot municipal library.

Consideration of 2 to 3 story residential development and/or professional office space above ground floor retail warrants additional consideration as the Plan develops. This area containing some civic uses is appropriately located adjacent to and east of the existing Tinton Falls Municipal Complex.

Office/High Tech Research and Development

A mixed-use business campus is proposed for the central portion of the Tinton Falls Reuse Area. The business campus is centered around the reuse of the Myer Center, currently an expansive 670,000 square foot building. The majority of the business center development would occur within the first ten (10) year development phase and would include Fabrication Shops, Administrative Offices, a Data Recovery Center (Myer Center), Testing Labs, and Research and Development Testing and Evaluation facilities. The second phase of development adds additional Class A Office/Research and Development facilities. A total of approximately 839,000 square feet of commercial, R&D space is proposed in Tinton Falls.

Open Space/Recreation

Expansive, interconnected open spaces create a parks framework for the Tinton Falls Reuse Area. Much of the open space areas are characterized by natural resources such as wetlands and forests. The open space system is intended to establish wetland buffers and provide continuous interconnected habitat corridors. Additional areas, primarily located along the wetlands corridor, north of the railroad tracks, are planned for reforestation.

In addition, small community parks are interspersed and Blue-Greenbelt trails meander throughout the development. A continuous linear perimeter park is proposed to provide a multi-purpose trail around the Reuse Area. There are approximately 99 total acres of open space within the Tinton Falls Reuse Area. A 12 acre community park containing a community Field House and ballfields is planned in the area buffering the residential area from the office complex.

A 2.5-acre neighborhood green is proposed at the center of the retail center. The green would serve as a passive recreation area and may host events in a bandshell or support a flexible program of markets, festivals, and art exhibits.

Because of the importance of and emphasis placed on the need for preservation and improvement of Open Space areas, a Recreation Plan, which identifies active and passive recreational areas as well as trail and pathway connections has been developed and follows the Land Use Plans.

Eatontown (Charles Wood) Reuse Area

The Eatontown (Charles Wood) Reuse Area is divided into two development areas, the western section composed of approximately 235 acres in the existing Charles Wood Area, and the eastern section composed of 219 acres in the Main Post Area. The Suneagles Golf Course encompasses the majority of the western development area, with the existing Howard Commons housing area covering the remaining portion. The Suneagles Golf Course is envisioned to remain as a golf course in perpetuity with a potential conference center and resort-style lodging. Although the existing units in the Howard Commons area are not deemed appropriate for reuse, this area is a suitable area for mixed-income housing.

Residential (Medium Density)

Although the former Howard Commons area currently contains housing units, the research and analysis conducted as part of this planning effort determined that reuse of these units is not feasible for a variety of building code and non-market responsive reasons. However, it was determined that this area is ideal for mixed-income housing that would help meet New Jersey Council on Affordable Housing (COAH) requirements. Based on these requirements, a minimum of 20% of the housing units are to be set aside for affordable residences. A total of 275 apartments and townhouses are proposed for this residential development component on Pinebrook Road. In addition, 302 new apartments are proposed adjacent to the Route 35 Lifestyle Center. A total of 577 residential units are planned for the Eatontown Redevelopment Area. Additional detail on this Key Area is provided in Chapter 4: Key Area Site Plans. It is anticipated that the Pinebrook residential development would occur in Phase 1 of the development process, with Route 35 residences developed in Phase 2.

Lodging

The second housing component, in the format of lodging, planned in the Eatontown (Charles Wood) Reuse Area is located in the central portion of the Suneagles Golf Course (proposed to remain a golf course accessible to veterans and the public). These units include townhouse/rowhouse style units (existing Megill housing) as part of an upscale conference hotel. Eighteen of the Megill units are intended to serve corporate, longer stay clientele that are making use of the conference center or visiting the area for business purposes. A number of existing units would require removal to provide ample space for a 150-room hotel development.

Institutional/Civic Use

The Institutional use of this area includes the reuse of Gibbs Halls and its outlying facilities. Gibbs Hall would house the golf clubhouse, lockers, pro-shop, restaurant and grill, administrative offices, and potentially be reused as a venue for catering of special events. The area would continue to provide restaurant service; however, the major change would be opening the Suneagles Golf Course to the public.

Commercial

A small commercial development in the form of a 12,530 square foot convenience retail facility is planned at the intersection of Hope and Pinebrook Road. This convenience retail is situated for easy access by the nearby mixed-income residential community in the former Howard Commons apartments location.

Open Space/Recreation

A large portion of the Eatontown (Charles Wood) Reuse Area is characterized by Open Space and Recreation. The existing Suneagles Golf Course would be opened up to the public; however, it would likely be privately-owned and run in conjunction with the hotel and conference center. As discussed later in this Plan, an easement requiring the continued protection of the area and continuation of the golf course use is recommended. Several linear community parks intersect the residential areas. Although public, they are intended to serve the new residential units with passive recreational space, promoting an active lifestyle and an opportunity to appreciate the natural environment. Additionally, trails extend along the rail line right-of-way, providing greenway connections between the development nodes within the Tinton Falls Reuse Area. A total of 314 acres of public open space is proposed in Eatontown, including the golf course.

Eatontown (Main Post) Reuse Area

The Eatontown (Main Post) Reuse Area contains a variety of development nodes, including a Lifestyle/Town Center with an Incubator office node to the north and Consultant Row to its south, a Municipal Complex, and a Recreation/Civic Use area. A special feature of note in this area is the presence and reuse of geothermal well fields. The proposed Town Center is centered around the well fields, which would be reused for their current purpose as well as remain as an open green space free of built structures, providing both active and passive recreational opportunities.

Commercial

Approximately 345,000 square feet of commercial incubator business and consultant's row space is proposed on the former Main Post portion of the base. The multi-facility commercial development fronting Route 35 is situated to transform this area into a new Eatontown Town Center and gateway to the Fort Monmouth Reuse Area. A Lifestyle Town Center along this main corridor would be served by a jitney bus transfer stop, providing access to all points throughout the Fort Monmouth Reuse Area. The 150,000 square foot Lifestyle Town Center may be developed within the first phase of development, and is anticipated to act as an initial economic stimulant for other components of the Plan to come later in the phasing process

Additional commercial uses located further to the northeast include a theater and bowling center. The existing auditorium (Building 1215) would be reused as a community theater. The new bowling center would also take advantage of the existing facility; however, renovations and improvements would likely be required to meet current market expectations.

Residential

Medium density apartments are planned for the area immediately east of the Lifestyle Town Center. These residential units would afford the benefit of being centered around a large open space area, where the geothermal well fields exist. The 302 units are projected to be developed in the second phase of the Plan, after the economic vitality of the area has had an opportunity to mature and historic housing has been absorbed by the marketplace.

Office

The Office space planned in the central portion of the Eatontown (Main Post) Reuse Area is intended to be used for Incubator and Professional Services space and also as a component for high-tech communications companies. Incubator space provides superior flexibility and connectivity for new businesses in a shared facility. As such, this incubator space is provided with the intent of inviting new innovative, start-up, businesses that do not need large facilities such as that provided at the Myers Center.

Institutional/Civic Use

There is one Institutional use area identified within the Eatontown (Main Post) Reuse Area. This includes the 52,000 square foot Mallette Hall and the amphitheater for use as a new Municipal Complex. The Eatontown Borough government offices have proposed to relocate to this space and thereby reestablish themselves in a new location amidst expansive green space and mixed-uses.

Open Space/Recreation

Open space areas, with both existing forested areas and areas identified for reforestation, outline the perimeter of the Eatontown (Main Post) Reuse Area. The eastern portion of the Eatontown (Main Post) Reuse Area is covered by an expanse of open space, with recreational ballfields in the center. Four

ballfields are identified in the Recreation Plan. A total of 125 acres of Blue-Greenbelt parks space are planned for the Eatontown (Main Post) Reuse Area. As previously identified, an expanse of green space on top of the geothermal well fields would be preserved in the center of the Lifestyle Center. Open space areas that are not proposed for active recreational purposes would be reforested as appropriate. Reforestation would allow for the connection of potential wildlife habitat, reinforcing the goal for creating an ecologically productive area.

Oceanport Reuse Area

The three major nodes proposed within the Oceanport Reuse Area include a High Tech/Green Industry Cluster, Education/ Medical Campus, and Oceanport Neighborhood Center. In addition, a boutique hotel and spa and historic housing area provide two additional character areas. Expansive green space is provided in the center of the Oceanport Reuse Area, where the Parade Ground is to be preserved.

Residential

There are three residential zones planned for the Oceanport Reuse Area. Located to the northeast of Oceanport Avenue are approximately 400 for rent and for sale apartments, just outside of the floodplain and Coastal Area Facility Review Act (CAFRA) required buffers. This medium density residential neighborhood located between Parker's Creek and Oceanport Creek would add vitality to the traditional multi-use main street proposed along Oceanport Avenue. This residential component of the Plan is not expected to be developed until the second phase of the Plan.

A mixed-use area is planned immediately to the west of this residential area, on the west side of which is a medium-density residential district. This district is centered on the valuable historic housing that currently exists at Fort Monmouth. The remainder of the historic housing that flanks the Parade Ground includes single-family housing units at a lower density, also designated to continue as a low density residential area lining the Parade Ground.

Finally, the southern portion of the Oceanport Reuse Area, along Main Street, includes a neighborhood of apartments, townhouses and small lot detached residences. A Residential zone in this area provides an appropriate transition with the existing housing outside of the Fort's gates along Main Street. This Residential area would benefit from the education and medical campus planned for the area. A total of 740 Residential units are planned for the Oceanport Reuse Area.

Mixed-Use/Multi-Use

The stretch of the Oceanport Avenue corridor that extends through the Reuse Area is identified for mixed-use development that could provide services and amenities to the residential developments on either side and the greater community. As shown in the Plan, the Oceanport Neighborhood Center is located amidst the residential development and overlooking the Parade Grounds to the southwest.

Institutional/Civic Use

Several institutional use zones are dispersed throughout the Oceanport Reuse Area. Institutional uses may include a school (educational), institutional, and administrative uses. Three of the buildings located around Barkers Circle, some currently being used as office space, are also identified as Institutional (administrative) space. As noted on the Plan, the Barkers Circle area is designated as a potential Oceanport Municipal Complex and apartments.

The existing museum and library are preserved, with the library continuing to serve in its current function. In addition to its continued use as a museum, many reuse opportunities present themselves. The existing museum is the original base theater and has the potential to be transformed back into a theater and venue for local theatrical arts or alternatively reused as an art gallery where local artists could exhibit their works.

As a result of the BRAC early land transfer process, the Federal Emergency Management Agency (FEMA) would be taking over Russel Hall, currently serving as the Garrison headquarters. This area is represented on the Land Use map and Plan in blue with the facility itself as well as approximately 8 acres of the Parade Ground being transferred to FEMA.

The westernmost area of the Parade Ground is also designated for Institutional use, with the existing chapel and associated facilities expected to remain. Additional Institutional areas and facilities planned include a medical/ educational complex, and several smaller buildings such as Armstrong and Squire Halls, providing potential educational reuse opportunities.

Commercial

There are three areas/facilities identified for Commercial use in the Oceanport Reuse Area. These include existing facilities whose use would remain, the bowling alley, fitness center, and commissary (grocery store). Oceanport Avenue would also be redeveloped as a traditional Main Street with multiple uses including conveniences and specialty retail, food and beverage amenities, and professional offices, with residential units above.

Lodging

The 20 year Land Use Plan identifies an area along Parker's Creek for development of Lodging; a portion of which would provide medium-density housing in the short term (10-year Phase 1). This waterfront area has the potential to provide a serene setting for a boutique spa and hotel, consistent with the Lodging designation.

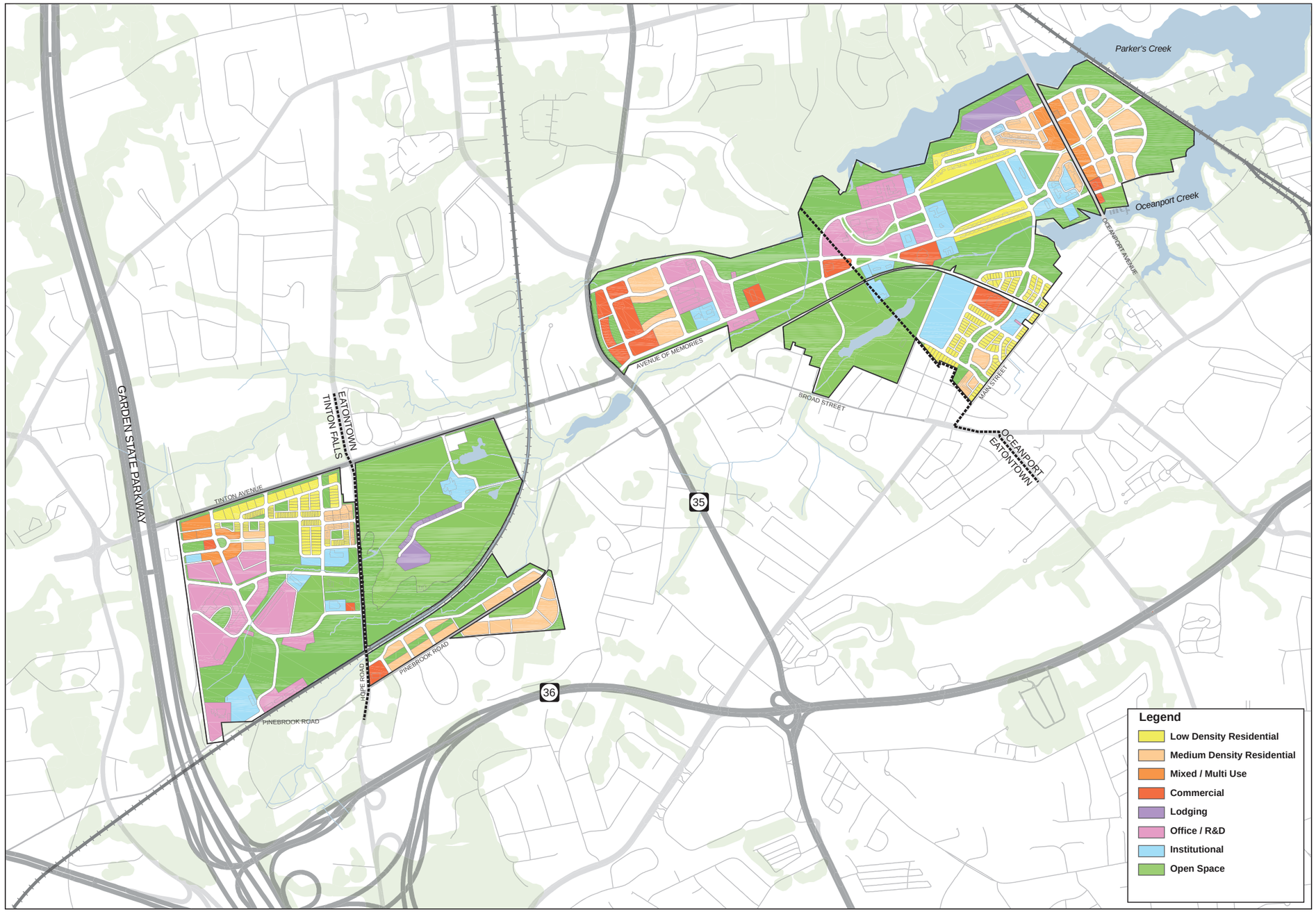
Office

The majority of the Office uses are located in the western portion of the Oceanport Reuse Area. A large 437,119 square foot high-technology office/R&D complex is designated to reuse some of the existing facilities as well as the development of new ones. The highly specialized equipment, including an anachoic chamber, makes the McAfee Center highly attractive for reuse by high-tech companies. Modern "flex" research and development office space would target Nano-Technology and Bio-Technology companies and emerging green industries.

Open Space/Recreation

Much of the Open Space areas designated within the Oceanport Reuse Area includes already forested area along the perimeter of the site and along the waterfront. A notable Open Space area is the Parade Ground, which would be required to remain free of built structures as a result of its historic status. Approximately 229 acres of open space and greenbelt parks are distributed throughout the Oceanport Reuse Area.

A special recreational opportunity is provided along the shores of the Oceanport Creek, a marina with a potential dining option. The existing marina is to be improved and expanded to provide greater public access to the water. A café/restaurant and pedestrian inviting esplanade are also proposed as part of the improvements. Additional detail on these improvements is provided in Chapter 4. Similarly a public esplanade is proposed adjacent to the Hotel Spa on Parker's Creek.



FORT MONMOUTH CONCEPT DIAGRAM : LAND USE PLAN IN 2028 (20 YEAR PLAN)

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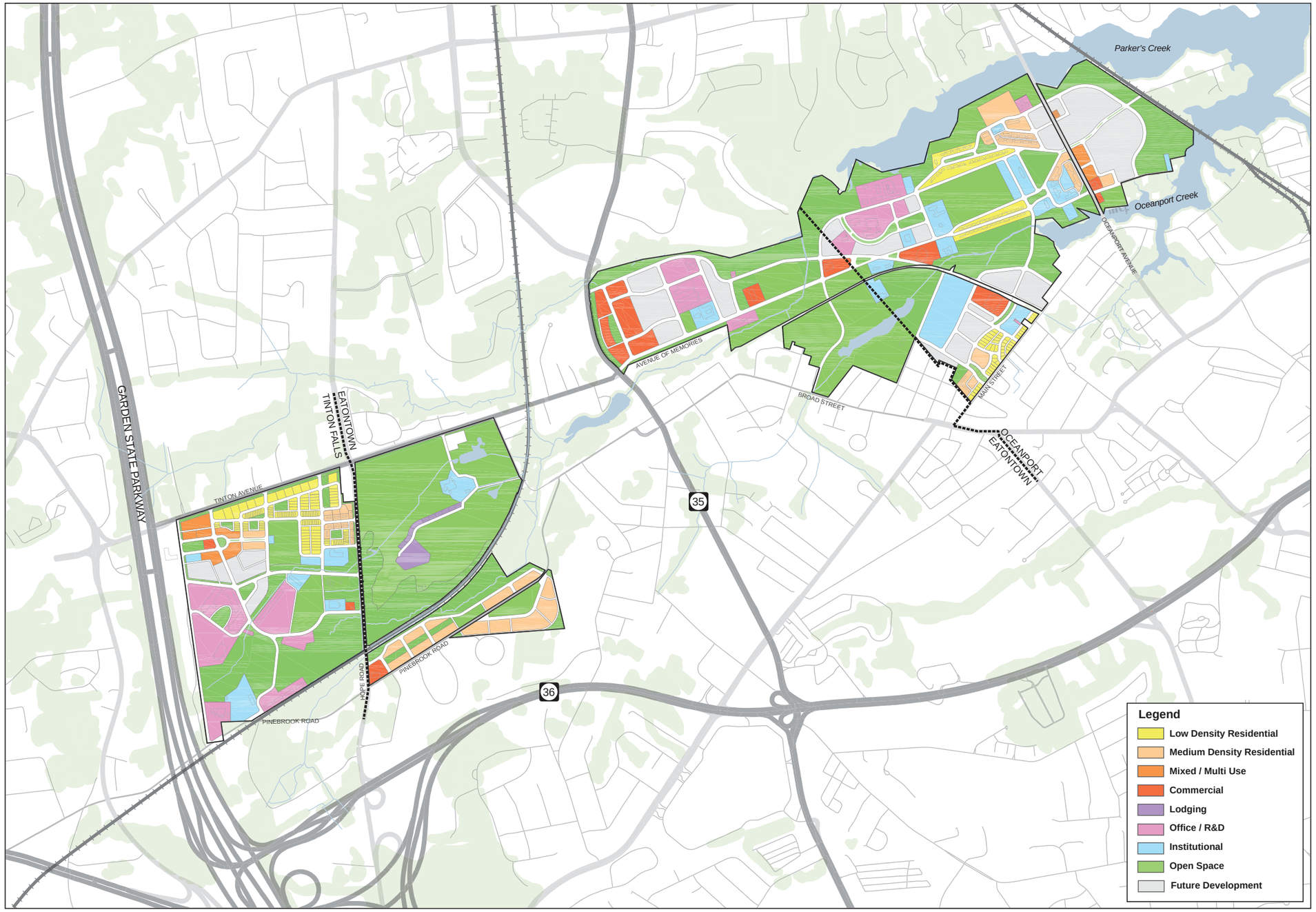

FORT MONMOUTH CONCEPT DIAGRAM : LAND USE PLAN IN 2018 (10 YEAR PLAN)

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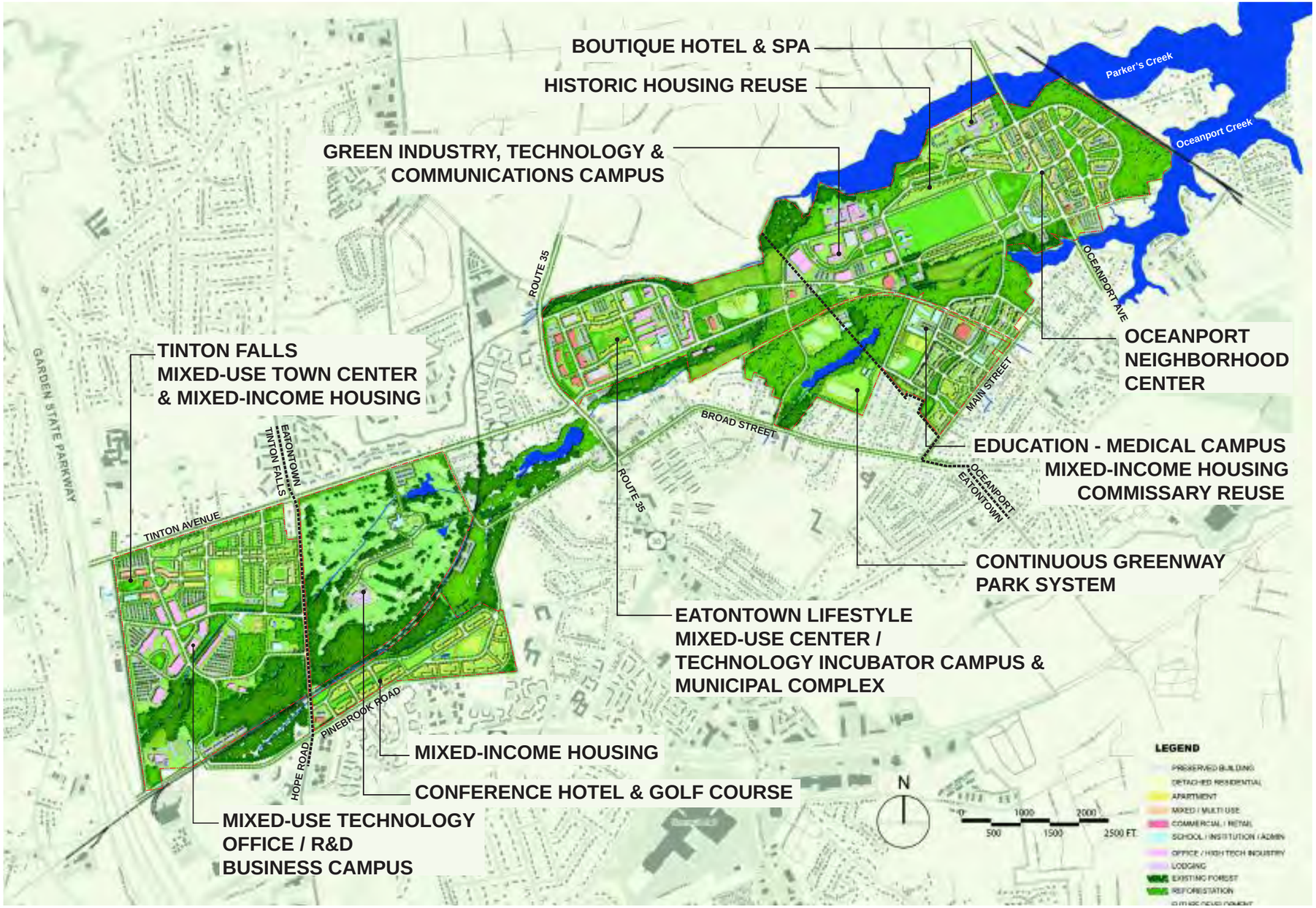
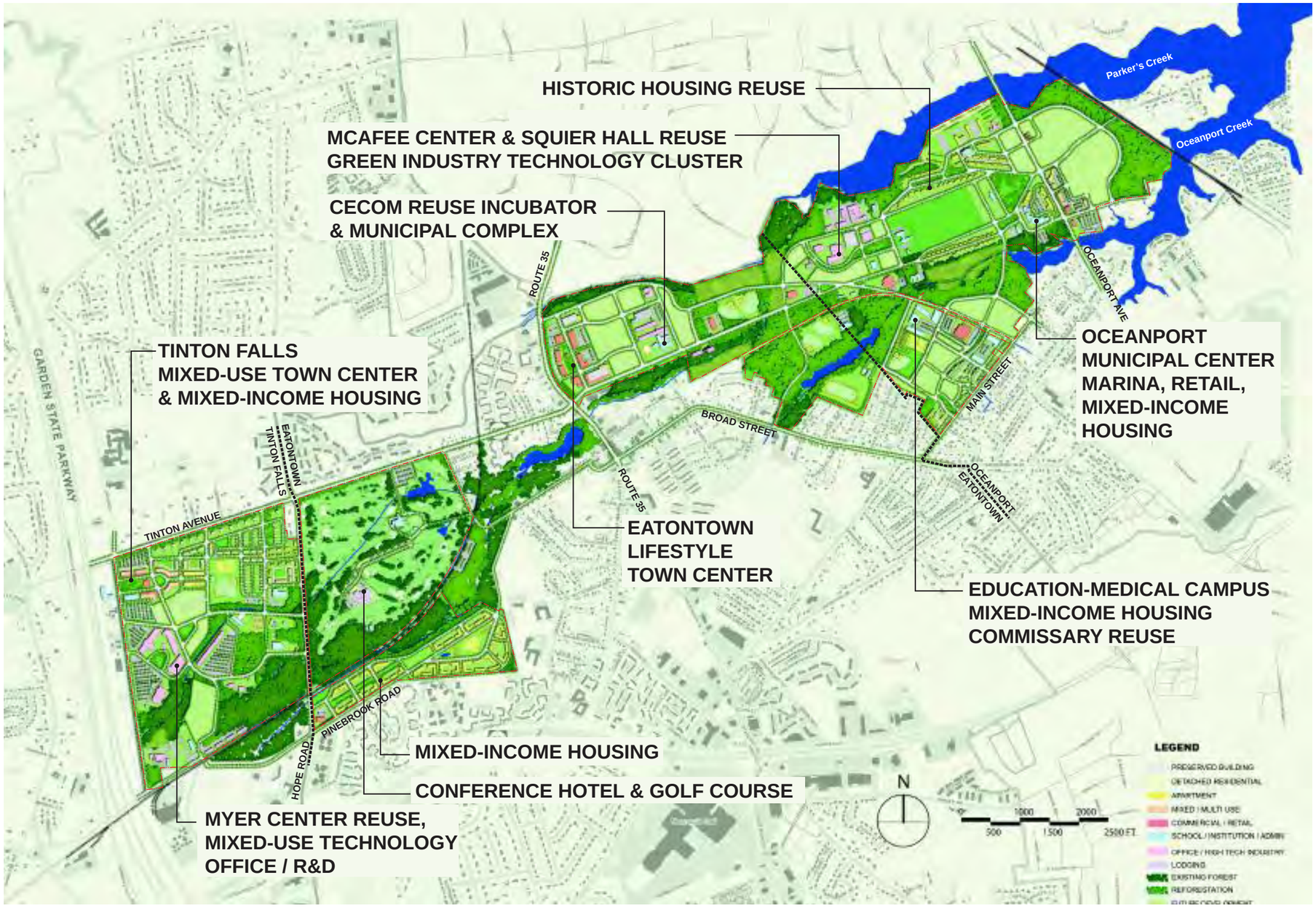


FORT MONMOUTH CONCEPT PLAN CONCEPT PLAN IN 2028 (20 - YEAR PLAN)

FMERPA



FORT MONMOUTH CONCEPT PLAN CONCEPT PLAN IN 2018 (10 - YEAR PLAN)

FMERPA

Artistic Rendering of Tinton Falls Redevelopment Area

Artist: Thomas W. Schaller

Artistic Rendering of Eatontown Redevelopment Area

Artist: Thomas W. Schaller

Artistic Rendering of Oceanport Redevelopment Area

Artist: Thomas W. Schaller

Existing Building Number	DESCRIPTION	Interim Use (I); Permanent Reuse (P)	Tinton Falls 10 Year Plan	Tinton Falls 20 Year Plan	Eatontown 10 Year Plan	Eatontown 20 Year Plan	Oceanport 10 Year Plan	Oceanport 20 Year Plan	Total 10 Year Plan	Total 20 Year Plan	Grand Total
	OFFICE/RESEARCH AND DEVELOPMENT										
173-174	Lab Testing, Office	P					6,388		6,388	-	6,388
209	Allison Hall Office	P					36,665		36,665	-	36,665
281	Professional Office	P					2,544		2,544	-	2,544
283	Squier Hall Office/Education	P					76,538		76,538	-	76,538
286	Russel Hall Garrison Headquarters	P					76,978		76,978	-	76,978
289, 290, 291, 295	General Office	P					21,006		21,006	-	21,006
600	McAfee Center	P					97,000		97,000	-	97,000
1150, 1152	Vail Hall Communication Center	P			36,483				36,483	-	36,483
1208-1210	CECOM Incubator & Professional Office	P			138,050	207,072			138,050	207,072	345,122
2502-2507	Shops/Warehouses	I	42,752						42,752	-	42,752
2525	Adminstrative Offices	P	86,719						86,719	-	86,719
2539- 2540	Lab Testing Buildings	P	15,756						15,756		15,756
2700 Myers Center	Data Recovery Center _ Reconfigured Myer Cent	P	445,522						445,522	-	445,522
2705	Testing Lab	P	47,592						47,592	-	47,592
2707	RDT&E Lab	P	26,476						26,476	-	26,476
New	Technology Flex Office	P				140,000	50,000		50,000	140,000	190,000
New	Office/Research & Development	P		175,000			50,000		50,000	175,000	225,000
New	Green Industry Cluster	P					100,000	200,000	100,000	200,000	300,000
New	Medical Office Building	P					20,000		20,000	-	20,000
	Subtotal Total Office/R&D Space		664,817	175,000	174,533	347,072	537,119	200,000	1,376,469	722,072	2,098,541
	Total Offive/R&D Space by Municipality			839,817		521,605		737,119			
	RETAIL										
114	Fitness Center	*P*					32,250		32,250	-	32,250
450	Public Marina	P					2,600		2,600	-	2,600
689	Bowling Alley	P			17,599				17,599	-	17,599
1007	Commissary Retail Center	P					53,700		53,700	-	53,700
2000	Gibbs Hall Suneagles Golf Club	P			37,125				37,125		37,125
2018	Suneagles Restaurant	P			3,205				3,205	-	3,205
2567	Gas Station	P	1,335						1,335	-	1,335
New	Neighborhood Convenience Retail	P	48,000	32,000	12,530		19,000	19,000	79,530	51,000	130,530
New	Lifestyle Town Center Retail	P			150,000				150,000	-	150,000
New	Waterfront Retail	P						9,000	-	9,000	9,000
New	Waterfront Boutique Hotel Retail	P						3,000	-	3,000	3,000
New	Spa	P						3,000	-	3,000	3,000
	Credit Union	P					5,000		5,000	-	5,000
	Subtotal Retail Space		49,335	32,000	220,459	-	112,550	34,000	382,344	66,000	448,344
	Total Retail Space by Municipality			81,335		220,459		146,550			
	HOSPITALITY/CONFERENCE CENTER (assume 750 SF per room)										
New	Conference Hotel	P			225,000				225,000	-	225,000
New	Conference Center	P			15,000				15,000	-	15,000
New	Waterfront Hotel	P						70,000	-	70,000	70,000
											-
	Total Hotel/Conference Center		-	-	240,000	-	-	70,000	240,000	70,000	310,000
	RESIDENTIAL (assume 1,500 SF per unit)										
2231-2240,2260	Hemp Hill Housing	P	22						22	-	22
211-319	Russel/Allen Avenue Housing	P					32		32	-	32
234-258	Gosslin Housing	P					45		45		45
261-270, 328, 360	Russel/Carty Avenue Apartments	P					36		36	-	36
271	Gardner Hall Residential	P					15		15	-	15
1077, 1078	Main Street	P					24		24		24
New	1-Family Small Lot	P	39				80	79	119	79	198
New	1-Family Large Lot	P	14						14	-	14
New	Townhouse/Rowhouse	P	83			302			83	302	385
New	Apartments	P	130		275		60	309	465	309	774
New	Oceanport Ave Apartments	P					30	30	30	30	60
	Subtotal Mixed Income Residential Units		288	-	275	302	322	418	885	720	1,605
	Total Residential Units by Municipality			288		577		740			
	Total Mixed Income Square Footage		439,700	-	445,800	453,000	1,122,697	627,000	1,327,500	1,080,000	2,407,500
	CIVIC										
206208	Barker Circle Oceanport Municipal Complex	P					76,776		76,776	-	76,776
275	Kaplan Hall Museum	P					7,432		7,432	-	7,432
501	Family Faith Day Center (former ACS Center)	P					2,832		2,832		2,832
502	Library	P					10,650		10,650	-	10,650
551	Armstrong Hall Education Building	P					13,595		13,595		13,595
702	Lane Hall Community Conference Center	P					12,100		12,100		12,100
814	Recreation Support Building	P					8,863		8,863	-	8,863
1206-1207	Eatontown Municipal Center Malette Hall	P			57,386				57,386	-	57,386
1215	Public Theater	P			18,883				18,883	-	18,883
2290	Child Development Center	P	19,600						19,600	-	19,600
2566	Recreartion Center (former Teen Center)	P	19,636						19,636	-	19,636
2560, 282	Fire/Emergency Services Station	P	10,070				6,089		16,159	-	16,159
2569	Community Pool/Tennis Center(s)	P	1,000						1,000	-	1,000
2707, 2709, 2713	Fire & Police Training Academy	P	11,110						11,110	-	11,110
1230	University Recreation Bubble	P							-	-	-
B500	Chapel	P					16,372		16,372	-	16,372
B1075 PAHC	VA - Community Medical Center	P					60,000		60,000	-	60,000
New	Middle School (450 students, 16-acres)	P					145,000		145,000	-	145,000
New	Fort Monmouth Jitney Bus	P			200				200	-	200
New	Library	P	27,000						27,000	-	27,000
New	Monmouth County Homeless Shelter	P					15,000				
	Total Civic		88,416	-	76,469	-	374,709	-	524,594	-	524,594
	Total Residential Square Footage		439,700	-	445,800	453,000	1,122,697	627,000	1,327,500	1,080,000	2,407,500
	Total Non-residential Square Footage		802,568	207,000	711,461	347,072	1,024,378	304,000	2,523,407	858,072	3,381,479
	Grand Total		1,242,268	207,000	1,157,261	800,072	2,147,075	931,000	3,850,907	1,938,072	5,788,979

Non-Residential Building Reuse Index

Non-Residential Building Reuse Index

Bldg Number	Bldg name	Existing use	Proposed Use	GSF	Tinton Falls	Eatontown	Oceanport	Office	Lab/Data	Homeless	Retail	Educ.	Other
114	Fort Monmouth Physical Fitness Center	Fitness Center	Health Club	32,250			32,250				32,250		
173 - 174	Lab Testing, Administrative General Purpose	same	same	6,388			6,388	6,388					
206, 208	Barker Circle; Barnes Hall	Residential	Municipal Office	67,776			67,776						
209	Allison Hall (Originally Hospital)	Office	Office	36,665			36,665	36,665					
270	Lodge	Guest Housing	Homeless Accommodation	11,315			11,315			11,315			
271	Gardner Hall	Residential	same	20,007			20,007			20,007			
275	Kaplan Hall	Communications Museum	same	7,432			7,432						7,432
281	Administrative Offices	same	Professional office	2,544			2,544	2,544					
282	Firehouse	same	same	6,089			6,089						6,089
283	Squier Hall	Office, Auditorium	same	76,538			76,538	76,538					
286	Garrison Headquarters	Office	FEMA Headquarters	76,978			76,978	76,978					
291	Administrative General Purpose	same	Office	12,006			12,006	12,006					
295	Administrative General Purpose	same	Office	9,000			9,000	9,000					
450	Boat House	same	same	2,600			2,600						2,600
451	Main Post Office	same	same	5,013			5,013						5,013
500	Chapel	Chapel	Chapel	16,372			16,372						16,372
501	Counseling Center	same	same	2,832			2,832						2,832
502	Main Library	Library	Municipal Library	10,650			10,650						10,650
551	Armstrong Hall	Classrooms	BCC Classrooms	13,595			13,595					13,595	
562	Water Tower/utility Building	same	same	332			332						332
600	McAfee Center	Office & R&D	Office & R&D	97,000			97,000						
689	Fort Monmouth Bowling Center	Bowling Alley	Bowling Alley	17,599		17,599					17,599		
702	Lane Hall	Community & Conference Center	same	12,100			12,100						
700	Recruiting Center	Office	Office	unknown									
NA	Credit Union	Bank	Bank	unknown									
814	Recreation Support facility	same	same	8,863		8,863							8,863
1007	Commissary	Commissary	Retail, Community Center	53,700			53,700				53,700		
1150 - 1152	Vail Hall	Communications Center	same	36,483		36,483			36,483				
1206 - 1207	Mallete Hall	CECOM HQ, Auditorium	Eatontown Municipal Bldg	57,386		57,386							57,386
1208 - 1210	CECOM Labs	Ops, Office, Labs	Incubator Space	345,120		345,120		172,560	172,560				
1215	Theater	Auditorium	Theater	18,883		18,883							18,883
1230	Field House Athletic Bubble	Field house	same - relocated off Fort	20,629		20,629						20,629	
2000	Gibbs Hall	Officers Open Dining	Golf Clubhouse	37,125		37,125							37,125
2018	Golf Course Restaurant	Officers Open Dining	Restaurant	3,205		3,205					3,205		
2290	Child Development Center	daycare	same	19,600	19,600							19,600	
2502 - 2504, 2506,2507	Shops	Machine Shops	Fabrication Shops	42,752	42,752								42,752
2525	Administration Building	Office Space	same	86,719	86,719			86,719					
2539 - 2540	Lab Testing Buildings	R&D	same	15,756	15,756				15,756				
2560	Firehouse	same	same	10,070	10,070								10,070
2566	Youth Center	Teen Youth Center	Community Rec. Center	19,636	19,636							19,636	
2567	Gas Station	Gs Station	same	1,335	3,000						1,335		
2627	Gun Range/Fire Training Center	Training	same	11,110	11,110								11,110
2700	Myer Center	HQ/Labs	Data Center or State NOI	673,540	673,540			336,770	336,770				
2705	Network Systems Building	Labs, Testing	same	47,592	47,592				47,592				
2707	RDT&E Labs	Labs, Testing	same	26,476	26,476				26,476				
Total Reuse Area excluding residential				2,079,061	956,251	545,293	579,182	816,168	635,637	31,322	108,089	73,460	237,509

Residential Building Reuse Index

Residential Building Reuse Index

Historic Housing Location	Building Number	Interim (I), Permanent (P)	Total Square Footage	Tinton Falls Square Footage	Eatontown Square Footage	Oceanport Square Footage	Tinton Falls Total Buildings	Total Units	Eatontown Total Buildings	Total Units	Oceanport Total Buildings	Total Units	Grand Total Buildings	Grand Total Units
Historic Housing														
Hemp Hill Housing	B2231-2240, 2260	P	40,700	40,700			11	22					11	22
Megill Housing	B2022-2030	P	33,300		33,300		9	18					9	18
Gosslin Housing	B234-258	P	126,288			126,288					25	45	25	45
Russel/Allen Avenue Housing	B211-319	P	282,496			282,496					19	32	19	32
Russel/Carty Avenue Apartments	B261-270, 328, 360	P	151,643			151,643					13	36	13	36
Barker Circle	B205, 207, 287	P	117,301			117,301					3	75	3	75
Gardner Hall Housing	B271	P	20,007			20,007					1	15	1	15
Non Historic Housing Location														
Main Street	B1077,1078	P	18,655			18,655					2	24	2	24
Total			790,390	40,700	33,300	716,390	20	40	-	-	63	227	83	267

Note: Square Footages exclude garages and out buildings

3.3 Existing Buildings & Facilities Review

As part of the planning process, the condition of buildings and facilities throughout Fort Monmouth was reviewed through data collection and on-site surveys. The facility survey involved a review of available existing data and a field survey of representative buildings located throughout Fort Monmouth, selected based on the following criteria:

- Permanency – Nothing originally built as a temporary structure was surveyed.
- Reuse Potential – Buildings assumed to have potential for reuse based on their existing use and condition were identified for survey.
- Size - Except for housing, only buildings over 10,000 sq. ft. were surveyed.
- Historical Significance – All eligible structures, or representative examples, were surveyed.
- Known interest in re-use – All structures for which there is a Notice of Interest ("NOI") were surveyed.

Refer to Section 7.0 Historic Preservation Guidelines for additional information regarding reuse of existing buildings.

Based upon the review of existing conditions approximately 2,000,000 square feet of non-residential buildings and 800,000 square feet residential buildings are proposed for reuse. A summary matrix of residential and non-residential buildings is provided on page 3-10. The selection of facilities for reuse is subject to change pending completion of FMERPA's NOI review and decision-making process.

3.4 Circulation Plan

As development of the Reuse Area progresses and anticipated growth in the surrounding communities occurs, the need for a clear and reliable transportation Plan would become increasingly important. In order to accommodate and manage this growth, significant improvements would be required. The first step in this process is the identification of both improvements to the existing roadway infrastructure and the management of transportation via improved linkages to transit facilities, thereby minimizing the demand placed on the road network.

This Circulation Element provides a framework for the transportation network improvements and is supplemented by a full report titled "Future Traffic Conditions and Analysis." This report provides a detailed analysis of roadway capacities and service levels as well as suggests improvements to the infrastructure to make the system both financially feasible and operationally acceptable.

The Circulation Element identifies a circulation network for the movement within the entire Reuse Area. The circulation system includes the internal network of roadways, bus/jitney stops and routes, trails, and sidewalks as well as the external network of freeways, arterials, transit stops and routes, and bicycle and pedestrian routes. The Circulation Element and Land Use Element are interconnected in that the Land Use Plan could not function without proper circulation and handling capacity.

Site Access

The Fort is currently a secure installation; therefore, direct access into the site is only available through three designated gates, with the remaining interior roadways terminated at dead ends at the perimeter of the site. Enhanced mobility is a critical factor in the redevelopment and reuse of Fort Monmouth. The opening of the Reuse Area to public traffic, following Fort Monmouth's closure in 2011, would provide an opportunity to greatly enhance east-west and north-south mobility throughout the communities. Under existing conditions, non-military vehicles must circumnavigate the secure site along State Routes 35 and 36, Hope Road, Tinton Avenue, Broad Street, Main Street, Oceanport Avenue, and Sycamore Avenue. During the A.M. and P.M. peak hours, key intersections throughout the area experience poor level of service resulting in travel delays. The reopening of the security gates to allow private vehicle travel throughout the Reuse Area provides an opportunity to enhance local and regional mobility.

Transportation Analysis

In order to enhance area mobility, support redevelopment and reuse of the site, and improve access to recreational facilities and open space, the Plan for on-Fort mobility must address the goals identified to the right.

Transportation Circulation Improvement Goals:

1. Open all security gates and remove all barricades to permit free access to the entire Reuse Area.

2. Open and extend adjacent neighborhood roadways into the Fort to provide mobility options to area residents.

3. Upgrade existing on-Fort roadways to meet State, County and or municipal regulations and standards as may be applicable, while maintaining the character of roadways within the Historic districts.

4. Supplement existing on-Fort roads with new east west and north-south connections through the Fort.

5. Provide for the inclusion of a jitney bus service loop linking all areas of the Fort to the Little Silver train station and to local bus service on Route 35.

6. Provide enhanced bus and jitney connectivity through the provision of safe and efficient intermodal stations and stops.

7. Provide alternative mobility strategies including multi-purpose trails, bikeways and an extensive pedestrian sidewalk system.

8. Improve off-Fort mobility through the improvement of key interchanges, intersections and roadways leading to Fort Monmouth.

1. Open all security gates and remove all barricades to permit free access to the entire Reuse Area.

Today, primary access to the Main Post occurs at three gates: The main gate at Route 35 and Tinton Avenue in Eatontown, and two main gates located on Oceanport Avenue in Oceanport. A secondary gate (Nicodemus Gate) located on Broad Street in Eatontown provides limited access to military personnel only. Tertiary gates located along Main Street in Oceanport are closed to all traffic. The Charles Wood Area is accessed at primary gates located on Tinton Avenue and Hope Road. This Reuse Plan proposes all gates be opened to public traffic and interior roadways be extended outward into the communities following the closure of Fort Monmouth in 2011.

2. Open and extend neighborhood streets.

Vehicular mobility through the Oceanport and Eatontown Reuse Areas can be further enhanced through the extension of streets currently abutting and terminating at the perimeter of the Reuse Area. Specifically, the opening of roadways would occur along Broad Street in Eatontown and Main Street in Oceanport. Further traffic and engineering assessment of streets recommended to be extended would be required in the next stage of planning to confirm feasibility and assess neighborhood impacts.

Existing closed gates on Main Street should be reopened and aligned with neighborhood streets. Stephenson Avenue adjacent to the Patterson Army Health Clinic may be aligned with Whitehall Court. The Razor Avenue gate should be realigned with Wolf Hill Avenue thereby providing enhanced north-south access to Eatontown Boulevard and Route 36. Additional new roads extending Monmouth Park Place and Center Street warrant further study in the next phases of planning.

Similarly, access to the Tinton Falls and western Eatontown Reuse Areas may be enhanced through the addition of a limited number of new intersections along Hope Road and Tinton Avenue. The two existing gates on Hope Road (Laboratory Road and Corregidor Road) should be opened to afford access adjacent to the Youth Center and the Child Development Center, respectively. An additional entrance from Hope Road warrants evaluation at Hemp Hill Road. Assessments of traffic signal progression along Hope Road would be part of future site planning efforts.

Additional access points from Tinton Avenue must consider the roadway's scenic designation, the location of Monmouth Regional High School, and residential uses. Consideration of realigning Norman J. Field Way and Municipal Drive (Pearl Harbor Way) should be considered to address traffic flow and safety. The Bataan Avenue gate and the potential for the extension of Guam Lane to Tinton Avenue should be evaluated in the next phase of work.

3. Upgrade existing on-Fort roadways to meet State, County, and/or municipal regulations and standards.

The following Street Typology Diagram and Street Cross Sections illustrate the proposed system of existing and new roadways that would form the Reuse Area's street network to enhance vehicular mobility. Existing roads would require upgrading to New Jersey Department of Transportation (NJ DOT) standards for lane width, shoulders, curbs, drainage, and other criteria. All new roads would be constructed to the standards of the governing agencies and R.S.I.S.

The following summarize some of the recommended roadway improvements. As previously stated, the rationale for the recommended improvements is based on planning experience as well as the "Future Traffic Considerations and Analysis" report.

Avenue of Memories – extends from the existing main gate at Tinton Avenue and Route 35, through the Historic District to Oceanport Avenue. Enhancement of this corridor is the most important interior improvement that can be made to enhance east-west vehicular mobility. Avenue of Memories would be a four-lane undivided roadway extending to Wilson Avenue at the Historic District.

Avenue of Memories/Saltzman Avenue and Sherril Avenue – would form a one-way pair through the Historic District to preserve the historic width of streets and the mature allees of trees lining them. Avenue of Memories and Saltzman Avenue would provide two lanes of travel eastbound, while Sherril Avenue would provide two lanes of travel westbound.

Razor Drive/North Drive – are proposed to be realigned to provide north-south access between Route 35 in Eatontown and Main Street in Oceanport. The proposed alignment is anticipated to primarily be a two-lane configuration with center turning lanes provided at development clusters in the vicinity of the commissary, Green Industry Cluster, and Lifestyle Town Center. The intersection of Route 35 and North Avenue is anticipated to provide right-in/right-out movements only to expedite traffic flows.

Main Post Historic District's Existing Streets – are to be maintained in their current configuration and alignment unless safety issues are identified in further studies. To the greatest extent practical, the existing roadway network should be retained and upgraded to meet the circulation needs of the planned redevelopment, thereby taking advantage of existing roadway and utility infrastructure. Given the clustering approach to the redevelopment strategy, a number of roads would be abandoned and demolished. Most notable among these is the removal of Alexander Avenue, Nicodemus Avenue, and Malterer Avenue in the area of the existing motor pool. Their removal would facilitate the creation of a large public park and recreation area, provide for the day lighting of the tributary to Oceanport Creek, and facilitate the establishment of wetland buffers to protect the water and habitat resources of the creek.

Additional improvements in the immediate vicinity of the Reuse Area, as identified in the full Transportation Report, include:

Route 36 and Hope Road - potential modifications include the separation of nearly all turning movements with the creation of new jughandles ramps on the east side of the intersection on State-owned lands, and the addition of a new off-ramp from the northbound Garden State Parkway (GSP).

Hope Road and Tinton Avenue- potential modifications include the reconfiguration of all intersection approaches to match the northbound Hope Road approach to Tinton Avenue, configured with two through lanes and one left-turn lane.

Route 35 and Tinton Avenue – in order to continue to serve as the main entrance to the area, as the gateway to the Reuse Area, additional roadway capacity is required. Potential modifications include three through lanes and exclusive left- and right-turn lanes on northbound Route 35; a double left-turn lane into the site, one through lane, and one shared through/right-turn lane on southbound Route 35. Exiting, potential modifications include a double left-turn, one through lane, and one right-turn lane into the site; and two through lanes and one left-turn lane on the eastbound Tinton Avenue approach.

Fort Monmouth Street Typologies and Sections

The Street Typology Map and Street Cross-Sections document the planning team's

recommendations for roadway improvements. The street sections are based in part on the character of existing internal streets and governing agency standards. The planning process included ground truthing of the site's roadways via measuring existing streets and photographically documenting existing conditions. Consideration of maintaining historic character, building to street relationships, and preserving significant street trees was given during the preparation of recommended street sections.

The physical location of streets and street types is illustrated in the Street Typology Map. Corresponding street sections identify the proposed right-of-way, pavement width, street use, parking, sidewalks, tree planting, bio-swale integration and other elements of the streets. All utilities should be placed underground or in rear alleys. Any proposed roadway improvements must maintain the integrity of the Fort Monmouth street typologies and corresponding sections.

Pedestrian Network

In addition to vehicular traffic, the proposed street network accommodates and promotes pedestrian circulation with extensive sidewalk coverage throughout the entire Reuse Area. The existing street system has a fragmented and incomplete network of sidewalks that would be addressed in the Final Plan. As redevelopment and infill takes place throughout the Reuse Area, existing sidewalk upgrades would be undertaken.

The Pedestrian Network Diagram illustrates the proposed integrated sidewalk system that links all components of the Reuse Plan. All street sections are recommended to be developed with sidewalks on both sides of the street to promote pedestrian mobility and contribute to community place-making. Minimum widths of sidewalks are recommended at 5 feet in Residential and Office/R&D clusters. Main Street or retail sidewalks are recommended at a minimum 15-foot width, with 20 feet preferred, to permit outdoor dining and display.

Multi-Purpose/Bicycle Routes

The provision of a comprehensive network of multi-purpose trails and bikeways throughout the Reuse Area is essential to creating a vibrant live-work environment. The Recreation Plan illustrates the conceptual alignment of the trail and pedestrian systems. The multi-purpose trail system is intended to link all development clusters to the Blue-Greenway system of open spaces and to other centers of activity. Multi-purpose trails are recommended to be planned throughout the Blue-Greenway and provide two-way circulation throughout. Multi-purpose trails shall be a minimum of 10 feet wide, and striped and marked in accordance with prevailing standards.

A combination of bicycle routes, lanes within roadbeds (striping and marking), and paths separated from vehicular traffic designed to NJ DOT's Bicycle Compatible Roadways and Bikeways Planning and Design Guidelines (April, 1996), New Jersey Bicycle Manual and Bicycle Plan ,and American Association of State Highway and Transportation Officials (AASHTO) standards is encouraged. To the greatest extent feasible, on-road bicycle dedicated Class 1 or 2 lanes and dedicated paths are to be employed to minimize vehicular conflicts. Bikeways are to have logical connections to surrounding neighborhoods, schools, and existing and proposed Monmouth County bikeways.

All multi-purpose and bicycle trails shall provide convenient and safe connection to public transportation systems (bus and jitney) to promote intermodal trips. Trailheads, intermodal transit stops, open spaces, and neighborhood clusters are to provide bicycle facilities including secure bicycle parking, trail maps, drinking fountains, and publicly accessible restrooms.

SIDEWALK IMPROVEMENTS

-- handicapped- access ramps at all intersection approaches

-- installation of tactile surfaces (ADA)

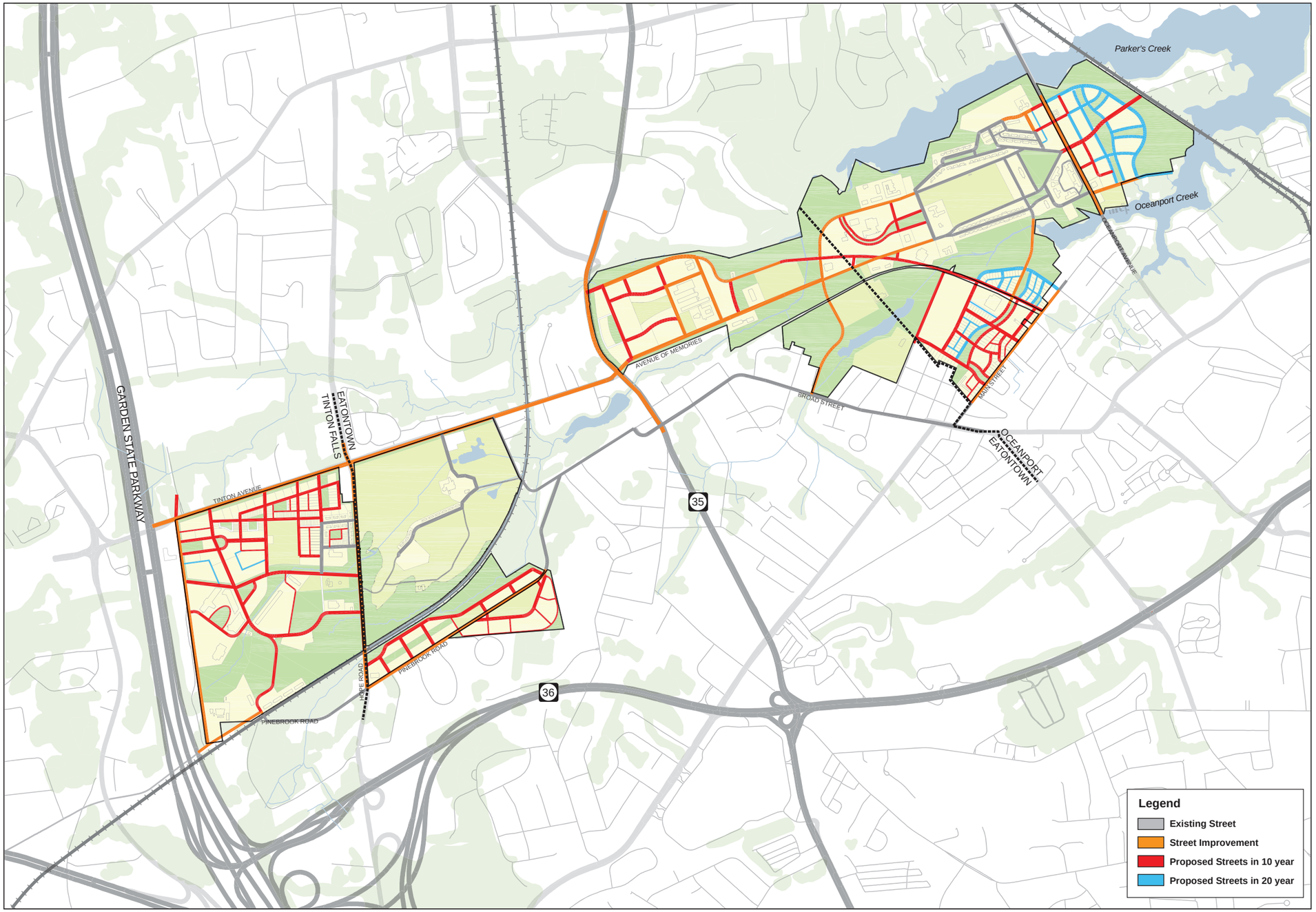
-- provision of adequate widths for ADA

Transit Service

Transit service is a critical component of the Transportation Element as it reduces congestion on roadways, reduces the need for a costly and inefficient expansion of infrastructure, and contributes to the sustainability concept encouraged. Transit service options explored as part of this planning effort focused on rail, bus, and jitney services.

A jitney service is proposed for internal circulation, access to the external roadway network, connection to local bus service on Route 35 and regional rail service at the Little Silver Train Station. The jitney service proposed encircles the entire Reuse Area, accessing all three municipalities. The route has drop-off locations, with two key spots that provide connections to bus service, providing access to a larger regional transit network.

Extensive dialogue has taken place between FMERPA, the consulting team, and New Jersey Transit and State representatives with regard to the potential for the provision of rail stations to access the regions core urban areas. At this time no rail station improvements are planned for Fort Monmouth. Provision for their addition has been made through the reservation of land on or adjacent to the post along the New Jersey coast line in Oceanport and in the southwest corner of Tinton Falls.



FORT MONMOUTH CONCEPT DIAGRAM : STREET PHASING PLAN

FMERPA

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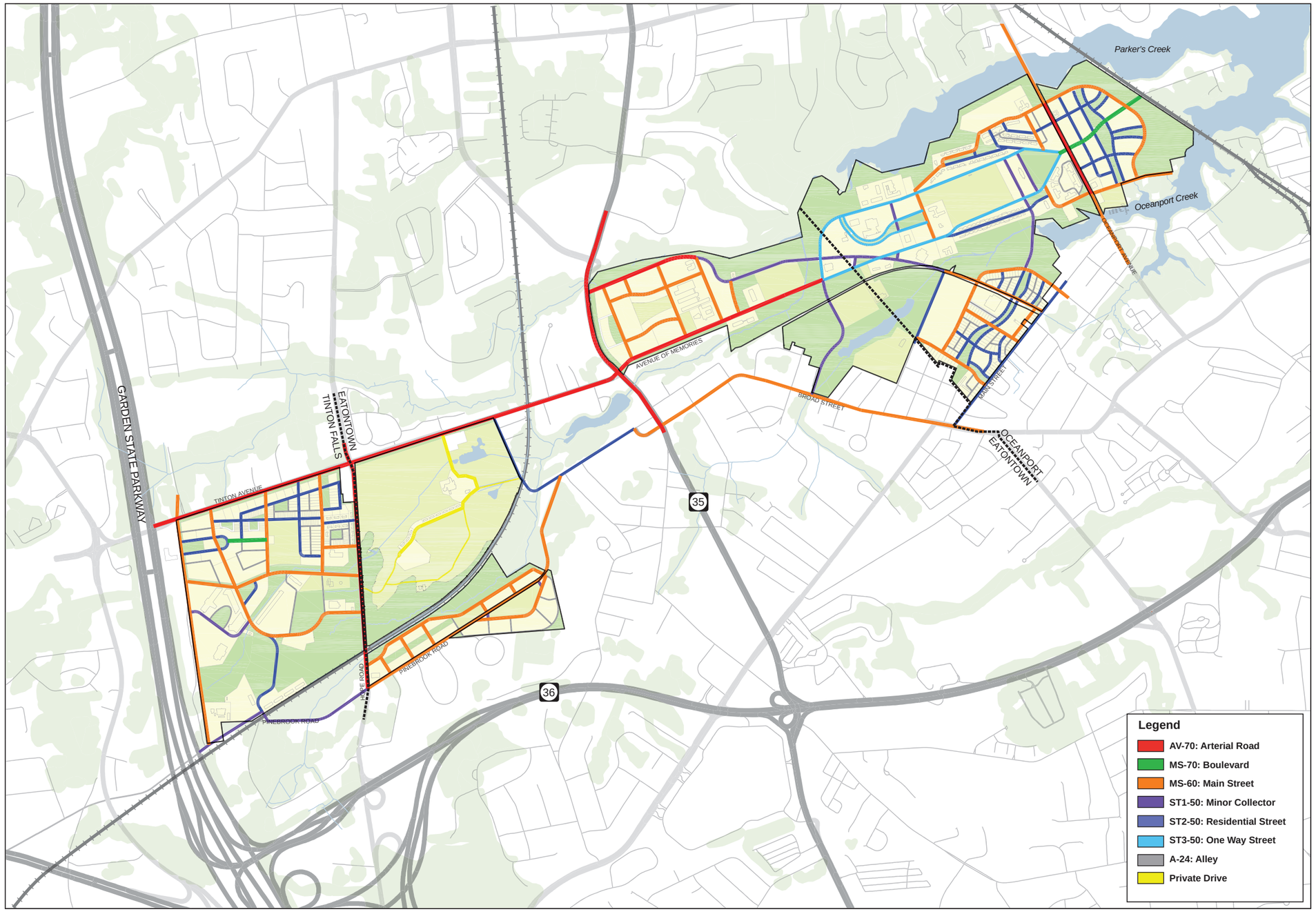

FORT MONMOUTH CONCEPT DIAGRAM : STREET TYPOLOGY MAP

FMERPA

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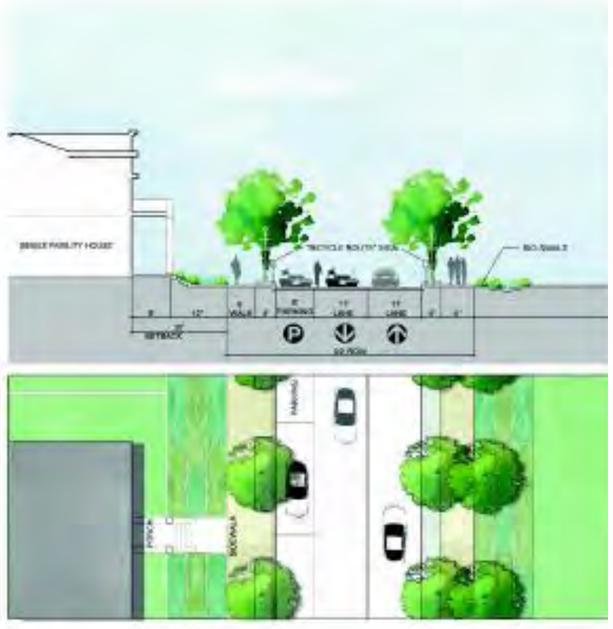
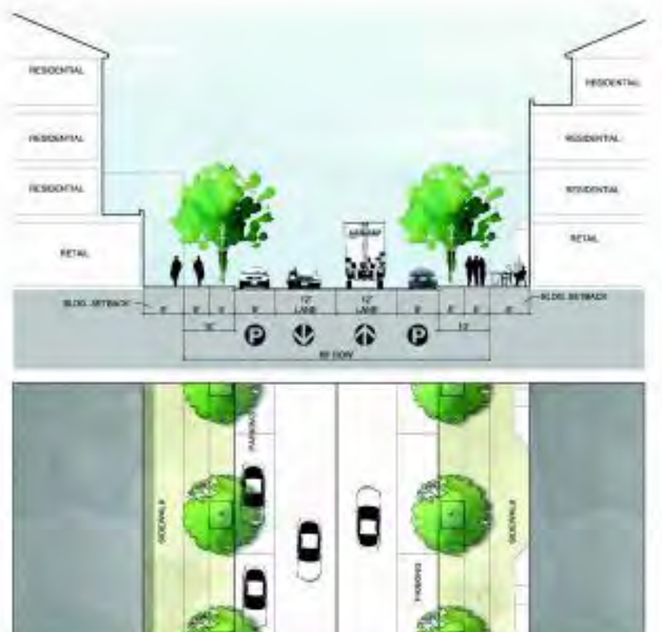
Street Typology Sections

A - 24	PARKING ALLEY



ST2 - 50	CRESCENT DRIVE

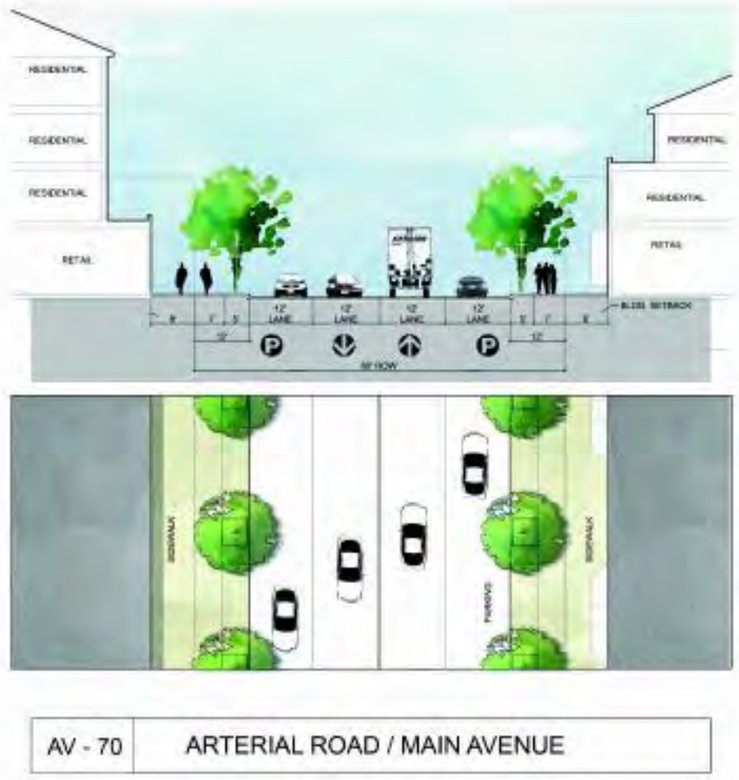


MS - 60	MAIN STREET RETAIL / RESIDENTIAL

Street Typology Sections

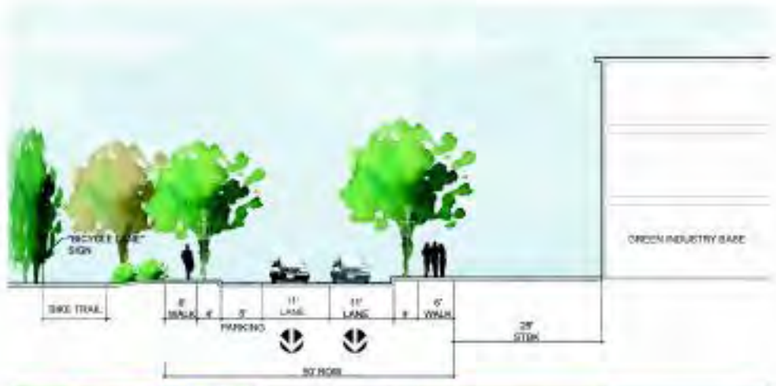
ST2 - 50	RESIDENTIAL STREET DOUBLE LOADED

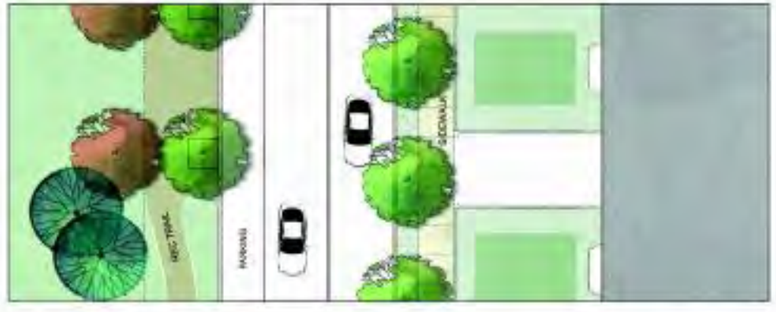
ST1 - 50	MINOR COLLECTOR ROAD



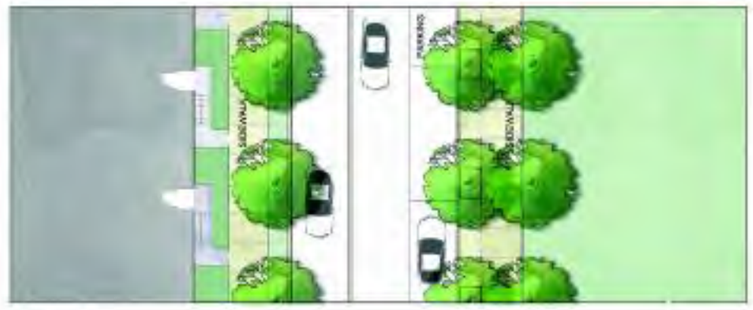
AV - 70	ARTERIAL ROAD / MAIN AVENUE

Street Typology Sections

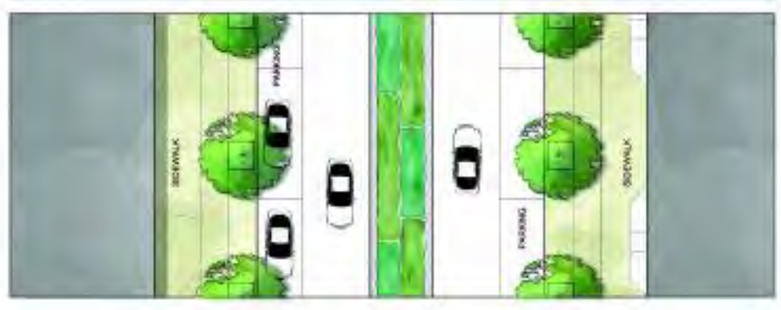




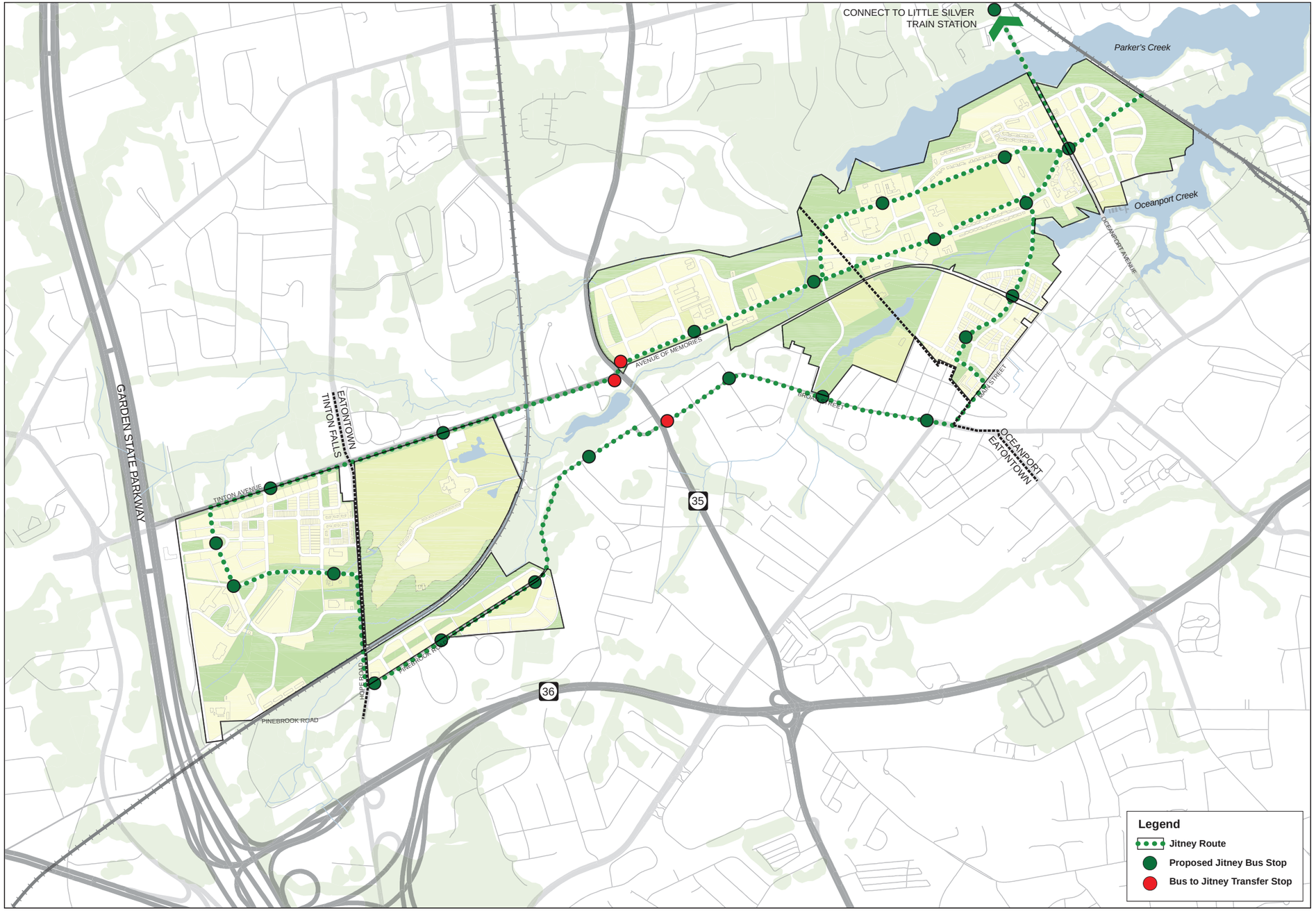
ST3 - 50	ONE WAY STREET (WILSON AVE. / E. AVE OF MEMORIES



ST-50	PARK SOUTH STREET / VILLAGE GREEN



MS - 70	BOULEVARD RETAIL / RESIDENTIAL



FORT MONMOUTH CONCEPT DIAGRAM : TRANSIT PLAN

FMERPA

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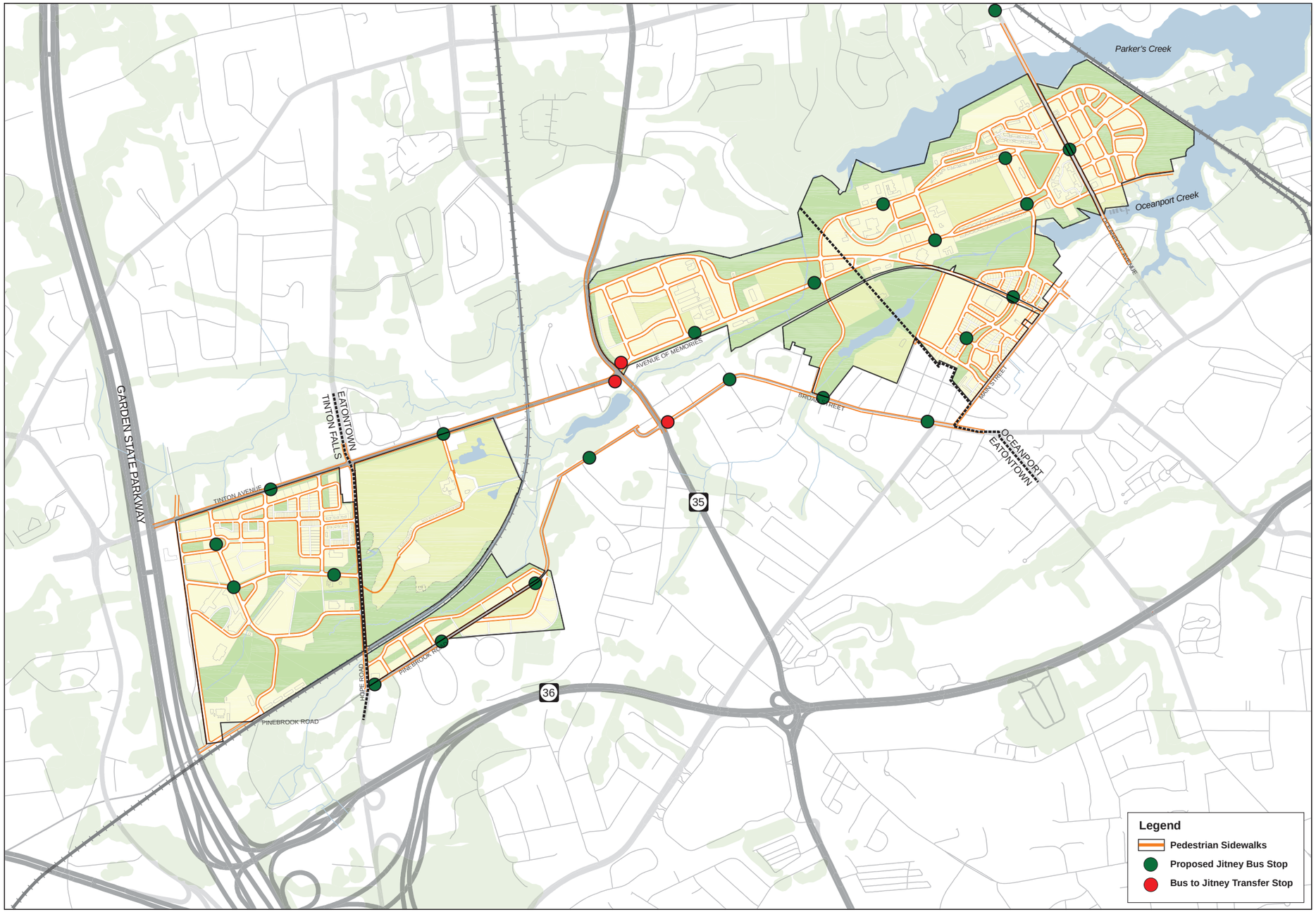

FORT MONMOUTH CONCEPT DIAGRAM : PEDESTRIAN NETWORK PLAN

FMERPA

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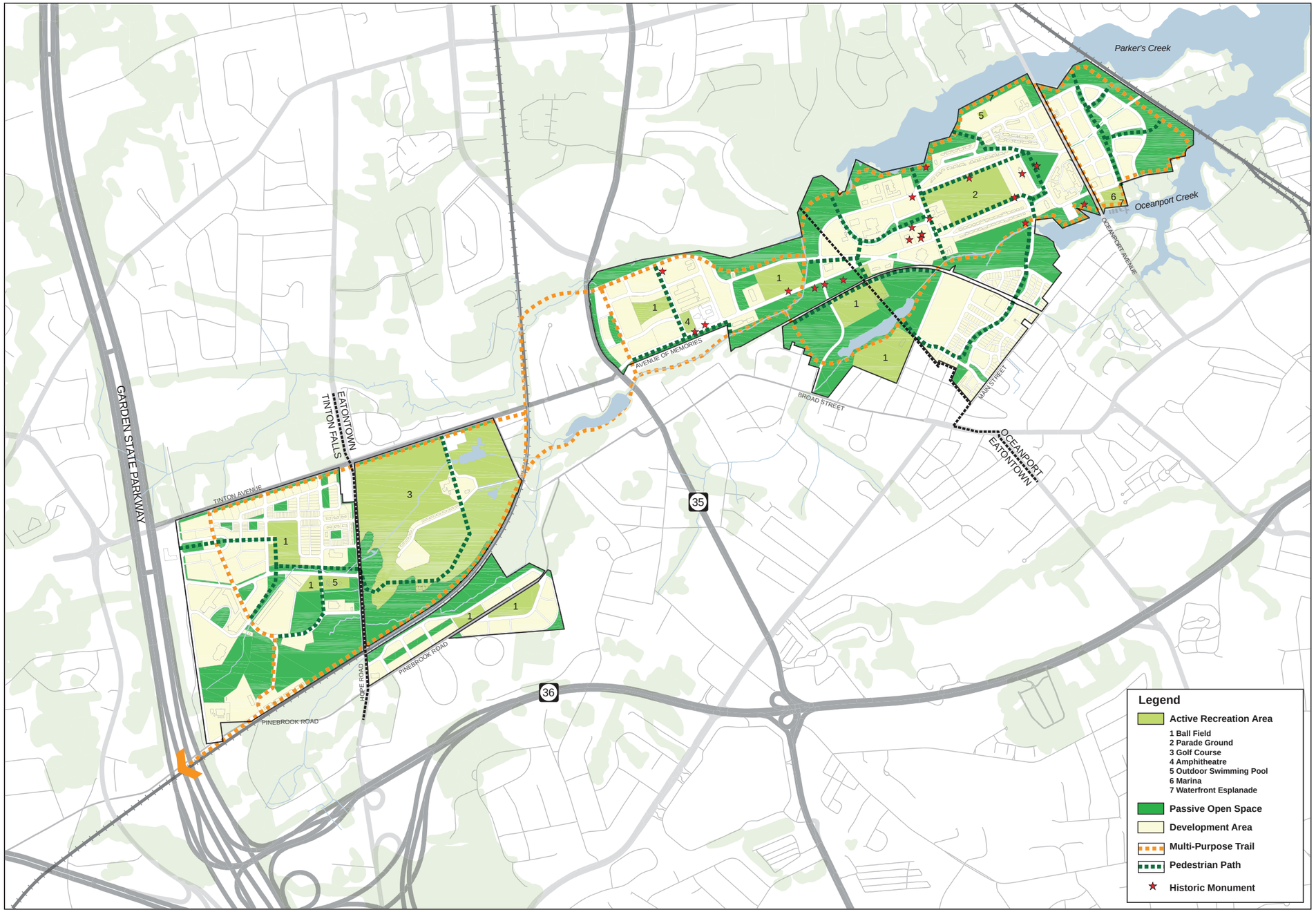

FORT MONMOUTH CONCEPT DIAGRAM : RECREATION PLAN IN 2028 (20-YEAR PLAN)

FMERPA

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4.0 KEY AREA PLANS AND SUSTAINABILITY

4.0 Key Area Plans and Sustainability

4.1 Introduction

Fort Monmouth Reuse and Redevelopment Plan

The Plan for Fort Monmouth creates a framework that is focused on enhancing real estate reuse and development velocity to address the creation of replacement and new jobs and return the region to economic vitality as expeditiously as possible. At the same time the Plan seeks to balance development with the protection and enhancement of natural resources and establish Fort Monmouth as a model for holistic sustainable redevelopment. The Plan proposes the attraction of high technology industries; development of mixed-income neighborhoods; creation of mixed-use, neighborhood centers in each of the Boroughs; provision for enhanced mobility; and the creation of an extensive open space network of ecological and recreational parks. The mix of proposed uses was determined based upon extensive market analysis, development of a robust economic revitalization strategy, and continuous dialogue with the State of New Jersey, Monmouth County, Eatontown, Oceanport, Tinton Falls, and special interest representatives. The Plan results in an opportunity to best balance the needs of all interested parties into an achievable vision for Fort Monmouth's future.

Land Use

The mix of land uses proposed in the 20-year Plan is presented in the table on page 3-12. The mix, while focusing on high technology industry attraction, is deliberately broad to accelerate redevelopment and provide for the creation of a broad range of jobs and housing typologies to meet the needs of a demographically diverse population left behind by the relocation of the mission. The inclusion of office, research and development, business service, incubator business, light manufacturing, retail, market rate and affordable housing, homeless housing, and civic/institutional space reflects FMERPA's commitment to diversity and the need for short, medium, and long-term economic opportunity.

The Plan reflects the redevelopment of five development clusters within the Fort Monmouth reuse and redevelopment area. In response to infrastructure availability and increasing ecological sensitivity, the highest intensity of development is proposed to occur in the Charles Wood area of Tinton Falls, with a reduction in density across the Fort from west to east. Within this density transect each cluster of development is proposed to be mixed-use in nature providing for job creation, residency, entertainment, and recreation, and thereby promoting healthy lifestyles where residents can choose to walk or bicycle to work and shop. The mixed-use centers are set within an extensive Blue-Greenbelt open space network that comprises approximately 45% of the Fort's land area.

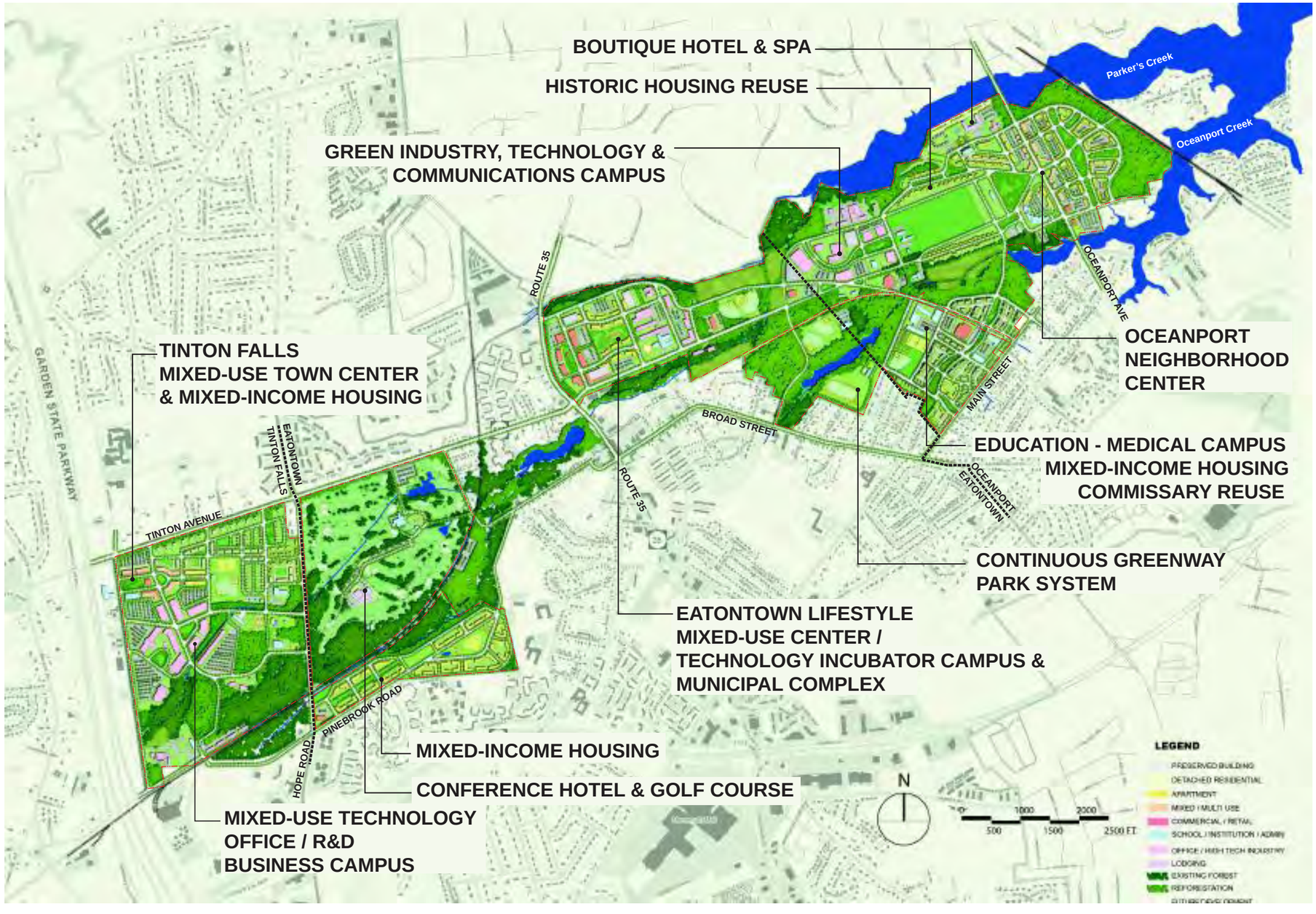
The land use program seeks to leverage the Fort's existing architectural and infrastructure assets as one of the tools to accelerate reuse and redevelopment. Over two million square feet of non-residential and approximately nine hundred thousand square feet of residential buildings are proposed for adaptive reuse. Many of these assets are historic resources, but more importantly many of the structures are enhanced by high-tech infrastructure and highly specialized research and communications equipment making them attractive for reuse in the early phases of plan implementation. Refer to page 3-12 for the reuse and redevelopment program summary.

Land Use Allocation

Description	Acres	Percentage of Site
Recreation/Open Space	503.52	44.74%
Commercial Office/High Tech/R&D	105.54	9.38%
Business Services/Retail	35.20	3.13%
Hospitality/ Conference Center	16.02	1.42%
Government/Civic/Institutional	51.78	4.60%
Residential/Mixed-Use	151.61	13.47%
Educational	19.82	1.76%
Medical/Health Care	2.89	0.26%
Roads & Right-of-Ways	241.98	21.50%

The following illustrate the preliminary Key Area Plans developed within the three Borough Reuse Areas. Key Area Plans are close-up, more detailed views of certain land use areas that are viewed as either particularly important to the Plan or key components to the area's growth.

The Area Plans and their development programs have evolved throughout the planning process as a result of public and stakeholder feedback obtained from the Final Draft Plan presentation, mitigation measures identified for the purpose of offsetting potential impacts, refinement of community impacts and revenue sharing strategies, and the iterative nature of the planning process in general.



FORT MONMOUTH CONCEPT PLAN CONCEPT PLAN IN 2028 (20 - YEAR PLAN)

FMERPA

4.2 Key Area Plans

TINTON FALLS REUSE AREA

Tinton Falls Town Center

The major redevelopment node located within Tinton Falls is a mixed-use retail town center, professional office/research and development and residential neighborhood organized around public open spaces located south of Tinton Avenue. This mixed-use town center provides an extension of the existing Tinton Falls Municipal Center located immediately to the west of the Tinton Falls Reuse Area. This two block mixed-use civic square is comprised of up to 80,000 square feet of convenience retail, shops, restaurants, and professional offices, with potential for above-retail apartments. This new mixed-use town center would link the employment center with the Borough's Municipal center to the west and proposed residential neighborhood to the east. The southwest corner of the square is proposed to be set aside for the future development of a 27,000 square foot Tinton Falls Public Library. Those within an approximately one-quarter mile radius would be treated with an array of amenities within walking distance.

This 2.5 acre civic square is intended to be used as a passive recreational area, an area for community events such as a farmers market, nighttime summer music, and outdoor theatrical events.

Mixed Income Residential

The transition from the mixed use node to the adjacent residential area to the east progresses with tree lined streets reaching towards the neighborhood's recreational area. This 12 acre park is home to the neighborhood's Field House, ballfields and playgrounds. A neighborhood of 288 mixed-income residences are planned surrounding the park. Along Tinton Avenue, behind the tree lined greenway fourteen (14) large lot detached homes are planned in keeping with the character across the scenic street. The remaining homes include reuse of the attached twenty-two (22) unit Hemphill residences, thirty-nine (39) small lot detached homes, eighty-three (83) townhouse/rowhouses, and one hundred thirty (130) 3-story apartments. Access to the other sections of the Tinton Falls Reuse Area is also afforded by an easy stroll to the jitney stop, which also leads to connections beyond the Reuse Area's "boundary line."

High Tech Industry

The central feature of the Office/High Tech Industry node is the reused Myer Center, transformed into a modern multi-tenant corporate facility that may potentially house a financial/insurance company data recovery center, general office space, and technological communications research and development companies. The Myer Center is proposed to be modified as three separate facilities to enhance absorption and make it more operationally efficient. Additional study would be required in future phases of development as potential tenants are identified. The business center provides a mix of Class A general office space, high-tech research and development space, and incubator space in new and renovated buildings. In combination with the proposed reuse of Building 2525 and future construction, a total of 839,817 gross square feet is envisioned. This reuse node is expected to serve as one of the primary economic engines for the Reuse area, generating tax revenue and employment opportunities.

This reuse node is also complemented by a central green within an open courtyard. Tree lined roadways and an interconnected sidewalk system also link the area to the general Reuse Area and provide a pedestrian friendly character throughout. Extensive parking areas are also provided adjacent to the Garden State Parkway, taking advantage of existing impervious surface area and infrastructure. These parking areas are recommended to have landscape islands incorporating shade trees and bio-swales at 120 foot spacing throughout the lots.

Fire & Police Training Center and the Fabrication Shops

In the southwest quadrant of the Tinton Falls Reuse Area the existing fire and police training facilities are proposed to be conveyed for their continued use in training State, county, and local firefighters and law enforcement officers. The metal fabrication shops, Buildings 2502 – 2507, located along the railroad right-of-way are ideally suited to private sector company reuse and comprised of 42,752 square feet in five structures.

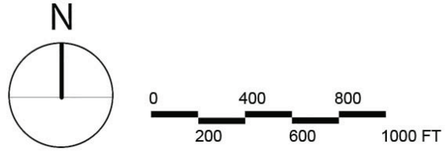
Civic Uses and Public Open Space

The existing civic uses along Hope Road are proposed to remain and include the Early Child Development Center, Pool and Park Complex, and the Teen Center converted to a community recreation center. All development areas within the Tinton Falls Reuse area are proposed to be connected to a continuous 99-acre greenbelt. The greenbelt is part of the Fort-wide "Blue-Green" belt system of parks and open space. It would serve as a passive and active recreational amenity and serve the function of preserving and protecting the wetland resources in this area of the Fort. Approximately 22 acres of active recreation, 77 acres of passive recreation and 3.25 miles of trails in Tinton Falls.

The bicycle and pedestrian trail network would enable the public to engage nature while offering modal choices that enhance mobility throughout this live-work-play development cluster. During the redevelopment process further investigation of enhancing and restoring habitats, integrating stormwater best management practices, and creating program linkages to area public schools should be explored.

TINTON FALLS AREA PLAN ENLARGEMENT

1. Large Lot Detached Housing
2. Small Lot Detached Housing
3. Townhouse
4. Mixed-Income Apartments
5. Hemphill Housing
6. Firehouse
7. Mixed-Use Town Center, Bandshell & Town Green
8. Library
9. Child Care
10. Municipal Use
11. Teen Center
12. Myers Center Reuse
13. Mixed-Use Technology Business Campus
14. Fire & Police Training Center
15. Fabrication Shops
16. Gas Station
17. Pool
18. Field House & Ball Fields
19. Wetland Preservation Park
20. Pulse Power Building R & D
21. Existing Tinton Falls Municipal Complex
22. Geothermal Wells



Artistic Rendering of Tinton Falls Community Center

Artist: Thomas W. Schaller

EATONTOWN REUSE AREA

The western portion of the Eatontown Reuse Area is composed of two Key Areas: the Suneagles Golf Course and associated facilities and the former Howard Commons residential area to the south.

Golf Course and Conference Facilities

As previously discussed, the existing golf course (approximately 129 acres) is to be preserved due to its historic and cultural value. The area would also remain as open space as a result of a perpetual easement requested by Monmouth County through an NOI or another mechanism. The golf course is proposed to remain a public facility and would provide perpetual access to retired veterans who currently enjoy the facility. Gibbs Halls (B2000) would also be retained as a Clubhouse/Pro-shop and would be used as part of the conference and banquet facility. This facility already operates as a dining/ catering facility; however, due to the age and condition of the equipment, extensive improvements would likely be required to meet current market demands and improve the capacity of the dining facility. The 150 room hotel and conference center is located on the site of the Megill Housing neighborhood. The facility would be geared toward guests for longer stays and those on business retreats. The unique setting within the Suneagles golf course in combination with a 20,000 square-foot conference and meeting facility would differentiate it in the marketplace. Local transit services should be provided to the New Jersey shore, area parks, and the proposed Oceanport boutique hotel, spa and wellness center.

Mixed Income Housing

The Howard Commons reuse area is intended to provide mixed-income housing, with an emphasis on affordable and workforce housing, for civil servants such as fire and safety and education professionals. This Residential node is focused on attracting income-restricted residents through the provision of higher density housing units that would also help Eatontown meet COAH requirements generated by the Fort's redevelopment. The 275 units would include apartment style housing along a linear green space. Convenience retail (12,530 sf) would also be provided to the west.

Located to the east of the lifestyle center, a total of 302 mixed-income apartments are envisioned to take on several different formats: above retail small apartments, and 3-story apartment buildings. A total of 577 mixed-income housing units are proposed in Eatontown.

Lifestyle Center/Eatontown Gateway

The design intent of the Lifestyle Town Center located along Route 35 is to create an exciting gateway to the eastern Reuse Areas. This major town center is envisioned as a multi-use area that serves the residences located in proximity to the area as well as the population beyond due to the center's accessibility along Route 35. The center includes 150,000 square feet of retail, restaurants, entertainment venues, residences, and other uses in a "lifestyle format" that creates a vibrant pedestrian environment. The retail may be comprised of a mix of national, regional and local retailers, boutiques, restaurants and a specialty food market in a "Main "Street" format. Shared parking for the retail and adjacent mixed-income apartments is proposed to be located over the existing geothermal field. All development within this node is proposed to preserve the geothermal fields through the location of open space or surface parking over the fields..

Eatontown Municipal Center

The 57,386 square foot Mallette Hall (B1207) with its auditorium and outdoor amphitheater are proposed as the new home for the Eatontown Municipal Complex. Given the anticipated redevelopment of the existing downtown and the desirability of municipal functions being at the center of the Post's redevelopment, this use would contribute to the vitality of the node.

Professional's Row and Incubator Business Center

The CECOM Labs (B1208, 1209, 1210) totaling 345,122 square feet are proposed for two reuse purposes: provision of incubator office space and a professional's row in approximately even measures. The incubator office space supported by State of New Jersey initiatives and programs would offer an ideal location for start-up companies as they develop their businesses. The Professional's Row is envisioned as a desirable location for the county's growing professional service industry including architects and engineers, legal professionals, and financial and accounting practices among others. Projected future growth of these industries and incubator businesses may be met through the development of new facilities east of the CECOM labs on the edge of the central park. A total of up to 140,000 additional square feet of additional office/R&D space may be realized over the 20-year build out.

Specialized Reuse Buildings

Vail Hall (B1150, 1152), located to the south of Mallette Hall, currently operates as the communications hub for Fort Monmouth. Future reuse is anticipated to take advantage of the specialized communications infrastructure and be attractive to the communications industry including potential reuse by wireless service providers.

Building 1215, the theater building, with its auditorium and 18,883 square feet of space, may be suitable for a not-for-profit theater or arts group. Further investigation of its reuse potential is warranted. The "state of the art" Bowling Center is located along the common border with Oceanport and is proposed to remain a privately operated bowling alley.

Public Open Space

To the west of the Lifestyle Incubator Business Center extending to the Oceanport borough line, a central park of more than 100-acres is proposed. The park includes both active recreation fields and passive areas for strolling, biking and enjoying nature.

The bikeway and pedestrian trail system would traverse the park connecting adjacent residential, commercial and retail zones to promote mobility. Additional trail connections to the existing downtown and area parks should be explored by the municipality.

The landfill to the north edge of the park is proposed to be clean up to recreational standards in accordance with NJDEP guidelines. The passive areas play an important role in re-establishing the ecological function and productivity by reconnecting the Parker's and Oceanport Creek tributaries across the Post. Reforestation and specialized habitat typologies along with wetland buffer enhancement should be incorporated into the parks design at later stages of redevelopment.

All post open spaces should be designed to include best management practices for the treatment of stormwater including bio-infiltration and recharge as well as constructed wetland filters to enhance water quality and protect groundwater resources.

A total of 314 acres of public open space is proposed in Eatontown, including the golf course. Approximately 31 acres of active recreation, 154 areas of passive recreation and 7 miles of trails are proposed.

EATONTOWN: HOWARD COMMONS AREA PLAN ENLARGEMENT

1. Suneagles Golf Course Main Entrance & Parking
2. Gibbs Hall - Clubhouse & Catering
3. Conference Center & Hotel
4. Restaurant
5. Ball Fields
6. Convenience Retail
7. Mixed Income Housing
8. Community Center & Pool
9. Wetland Preservation Park

EATONTOWN: ROUTE 35 AREA PLAN ENLARGEMENT

1. Lifestyle Town Center
2. Mixed-Income Apartments
3. Parking Structure
4. Incubator & Professional Services
5. Eatontown Municipal Building
6. Office Space
7. Auditorium / Theatre
8. Bowling Center
9. Cell Tower
10. Amphitheatre
11. Ball Fields / Recreation
12. Wetland Preservation Park
13. Office / R & D Space
14. Local Bus to Jitney Transfer Station
15. Geothermal Field

Artistic Rendering of Eatontown Lifestyle Center

Artist: Thomas W. Schaller

OCEANPORT REUSE AREA

High-Tech and Green Industry Campus

The High Tech and Green Industry Campus located in the central portion of the Reuse Area and the westernmost portion of the Oceanport Reuse Area, includes R&D facilities where cutting edge research and development activities can take place, furthering the State of New Jersey's initiative to promote sustainability, renewable energy, and attract biotechnology and nanotechnology companies to Fort Monmouth. A total of 400,000 square feet of high-tech R&D space is proposed at build out. This campus provides an opportunity to leverage existing high tech facilities, infrastructure, and the intellectual capital of a skilled area work force.

The intention of the Green Industry campus is multi-purpose:

- To serve as an educational showpiece
- To provide the Reuse Area with a source of green/renewable energy
- To provide a space for research and development activities, further supporting NJ's High-tech Economic Development initiatives
- To leverage existing intellectual capital in area to further the development of sustainable energy technologies

This campus is to become the area's main knowledge center. The campus would leverage the high tech infrastructure already existing within the McAfee Center (B688) and would capitalize on the civic amenities afforded by the library and recreation center. The 97,000 square foot McAfee Center is proposed to be adaptively reused by a high-tech communications research company who can employ the highly specialized equipment. The building is a skiff and contains an anechoic chamber for specialized radio frequency research.

Squier Hall (B283) at 76,583 square feet is currently used for administrative purposes, is suitable for similar reuse, and is readily adaptable to educational purposes. To the south of the technology cluster, Armstong Hall (B551) presents another opportunity for educational reuse or the potential for an environmental center. Programs to educate visitors as well as the undertaking of environmental/ecological research experiments in the adjacent tidal and terrestrial areas could be envisioned.

Existing in-kind building reuse is proposed for the Library (B502), Chapel (B500), the Counseling Center (B501), and Fitness Center (B114). A linear central park provides a front for all of the buildings in the cluster and provides a greenway linkage between the Parade and the perimeter Blue-Greenbelt open space system.

Historic Oceanport Neighborhood Center

The vision for the Oceanport Historic Housing area is the preservation of historic housing to showcase the cultural value and history of the post. The housing flanking both sides of the Parade Ground is a contributing element to this historic district and is worthy of reuse in today's residential market. The Parade Ground would continue to provide a central expanse of green space and character-defining feature of the Historic Housing Neighborhood. Although no permanent structures are to be placed on the Parade Ground, the large open space would be used for active recreation such as youth sporting league games and special events.

A total of 117 historic residential units are proposed for reuse in the Historic Main Post area. The 45 Gosselin residences have been identified for potential university faculty and married student housing. Gardner Hall (B271) is suitable for mixed-income apartments. The spacious 68 Russel/Allen and Russel/Carty residences at 3,700 to over 6,000 square feet would be attractive to the for sale, single-family, high-end home buyer.

Limited improvements would be done on the historic housing due to the restriction on alterations to the structures. Narrow tree lined streets would continue to provide character to the area and provide connections to the larger Reuse Area. The natural areas alongside the housing would remain and would be reforested as appropriate.

Three of the Barker Circle buildings (B205, 207, 287) are proposed for reuse as mixed-income housing, while the remaining two buildings (B206, 208) are proposed for a new Oceanport Municipal Center adjacent to the firehouse. With the addition of a large meeting room a total of 50,000 square feet of space could be made available.

Russell Hall (B286), the 76,978 square foot Garrison Headquarters located at the eastern end of the Parade, would be conveyed to FEMA for their headquarters. A total of 8 acres have been requested including the parking lot and heliport located adjacent to the building.

Parker's Creek Boutique Hotel and Spa

A unique boutique hotel and wellness spa is envisioned along Parker's Creek. This boutique 75 room hotel and spa would include limited lodging facilities oriented toward those looking for a restorative getaway in a luxurious setting. The area is a complement to the medical campus to the south, further acknowledging the contribution of nature and outdoors to human health.

Public access to the waterfront would be maintained and encouraged by shoreline improvements and a riverfront promenade. The promenade would encourage bird watching and nature observation as well as fishing. Docking and direct access to the water would not be provided.

Education/Medical Campus

The Patterson Army Health Clinic is proposed to be replaced with a new 60,000 square foot joint veterans and community health care clinic. The new clinic would be supported by a 20,000 square foot professional medical office building with the potential addition of professional medical offices to create a "wellness campus" totaling 80,000 square feet. This medical campus would provide services to area veterans and residents. The center would also be improved to allow for medical research activities. During the next phase of work, additional analysis of the reuse feasibility of the clinic should be explored. The extensive green space would be preserved and improved, acknowledging the contribution of the natural element to wellness.

The Educational component includes a 15 acre site for future school development to meet Oceanport's needs. The site is sized to accommodate between 400 and 450 students complete with academic space, parking, ballfields, tennis courts, and flexible outdoor recreational space.

Residential

Townhouses and small lot detached residences are proposed in the area of the school to complement existing Main Street residences south of the Post. A total of 159 townhouses and small cottage type homes are proposed on lots ranging from 3,000 to 7,500 square feet.

Public Open Space

In addition to the proposed school's active recreational element, a linear greenway connects the Educational Medical Campus and residences to the Fort wide Blue-Greenbelt system and the nearby track and football complex.

Oceanport Village Center

The traditional Main Street town center is located along Oceanport Avenue and provides an additional opportunity for the creation of a gateway into the Reuse Area. This gateway area includes a smaller scale walkable Main Street, with vehicular access provided by Oceanport Avenue. Constructed of traditionally scaled blocks and lined with a mix of specialty and convenience retail, restaurants, small professional offices, and potentially art galleries, Oceanport Avenue would be transformed into the civic hub of the Borough. The existing Credit Union is proposed to remain and the southern end of the avenue anchored by a new waterfront restaurant adjacent to the public boat ramp and marina. Single rows of trees would line the streets activated by the first floor retail and outdoor cafes. This small scale walkable village would be inviting to local start up businesses and cafes. The opportunity for an upscale organic restaurant to be located at the western edge exists where it would be afforded a grand view of the vast green space to the west.

Enhancement of the marina is proposed to incorporate a public promenade and gateway pocket park just east of the bridge over Oceanport Creek. The public boat ramp and parking areas are proposed to remain and the marina support facility enhanced.

Oceanport Village Center Residences

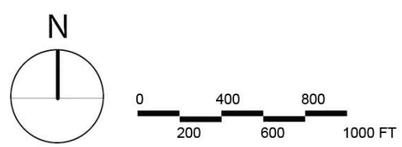
To achieve a traditional two to three story Main Street character, mixed-income apartments are proposed above the Oceanport Avenue retail uses. To the east of the Avenue, nine blocks of 3 story mixed-income apartments are proposed within a generous greenway framework. A total of 309 units are proposed with parking located internal to the blocks. Finished floor elevations in this area of the redevelopment would require additional analysis to ensure they are constructed above the floodplain. A total of 740 residential units are proposed in Oceanport in the current plan.

Public Open Space

A total of 173 acres of public open space is proposed in Oceanport Borough. Approximately 28 acres of active recreation, 145 acres of passive recreation, and 7 miles of trails are proposed. A significant portion of this open space is proposed to be developed as ecological buffers to Parker's and Oceanport Creeks and in keeping with CAFRA regulations. These buffers would be critical to the protection of water quality and habitats along the creek's edges. Residences proposed east of Oceanport Avenue have been set back significantly from the creeks in response to the FEMA mapped 100 year floodplain creating a significant buffer between the Horseneck Point residences and the proposed development.

OCEANPORT MAIN POST AREA PLAN ENLARGEMENT

1. Small Lot Detached Housing
2. Mixed-Income Apartments
3. Townhouse
4. Historic District Housing
5. Boutique Hotel & Spa
6. Parade Ground
7. Retail & Professional Office
8. Credit Union
9. Marina, Restaurant & Public Boat Ramp
10. Oceanport Municipal Complex & Mixed-Income Apartments
11. FEMA Office & Property
12. Green Industry Campus
13. Chapel
14. Fitness Center
15. Museum / Art Center
16. Retail Center
17. Medical Center & Medical Offices
18. New School
19. Ball Fields
20. Lane Hall Community Center
21. McAfee Center Reuse / Communication R & D
22. Library
23. Day Center
24. Allison Hall Offices
25. Office Educational Reuse
26. Educational Reuse
27. Waterfront Esplanade
28. WWII Barracks - Retail Reuse
29. Permanent Supportive Housing
30. County Shelter
31. Wetland Preservation Park
32. Geothermal Wells
33. Cell Tower



Artistic Rendering of Oceanport Avenue

Artist: Thomas W. Schaller

4.3 SUSTAINABILITY

The Fort Monmouth Opportunity

The redevelopment of Fort Monmouth presents an unprecedented opportunity in the State of New Jersey to develop a model sustainable technology community. Sustainable developments are those which fulfill present and future needs (WECD, 1987) while only using and not harming renewable resources and unique human-environmental systems of a site: air, water, land, energy, and human ecology and/or those of other off-site sustainable systems (Rosenbaum 1993 and Vieria 1993). The redevelopment of Fort Monmouth, consistent with state of the art sustainable practices, provides the opportunity to advance the State's sustainable policies and capitalize on the robust green building toolbox available through New Jersey State Agencies.

State policies and programs are evolving and remain very dynamic in nature with new programs being developed continuously. Governor Corzine has placed global warming and energy issues at the forefront noting they are not just problems to be solved, but also that there is an economic opportunity to be capitalized upon. In conjunction with an energy use reduction goal of 20 percent by 2020 and the development of the State's Energy Master Plan in 2007, the Governor signed Executive Order 54 calling for a 20 percent reduction in greenhouse gas emissions to 1990 levels by 2020 and an 80 percent reduction of 2006 greenhouse gas levels by 2050. The goals are linked to New Jersey's Renewable Portfolio Standard adopted by the New Jersey Board of Public Utilities (BPU) that requires 20 percent of the State's electricity come from renewable sources by the year 2020. Along with the BPU program, many of the State's agencies, including the New Jersey Department of Environmental Protection (NJDEP), Housing and Mortgage Finance Agency (HMFA), New Jersey Department of Transportation (NJDOT), and the New Jersey Department of Community Affairs (NJDCA), offer a variety of financial incentives in the form of grant and loan programs that support sustainable community development.

NJDEP's Office of Planning and Sustainable Communities (OPSC) defines a sustainable community as one that manages and stewards its natural resources and environmental assets such that their value is preserved, restored, and enhanced for present and future generations; and such stewardship complements the community's effort to foster economic and social health. A listing of programs offered by OPSC is provided below and additional information about the programs can be accessed at www.nj.gov/dep/opsc.

New Jersey Department of Environmental Protection

- Green Acres Grants and Loans
- Green Communities Challenge Grant Urban & Community Forestry Program
- Shore Protection Grants and Loans
- Recreational Trails Development & Maintenance
- Historic Preservation Certified Local Government Grants (CLG)
- 1992 Dam Restoration and Inland Water Projects Loan Program
- Environmental Infrastructure Financing Program
- Pinelands Infrastructure Trust Financing Program
- Combined Sewer Overflow Planning & Design Grants
- Drinking Water State Revolving Fund Program
- Municipal Recycling Tonnage Grant Program
- Solid Waste Services Grants
- Local Tire Management Program Fund Grants
- Nonpoint Source Pollution Control and Management Implementation Grants
- Water Quality Planning Pass-Through Grant Program
- Hazardous Discharge Site Remediation Fund (HDSRF)
- New Jersey Clean Communities

Other State Agency Programs

- Board of Public Utilities (BPU) - Clean Energy Funding
- Department of Agriculture - Farmland Preservation
- Department of Community Affairs - Smart Growth Planning
- Department of Community Affairs "HMFA Green Future & SUNLIT Programs"
- Department of Transportation "Transit Village Initiative"
- Safe Routes to School Program
- The Regional Greenhouse Gas Initiative (RGGI or "ReGGIe")

A Comprehensive and Integrated Sustainability Approach

Fort Monmouth's 1,126 acres and approximately five million square feet of buildings located between ecologically sensitive Parker's and Oceanport Creeks, with existing alternative geothermal energy infrastructure and adjacency to regional transit, presents an exciting opportunity to create a comprehensive and integrated approach to sustainable development. The consulting team recommends that during the next phases of plan implementation, further consideration of establishing measurable guidelines for sustainable development be explored. These guidelines may include recognized US Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) rating standards potentially including LEED for New Construction, LEED for Commercial Interiors, and LEED for Existing Buildings. The USGBC is developing future programs that may be available before 2011 including LEED for Neighborhood Developments (LEED–ND), LEED for Homes, LEED for Schools, Retail, Healthcare, Laboratories, and Multi-building Campuses.

While LEED is the currently accepted standard by which green development is measured, best management practices are evolving beyond LEED. The Fort Monmouth Reuse and Redevelopment Plan embraces smart growth principles and endorses the adoption of Transit Oriented Development (TOD) principles within recognized capital and policy constraints. As the plan evolves, there are ten broad focus areas that should be considered in developing sustainability guidelines for redevelopment. The focus areas include:

1. Site Planning and Landscape
2. Stormwater Management
3. Air Quality
4. Infrastructure
5. Energy
6. Transportation and Connectivity
7. Green Buildings and Reuse
8. Community and Quality of Life
9. Construction Management
10. Operations and Maintenance

In adopting a comprehensive approach, Fort Monmouth can promote and advocate for best management practices, including environmental remediation, ecological restoration and protection, green infrastructure, architectural design, construction, and site planning, as well as the ongoing sustainable management of these buildings. The land use plan envisions the development of a mixed-use community that includes high-tech and general office space, residential, retail, school, hotel, convention center, community space, open space, and access to transit alternatives. The following Sustainable Strategies Summary Matrix identifies vision statements, potential strategies, and sample goals to address each of the ten focus areas identified above.

The development and adoption of sustainability guidelines should be undertaken by the implementation LRA as the project moves forward, as well as a thorough and measured analysis of market receptivity, life cycle costs, and benefits.

SUSTAINABLE STRATEGIES MATRIX

Focus Area	Vision	Potential Strategies	Potential Goals & Targets
Site Planning and Landscape	Fort Monmouth will be a mixed-use, compact, clustered, and walkable community. The build-out will include massing and orientation of built structures to create quality open spaces, frame access and views and optimize passive solar design. The clustered design will be linked by a Blue-Greenway network of open spaces that interconnect the creeks with existing and new open space between the Garden State Parkway and Horseneck Point to create a continuous ecological resource and multi-purpose trail network. Reforestation of significant portions of the property is recommended to enhance habitat diversity and connectivity and enhance carbon sequestration.	S-1 Landfill Remediation & Phyto-Remediation S-2 Waterfront Climate Adaptation S-3 Wetland Preservation & Restoration S-4 Mixed-Use Land Use Clustering S-5 Interconnected Open Space Plan S-6 Green Infrastructure Streetscape Design S-7 Multi-modal Site Circulation S-8 Density Ratio Enhancement S-9 Native Plant, Water Efficient Landscaping S-10 Biodiversity Strategies S-11 Reforestation – Carbon Sequestration S-12 Habitat Enhancement S-13 Designed Experimentation	1. Landfill reclamation will be done on-site with in-situ remediation schemes utilizing phyto-remediation, along with NJDEP approved capping strategies. 2. At least 1,500 residential units will be developed on the site at an average density of 4 dwelling units per acre. 3. 75% or more of the project's blocks will be designed for appropriate solar orientation. 4. A minimum of 45% of the site will be allocated to open space. 5. The site will be developed as a pilot study for sustainability, flood control system, and a native plant center. 6. The site will be integrated with the Parkers & Oceanport Creek estuaries and existing park network. 7. The existing wetlands at Fort Monmouth will be preserved and enhanced and buffers established. 8. Fort Monmouth will integrate appropriate climate adaptation strategies to address sea level change and other climate issues. 9. Employ conservation easements and deed restrictions to protect open space and ecological resources.
Stormwater Management	Fort Monmouth should utilize progressive, sustainable, and robust water management practices that are fully integrated into the site, neighborhood and adjacent land uses. High quality open spaces will provide ecosystem services such as stormwater retention, water filtration and urban cooling through shade vegetation. The Suneagles Golf Course presents an opportunity to address stormwater and dam issues in the western portion of the fort. The system will be designed to include collection, sequential treatment, storage and on-site reuse, capable of handling future climate scenarios and adaptable for continued monitoring and upgrades.	SW-1 Erosion & Sedimentation Control SW-2 Controlled Paving Strategies SW-3 Stormwater Runoff & Water Quality SW-4 Water Recycling & Reuse SW-5 Flood Control SW-6 Stormwater Adaptive Management	1. Develop erosion control strategies utilizing bioengineering approaches and temporary detention basins 2. Increase the scale of the constructed hydrology & habitat system to 1.5 times the current size for flood treatment and control 3. Implement a comprehensive stormwater management plan that infiltrates, reuses, or evapo-transpirates runoff from small storms (or 90% of all storms) 4. Treat 100% of stormwater collected from these storms on-site via constructed wetlands and other stormwater treatment systems 5. Recycle 25% wastewater to be used for irrigation and other appropriate uses
Air Quality	Air quality at Fort Monmouth may be improved by promoting cleaner fuels for on-site energy generation, controlling transport emissions, implementing vehicle reduction strategies, and planting an abundance of trees. Best practice technologies and sustainable management plans will address air quality issues during the design, construction, operation and maintenance stages of Fort Monmouth redevelopment.	AQ-1 Tree Planting Initiative & Reforestation AQ-2 Air Quality Monitoring AQ-3 Building Emissions AQ-4 Transportation Emissions AQ-5 On-Site Power Generation Emissions	1. Undertake a tree planting-reforestation program 2. Install an air quality monitoring program 3. Construction and Maintenance Vehicles will be low emitting 4. Energy systems and components will be Energy Star compliant 5. Renewable or Alternative Fuels for Power Generation will be used

Focus Area	Vision	Potential Strategies	Potential Goals & Targets
Energy	An energy master plan should determine the strategy for Fort Monmouth to meet its own energy demands and reduce dependence on the electrical grid. Energy generated on-site will be sourced from cleaner and alternative fuels and renewable technologies. The attractions of green industries including Photo-voltaic and Hydrogen Fuel Cell companies working within a closed loop system presents a unique opportunity. Energy loads from buildings and infrastructure will be reduced through design and coupled with optimized energy management, will lower the overall carbon footprint.	E-1 Energy Master Plan E-2 Integrated Design E-3 District Heating & Cooling E-4 On-Site Energy Generation E-5 Combined Heat & Power E-6 On-Site Renewable Energy E-7 Green Power E-8 Peak Shaving E-9 Infrastructure Energy Efficiency E-10 Greenhouse Gases & Carbon Footprint	1. Develop on-site energy generation system with the capacity to supply all of the annual electrical and thermal energy consumption. 2. Incorporate on-site renewable energy technologies to provide a minimum of 5% electrical and 25% thermal consumption. 3. A minimum of 5% of any electricity purchased from the utility will be supplied by Green Power. 4. Incorporate a district heating and cooling system that will connect to all buildings and meets 100% of the thermal load.
Transportation and Connectivity	Fort Monmouth will be connected to all activity centers within the site and to the surrounding communities, by emphasizing walking, cycling, and encouraging the use of public transit. A proposed Shuttle Bus will link all areas of the Fort to regional rail service and the potential for rail station development in the Charles Wood Area should continue to be explored. Pedestrian-oriented streets and a continuous bicycle network will reduce vehicle-dependency and promote a healthy lifestyle.	T-1 Transportation Demand Management Plan T-2 Pedestrian-Oriented Streets T-3 Bicycle – Multi-Purpose Trail Network T-4 Promote Electric Vehicle Use T-5 Parking Control T-6 Shared Parking T-7 Shuttle Bus, Van, & Car Share Programs T-8 Promoting Public Transit	1. All residents, employees and visitors to Fort Monmouth will be within a 10-minute walk of public transportation. 2. Bicycle routes will connect throughout the entire site and extend to existing and proposed bicycle networks. 3. Bicycle parking will be provided throughout the site. 4. Shared parking will be employed throughout the Fort. 5. Carpooling, car sharing, fuel efficient vehicles, and NEV's will be given priority parking. 6. A shuttle bus will connect enhanced public transit systems surrounding the Fort with all development clusters. 7. Existing street networks will be extended through the fort to enhance mobility and relieve congestion.
Green Buildings	All buildings at Fort Monmouth should be designed to the highest green building standards, integrating best management practices and LEED criteria. Design will pay particular attention to acoustics, improved indoor environmental quality, daylighting, and energy and water efficiency. All buildings should be commissioned to ensure optimum system performance. A showcase building, open to the public, will demonstrate the sustainability features implemented.	GB-1 LEED Certification GB-2 Building Orientation GB-3 Universal Accessibility GB-4 Daylighting GB-5 Energy Performance GB-6 Green Roofs GB-7 Indoor Environmental Quality GB-8 Acoustics GB-9 Building Materials GB-10 Water Efficiency & Wastewater Management GB-11 Commissioning GB-12 Sustainability Showcase Building	1. Maximize the adaptive reuse of existing buildings and infrastructure. 2. At least 40% of the square footage of buildings should be LEED Silver certified and 10% LEED Gold certified. The remaining buildings should meet the equivalent of LEED certified standards. 3. At least 75% of the stand-alone building frontages will be designed & oriented for optimal solar orientation. 4. A modeled energy performance target of at least 20% or better will be achieved for residential buildings and 25% or better for commercial and institutional buildings. 5. Buildings must maximize daylighting for at least 95% of all occupied spaces, 75% of interior spaces, and views for 90% occupied spaces. 6. Source 20% of the building materials with recycled content and 20% of the materials locally. 7. Specify 50% Forest Stewardship Council (FSC) certified wood for all interior finish woodwork. 8. Specify rapidly renewable materials for 5% of the total value of building materials. 9. At least 50% of the exposed new building roof areas should be green roofs. 10. Buildings will meet the following criteria for water and wastewater: Consume 50% less potable water, treat 100% of the wastewater on-site for 75% of the buildings, recycle at least 50% of the grey water from buildings

Focus Area	Vision	Potential Strategies	Potential Goals & Targets
Construction Management	During construction, Fort Monmouth will be a safe, clean, and environmentally responsible site that demonstrates progressive and sustainable construction best management practices with regard to energy use, air and water pollution, and construction waste. Construction activities will be sensitive to the local ecology and surrounding neighborhoods.	CM-1 Energy & Water Use CM-2 Construction Waste Management CM-3 Low-Emitting Construction Vehicles CM-4 Sustainable Wood in Temporary Construction Practices CM-5 Environmental Training CM-6 Air, Water, & Noise Pollution CM-7 Ecology in Construction Zone CM-8 Site Cleanliness CM-9 Communication & Community Involvement	1. Monitor, report and target CO2 emissions arising from construction activities. 2. Separate and recycle demolition debris and reuse on site. 3. Divert 90% of construction and demolition waste from landfills. 4. Train all site personnel on sustainable development issues. 5. Utilize energy efficient construction and site equipment. 6. Operate a clean and considerate construction site.
Operations and Maintenance	Fort Monmouth will be managed by trained operation and maintenance staff who are familiar with green building systems, cleaning products, materials, and equipment to ensure a safe and clean environment. Waste will be reduced through the implementation of recycling and composting initiatives. Residents and business owners will be guided with a manual on day-to-day indoor sustainable living.	OM-1 Building & Home User Guide OM-2 Retail Sustainability Guidelines OM-3 Green Purchasing Guidelines OM-4 Facilities Management Training OM-5 Recycling and Composting OM-6 Management Plans OM-7 Landscape Maintenance	1. Each residential and commercial unit shall include a Building User Guide, that includes green purchasing guidelines. 2. All retail tenants must adhere to sustainability guidelines for the fit-out of their space. 3. Fort Monmouth must recycle 50% of its total waste stream.

5.0 INFRASTRUCTURE PLAN

5.0 Infrastructure Plan

5.1 Anticipated Development

The anticipated development provided in the Fort Monmouth Reuse and Redevelopment Plan was used to project the demands for the various utilities serving the area. The Reuse and Redevelopment Program is summarized on Page 3-12. Based on the Plan, Utility demands were calculated for gas, electric, water and wastewater based on the development summary provided. The demands were projected by development type in square feet (SF), within each of the three municipalities, and for 10 Year and 20 Year periods.

Projected utility demands were submitted to the appropriate utility company to review and provide:

- Input on the ability of the utility company to meet projected demands,
- An analysis of system improvements and upgrades needed to meet projected demands,
- Cost estimates associated with identified system improvements, and
- The utility company's policy with respect to a potential cost-sharing program.

A summary of the utility demand analyses along with the responses of the respective utility companies follows.

5.2 Utility Systems

Gas Utility

New Jersey Natural Gas (NJNG) currently provides service to and throughout the Fort Monmouth facilities, as this is the only utility that was previously privatized. The anticipated natural gas demand associated with the projected development is approximately 151,000 cubic feet per hour (CFH) for the 10 Year Plan and 68,000 CFH for the 20 Year Plan periods, for a total demand of approximately 219,000 CFH. Approximately 80% of the estimated gross natural gas demand for the total build-out is required for Office/R&D and Residential components of the Plan.

Adequacy of Existing System

NJNG, on the basis of their system model for the proposed development, responded that the existing system can support the 10 Year (until 2018) additional load in Tinton Falls, Eatontown, and Oceanport Reuse Areas. However, by the end of the 20 Year Plan (2028) the model projects some weakness in the

Eatontown, Belmar, and Spring Lake sections of their service area.

System Improvements

NJNG projects that some minimal system improvements may be needed in the Red Bank, Fairhaven, and Rumson areas for the 10 Year Plan. By the end of the 20 Year Plan period, however, substantial system improvements will be required in the Tinton Falls, Eatontown, Oceanport, Belmar, and Spring Lake sections.

Currently, NJNG performs system improvements as a part of their standard maintenance procedures to support existing and new customers.

Costs

Based on current tariff and standard operating procedures, NJNG plans to provide new gas main services to serve the proposed redevelopment under a Firm Rate free of charge, as long as the cost to serve equals or is less than ten times the margin. In other words, per the current procedures, NJNG would forgo ten years' margin, not making any money on a gas main extension until year eleven.

The work associated with the potential system improvements is not typically charged to a customer, rather it is absorbed by the rate base. In the case of the proposed redevelopment, this would be the norm. For example, the Franklin line (transmission main that serves the Fort Monmouth area) is currently being replaced and this cost is covered in the transportation charges that all customers pay. Hence, such an improvement substantially increases the amount of gas that can flow to support the proposed Reuse Areas as well as any other projects in the area.

Comments/Suggestions

NJNG requires a detailed Final Reuse Plan in order to further refine its gas distribution system model, which in turn would enable NJNG to project itemized distribution improvements and related costs. Based on the initial forecasts, NJNG deems adequate the potential to handle the projected redevelopment per the 10 Year Plan, and costs associated with the 20 Year projected redevelopment need to be investigated further as they are more likely to impact the development process.

Electric Utility

Electricity is currently supplied to Fort Monmouth by Jersey Central Power & Light (JCP&L). The anticipated electric demand associated with the projected redevelopment is approximately 30,000 Kilowatts (KW) for the 10 Year Plan and 14,000 KW for the 20 Year Plan periods, for a total demand of approximately 44,000 KW. Approximately 77% of the estimated gross electric demand for the total build-out is required for Office/R&D and Residential components of the Reuse Plan.

Adequacy of Existing System

Annual consumption of electricity by Fort Monmouth is currently approximately 20,000 KW. Approximately 90 Uninterruptible Power Supply (UPS) systems and 51 emergency generators are located in various buildings throughout the facility. The electricity is distributed through a series of transformers located throughout the Fort area, and there is concern about the feasibility of the existing system to handle the projected demands.

System Improvements

Upon review of the projected demands, JCP&L reported that, typically, customer-owned facilities do not meet JCP&L standards and are not reused by JCP&L. Further, JCP&L indicated that additional capacity, if required, would be determined when the Final Reuse Plan and specific site plans and loading impacts are developed and submitted for review. Area requirements are dynamic and time-sensitive, so available capacity, service proposals, and associated costs could be affected by the timing of applications and installations. Capacity is not reserved. Depending upon the magnitude of new loads, coupled with regional load requirements, significant infrastructure improvements may be required outside of the Reuse Area. These improvements may require existing transmission circuits to be rebuilt, upgraded, or replaced.

The full impact of the development on JCP&L, and the need for improvements, would be determined by an Initial Load Study (ILS), which requires a well-defined redevelopment proposal and timeline, including detailed locations of proposed loads. JCP&L indicated that new substations would be required

within the Reuse Areas; however, these could be on existing substation sites. Easements or conveyance of property would also be required.

Costs

JCP&L provided the following cost information and assumptions:

• Primary/Secondary Distribution (6 – 12.5kV Overhead Feeders)	$5,400,000
• Transmission (Relocation of existing Transmission, Rebuild existing line)	$2,100,000
• Substation (2 Substations – high side 34.5kV)	$4,700,000
Subtotal	$12,200,000
Tax Gross up (23.97%)	$ 3,000,000
Total	$15,200,000

NOTE:

1. Cost estimates are not based upon a planning study. Costs are 2008 dollars.

2. The municipalities of Oceanport, Eatontown, and Tinton Falls may require by ordinance that electric distribution be done underground. Costs associated would require detailed study at later stages of implementation.

Assumptions:

1. All JCP&L facilities are overhead, except for transformers larger than 300kVA.

2. All three phase underground commercial services are installed and owned by the company/customer requesting service.

3. Overhead line extensions are along existing roads.

4. Distribution costs were developed utilizing a per foot cost estimate that reflected the existing system denoted in the base maps that were provided. It needs to be noted, however, the actual build-out of the system may be significantly different.

5. Smart Growth designations would be granted for the area, thus line extension costs to the developer/customer would be refundable, predicated on meeting revenue requirements.

6. JCP&L facilities are not in a designated wetland area, which would require permitting and additional engineering costs.

7. The rough distribution design has capacity to serve approximately 42 MW of load.

8. The existing transmission, presently, can support 20 MW of load. Any increase beyond the 20 MW would require a full planning study that incorporates the review of the Fort Monmouth load projection, in conjunction with the loading impacts from surrounding communities and the County. This is a detailed study that requires a non-refundable fee.

9. The new JCP&L substations would require an acre of property. If bulk (115kV or 230kV) transmission is required to support the redevelopment, the substation footprint is a minimum of 2 acres, and the associated costs are substantially greater than noted above.

10. There are no single customers with loads exceeding 2,500kVA. Customers exceeding 2,500kVA may be required to accept transmission service and provide their own transformation and regulation.

Comments/Suggestions

JCP&L requires a detailed Final Reuse Plan in order to further refine its electrical distribution system needs, and provide reliable conclusions on its ability to meet projected demands and at what cost. JCP&L has also been requested to provide costs for an underground distribution system within the Fort property.

Water Utility

New Jersey American Water (NJAW) currently provides service to and throughout the Fort Monmouth facilities. The anticipated water demand associated with the projected development is approximately 1,000,000 gallons per day (gpd) for the 10 Year Plan and 670,000 gpd for the 20 Year Plan periods, for a total demand of approximately 1,670,000 gpd. Approximately 75 % of the estimated gross water demand for the total build-out is required for Office/R&D and Residential components of the development.

Adequacy of Existing System

The Main Post and Charles Wood Area have had some water quality problems throughout the years, primarily due to the system's age. Presently, the system is presumed to be in fairly reliable condition, with adequate quality; however, it may be preferable for a developer, or NJAW, to install a new water distribution system rather than replacing and/or repairing the existing one. In fact, NJAW has indicated that a majority of the water system piping has reached its useful life, and the proposed development would require installation of new water mains, sized to meet demand. NJAW does currently have several large diameter water mains adjacent to the Fort property that may be able to adequately service the property; however, NJAW makes no guarantee that the allocation required would be available at the time of application/development.

System Improvements

NJAW has indicated that the development Plan extends into a time frame where water allocation would potentially be a problem unless several long-term projects are completed. However, NJAW has not provided any further detail, plans, or reports on potential improvements.

Costs

NJAW currently anticipates that all on-site piping would have to be replaced to meet the demands and/or layout of the proposed development. These costs would be paid for by the developer, with the potential for eligibility for refund depending on then-current Smart Growth development programs. NJAW has not provided any estimates for the potential improvements.

Comments/Suggestions

The maintenance and repair of the existing water distribution system would be complex and costly. It may be advantageous to utilize the existing storage tanks located in the Reuse Area. Potential use of any aquifer to supplement water service would be subject to the approval of the New Jersey Department of Environmental Protection.

Additional follow-up with NJAW's Developer Services Department would be required. They have indicated that a formal application, including at least a concept design of the on-site system, would be required for NJAW to initiate its Developer Services Service Extension review process.

Wastewater

Wastewater from Fort Monmouth currently flows to Two Rivers Water Reclamation Authority (TRWRA) wastewater lift/metering stations, and is then pumped to the TRWRA's wastewater treatment plant located in Monmouth Beach on the Shrewsbury River. Currently, TRWRA is under a self-imposed ban on new sewer connections for an anticipated two year period as of July 2007.

The anticipated wastewater output associated with the projected development is approximately 1,000,000 (gpd) per the 10 Year Plan and 670,000 gpd per the 20 Year Plan periods, with a total output of approximately 1,670,000 gpd. Approximately 75 % of the estimated gross wastewater output from the total build-out would result from the Office/R&D and Residential components of the development. Considering the addition of infiltration/inflow, the gross quantity of wastewater to be treated is estimated at 1, 750,000 gpd.

Adequacy of Existing System

For the year 2007, the total metered flow discharged from both the Main Post and Charles Wood Areas was 142 million gallons, although Fort Monmouth was charged for 204 million gallons due to the required minimum charges. This current arrangement resulted in Fort Monmouth being charged for 62 million gallons of wastewater discharge above its actual usage.

The TRWRA's treatment plant located on the Shrewsbury River is permitted to treat 13.83 mgd on average per month. The constraint in the system, however, is the TRWRA's main wastewater pump station. From March to May of 2007, it was observed that the pump station was operating above its capacity, and it was this overloading of the pump station that resulted in the sewer connection ban.

In consultation with FMERPA, the TRWRA has indicated that a more detailed analysis of the existing on-site wastewater piping system is necessary to ascertain the condition of the system, the severity of the infiltration/inflow, and the feasibility of repair versus replacement of the piping. To this end, FMERPA has assembled a subcommittee of the Infrastructure Advisory Committee, with representatives from each of the three towns, the TRWRA, and the Garrison office of Fort Monmouth. This subcommittee has been charged with developing a Request for Proposals (RFP) for engineering services to perform an in-depth assessment of the existing wastewater system piping. The portions of the system to be assessed and the methods of testing are still being evaluated. It is anticipated that the engineering services would be scheduled for the spring of 2009. FMERPA has secured federal funds to undertake these services.

System Improvements

It can be inferred from the above projected demand estimates and the capacity of the TRWRA treatment plant that the treatment plant itself could adequately handle the additional wastewater flows projected by the Reuse Plans. The existing pump station, however, would have to be replaced to match the capacity of the treatment plant. The TRWRA recently completed a $45 million upgrade of the treatment plant; hence, it is anticipated that funding the replacement of the existing pump station is a major concern for the TRWRA.

The results of the detailed analysis of the existing on-site wastewater system would also serve to determine recommendations regarding the extent, magnitude, and cost of repair and/or replacement of the existing system.

Costs

The TRWRA stated that the existing pump station cannot be expanded and would have to be replaced to provide the additional capacity. The TRWRA has selected a new location on the site of the TRWRA treatment plant. The TRWRA estimates the cost to construct the new pump station between $25 and $35 million dollars.

Comments/Suggestions

The existing TRWRA treatment plant is adequate to handle the future wastewater needs of the proposed redevelopment of Fort Monmouth. The constraint lies in the inadequacy of the existing pump station to pump the current wastewater flows to the treatment plant, much less the additional demands of future development. Based on the construction schedule of the proposed redevelopment, it would appear that there is adequate time for the TRWRA to construct a new pump station. Discussions between the TRWRA and FMERPA should proceed.

Telephone

Verizon did not provide any details on their ability to handle the demands of the redevelopment of Fort Monmouth; however, they did state that all the costs associated with any upgrades to the existing systems required and installation of new infrastructure would be at the expense of the developer. Verizon further stated that they would require more detailed concept redevelopment Plans before they could proceed with a feasibility analysis and cost breakdown of their distribution systems, as well as a "letter of intent" for payment of all of their costs to perform the analysis. Through FMERPA, assistance has been solicited from a representative of the New Jersey Board of Public Utilities (NJBPU) to seek a greater level of cooperation from Verizon on the condition of the existing telephone system, the potential for system improvements, and costs for meeting the proposed development demands on the Fort property.

6.0 ENVIRONMENTAL REMEDIATION GUIDELINES

6.0 Environmental Remediation Guidelines

This section of the Plan provides an overview of recommendations related to environmental cleanup. Please refer to Technical Memorandum: Environmental Conditions (September 2007) for the history and current conditions of the site.

6.1 Environmental Conditions

Research and development activities and associated support activities that have occurred at Fort Monmouth during its over 80 years of operation have resulted in the generation of a number of wastes. Prior to recognition of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA), disposal of some wastes occurred on site instead of being transported off-site and handled by the proper authorities. Due to this common practice, the Installation Restoration Program (IRP) was developed by the DoD to comply with federal guidelines for managing and controlling past hazardous waste disposal actions. The IRP is intended to address the cleanup and environmental impacts of contamination and damage resulting from past, not current, activities. The DoD is the lead federal agency responsible for conducting environmental investigations and implementing the final cleanup plans at a military base under the IRP.

As a result of Fort Monmouth's history of research and development (R&D) activity, known and potential environmental concerns identified to date include:

- 43 IRP sites (26 are considered No Further Action (NFA) sites, 17 are still active)
- Petroleum Hydrocarbons Releases resulting from Underground Storage Tanks (USTs) and Above-ground Storage Tanks (ASTs)
- Munitions and Explosives of Concern (MECs)(1 active range)
- Potential Radiological Contamination
- Underground Utilities
- Asbestos and Lead-Based Paint
- Polychlorinated Biphenyl (PCB)-Impacted Equipment, Storage, Spills, and Disposal Areas
- Pesticide and Herbicide Storage Areas, Mixing Areas, and Site-Wide Application

Note: Additional detail and background information is provided in the referenced Technical Memorandum

It should be noted that many of the potential environmental concerns do not pose environmental constraints; however, field investigation and remediation would be necessary to ensure that environmental risk is managed as property transfer proceeds.

The current quantitative environmental information has been used to help guide reuse planning activities, including identification of appropriate locations of each land uses depending on level of contamination, budgeting considerations, potential schedule impacts, and potential land use controls. Final remediation requirements would be determined by the New Jersey Department of Environmental Protection (DEP) and would include consideration of the future land use proposed for the individual areas. Critical environmental constraints were honored during the Plan development. In other words, prime development locations do not conflict with IRP site restrictions. In order to further reduce the level of contamination on the site, administrative controls, engineering controls,

and additional investigation may be used to mitigate contamination or reduce minor environmental constraints.

Due to the potential for other environmental contamination, not previously detected, to exist throughout the installation, use of a Materials Management Plan and a Health and Safety Plan during construction activities is strongly recommended. If potentially contaminated soil, sediment, or water is observed during construction or renovation activities, the procedures outlined in the Materials Management Plan should be followed.

6.2 Property Reuse Constraints

While there would clearly be environmental remediation efforts within the Reuse Areas continuing well into the future, this Plan has been developed so that none of the proposed land uses are subject to critical constraints from the environmental sites. The Plan development process has been completed in concert with this evaluation of environmental conditions and, as a result, any severe constraints resulting from environmental conditions have already been identified and avoided. The following figure on page 6-4 shows the known environmental conditions combined with the current reuse Plan and illustrates the compatible reuse proposed for critical environmental sites such as the landfills.

As the property transfer proceeds and the disposition strategy is refined, it is critical that the stakeholders continue to be aware of engineering constraints imposed by the remaining environmental conditions. Issues such as potential vapor intrusion into new or existing structures from contaminated groundwater would require minimal additional engineering and construction costs that must be factored into any future transfer strategy. The continuing investigation and remediation activities performed by the Army would also continue to refine the understanding and consideration of any future engineering constraints resulting from environmental conditions. FMERPA or its successor must remain vigilant in monitoring the progress of the Army's efforts and the resulting improved understanding of the environmental conditions within the Reuse Areas.

This section, including environmental concerns and cleanup requirements would be updated once the Final Plan is determined based on the data that is available at this time.

6.3 Remediation Requirements

Because of the proactive approach taken by Fort Monmouth staff in identifying, investigating, and remediating the IRP sites at the installation, future remediation requirements should be straightforward to formulate. Ultimate remediation requirements would be coordinated with and determined by the NJDEP with future property use as one of the criteria considered for formulating appropriate remediation requirements. The environmental data gaps are limited at the site; therefore, the only critical remaining issue that must be resolved is the finalization of the redevelopment components. The current Plan has been developed so as to avoid critical conflicts between the selected land use and the existing environmental conditions. Thus, environmental remediation is not a prerequisite for any redevelopment activity proposed. There are likely situations where a remediation effort could benefit from concurrent performance of a development activity or where a concurrent remediation effort would be required to be protective of human health. However, this type of aggressive scheduling cannot be completed until a disposition strategy and schedule are complete.

6.4 Remediation Timeframe and Responsibilities

The Base Closure & Realignment (BRAC) Acts of 1988 and 1990 provide a number of specific legal requirements that must be met when a military base is closed and transferred to a different owner, such as FMERPA. Specifically, the US Army is responsible for either transferring clean property or for paying for the investigation and cleanup of environmental contamination in soil, sediment, groundwater, and surface water necessary to protect human health and the environment.

It is important to understand that there are two different environmental remediation scenarios allowed under the BRAC law that create both opportunity and complexity in the planning of property disposition. Without BRAC, the Army would be required to transfer property only after it had satisfied the provisions of CERCLA. While this routine approach remains one of the possible scenarios, the BRAC provisions make it possible for the Army to transfer the remediation responsibility to the new property owner prior to satisfying the CERCLA requirements. This process is referred to as Early Transfer or accelerated transfer and involves a negotiation process whereby the Army agrees to provide funds for the necessary environmental remediation.

The flexibility allowed by BRAC means that the timing of the environmental remediation of the Reuse Areas can be adjusted to address the community's needs as identified in the reuse planning process. For example, a highly desirable property that is determined to represent economic benefit to the community and is contaminated could be a candidate for transfer prior to remediation. This Early Transfer places more control in the hands of the community for ensuring that the remediation goals meet the land use needs identified by the community as opposed to those imposed by the Army. In cases where a specific parcel is not as economically critical, or the transfer schedule is not short, the Army could proceed with remediation on their schedule and transfer the property along with the NJDEP approval of a completed remedy sufficient to protect human health and the environment under the planned land use scenario.

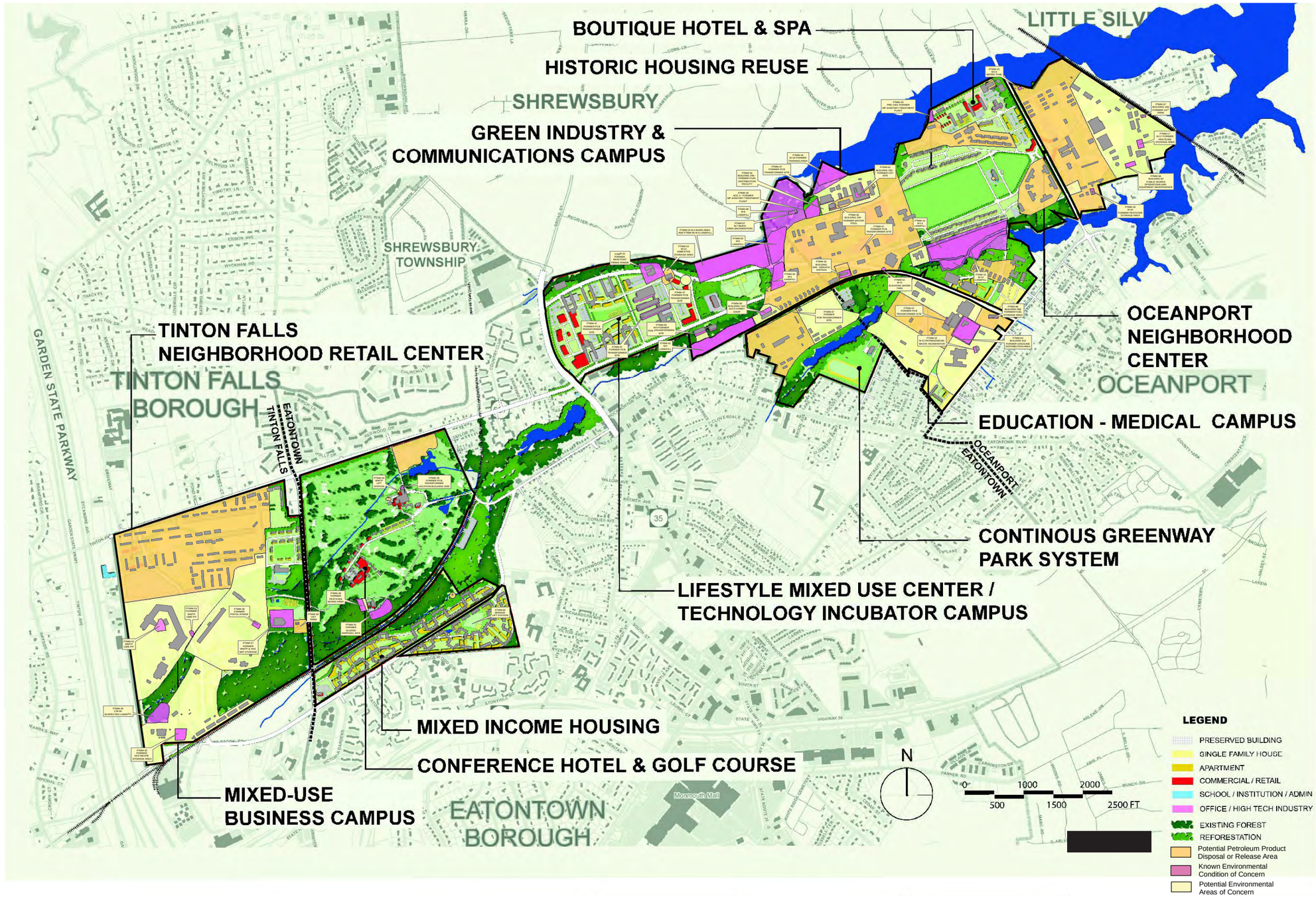
This inter-related nature of the environmental responsibilities under BRAC make the determination of a remediation schedule prior to finalization of a disposition strategy and associated schedule problematic. Further complication arises from the fact that the FMERPA would identify development schedule constraints that are unknown to the Army, and are driven by economic factors that are not of concern to the Army, and that are likely to change over time. These schedule requirements must also be taken into consideration when developing a timeframe and establishing whom the responsible party is with respect to remediation as part of the disposition implementation.

The degree of remediation that is eventually achieved is also of great concern to the community and is closely related to the land use proposed for the transferred property. Environmental remediation is intended to reduce or eliminate ecological or human health risk that could be created by environmental contaminants. Risk (ecological or human health) is characterized by considering a variety of factors that have the potential to contribute to that risk including, at the basic level, the type and concentration of contaminants and the magnitude of exposure for both ecological and human receptors. Residential use creates more exposure than recreational use because people spend more time on average in and around their homes than walking in a park. Because regulatory cleanup criteria are driven by an evaluation of the risk that is created on a site specific basis, it is critical that land use be identified prior to establishing these cleanup criteria. For example, the cleanup criteria for a landfill that is planned to be used as open space would be much less restrictive than for a landfill planned for residential use. This process is straightforward and well understood; however, it is not possible to finalize the cleanup criteria for any specific site within the Reuse Areas until the Plan and disposition strategy is finalized.

Finally, the cost of environmental remediation is also dependent upon the finalization of the Plan. The Early Transfer includes a detailed negotiation process where FMERPA or its successor would study the environmental conditions associated with any specific Early Transfer properties and, in cooperation with NJDEP, forecast the required remediation efforts. The Army and the community would then agree to a transfer including funding that would allow FMERPA to achieve the regulatory criteria and obtain clean closure for each site. Although the simplest example of funding the remediation is for the Army to provide a grant in the negotiated amount, there are other approaches that may be attractive at Fort Monmouth. For example, because of the value of a specific parcel, the Army may prefer to discount the purchase price for a specific parcel by an amount commensurate with the remediation cost. In the end however, these alternatives are variations on the theme of Army funded remediation in support of an Early Transfer.

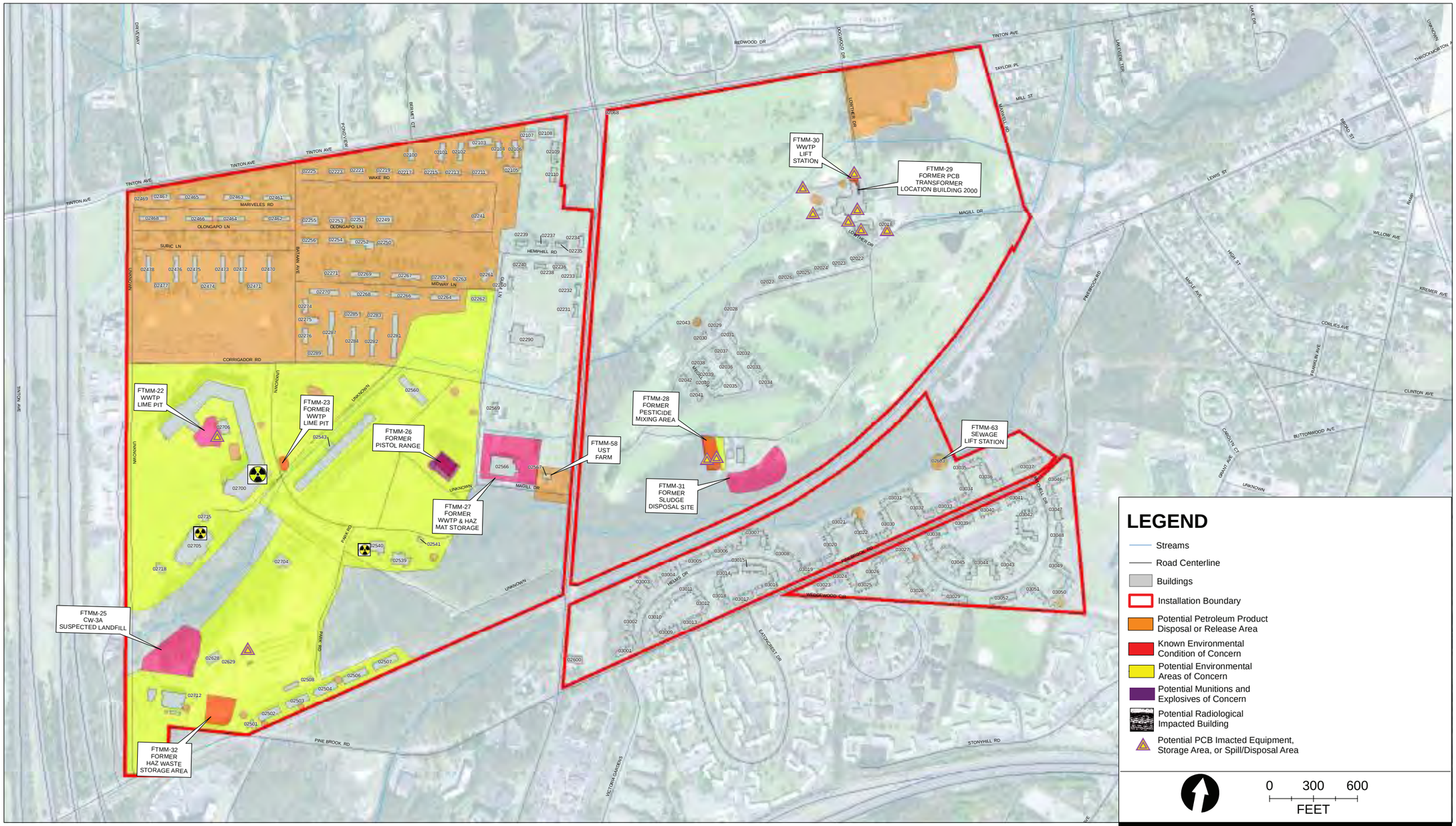
Any properties that remain in the Army's hands as part of the disposition strategy would proceed through cleanup to clean closure under the Army's direct supervision and using funds separate from any direct community involvement. FMERPA would continue to be able to comment on the costs, schedule, and cleanup criteria for these properties but would lack any direct influence on the Army's process or progress.

Because of these identified interrelated factors, it is impossible to establish a clear timeframe regarding remediation of the Reuse Areas or to establish responsibilities beyond the general understanding that the Army is ultimately responsible under law. Once the Reuse Plan is adopted, and a strategy and schedule is in place, a more detailed environmental remediation timeframe and responsibility matrix can be developed.



Source: Matrix Design Group

Environmental Conditions of the Property



LEGEND

- Streams
- Road Centerline
- Buildings
- Installation Boundary
- Potential Petroleum Product Disposal or Release Area
- Known Environmental Condition of Concern
- Potential Environmental Areas of Concern
- Potential Munitions and Explosives of Concern
- Potential Radiological Impacted Building
- Potential PCB Imacted Equipment, Storage Area, or Spill/Disposal Area

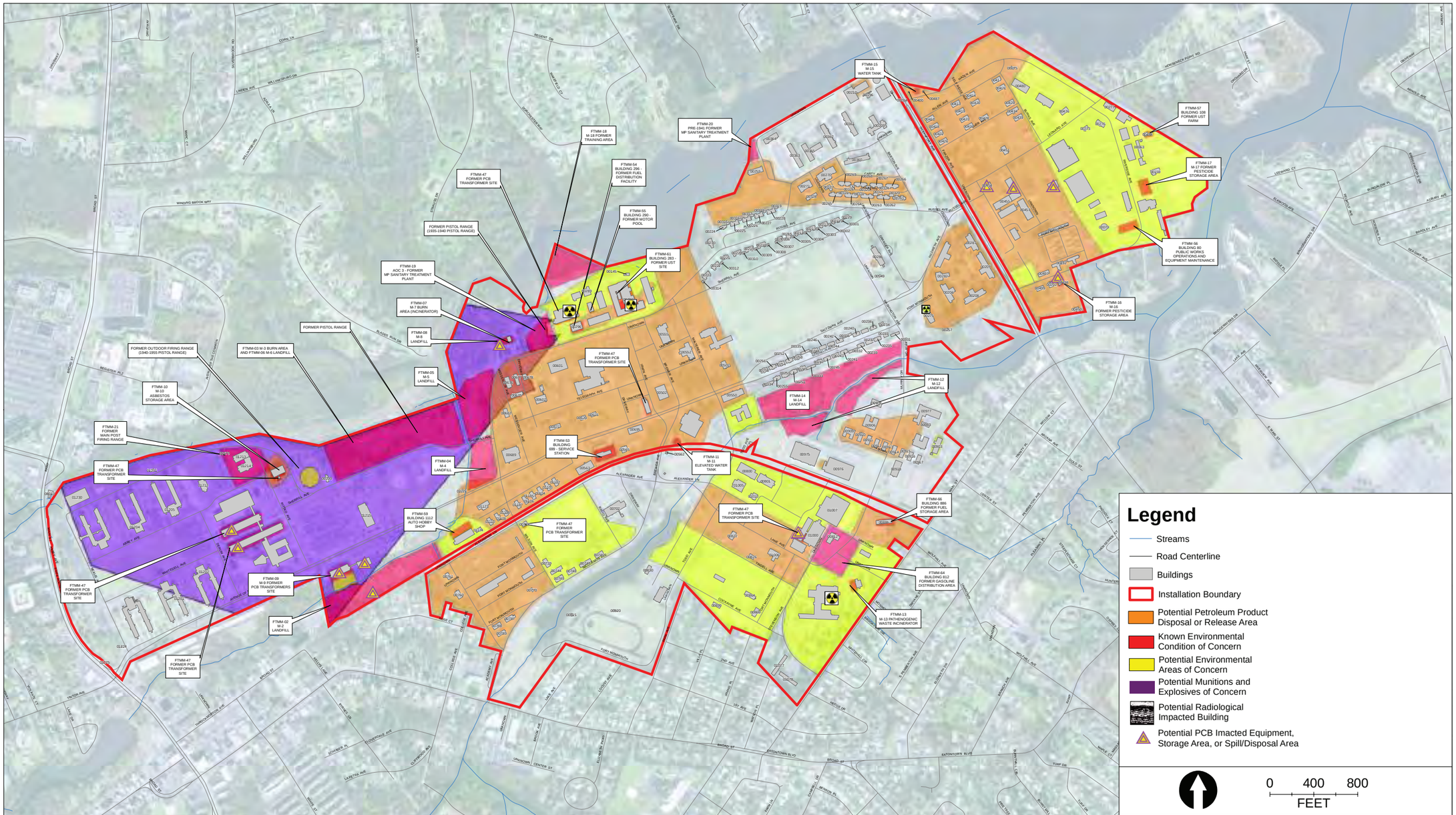
FIGURE 2: ENVIRONMENTAL CONDITIONS OF CONCERN: CHARLES WOOD

FORT MONMOUTH REUSE AND REDEVELOPMENT PLAN

FMERPA

Matrix Design Group Inc. Integrated Design Solutions | FORT MONMOUTH Community Planning for a Bright Future | EDAW | AECOM

Environmental Conditions of the Property



FORT MONMOUTH REUSE AND REDEVELOPMENT PLAN

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ENVIRONMENTAL CONDITIONS OF CONCERN: MAIN POST

Environmental Conditions of the Property

7.0 HISTORIC PRESERVATION GUIDELINES

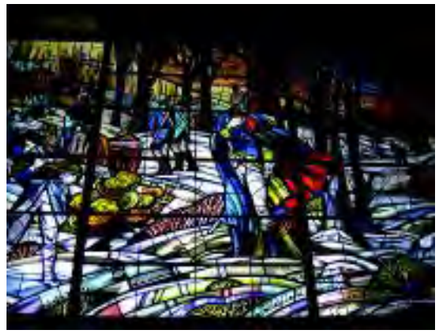
7.0 Historic Preservation Guidelines

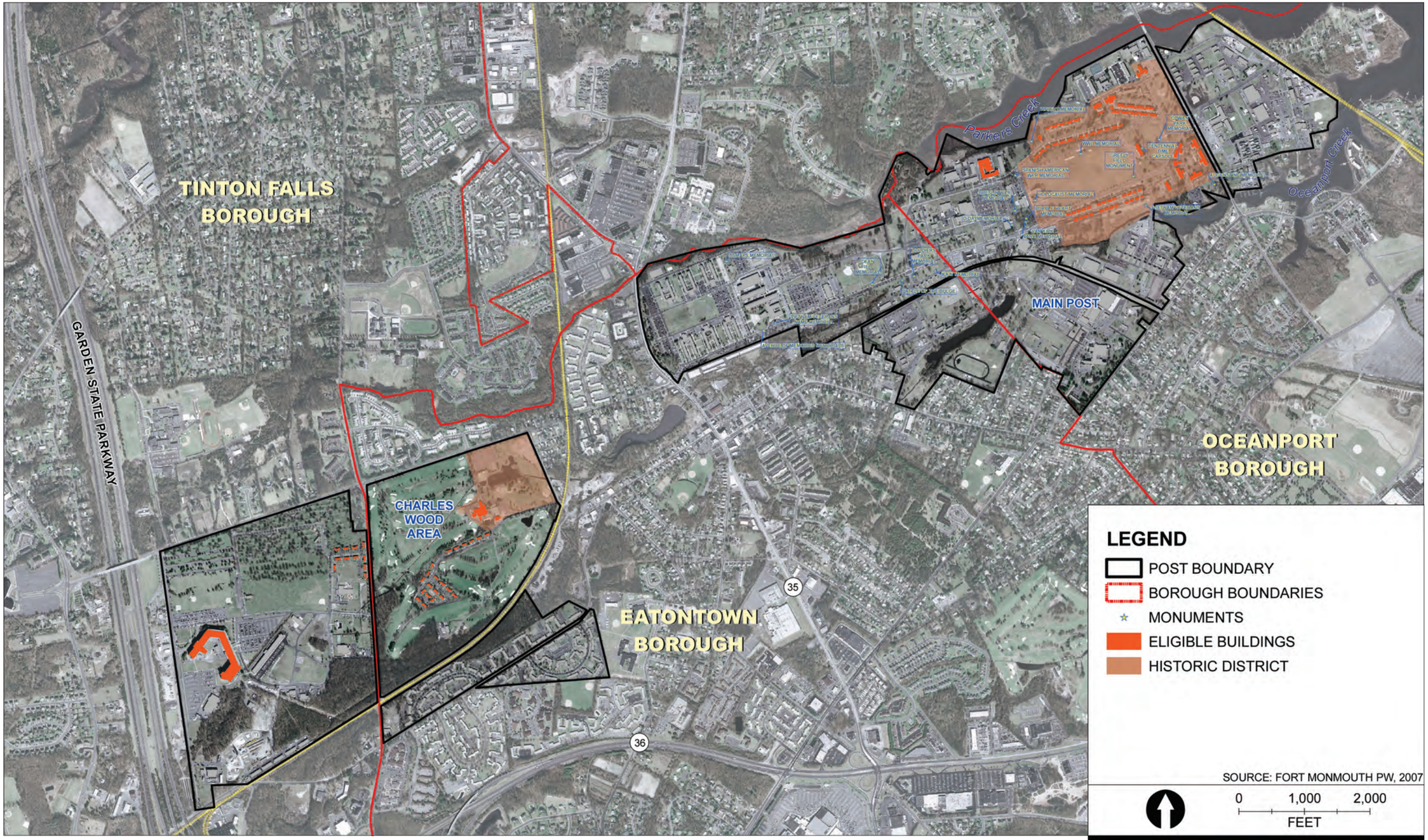
7.1 Historic Resources Overview

The buildings within Fort Monmouth display a wide range of design characteristics and uses including residential, educational, commercial, office, and industrial. These buildings were developed over time in different architectural styles in response to the needs of the garrison and its mission. They have been generally well maintained by the Army, but vary individually in condition and their adaptability to civilian uses.

Based upon the buildings' architectural merit, their association with significant events in American history such as World War II and the Cold War, or both, it has been determined that there are nearly 100 buildings eligible for the State and National Register of Historic Places.

Historic preservation guidelines for the buildings determined to have historic significance are based on the latest revisions of The Secretary of Interior's Standards for Rehabilitation, published by the United States Department of Interior. This document defines the various levels of preservation treatment; which are: preservation, restoration, rehabilitation, and reconstruction; and gives guidelines for the treatment depending on the circumstances.





FORT MONMOUTH REUSE AND REDEVELOPMENT PLAN

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AUGUST 2007

7.1.1 Historic Resources to be Retained

Through a series of buildings surveys and consultations with stakeholders, several buildings were either identified to be physically retained or their history and cultural value be retained through mitigation measures such as documentation and educational showpieces and displays.

HISTORIC DISTRICTS

Three historic districts within Fort Monmouth have been determined as eligible for listing on the National Register of Historic Places by the NJ State Historic Preservation Office.

Fort Monmouth Historic District, Main Post

The largest of the districts is the Fort Monmouth Historic District, which comprises 94 resources that date from the late 1920s through the mid-1930s, with one exception (the WWII Memorial, dating to 1952.)

The resources included in the Fort Monmouth Historic District are largely of brick construction, and represent a range of uses, including offices and administrative functions, family housing, garages, and a fire station. The Parade Ground (and associated WWII Memorial) is also located within the district boundaries.

Russel Hall, Building 286, the garrison headquarters, at the east end of the Parade Ground (Photo courtesy of FMERPA)

Camp Charles Wood Historic District

The Camp Charles Wood Historic District contains far fewer structures but is nearly as large as the Fort Monmouth Historic District in area. The focal point of the district is Gibbs Hall (Building 2000), a 1926, Tudor Revival style golf clubhouse that was originally constructed as the Suneagles Country Club. Gibbs Hall (Building 2000) and its accompanying outbuildings (Buildings 2001, 2018, 2019, and 2020), as well as the surrounding golf course (originally designed by A. W. Tillinghast, a well-known golf course architect) are contained within the historic district.

Gibbs Hall, Building 2000

Camp Charles Wood Residential Historic District

A Residential Historic District located to the east side of Hope Road at the center of the Charles Wood portion of the base includes a total of 32 housing units, constructed circa 1949 to 1955. The buildings were constructed as duplexes and represent the earliest housing to be constructed in the Camp Charles Wood area. As such, they are significant for their association with the post-World War II efforts of Fort Monmouth, which focused on communications research and development. The NJ State Historic Preservation Officer has determined that this housing is not eligible for listing in the National Register at this time.

Megill Circle housing in Camp Charles Wood Residential Historic District

HISTORIC STRUCTURES

In addition to Historic Districts, several historic buildings have been identified for retention or interpretation.

Squier Hall (Building 283)
- **Eligible for individual listing on the National Register**
- **Constructed in 1935 as research laboratories and training facilities**
- **Exterior of the building is original; interiors have been renovated**

World War II Temporary Wood Structures
- **Many one- and two- story wood frame buildings were constructed for barracks and training facilities as part of Fort Monmouth expansion during World War II**
- **A large number of these structures have been demolished**
- **Significant part of the World War II era at Fort Monmouth**

Myer Center (Building 2700)
- **Eligible for listing on the National Register**
- **Associated with the Cold War and the development of military electronics**
- **Local landmark; highly visible from the Garden State Parkway**

Dymaxion Deployment Units (on roof, as seen from the ground)
- **Designed in 1940 as inexpensive, temporary housing for Army during World War II**
- **Concept design based on the functional style of the grain bin**
- **Constructed of corrugated steel**

MONUMENTS AND MEMORIALS

One of the goals of the Historical Preservation Advisory Committee has been the documentation and preservation of the existing memorials and markers dispersed throughout Fort Monmouth. The twenty memorials identified range from such large-scale, architectural works as the World War II Memorial at the edge of the Parade Ground (Greely Field) to the markers that line the Avenue of Memories.

Only one memorial is located on Camp Charles Wood (Constitution Plaza at the Myer Center); the remaining nineteen are all found on the Main Post. The majority of the memorials were installed in the 1950s, although the collection grew over the next several decades.

World War II Memorial

7.1.2 Recommended Reuse Options

HISTORIC DISTRICTS

Fort Monmouth Historic District, Main Post

The resources included in the Fort Monmouth Main Post Historic District are, of the three identified historic districts, the most diverse in terms of style and use. Its significance is both historic and architectural; the Fort Monmouth Historic District stands as a physical reminder of Fort Monmouth's early years of development as an Army post. As such, the physical arrangement of this district is of extreme importance and should be respected when new construction is being considered. The open space – the parade ground – at the core of the district should be maintained as one of the most important character defining elements of the district. Similarly, the arrangement of the residential buildings at the edge of the parade ground, and the termination of the ground at its east end in the imposing Art Deco Style Russel Hall (Building 286), are key design elements. In considering new construction within or adjacent to this district, key design considerations would include symmetry, scale (two to three stories), material (brick or other masonry), and details such as door and window openings.

Housing Flanking Parade Ground

Reuse Recommendations

The detached and double housing units surrounding the Parade Ground are well-suited for re-use as housing. They range from modest to substantial in scale, and would suit a variety of markets without significant modifications.

Recommended Treatments

The recommended treatment for these buildings is Preservation. They are currently in good condition, and would remain so with standard maintenance. They do not require any significant alterations for continued use as housing.

Barker Circle

The buildings known as Barker Circle were originally constructed for barrack-type housing. The plans of these buildings do not readily adapt to traditional civilian housing forms, but they are suitable for adaptation to office use or loft-type housing.

Fire House

The firehouse facing the Parade Ground at Barker Circle should be re-used as a firehouse.

Recommended Treatments

The recommended treatment for the firehouse is Rehabilitation. It would need some improvements to accommodate modern emergency equipment, but its essential character-defining features may be retained with compatible new doors and windows.

Aerial view of Barker Circle from the southeast. The fire house is at the upper center of the complex

Colonnaded Facade at Barker Circle

Family Housing Surrounding the Parade Grounds

Recommended Treatments

Rehabilitation is the recommended treatment for these buildings. Because they have been previously altered, further alterations which do not detract from the character-defining features of the original work are appropriate.

These buildings would require complete interior renovation including mechanical and electrical systems, as well as upgrades to comply with the NJ Barrier-Free Subcode. Structural improvements are also required at the porches.

Kaplan Hall

Kaplan Hall was built as a theatre for Fort Monmouth, and has been adapted to serve as a museum. It is recommended that it remain a museum or other civic use.

Recommended Treatments

Preservation is recommended for Kaplan Hall. While the building would require some improvements for energy efficiency and barrier-free access, there is no need for substantial alteration that would constitute an adverse impact to adapt to a new use.

Gardner Hall and Guest House

To the north of the housing at the northern edge of the Parade Ground are two buildings, Gardner Hall and the Guest House, currently serving as short-term housing for visitors and temporary duty personnel at the Fort. These low, hip-roofed buildings are contributing elements in the Fort Monmouth Historic District, and should be retained for re-use as housing.

Recommended Treatments

These buildings would require Rehabilitation to adapt to a different housing use. Their exterior character-defining features such as the overhanging roofs and porches should be retained. Provision for barrier-free access would be required. If one of these buildings is demolished, mitigation would be required under Section 106 of the National Historic Preservation Act.

Allison Hall

Allison Hall was built as the hospital for Fort Monmouth. It is a sound building that has been renovated several times to serve as office space. It can be adapted again to continue to serve as office space for new tenants.

Recommended Treatments

Allison Hall would require rehabilitation to continue as office space. The interior would require improvements to comply with NJ Building Codes, including barrier-free access. Some original interior features, such as metal moldings and transoms at interior door frames, should be retained in any rehabilitation.

Parade Ground

The Parade Ground is the primary character-defining feature of the Fort Monmouth Historic District. It is remarkable in its scale, and provides a gracious setting for the housing that lines its edges. It should remain an unobstructed green space for the use of the community.

Recommended Treatments

Preservation is the recommended treatment for the Parade Ground. Existing plantings and walks should be preserved, and additional walks or paths added as needed for the new community. No structures or landscaping should be erected on the Parade Ground; it should remain an open lawn.

Russel Hall

Russel Hall dominates the Parade Ground, and is the anchor of the entrance to Fort Monmouth. This Art Deco brick building would remain in the hands of the US government, and would continue to be used for office space.

Recommended Treatments

Russel Hall would continue to be preserved by the US government.

Chapel

The Chapel is a non-contributing element of the Fort Monmouth Historic District based on National Register of Historic Places criteria. It is, however, harmonious in scale and design with the other buildings surrounding the Parade Ground, and should be retained as a religious structure.

Recommended Treatments

The Chapel may be preserved, rehabilitated, or demolished. Changes required for a new use would be suitable as long as they do not adversely affect other contributing elements of the Historic District. New construction should follow the guidelines for new construction.

Antennae

Several antennae remain at the northeast corner of the Fort Monmouth Historic District as a reminder of the Fort's role in development of communications technology during the Cold War. These structures would be relocated by the Army when they leave Fort Monmouth.

Recommended Treatments

Because these antennas relate directly to the historic significance of Fort Monmouth, they should be documented prior to removal as part of mitigation of the adverse impact on the Fort Monmouth Historic District.

Gardner Hall

Antennas in domes at the northeast corner of Fort Monmouth. Allison Hall is to the left, above the parking lot.

The Parade Ground from the east. Russel Hall and the Chapel sit at either end of the open space. The World War II Memorial is the only structure within the Parade Ground.

Camp Charles Wood Historic District, Gibbs Hall and Suneagles Golf Course

Reuse Recommendation

The focal point of the Camp Charles Wood Historic District is Gibbs Hall (Building 2000), a 1926, Tudor Revival style golf clubhouse that was originally constructed as the Suneagles Country Club. New construction within or adjacent to this district would need to respect the scale and style of Gibbs Hall as well as its primacy in the district. Gibbs Hall should be re-used in keeping with its original design intent and current use as a clubhouse and restaurant. The building has a commercial kitchen and dining rooms that are conducive to reuse. General dining areas are also available, although the banquet capabilities are small in scale.

Recommended Treatments

Gibbs Hall requires preservation and minor rehabilitation to address current building conditions and make interior upgrades to suit expanded usage. Rehabilitation should retain original features and materials at both the interior and exterior, including fireplaces, ornamental plaster, and copper trim.

Other Historic Structures

Squier Hall

Reuse Recommendations

Squier Hall (Building 283) is currently used as office space and would be most appropriately reused as office space. Its layout is irregular, although most wings have double-loaded corridors.

Recommended Treatments

The exterior of the building should be preserved, and any necessary repairs performed. The interior may be rehabilitated with new plan layouts and finishes as required to meet the needs of a new user. Barrier-free access and energy conservation should also be improved.

Dymaxion Deployment Units

Reuse Recommendations

The Dymaxion Deployment Units should be removed from the roof of the Myer Center, and located where they can be used and/or interpreted to the public. They would not be suitable for re-use as housing, their original function, but could be used for retail or welcome space.

Recommended Treatments

Because of their significance and rarity, the Dymaxion Deployment Units should be restored to their original condition after relocation.

Myer Center

Reuse Recommendations

The Albert J. Myer Center is a sound building constructed for telecommunications research purposes. It has a plan layout of two corridors defining two perimeter zones and an interior zone, corresponding to the layout of steel and concrete masonry unit piers. The building has high floor-to-floor heights and a relatively flexible plan, making it suitable for continued use for communications and electronics research.

Recommended Treatments

The Myer Center would need significant modernization to building systems and finishes for use for new tenants. It would also require development of a strategy to subdivide the building for phased occupancy, taking into account exiting, vertical transportation, and services such as HVAC and rest rooms. Because of limited original interior character-defining features, interior treatments would require little regulation.

At the exterior, a Rehabilitation approach should be employed. The existing building skin is not original, and the narrow strip windows present an austere appearance. The windows and wall cladding could be modified to create a more human scale for the building, and to be more in character with its original appearance.

World War II Temporary Structures

Reuse Recommendations

Throughout Fort Monmouth are temporary wood structures related to the expansion of the Fort during World War II. Because they were hastily built and not intended for permanent use, these structures all require substantial upgrades for energy efficiency and code compliance for adaptation to permanent use. As a result of a programmatic agreement concerning temporary structures

Gibbs Hall

Fireplace with ornamental over-mantle at interior lobby of Gibbs Hall

Squier Hall

nationwide, none of these structures are required to be retained. Because they represent a significant period of the history of Fort Monmouth, however, relocation and re-use of a small number of these structures for seasonal recreational or specialty retail use is recommended.

Recommended Treatments

The World War II structures should be relocated as needed, and placed on new foundations. Rehabilitation should include removal of later accretions, new roofing and siding similar in character to the original, rehabilitation of existing wood windows, installation of building systems required for new uses, and barrier-free access.

MONUMENTS AND MEMORIALS

Reuse Recommendations

The monuments and memorials should remain in place where their settings remain intact. Where a change in setting is necessary, the memorial should be relocated to a compatible location.

Recommended Treatments

As a number of these monuments and memorials have reached fifty years of age, an assessment of their condition by a professional conservator is recommended. This assessment should include a prioritized list of recommendations for restoration and maintenance, and also provide associated costs for the work outlined. Such an assessment is particularly important for the large-scale memorials and/or those with a structural component, such as the World War II Memorial, the Augenstine Memorial, or the Spanish American War Memorial, all of which date to the early 1950s.

The Dymaxion Deployment Unit should be placed on a concrete foundation, and all materials restored to their original condition.

The Myer Center from the west. The Dymaxion Deployment Unit is on the roof beyond, near the chimney stack.

7.2 Effects on Historic Structures and Recommended Mitigation Measures

This chapter outlines the potential effects to the historic structures of Fort Monmouth that would be realized in both the 10-Year and 20-Year Concept Plans. In general, potential effects can include both direct physical effects, such as demolition or alteration, and indirect effects, such as the introduction of new buildings or site features in close proximity that are out of character with a property or that alter its historic setting and context.

Main Post

The Main Post has a large collection of buildings, many incorporated within an eligible historic district, that are appropriate for preservation and reuse. The administrative and residential buildings on the Main Post have been well maintained and are in sound condition, and both the 10- and 20-Year Concept Plans show retention and reuse of the majority of these buildings. In fact, few physical changes to the existing buildings or their physical setting are anticipated within the eligible Fort Monmouth Historic District, and many buildings would continue to serve the same or similar use.

The buildings that comprise Barker Circle would remain, but plans show these buildings being adapted for use as municipal offices and residential reuse. The adaptive use of the buildings is considered to be a direct effect, but one that can be mitigated through design consultation with the New Jersey State Historic Preservation Office (NJSHPO).

The 20-Year Concept Plan also shows new construction to the north of Allison Hall (Building 209), a building that was originally constructed as a hospital but was later converted for office use. This new construction may visually alter the surrounding area, resulting in an indirect effect on the eligible resource (Fort Monmouth Historic District). New construction would need to be sensitive to the historic buildings in close proximity, such as Allison Hall, and the adjacent historic district, and designs should be developed in consultation with the NJSHPO and local historic preservation commissions.

Similarly, while the 10-Year Concept Plan shows no immediate changes to the Register-eligible Squier Hall (Building 283), the 20-Year Concept Plan provides for the growth and development of a new high tech green industry "center" immediately to the south of Squier Hall. This new construction would visually alter the surrounding area, resulting in an indirect effect on the eligible resource (Squier Hall). New construction would need to be sensitive to the historic building and to the general physical context.

Camp Charles Wood

The creation of a new hotel and conference center to the west of Gibbs Hall (Building 2000) is shown on the 10-Year Concept Plan. This new construction constitutes an indirect effect on National Register eligible resources. The new conference center would have an indirect effect on Gibbs Hall and its associated resources, as it would be within the viewshed of the Register-eligible building and would alter their physical context. Mitigation should include documentation of the entire Megill Circle complex and its landscape, and consultation with the NJSHPO and local historic preservation commissions regarding design of new construction.

The Myer Center (Building 2700-01) is an approximately 675,000 square foot, open hexagon plan research facility built in the 1950s. The Myer Center, which has been identified as an individually eligible building, dominates the western section of the Charles Wood area. The 10-Year Concept Plan shows partial demolition of the Myer Center, and its reuse as a commercial / general office / data center, with additional new construction to be completed as part of the 20-Year Concept Plan. These Plans constitute a direct effect on the Register-eligible building. Mitigation should include documentation of the structure, interpretation of its history, and design consultation regarding alterations and adjacent construction.

Myer Center courtyard

7.3 Guidelines for Preservation and New Construction

Preservation

The Secretary of Interior's Standards for the Treatment of Historic Properties [http://www.nps.gov/history/hps/tps/standguide] define four categories of treatment for historic structures, each of which involves varying degrees of retention of historic materials.

Preservation

Preservation is defined as "the act or process of applying measures necessary to sustain the existing form, integrity, and materials of a historic property." This treatment requires the retention of the greatest amount of historic fabric, including the features that illustrate the building's evolution over time.

Restoration

Restoration is defined as "the process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of removal of features from other periods in its history and reconstruction of features from the restoration period." In restoration, material authenticity is often sacrificed, as certain materials may be removed or missing features rebuilt to depict a single period.

Rehabilitation

The broadest category in the Secretary of Interior's Standards is rehabilitation. This is defined as "the act of process of making possible a compatible use for the property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values." Projects in this category may range from building renovation for similar uses, restoration of landmark public buildings that do not involve a change of use, to the adaptation of historic structures for uses other than the original. As in Preservation, a large amount of material fabric is retained

in Rehabilitation, as more than one period in the building may be represented. However, there may be less material authenticity due to the fact that alterations and additions for a new use are often required in this treatment category. Often, these projects involve very extensive renovations to HVAC, electrical, fire protection, plumbing, and security systems; while allowing the original design and materials of historic spaces to be preserved.

Reconstruction

Reconstruction is defined as "the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location." A reconstruction has the least authenticity of historic materials, since it depicts a single period in history using new materials, and is often based solely on archeology or other documentary evidence.

It is anticipated and recommended that the majority of the work on historic buildings at Fort Monmouth would be in the area of Rehabilitation. The monuments and memorials would be in the Preservation category, and the Family Houses on the Parade Ground would also be in the area of Preservation as they would serve for their original use. Restoration of buildings to a given historic time period is not anticipated, as the resources evolved over time and were utilized through many historic periods. Reconstruction or the creation of exact replicas of historic structures or sites is not anticipated or recommended in the Plan.

Modifications to existing structures should be designed to ensure minimal loss or removal of distinctive or character defining features, such as:

- Scale and massing of exterior walls
- Fenestration
- Decorative masonry details
- Decorative wood trim
- Roof shapes
- Special roofs and roof trim
- Porticos and porches
- Ornamental metals
- Dormers
- Shutters
- Decorative chimneys
- Landscape entrance elements

New Construction

The design of new buildings, as well as the design of building additions, within or adjacent to the defined historic districts or individually eligible buildings must be treated sensitively in order to preserve the historic character of the districts, each of which possesses its own identity and sense of place, and the significant landmarks. New buildings should respect not only the built context, but also the character of the landscape and streetscape.

Additional archaeological investigation that incorporates a program of subsurface testing is recommended to complement the information that has already been gathered on Fort Monmouth's above-ground resources and present a more complete picture of the cultural resources associated with the development of this site. It is important to complete archaeological investigations prior to the commencement of any new building on the Fort Monmouth property.

Compatible new construction can be achieved through an understanding and respect for a variety of design principles, including: setback, orientation, scale, proportion, massing, height, materials, and roof shape. In addition, the location and design of landscape features – trees, driveways, sidewalks, and even outbuildings – contribute to the character of the historic district or the setting of the significant building and should be considered throughout the planning process.

Generally:

- Modifications to existing structures should be designed to ensure minimal loss or removal of distinctive or character-defining features;
- The design of additions or new structures should be of a size and scale that is in keeping with the size and scale of the historic structure or structures; and
- The creation of exact replicas of existing historic structures is not recommended.

7.4 Section 106 Process

7.4.1 Consultation

In considering the future of Fort Monmouth's historic resources, FMERPA (Fort Monmouth Economic Revitalization Planning Authority), acting on behalf of the Army, is required to participate in the Section 106 review process. Section 106 review (which refers to Section 106 of the National Historic Preservation Act of 1966) requires federal agencies to consult with the State Historic Preservation Officer prior to implementing projects that impact historic properties, and ensures that private citizens and local governments have an opportunity to participate in the preservation planning process.

The Section 106 review process requires the project team to work with the New Jersey State Historic Preservation Office to reach a consensus regarding the eligibility of the resources and then to evaluate the effect of the proposed projects on those resources. Consultation with the NJSHPO typically results in a Memorandum of Agreement (MOA) or Programmatic Agreement (PA), which outlines the means by which the effects on historic resources would be mitigated.

The historic preservation review process mandated by Section 106 is outlined in regulations issued by the Advisory Council on Historic Preservation (ACHP). Revised regulations, "Protection of Historic Properties," (36 CFR Part 800), became effective January 11, 2001.

7.4.2 Mitigation

As mandated by Section 106 of the NHPA of 1966, FMERPA is participating in an ongoing consultation process with the NJ SHPO with respect to potential impacts on historic resources. As part of this consultation process, measures are being developed to avoid or minimize any significant adverse impacts – both direct and indirect – to historic resources.

Mitigation options may include:

- Ongoing consultation with NJ SHPO with respect to the design of project elements that would physically alter a historic resource or that could affect its context or setting.
- Documentation of historic resources and landscapes prior to their removal or alteration, ideally performed while the buildings and landscapes maintain the current degree of historic integrity. The level and type of documentation should be determined in consultation with the NJ SHPO.
- Additional study of the property. For instance, archaeological investigation that incorporates a program of subsurface testing could complement the information that has already been gathered on Fort Monmouth's above-ground resources, and would present a more complete picture of the cultural resources associated with the development of this important site.
- Public dissemination of the importance and historical significance of Fort Monmouth and its attendant resources, such as the development of a website, walking tour, publication, or permanent on-site exhibition.

8.0 COMMUNITY IMPACTS

8.0 Community Impacts

8.1 Overview

Economics Research Associates (ERA) has conducted a net fiscal impact analysis for the preliminary redevelopment program for Fort Monmouth. The analysis focuses primarily on the impacts to the municipal operating budgets of the three boroughs that encompass the Fort: Eatontown, Oceanport and Tinton Falls, as well as impacts to the local and regional school operating budgets. As part of our analysis, ERA met with Administrators or Chief Financial Officers for each of the Boroughs to discuss cost allocation methodologies and tax and equalization rates, and interviewed local assessors regarding valuation methodologies.

ERA provides our findings, expressed in constant 2008 dollars, in this memorandum report. These findings are based on the proposed plan concept as currently envisioned. As such, the estimates of fiscal costs and revenues are subject to modification as the proposed plan concept continues to evolve.

The proposed uses in the redevelopment program, by jurisdiction, are summarized in the following table (Note: the 20-year plan is additive to the 10-year plan).

8.2 Summary of Findings

ERA's analysis concludes that the proposed physical development plan will generally result in positive fiscal impacts for the jurisdictions analyzed. The net fiscal impact to the municipal operating, local school district, and regional high school district funds are generally favorable as summarized below in Table 2.

Table 1: Proposed Redevelopment Program

	Eatontown		Oceanport		Tinton Falls	
	10-Year Plan	20-Year Plan	10-Year Plan	20-Year Plan	10-Year Plan	20-Year Plan
Office and R&D Space (SF)	174,533	397,072	437,119	200,000	664,817	225,000
Retail Space (SF)	165,735	-	112,550	34,000	48,000	32,000
Hotel / Conference Center Space (SF)	254,400	-	-	70,000	-	-
Residential Units	275	302	294	418	288	-
Civic Uses Space (SF)	76,611	-	359,709	-	88,416	-

Source: EDAW; Economics Research Associates, 2008.

Table 2: Summary of Net Fiscal Impacts

	Municipal Use Fund		Local District K-8 School Fund		Regional 9-12 High School Fund	
	Year 10	Year 20	Year 10	Year 20	Year 10	Year 20
EATONTOWN					*Monmouth*	
Real Property Tax Revenues	$948,000	$1,904,000	$1,143,000	$2,295,000	$669,000	$1,343,000
Hotel Tax	$162,000	$162,000				
Estimated Public Service Costs	($580,000)	($1,099,000)	($97,000)	($246,000)	($32,000)	($113,000)
Net Fiscal Impact	$530,000	$967,000	$1,046,000	$2,049,000	$637,000	$1,230,000
OCEANPORT					*Shore*	
Real Property Tax Revenues	$749,000	$1,302,000	$1,254,000	$2,178,000	$572,000	$993,000
Hotel Tax	$0	$75,000				
Estimated Public Service Costs	($742,000)	($1,330,000)	($402,000)	($554,000)	($298,000)	($391,000)
Net Fiscal Impact	$7,000	$47,000	$852,000	$1,624,000	$274,000	$602,000
TINTON FALLS					*Monmouth*	
Real Property Tax Revenues	$837,000	$1,028,000	$1,526,000	$1,876,000	$874,000	$1,075,000
Estimated Public Service Costs	($430,000)	($482,000)	($294,000)	($294,000)	($139,000)	($139,000)
Net Fiscal Impact	$407,000	$546,000	$1,232,000	$1,582,000	$735,000	$936,000

Source: Economics Research Associates, 2008.

8.3 Methodology

The two primary components of a net fiscal impact analysis include revenue generation and cost allocation, which are each discussed in their respective sections below.

Revenue Generation

The majority of non-State and non-Federal funding for municipal operations is generated through property taxes, for each of the three subject jurisdictions. Other sources of revenue include hotel taxes, which have been incorporated in this analysis, as well as fines and fees, which have been excluded from this analysis, since they generally cover the costs of services provided by the municipal government, and are therefore considered "revenue neutral".

According to discussions with local tax assessors, the most common method for valuing commercial property, or other property where rent is collected, is the income approach to valuation. The income approach applies a capitalization rate to the estimated net operating income of a given property. Generally, the land value is built into the resulting property value, unless there is a large amount of developable land in addition to the land already improved. ERA valued for-sale residential property using a sales comparables approach.

Eatontown and Oceanport were reassessed within the last few years, while Tinton Falls has been recently reassessed. Therefore, we have assumed that assessed values will reflect actual market values for property tax generation. The property tax levies, per $100 in assessed value, that were incorporated into this analysis, were from the Monmouth County Board of Taxation General Rate Certification Schedule for 2007 for Eatontown and Oceanport, while the Tinton Falls levies are based on 2008 estimates, provided by the Borough Chief Financial Officer, since the recent revaluation has rendered the 2007 Tinton Falls approved rates inappropriate for this analysis. The tax levies incorporated are summarized in Table 3 below.

Comparables

ERA relied on Hanley Wood Market Intelligence data to develop sales comparable assumptions for the proposed for-sale residential units. Comparables were obtained for multiple unit types within 19 area developments. New townhouse units generally range from the mid $400,000s to the mid $500,000s, with a few upper end units in Tinton Falls selling for around the $900,000 pricepoint. ERA assumed a townhouse value of $450,000.

Other than a few developments with price ranges from $1.0 to $4.0 million dollars, most of the single family homes on the market are in the $500,000 to $900,000 price range with the greatest numbers in the $600,000 to $800,000 range. Therefore, ERA assumed $600,000 values for the small lot single family units and $800,000 for the large lot single family developments.

Blended average sales prices (and rents, discussed below) were developed to account for COAH low- and moderate-income housing requirements, as shown in the table below.

The golf course and gas station were also valued using a comparables approach, due to a lack of sufficient operating inputs to determine net operating income. The comparables are of actual assessed value, as determined through the Monmouth County online assessment database. The assessed values were adjusted to actual market value using the ratio of assessed value to true value, as indicated in the 2007 Director's Table of Equalized Valuations (for use in 2008), as shown in the following two tables.

Table 3: Tax Levies per $100 in Assessed Value

	Eatontown	Oceanport	Tinton Falls
District School Budget	0.569	0.522	0.644
Regional School Budget	0.333	0.238	0.369
Local Municipal Purposes	0.472	0.312	0.353

Source: EDAW; Economics Research Associates, 2008.

Table 4: Market Rate and Affordable Housing Blended Values

Tenure	Planned Units	Target HH Income	Pct Income to Hsg	Affordable Rent / Sales Price	Market Rate Comparable	Percent Affordable	Blended Average Rent / Sales Price
Existing Rental Apartments	22	$ 31,712	30%	$ 793	$ 1,100	20%	$ 1,040
New Rental Apartments	495	$ 38,055	30%	$ 951	$ 2,100	20%	$ 1,870
For Sale Attached	385	$ 43,974	30%	$ 181,588	$ 450,000	20%	$ 396,300
Single Family Small Lot	315	$ 43,974	30%	$ 181,588	$ 600,000	20%	$ 516,300
Single Family Large Lot	14	$ 55,814	30%	$ 230,481	$ 800,000	20%	$ 686,100

Source: Economics Research Associates, 2008.

Table 5: Golf Course Assessment Comparables

Golf Course	Acreage	Total Assmnt	% Market	Market	Assmnt / Ac
Bel-Aire	81.90	$ 9,551,300	56.46%	$ 16,916,932	$ 206,556
Howell Park	285.55	$ 7,792,500	97.20%	$ 8,016,975	$ 28,076
Charleston Springs	594.25	$ 8,939,900	64.72%	$ 13,813,195	$ 23,245
Pine Brook	60.49	$ 3,024,500	98.24%	$ 3,078,685	$ 50,896
Hominy Hill	179.80	$ 6,564,100	41.72%	$ 15,733,701	$ 87,507
Shark River	292.81	$ 12,632,200	74.19%	$ 17,026,823	$ 58,150
				Average:	$ 75,738

Source: Monmouth County, NJ; Economics Research Associates, 2008.

Table 6: Gas Station Assessment Comparables

Gas Station	Street	Municipality	Assessment	% of Market	Market
BP	20 Main St	Asbury Park	$ 685,700	30.43%	$ 2,253,368
BP	264 Hwy 35	Eatontown	$ 631,900	102.97%	$ 613,674
Exxon	Hwy 35 & Wyckoff	Eatontown	$ 1,225,000	102.97%	$ 1,189,667
Exxon	Hwy 35 & Tinton	Eatontown	$ 800,000	102.97%	$ 776,925
Getty	Hwy 35	Eatontown	$ 1,395,000	102.97%	$ 1,354,764
Exxon	4211 Rt 9	Freehold	$ 1,307,200	47.06%	$ 2,777,731
Fast Fuel	238 Jerseyville Ave	Freehold	$ 359,900	47.06%	$ 764,768
Sun	3541 Rt 9	Freehold	$ 401,300	47.06%	$ 852,741
Exxon	963 Hwy 36	Hazlet	$ 359,900	40.04%	$ 898,851
Exxon	3328 Hwy 35	Hazlet	$ 459,700	40.04%	$ 1,148,102
Sunoco	210 Hwy 36	Hazlet	$ 366,600	40.04%	$ 915,584
Exxon	46 Main St	Holmdel	$ 1,050,000	100.27%	$ 1,047,173
Exxon	639 Hwy 9	Howell	$ 1,178,000	97.20%	$ 1,211,934
Getty	Broad & Hwy 36	Keyport	$ 304,600	41.90%	$ 726,969
Exxon	Branch & Sycamore	Little Silver	$ 545,900	75.46%	$ 723,430
Sun	1075 Norwood Ave	Long Branch	$ 897,100	102.12%	$ 878,476
				Average:	$ 1,133,385

Source: Tax Board, Monmouth County, NJ; Economics Research Associates, 2008.

Net Operating Income

The income approach to valuation is driven largely by anticipated rents and expenses.

Office and retail space rental rates are based on Costar rent data for a five mile radius around the Fort. Average per square foot (PSF) rents for the following uses (and classes) are as follows:

- Office Class A & B = $21.13 (generally ranging from $18.00 to $26.00 PSF)
- Office Class C = $19.52 (generally ranging from $16.00 to $24.00 PSF)
- Retail = $26.72 (generally ranging from $16.00 to $28.00 PSF)

For most proposed uses, ERA applied the lower end of the rent spectrum to the existing structures that will remain, and higher anticipated rents to planned new buildings. McAfee Center and Suneagles restaurant are exceptions.

Based on the predominance of triple net leases in the Costar data, it was assumed that all expenses would be passed through to the tenants for the commercial uses.

According to Reis apartment market data, the average asking rent in the Central New Jersey Shore submarket is approximately $1,100 per month overall, while at those properties constructed after 1999, average asking rents are over $2,100.

For apartment operating expenses, ERA assumed $4,800 per unit annually, based on ULI's "Dollars and Cents of Multifamily Housing", for garden apartments in the New York-Newark-Edison market area.

Detailed valuation calculations, and resulting property taxes, for each of the proposed uses at Fort Monmouth can be found in the Appendix (provided under separate cover), with the exception of the hotel uses, which are described below.

Hotel

Estimates of stabilized year net operating income and financial statements are presented according to the Uniform System of Accounts for lodging properties. It is assumed that the conference center hotel will contain 150 rooms and the waterfront hotel will contain 75 rooms. To derive the projected net operating income for both the conference center hotel and the waterfront hotel, ERA utilized market-based occupancy and rate projections from the prior ERA study regarding the market demand for lodging facilities at Fort Monmouth. ERA assumes an average annual occupancy of 68% for both properties and an average daily rate (ADR) of $145 for the conference hotel and $135 for the waterfront hotel. Rooms revenue is assumed to account for 60.9 percent and 62.2 percent of total revenue for the conference and waterfront hotels respectively. Estimated stabilized total revenue is $8.86 million for the conference hotel and $4.04 million for the waterfront hotel.

Expenses are estimated on a fixed and variable basis. Variable expense ratios are derived from the PKF annual lodging report and the STR HOST study. Fixed salary expenses were assumed from average wages for New Jersey for various positions according to the Bureau of Labor Statistics. A staffing plan was completed assuming an industry standard 1.5 employees per room for full service upscale properties. Fixed utility expenses were assumed from utilization estimates provided by the EPA and usage charges estimates provided by the New Jersey Natural Gas Company and PPL electric company. Estimated stabilized year net operating income is $1.72 million for the conference hotel and $800,000 for the waterfront hotel.

Table 7: Conference Hotel Net Revenue Estimate

	Amount	Percent	PAR[1]	POR[2]
Revenue				
Rooms	$ 5,398,350	60.9%	$ 35,989	$ 145.00
Food	2,308,260	26.1%	$ 15,388	$ 62.00
Beverage	558,450	6.3%	$ 3,723	$ 15.00
Rentals and Other Income	148,920	1.7%	$ 993	$ 4.00
Telecommunications	74,460	0.8%	$ 496	$ 2.00
Other Departments	372,300	4.2%	$ 2,482	$ 10.00
Total Revenue	**$ 8,860,740**	**100.0%**	**$ 118,143**	**$ 238.00**
Departmental Expenses				
Rooms	$ 1,534,556	28.4%	$ 10,230	$ 41.22
Food and Beverage	1,793,010	77.7%	$ 11,953	$ 48.16
Telecommunications	72,944	98.0%	$ 486	$ 1.96
Other	385,055	103.4%	$ 2,567	$ 10.34
Total Departmental Expenses	**$ 3,785,565**	**42.7%**	**$ 25,237**	**$ 101.68**
Gross Operating Profit	**$ 5,075,175**	**57.3%**	**$ 33,834**	**$ 136.32**
Undistributed Operating Expenses				
Administrative & General	$ 819,060	9.2%	$ 5,460	$ 22.00
Franchise Fees	88,607	1.0%	$ 591	$ 2.38
Marketing	611,391	6.9%	$ 4,076	$ 16.42
Property Operation and Maintenance	446,760	5.0%	$ 2,978	$ 12.00
Utilities	478,480	5.4%	$ 3,190	$ 12.85
Management Fee	292,404	3.3%	$ 1,949	$ 7.85
Insurance	135,000	1.5%	$ 900	$ 3.63
Other	44,304	0.5%	$ 295	$ 1.19
Total Undistributed Operating Expenses	**$ 2,916,007**	**32.9%**	**$ 19,440**	**$ 78.32**
Income before Reserve	**$ 2,159,168**	**24.4%**	**$ 14,394**	**$ 58.00**
Replacement Reserve	$ 443,037	5.0%	$ 2,954	$ 11.90
EBITDA	**$ 1,716,131**	**19.4%**	**$ 11,441**	**$ 46.10**

Source: Economics Research Associates, 2008
1/: PAR: Per Available Room. This denotes revenue and cost per hotel room.
2/: POR: Per Occupied Room. This denotes revenue and cost per annual occupied rooms.
Note: Stabilized year estimates exclude inflation.

Table 8: Waterfront Hotel Net Revenue Estimate

	Amount	Percent	PAR[1]	POR[2]
Revenue				
Rooms	$ 2,513,025	62.2%	$ 33,507	$ 135.00
Food	1,023,825	25.3%	13,651	55.00
Beverage	279,225	6.9%	3,723	15.00
Rentals and Other Income	74,460	1.8%	993	4.00
Telecommunications	37,230	0.9%	496	2.00
Other Departments	111,690	2.8%	1,489	6.00
Total Revenue	**$ 4,039,455**	**100.0%**	**$ 53,859**	**$ 217.00**
Departmental Expenses				
Rooms	$ 665,737	26.5%	$ 8,876	$ 35.76
Food and Beverage	721,928	70.5%	9,626	38.78
Telecommunications	25,316	68.0%	338	1.36
Other	232,326	208.0%	3,098	12.48
Total Departmental Expenses	**$ 1,645,307**	**40.7%**	**$ 21,937**	**$ 88.39**
Gross Operating Profit	**$ 2,394,148**	**59.3%**	**$ 31,922**	**$ 128.61**
Undistributed Operating Expenses				
Administrative & General	$ 372,300	9.2%	$ 4,964	$ 20.00
Franchise Fees	40,395	1.0%	539	2.17
Marketing	278,722	6.9%	3,716	14.97
Property Operation and Maintenance	186,150	4.6%	2,482	10.00
Utilities	239,240	5.9%	3,190	12.85
Management Fee	137,341	3.4%	1,831	7.38
Insurance	75,000	1.9%	1,000	4.03
Other	40,395	1.0%	539	2.17
Total Undistributed Operating Expenses	**$ 1,369,543**	**33.9%**	**$ 18,261**	**$ 73.57**
Income before Reserve	**$ 1,024,606**	**25.4%**	**$ 13,661**	**$ 55.04**
Replacement Reserve	$ 201,973	5.0%	$ 2,693	10.85
EBITDA	**$ 822,633**	**20.4%**	**$ 10,968**	**$ 44.19**

Source: Economics Research Associates, 2008

1/: PAR: Per Available Room. This denotes revenue and cost per hotel room.

2/: POR: Per Occupied Room. This denotes revenue and cost per annual occupied rooms.

Note: Stabilized year estimates exclude inflation.

Table 9: Local Hotel Tax Estimate

Municipality / Facility	Year 10 Room Revenue	Year 20 Room Revenue	Year 10 Local Hotel Tax Revenue (@3%)	Year 20 Local Hotel Tax Revenue (@3%)
Eatontown				
Conference Hotel	$ 5,398,350	$ 5,398,350	$ 161,951	$ 161,951
Oceanport				
Waterfront Hotel	$ -	$ 2,513,025	$ -	$ 75,391

Source: Economics Research Associates, 2008.

Public Service Cost Allocation Methodology

Based on public service cost methodologies published by the International City/County Management Association (ICMA) and The Fiscal Impact Handbook (Burchell and Listokin, 1983), ERA relied upon the per capita marginal cost approach to estimating the potential incremental public service costs that could result from reversion of the Fort Monmouth base to the jurisdictions of Oceanport, Tinton Falls, and Eatontown. ERA's cost factors include municipal operating costs and public school education costs only.

The marginal cost approach projects the fiscal impact of the proposed redevelopment by calculating the current average cost per resident, employee, or public school child, respectively, and subsequently applying the factors as impact costs to the proposed growth increment based on detailed demographic profiles of the proposed plan land uses.

The per capita marginal cost approach to fiscal cost estimates requires the following inputs:

- Estimates of the new residents, employees, and public school children that would result from the proposed redevelopment
- Analysis of the fixed (staffing) and variable (materials) costs of the local jurisdictions General Fund operations.
- Estimates of the cost per public school child (net of State and Federal transfers) to both the local District School (elementary and middle schools) and the Regional High School District.
- Ratio of total residential property assessed value to total commercial property assessed value as the basis for allocating public service costs to new residents and employees.

ERA provides a summary of the underlying data sources, assumptions, and other factors that support an estimate of the potential incremental public service costs that could result in Year 10 and Year 20 of the proposed Fort Monmouth redevelopment in the following section.

Population, Households, and Employment

ERA relied upon proprietary 2008 data reported by ESRI Business Information Solutions, a demographic and economic forecasting company to develop estimates of current residential and commercial populations in each jurisdiction. For the purpose of estimating average household size as the basis for projecting new residents resulting from the proposed housing program, ERA assumed the current average household size reported for all unit types. ERA considers this approach to be conservative because multifamily housing units typically are associated with smaller than average household size. As such, the estimated new residential population and residential public service costs are likely overstated. A summary of ERA's residential population estimates in Year 10 and Year 20 of buildout is provided in the following table.

Table 10: Estimated Residential Population

EATONTOWN	Housing Units			Persons / HH	New Residents		
	Year 10	Year 20	Total		Year 10	Year 20	Total
Townhouse/Rowhouse	0	302	302	2.34	-	707	707
Garden Apartments - Howard Commons	275	0	275	2.34	644	-	644
Total	**275**	**302**	**577**		**644**	**707**	**1,350**

OCEANPORT	Housing Units			Persons / HH	New Residents		
	Year 10	Year 20	Total		Year 10	Year 20	Total
Gardner Hall Residential	15	0	15	2.69	40	-	35
Historic District 1-Family	117	0	117	2.69	315	-	274
1-Family Small Lot	80	79	159	2.69	215	213	372
Apartments	60	309	369	2.69	161	831	863
Oceanport Ave Apartments	30	30	60	2.69	81	81	140
Total	**302**	**418**	**720**		**812**	**1,124**	**1,685**

TINTON FALLS	Housing Units			Persons / HH	New Residents		
	Year 10	Year 20	Total		Year 10	Year 20	Total
Hemp Hill Housing	22	0	22	2.49	55	-	55
1-Family Small Lot	39	0	39	2.49	97	-	97
1-Family Large Lot	14	0	14	2.49	35	-	35
Townhouse/Rowhouse	83	0	83	2.49	207	-	207
Apartments	130	0	130	2.49	324	-	324
Total	288	0	288		717	0	717
Grand Total	865	720	1,585		2,173	1,831	3,752

Source: Boroughs of Oceanport, Eatontown, and Tinton Falls; ESRI Business Information Solutions; Economics Research Associates, 2008.

Employment Generation Factors

ERA's estimates of new employment that would be created by the reuse of existing commercial buildings and the construction of new commercial property is based on employment generation factors published by ULI-the Urban Land Institute's Dollar and Cents of Shopping Centers and ULI's Dollars and Cents Multifamily Housing. A summary of the employment generation factors and projected employment yield associated with the proposed plan is located in Appendix Table B-1.

Local Fund "Appropriations" (Operating) Cost Factors

ERA evaluated the standard form New Jersey 2008 Municipal Budget for each jurisdiction that will be impacted by the reversion of the Fort Monmouth site to the localities. For the purpose of calculating per capita marginal cost factors, ERA focused on the "Current Fund – Appropriations" (operating) budgets for FY2008 as the basis for estimating the potential incremental costs associated with providing municipal services to current and projected residents and employees. Specifically, ERA included 100 percent of the "Current Fund – Appropriation" costs detailed on budget sheets 12 through budget sheet 17 (refer to Appendix B-2 for detailed summary of appropriations line items included in the public service cost analysis).

ERA determined that typically, more than 50 percent of each Borough's operating budget is dedicated to staffing and wage costs. However, based on interviews with the Chief Financial Officers or Borough Administrators of each of the localities, ERA concluded that the residential and commercial uses proposed by the Fort Monmouth plan would not require a significant increase in current municipal staffing levels. Based on ERA's experience in similar communities, ERA applied a cost burden factor of 20 percent to salaries and wages. ERA determined that other annual ongoing expenses (variable operating costs) would be directly impacted by an increase in residential and commercial activity in each jurisdiction. ERA applied a cost burden factor of 100 percent to these expenses, such as utilities, equipment repair and maintenance, machinery supplies, and motor fuel.

Finally, ERA evaluated the relative cost burden of residential and commercial populations in each jurisdiction. This step is typically calculated by evaluating the relationship between the total assessed value of residential versus commercial property. ERA obtained estimates from each jurisdiction regarding the relative weight of the residential and commercial values as the basis for performing the allocation calculations detailed in the following series of tables. (Note: ERA will update this analysis to reflect actual assessed values as more accurate and up to date assumptions are made available.)

The estimated residential cost value was then divided by total residential population to yield the residential per capita public service cost value and the estimated commercial cost value was then divided by the total commercial population to yield the estimated commercial per capita cost value, as defined by the proposed development program outlined in the appendix to this report. These values were then multiplied by the estimated new residential and commercial populations that are expected to result from the proposed Fort Monmouth plan to develop the total public service cost impact to each jurisdiction.

Table 11: Per Capita Public Service Cost Estimates – Eatontown

EATONTOWN	2008 Residents	2008 Employees	Total Population Served
Persons	14,156	13,702	27,858
% of Total	51%	49%	100%

		Value Impacted by New Residents/Employees	
Current Fund Appropriations (2008)		%	$
Total Salaries	$ 8,534,044	20%	$ 1,706,809
Total Other Expenses	$ 6,268,278	100%	$ 6,268,278
Total Operating Appropriations	$ 14,802,322		**$ 7,975,087**

Per Capita Fund Appropriations (2008)	Residential Property	Commercial Property	Total
	$ 7,975,087	**$ 7,975,087**	
Assessed Value Ratio	65%	35%	100%
Current Fund Appropriations Impacted by New Residents/Employees	$ 5,183,806	$ 2,791,280	$ 7,975,087
Persons	14,156	13,702	27,858
Per Capita Public Service Cost	**$ 366**	**$ 204**	

Source: Borough of Eatontown; ESRI Business Information Solutions; Economics Research Associates, 2008.

Table 12: Per Capita Public Service Cost Estimates –Oceanport

OCEANPORT	2008 Residents	2008 Employees	Total Population Served
Persons	5,864	2,508	8,372
% of Total	70%	30%	100%

		Value Impacted by New Residents/Employees	
Current Fund Appropriations (2008)		%	$
Total Salaries	$ 2,675,584	20%	$ 535,117
Total Other Expenses	$ 2,317,664	100%	$ 2,317,664
Total Operating Appropriations	$ 4,993,248		**$ 2,852,781**

Per Capita Fund Appropriations (2008)	Residential Property	Commercial Property	Total
	$ 2,852,781	**$ 2,852,781**	
Assessed Value Ratio	75%	25%	100%
Current Fund Appropriations Impacted by New Residents/Employees	$ 2,139,586	$ 713,195	$ 2,852,781
Persons	5,864	2,508	8,372
Per Capita Public Service Cost	**$ 365**	**$ 284**	

Source: Borough of Oceanport; ESRI Business Information Solutions; Economics Research Associates, 2008.

Table 13: Per Capita Public Service Cost Estimates –Tinton Falls

TINTON FALLS	2008 Residents	2008 Employees	Total Population Served
Persons	16,909	6,857	23,766
% of Total	71%	29%	100%

		Value Impacted by New Residents/Employees	
Current Fund Appropriations (2008)		%	$
Total Salaries	9729087	20%	$ 1,945,817
Total Other Expenses	5967695	100%	$ 5,967,695
Total Operating Appropriations	$ 15,696,782		**$ 7,913,512**

Per Capita Fund Appropriations (2008)	Residential Property	Commercial Property	Total
	$ 5,967,695	**$ 5,967,695**	
Assessed Value Ratio	75%	25%	100%
Current Fund Appropriations Impacted by New Residents/Employees	$ 4,475,771	$ 1,491,924	$ 5,967,695
Persons	16,909	6,857	23,766
Per Capita Public Service Cost	**$ 265**	**$ 218**	

Source: Borough of Tinton Falls; ESRI Business Information Solutions; Economics Research Associates, 2008.

Utility Fund Expenditures

Based on discussions with individual jurisdictions, the majority of new residential and commercial property will likely be served by fee-based public utility services. Accordingly, these items are considered "revenue neutral" and are excluded from the analysis.

Civic Uses

The proposed Fort Monmouth plan includes a variety of civic uses that are proposed to revert to the Boroughs or non-profit uses, or be sold for private operation. For those uses that are intended for continued public use, existing and proposed properties may require upfront capital investment for acquisition or renovation. Costs estimates for the majority of these properties were not available. ERA concludes that an estimate of the one-time capital cost impact to the Boroughs will require further evaluation. A summary of the civic uses as currently allocated to each jurisdiction follows.

Eatontown

- Eatontown Municipal Center Malette Hall
- Public Theater
- Gibbs Hall Suneagles Golf Club (Acres)
- Fort Monmouth Jitney Bus

Oceanport

- Barker Circle Oceanport Municipal Complex
- Kaplan Hall Museum
- Public Marina
- Counseling Center
- Library
- Armstrong Hall Education Building
- Lane Hall Community Conference Center
- Recreation Support Building
- Fire/Emergency Services Station
- Chapel
- VA - Community Medical Center
- Main Post Office
- Middle School (450 students, 16-acres)

Tinton Falls

- Child Development Center
- Recreation Center (formerly Teen Center)
- Fire/Emergency Services Station
- Community Pool/Tennis Center(s)
- Fire & Police Training Academy
- Library

Public School Education Estimates

Public school education costs are based on current costs per pupil reported by local and regional school district budgets. Public school child generation factors are based on the Quick Guide to New Jersey Residential and Demographic Multipliers (Listokin, Bloustein School of Planning and Public Policy, November 2006). Note that ERA includes only local costs per pupil (net of costs funded by State and Federal sources). The following series of tables summarizes ERA's assumptions regarding the potential cost of public school education that could result from new school children living within the Fort Monmouth site.

Table 14: Estimated Current Fund – Appropriations (Operating) Costs FY2008

EATONTOWN	Year 10	Year 20	Total	Per Capita Cost	Total Estimated Cost Year 10	Total Estimated Cost Year 20	Total Estimated Cost Total
New Residents	644	707	1,350	$ 366	$ 235,644	$ 258,780	$ 494,424
New Employees	1,689	1,277	2,966	$ 204	$ 344,122	$ 260,179	$ 604,300
Total	**2,333**	**1,984**	**4,317**		**$ 579,766**	**$ 518,959**	**$ 1,098,725**

OCEANPORT	Year 10	Year 20	Total	Per Capita Cost	Total Estimated Cost Year 10	Total Estimated Cost Year 20	Total Estimated Cost Total
New Residents	812	1,124	1,937	$ 365	$ 296,411	$ 410,265	$ 706,676
New Employees	1,568	625	2,193	$ 284	$ 445,985	$ 177,716	$ 623,701
Total	**2,381**	**1,749**	**4,130**		**$ 742,397**	**$ 587,981**	**$ 1,330,377**

TINTON FALLS	Year 10	Year 20	Total	Per Capita Cost	Total Estimated Cost Year 10	Total Estimated Cost Year 20	Total Estimated Cost Total
New Residents	717	0	717	$ 265	$ 189,820	$ -	$ 262,603
New Employees	1,103	239	1,342	$ 218	$ 239,940	$ 52,001	$ 273,339
Total	**1,820**	**239**	**2,059**		**$ 429,760**	**$ 52,001**	**$ 535,943**

TOTAL PROJECT SITE							
New Residents	**2,173**	**1,831**	**4,004**		**$ 721,876**	**$ 669,045**	**$ 1,390,921**
New Employees	**4,360**	**2,141**	**6,501**		**$ 1,030,047**	**$ 489,895**	**$ 1,519,942**

Source: Boroughs of Oceanport, Eatontown, and Tinton Falls; ESRI Business Information Solutions; Economics Research Associates, 2008.

Table 15: Estimated Local Cost per Pupil

	Proposed 2008-2009 /1			
	Eatontown	Oceanport	Tinton Falls	Monmouth Regional High School
Revenues: Local Tax Levy	$ 12,859,451	$ 7,256,612	$ 17,580,444	$ 19,164,921
Total Revenue	$ 23,248,071	$ 9,818,293	$ 28,243,300	$ 26,910,338
Local Tax Levy as % of Total /2	55%	74%	62%	71%
Per Pupil Cost Estimate	$ 14,874	$ 11,142	$ 14,126	$ 17,882
Estimated Local Cost Per Pupil /3	$ 8,227	$ 8,235	$ 8,793	$ 12,735

/1 Eatontown, Oceanport, and Tinton Falls School District Budgets, 2008.
/2 ERA estimate, 2008.
/3 ERA estimate, 2008.
Source: Economics Research Associates, 2008.

Table 16: Local School District Student Generation Estimates (K-8)

EATONTOWN	Housing Units			Pupils / HH	New Public School Children		
	Year 10	Year 20	Total		Year 10	Year 20	Total
Townhouse/Rowhouse	0	302	302	0.059999	-	18	18
Garden Apartments - Howard Commons	275	0	275	0.0429994	12	-	12
Total	**275**	**302**	**577**		**12**	**18**	**30**

OCEANPORT	Housing Units			Pupils / HH	New Public School Children		
	Year 10	Year 20	Total		Year 10	Year 20	Total
Gardner Hall Residential	15	0	15	0.037	1	-	1
Historic District 1-Family	117	0	117	0.3159934	37	-	37
1-Family Small Lot	80	79	159	0.3159934	5	5	10
Apartments	60	309	369	0.037	2	11	14
Oceanport Ave Apartments	30	30	60	0.037	1	1	2
Total	**302**	**418**	**720**		**46**	**17**	**63**

TINTON FALLS	Housing Units			Pupils / HH	New Public School Children		
	Year 10	Year 20	Total		Year 10	Year 20	Total
Hemp Hill Housing	22	0	22	0.3159934	7	-	7
1-Family Small Lot	39	0	39	0.3159934	12	-	12
1-Family Large Lot	14	0	14	0.3159934	4	-	4
Townhouse/Rowhouse	83	0	83	0.059999	5	-	5
Apartments	130	0	130	0.037	5	-	5
Total	288	0	288		33	0	33
Grand Total	865	720	1,585		91	35	126

Basis for Proposed Student Generation Factors: A Quick Guide to New Jersey Residential and Demographic Multipliers, Listokin / Rutgers Bloustein School of Planning and Public Policy, November 2006.

Listokin	Elementary K-6	Junior High 7-9	High School 10-12	Total
Single-Family Detached	0.25	0.099	0.074	0.423
Single-Family Attached	0.05	0.015	0.016	0.081
Multifamily Rental	0.037	0.009	0.006	0.052

Adjusted	Elementary K-6	Junior High 7-8	High School 9-12	Total
Single-Family Detached	0.25	0.066	0.107	0.423
Single-Family Attached	0.05	0.010	0.021	0.081
Multifamily Rental	0.037	0.006	0.009	0.052

Source: Boroughs of Oceanport, Eatontown, and Tinton Falls; ESRI Business Information Solutions; Economics Research Associates, 2008.

Table 17: Regional High School District Student Generation Estimates (10-12)

EATONTOWN	Housing Units			Pupils / HH	New Public School Children		
	Year 10	Year 20	Total		Year 10	Year 20	Total
Townhouse/Rowhouse	0	302	302	0.0209995	-	6	6
Garden Apartments - Howard Commons	275	0	275	0.0089997	2	-	2
Total	**275**	**302**	**577**		**2**	**6**	**9**

OCEANPORT	Housing Units			Pupils / HH	New Public School Children		
	Year 10	Year 20	Total		Year 10	Year 20	Total
Gardner Hall Residential	15	0	15	0.0089997	0	-	0
Historic District 1-Family	117	0	117	0.1069967	13	-	13
1-Family Small Lot	80	79	159	0.1069967	2	2	3
Apartments	60	309	369	0.0089997	1	3	3
Oceanport Ave Apartments	30	30	60	0.0089997	0	0	1
Total	**302**	**418**	**720**		**15**	**5**	**20**

TINTON FALLS	Housing Units			Pupils / HH	New Public School Children		
	Year 10	Year 20	Total		Year 10	Year 20	Total
Hemp Hill Housing	22	0	22	0.1069967	2	-	2
1-Family Small Lot	39	0	39	0.1069967	4	-	4
1-Family Large Lot	14	0	14	0.1069967	1	-	1
Townhouse/Rowhouse	83	0	83	0.0209995	2	-	2
Apartments	130	0	130	0.0089997	1	-	1
Total	288	0	288		11	0	11
Grand Total	865	720	1,585		29	11	40

Basis for Proposed Student Generation Factors: A Quick Guide to New Jersey Residential and Demographic Multipliers, Listokin / Rutgers Bloustein School of Planning and Public Policy, November 2006.

Listokin	Elementary K-6	Junior High 7-9	High School 10-12	Total
Single-Family Detached	0.250	0.099	0.074	0.423
Single-Family Attached	0.050	0.015	0.016	0.081
Multifamily Rental	0.037	0.009	0.006	0.052

Adjusted	Elementary K-6	Junior High 7-8	High School 9-12	Total
Single-Family Detached	0.250	0.066	0.107	0.423
Single-Family Attached	0.050	0.010	0.021	0.081
Multifamily Rental	0.037	0.006	0.009	0.052

Source: Boroughs of Oceanport, Eatontown, and Tinton Falls; ESRI Business Information Solutions; Economics Research Associates, 2008.

Table 18: Estimated Public School Education Costs at Buildout

EATONTOWN	Public School Children			Per Capita Cost	Total Estimated Cost		
	Year 10	Year 20	Total		Year 10	Year 20	Total
Local School District	12	18	30	$ 8,227	$ 97,288	$ 149,078	$ 246,366
Regional High School	2	6	9	$ 12,735	$ 31,518	$ 80,764	$ 112,283
Total	**14**	**24**	**39**	**$**	**$ 128,806**	**$ 229,843**	**$ 358,649**

OCEANPORT	Public School Children			Per Capita Cost	Total Estimated Cost		
	Year 10	Year 20	Total		Year 10	Year 20	Total
Local School District	46	17	63	$ 8,806	$ 402,061	$ 152,198	$ 554,260
Regional High School	15	5	20	$ 19,658	$ 297,688	$ 92,585	$ 390,274
Total	**61**	**22**	**83**	**$**	**$ 699,750**	**$ 244,784**	**$ 944,534**

TINTON FALLS	Public School Children			Per Capita Cost	Total Estimated Cost		
	Year 10	Year 20	Total		Year 10	Year 20	Total
Local School District	33	0	33	$ 8,793	$ 294,470	$ -	$ 294,470
Regional High School	11	0	11	$ 12,735	$ 139,293	$ -	$ 139,293
Total	**44**	**0**	**44**	**$**	**$ 433,763**	**$ -**	**$ 433,763**

Source: Boroughs of Oceanport, Eatontown, and Tinton Falls; A Quick Guide to New Jersey Residential Demographic Multipliers, Bloustein School of Planning and Public Policy (Listokin), 2008; ESRI Business Information Solutions; Economics Research Associates, 2008.

8.4 Conclusion

ERA's analysis concludes that the proposed physical development Plan would generally result in positive fiscal impacts for the jurisdictions analyzed. The net fiscal impact to the municipal operating, local school district, and regional high school district funds are generally quite favorable.

8.5 Appendix

Appendix Table A-1: Fort Monmouth Property Tax Generation

Existing Building Number	DESCRIPTION	10 Year Plan	20 Year Plan	Year 10 Assessed Value	Year 20 Assessed Value	Year 10 Municipal Use Property Tax Revenue	Year 20 Municipal Use Property Tax Revenue	Year 10 District School Property Tax Revenue	Year 20 District School Property Tax Revenue	Year 10 Regional High School Property Tax Revenue	Year 20 Regional High School Property Tax Revenue
EATONTOWN						**0.472**	**0.472**	**0.569**	**0.569**	**0.333**	**0.333**
	OFFICE/RESEARCH AND DEVELOPMENT										
1150-1152	Vail Hall Communication Center	36,483	-	$ 7,798,241	$ 7,798,241	$ 36,808	$ 36,808	$ 44,372	$ 44,372	$ 25,968	$ 25,968
1208-1210	CECOM Incubator & Professional Office	138,050	157,072	$ 29,508,188	$ 63,082,328	$ 139,279	$ 297,749	$ 167,902	$ 358,938	$ 98,262	$ 210,064
New	Technology Flex Office	-	190,000	$ -	$ 49,162,500	$ -	$ 232,047	$ -	$ 279,735	$ -	$ 163,711
	Total Office/R&D Space	174,533	347,072								
	RETAIL										
689	Bowling Alley	17,599	-	$ 31,713,398	$ 31,713,398	$ 149,687	$ 149,687	$ 180,449	$ 180,449	$ 105,606	$ 105,606
2,018	Suneagles Restaurant	3,205	-	$ 901,406	$ 901,406	$ 4,255	$ 4,255	$ 5,129	$ 5,129	$ 3,002	$ 3,002
New	Neighborhood Convenience Retail	12,530	-	$ 3,524,063	$ 3,524,063	$ 16,634	$ 16,634	$ 20,052	$ 20,052	$ 11,735	$ 11,735
New	Lifestyle Town Center Retail	150,000	-	$ 42,187,500	$ 42,187,500	$ 199,125	$ 199,125	$ 240,047	$ 240,047	$ 140,484	$ 140,484
	Total Retail Space	165,735	-								
	HOSPITALITY/CONFERENCE CENTER (assume 750 SF per room)										
B2022-B2042	Conference Hotel Residential	14,400	-	$ 1,292,146	$ 1,372,905	$ 6,099	$ 6,480	$ 7,352	$ 7,812	$ 4,303	$ 4,572
New	Conference Hotel	225,000	-	$ 20,189,776	$ 20,189,776	$ 95,296	$ 95,296	$ 114,880	$ 114,880	$ 67,232	$ 67,232
New	Conference Center	15,000	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Total Hotel/Conference Center	254,400	-								
	RESIDENTIAL (assume 1,500 SF per unit)										
New	Townhouse/Rowhouse	-	302	$ -	$ 119,682,600	$ -	$ 564,902	$ -	$ 680,994	$ -	$ 398,543
New	Garden Apartments - Howard Commons	275	-	$ 52,923,750	$ 52,923,750	$ 249,800	$ 249,800	$ 301,136	$ 301,136	$ 176,236	$ 176,236
	Total Mixed Income	275	302								
	CIVIC										
B1206-1207	Eatontown Municipal Center Malette Hall	57,386	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1,215	Public Theater	18,883	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Golf Course	Gibbs Hall Suneagles Golf Club	142	-	$ 10,800,360	$ 10,800,360	$ 50,978	$ 50,978	$ 61,454	$ 61,454	$ 35,965	$ 35,965
New	Fort Monmouth Jitney Bus	200	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Total Civic	76,611	-			**$ 947,959**	**$ 1,903,759**	**$ 1,142,773**	**$ 2,294,998**	**$ 668,793**	**$ 1,343,118**
OCEANPORT						**0.312**	**0.312**	**0.522**	**0.522**	**0.238**	**0.238**
	OFFICE/RESEARCH AND DEVELOPMENT										
173-174	Lab Testing, Office	6,388	-	$ 1,365,435	$ 1,365,435	$ 4,260	$ 4,260	$ 7,128	$ 7,128	$ 3,250	$ 3,250
209	Allison Hall Office	36,665	-	$ 7,837,144	$ 7,837,144	$ 24,452	$ 24,452	$ 40,910	$ 40,910	$ 18,652	$ 18,652
281	Professional Office	2,544	-	$ 543,780	$ 543,780	$ 1,697	$ 1,697	$ 2,839	$ 2,839	$ 1,294	$ 1,294
283	Squier Hall Office/Education	76,538	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
286	Russel Hall Garrison Headquarters	76,978	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
289, 290, 291, 295	General Office	21,006	-	$ 4,490,033	$ 4,490,033	$ 14,009	$ 14,009	$ 23,438	$ 23,438	$ 10,686	$ 10,686
600	McAfee Center	97,000	-	$ 25,098,750	$ 25,098,750	$ 78,308	$ 78,308	$ 131,015	$ 131,015	$ 59,735	$ 59,735
New	Green Industry Cluster	200,000	200,000	$ 51,750,000	$ 103,500,000	$ 161,460	$ 322,920	$ 270,135	$ 540,270	$ 123,165	$ 246,330
New	Medical Office Building	20,000	-	$ 5,175,000	$ 5,175,000	$ 16,146	$ 16,146	$ 27,014	$ 27,014	$ 12,317	$ 12,317
	Total Office/R&D Space	537,119	200,000								
	RETAIL										
114	Fitness Center	32,250	-	$ 5,805,000	$ 5,805,000	$ 18,112	$ 18,112	$ 30,302	$ 30,302	$ 13,816	$ 13,816
B450	Public Marina	2,600	-	$ 2,698,000	$ 2,698,000	$ 8,418	$ 8,418	$ 14,084	$ 14,084	$ 6,421	$ 6,421
1007	Commissary Retail Center	53,700	-	$ 9,666,000	$ 9,666,000	$ 30,158	$ 30,158	$ 50,457	$ 50,457	$ 23,005	$ 23,005
New	Neighborhood Convenience Retail	19,000	19,000	$ 5,343,750	$ 10,687,500	$ 16,673	$ 33,345	$ 27,894	$ 55,789	$ 12,718	$ 25,436
New	Waterfront Retail	-	9,000	$ -	$ 2,531,250	$ -	$ 7,898	$ -	$ 13,213	$ -	$ 6,024
New	Waterfront Boutique Hotel Retail	-	3,000	$ -	$ 843,750	$ -	$ 2,633	$ -	$ 4,404	$ -	$ 2,008
New	Spa	-	3,000	$ -	$ 843,750	$ -	$ 2,633	$ -	$ 4,404	$ -	$ 2,008
	Credit Union	5,000	-	$ 1,406,250	$ 1,406,250	$ 4,388	$ 4,388	$ 7,341	$ 7,341	$ 3,347	$ 3,347
	Total Retail Space	112,550	34,000								
	HOSPITALITY/CONFERENCE CENTER (assume 750 SF per room)										
New	Waterfront Hotel		70,000	$ -	$ 9,678,033	$ -	$ 30,195	$ -	$ 50,519	$ -	$ 23,034
	Total Hotel/Conference Center	-	70,000								

Appendix Table A-1: Fort Monmouth Property Tax Generation (Continued)

Existing Building Number	DESCRIPTION	10 Year Plan	20 Year Plan	Year 10 Assessed Value	Year 20 Assessed Value	Year 10 Municipal Use Property Tax Revenue	Year 20 Municipal Use Property Tax Revenue	Year 10 District School Property Tax Revenue	Year 20 District School Property Tax Revenue	Year 10 Regional High School Property Tax Revenue	Year 20 Regional High School Property Tax Revenue
	RESIDENTIAL (assume 1,500 SF per unit)										
271	Gardner Hall Residential	15	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
0	Historic District 1-Family	117	-	$ 60,407,100	$ 60,407,100	$ 188,470	$ 188,470	$ 315,325	$ 315,325	$ 143,769	$ 143,769
New	1-Family Small Lot	80	79	$ 41,304,000	$ 82,091,700	$ 128,868	$ 256,126	$ 215,607	$ 428,519	$ 98,304	$ 195,378
New	Apartments	60	309	$ 11,547,000	$ 71,014,050	$ 36,027	$ 221,564	$ 60,275	$ 370,693	$ 27,482	$ 169,013
New	Oceanport Ave Apartments	30	30	$ 5,773,500	$ 11,547,000	$ 18,013	$ 36,027	$ 30,138	$ 60,275	$ 13,741	$ 27,482
	Total Mixed Income	302	418								
	CIVIC										
206, 208	Barker Circle Oceanport Municipal Complex	76,776	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
275	Kaplan Hall Museum	7,432	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
501	Counseling Center	2,832	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
502	Library	10,650	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
551	Armstrong Hall Education Building	13,595	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
702	Lane Hall Community Conference Center	12,100	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
814	Recreation Support Building	8,863	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
B2560 or 282	Fire/Emergency Services Station	6,089	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
B500	Chapel	16,372	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
B1075 PAHC	VA - Community Medical Center	60,000	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
New	Middle School (450 students, 16-acres)	145,000	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Total Civic	359,709	-			**$ 749,458**	**$ 1,301,756**	**$ 1,253,900**	**$ 2,177,938**	**$ 571,702**	**$ 993,006**
TINTON FALLS						**0.353**	**0.353**	**0.644**	**0.644**	**0.369**	**0.369**
	OFFICE/RESEARCH AND DEVELOPMENT										
2502-2507	Shops/Warehouses	42,752	-								
2525	Administrative Offices	86,719	-	$ 18,536,186	$ 18,536,186	$ 65,433	$ 65,433	$ 119,373	$ 119,373	$ 68,399	$ 68,399
2539- 2540	Lab Testing Buildings	15,756	-	$ 3,367,845	$ 3,367,845	$ 11,888	$ 11,888	$ 21,689	$ 21,689	$ 12,427	$ 12,427
2700 Myers Center	Data Recovery Center _ Reconfigured	445,522	-	$ 95,230,328	$ 95,230,328	$ 336,163	$ 336,163	$ 613,283	$ 613,283	$ 351,400	$ 351,400
2705	Testing Lab	47,592	-	$ 10,172,790	$ 10,172,790	$ 35,910	$ 35,910	$ 65,513	$ 65,513	$ 37,538	$ 37,538
2707	RDT&E Lab	26,476	-	$ 5,659,245	$ 5,659,245	$ 19,977	$ 19,977	$ 36,446	$ 36,446	$ 20,883	$ 20,883
New	Office/Research & Development	-	175,000	$ -	$ 45,281,250	$ -	$ 159,843	$ -	$ 291,611	$ -	$ 167,088
	Total Office/R&D Space	664,817	175,000								
	RETAIL										
2567	Gas Station	1	-	$ 1,100,000	$ 1,100,000	$ 3,883	$ 3,883	$ 7,084	$ 7,084	$ 4,059	$ 4,059
New	Neighborhood Convenience Retail	48,000	32,000	$ 13,500,000	$ 22,500,000	$ 47,655	$ 79,425	$ 86,940	$ 144,900	$ 49,815	$ 83,025
	Total Retail Space	48,001	32,000								
	RESIDENTIAL (assume 1,500 SF per unit)										
B2231-2240,2260	Hemp Hill Housing	22	-	$ 1,768,800	$ 1,768,800	$ 6,244	$ 6,244	$ 11,391	$ 11,391	$ 6,527	$ 6,527
New	1-Family Small Lot	39	-	$ 20,135,700	$ 20,135,700	$ 71,079	$ 71,079	$ 129,674	$ 129,674	$ 74,301	$ 74,301
New	1-Family Large Lot	14	-	$ 9,605,400	$ 9,605,400	$ 33,907	$ 33,907	$ 61,859	$ 61,859	$ 35,444	$ 35,444
New	Townhouse/Rowhouse	83	-	$ 32,892,900	$ 32,892,900	$ 116,112	$ 116,112	$ 211,830	$ 211,830	$ 121,375	$ 121,375
New	Apartments	130	-	$ 25,018,500	$ 25,018,500	$ 88,315	$ 88,315	$ 161,119	$ 161,119	$ 92,318	$ 92,318
	Total Mixed Income	288	-								
	CIVIC										
B2290	Child Development Center	19,600	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2566	Youth Center	19,636	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
B2560 or 282	Fire/Emergency Services Station	10,070	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
B2569	Community Pool/Tennis Center(s)	1,000	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
B2707, 2709, 2713	Fire & Police Training Academy	11,110	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
New	Library	27,000	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Total Civic	88,416	-			**$ 836,567**	**$ 1,028,179**	**$ 1,526,201**	**$ 1,875,772**	**$ 874,485**	**$ 1,074,782**

Source: Economics Research Associates, 2008.

Appendix Table A-2: Fort Monmouth Assessed Value

Existing Building Number	DESCRIPTION	Interim Use (I); Permanent Reuse (P)	Likely User	10 Year Plan	20 Year Plan	Valuation Method	Year 10 Market Value	Year 20 Market Value	Assessed Value to Market Value Ratio	Year 10 Assessed Value	Year 20 Assessed Value
EATONTOWN											
	OFFICE/RESEARCH AND DEVELOPMENT										
1150-1152	Vail Hall Communication Center	P	FP	36,483		I	$ 7,798,241	$ 7,798,241	100%	$ 7,798,241	$ 7,798,241
1208-1210	CECOM Incubator & Professional Office	P	FP	138,050	157,072	I	$ 29,508,188	$ 63,082,328	100%	$ 29,508,188	$ 63,082,328
New	Technology Flex Office	P	FP		190,000	I	$ -	$ 49,162,500	100%	$ -	$ 49,162,500
										$ -	$ -
	Total Office/R&D Space			174,533	347,072					$ -	$ -
										$ -	$ -
	RETAIL									$ -	$ -
689	Bowling Alley	P	FP	17,599		I	$ 31,713,398	$ 31,713,398	100%	$ 31,713,398	$ 31,713,398
2018	Suneagles Restaurant	P	FP	3,205		I	$ 901,406	$ 901,406	100%	$ 901,406	$ 901,406
New	Neighborhood Convenience Retail	P	FP	12,530		I	$ 3,524,063	$ 3,524,063	100%	$ 3,524,063	$ 3,524,063
New	Lifestyle Town Center Retail	P	FP	150,000		I	$ 42,187,500	$ 42,187,500	100%	$ 42,187,500	$ 42,187,500
	Total Retail Space			165,735	-						
	HOSPITALITY/CONFERENCE CENTER (assume 750 SF per room)										
B2022-B2042	Conference Hotel Residential	P	FP	14,400		I	$ 1,292,146	$ 1,372,905	100%	$ 1,292,146	$ 1,372,905
New	Conference Hotel	P	FP	225,000		I	$ 20,189,776	$ 20,189,776	100%	$ 20,189,776	$ 20,189,776
New	Conference Center	P	FP	15,000		I	$ -	$ -	100%	$ -	$ -
	Total Hotel/Conference Center			254,400	-						
	RESIDENTIAL (assume 1,500 SF per unit)										
New	Townhouse/Rowhouse	P	FP		302	C	$ -	$ 119,682,600	100%	$ -	$ 119,682,600
New	Garden Apartments - Howard Commons	P	FP	275		I	$ 52,923,750	$ 52,923,750	100%	$ 52,923,750	$ 52,923,750
	Total Mixed Income			275	302						
	CIVIC										
B1206-1207	Eatontown Municipal Center Malette Hall	P	BO	57,386		N	$ -	$ -	100%	$ -	$ -
1215	Public Theater	P	NP	18,883		N	$ -	$ -	100%	$ -	$ -
Golf Course	Gibbs Hall Suneagles Golf Club	P	FP	142.11		C	$ 10,800,360	$ 10,800,360	100%	$ 10,800,360	$ 10,800,360
New	Fort Monmouth Jitney Bus	P	NP	200		N	$ -	$ -	100%	$ -	$ -
	Total Civic			76,611	-						
OCEANPORT											
	OFFICE/RESEARCH AND DEVELOPMENT										
173-174	Lab Testing, Office	P	FP	6,388		I	$ 1,365,435	$ 1,365,435	100%	$ 1,365,435	$ 1,365,435
209	Allison Hall Office	P	FP	36,665		I	$ 7,837,144	$ 7,837,144	100%	$ 7,837,144	$ 7,837,144
281	Professional Office	P	FP	2,544		I	$ 543,780	$ 543,780	100%	$ 543,780	$ 543,780
283	Squier Hall Office/Education	P	FP	76,538		N	$ -	$ -	100%	$ -	$ -
286	Russel Hall Garrison Headquarters	P	NP	76,978		N	$ -	$ -	100%	$ -	$ -
289, 290, 291, 295	General Office	P	FP	21,006		I	$ 4,490,033	$ 4,490,033	100%	$ 4,490,033	$ 4,490,033
600	McAfee Center	P	FP	97,000		I	$ 25,098,750	$ 25,098,750	100%	$ 25,098,750	$ 25,098,750
New	Green Industry Cluster	P	FP	200,000	200,000	I	$ 51,750,000	$ 103,500,000	100%	$ 51,750,000	$ 103,500,000
New	Medical Office Building	P	FP	20,000		I	$ 5,175,000	$ 5,175,000	100%	$ 5,175,000	$ 5,175,000
	Total Office/R&D Space			537,119	200,000						
	RETAIL										
114	Fitness Center	P	FP	32,250		I	$ 5,805,000	$ 5,805,000	100%	$ 5,805,000	$ 5,805,000
B450	Public Marina	P	FP	2,600		C	$ 2,698,000	$ 2,698,000	100%	$ 2,698,000	$ 2,698,000
1007	Commissary Retail Center	P	FP	53,700		I	$ 9,666,000	$ 9,666,000	100%	$ 9,666,000	$ 9,666,000
New	Neighborhood Convenience Retail	P	FP	19,000	19,000	I	$ 5,343,750	$ 10,687,500	100%	$ 5,343,750	$ 10,687,500
New	Waterfront Retail	P	FP		9,000	I	$ -	$ 2,531,250	100%	$ -	$ 2,531,250
New	Waterfront Boutique Hotel Retail	P	FP		3,000	I	$ -	$ 843,750	100%	$ -	$ 843,750
New	Spa	P	FP		3,000	I	$ -	$ 843,750	100%	$ -	$ 843,750
	Credit Union	P	FP	5,000		I	$ 1,406,250	$ 1,406,250	100%	$ 1,406,250	$ 1,406,250
	Total Retail Space			112,550	34,000						
	HOSPITALITY/CONFERENCE CENTER (assume 750 SF per room)										
New	Waterfront Hotel	P	FP		70,000	I	$ -	$ 9,678,033	100%	$ -	$ 9,678,033
	Total Hotel/Conference Center			-	70,000						

Appendix Table A-2: Fort Monmouth Assessed Value (Continued)

Existing Building Number	DESCRIPTION	Interim Use (I); Permanent Reuse (P)	Likely User	10 Year Plan	20 Year Plan	Valuation Method	Year 10 Market Value	Year 20 Market Value	Assessed Value to Market Value Ratio	Year 10 Assessed Value	Year 20 Assessed Value
	RESIDENTIAL (assume 1,500 SF per unit)										
271	Gardner Hall Residential	P	FP	15		N	$ -	$ -	100%	$ -	$ -
	Historic District 1-Family	P	FP	117		C	$ 60,407,100	$ 60,407,100	100%	$ 60,407,100	$ 60,407,100
New	1-Family Small Lot	P	FP	80	79	C	$ 41,304,000	$ 82,091,700	100%	$ 41,304,000	$ 82,091,700
New	Apartments	P	FP	60	309	I	$ 11,547,000	$ 71,014,050	100%	$ 11,547,000	$ 71,014,050
New	Oceanport Ave Apartments	P	FP	30	30	I	$ 5,773,500	$ 11,547,000	100%	$ 5,773,500	$ 11,547,000
	Total Mixed Income			287	418						
	CIVIC										
206, 208	Barker Circle Oceanport Municipal Complex	P	BO	76,776		N	$ -	$ -	100%	$ -	$ -
275	Kaplan Hall Museum	P	NP	7,432		N	$ -	$ -	100%	$ -	$ -
501	Counseling Center	P	NP	2,832		N	$ -	$ -	100%	$ -	$ -
502	Library	P	CO	10,650		N	$ -	$ -	100%	$ -	$ -
551	Armstrong Hall Education Building	P	NP	13,595		N	$ -	$ -	100%	$ -	$ -
702	Lane Hall Community Conference Center	P	CO	12,100		N	$ -	$ -	100%	$ -	$ -
814	Recreation Support Building	P	CO	8,863		N	$ -	$ -	100%	$ -	$ -
B2560 or 282	Fire/Emergency Services Station	P	BO	6,089		N	$ -	$ -	100%	$ -	$ -
B500	Chapel	P	NP	16,372		N	$ -	$ -	100%	$ -	$ -
B1075 PAHC	VA - Community Medical Center	P	FE	60,000		N	$ -	$ -	100%	$ -	$ -
New	Middle School (450 students, 16-acres)	P	SD	145,000		N	$ -	$ -	100%	$ -	$ -
	Total Civic			359,709	-						
TINTON FALLS											
	OFFICE/RESEARCH AND DEVELOPMENT										
2502-2507	Shops/Warehouses	I	NP	42,752		I	$ -	$ -	100%	$ -	$ -
2525	Administrative Offices	P	FP	86,719		I	$ 18,536,186	$ 18,536,186	100%	$ 18,536,186	$ 18,536,186
2539- 2540	Lab Testing Buildings	P	FP	15,756		I	$ 3,367,845	$ 3,367,845	100%	$ 3,367,845	$ 3,367,845
2700 Myers Center	Data Recovery Center _ Reconfigured	P	FP	445,522		I	$ 95,230,328	$ 95,230,328	100%	$ 95,230,328	$ 95,230,328
2705	Testing Lab	P	FP	47,592		I	$ 10,172,790	$ 10,172,790	100%	$ 10,172,790	$ 10,172,790
2707	RDT&E Lab	P	FP	26,476		I	$ 5,659,245	$ 5,659,245	100%	$ 5,659,245	$ 5,659,245
New	Office/Research & Development	P	FP		175,000	I	$ -	$ 45,281,250	100%	$ -	$ 45,281,250
	Total Office/R&D Space			664,817	175,000						
	RETAIL										
2567	Gas Station	P	FP	1		C	$ 1,100,000	$ 1,100,000	100%	$ 1,100,000	$ 1,100,000
New	Neighborhood Convenience Retail	P	FP	48,000	32,000	I	$ 13,500,000	$ 22,500,000	100%	$ 13,500,000	$ 22,500,000
	Total Retail Space			48,001	32,000						
	RESIDENTIAL (assume 1,500 SF per unit)										
B2231-2240,2260	Hemp Hill Housing	P	FP	22		I	$ 1,768,800	$ 1,768,800	100%	$ 1,768,800	$ 1,768,800
New	1-Family Small Lot	P	FP	39		C	$ 20,135,700	$ 20,135,700	100%	$ 20,135,700	$ 20,135,700
New	1-Family Large Lot	P	FP	14		C	$ 9,605,400	$ 9,605,400	100%	$ 9,605,400	$ 9,605,400
New	Townhouse/Rowhouse	P	FP	83		C	$ 32,892,900	$ 32,892,900	100%	$ 32,892,900	$ 32,892,900
New	Apartments	P	FP	130		I	$ 25,018,500	$ 25,018,500	100%	$ 25,018,500	$ 25,018,500
	Total Mixed Income			288	-						
	CIVIC										
B2290	Child Development Center	P	SD	19,600		N	$ -	$ -	100%	$ -	$ -
2,566	Youth Center	P	SD	19,636		N	$ -	$ -	100%	$ -	$ -
B2560 or 282	Fire/Emergency Services Station	P	FD	10,070		N	$ -	$ -	100%	$ -	$ -
B2569	Community Pool/Tennis Center(s)	P	BO	1,000		N	$ -	$ -	100%	$ -	$ -
B2707, 2709, 2713	Fire & Police Training Academy	P	BO	11,110		N	$ -	$ -	100%	$ -	$ -
New	Library	P	BO	27,000		N	$ -	$ -	100%	$ -	$ -
	Total Civic			88,416	-						

Source: EDAW; Economics Research Associates, 2008.

Likely Users:
BO = Borough
CO = County
FD = Fire District
SD = School District
FP = For Profit
NP = Non Profit

Valuation Method:
C = Comparables
I = Income
R = Replacement
N = Not Valued

Appendix Table A-3: Fort Monmouth Valuation - Income Approach

Existing Building Number	DESCRIPTION	10 Year Plan	20 Year Plan	Price / Rent	Pricing Unit	Occu-pancy	Year 10 Rental Income	Year 20 Rental Income	Rent Type	Op Ex	Op Ex Units	Year 10 Total Op Ex	Year 20 Total Op Ex	Year 10 NOI	Year 20 NOI	Cap Rate	Year 10 Market Value	Year 20 Market Value
EATONTOWN																		
	OFFICE/RESEARCH AND DEVELOPMENT																	
1150-1152	Vail Hall Communication Center	36,483	-	$ 19.00	SF / Ann	90%	$ 623,859	$ 623,859	NNN	$ -	NA	$ -	$ -	$ 623,859	$ 623,859	8.0%	$ 7,798,241	$ 7,798,241
1208-1210	CECOM Incubator & Professional Office	138,050	157,072	$ 19.00	SF / Ann	90%	$ 2,360,655	$ 5,046,586	NNN	$ -	NA	$ -	$ -	$ 2,360,655	$ 5,046,586	8.0%	$ 29,508,188	$ 63,082,328
New	Technology Flex Office	-	190,000	$ 23.00	SF / Ann	90%	$ -	$ 3,933,000	NNN	$ -	NA	$ -	$ -	$ -	$ 3,933,000	8.0%	$ -	$ 49,162,500
	Total Office/R&D Space	174,533	347,072															
	RETAIL																	
689	Bowling Alley	17,599	-	$ 16.00	SF / Ann	901%	$ 2,537,072	$ 2,537,072	NNN	$ -	NA	$ -	$ -	$ 2,537,072	$ 2,537,072	8.0%	$ 31,713,398	$ 31,713,398
2018	Suneagles Restaurant	3,205	-	$ 25.00	SF / Ann	90%	$ 72,113	$ 72,113	NNN	$ -	NA	$ -	$ -	$ 72,113	$ 72,113	8.0%	$ 901,406	$ 901,406
New	Neighborhood Convenience Retail	12,530	-	$ 25.00	SF / Ann	90%	$ 281,925	$ 281,925	NNN	$ -	NA	$ -	$ -	$ 281,925	$ 281,925	8.0%	$ 3,524,063	$ 3,524,063
New	Lifestyle Town Center Retail	150,000	-	$ 25.00	SF / Ann	90%	$ 3,375,000	$ 3,375,000	NNN	$ -	NA	$ -	$ -	$ 3,375,000	$ 3,375,000	8.0%	$ 42,187,500	$ 42,187,500
	Total Retail Space	165,735	-															
	HOSPITALITY/CONFERENCE CENTER (assume 750 SF per room)																	
B2022-B2042	Conference Hotel Residential	14,400	-	See Hotel Income Calculation Sheets										$ 109,832	$ 109,832	8.0%	$ 1,372,905	$ 1,372,905
New	Conference Hotel	225,000	-	See Hotel Income Calculation Sheets (includes conference center value)										$ 1,716,131	$ 1,716,131	8.5%	$ 20,189,776	$ 20,189,776
New	Conference Center	15,000	-	See Hotel Income Calculation Sheets										$ -	$ -	8.5%	$ -	$ -
	Total Hotel/Conference Center	254,400	-															
	RESIDENTIAL (assume 1,500 SF per unit)																	
New	Garden Apartments - Howard Commons	275	-	$ 1,870	Unit / Mo	90%	$ 5,553,900	$ 5,553,900	FS	$ 4,800	Unit	$ 1,320,000	$ 1,320,000	$ 4,233,900	$ 4,233,900	8.0%	$ 52,923,750	$ 52,923,750
	Total Mixed Income	275	-															
	CIVIC																	
	Total Civic	-	-															
OCEANPORT																		
	OFFICE/RESEARCH AND DEVELOPMENT																	
173-174	Lab Testing, Office	6,388	-	$ 19.00	SF / Ann	90%	$ 109,235	$ 109,235	NNN	$ -	NA	$ -	$ -	$ 109,235	$ 109,235	8.0%	$ 1,365,435	$ 1,365,435
209	Allison Hall Office	36,665	-	$ 19.00	SF / Ann	90%	$ 626,972	$ 626,972	NNN	$ -	NA	$ -	$ -	$ 626,972	$ 626,972	8.0%	$ 7,837,144	$ 7,837,144
281	Professional Office	2,544	-	$ 19.00	SF / Ann	90%	$ 43,502	$ 43,502	NNN	$ -	NA	$ -	$ -	$ 43,502	$ 43,502	8.0%	$ 543,780	$ 543,780
289, 290, 291, 295	General Office	21,006	-	$ 19.00	SF / Ann	90%	$ 359,203	$ 359,203	NNN	$ -	NA	$ -	$ -	$ 359,203	$ 359,203	8.0%	$ 4,490,033	$ 4,490,033
600	McAfee Center	97,000	-	$ 23.00	SF / Ann	90%	$ 2,007,900	$ 2,007,900	NNN	$ -	NA	$ -	$ -	$ 2,007,900	$ 2,007,900	8.0%	$ 25,098,750	$ 25,098,750
New	Green Industry Cluster	200,000	200,000	$ 23.00	SF / Ann	90%	$ 4,140,000	$ 8,280,000	NNN	$ -	NA	$ -	$ -	$ 4,140,000	$ 8,280,000	8.0%	$ 51,750,000	$ 103,500,000
New	Medical Office Building	20,000	-	$ 23.00	SF / Ann	90%	$ 414,000	$ 414,000	NNN	$ -	NA	$ -	$ -	$ 414,000	$ 414,000	8.0%	$ 5,175,000	$ 5,175,000
	Total Office/R&D Space	383,603	200,000															
	RETAIL																	
114	Fitness Center	32,250	-	$ 16.00	SF / Ann	90%	$ 464,400	$ 464,400	NNN	$ -	NA	$ -	$ -	$ 464,400	$ 464,400	8.0%	$ 5,805,000	$ 5,805,000
1007	Commissary Retail Center	53,700	-	$ 16.00	SF / Ann	90%	$ 773,280	$ 773,280	NNN	$ -	NA	$ -	$ -	$ 773,280	$ 773,280	8.0%	$ 9,666,000	$ 9,666,000
New	Neighborhood Convenience Retail	19,000	19,000	$ 25.00	SF / Ann	90%	$ 427,500	$ 855,000	NNN	$ -	NA	$ -	$ -	$ 427,500	$ 855,000	8.0%	$ 5,343,750	$ 10,687,500
New	Waterfront Retail	-	9,000	$ 25.00	SF / Ann	90%	$ -	$ 202,500	NNN	$ -	NA	$ -	$ -	$ -	$ 202,500	8.0%	$ -	$ 2,531,250
New	Waterfront Boutique Hotel Retail	-	3,000	$ 25.00	SF / Ann	90%	$ -	$ 67,500	NNN	$ -	NA	$ -	$ -	$ -	$ 67,500	8.0%	$ -	$ 843,750
New	Spa	-	3,000	$ 25.00	SF / Ann	90%	$ -	$ 67,500	NNN	$ -	NA	$ -	$ -	$ -	$ 67,500	8.0%	$ -	$ 843,750
0	Credit Union	5,000	-	$ 25.00	SF / Ann	90%	$ 112,500	$ 112,500	NNN	$ -	NA	$ -	$ -	$ 112,500	$ 112,500	8.0%	$ 1,406,250	$ 1,406,250
	Total Retail Space	109,950	34,000															
	HOSPITALITY/CONFERENCE CENTER (assume 750 SF per room)																	
New	Waterfront Hotel	-	70,000	See Hotel Income Calculation Sheets										$ -	$ 822,633	8.5%	$ -	$ 9,678,033
	Total Hotel/Conference Center	-	70,000															

Appendix Table A-3: Fort Monmouth Valuation - Income Approach (Continued)

Existing Building Number	DESCRIPTION	10 Year Plan	20 Year Plan	Price / Rent	Pricing Unit	Occu-pancy	Year 10 Rental Income	Year 20 Rental Income	Rent Type	Op Ex	Op Ex Units	Year 10 Total Op Ex	Year 20 Total Op Ex	Year 10 NOI	Year 20 NOI	Cap Rate	Year 10 Market Value	Year 20 Market Value
	RESIDENTIAL (assume 1,500 SF per unit)																	
New	Apartments	60	309	$ 1,870	Unit / Mo	90%	$ 1,211,760	$ 7,452,324	FS	$ 4,800	Unit	$ 288,000	$ 1,771,200	$ 923,760	$ 5,681,124	8.0%	$ 11,547,000	$ 71,014,050
New	Oceanport Ave Apartments	30	30	$ 1,870	Unit / Mo	90%	$ 605,880	$ 1,211,760	FS	$ 4,800	Unit	$ 144,000	$ 288,000	$ 461,880	$ 923,760	8.0%	$ 5,773,500	$ 11,547,000
	Total Mixed Income	90	339															
	CIVIC																	
	Total Civic	-	-															
TINTON FALLS																		
	OFFICE/RESEARCH AND DEVELOPMENT																	
2502-2507	Shops/Warehouses	42,752	-															
2525	Administrative Offices	86,719	-	$ 19.00	SF / Ann	90%	$ 1,482,895	$ 1,482,895	NNN	$ -	NA	$ -	$ -	$ 1,482,895	$ 1,482,895	8.0%	$ 18,536,186	$ 18,536,186
2539- 2540	Lab Testing Buildings	15,756	-	$ 19.00	SF / Ann	90%	$ 269,428	$ 269,428	NNN	$ -	NA	$ -	$ -	$ 269,428	$ 269,428	8.0%	$ 3,367,845	$ 3,367,845
2700 Myers Center	Data Recovery Center _ Reconfigured	445,522	-	$ 19.00	SF / Ann	90%	$ 7,618,426	$ 7,618,426	NNN	$ -	NA	$ -	$ -	$ 7,618,426	$ 7,618,426	8.0%	$ 95,230,328	$ 95,230,328
2705	Testing Lab	47,592	-	$ 19.00	SF / Ann	90%	$ 813,823	$ 813,823	NNN	$ -	NA	$ -	$ -	$ 813,823	$ 813,823	8.0%	$ 10,172,790	$ 10,172,790
2707	RDT&E Lab	26,476	-	$ 19.00	SF / Ann	90%	$ 452,740	$ 452,740	NNN	$ -	NA	$ -	$ -	$ 452,740	$ 452,740	8.0%	$ 5,659,245	$ 5,659,245
New	Office/Research & Development	-	175,000	$ 23.00	SF / Ann	90%	$ -	$ 3,622,500	NNN	$ -	NA	$ -	$ -	$ -	$ 3,622,500	8.0%	$ -	$ 45,281,250
	Total Office/R&D Space	664,817	175,000															
	RETAIL																	
New	Neighborhood Convenience Retail	48,000	32,000	$ 25.00	SF / Ann	90%	$ 1,080,000	$ 1,800,000	NNN	$ -	NA	$ -	$ -	$ 1,080,000	$ 1,800,000	8.0%	$ 13,500,000	$ 22,500,000
	Total Retail Space	48,000	32,000															
	RESIDENTIAL (assume 1,500 SF per unit)																	
B2231-2240,2260	Hemp Hill Housing	22	-	$ 1,040	Unit / Mo	90%	$ 247,104	$ 247,104	FS	$ 4,800	Unit	$ 105,600	$ 105,600	$ 141,504	$ 141,504	8.0%	$ 1,768,800	$ 1,768,800
New	Apartments	130	-	$ 1,870	Unit / Mo	90%	$ 2,625,480	$ 2,625,480	FS	$ 4,800	Unit	$ 624,000	$ 624,000	$ 2,001,480	$ 2,001,480	8.0%	$ 25,018,500	$ 25,018,500
	Total Mixed Income	152	-															
	CIVIC																	
	Total Civic	-	-															

Source: Costar office, flex, and retail rent data; Reis apartment market data; ULI Dollars and Cents of Multifamily Housing; Economics Research Associates, 2008.

Appendix Table A-4: Fort Monmouth Valuation - Comparables Approach

Existing Building Number	DESCRIPTION	10 Year Plan	20 Year Plan	Price / Rent	Pricing Unit	Year 10 Market Value	Year 20 Market Value
EATONTOWN							
	OFFICE/RESEARCH AND DEVELOPMENT						
	Total Office/R&D Space	-	-				
	RETAIL						
	Total Retail Space	-	-				
	HOSPITALITY/CONFERENCE CENTER (assume 750 SF per room)						
	Total Hotel/Conference Center	-	-				
	RESIDENTIAL (assume 1,500 SF per unit)						
New	Townhouse/Rowhouse	-	302	$ 396,300	Unit	$ -	$ 119,682,600
	Total Mixed Income	-	302				
	CIVIC						
Golf Course	Gibbs Hall Suneagles Golf Club	142.11	-	$ 76,000	Acre	$ 10,800,360	$ 10,800,360
	Total Civic	142	-				
OCEANPORT							
	OFFICE/RESEARCH AND DEVELOPMENT						
	Total Office/R&D Space	-	-				
	RETAIL						
B450	Public Marina	71	-	$ 38,000	Slip	$ 2,698,000	$ 2,698,000
	Total Retail Space	71	-				
	HOSPITALITY/CONFERENCE CENTER (assume 750 SF per room)						
	Total Hotel/Conference Center	-	-				
	RESIDENTIAL (assume 1,500 SF per unit)						
-	Historic District 1-Family	117	-	$ 516,300	Unit	$ 60,407,100	$ 60,407,100
New	1-Family Small Lot	80	79	$ 516,300	Unit	$ 41,304,000	$ 82,091,700
	Total Mixed Income	197	79				
	CIVIC						
	Total Civic	-	-				
TINTON FALLS							
	OFFICE/RESEARCH AND DEVELOPMENT						
	Total Office/R&D Space	-	-				
	RETAIL						
2567	Gas Station	1	-	$ 1,100,000	Unit	$ 1,100,000	$ 1,100,000
	Total Retail Space	1	-				
	RESIDENTIAL (assume 1,500 SF per unit)						
New	1-Family Small Lot	39	-	$ 516,300	Unit	$ 20,135,700	$ 20,135,700
New	1-Family Large Lot	14	-	$ 686,100	Unit	$ 9,605,400	$ 9,605,400
New	Townhouse/Rowhouse	83	-	$ 396,300	Unit	$ 32,892,900	$ 32,892,900
	Total Mixed Income	136	-				
	CIVIC						
	Total Civic	-	-				

Source: Hanley Wood Market Intelligence; Monmouth County tax assessor online database; Economics Research Associates, 2008.

Appendix B-1: Fort Monmouth Employment Generation Analysis

Existing Building Number	DESCRIPTION	10 Year Plan	20 Year Plan	Employment Factor / SF /1	Total Estimated Employees 10 Year Plan	Total Estimated Employees 20 Year Plan
EATONTOWN						
	OFFICE/RESEARCH AND DEVELOPMENT					
1150-1152	Vail Hall Communication Center	36,483	-	275	133	-
1208-1210	CECOM Incubator & Professional Office	138,050	157,072	275	502	571
New	Technology Flex Office	-	190,000	275	-	691
	Total Office/R&D Space	174,533	347,072		635	1,262
	RETAIL					
689	Bowling Alley	17,599	-	1500	12	-
2018	Suneagles Restaurant	3,205	-	400	8	-
New	Neighborhood Convenience Retail	12,530	-	400	31	-
New	Lifestyle Town Center Retail	150,000	-	400	375	-
	Total Retail Space	183,334	-		414	-
	HOSPITALITY/CONFERENCE CENTER (assume 750 SF per room)			***Employees per Room***		
B2022-B2042	Conference Hotel Residential	14,400	-	1.5	29	-
New	Conference Hotel	225,000	-	1.5	450	-
New	Conference Center	15,000	-	1.5	30	-
	Total Hotel/Conference Center	254,400	-	5	509	-
	RESIDENTIAL (assume 1,500 SF per unit)					
New	Townhouse/Rowhouse	-	302	0.05	-	15
New	Garden Apartments - Howard Commons	275	-	0.05	14	-
	Total Mixed Income	275	302	0	14	15
	CIVIC					
B1206-1207	Eatontown Municipal Center Malette Hall	57,386	-	750	77	-
1215	Public Theater	18,883	-	750	25	-
Golf Course	Gibbs Hall Suneagles Golf Club (Acres)	142	-	16	16	-
New	Fort Monmouth Jitney Bus	200	-	N/A	N/A	N/A
	Total Civic	76,611	-		118	-
	TOTAL				1,689	1,277
OCEANPORT						
	OFFICE/RESEARCH AND DEVELOPMENT					
173-174	Lab Testing, Office	6,388	-	500	13	-
209	Allison Hall Office	36,665	-	500	73	-
281	Professional Office	2,544	-	275	9	-
283	Squier Hall Office/Education	76,538	-	500	153	-
286	Russel Hall Garrison Headquarters	76,978	-	500	154	-
289, 290, 291, 295	General Office	21,006	-	275	76	-
600	McAfee Center	97,000	-	500	194	-
New	Green Industry Cluster	200,000	200,000	500	400	400
New	Medical Office Building	20,000	-	375	53	-
	Total Office/R&D Space	537,119	200,000		1,126	400
	RETAIL					
114	Fitness Center	32,250	-	500	65	-
B450	Public Marina	2,600	-	NA		
1007	Commissary Retail Center	53,700	-	500	107	-
New	Neighborhood Convenience Retail	19,000	19,000	500	38	38
New	Waterfront Retail	-	9,000	500	-	18
New	Waterfront Boutique Hotel Retail	-	3,000	500	-	6
New	Spa	-	3,000	500	-	6
	Credit Union	5,000	-	500	10	-
	Total Retail Space	112,550	34,000		220	68
	HOSPITALITY/CONFERENCE CENTER (assume 750 SF per room)			***Employees per Room***		
New	Waterfront Hotel	-	70,000	1.50	-	140
	Total Hotel/Conference Center	-	70,000		-	140

Appendix B-1: Fort Monmouth Employment Generation Analysis

Existing Building Number	DESCRIPTION	10 Year Plan	20 Year Plan	Employment Factor / SF /1	Total Estimated Employees 10 Year Plan	20 Year Plan
	RESIDENTIAL (assume 1,500 SF per unit)			***Employees / Unit***		
271	Gardner Hall Residential	15	-	0.05	1	-
	Historic District 1-Family	117	-	N/A	N/A	N/A
New	1-Family Small Lot	80	79	N/A	N/A	N/A
New	Apartments	60	309	0.05	3	15
New	Oceanport Ave Apartments	30	30	0.05	2	2
	Total Mixed Income	302	418		5	17
	CIVIC					
206,208	Barker Circle Oceanport Municipal Complex	76,776	-	NA	-	-
275	Kaplan Hall Museum	7,432	-	NA	1	-
501	Counseling Center	2,832	-	500	6	-
502	Library	10,650	-	500	21	-
551	Armstrong Hall Education Building	13,595	-	500	27	-
702	Lane Hall Community Conference Center	12,100	-	500	24	-
814	Recreation Support Building	8,863	-	500	18	-
B2560 or 282	Fire/Emergency Services Station	6,089	-	N/A		
B500	Chapel	16,372	-	N/A		
B1075 PAHC	VA - Community Medical Center	60,000	-	500	120	-
New	Middle School (450 students, 16-acres)	145,000	-	N/A		
	Total Civic	359,709	-		217	-
	TOTAL				1,568	625
TINTON FALLS						
	OFFICE/RESEARCH AND DEVELOPMENT					
2502-2507	Shops/Warehouses	42,752	-	500	86	-
2525	Administrative Offices	86,719	-	275	315	-
2539- 2540	Lab Testing Buildings	15,756	-	500	32	-
2700 Myers Center	Data Recovery Center _ Reconfigured	445,522	-	1000	446	-
2705	Testing Lab	47,592	-	1000	48	-
2707	RDT&E Lab	26,476	-	1000	26	-
New	Office/Research & Development	-	175,000	1000	-	175
	Total Office/R&D Space	664,817	175,000		952	175
	RETAIL					
2567	Gas Station	1	-	N/A	5	
New	Neighborhood Convenience Retail	48,000	32,000	500	96	64
	Total Retail Space	48,001	32,000	500	101	64
	RESIDENTIAL (assume 1,500 SF per unit)			***Employees / Unit***		
B2231-2240,2260	Hemp Hill Housing	22	-	0.05	1	-
New	1-Family Small Lot	39	-	N/A	N/A	N/A
New	1-Family Large Lot	14	-	N/A	N/A	N/A
New	Townhouse/Rowhouse	83	-	N/A	N/A	N/A
New	Apartments	130	-	0.05	7	-
	Total Mixed Income	288	-	0	8	-
	CIVIC					
B2290	Child Development Center	19,600	-	1000	20	-
2,566	Youth Center	19,636	-	1,000	20	-
B2560 or 282	Fire/Emergency Services Station	10,070	-	N/A		
B2569	Community Pool/Tennis Center(s)	1,000	-	N/A		
B2707, 2709, 2713	Fire & Police Training Academy	11,110	-	N/A		
New	Library	27,000	-	9000	3	-
	Total Civic	88,416	-	11,000	42	-
	TOTAL				1,103	239

1/ ULI Dollars & Cents of Shopping Centers, 2007; ULI Dollars & Cents of Multifamily Housing, 2006.
2/ Bowling Proprietors Association of America, 2008; US Bureau of Labor Statistics, Recreation Occupations, 2008.
Source: Economics Research Associates, 2008.

Appendix Table B-2: Current Fund Appropriations Included in Public Service Cost Analysis

General Appropriations
Borough Council
Office of the Mayor
Municipal Clerk
Office of the Tax Assessor
Division of Administration
Human Resources
Division of Central Services
Division of Engineering
Historical Sites Office
Division of Law
Division of Central Maintenance
Division of Streets
Division of Sanitation
Division of Buildings and Grounds
Maintenance of Parks
Shade Tree
Community Services Act
Police
Division of Emergency Managements
Prosecutor
Division of Finance
Division of Revenue
Division of Health
Environmental Health Sciences
Contribution to Social Services Agencies
Alliance Program
Division of Recreation
Municipal Library
Division of Housing
Division of Planning
Division of Code Enforcement
Division of Fire Prevention
Animal Control Services
Municipal Court
Public Defender
Public Employees Occupational Safety and Health Act
Insurance
State Uniform Construction Code
Utilities
Accumulated Leave Compensation

Source: FY2008 Municipal Budget Summary, Sheet 12 through Sheet 17; Economics Research Associates, 2008.

9.0 ZONING & LAND USE IMPACTS

9.0 Zoning & Land Use Impacts

9.1 Statement Of Goals and Objectives

The following Goals and Objectives have been developed to guide the preparation of this plan:

To create a "green community" model where sustainable redevelopment at Fort Monmouth balances the economic, environmental and social triple bottom line within the limits of available resources.

To plan for beneficial redevelopment that improves and reinforces the quality of life in the constituent municipalities consistent with State, County & Municipal planning policy, by:

- Creating Mixed-Use Live/Work/Leisure Centers;
- Linking centers & increasing local and regional mobility with connected transit infrastructure serving the region and the Fort;
- Enhancing auto mobility and redevelopment capacity with targeted roadway improvements;
- Establishing a continuous Blue – Greenbelt combining active and passive open space, wildlife habitat, riparian corridors and wetlands;
- Enhancing bicycle & pedestrian mobility throughout the Fort and adjoining areas utilizing the Blue - Greenbelt to maximize linkages; and
- Eliminating perceived Fort boundaries and connecting proposed and existing land uses to reintegrate the Fort to the communities

To promote the efficient and comprehensive conversion and revitalization of Fort Monmouth and leverage existing Fort Monmouth assets, by

- Reusing, adapting, replacing or upgrading the Fort Monmouth buildings
- Stabilizing and growing the high-tech workforce in the region and managing job replacement & employee training
- Retaining jobs and creating new employment and other business opportunities
- Attracting and supporting NJ growth industries (Communications, renewable energy, life science, nanotech, stem cell, homeland security)

To promote a balance of land uses and varied housing types (including Homeless, COAH & Workforce housing) that meets regional needs and promotes municipal fiscal health.

9.1.1 Current Local Land Use Policies

Eatontown

A July 23, 2007 update of the Eatontown Master Plan incorporated the results and recommendations of Borough planning studies on the reuse of Fort Monmouth and the future of the downtown Village area of the Borough. The Planning Board also updated the statement of relationship of the Borough plan to the plans of adjoining municipalities, the County and the State. Two of the goals of the Master Plan that relate to Fort Monmouth included:

- To design and implement the road plan of the Borough to facilitate the movement of residents from one quadrant to others without using Routes 35 and 36 or the Route 35/Route 36 intersection; to discourage traffic from outside the Borough from using streets internal to residential areas; and, to assure that adequate parking is provided by all new developments.
- To support the commercial and industrial attractiveness of the Borough by facilitating continued viability of existing commercial development along Routes 35 and 36, and additional and upgraded development on vacant land within existing commercial areas.

As part of the reuse and redevelopment of Fort Monmouth for civilian activity, the Borough Master Plan recommends the following:

a. Relocate the Borough municipal complex onto Fort Monmouth to reoccupy the Fort Monmouth Life Cycle Management Building as the new Borough municipal complex.

b. Adopt the recommendations of the Howard Commons Reuse Study prepared February 2003 by Kise, Straw and Kolodner. The Howard Commons study is appended to the Borough Master Plan and adopted by reference as the Borough plan for the reuse of the Howard Commons area of Fort Monmouth.

c. Endorse the public benefit conveyance of surplus property at Fort Monmouth for park and recreation purposes as recommended by Monmouth County in the County notice of intent dated February 14, 2007.

The Land Use Plan identified Federal government lands at Fort Monmouth as the "Fort Monmouth Reuse Planning Area" on the Master Plan map. These lands are included in the zone plan as part of the P-1 zone for public use.

The Land Use Plan recommends that the Howard Commons Area of Fort Monmouth be redeveloped and reused in accordance with the recommendations of the Howard Commons Reuse Study prepared February 2003 by Kise, Kolodner, and Straw. The Howard Commons planning area is shown on the Borough Master Plan map and the Howard

Commons Reuse Study is appended to and adopted as part of this Borough Master Plan.

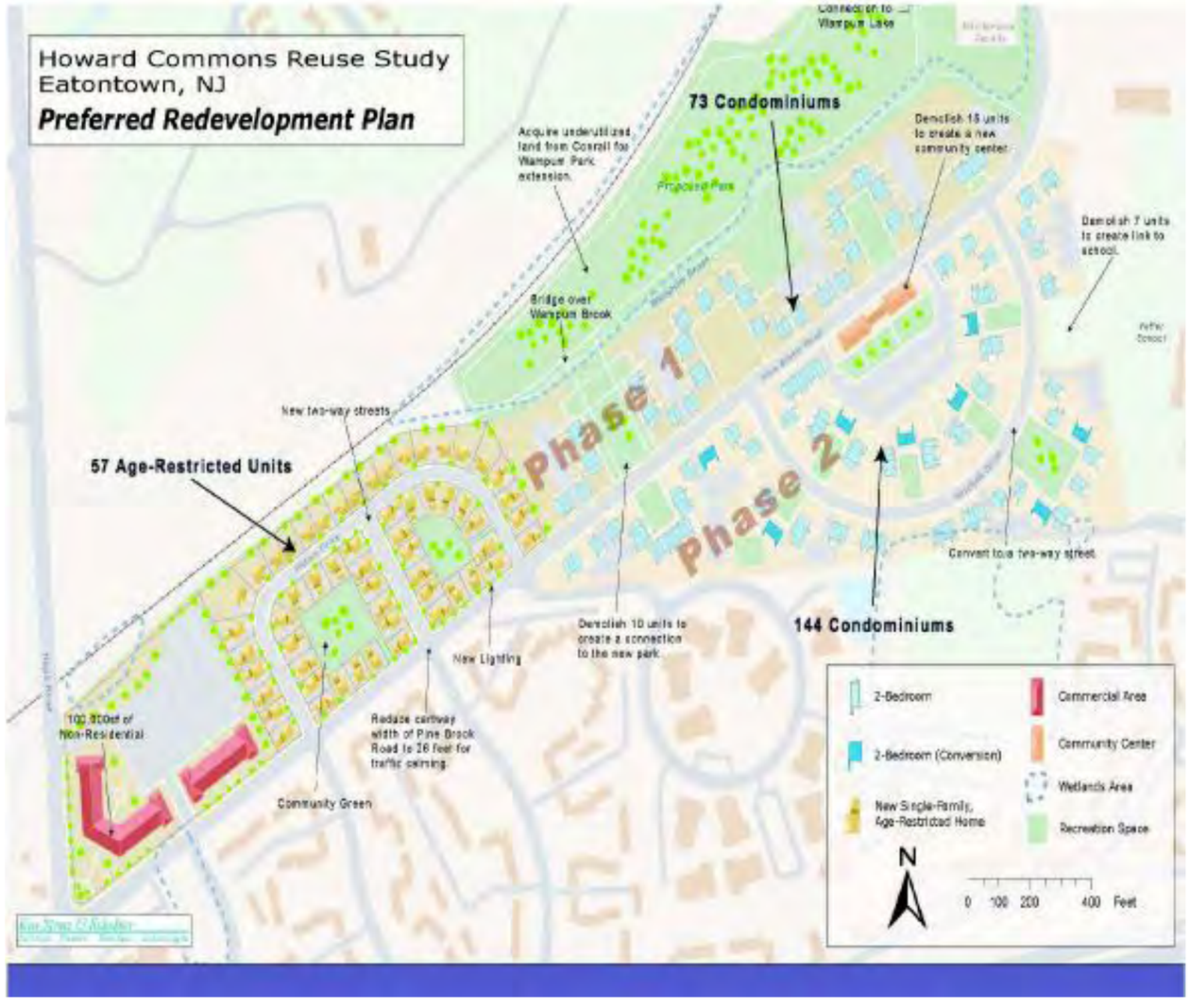
The Eatontown plan also recommends that the Fort Monmouth reuse plan should provide for the relocation of the Borough municipal complex from Broad Street into the Fort Monmouth Life Cycle Management Building. The Borough Master Plan map shows the location of the Life Cycle Management Building as the proposed location of the Borough municipal building.

Eatontown advances the concept that the Fort Monmouth reuse plan should provide for reuse of land within the base as park and recreation land as recommended by the February 14, 2007 notice of public interest by Monmouth County for the conveyance of surplus property for park and recreation use. Three recreation parcels are located in Eatontown, including Husky Brook Lake and the football complex; Lefetra Creek, Parkers Creek and Mill Creek, the baseball/ softball fields and bowling center; and the base golf course.

The Borough Master Plan map shows the location of the proposed Fort Monmouth Park and recreation land.

A description of the proposed use of each of the three open space and recreation parcels is included in the Borough's Open Space, Recreation, and Conservation Plan Element.

The Eatontown plan also recommends that Tinton Avenue (CR 537) should be extended as a through street across the base from Route 35 eastward to Oceanport.



Oceanport

From Fort to Village: A Vision for Oceanport's Fort Monmouth is a plan for redevelopment of the Ft. Monmouth property in Oceanport. Intended as a demonstration of the principles of smart growth set forth in the New Jersey State Development and Redevelopment Plan, new development would be compact, walkable and bikeable.

Natural features of the site including wetlands and waterfronts would be preserved and upgraded, and new development would conserve energy by being designed in accordance with the LEED standards for neighborhood development.

Two of the goals of the Oceanport Plan that relate to Fort Monmouth include:

- Creating employment opportunities and commercial ratables is one of Oceanport's major objectives. The existing McAfee Center is one of the most modern office space structures on the base and would lend itself to the conversion to commercial office space.

Overall Concept Plan

- The creation of a series of public space that integrate all of these elements together in order to produce a community framework that embodies sustainable principles of community development. These components would be comprised of existing natural areas as well as built areas.

From Fort to Village finds that the open spaces within Fort Monmouth are largely based on the existing unique natural attributes. These include the coastal fringes, freshwater wetlands, and stream corridors associated with Parker's and Oceanport Creeks, branches of the Shrewsbury River. Areas identified as bald eagle habitat and the existing marina are integral to this network, which also includes the existing ponds and recreational lands, as well as those open lands identified for public benefit conveyance by Monmouth County Parks. Oceanport's plan envisions the integration of existing contaminated lands within the open space network, where they may be contained while contributing to the framework of open spaces.

The following is a summary of the specific recommendations of the Oceanport Vision Plan:

a. The open space requested by the Monmouth County Parks Department, including the historic parade ground and the environmentally sensitive land along Oceanport Creek and Parker's Creek, would become dedicated public property. This land would serve as open space for both the Fort development and surrounding neighborhoods.

b. The Fort Monmouth Historic District would be preserved and structures within the district would be restored and reused in accordance with the Secretary of the Interior Standards.

c. The 98 acres between Oceanport Avenue and the NJ Transit tracks would be developed as a mixed-use, small scale,

age Center Concept Plan

walkable village. Oceanport Avenue would be developed as a boulevard and provide the major North-South traffic route for Oceanport development.

d. The Patterson Medical Center would be maintained as a veterans health facility and the land close to the Center would be developed with a mix of health care providers and professional offices. This area would also provide sites for an elementary and a middle school located next to County open space.

e. The Oceanport Board of Education has requested the conveyance of the McAfee Center. If it is not used by the B.O.E., then McAfee Center and the surrounding property are seen as well suited to be developed as an office campus.

f. The 28 acres along Parker's Creek is a prime waterfront development site that calls for the highest design quality with a unique resort hotel, spa, and/or conference facility.

g. Redevelopment of Ft. Monmouth would require the creation of an east-west arterial street in order to connect the proposed development areas with Rt. 35 and the regional highway system. The new east-west street should be designed to be compatible with the historic district and connect with Oceanport Avenue.

h. The vision plan envisions that there would be a jitney or small bus system connecting the various development centers at the Fort with the Little Silver train station. Since jitneys are generally small-capacity vehicles that follow a service route, but can divert to pick up and drop off passengers, the jitney would serve as an important link to the NJ Transit rail system. Such a system would also allow commuters from outside the area to access jobs located within the redevelopment area.

Medical Office Park Concept Plan

Tinton Falls

Public land parcels represent the single largest land category, including 3,249 acres or nearly 33% of Tinton Falls's total land area. The three largest publicly-owned sites - Naval Weapons Station Earle (approximately 1200 acres), Fort Monmouth (approximately 170 acres), and the Monmouth County Reclamation Center (approximately 900 acres) – are dominant land uses in Tinton Falls, with other publicly-owned parcels such as schools and open space scattered throughout the Borough.

One of the goals of the Tinton Falls Master Plan is to ensure the most appropriate reuse of Fort Monmouth. The Borough's objectives for land use include being actively involved in the planning process for the redevelopment of Fort Monmouth in order to ensure the most appropriate and beneficial reuse of the site.

Goals for housing include the objective of fully integrating affordable housing throughout the Borough, both within development projects and geographically throughout Tinton Falls.

Tinton Falls land use policies regarding Fort Monmouth are summarized below.

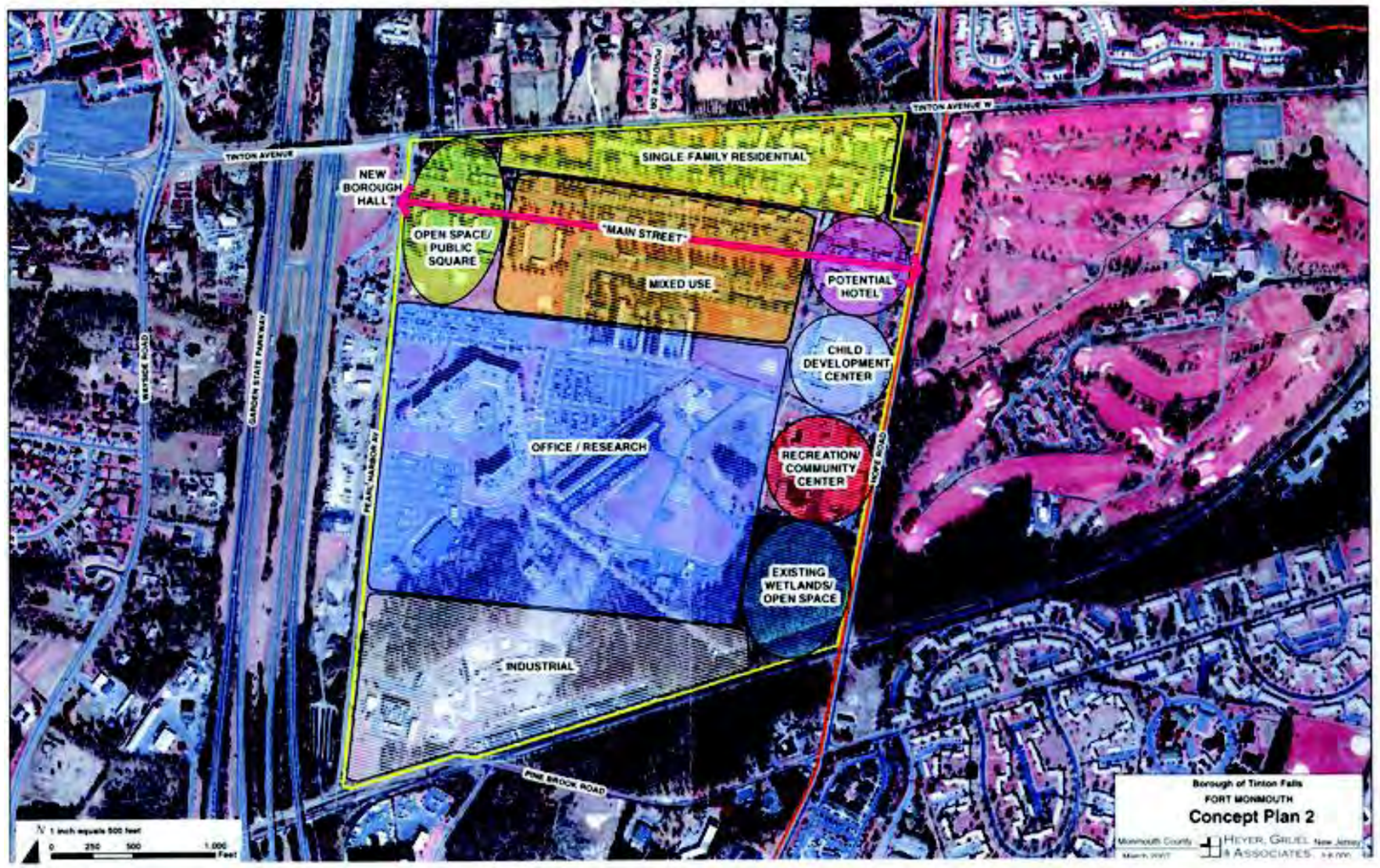
a. Fort Monmouth would become private land under statutory provisions that give the Borough limited ability to regulate the land use of the parcel. However, Tinton Falls sees this property as the last and best opportunity to create something special for the Borough, and seeks to advance its vision for the ultimate development of the site.

This vision is graphically shown on the Concept Plan map for Fort Monmouth that assumes a variety of uses, some public, some of which may be private. For example, the County may have an interest in the Fire Academy and other public uses on the site. The remainder of the site should be carefully developed, if it becomes available.

b. Sensitivity to the development of Tinton Avenue West is a principal concern.

- The properties to the north of Tinton Avenue adjacent to Fort Monmouth are within the Borough's RA Residential Agricultural designation, the lowest intensity zone within the Borough. The roadway is also designed as a scenic corridor by the County.

- The uses of Fort Monmouth lands along the Tinton Avenue frontage should be restricted to either very low intensity uses or buffering along the road. New curb cuts and significant traffic generators should not be located adjacent to Tinton Avenue.



- The central core of the Fort Monmouth site has great potential to serve as Tinton Falls' Town Center and the Borough hopes to create a new "Main Street" development running westward from Hope Road and terminating at the municipal complex adjacent to the Parkway. Along this Main Street and on the balance of the tract, a compact mixed-use, walking scale community could be developed. The Town Center should include a substantial commercial component as well as residential development, entertainment uses, and well defined public spaces including a possible new Library.

- Linkages to the neighborhoods of Tinton Falls should be carefully considered. The Town Center should also accommodate affordable housing. Consideration should be given to development of a hotel.

- A significant open space component should be included which can also connect the activity centers within the site and preserve the site's environmental features.

9.1.2 Comparison of Fort Monmouth Concept Plan and Local Plans

The following analysis identifies by municipality how the proposed concept reuse plan for Fort Monmouth compares with the local plans described above.

Oceanport (Proceeding from east to west on concept plan)

a. Concurrence

1. Medium density housing between NJ Transit line and Oceanport Ave.
2. The land areas along Oceanport Creek and Parker's Creek would be developed as natural open spaces
3. Marina
4. Mixed use retail/housing around Oceanport Ave.
5. Historic Parade Ground and surrounding structures preserved
6. Mixed Use resort/cottage retail along Parkers Creek (Borough refers to it as Riverfront Resort Development area)
7. Ecotech Park or McAfee Corporate Center - agreement except for name

b. Open

1. Municipal Complex - Borough plan includes it as part of the mixed-use area, while the FMERPA plan locates this facility at Barker Circle, where the Borough plan indicates University residences and fire station or municipal uses
2. Paterson Army Health Clinic, school - Oceanport proposes townhouses and professional offices (medical) while FMERPA Plan calls for a medical office building, apartments, townhouses and a limited number of detached small lot homes.
3. Homeless accommodations
4. The FMERPA Plan calls for single-family detached housing across the street from similar housing on Main Street.
5. Thoroughbred training and stabling facility (Oceanport Resolution #R-08-97 adopted June 19, 2008)

Eatontown

a. Concurrence

1. Howard Commons Area – this area is intended for housing in both Borough's and FMERPA's concept plans.
2. Relocate Borough administrative offices to the Mallette Hall.
3. Tinton Avenue (CR 537) should be extended as a through street across the base from Route 35 eastward to Oceanport
4. Open space areas

b. No Comments or acknowledgement

1. Hotel and conference center
2. Commercial incubator, community center retail and housing in Master Plan (there is a town center identified in the Howard Commons report)
3. Homeless accommodations

c. Open

1. Howard Commons Area – type of housing - FMERPA Plan calls for courtyard apartments and is silent on ownership and age restriction, while the Borough plan calls for age-restricted housing and condominiums

Tinton Falls

a. Concurrence

1. Town Center "Main Street" is identified in FMERPA Plan and Borough's concept plan
2. Commercial/general office
3. Open space to the east

b. Open

1. Homeless accomodations

9.2 Municipal Zoning Initiatives related to Fort Monmouth

The FMERPA plan development process would include public meetings with municipalities regarding the plan, which would provide a forum for communicating municipal positions on the base redevelopment. A formal procedure mandated as part of the FMERPA planning process requires a review of the draft FMERPA plan by municipal planning boards and comparison to the municipal Master Plan:

C.52:27I-15 Submission of proposed plan to constituent municipalities.

15. Prior to the adoption of the plan, or revision or amendment thereto, the authority shall transmit a copy of the proposed plan to the planning board of each constituent municipality. Within 45 days after referral, each planning board shall transmit to the authority a report containing its recommendation concerning the plan. This report shall include an identification of any provisions in the proposed plan that are inconsistent with the master plan and recommendations concerning these inconsistencies and any other matters as the board deems appropriate.

The host municipalities have indicated the following local zoning preferences for implementation and their implications:

Eatontown

Pending the finalization of a reuse plan for Fort Monmouth and the adoption of a redevelopment plan for Eatontown Village, no other zone changes are being recommended at this time to implement the land use element.

Oceanport

With the completion of the ***Fort to Village Plan: A Vision for Oceanport's Fort Monmouth***, Oceanport has articulated its vision for the redevelopment of the 419 acres of Fort Monmouth that lie within its boundaries. However, this plan does not represent the end of the process. As FMERPA proceeds through the development of the plan for the Fort, the ***Fort to Village Plan*** may be used by Oceanport to inform the FMERPA plan process and other regional and state planning initiatives.

The inclusion of the ***Fort to Village Plan*** in the local Master Plan would provide that the required referral and review by the Planning Board would capture the principles and concepts contained in the Concept Plan. Ultimately, the entire Master Plan should be updated to reflect the vision for Fort Monmouth.

Tinton Falls

Tinton Falls includes most lands on Fort Monmouth within the IOP Industrial/ Office Park Districts (IOP-10, IOP-15, IOP-20, IOP-25, IOP-35, and IOP-50). The IOP zones permitted and conditional uses are as follows:

1. Permitted uses include offices; hotels and motels; research facilities; hospital; veterinary hospitals; utilities; restaurants; restaurants with bar; manufacturing; fabrication and assembly operations; agricultural uses but not "farms"; tennis courts, gymnasiums, weight rooms and exercise centers; instructional centers; golf courses, parks, and other open space uses; elementary, middle, and high schools offering academic instruction with curriculums approved by the elementary and/or regional boards of education; retail/ warehouse uses, lumber yards, and home improvement centers; Borough uses; child care centers; automobile car wash in the IOP- 15, IOP-20 and IOP-25 districts; utility services; a continuing care retirement community (CCRC) under the provisions of a general development plan and certain requirements; and an active adult community in the IOP-35 zone.

2. Conditional uses include automobile service stations; permitted office, research, hospital, warehousing, manufacturing, fabrication and assembly operations shall be permitted limited accessory and incidental to retail outlets; warehousing; residence inns; outdoor equipment storage; commercial radio and other communications towers; a limited recycling operation in the IOP-20 district only; and assisted living residences.

The majority of the IOP zones are located in the center of the Borough, including lands at Fort Monmouth and Naval Weapons Station Earle. Several other smaller IOP zones are located in different sections of the Borough.

The Open Space Government Use designation represents a new land use category for Tinton Falls. This designation includes the County Park south of Route 33 and the County-owned parcels on the east side of Wayside Road. This category also includes those large publicly-held parcels including Fort Monmouth, Naval Weapons Station Earle, and the County Reclamation Center. The intent of this designation is to allow the existing activities on the properties as a matter of right while not committing to a specific zone assuming the properties become available for development.

It is recommended that the Borough give some thought to the ultimate disposition of these properties if they become available for development. For example, that portion of Earle located within Tinton Falls is an extremely valuable property from an open space perspective. It includes an extensive habitat suitable for rare and endangered species and would make an excellent open space tract. The landfill would ultimately close and could serve as an industrial park property or a portion might be used for intensive active outdoor recreation. The County should prepare a reuse Plan for the landfill's ultimate closure.

9.3 Monmouth County Plans

The Monmouth County Planning Board approach to planning is a reflection of the County Enabling legislation in New Jersey. Not having direct land use control, the County has assumed a leadership position by advocating for good planning at the municipal level, as well as preparing functional plans in cooperation with other County agencies. The following is a synopsis of the several plans the County has prepared.

Monmouth County Growth Management Guide

The Growth Management Guide was adopted by the Planning Board in December 1995. With a structure similar to the SDRP, outlining a series of goals, objectives, and policies in ten categories, the plan addresses air resources, centers, comprehensive planning, economic development, farmland preservation and agriculture development, historic, cultural, natural and scenic resources, housing, solid waste, transportation, and water resources.

Each of the categories has a goal with several objectives and related policies. The municipalities in Monmouth County use this document to address the statutory requirement of reviewing adjacent municipal plans, County plans, and the SDRP.

Monmouth County Open Space Plan

The Monmouth County Open Space Plan, adopted by the Monmouth County Planning Board, as an element of the Monmouth County Growth Management Guide in August 2006, specifically mentions the acquisition of a portion of the Fort Monmouth property as a new County park site. To fulfill this acquisition,

Monmouth County filed a Notice of Interest for park and recreation lands within Fort Monmouth property. The County subsequently filed an application to the National Park Service's Federal Lands to Park Program for a Public Benefit Conveyance, which was endorsed by the three host communities of Eatontown, Oceanport and Tinton Falls, and is consistent with their local land use policies and the current Fort Monmouth Reuse and Redevelopment Plan. This application was approved by the National Park Service on July 26, 2008. Conveyance of the requested property will be pursued as disposition and conveyance strategies are developed in conjunction with approval of the Reuse Plan.

Coastal Monmouth Plan

The Coastal Monmouth Plan (CMP) is a two-year regional planning effort that would create a vision for the future of the Monmouth County, NJ Atlantic Coastal Region, which spans over 27 miles of the New Jersey shoreline. Covering the region as a whole as well as each of the 30 municipalities within the study area (including Oceanport and Eatontown), the Plan's purpose is to help the communities prepare, collectively and individually, for sustainable growth, while protecting environmental resources and maintaining their unique coastal character.

The project started in the fall of 2006 and would be completed in the fall of 2008, with the Boroughs of Eatontown and Oceanport as two of the participants.

The Plan has several purposes:

a. To establish a set of planning alternatives to help coastal municipalities manage their remaining development potential, conserve open space, explore redevelopment opportunities and address the impacts of future growth on infrastructure, the natural environment, and the overall quality of life.

b. To formulate a plan that would be adopted as an element for the Monmouth

County Growth Management Guide.

c. To formulate a regional plan suitable for endorsement by the New Jersey State Planning Commission. (Project is receiving funding from the Department of Community Affairs).

The Plan would examine the region's land development pattern and identify the present and future capacity for growth to support economic development. Using demographic, socioeconomic and land use data, it would evaluate a set of planning alternatives to help the area guide future growth and conservation efforts. An Implementation Agenda would provide a strategic framework for municipalities, the County, and State agencies to follow in order to carry out identified strategies necessary to meet the vision of the Coastal Monmouth Region.

On March 15, 2007 the second meeting of the Coastal Regional Collaborative convened at Brookdale Community College, in the Student Life Center. Approximately 55 municipal representatives, stakeholders, and government agency officials from Monmouth County communities met. One of the announcements was that Freeholder Burry had asked the Monmouth County Planning Board to coordinate planning activities (of the study) with the Fort Monmouth Redevelopment Commission.

On May 30, 2007 a one-on-one meeting was conducted by the County with representatives from Neptune Township, Eatontown, and Ocean Township. The meeting took place at the Neptune City Borough Community Center. On June 13, 2007 a meeting was held with municipal representatives from Oceanport.

Monmouth County staff view redevelopment of the Fort as a regional issue, due to implications for vehicle traffic. The only definitive discussion items with the municipalities have been the need to maintain the Emergency Management Facility and the need to provide as much open space as possible. The County's involvement in the planning process would continue and evolve as the next steps occur.

9.4 New Jersey State Development and Redevelopment Plan

The New Jersey State Development and Redevelopment Plan (SDRP) is an outgrowth of the State Planning Act which was signed into law January 2, 1985. The SDRP was first adopted on June 12, 1992. It was revised and readopted on March 1, 2001 and presently is in the process of being reconsidered for readoption.

The purpose of the SDRP is to provide a vision for the future that would preserve and enhance the quality of life for all residents of New Jersey. The SDRP is the result of a cross-acceptance process that includes officials from counties, municipalities and the citizens of New Jersey in numerous public assemblies, discussing all of the major aspects of the Plan - its goals, strategies, policies, and application. This process ensures that the Plan belongs to the citizens of New Jersey, whose hopes and visions have shaped it.

Within the State Planning Act, the Legislature declared that the purpose of the SDRP is to:

Coordinate planning activities and establish Statewide planning objectives in the following areas: land use, housing, economic development, transportation, natural resource conservation, agriculture and farmland retention, recreation, urban and suburban redevelopment, historic preservation, public facilities and services, and intergovernmental coordination (N.J.S.A. 52:18A-200(f)

The objectives of the SDRP are outlined in its statewide goals and strategies, as follows:

1. Revitalize the State's Cities and Towns

- Protect, preserve, and develop the valuable human and economic assets in cities, towns, and other urban areas. Plan to improve their livability and sustainability by investing public resources in accordance with current plans which are consistent with the provisions of the State Plan. Leverage private investments in jobs and housing; provide comprehensive public services at lower costs and higher quality; and improve the natural and built environment. Incorporate ecological design through mechanisms such as solar access for heating and power generation. Level the playing field in such areas as financing services, infrastructure, and regulation. Reduce the barriers which limit mobility and access of city residents, particularly the poor and minorities, to jobs, housing, services, and open space within the region. Build on the assets of cities and towns such as their labor force, available land and buildings, strategic location, and diverse populations.

2. Conserve the State's Natural Resources and Systems

- Conserve the state's natural resources and systems as capital assets of the public by promoting ecologically sound development and redevelopment in the Metropolitan and Suburban Planning Areas, accommodating environmentally designed development and redevelopment in Centers in the Fringe, Rural and Environmentally Sensitive Planning Areas, and by restoring the integrity of natural systems in areas where they have been degraded or damaged. Plan, design, invest in and manage the development and redevelopment of Centers and the use of land, water, soil, plant, and animal resources to maintain biodiversity and the viability of ecological systems. Maximize the ability of natural systems to control runoff and flooding, and to improve air and water quality and supply.

3. Promote Beneficial Economic Growth Development and Renewal for All Residents of New Jersey

- Promote socially and ecologically beneficial economic growth, development and renewal, and improve both the quality of life and the standard of living of New Jersey residents, particularly the poor and minorities, through partnerships and collaborative planning with the private sector. Capitalize on the state's strengths—its entrepreneurship, skilled labor, cultural diversity, diversified economy and environment, strategic location and logistical excellence—and make the state more competitive through infrastructure and public services cost savings and regulatory streamlining resulting from comprehensive and coordinated planning. Retain and expand businesses, and encourage new, environmentally sustainable businesses in Centers and areas with existing infrastructure. Encourage economic growth in locations and ways that are both fiscally and environmentally sound. Promote the food and agricultural industry throughout New Jersey through coordinated planning, regulations, investments and incentive programs—both in Centers to retain and encourage new businesses and in the Environs to preserve large contiguous areas of farmland.

4. Protect the Environment, Prevent and Clean-Up Pollution

- Develop standards of performance and create incentives to prevent and reduce pollution and toxic emissions at the source, in order to conserve resources and protect public health. Promote the development of businesses that provide goods and services that eliminate pollution and toxic emissions or reduce resource depletion. Actively pursue public/private partnerships, the latest technology, and strict enforcement to prevent toxic emissions and clean up polluted air, land, and water without shifting pollutants from one medium to another; from one geographic location to another; or from one generation to another. Promote ecologically designed development and redevelopment in the Metropolitan and Suburban Planning Areas and accommodate ecologically designed development in Centers in the Fringe, Rural, and Environmentally Sensitive Planning Areas, to reduce automobile usage; land, water and energy consumption; and to minimize impacts on public health and biological systems, water and air quality. Plant and maintain trees and native vegetation. Reduce waste and reuse and recycle.

5. Provide Adequate Public Services at a Reasonable Cost

- Provide infrastructure and related services more efficiently by supporting investments based on comprehensive planning and by providing financial incentives for jurisdictions that cooperate in supplying public infrastructure and shared services. Encourage the use of infrastructure needs assessments and life-cycle costing. Reduce demands for infrastructure investment by using public and private markets to manage peak demands, applying alternative management and financing approaches, using resource conserving technologies and information systems to provide and manage public facilities and services, and purchasing land and easements to prevent development, protect flood plains and sustain agriculture where appropriate.

6. Provide Housing at a Reasonable Cost

- Provide adequate housing at a reasonable cost through public/private partnerships that create and maintain a broad choice of attractive, affordable, ecologically designed housing, particularly for those most in need. Create and maintain housing in the Metropolitan and Suburban Planning Areas and in Centers in the Fringe, Rural, and Environmentally Sensitive Planning Areas, at densities which support transit and reduce commuting time and costs, and at locations easily accessible,

preferably on foot, to employment, retail, services, and cultural, civic, and recreational opportunities. Support regional and community-based housing initiatives and remove unnecessary regulatory and financial barriers to the delivery of housing at appropriate locations.

7. Preserve and Enhance Areas with Historic, Cultural, Scenic, Open Space, and Recreational Values

- Enhance, preserve and use historic, cultural, scenic, open space, and recreational assets by collaborative planning, design, investment, and management techniques. Locate and design development and redevelopment and supporting infrastructure to improve access to and protect these sites. Support the important role of the arts in contributing to community life and civic beauty.

8. Ensure Sound and Integrated Planning and Implementation Statewide

- Use the State Plan and the Plan Endorsement process as a guide to achieve comprehensive, coordinated, long-term planning based on capacity analysis and citizen participation; and to integrate planning with investment, program, and regulatory land-use decisions at all levels of government and the private sector, in an efficient, effective, and equitable manner. Ensure that all development, redevelopment, revitalization, or conservation efforts support State Planning Goals and are consistent with the Statewide Policies and State Plan Policy Map of the State Plan.

These objectives are to be achieved through a series of statewide policies addressing equity, comprehensive planning, public investment priorities, infrastructure investments, economic development, urban revitalization, transportation, historic, cultural and scenic resources, air resources, water resources, open lands and natural systems, energy resources, waste, recycling and brownfields, agriculture, coastal resources, planning established by state statue (Meadowlands, Pinelands and Highlands), special resource areas, and design.

These statewide objectives are applied through the State Plan Policy Map which is divided into six (6) planning areas and five (5) levels of Centers. The planning areas, which do not coincide with municipal boundaries, attempt to address growth in terms of its character, location, and magnitude. The planning areas are:

1. ***Metropolitan Planning Area*** - The communities within the Metropolitan Planning Area have many things in common: mature settlement patterns resulting in a diminished supply of vacant land; infrastructure systems that generally are beyond or approaching their reasonable life expectancy; the need to rehabilitate housing to meet ever changing market standards; the recognition that redevelopment is, or would be in the not-too-distant future, the predominant form of growth; and a growing realization of the need to regionalize an increasing number of services and systems in light of growing fiscal constraints.

2. ***Suburban Planning Area*** - The Suburban Planning Area is generally located adjacent to the more densely developed Metropolitan Planning Area, but can be distinguished from it by a lack of high intensity urban form, by the availability of developable land, and by a more dispersed and fragmented pattern of predominantly low-density development. These areas are or would be served by regional infrastructure, except that, outside of Centers and major transportation corridors, there is limited, if any, availability of alternative modes of transportation to the automobile. These areas have generally been designated for growth in municipal Master Plans. As development expands, these services would become increasingly available if planned properly.

3. ***Fringe Planning Area*** - The Fringe Planning Area is a predominantly rural landscape (not prime agricultural or environmentally sensitive land) with scattered small communities and free-standing residential, commercial, and industrial development. Large investments in water and sewer and local road networks have not occurred and circulation is primarily provided by state and county highways supplemented by locally-maintained roads. Investments in water and sewer are mainly in existing or proposed Centers.

4. ***Rural Planning Area*** - The open lands of the Rural Planning Area include most of New Jersey's prime farmland, which has the greatest potential of sustaining continued agricultural activities in the future. They also include wooded tracts, lands with one or more environmentally sensitive features, and rural towns and villages.

4B. ***Rural/Environmentally Sensitive Planning Area*** - Some lands in the Rural Planning Area (PA4) have one or more environmentally sensitive features qualifying for delineation as Rural/ Environmentally Sensitive (PA4B). This sub-area contains valuable ecosystems or wildlife habitats. Rural/Environmentally Sensitive Planning Areas are supportive of agriculture and other related economic development efforts that ensure diversity within New Jersey. Any development or redevelopment planned in the Rural/Environmentally Sensitive Area should respect the natural resources and environmentally sensitive features of the area.

5. ***Environmentally Sensitive Planning Area*** - The Environmentally Sensitive Planning Area contains large contiguous land areas with valuable ecosystems, geological features and wildlife habitats. The Environmentally Sensitive Planning Area is highly vulnerable to damage of many sorts from new development in the Environs, including fragmentation of landscapes, degradation of aquifers and potable water, habitat destruction, extinction of plant and animal species and destruction of other irreplaceable resources which are vital for the preservation of the ecological integrity of New Jersey's natural resources.

Centers are the SDRP's preferred vehicle for accommodating growth. Center-based development patterns are superior to sprawl for a number of reasons (see sidebar on page 231). A Center's compact form is considerably more efficient than sprawl, providing opportunities for cost savings across a wide range of factors. Compact form also translates into significant land savings. A Center's development form and structure, designed to accommodate diversity, is also more flexible than single-use, single-purpose sprawl, allowing Centers to evolve and adapt over time, in response to changing conditions and markets. Centers promote community, protect the environment, provide enhanced cultural and aesthetic experiences, and offer residents a superior quality of life. The five types of centers are:

Urban Center- Generally the largest Centers, offering the most diverse mix of industry, commerce, services, residences and cultural facilities (Newark, Jersey City, Atlantic City, Camden)

Regional Centers - A compact mix of residential, commercial and public uses, serving a large surrounding area and developed at an intensity that makes public transportation feasible. (Red Bank, Eatontown, Long Branch).

Towns - Traditional Centers of commerce or government throughout New Jersey, with diverse residential neighborhoods served by a mixed-use Core offering locally oriented goods and services (Freehold, Highland Park, Matawan, Atlantic Highlands)

Villages - Primarily residential places that offer a small Core with limited public facilities, consumer services and community activities (Englishtown, Pine Brook, Hance Park)

Hamlets- Small-scale, compact residential settlements organized around a community focal point, such as a house of worship, luncheonette, small park or a civic building (Adelphia, Imlaystown)

The SDRP is shaped through a Cross-Acceptance process that involves all stakeholders. In the State Planning Act Cross-Acceptance is the prescribed method for advancing the goals and vision of the SDRP. According to the Act it is:

"a process of comparison of planning policies among governmental levels with the purpose of attaining compatibility between local, county and State plans. The process is designed to result in a written statement of agreement or disagreement and areas requiring modification by parties to the cross acceptance." (N.J.S.A. 52:18A-202.b.)

This description has been embodied in rules which in turn have led to a process of comparison and identification of issues and recommendations by the counties such as Monmouth on behalf of its municipalities. It then proceeds to series of negotiations where agreements, disagreements, and issues which require further discussion are identified or are resolved in the process of Plan Endorsement. The agreed upon issues result in revisions or modifications to the SDRP and the points of disagreement and further issues in need of refinement move forward into the final phase of Cross-Acceptance, the issue resolution phase.

Implementation of SDRP is carried out by State agencies, regional entities, Counties, and municipalities. State agencies do it by not only participating in the Cross-Acceptance process but also by incorporating the SDRP's policies and provisions into their functional plans such as transportation, water supply, and wastewater management. Along with regional agencies, State agencies use the policies of the SDRP in their public investments and in their regulatory programs, such the Coastal Area Facilities Review Act (CAFRA) which utilizes the State Plan Policy Map to regulate impervious surface.

On April 28, 2004 the State Planning Commission approved the release of the Preliminary State Development and Redevelopment Plan (State Plan) and the Preliminary State Plan Policy Map. This action launched the third round of Cross-Acceptance. At the same time a revised State Plan Policy Map was also released. Both documents did not impact Fort Monmouth.

As 2008 progresses, the Cross-Acceptance process is in the final phase. Monmouth County's negotiation with the State Planning Commission concluded with a public hearing on August 21, 2007. Nine agreements between the State Planning Commission and the County were reached which involved Tinton Falls, but none of them impacted Fort Monmouth. The State Planning Commission is now in the process of preparing a Final Draft Plan.

Municipalities and counties can implement the policies and provisions of the SDRP informally or formally. The formal process is called Plan Endorsement. It ensures that municipal, County, regional, and State Agency plans are consistent with the State Development and Redevelopment Plan and with each other. An endorsed plan entitles municipalities and counties to a higher priority for available funding, streamlined permit reviews, and coordinated state agency services. Priority is given to county and regional strategic plans.

In Monmouth County several regional initiatives have been advanced by the County Planning Board. The most advanced is the Western Monmouth Development Plan which involves Howell, Freehold, Marlboro and Manalapan Townships, Freehold, Englishtown and Farmingdale. Other Monmouth County efforts have resulted in pre-petition meetings for the Coastal Region Plan involving Allenhurst, Little Silver, Rumson, Asbury Park, Loch Arbour, Sea Bright, Avon, Long Branch, Sea Girt, Belmar, Manasquan, Shrewsbury Borough, Bradley Beach Monmouth Beach, Shrewsbury Township, Brielle, Neptune City, South Belmar, Deal, Neptune Township, Spring Lake, Eatontown, Ocean Township, Spring Lake Heights, Fair Haven, Oceanport, Wall, Interlaken, Red Bank, and West Long Branch.

A pre-petition meeting was also held for the Bayshore Plan involving Atlantic Highlands, Aberdeen Township, Hazlet, Holmdel Township, Keansburg, Highlands, Keyport, Matawan, Middletown, and Union Beach.

It is anticipated that upon completion of the Coastal Monmouth Plan it would be filed with the State Planning Commission for Plan Endorsement.

It is recommended that each of the Fort Monmouth municipalities petition the State Planning Commission for Plan Endorsement, particlarly since the FMERPA Plan recommends a new center in each of the three municipalities. Eatontown held a pre-petition meeting for Plan Endorsement with the Office of Smart Growth and other State agencies on November 20, 2007. Oceanport, which falls within the CAFRA zone, would be required to work with the Office of Smart Growth and NJDEP to designate the Town Center within the Borough.

9.5 Fair Housing Considerations

Existing Housing on Fort Monmouth

According to the official report from the Garrison, the existing complement of housing on Fort Monmouth is less than 1,000 dwelling units. Table 9-1 shows additional detail.

Council on Affordable Housing

Affordable housing is an important part of a balanced land use plan. Yet defining the dimensions of affordable housing need is difficult. The range of below market rate housing options serves a clientele that spans from the homeless to households spending an inordinate amount of income on housing (cost burden), but it also includes the workforce housing needed to assure that New Jersey can remain competitive in attracting and retaining industry.

New Jersey is a national leader in defining the affordable housing obligations of its municipalities. Home to the Mount Laurel doctrine, a pronouncement of New Jersey's Supreme Court that identified the constitutional obligation, municipalities are held accountable to assure that the zoning governing lands within their borders provides a realistic opportunity for the creation of the municipality's fair share of the affordable housing need in the region.

New Jersey has codified the Mount Laurel decisions through the Fair Housing Act and Administrative Code regulations of the Council on Affordable Housing (COAH). Charged with calculating and disaggregating affordable housing needs in the state, COAH has on several occasions promulgated substantive and procedural rules governing the production of affordable housing. In their initial iteration, the COAH rules calculated regional housing need for rehabilitation of substandard units occupied by lower income households and for the construction of new units to meet regional needs. "Fair share" assignments were made on a municipality by municipality basis requiring a minimum, that local zoning provide a realistic opportunity to accommodate these units. In subsequent iterations of the rules, referred to as the Second Round and Third Round rules, the calculated need assessments

were reexamined and adjusted. In the Third Round rules a new concept was included which is referred to as "growth share". The Third Round rules continue assignment of rehabilitation need, prior round recalculated need, and the new growth share element. The Third Round rules were effective December 20,2004 and amended on May 15, 2006. These rules projected that the Statewide need for housing affordable to low- and moderate-income households approximated roughly 53,000 dwelling units.

New Jersey's Appellate Division concluded in January 2007 that the initial Third Round rules were flawed and directed COAH to remedy certain defects and promulgate revised rules. Among the criticisms by the Appellate Division was its finding that the rules would not realistically accomplish the identified need and in fact understated the extent of such need.

In the initial Third Round rules, growth share required the production of an affordable unit for every eight new market rate dwelling units. Affordable housing obligations also accrued from job creation, and the original Third Round rules required one affordable unit for every 25 jobs, with the calculation of jobs based on floor area by building use group, a typology used by the New Jersey Department of Community Affairs in its administration of the Uniform Construction Code.

After revisiting the need calculations, COAH proposed a target of 115,666 affordable units statewide by the year 2018 and modified several of the terms of the growth share provision. Most notably, the affordable housing production requirements doubled from one affordable unit per eight market-rate dwelling units (one affordable among 9 total units) to one affordable unit per four market-rate dwelling units (one affordable among 9 total units). A fifth market unit is provided as the presumptive compensatory benefit in return for construction of one affordable housing unit. Application of the growth share concept has also been modified in NJAC 5:97 et seq., with jobs gained from non-residential space accruing an obligation for one affordable unit for every 16 jobs.

Additionally, where demolished dwelling units were previously subtracted from the growth share obligation under the initial Third Round rules, such residential reconstruction would be considered a new unit with a growth share obligation, despite the fact that the net number of dwelling units has not increased with the removal and replacement of an existing dwelling.

On May 6, 2008, COAH adopted N.J.A.C. 5:97, which became effective on June 2, 2008. In consideration of the extensive public comments, COAH also proposed amendments to N.J.A.C. 5:97, which were published on June 16, 2008 with a public comment period extending to August 15, 2008. The proposed rule also recalculated the housing need by municipality, producing the third set of affordable housing assignments that municipalities have had to address in the Third Round.

Prospects for redevelopment at Fort

Monmouth received a boost on July 17, 2008, when Governor Corzine signed the latest amendment to the Fair Housing Act (A-500/S-1783) making FMERPA one of the regional planning entities whose jurisdiction is called out for special COAH treatment. As a result of this legislation, COAH is convening a working group including mayors of the host towns to address key issues related to the method of calculating affordable housing obligations. This will be particularly important to FMERPA's ability to adopt and implement a viable reuse plan for robust redevelopment.

Recognizing that COAH's presumptive affordable housing set-aside (at least 20 percent of the residential units) could interfere with the economic feasibility of the redevelopment of Fort Monmouth, the Act now provides potential adjustments of the COAH obligation, which can mitigate the dire circumstances surrounding the Fort closing. This could be essential to an economically viable plan, especially since municipal compliance options are changing at a time when municipal affordable housing obligations have increased dramatically. The elimination of the Regional Contribution Agreement (RCA), a key COAH compliance mechanism

Table 9-1: Existing Housing

Neighborhood	# Units	Total Occupied	% Occupied	Total Vacant	Vacant Ready	Vacant Not Ready
Russel/Allen	32	27	84.38%	5	4	1
Russel/Carty	36	31	86.11%	5	5	0
Megill	42	37	88.10%	5	1	4
Hope/Hemphill/Guam Ln	22	20	90.91%	2	2	0
Gosselin	45	45	100.00%	0	0	0
Howard Commons	486	0	0.00%	486	0	486
TOTALS:	663	160	24.13%	503	12	491
Lodging Buildings:						
361, 362, 363, 364, 270*, 271, 1077, 1078	251					
Total w/lodging	914					
Dorm Rooms* @ Prep School	71					
Total w/lodging and Dormitory Rooms	985					
**Dormitory Rooms and Building 270 units do not have individual kitchens or kitchenettes.*						
216 Includes both sides of double units (19 double units)						
1, 3, 5, 7 Gosselin Avenue-Quarters not renovated						

that allowed municipalities to fund affordable housing construction outside their jurisdiction, puts new pressure on the State's remaining vacant lands and municipal resources.

A statewide commercial development fee (2.5% of value), which became effective upon signing by the Governor, now provides the uniform mechanism whereby commercial developers can discharge the affordable housing obligation they create for the municipality. As Fort Monmouth's closing impacts the host municipalities and the regional economy, prospects for timely and efficient redevelopment will depend on the economics of the plan, and a unique approach to the COAH mandate, as envisioned in the Fair Housing Act, will be essential.

As FMERPA examines the affordable housing responsibilities affecting the Fort Monmouth lands, several facts must be recognized:

1. Currently, due to its existence as a federally-owned property, Fort Monmouth accrues no affordable housing obligation according to the Fair Housing Act and the COAH rules. Any responsibility for accomodating future affordable housing needs resides with the municipality to which the housing obligation would be assigned or within which growth occurs. However, the Reuse Plan accomodates the future possibility of affordable housing units in each of the three host municipalities on the Fort Monmouth property.
2. The US Department of Housing and Urban Development has prioritized the reuse of military installations closed through the Base Realignment and Closing Commission procedure for housing of the homeless. This is a burden not imposed by the State of New Jersey and not quantified by any government agency. The Corporation for Supportive Housing conducted a HUD mandated Point In Time Survey on January 29, 2008 under contract to the New Jersey Housing and Mortgage Finance Agency (HMFA). This survey identified 452 homeless persons in Monmouth County, representing 6% of the Statewide total.
3. The proposed redevelopment at Fort Monmouth would be substantially impacted by the cost implications of the proposed COAH rules, although the uncertain nature of the final rule provisions makes this impact difficult to accurately predict.

In summary, the impact of COAH's affordable housing requirements to the host municipalities, as they relate to Fort Monmouth's redevelopment, is not possible to predict accurately at this time. However, with the recent adoption of N.J.A.C. 5:97, and with amendments currently proposed, the effective rules and the proposed amendments result in the following COAH-assigned municipal affordable housing obligations.

Eatontown

- Under the original Third Round rules Eatontown's total fair share obligation was comprised of a municipality's rehabilitation share, the total remaining obligation from prior rounds, and the growth share. As indicated in Appendix C of N.J.A.C. 5:94, Eatontown's rehabilitation share was 12 units, and Eatontown's total remaining obligation from prior rounds was 503 units. Eatontown's growth share obligation was 69 units.

- Under the newly effective N.J.A.C. 5:97, Eatontown's rehabilitation share is 32 units, and Eatontown's total remaining obligation from prior rounds is 504 units. Eatontown's growth share obligation is 429 units.

- Under the proposed amendments to N.J.A.C. 5:97 the only change is in the growth share, which is proposed to increase to 491 units.

Table 9-2: Housing Rules

Municipal Fair Share	Rehabilitation	Prior Round Obligation	Growth Share
Eatontown			
Original Round 3 (N.J.A.C. 5:94)	12	503	69
Effective rules N.J.A.C. 5:97	32	504	429
Proposed amendments	32	504	491
Oceanport			
Original Round 3 (N.J.A.C. 5:94)	0	157	26
Effective rules N.J.A.C. 5:97	0	149	43
Proposed amendments	0	149	53
Tinton Falls			
Original Round 3 (N.J.A.C. 5:94)	0	655	178
Effective rules N.J.A.C. 5:97	26	622	555
Proposed amendments	26	622	494

Source: Banisch Associates, Inc.

Oceanport

- As indicated in Appendix C of N.J.A.C. 5:94, Oceanport's original Third Round rehabilitation share was 0, the total remaining obligation from prior rounds was 157 units and the growth share obligation was 26 units.

- Under N.J.A.C. 5:97 as recently adopted, Oceanport's rehabilitation share is 0 units, Oceanport's total remaining obligation from prior rounds is 149 units and the growth share obligation is 43 units.

- Under the proposed amendments Oceanport's growth share obligation would increase to 53 units.

Tinton Falls

- As indicated in Appendix C of N.J.A.C. 5:94, Tinton Falls' initial Third Round rehabilitation share was 0, the total remaining obligation from prior rounds was 655 units, and the Tinton Falls' growth share obligation was 178 units.

- Under N.J.A.C. 5:97, Tinton Falls' rehabilitation share is 26 units, the total remaining obligation from prior rounds is 622 units, and Tinton Falls' growth share obligation is 555 units.

- Under the proposed amendments, Tinton Falls' growth share would decrease to 494 units

Housing for the Homeless

According to the Base Closure Community Redevelopment and Homeless Assistance Act of 1994 (Pub. L. 103-421) ("Homeless Assistance Act"), State and local governments, representatives of the homeless, and other interested parties may submit to the local redevelopment authority a notice of the interest in the buildings or property, or any portion thereof. The local redevelopment authority can negotiate with qualified homeless providers to accommodate some of the needs of the homeless on the base. The redevelopment authority shall, in preparing the reuse and redevelopment plan, consider these interests to assist the homeless in the use of the buildings and property at the installation that are expressed in the notices of interest submitted to the redevelopment authority.

While there are no numerical requirements stipulated in the Homeless Assistance Act, the property at Fort Monmouth would accommodate a variety of opportunities to serve the homeless, which would be required in order to receive HUD approval of FMERPA's reuse plan.

The accommodations that are supported by FMERPA and being submitted to HUD are:

1. Building 501, currently the Counseling Center, is recommended to be conveyed to Family Promise, a faith-based non-profit organization, for use as a day center for up to 10 homeless families. As no families would be in residence at this location, there would be no additional burden on the local school district.

2. A single adult shelter to house up to 40 homeless single adults. This shelter is currently located on Fort Monmouth in Buildings 417 and 421. As these buildings are currently in the FEMA designated flood plain and the shelter is not appropriately located in their current location for the development planned for that area of the Fort Monmouth, a new shelter is proposed to be built to the east of Squier Hall. Should it become necessary to vacate the current facilities before the new shelter is built, facilities would need to be made available in the interim. As no children would be in residence at this shelter, there would be no additional burden on the local school district.

3. Building 270, a lodging facility is recommended to be conveyed to the Affordable Housing Alliance as part of a Permanent Supportive Housing Bank. This building is proposed to house an assisted living, Single Room Occupancy (SRO) program. This facility would consist of a minimum of 16 bedroom units. As no families would be in residence at this location, there would be no additional burden on the local school district.

4. A total of 40 single family units for permanent supportive housing are recommended to be conveyed to the Affordable Housing Alliance as part of a Permanent Supportive Housing Bank. These units would be located at scattered sites within the housing units planned for the Eatontown and Tinton Falls reuse areas. It is proposed that these units consist of two - 4 bedroom units, eight – 3 bedroom units, twenty – 2 bedroom units and ten – 1 bedroom units.

5. Additionally, 180 Turning Lives Around, Inc. would be acquiring and constructing an expanded, replacement, safe house for victims of domestic violence and their children at an off-site property located within the Fort Monmouth Region. FMERPA is recommending that a monetary accommodation in the amount of $4.5 million be given to 180 Turning Lives Around, Inc. to help fund the acquisition and construction of this new safe house at an off-site location.

Although not a homeless accommodation, FMERPA would also be recommending conveyance of land to accommodate a Public Benefit Conveyance Notice of Interest request, for Self-Help Housing.

10.0 NEXT STEPS: IMPLEMENTING THE VISION

10.0 Next Steps: Implementing the Vision

The vision for the reuse and redevelopment of Fort Monmouth calls for the creation of a Sustainable Technology Community composed of activity zones designed to energize the site and blend with the fabric of the host communities, while also respecting existing neighborhood character. This Plan has been developed in cooperation with the host municipalities and Monmouth County, who have identified local objectives, and is documented in the preceding chapters of this Plan through diagrams, plans, illustrations, text, and tabular data.

This chapter identifies the necessary steps for realizing the Fort's transformation into a built Sustainable Technology Community. The planning process for reaching the desired results for the Reuse Areas does not end with the completion of this Plan. Additional review and analysis would need to occur prior to the formal adoption of a preferred Final Reuse Plan. The following steps are necessary to finalize the Plan and begin the process of implementation.

10.1 Implementation

1. RESOLVE COAH OBLIGATIONS

The revised Third Round COAH rules, outlining municipal affordable housing obligations, were up for adoption in June 2008. FMERPA commented on the proposed rule, asking whether the affordable housing obligation related to Fort Monmouth could be met by the host municipalities on a regional rather than individual basis. FMERPA and the Boroughs are involved in ongoing discussions to clarify the COAH obligation for the redevelopment of Fort Monmouth and the three municipalities.

2. FINALIZE COMMUNITY IMPACT ANALYSIS

The multi-disciplinary planning team and FMERPA have held extensive discussions with the communities regarding the assessment. Fully analyzing, developing, understanding, and building consensus on the potential impacts of the area's reuse and redevelopment are critical to the Plan's adoption by FMERPA with support of the local municipalities. Coordination between FMERPA, the planning team, and the community will continue beyond the release of this Final Plan.

3. EXPLORE POTENTIAL BENEFITS OF A REVENUE SHARING MODEL OR INTER-LOCAL AGREEMENTS

A model for Revenue and Cost Sharing that provides a win-win-win scenario for the three Boroughs can only be developed with a full understanding of the community impacts of redevelopment and reuse. During this ongoing phase of work, a range of sharing structures should be explored. These could include formation of an oversight entity, or the establishment of a series of inter-local agreements between the Boroughs to provide the required services in an efficient manner.

4. CONCEPT PLAN ADOPTED

This Reuse Plan is intended to serve as a guiding document to FMERPA and other regulatory authorities as the Reuse Plan is evaluated. FMERPA adopted the Reuse Concept Plan on September 03, 2008, understanding that the Final Reuse Plan would continue to evolve. The adoption of the Reuse Concept Plan sends an important message to community members and state and local officials that FMERPA supports the Reuse Plan and planning essentials set forth in the Plan.

5. PROMOTE THE REUSE PLAN

FMERPA should continue to review the Plan with the host municipalities and other public and private stakeholders. This would enable FMERPA to maintain a level of public involvement and continually receive, and incorporate into the planning process, valuable public input, a crucial process for building consensus and setting the stage for successful implementation. To communicate the vision for the Reuse Areas, a variety of media should be engaged including brochures, websites, and print and televised media. These vehicles would allow FMERPA to promote the Plan, and make it a tool for transformation of Fort Monmouth that "learns" how to evolve in response to changing economic and other circumstances. To aid this process, the State, municipalities, and FMERPA should develop a communications strategy and allocate funds to ensure the sustained promotion of the Plan.

6. COLLABORATE

The strength and viability of the Plan would rely on multi-level partnerships. These should include partnerships between the State of New Jersey, Monmouth County, and the host and adjacent Boroughs, the Department of the Army, the Department of Housing and Urban Development (HUD), local advocates, and the redevelopment community.

The Reuse Plan is just one component of the larger BRAC process. Additional review of the Plan is necessary and the Final Reuse Plan should incorporate the requirements of NJDEP regarding cleanup, the implications of newly-adopted COAH requirements, compliance with the NJ SHPO requirements, and the HUD Homeless Screening Process.

7. ADOPT ZONING AND A FORM-BASED CODE

The Fort Monmouth Implementation Local Redevelopment Authority (LRA) should adopt a Form-Based Code to guide the redevelopment process. The Code should be referred to the three Boroughs as required by N.J.S.A. 52-27I-14.

A Form-Based Code would allow as-of-right development of the property in conformance with standards designed to achieve the stated vision of the Reuse Area, and eliminate the guessing game often associated with conventional zoning. Recognizing that the Reuse Area would continue to contain valuable historic resources, the Form-Based Code would include mechanisms for the proper maintenance of historic structures and a strict review process for new development. Appropriate regulations that are supportive of community-endorsed policies can encourage reuse and redevelopment by providing transparency, clarity, and certainty. By establishing clear standards that support the Boroughs' vision, a Form-Based Code would provide a visual guide to design character, helping FMERPA and the communities assure that reuse and redevelopment would occur in a desirable fashion

8. ESTABLISH THE OFFICE OF THE POST ARCHITECT

FMERPA's Implementation LRA should establish the Office of the Post's Architect and establish the position of Post Architect. This professional should have a full understanding of the principles that underpin the Reuse Plan, as well as a comprehensive understanding of the historical significance and heritage of Fort Monmouth. The Post Architect should oversee the application of the Fort's zoning and form-based code. The Post Architect in concert with the LRA and local authorities would review development and building plans for compliance with regulating ordinances and provide design guidance as the Plan evolves over time.

9. EVALUATE STAFFING NEEDS OF THE IMPLEMENTATION LRA

At the conclusion of the Planning LRA's duties, an Implementation LRA should be formed to oversee the reuse and redevelopment of the Post. Consideration of the specialized staffing needs should be undertaken in the near future. A staffing Plan should be developed to address Post promotion and marketing, day to day operations, implementation of the reuse Plan, economic development policies and incentives, environmental protection, historic preservation, maintenance of facilities and infrastructure, legal counsel, ongoing public communications, and administrative support.

10. MAINTAIN INFRASTRUCTURE

Resources need to be made available to insure that infrastructure repairs are met by Federal Authorities while they still control the property. Some infrastructure demands would be met by market forces and user fees, while other services would require ongoing support of the LRA, Boroughs, or County such as police and fire protection, maintenance of streets, roads, bridges and parks. Returning infrastructure in working condition to the appropriate authority is critical to early success of the Plan. Additional investigation of how the utility infrastructure would be operated is warranted as it could provide revenue to the LRA in support of future reuse.

11. BEGIN ENVIRONMENTAL CLEAN-UP

Fort Monmouth clean-up before reversion is critical. The Implementation LRA should analyze the options for clean-up and remediation of contaminated areas of the Post. Discussion with the federal government to further understand clean-up funding availability and timetables should be undertaken. Alternative approaches to federal clean-up including privatization for the clean-up process warrant exploration.

12. PURSUE FUNDING MECHANISMS

To achieve the goals for reuse of Fort Monmouth, discussions should be entered into with Federal, State, County, and Borough representatives to further explore a variety of funding mechanisms. Key funding sources used at other base closings include:

- Bonds and private debt
- Federal, State, County and Local Government Appropriations
- Federal and State grants
- Local Redevelopment Authority revenues.

Additional funding sources for reuse and redevelopment include private foundation grants, private investment capital, tax credits, impact fees, business improvement districts, and special assessment districts. The format of real estate transactions would also have an impact on the degree to which funding would be needed from public sources. Short- and long-term leases and rental opportunities, as well as the sale of structures and property can assist with lessening the financial impact of the maintenance and upkeep of the property.

13. ATTAIN SHPO APPROVAL OF HISTORIC DISTRICT(S)

The LRA should hire a Historic Preservation Consultant to prepare the necessary studies and reports for SHPO in support of the creation of historic districts at the Post. These analyses should also prepare a plan for the long-term maintenance and protection of the Post's valuable heritage resources.

14. PRO-ACTIVELY MARKET FORT MONMOUTH

Additional plans and strategies would be required in the years ahead to properly market and position Fort Monmouth. The Implementation LRA should further detail and implement a marketing strategy to attract businesses, residents, institutions, and visitors to Fort Monmouth. This strategy should focus on the branding and identity of Fort Monmouth as a Sustainable Technology Community, where heritage tourism, protected open spaces and economic vitality are combined for a desirable quality of life and beneficial future as these areas formerly behind the fence become reintegrated into the fabric of the boroughs.

10.2 Impact Statement

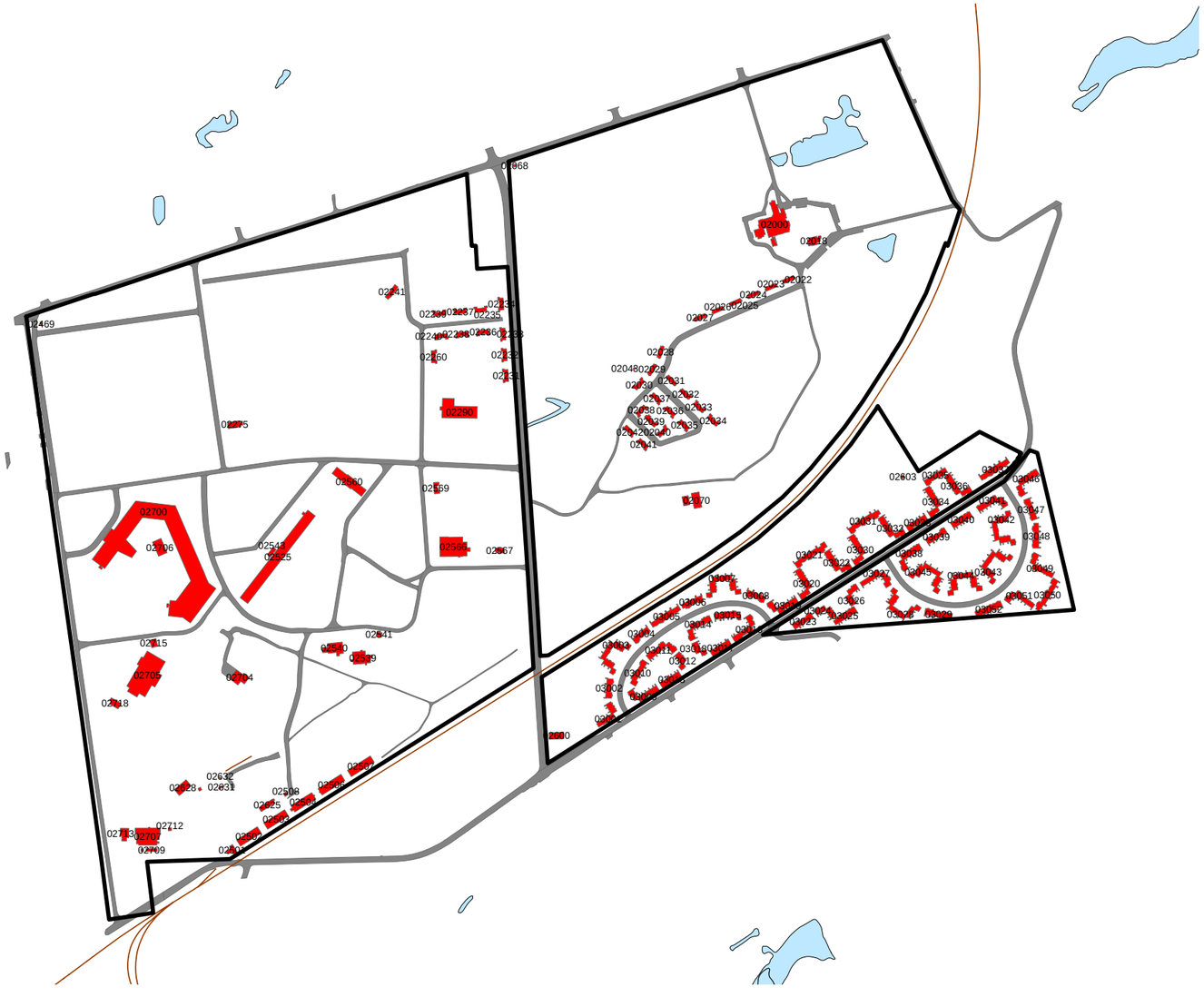
The County of Monmouth and the communities contiguous to Fort Monmouth have long enjoyed a communal relationship with both the employees and the military personnel at the Fort. This social and economic interaction has been an essential fiber in the fabric of this Central New Jersey region. The strength of this fabric has been severely diminished as a result of the 2005 BRAC decision to close Fort Monmouth. The impact of this decision cuts across a myriad of social and economic issues, many of which are being addressed through the creation of the Fort Monmouth Reuse and Redevelopment Plan and the associated economic, social, and infrastructure studies that support the Plan. In order for this region to continue to prosper following the Fort closure as dictated by the BRAC decision, careful and measured execution of a robust economic revitalization strategy is mandatory. This should be carried out in concert with addressing the obvious needs for affordable housing and the homeless continuum. The uncertainty that these elements bring to the residents of the three host communities of Tinton Falls, Eatontown, and Oceanport, which are already reeling from the economic downturn and one of the most severe tax burdens in the country, is further aggravated by the enormity of the prospective infrastructure costs that their towns face.

While the Plan itself, as a land use concept, enjoys the support of a majority of the area's people, much of the skepticism of its execution is centered around the cost and the time to execute the Plan. Necessary improvements to essential components such as electrical service, potable water, sewerage treatment, sludge removal and treatment, local and regional traffic mitigation, and public transportation availability will require extensive funding, very little if any of which will be available from an already deficit ridden State. Without the necessary funding from private or federal sources to address these essential components, the Plan, regardless of its enormous upside potential, may fail. And failure is not an option.

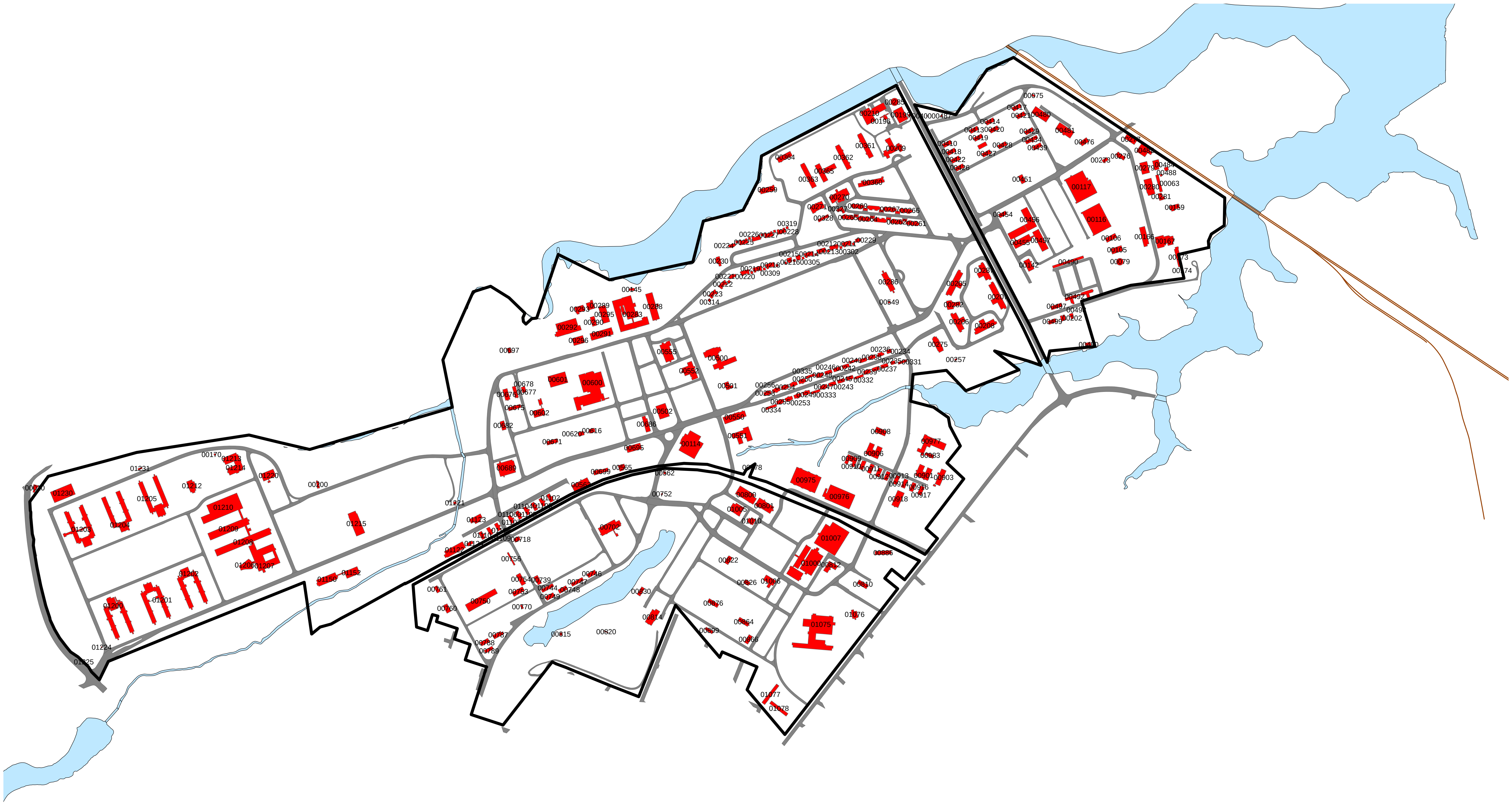
Therefore, we look forward to addressing this Plan, its potential contributions to the revitalization of the region, and its attendant needs, with our colleagues at the Department of the Army.

11.0 Existing Buildings Plan and Index

11.0 Existing Buildings Index and Plan



Existing Fort Monmouth Building Key Plan: Charles Woods Area



Existing Fort Monmouth Building Key plan: Main Post Area

Building Number	Permanent/Temporary	Building/Property Description		Gross Square Ft.	Year Built
00001	P	SOFTBALL FIELD			1969.0
00002	P	SOFTBALL FIELD			1969.0
00004	T	WASH PLAT ORG			1941.0
00055	P	LD/UNLD DOC/RMP			1955.0
00063	T	STORAGE GP INST	SF	3696.0	1940.0
00072	P	OPEN STR INST	SY	9852.0	1943.0
00073	P	POL PIPE ABV			1974.0
00075	P	SCALE HOUSE	SF	450.0	1969.0
00077	T	REC PIER/PLAT			1968.0
00079	P	STR SHED GP INS	SF	3600.0	1982.0
00082	P	LD/UNLD DOC/RMP			1971.0
00091	P	CHLORINATOR FAC			1990.0
00091	P	WTR SUP/TRT BLD	SF	196.0	
00100	P	FLAGPOLE			1939.0
00101	T	HEAT PLANT OIL			1943.0
00101	T	HEAT PLT BLDG	SF	494.0	
00105	T	STORAGE GP INST	SF	4800.0	1943.0
00106	T	STORAGE GP INST	SF	4050.0	1943.0
00110	S	STR SHED GP INS	SF	49.0	1955.0
00112	S	MISC SHED	SF	160.0	1955.0
00113	P	BASEBALL FIELD			1956.0
00114	P	PHYS FIT CTR	SF	32250.0	1952.0
00115	P	MON/MEMORIALS			1952.0
00116	P	STORAGE GP INST	SF	40951.0	1943.0
00117	P	STORAGE GP INST	SF	43920.0	1943.0
00118	P	ACCESS CNT FAC	SF	123.0	1955.0
00119	P	SEW/WST WTR TRT	SF	89.0	1952.0
00120	P	INFO SYS FAC	SF	60.0	1958.0
00120	P	MISC SHED	SF	140.0	
00121	P	FLAM MAT STR IN	SF	200.0	1990.0
00122	P	FLAM MAT STR IN	SF	2885.0	1990.0
00123	P	FLAM MAT STR IN	SF	200.0	1990.0
00124	P	ACCESS CNT FAC	SF	45.0	1981.0
00125	P	INFO SYS FAC	SF	432.0	2001.0
00142	P	BOX/CRATE SHOP	SF	6316.0	1922.0
00145	S	STORAGE GP INST	SF	905.0	1941.0
00159	S	STORAGE GP INST	SF	3438.0	1941.0
00166	P	ENG/HOUSING MNT	SF	4810.0	1942.0
00166	P	ADMIN GEN PURP	SF	3455.0	
00167	P	ADMIN GEN PURP	SF	13570.0	1942.0
00168	P	REC SHELTER	SF	500.0	1996.0
00169	P	CENT WASH BLDG	SF	170.0	1998.0
00173	P	LAB/TST BLDG GP	SF	1800.0	1974.0
00173	P	ADMIN GEN PURP	SF	3806.0	
00174	P	STORAGE GP INST	SF	782.0	1995.0
00200	S	XMITTER BLDG	SF	1280.0	1958.0
00201	T	PLT/UTIL BLDG	SF	218.0	1943.0
00203	P	COURT AREA			1973.0
00205	P	ENLISTED UPH	SF	41376.0	1927.0
00206	P	ADMIN GEN PURP	SF	31392.0	1927.0
00207	P	ENLISTED UPH	SF	43872.0	1927.0
00208	P	ENLISTED UPH	SF	36384.0	1927.0
00209	P	ADMIN GEN PURP	SF	36665.0	1928.0
00210	P	COMMO EQ BLDG	SF	29296.0	1975.0
00211	P	FH COL	SF	6834.0	1929.0
00212	P	FH COL	SF	6834.0	1929.0
00213	P	FH COL	SF	6834.0	1929.0
00214	P	FH COL	SF	6428.0	1932.0
00215	P	FH COL	SF	3396.0	1931.0
00216	P	FH COL	SF	3496.0	1931.0
00217	P	SEWAGE LFT STAT			1975.0
00218	P	FH COL	SF	6743.0	1932.0
00219	P	FH COL	SF	6743.0	1932.0
00220	P	FH COL	SF	6743.0	1935.0
00221	P	FH GENERAL OFF	SF	3108.0	1931.0
00222	P	FH COL	SF	6743.0	1935.0
00223	P	FH COL	SF	6743.0	1935.0
00224	P	FH GENERAL OFF	SF	3108.0	1931.0
00225	P	FH COL	SF	6743.0	1932.0
00226	P	FH COL	SF	6743.0	1932.0
00227	P	FH COL	SF	6743.0	1932.0
00228	P	FH COL	SF	6743.0	1932.0
00229	P	FH COL	SF	3020.0	1931.0
00230	P	FH GENERAL OFF	SF	5273.0	1936.0
00233	P	FH SR NCO	SF	4724.0	1929.0
00234	P	FH SR NCO	SF	3780.0	1931.0
00235	P	FH SR NCO	SF	6024.0	1931.0
00236	P	FH SR NCO	SF	3780.0	1931.0
00237	P	FH SR NCO	SF	6024.0	1931.0
00238	P	FH SR NCO	SF	5592.0	1931.0
00239	P	FH SR NCO	SF	6024.0	1931.0
00240	P	FH SR NCO	SF	5592.0	1932.0
00241	P	FH SR NCO	SF	5592.0	1932.0
00242	P	FH SR NCO	SF	5592.0	1932.0
00243	P	FH SR NCO	SF	5592.0	1932.0
00244	P	FH SR NCO	SF	5592.0	1932.0
00245	P	FH SR NCO	SF	5592.0	1932.0
00246	P	FH SR NCO	SF	5592.0	1932.0
00247	P	FH SR NCO	SF	5592.0	1934.0
00248	P	FH SR NCO	SF	5592.0	1934.0
00249	P	FH SR NCO	SF	5592.0	1934.0
00250	P	FH SR NCO	SF	5592.0	1934.0
00251	P	FH SR NCO	SF	5592.0	1934.0
00252	P	FH SR NCO	SF	5592.0	1934.0
00253	P	FH SR NCO	SF	5592.0	1934.0
00254	P	FH SR NCO	SF	5592.0	1934.0

00255	P	FH SR NCO	SF	5592.0	1934.0
00256	P	FH SR NCO	SF	5592.0	1934.0
00257	P	SEWAGE LFT STAT			1930.0
00258	P	FH SR NCO	SF	5592.0	1934.0
00259	P	PVT/ORG CLUB	SF	6182.0	1938.0
00260	P	SEWAGE LFT STAT			1930.0
00261	P	FH LTC/MAJ	SF	11856.0	1930.0
00262	P	FH LTC/MAJ	SF	11856.0	1930.0
00263	P	FH LTC/MAJ	SF	12656.0	1930.0
00264	P	FH LTC/MAJ	SF	12656.0	1931.0
00265	P	FH LTC/MAJ	SF	12656.0	1932.0
00266	P	FH LTC/MAJ	SF	12656.0	1932.0
00267	P	FH LTC/MAJ	SF	11856.0	1931.0
00268	P	FH LTC/MAJ	SF	12656.0	1931.0
00269	P	FH LTC/MAJ	SF	12656.0	1930.0
00270	P	ADMIN GEN PURP	SF	3000.0	1930.0
00270	P	ARMY LODGING	SF	11315.0	
00271	P	UOQ MILITARY	SF	20007.0	1934.0
00272	P	COURT AREA			1969.0
00273	P	VEH FUEL MOGAS			1991.0
00273	P	FUEL/POL BLDG	SF	72.0	
00273	P	MOGAS STR UNGD			
00275	P	MUSEUM SPT BLDG	SF	7432.0	1934.0
00276	P	ADMIN GEN PURP	SF	2744.0	1953.0
00277	P	ADMIN GEN PURP	SF	12600.0	1951.0
00279	P	ENG/HOUSING MNT	SF	7168.0	1934.0
00280	P	ENG/HOUSING MNT	SF	9936.0	1934.0
00281	P	ENG/HOUSING MNT	SF	2544.0	1934.0
00282	P	FIRE STATION	SF	6089.0	1935.0
00283	P	ADMIN GEN PURP	SF	73994.0	1935.0
00283	P	AUDITORIUM GP	SF	2544.0	
00284	T	STORAGE GP INST	SF	357.0	1940.0
00286	P	ADMIN GEN PURP	SF	42300.0	1936.0
00287	P	ENLISTED UPH	SF	32053.0	1940.0
00288	S	ADMIN GEN PURP	SF	15038.0	1941.0
00291	P	ADMIN GEN PURP	SF	12006.0	1966.0
00292	S	STORAGE GP INST	SF	13440.0	1944.0
00292	S	ADMIN GEN PURP	SF	17600.0	
00293	P	LAB/TST BLDG GP	SF	4217.0	1943.0
00295	P	ADMIN GEN PURP	SF	9000.0	1969.0
00296	P	ADMIN GEN PURP	SF	5996.0	1970.0
00301	P	GARAGE FAM HS	SF	412.0	1932.0
00302	P	GARAGE FAM HS	SF	412.0	1932.0
00303	P	GARAGE FAM HS	SF	412.0	1932.0
00304	P	GARAGE FAM HS	SF	412.0	1932.0
00305	P	GARAGE FAM HS	SF	412.0	1932.0
00306	P	GARAGE FAM HS	SF	412.0	1932.0
00307	P	GARAGE FAM HS	SF	412.0	1932.0
00308	P	GARAGE FAM HS	SF	412.0	1932.0
00309	P	GARAGE FAM HS	SF	412.0	1932.0
00310	P	GARAGE FAM HS	SF	412.0	1932.0
00312	P	GARAGE FAM HS	SF	499.0	1951.0
00313	P	GARAGE FAM HS	SF	412.0	1932.0
00314	P	GARAGE FAM HS	SF	412.0	1932.0
00315	P	GARAGE FAM HS	SF	412.0	1932.0
00316	P	GARAGE FAM HS	SF	412.0	1932.0
00317	P	GARAGE FAM HS	SF	412.0	1932.0
00318	P	GARAGE FAM HS	SF	412.0	1932.0
00319	P	GARAGE FAM HS	SF	412.0	1932.0
00320	P	GARAGE FAM HS	SF	847.0	1934.0
00321	P	GARAGE FAM HS	SF	847.0	1934.0
00322	P	GARAGE FAM HS	SF	847.0	1934.0
00323	P	GARAGE FAM HS	SF	847.0	1934.0
00324	P	GARAGE FAM HS	SF	847.0	1934.0
00325	P	GARAGE FAM HS	SF	847.0	1934.0
00326	P	GARAGE FAM HS	SF	847.0	1934.0
00327	P	GARAGE FAM HS	SF	1851.0	1934.0
00328	P	GARAGE FAM HS	SF	2409.0	1937.0
00331	P	GARAGE FAM HS	SF	1600.0	1934.0
00332	P	GARAGE FAM HS	SF	1600.0	1934.0
00333	P	GARAGE FAM HS	SF	1600.0	1934.0
00334	P	GARAGE FAM HS	SF	2000.0	1934.0
00335	P	GARAGE FAM HS	SF	1600.0	1934.0
00336	P	GARAGE FAM HS	SF	1600.0	1934.0
00340	P	PLAYGROUND GP			1985.0
00341	P	PLAYGROUND GP			1985.0
00342	P	PLAYGROUND GP			1985.0
00360	P	ARMY LODGING	SF	23415.0	1956.0
00361	P	ENLISTED UPH	SF	27160.0	1965.0
00362	P	ENLISTED UPH	SF	27140.0	1965.0
00363	P	ARMY LODGING	SF	27137.0	1968.0
00364	P	ARMY LODGING	SF	10720.0	1971.0
00365	P	ARMY LODGING	SF	34313.0	1991.0
00366	P	SEWAGE LFT STAT			1992.0
00367	P	SEWAGE LFT STAT			1992.0
00400	P	SEWAGE LFT STAT			1940.0
00402	P	PLAYGROUND GP			1985.0
00410	T	TT OFF QTRS	SF	4720.0	1940.0
00413	T	TT OFF QTRS	SF	4720.0	1940.0
00414	T	STORAGE GP INST	SF	4720.0	1940.0
00417	T	HOMELESS SHELTR	SF	4720.0	1940.0
00418	T	TT OFF QTRS	SF	4720.0	1940.0
00419	T	STORAGE GP INST	SF	2360.0	1941.0
00419	T	ADMIN GEN PURP	SF	2360.0	
00420	T	ADMIN GEN PURP	SF	4720.0	1940.0
00421	T	HOMELESS SHELTR	SF	4720.0	1941.0
00422	T	ADMIN GEN PURP	SF	2360.0	1940.0
00422	T	PVT/ORG CLUB	SF	2360.0	
00423	T	ADMIN GEN PURP	SF	4720.0	1941.0
00426	T	PVT/ORG CLUB	SF	4720.0	1940.0
00427	T	ADMIN GEN PURP	SF	4720.0	1941.0
00428	T	ADMIN GEN PURP	SF	4720.0	1941.0

00429	T	ADMIN GEN PURP	SF	4720.0	1941.0
00434	T	PVT/ORG CLUB	SF	2888.0	1941.0
00439	T	ADMIN GEN PURP	SF	4720.0	1941.0
00450	P	BOAT HOUSE	SF	2600.0	1986.0
00451	P	PO MAIN	SF	5013.0	1988.0
00454	P	ADMIN GEN PURP	SF	2135.0	1939.0
00476	P	STORAGE GP INST	SF	3016.0	1985.0
00480	S	STORAGE GP INST	SF	9267.0	1941.0
00481	S	STORAGE GP INST	SF	9267.0	1941.0
00482	T	HAZ MAT STR INS	SF	9267.0	1941.0
00484	S	ENG/HOUSING MNT	SF	3817.0	1941.0
00486	P	WAT STR TK POT			1941.0
00487	P	PUMP STAT POT			1943.0
00487	P	WTR SUP/TRT BLD	SF	196.0	
00488	P	DRUM RECON PLT	SF	900.0	1997.0
00490	P	STORAGE GP INST	SF	6069.0	1939.0
00490	P	TRALR PARK BLDG	SF	5269.0	
00491	P	SEWAGE LFT STAT			1951.0
00494	T	CHLORINATOR FAC			1940.0
00494	T	WTR SUP/TRT BLD	SF	131.0	
00497	P	STORAGE GP INST	SF	3000.0	1940.0
00498	P	ADMIN GEN PURP	SF	1223.0	1939.0
00499	P	COURTROOM	SF	2040.0	1939.0
00500	P	CHAPEL	SF	16372.0	1962.0
00501	P	ADMIN GEN PURP	SF	2832.0	1969.0
00502	P	LIBRARY MAIN	SF	10650.0	1974.0
00549	P	STANDBY GEN			1950.0
00549	P	PWR PLT BLDG	SF	352.0	
00550	S	ADMIN GEN PURP	SF	11767.0	1941.0
00551	P	ORG CLASSROOM	SF	8595.0	1942.0
00551	P	ACES FAC	SF	5000.0	
00552	S	RECREATION CTR	SF	16420.0	1941.0
00553	P	PUMP STAT POT			1943.0
00553	P	WTR SUP/TRT BLD	SF	64.0	
00555	S	ADMIN GEN PURP	SF	18967.0	1941.0
00557	P	WAT STR TK POT			1943.0
00562	T	PLT/UTIL BLDG	SF	332.0	1941.0
00563	S	ADMIN GEN PURP	SF	8894.0	1941.0
00600	P	SCIF	SF	44492.0	1997.0
00600	P	COMMO EQ BLDG	SF	45000.0	
00601	P	ORG STR BLDG	SF	16000.0	1997.0
00602	P	ORG STR BLDG	SF	6000.0	1997.0
00616	P	CO HQ BLDG	SF	1520.0	1967.0
00620	P	CO HQ BLDG	SF	1520.0	1967.0
00671	P	CIDC FLD OPS BD	SF	3020.0	1967.0
00675	S	ADMIN GEN PURP	SF	2892.0	1941.0
00676	S	ADMIN GEN PURP	SF	3663.0	1941.0
00677	S	ADMIN GEN PURP	SF	2592.0	1941.0
00678	P	ADMIN GEN PURP	SF	1520.0	1967.0
00682	S	MARS STATION	SF	4720.0	1941.0
00686	S	THRIFT SHOP	SF	5929.0	1957.0
00689	P	BOWLING CENTER	SF	17599.0	1967.0
00699	P	EXCH AUTO SER	SF	1769.0	1953.0
00702	P	CMTY/CONF CTR	SF	12100.0	1983.0
00750	P	VEH FUEL MOGAS			1987.0
00750	P	VEH MAINT SHOP	SF	14391.0	
00752	P	SEWAGE LFT STAT			1941.0
00753	P	STORAGE GP INST	SF	4311.0	1987.0
00754	P	STORAGE GP INST	SF	4320.0	1987.0
00755	P	ACCESS CNT FAC	SF	112.0	1987.0
00756	P	STORAGE GP INST	SF	1260.0	1992.0
00760	P	STORAGE GP INST	SF	3012.0	1988.0
00761	P	STORAGE GP INST	SF	1800.0	1988.0
00770	P	STORAGE GP INST	SF	570.0	1989.0
00787	S	ADMIN GEN PURP	SF	5314.0	1941.0
00788	S	ORG CLASSROOM	SF	4720.0	1941.0
00789	S	ADMIN GEN PURP	SF	2000.0	1941.0
00792	S	INFO SYS FAC	SF	49.0	1956.0
00793	P	CHLORINATOR FAC			1984.0
00793	P	WTR SUP/TRT BLD	SF	131.0	
00800	S	ORG CLASSROOM	SF	5964.0	1942.0
00800	S	ADMIN GEN PURP	SF	9000.0	
00801	S	REC EQ CHECKOUT	SF	9267.0	1941.0
00803	P	MULTI ATH FIELD			1954.0
00810	S	VET FACILITY	SF	3222.0	1941.0
00812	S	ACS CTR	SF	5563.0	1941.0
00814	P	REC SPT FAC	SF	8863.0	1966.0
00815	P	REC SHELTER	SF	500.0	1972.0
00816	P	RUNNING TRACK			1954.0
00817	P	GRANDSTAN/BLEAC			1988.0
00818	P	GRANDSTAN/BLEAC			1988.0
00819	P	GRANDSTAN/BLEAC			1988.0
00820	P	GRANDSTAN/BLEAC			1988.0
00822	P	EXCHANGE CAFE	SF	2525.0	1989.0
00826	P	ADMIN GEN PURP	SF	1520.0	1967.0
00830	P	REC/PICNIC AREA	AC	2856.0	1990.0
00886	S	STORAGE GP INST	SF	4608.0	1943.0
00900	T	STORAGE GP INST	SF	3393.0	1941.0
00901	S	ADMIN GEN PURP	SF	12897.0	1941.0
00903	T	HEAT PLANT OIL			1943.0
00903	T	HEAT PLT BLDG	SF	296.0	
00904	T	HEAT PLANT OIL			1946.0
00904	T	HEAT PLT BLDG	SF	236.0	
00906	S	COMMO EQ BLDG	SF	11102.0	1942.0
00909	S	ADMIN GEN PURP	SF	5269.0	1942.0
00910	S	ADMIN GEN PURP	SF	4720.0	1943.0
00911	S	ADMIN GEN PURP	SF	4720.0	1943.0
00912	S	ADMIN GEN PURP	SF	4720.0	1943.0
00913	S	ADMIN GEN PURP	SF	4720.0	1943.0
00914	S	ADMIN GEN PURP	SF	4720.0	1943.0
00915	S	ADMIN GEN PURP	SF	4720.0	1943.0
00916	S	ADMIN GEN PURP	SF	4720.0	1943.0

00917	S	ADMIN GEN PURP	SF	4720.0	1943.0
00918	P	ADMIN GEN PURP	SF	8570.0	1967.0
00919	T	HEAT PLANT OIL			1943.0
00919	T	HEAT PLT BLDG	SF	296.0	
00920	S	ACCESS CNT FAC	SF	64.0	1981.0
00921	T	HEAT PLANT OIL			1943.0
00921	T	HEAT PLT BLDG	SF	385.0	
00922	T	HEAT PLANT OIL			1943.0
00922	T	HEAT PLT BLDG	SF	296.0	
00949	P	SEWAGE LFT STAT			1943.0
00952	P	PLT/UTIL BLDG	SF	86.0	1946.0
00953	P	PLT/UTIL BLDG	SF	86.0	1946.0
00975	P	STORAGE GP INST	SF	36000.0	1954.0
00976	P	COLD STR INST	SF	13440.0	1954.0
00976	P	STORAGE GP INST	SF	13440.0	
00977	P	POLICE/MP STA	SF	18675.0	1953.0
00978	P	SUB/SWIT STA BD	SF	988.0	1954.0
00979	P	SEWAGE LFT STAT		0.0	1954.0
00983	P	WK ANIMAL BLDG	SF	1924.0	1977.0
01000	P	EXCH MAIN STORE	SF	28904.0	1970.0
01001	P	EXCH SER OUTLET	SF	9018.0	1970.0
01002	P	EXCH SER OUTLET	SF	3162.0	1970.0
01003	P	EXCH SER OUTLET	SF	4542.0	1970.0
01005	P	PO MAIN	SF	7645.0	1971.0
01006	P	BANK	SF	5100.0	1975.0
01007	P	COMMISSARY	SF	53700.0	1998.0
01010	P	ACS CTR	SF	2600.0	1970.0
01074	P	CHLORINATOR FAC			1984.0
01074	P	WTR SUP/TRT BLD	SF	131.0	1984.0
01075	P	MED WAREHOUSE	SF	700.0	1961.0
01075	P	DENTAL CLINIC	SF	2800.0	
01075	P	HEALTH CLINIC	SF	114157.0	
01077	P	UOQ MILITARY	SF	9282.0	1962.0
01078	P	UOQ MILITARY	SF	9373.0	1962.0
01102	S	STORAGE GP INST	SF	4130.0	1942.0
01103	S	ADMIN GEN PURP	SF	4130.0	1942.0
01104	S	ADMIN GEN PURP	SF	4130.0	1942.0
01105	S	ADMIN GEN PURP	SF	2065.0	1942.0
01105	S	PVT/ORG CLUB	SF	2065.0	
01106	S	PVT/ORG CLUB	SF	4130.0	1942.0
01107	S	ADMIN GEN PURP	SF	2065.0	1942.0
01107	S	PVT/ORG CLUB	SF	2065.0	
01108	S	CIDC FLD OPS BD	SF	4130.0	1942.0
01109	S	ORG CLASSROOM	SF	4130.0	1942.0
01110	S	PVT/ORG CLUB	SF	4130.0	1942.0
01122	P	AUTO SKILL CTR	SF	11624.0	1971.0
01123	P	ADMIN GEN PURP	SF	5400.0	1976.0
01124	P	MWR CAR WASH	SF	1092.0	1994.0
0114A	P	SEWAGE LFT STAT			1960.0
01150	P	COMMO CTR	SF	36483.0	1952.0
01152	P	INFO PROC CTR	SF	7200.0	1971.0

01200	P	ADMIN GEN PURP	SF	84878.0	1953.0
01201	P	EMERG OPNS CNTR	SF	14764.0	1953.0
01201	P	ADMIN GEN PURP	SF	73114.0	
01202	P	ADMIN GEN PURP	SF	84878.0	1953.0
01203	P	INFO PROC CTR	SF	83438.0	1953.0
01204	P	GEN INST BLDG	SF	30537.0	1953.0
01204	P	LAB INST	SF	1643.0	
01204	P	AUTO-AID INST	SF	5416.0	
01204	P	ENLISTED UPH	SF	34902.0	
01204	P	MISC FAC DET	SF	9500.0	
01204	P	AUDITORIUM GP	SF	6683.0	
01205	P	ENLISTED UPH	SF	76857.0	1953.0
01205	P	DINING FACILITY	SF	6683.0	
01206	P	AUDITORIUM GP	SF	9256.0	1953.0
01207	P	ADMIN GEN PURP	SF	57386.0	1953.0
01208	P	EMERG OPNS CNTR	SF	1423.0	1953.0
01208	P	ADMIN GEN PURP	SF	126641.0	
01209	P	LAB/TST BLDG GP	SF	23124.0	1953.0
01209	P	ADMIN GEN PURP	SF	69372.0	
01209	P	ORG STR BLDG	SF	600.0	
01210	P	COMMO EQ BLDG	SF	23780.0	1953.0
01210	P	ADMIN GEN PURP	SF	61732.0	
01210	P	LAB/TST BLDG GP	SF	30866.0	
01210	P	FST FD/SNK BAR	SF	496.0	
01211	P	OUTDOOR THEATER			1953.0
01212	P	ADMIN GEN PURP	SF	6029.0	1960.0
01213	P	ADMIN GEN PURP	SF	9205.0	1967.0
01214	P	ADMIN GEN PURP	SF	7685.0	1967.0
01215	P	AUDITORIUM GP	SF	18883.0	1968.0
01220	P	HEAT PLANT OIL			1953.0
01220	P	HEAT PLT BLDG	SF	9011.0	
01221	P	SEWAGE LFT STAT			1953.0
01222	P	ACCESS CNT FAC	SF	45.0	1957.0
01223	P	MISC SHED	SF	72.0	1963.0
01224	P	MISC SHED	SF	72.0	1967.0
01226	P	INFO STAND			1993.0
01231	P	SUBSTATION			1994.0
01232	P	IMPROVED LANDS	AC	6.94	2005.0
0170D	P	SEWAGE LFT STAT			1950.0
02000	P	OFF OPEN DINING	SF	37125.0	1942.0
02001	P	COURT AREA			1942.0
02002	P	COURT AREA			1968.0
02017	P	SEW/WST WTR TRT	SF	123.0	1943.0
02018	P	OFF OPEN DINING	SF	3205.0	1942.0
02020	P	OD SWIM POOL			1942.0
02021	P	SEW/WST WTR TRT	SF	178.0	1983.0
02022	P	FH COL	SF	3700.0	1951.0
02023	P	FH COL	SF	3700.0	1949.0
02024	P	FH COL	SF	3700.0	1949.0
02025	P	FH COL	SF	3700.0	1949.0
02026	P	FH COL	SF	3700.0	1949.0

00200	S	XMITTER BLDG	SF	1280.0	1958.0
00201	T	PLT/UTIL BLDG	SF	218.0	1943.0
00203	P	COURT AREA			1973.0
00205	P	ENLISTED UPH	SF	41376.0	1927.0
00206	P	ADMIN GEN PURP	SF	31392.0	1927.0
00207	P	ENLISTED UPH	SF	43872.0	1927.0
00208	P	ENLISTED UPH	SF	36384.0	1927.0
00209	P	ADMIN GEN PURP	SF	36665.0	1928.0
00210	P	COMMO EQ BLDG	SF	29296.0	1975.0
00211	P	FH COL	SF	6834.0	1929.0
00212	P	FH COL	SF	6834.0	1929.0
00213	P	FH COL	SF	6834.0	1929.0
00214	P	FH COL	SF	6428.0	1932.0
00215	P	FH COL	SF	3396.0	1931.0
00216	P	FH COL	SF	3496.0	1931.0
00217	P	SEWAGE LFT STAT			1975.0
00218	P	FH COL	SF	6743.0	1932.0
00219	P	FH COL	SF	6743.0	1932.0
00220	P	FH COL	SF	6743.0	1935.0
00221	P	FH GENERAL OFF	SF	3108.0	1931.0
00222	P	FH COL	SF	6743.0	1935.0
00223	P	FH COL	SF	6743.0	1935.0
00224	P	FH GENERAL OFF	SF	3108.0	1931.0
00225	P	FH COL	SF	6743.0	1932.0
00226	P	FH COL	SF	6743.0	1932.0
00227	P	FH COL	SF	6743.0	1932.0
00228	P	FH COL	SF	6743.0	1932.0
00229	P	FH COL	SF	3020.0	1931.0
00230	P	FH GENERAL OFF	SF	5273.0	1936.0
00233	P	FH SR NCO	SF	4724.0	1929.0
00234	P	FH SR NCO	SF	3780.0	1931.0
00235	P	FH SR NCO	SF	6024.0	1931.0
00236	P	FH SR NCO	SF	3780.0	1931.0
00237	P	FH SR NCO	SF	6024.0	1931.0
00238	P	FH SR NCO	SF	5592.0	1931.0
00239	P	FH SR NCO	SF	6024.0	1931.0
00240	P	FH SR NCO	SF	5592.0	1932.0
00241	P	FH SR NCO	SF	5592.0	1932.0
00242	P	FH SR NCO	SF	5592.0	1932.0
00243	P	FH SR NCO	SF	5592.0	1932.0
00244	P	FH SR NCO	SF	5592.0	1932.0
00245	P	FH SR NCO	SF	5592.0	1932.0
00246	P	FH SR NCO	SF	5592.0	1932.0
00247	P	FH SR NCO	SF	5592.0	1934.0
00248	P	FH SR NCO	SF	5592.0	1934.0
00249	P	FH SR NCO	SF	5592.0	1934.0
00250	P	FH SR NCO	SF	5592.0	1934.0
00251	P	FH SR NCO	SF	5592.0	1934.0
00252	P	FH SR NCO	SF	5592.0	1934.0
00253	P	FH SR NCO	SF	5592.0	1934.0
00254	P	FH SR NCO	SF	5592.0	1934.0

02027	P	FH COL	SF	3700.0	1949.0
02028	P	FH COL	SF	3700.0	1949.0
02029	P	FH LTC/MAJ	SF	3700.0	1949.0
02030	P	FH LTC/MAJ	SF	3700.0	1949.0
02031	P	FH LTC/MAJ	SF	3700.0	1949.0
02032	P	FH LTC/MAJ	SF	3700.0	1949.0
02033	P	FH LTC/MAJ	SF	3700.0	1949.0
02034	P	FH LTC/MAJ	SF	3700.0	1949.0
02035	P	FH LTC/MAJ	SF	3700.0	1949.0
02036	P	FH LTC/MAJ	SF	3700.0	1949.0
02037	P	FH LTC/MAJ	SF	3700.0	1949.0
02038	P	FH LTC/MAJ	SF	3700.0	1951.0
02039	P	FH LTC/MAJ	SF	3700.0	1951.0
02040	P	FH LTC/MAJ	SF	3700.0	1951.0
02041	P	FH LTC/MAJ	SF	3700.0	1951.0
02042	P	FH LTC/MAJ	SF	3700.0	1951.0
02043	P	SEW/WST WTR TRT	SF	110.0	1948.0
02046	P	CENT WASH BLDG	SF	170.0	1998.0
02068	P	CHLORINATOR FAC			1953.0
02070	P	STORAGE GP INST	SF	5000.0	1991.0
02071	P	STORAGE GP INST	SF	2400.0	1999.0
0210A	P	SEWAGE LFT STAT			1975.0
02231	P	FH LTC/MAJ	SF	3700.0	1955.0
02232	P	FH LTC/MAJ	SF	3700.0	1955.0
02233	P	FH LTC/MAJ	SF	3700.0	1955.0
02234	P	FH LTC/MAJ	SF	3700.0	1955.0
02235	P	FH LTC/MAJ	SF	3700.0	1955.0
02236	P	FH LTC/MAJ	SF	3700.0	1955.0
02237	P	FH LTC/MAJ	SF	3700.0	1955.0
02238	P	FH LTC/MAJ	SF	3700.0	1955.0
02239	P	FH LTC/MAJ	SF	3700.0	1955.0
02240	P	FH LTC/MAJ	SF	3700.0	1955.0
02241	P	ACS CTR	SF	4692.0	1960.0
02260	P	FH LTC/MAJ	SF	3700.0	1955.0
02275	S	CHAPEL	SF	3279.0	1942.0
02290	P	CDC UNDER 6 YRS	SF	19600.0	1996.0
02291	P	SEWAGE LFT STAT			1995.0
02292	P	IMHOFF TANK			1996.0
02300	P	PLAYGROUND GP			1985.0
02469	P	PLT/UTIL BLDG	SF	140.0	1954.0
02501	P	ORG CLASSROOM	SF	1440.0	1942.0
02502	P	PREC MACH SHOP	SF	7680.0	1942.0
02503	P	PREC MACH SHOP	SF	7680.0	1942.0
02504	P	PREC MACH SHOP	SF	7936.0	1942.0
02506	P	PREC MACH SHOP	SF	10944.0	1942.0
02507	P	STORAGE GP INST	SF	8512.0	1942.0
02508	P	SEP TOIL/SHOWER	SF	480.0	1942.0
02510	P	CHLORINATOR FAC			1953.0
02510	P	WTR SUP/TRT BLD	SF	196.0	
02525	P	ADMIN GEN PURP	SF	86400.0	1942.0
02535	T	LAB/TST BLDG GP	SF	738.0	1942.0

03002	P	FH JR NCO/ENL	SF	7240.0	1953.0
03003	P	FH JR NCO/ENL	SF	19064.0	1953.0
03004	P	FH JR NCO/ENL	SF	7367.0	1953.0
03005	P	FH JR NCO/ENL	SF	12324.0	1953.0
03006	P	FH JR NCO/ENL	SF	7367.0	1953.0
03007	P	FH JR NCO/ENL	SF	14064.0	1953.0
03008	P	FH JR NCO/ENL	SF	7240.0	1953.0
03009	P	FH JR NCO/ENL	SF	12268.0	1953.0
03010	P	FH JR NCO/ENL	SF	9058.0	1953.0
03011	P	FH JR NCO/ENL	SF	12268.0	1953.0
03012	P	FH JR NCO/ENL	SF	6363.0	1953.0
03013	P	FH JR NCO/ENL	SF	8704.0	1953.0
03014	P	FH JR NCO/ENL	SF	12268.0	1953.0
03015	P	FH JR NCO/ENL	SF	9058.0	1953.0
03016	P	FH JR NCO/ENL	SF	12268.0	1953.0
03017	P	FH JR NCO/ENL	SF	8704.0	1953.0
03018	P	FH JR NCO/ENL	SF	6210.0	1953.0
03019	P	FH JR NCO/ENL	SF	12268.0	1953.0
03020	P	FH JR NCO/ENL	SF	12658.0	1953.0
03021	P	FH JR NCO/ENL	SF	13048.0	1953.0
03022	P	FH JR NCO/ENL	SF	12658.0	1953.0
03023	P	FH JR NCO/ENL	SF	7540.0	1953.0
03024	P	FH JR NCO/ENL	SF	7681.0	1953.0
03025	P	FH JR NCO/ENL	SF	8063.0	1953.0
03026	P	FH JR NCO/ENL	SF	7681.0	1953.0
03027	P	FH JR NCO/ENL	SF	12374.0	1953.0
03028	P	FH JR NCO/ENL	SF	18620.0	1953.0
03029	P	FH JR NCO/ENL	SF	9430.0	1953.0
03030	P	FH JR NCO/ENL	SF	12658.0	1953.0
03031	P	FH JR NCO/ENL	SF	12324.0	1953.0
03032	P	FH JR NCO/ENL	SF	12658.0	1953.0
03033	P	FH JR NCO/ENL	SF	8340.0	1953.0
03034	P	FH JR NCO/ENL	SF	12905.0	1953.0
03035	P	FH JR NCO/ENL	SF	9058.0	1953.0
03036	P	FH JR NCO/ENL	SF	12905.0	1953.0
03037	P	FH JR NCO/ENL	SF	12324.0	1953.0
03038	P	FH JR NCO/ENL	SF	12905.0	1953.0
03039	P	FH JR NCO/ENL	SF	8340.0	1953.0
03040	P	FH JR NCO/ENL	SF	8804.0	1953.0
03041	P	FH SR NCO	SF	12268.0	1953.0
03042	P	FH SR NCO	SF	19488.0	1953.0
03043	P	FH SR NCO	SF	19488.0	1953.0
03044	P	FH SR NCO	SF	19488.0	1953.0
03045	P	FH SR NCO	SF	19488.0	1953.0
03046	P	FH JR NCO/ENL	SF	11344.0	1953.0
03047	P	FH JR NCO/ENL	SF	7540.0	1953.0
03048	P	FH JR NCO/ENL	SF	8028.0	1953.0
03049	P	FH JR NCO/ENL	SF	11344.0	1953.0
03050	P	FH JR NCO/ENL	SF	13048.0	1953.0
03051	P	FH JR NCO/ENL	SF	11344.0	1953.0
03052	P	FH JR NCO/ENL	SF	9430.0	1953.0

03300	P	PLAYGROUND GP			1985.0
03301	P	PLAYGROUND GP			1985.0
03302	P	PLAYGROUND GP			1985.0
03303	P	PLAYGROUND GP			1985.0
03304	P	PLAYGROUND GP			1985.0
03305	P	PLAYGROUND GP			1985.0
03306	P	PLAYGROUND GP			1985.0
10000	P	SOFTBALL FIELD			1960.0
11130	P	RW LAND PAD PAV	SY	2100.0	1955.0
1204A	P	HEAT PLT GEO			2005.0
1205A	P	HEAT PLT GEO			2005.0
12300	S	PE TNG BUILDING	SF	20000.0	2004.0
13510	P	COMMO LINES UNG			1954.0
13511	P	COMMO LINES UNG			1954.0
13512	P	COMMO LINES UNG			1954.0
15410	P	BULKHEADS			1953.0
17980	P	PARADE/DRIL FLD	AC	25.0	1917.0
17981	P	PARADE/DRIL FLD	AC	7.0	1952.0
2018A	P	SEWAGE LFT STAT			1960.0
2302A	T	STR SHED GP INS	SF	247.0	1945.0
2542A	P	PLT/UTIL BLDG	SF	264.0	1951.0
71310	S	TRAILER SITES			1943.0
75011	P	GOLF CSE 18-HOL	AC	152.0	1942.0
75028	P	OD ROLL RINK			1966.0
81230	P	EXT LIGHTING			1965.0
81231	P	EXT LIGHTING			1968.0
81240	P	OH ELECT LINES			1962.0
81260	P	TRANSFORMERS			1967.0
81261	P	TRANSFORMERS			1968.0
81262	P	TRANSFORMERS			1968.0
81263	P	TRANSFORMERS			1970.0
81291	P	UNG ELECT LINES			1962.0
81293	P	OH ELECT LINES			1942.0
81294	S	TRANSFORMERS			1943.0
81360	P	TRANSFORMERS			1977.0
81392	P	SUBSTATION			1953.0
82211	P	HOT WATER LINES			1958.0
82240	P	STEAM LINES			1953.0
83210	P	SANITARY SEWER			1940.0
83211	P	SANITARY SEWER			1943.0
84210	P	WATER DIST POT			1943.0
84291	P	WATER DIST POT			1943.0
85113	T	ROADS, UNPAVED	SY	15091.0	1962.0
85114	P	TA ROADS PAVED	SY	96105.0	1943.0
85115	T	TA ROADS UNPAVE	SY	28051.0	1943.0
85211	P	SIDEWALKS PVD	SY	64049.0	1956.0
85213	S	SIDEWALKS PVD	SY	53762.0	1959.0
85214	P	NONORG PK PAVD	SY	84474.0	1943.0
85215	P	NONORG PK PAVD	SY	169676.0	1962.0
85216	S	NONORG PK PAVD	SY	434353.0	1960.0
85217	P	SIDEWALKS PVD	SY	6530.0	1943.0

85218	P	SIDEWALKS PVD	SY	42424.0	1943.0
85219	S	NONORG PK PAVD	SY	99290.0	1943.0
85220	S	SIDEWALKS PVD	SY	4959.0	1943.0
87110	P	STORM SEWER			1962.0
87111	P	STORM SEWER			1943.0
87112	P	DRAINAGE DITCH			1943.0
87131	P	IRRIGATION FAC			1969.0
87210	P	FENCING/WALLS			1962.0
87251	P	ENTRANCE GATE			1962.0
88010	P	FIRE ALARM SYS			1943.0
88011	P	FIRE ALARM SYS			1943.0
88040	P	INTRU ALM SYS			1970.0
91110	P	LAND HELD PUR	AC	636.1	1940.0
91111	P	LAND HELD PUR	AC	489.5	1942.0

EDAW | AECOM

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Exhibit B	Site Specific Evaluations

1.0 INTRODUCTION

A natural attenuation program with long-term monitoring (LTM) to remediate ground water concentrations exceeding the New Jersey Department of Environmental Protection's (NJDEP's) Ground Water Quality Standards (GWQS) for Class II-A Aquifers at Fort Monmouth, New Jersey is being conducted in accordance with the Remedial Action Work Plans (RAWPs) prepared specifically for individual Sites.

During the performance of LTM, various metals have been detected at concentrations exceeding the NJDEP GWQS. It has been suspected that most of these exceedances are likely due to naturally-occurring background conditions and represent a combination of a natural, dissolved component, along with input from sample turbidity. The lack of a specific source area for the detected contaminants provides confidence that metals detected in ground water are not from contaminants discharged at the site.

The objectives of this evaluation are to (1) document the presence of naturally-occurring metals; (2) identify various conditions which are likely to have resulted in the exceedances identified in the ground water LTM program; and (3) develop a meaningful strategy for determining which sites, and which individual metals, represent site contamination for which the Fort remains responsible.

Specifically, this evaluation encompassed the following:

- Determine factors potentially contributing to exceedances;
- Reference published data sources which documents metals naturally occurring in soils;
- Identify which sites have metal concentrations exceeding the NJDEP GWQS;
- Evaluate site-specific conditions which may impact results; and
- Identify and discuss recommendations for the future sampling and analysis of metals on the Fort, and establish ground water Classification Exception Areas (CEAs).

This evaluation was conducted in general accordance with the NJDEP's *Technical Requirements for Site Remediation* (*TRSR*), N.J.A.C. (New Jersey Administrative Code) 7:26E et seq.

2.0 SITE LOCATION AND DESCRIPTION

Fort Monmouth is located in the central-eastern portion of Monmouth County, New Jersey, approximately 45 miles south of New York City and 70 miles northeast of Philadelphia (Figures 1 and 2). This report covers 23 sections of the base, identified as the following sites: Buildings 80 and 166 (FTMM–56), 108 (FTMM–57), 283 (FTMM–61), 287, 290 (FTMM–55), 296 (FTMM–54), 699 (FTMM–53), 750, 812 (FTMM-64), 886 (FTMM–66), 2567 (FTMM–58), M-2 (FTMM-02), M-3 (FTMM-03), M-4 (FTMM–04), M-5 (FTMM–05), M-8 (FTMM-08), M-12 (FTMM-12), M-14 (FTMM–14), M-18 (FTMM–18), CW-1 (FTMM–22), CW-3A (FTMM–25), and CW-6. These individual sites can be separated into four general usage areas as listed below. This document is not meant to provide detailed historical accounts for the individual sites, as these are provided in site-specific remedial progress documents.

- Historical Landfills – M-2, M-3, M-4, M-5, M-8, M-12, M-14, MP-18, and CW-3A;
- Various Office, Research, Storage, and General Use Buildings – Buildings CW-1, and CW-6 (former pesticide storage facility);
- Underground Storage Tank Sites – Buildings 80 and 166, 108, 283, 287, 290, 296, 750 (motor pool), and 886; and
- Gasoline Service Stations – Buildings 699 and 2567.

Individual sites are shown on the Contaminated Site Location Maps for Main Post and Charles Wood Areas provided as Figures 3 and 4, respectively.

3.0 METALS DETECTED AT CONCENTRATIONS EXCEEDING GWQS

Roy F. Weston, Inc. (Weston) prepared a *Site Investigation Report* (SIR) in December of 1995 entitled *Final Site Investigation, Main Post and Charles Wood Areas, Fort Monmouth, New Jersey*. As part of the SIR for the Fort Monmouth military installation, Weston conducted soil sampling, monitoring well installation activities, ground water sampling, and geophysical surveying. In addition to soil and ground water sampling at different sites throughout the Main Post and Charles Wood Areas of Fort Monmouth, Weston established background concentrations for soil and ground water for the Fort Monmouth installation. These background concentrations have been referenced in various technical submittals and used by the DPW for comparing sampling results for native constituents of soil and ground water.

In the ground water results tables included in the 1995 Weston SIR, Weston identified aluminum (Al), arsenic (As), iron (Fe), manganese (Mn), sodium (Na) and lead (Pb) at concentrations greater than the NJDEP GWQS. Lead was the only constituent which was considered a COC; the remaining metal exceedances were considered background concentrations.

On-going LTM conducted at Fort Monmouth indicated several other metals were detected in ground water at concentrations greater than the GWQS across individual sites on the Fort. Those metals include antimony (Sb), beryllium (Be), cadmium (Cd), chromium (Cr), nickel (Ni), selenium (Se), and thallium (Tl). [Although commonly detected in ground water, barium (Ba) and copper (Cu) rarely exceed the GWQS.]

4.0 FACTORS AFFECTING RESULTS

Numerous factors were identified which could have contributed to the elevated concentrations of metals in ground water samples. These factors are discussed in the sections below.

4.1 Naturally-Occurring Constituents

Metals are naturally-occurring in the environment in rocks, soil, and ground water. Natural background levels are concentrations present in the environment of the region of the site and have not been influenced by anthropogenic activities.

Metals such as antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, nickel, selenium, and thallium have all been documented as being naturally-occurring constituents in soil and ground water in the Fort Monmouth area (refer to Section 5.0).

4.2 Sampling Techniques

Prior to 2010, metals at Fort Monmouth were sampled via standard-purge, which evacuates three to five monitoring well volumes prior to sampling. This sampling method potentially increases turbidity in the water column through agitation, and generally results in the introduction of fine particulates (turbidity) into the samples. Resulting analytical concentrations tend to increase as turbidity increases due to sorption of metals on particulates in the water. Metals are also contained within the mineral composition of soils.

Low-flow purging (also known slow-purge) is a method utilized to collect ground water samples from monitoring wells that are more representative of ambient ground water conditions in the aquifer. Essentially, the rate at which water is evacuated from the well is reduced, minimizing the drawdown inside of the well, thereby minimizing disturbance of sediment on the bottom of the well, and within the well gravel pack and surrounding formation. At certain sites, the slow-purge technique effectively reduces turbidity in the resulting samples.

Fort Monmouth sampling personnel have reported highly turbid samples being collected regardless of the sampling technique used. This is most likely as a result of the high percentage of fines present in the formations containing silt and clays.

Regardless of sampling technique, any metals introduced into the sample via turbidity become represented in the analytical results due to the nitric acid preservation required by the laboratory analytical method.

4.3 Well Construction

Similar to the effects of sampling techniques, the quality of individual monitoring well construction can influence analytical results. For example, well screening and filter pack conditions affect the amount of sediment introduced into the ground water sample. The age of the well, number of times sampled, construction materials/techniques, and formation characteristics can affect the amount of fine particulates that are ultimately introduced into the samples.

4.4 Laboratory Errors

During the 2009 ground water sampling events, it was discovered that the Fort Monmouth Environmental Testing Laboratory (FMETL) experienced difficulties in quantifying certain metal results. Specifically, selenium and thallium were not reported due to data quality objectives that were not met in low-range detection of these elements.

As reported by Fort Monmouth DPW, prior to the first quarter 2009, thallium was not identified as a COC in ground water. However, in 2009, thallium was detected in nearly all monitoring wells throughout Fort Monmouth at similar concentrations. Thallium concentrations exceeding the GWQS are thought to be falsely positive due to laboratory instrumentation issues. The results for thallium were not identified in the laboratory non-conformance report since blank samples associated with these results reported thallium concentrations less than the GWQS.

4.5 Factors Affecting Solubility

The pH of soil and ground water may have contributed to increased solubility of metals. Lower pHs (more acidic) could potentially increase the solubility of metals in ground water. As an example, samples collected for metals analysis are preserved with nitric acid to lower the pH to ensure that all of the metals are dissolved and, therefore, reflected in the laboratory analysis.

Temperature, aeration, mineral levels, redox parameters and biological conditions of the soil and ground water are amongst the many variable factors which can affect the solubility of soils in ground water. All of these factors can be dependent upon many other variables (such as pH) and thus it is difficult to quantify how individual site factors can influence metals results at Fort Monmouth.

5.0 PUBLISHED DOCUMENTS

Brinkerhoff reviewed various published documents regarding metals naturally-occurring in the environment. Fort Monmouth conducted their own study under the direction of the NJDEP regarding glauconitic soils to investigate a possible connection to the elevated metal detections in ground water on the installation. This report, including several other sources, are discussed below. Metals in New Jersey soils and ground water, particularly areas with glauconite-rich soils, are prevalent.

5.1 U.S. Army Garrison Fort Monmouth, March 2011, Base-Wide Glauconitic Soil Sampling Report – Fort Monmouth – Main Post Area

The U.S. Army Fort Monmouth, Directorate of Public Works wanted to assess if naturally-occurring glauconitic soils were attributing to the elevated metals detections observed in ground water collected from wells throughout the installation since no documented or confirmed source was identified. This report is included in Appendix A.

Six soil samples were collected from three locations (near Buildings 108, and 296 and historic landfill M-2). Soil results indicate the following metals were detected, however, were below the NJDEP Residential Direct Contact Soil Remediation Standards: aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc.

Six ground water samples were collected from three monitoring wells at a shallow and deep interval via slow-purge sampling technique. Of the six samples, three samples had arsenic concentrations exceed the GWQS and four had lead concentrations exceed the GWQS.

The study found that no direct correlation could be established between the metals concentrations detected in soil and ground water at the sites. However, the highest detections of arsenic and lead concentrations in ground water were detected adjacent to a glauconite-rich soil layer. The Fort Monmouth DPW concluded that arsenic and other trace metals were due to naturally-occurring conditions and not due to a site- specific source based on the lack of a clear distribution gradient and correlation between soil results and ground water results. Additionally, the DPW concluded that sample turbidity was a contributing factor in ground water concentrations in excess of the GWQS, and recommended the inclusion of filtered samples to evaluate the input from sample turbidity.

5.2 Published References

Brinkerhoff reviewed several other reference documents to confirm the natural presence of metals in soils and ground water in New Jersey. Documents reviewed and brief summaries are included below:

- Dooley, 2001, *Baseline Concentrations of Arsenic, Beryllium and Associated Elements in Glauconite and Glauconitic Soils in the New Jersey Coastal Plain*

This study describes how glauconite - a green, iron-rich, mineral occurs in significant concentrations in sedimentary formations of marine origin. These deposits form glauconitic soils from chemical weathering which underlie the New Jersey Coastal Plain physiographic providence.

These soils have been found to contain high concentrations of arsenic and beryllium. Additionally, high median concentrations of antimony, boron, and chromium were observed in glauconite-containing soils.

- Paul F. Sanders, Ph.D., May 2003, *Ambient Levels of Metals in New Jersey Soils*

Three studies conducted between 1996 and 2001 for a research project study by the Environmental Assessment and Risk Analysis Element at the NJDEP determined the ambient levels of extractable metals in New Jersey soils. This project was initiated to assist in the development of soil cleanup criteria, which could not be more stringent than background concentrations.

Aluminum, calcium, iron, magnesium, manganese, potassium, and sodium were abundant with concentrations measured at several hundred to several thousand milligrams per kilogram (mg/kg). Arsenic, barium, chromium, mercury, vanadium, and zinc were common with concentrations ranging between 10 to 100 mg/kg. Beryllium, cobalt, copper, nickel and lead were less common, and antimony, cadmium, selenium, silver, and thallium were detected at trace concentrations.

This study demonstrates that most metals are found in New Jersey soils at detectable concentrations. The metals arsenic and beryllium are the only two metals with soil criterion set by ambient levels in soil, indicating they are commonly encountered.

- Michael Serfes for the New Jersey Geological Survey, 2004, *Arsenic in New Jersey Ground Water*

This article introduces arsenic as a common constituent to New Jersey ground water. Arsenic becomes mobilized in ground water under chemically alkaline and reducing conditions. Certain natural minerals stored in bedrock can weather and be introduced into ground water.

Arsenical pesticides are not very mobile in soils and are not a major source in ground water because they are not very water-soluble and bind tightly to soil particles. However, arsenic naturally found in soils could become water-soluble depending on pH and other factors.

- Princeton Geosciences, Inc., 2007, *Trace Metals Characterization in Glauconitic Coastal Plain Soil and Associated Ground water*

A project by Princeton Geosciences identified arsenic concentrations in soil as great as 100 mg/kg for a site located in the New Jersey Coastal Plain. Samples were collected within a glauconite-containing soil matrix, leading to high concentrations of arsenic. Ground water samples contained trace metals such as aluminum, beryllium, chromium, iron, lead, and manganese. Princeton Geosciences concluded that the elevated concentrations of trace metals were attributed to turbidity in the samples. Further research and statistical evaluation led Princeton Geosciences to conclude that metals were naturally-occurring.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The metals most often reported as exceedances of the applicable GWQS have the following aspects in common:

- They are common in soils, as documented through site-specific analysis and published sources; and
- have very low GWQS, ranging from 1 µg/L for beryllium, upwards to 6 µg/L for antimony.

More than any other factor, turbidity in ground water samples has the capability to result in analytical results exceeding the published GWQS. Due to the interference from sample turbidity, exceedances of the GWQS by dissolved-phase metals is not certain. As the GWQS were developed based on dissolved-phase contaminants, direct comparison to the GWQS frequently results in "false positives" when evaluating site data.

In consideration of the impending closure of Fort Monmouth, the following general recommendations are provided:

- Based on data from the current reporting period (through 3rd Quarter 2010), establish interim ground water Classification Exception Areas (CEAs) for each applicable site. Each CEA should clearly indicate that elevated results are suspected due to sample turbidity.
- The sampling strategy described in Section 7.0 herein should be implemented to reduce the input from sample turbidity, and thus better represent the actual concentrations of dissolved-phase metals. Upon completion of each sampling event, the data should be compared to the GWQS. Metals concentrations laboratory-determined to be in compliance with the GWQS should be removed from further consideration.
- Data generated should be evaluated during the performance of the 2012 CEA Biennial Certification, with metals concentrations laboratory-determined to be in compliance with the GWQS removed from each CEA as needed. Dissolved-phase metals remaining in excess of the GWQS should be evaluated on a site-specific basis to determine whether sources of contamination exist, or the dissolved-phase component is from a natural background condition.

7.0 SAMPLING STRATEGY DEVELOPMENT

In order to reduce the input from sample turbidity, and thus better-represent the actual concentrations of dissolved-phase metals, the following strategy was developed:

- Removal of extreme outliers from the data set using a 90th Percentile Analysis;
- Comparison of 90th percentile values to the applicable GWQS, with parameters exceeding the GWQS retained for further field investigation;
- Selection of monitoring wells at each site for further field investigation, biased towards those with previous elevated results; and
- Development of sample collection methodology, using a combination of slow purge well evacuation, and the use of raw and filtered sample pairs to reduce sample turbidity and enable the comparison between the raw (traditional) and filtered samples to evaluate the contribution from sample turbidity.

Site-specific results of the comparisons and recommended sampling protocol are provided in the Site Specific Evaluations included in Exhibit B of this report. Each Site Specific Evaluation includes a statistical summary of the 90th Percentile Analysis, 90th Percentile Data Summary Table (Table 1), discussion of the recommended sampling protocol, and Concentration Ranking and Recommended Well Sampling Table (Table 2).

7.1 90^{th} Percentile Analysis

Procedure

The 90^{th} Percentile Analysis is a statistical approach which removes data outliers from a data group in order to present a more representative data set. Fort Monmouth personnel assembled the data sets for each applicable site and provided the calculations to Brinkerhoff. Only detections were used in calculations. By only including the detections and not the multitude of samples that were non-detect, this approach provided a more conservative outcome.

Utilizing an Excel spreadsheet, the 90^{th} percentile and mean were calculated for each metal. Concentrations exceeding the 90^{th} percentile were determined to be extreme outliers and were excluded from the data set. An adjusted mean was then calculated.

Metals values were compared to the GWQS at the 90^{th} percentile, then to the mean and finally to the adjusted mean. This data set included various timeframes of sampling events, various numbers of monitoring wells at each site, and various metals. Timeframes were chosen by a Fort Monmouth representative based on a manageable and representative data set starting in the first quarter 2005 through to the third quarter 2010. If data were not available back to the first quarter 2005, the earliest available date was

used. Some sites did not have enough metals data to conduct statistical analysis and were not utilized in this study. These sites included Buildings 707, 745, 1104 and 1122.

Data Evaluation

The data evaluation performed for each site consists of the identification of the following:

- Metals for which the 90th percentile values meet the GWQS;
- Metals for which mean values meet the GWQS; and
- Metals for which the adjusted mean values meet the GWQS.

For the purposes of this analysis, metals with 90th percentile values meeting the GWQS were excluded from further evaluation. Although metals with mean values, or adjusted mean values meeting the GWQS are identified, this comparison is not considered sufficient to exclude these parameters from further investigation.

Note that due to possible laboratory inaccuracies affecting selenium and/or thallium results, the 90th Percentile Analysis was not used to determine compliance with the GWQS for these metals.

Site-specific results of the comparisons are discussed in the Site Specific Evaluations included in Exhibit B of this report.

7.2 Concentration Ranking and Well Selection Protocol

For future sampling events, the monitoring wells recommended for sampling were selected with a bias towards those wells demonstrating the highest concentrations as follows.

For the available data (generally from 4th Quarter 2008 through 3rd Quarter 2010), the highest observed concentrations for the site monitoring wells were ranked for each metal of concern. For larger sites, such as landfills, the highest four concentrations were listed; for smaller sites, the highest two concentrations were deemed adequate. (Each well was counted only once for each parameter of concern.)

The above procedure resulted in a small group of monitoring wells for each applicable site to be sampled using the prescribed protocol.

7.3 Sample Collection Methodology

The proposed sample collection methodology consists of a combination of slow purge well evacuation, and the use of raw and filtered sample pairs to reduce sample turbidity. This approach also enables a comparison between the raw (traditional) and filtered samples to evaluate the contribution from sample turbidity.

Specifically, for future sampling events, raw and filtered water sample pairs should be collected from select wells, to evaluate the input from sample turbidity. Samples should be analyzed by a NJ certified laboratory for the metals for which the 90th Percentile values do not meet the GWQS. (Refer to the Site Specific Evaluations in Exhibit B for the individual site evaluation and monitoring well selection.)

Slow-purge methodology should be followed for all sampling events which include metals analyses.

7.4 Sample Collection Frequency

Sample collection should generally be performed on a semiannual basis, targeting the times of the year typically exhibiting elevated precipitation amounts, and increased likelihood of infiltration to ground water (generally Spring and Fall).

Although precipitation in New Jersey is generally well distributed throughout the year, winter is considered less desirable due to the potential for snow along with a frozen ground surface. Likewise, summer is less desirable due to increased evaporation, increased absorption capacity due to dry soil conditions, and increase use by vegetation.

The semiannual collection protocol is intended to generate sufficient dissolved-phase data to draw meaningful conclusions prior to the 2012 CEA Biennial Certification.

8.0 REFERENCES

Dooley, 2001, *Baseline Concentrations of Arsenic, Beryllium and Associated Elements in Glauconite and Glauconitic Soils in the New Jersey Coastal Plain*

NJDEP, 2009, *Technical Requirements for Site Remediation* (*TRSR*), NJAC (New Jersey Administrative Code) 7:26E et seq.

Princeton Geosciences, Inc., 2007, *Trace Metals Characterization in Glauconitic Coastal Plain Soil and Associated Groundwater*

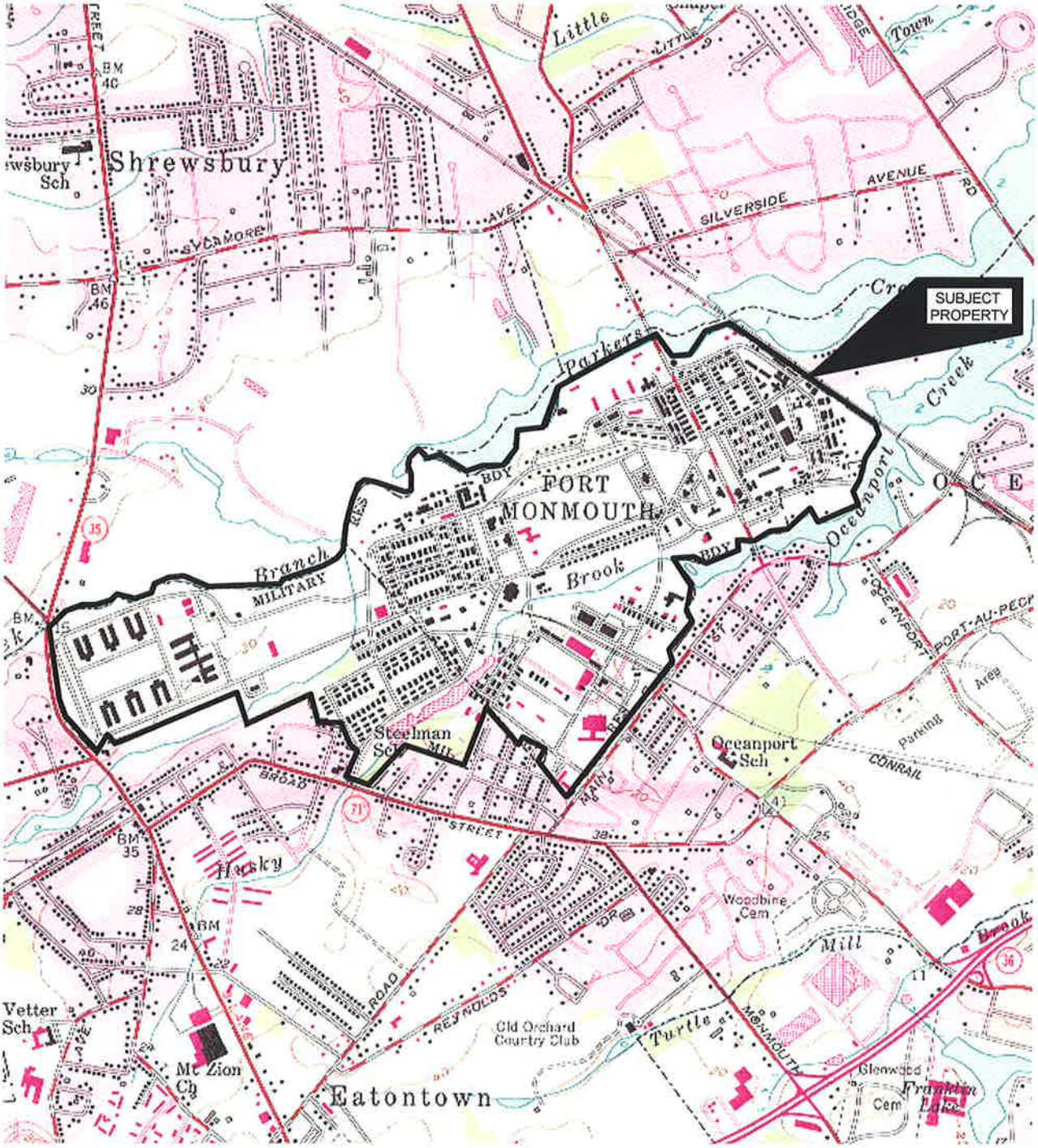
Paul F. Sanders, Ph.D., May 2003, *Ambient Levels of Metals in New Jersey Soils*

Michael Serfes for the New Jersey Geological Survey, 2004, *Arsenic in New Jersey Ground Water*

US Army Garrison Fort Monmouth, March 2011, *Base-Wide Glauconitic Soil Sampling Report – Fort Monmouth – Main Post Area*

Roy F. Weston, Inc., December 1995, *Final Site Investigation, Main Post and Charles Wood Areas, Fort Monmouth, New Jersey*

Figures



LONG BRANCH, N. J.
40073-C8-TF-024

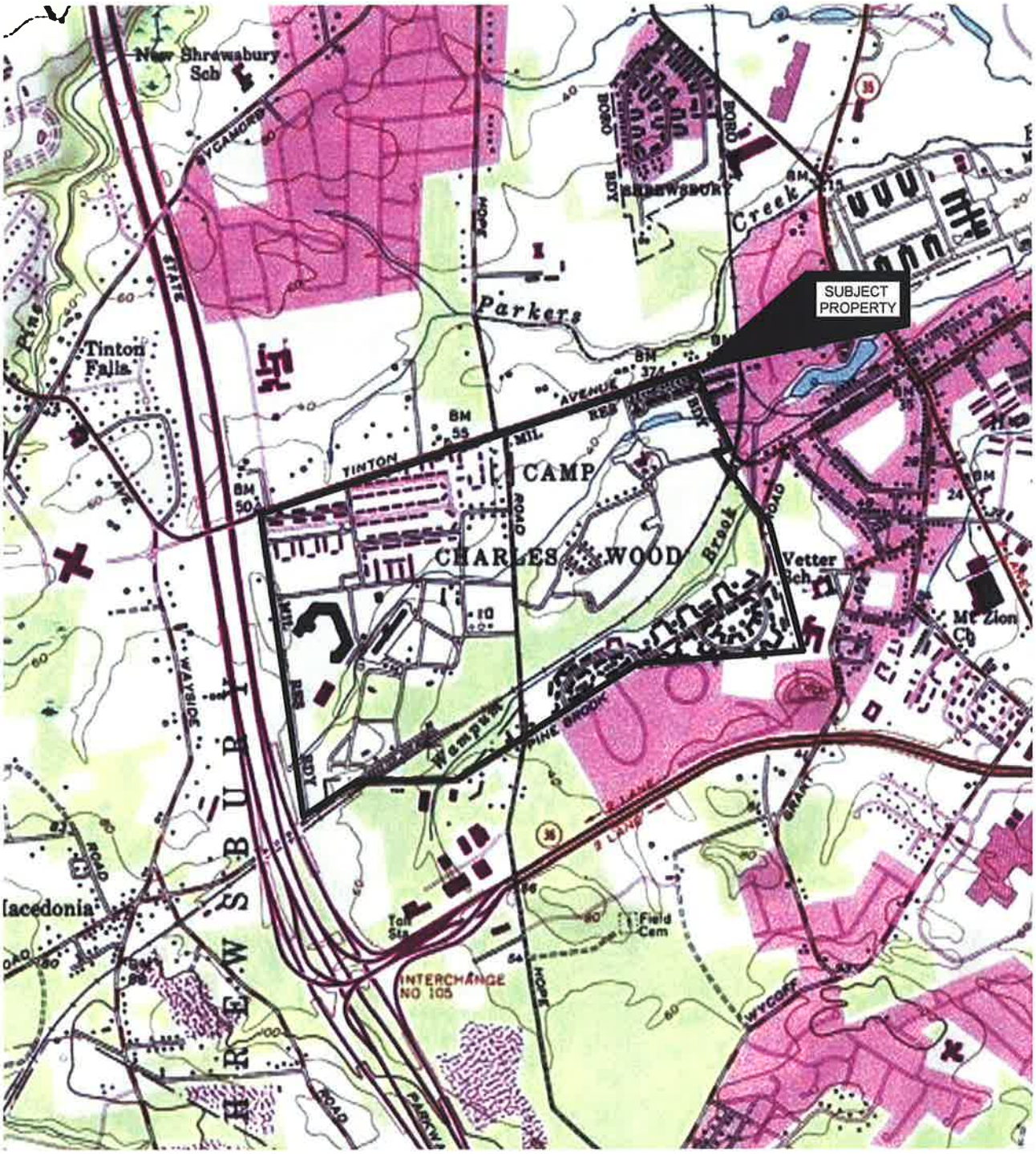
1954
PHOTOREVISED 1981
DMA 6164 I SE-SERIES V822

QUADRANGLE LOCATION

BRINKERHOFF
ENVIRONMENTAL SERVICES, INC.

FIGURE 1 - SITE LOCATION MAP
U.S.G.S. TOPOGRAPHIC LONG BRANCH, NJ QUAD
US ARMY FORT MONMOUTH
MAIN POST
FORT MONMOUTH, NEW JERSEY

DATE: 5/4/11	JOB NO.: 09BR116	SCALE: 1′ = 2000′



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SCALE: 1"=2000′

LONG BRANCH, N. J.
40073-C8-TF-024

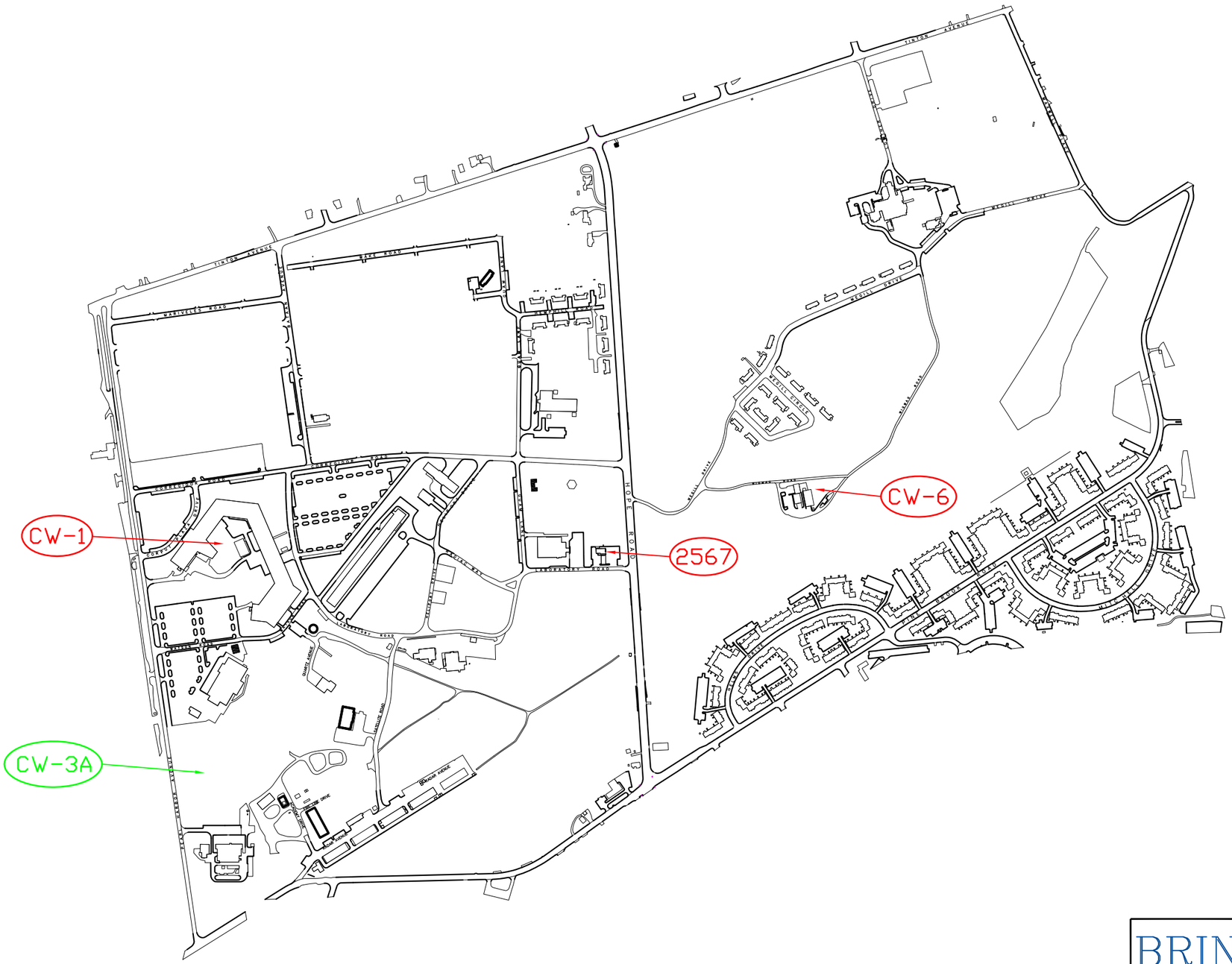
1954
PHOTOREVISED 1981
DMA 6164 I SE-SERIES V822

QUADRANGLE LOCATION

BRINKERHOFF
ENVIRONMENTAL SERVICES, INC.

FIGURE 2 - SITE LOCATION MAP
U.S.G.S. TOPOGRAPHIC LONG BRANCH, NJ QUAD
US ARMY FORT MONMOUTH
CHARLES WOOD AREA
FORT MONMOUTH, NEW JERSEY

DATE: 5/4/11	JOB NO.: 09BR116	SCALE: 1" = 2000′



LEGEND

(2567) - BUILDING NUMBER/CONTAMINATED AREA LOCATION

(CW-3A) - HISTORIC LANDFILL LOCATION

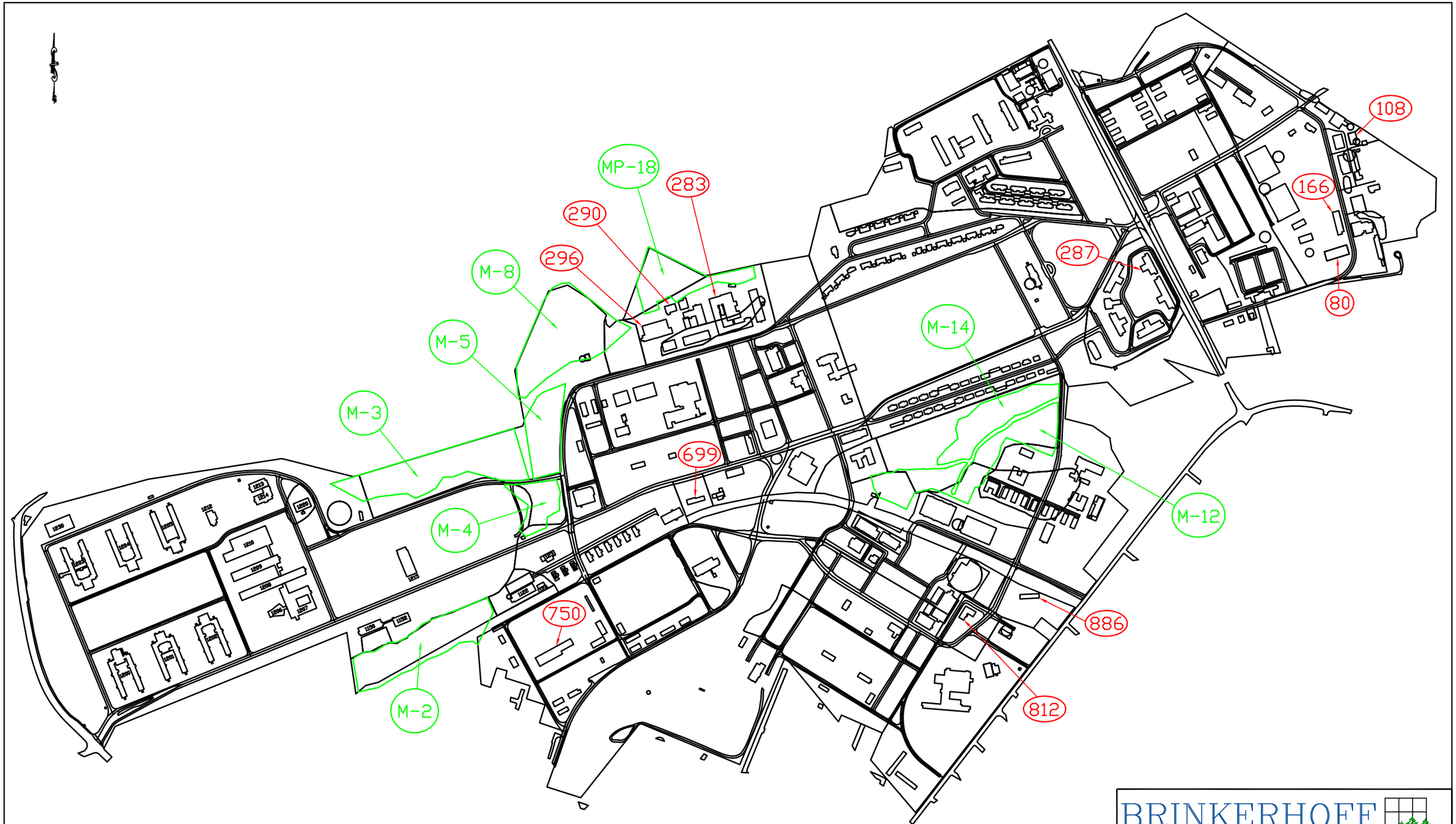
0′ 350′ 700′

SCALE: 1"=700′

BRINKERHOFF
ENVIRONMENTAL SERVICES, INC.

FIGURE 4
CONTAMINATED SITE LOCATION MAP
US ARMY FORT MONMOUTH
CHARLES WOOD AREA
FORT MONMOUTH, NEW JERSEY

DATE: 5/4/11	JOB NO.: 09BR116	SCALE: 1" = 700′



LEGEND

(886) - BUILDING NUMBER/CONTAMINATED AREA LOCATION

(M-2) - HISTORIC LANDFILL LOCATION

0′ 350′ 700′

SCALE: 1"=700′

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ENVIRONMENTAL SERVICES, INC.

FIGURE 3
CONTAMINATED SITE LOCATION MAP
US ARMY FORT MONMOUTH
MAIN POST
FORT MONMOUTH, NEW JERSEY

DATE: 5/4/11	JOB NO.: 09BR116	SCALE: 1" = 700′

Exhibit A
Base-Wide Glauconitic Soil Sampling Report

DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY GARRISON FORT MONMOUTH
FORT MONMOUTH, NEW JERSEY 07703-5000

REPLY TO
ATTENTION OF

Directorate of Public Works

March 9, 2011

Larry Quinn, Site Manager
New Jersey Department of Environmental Protection
Bureau of Investigation, Design and Construction
401 East State Street, P.O Box 413
Trenton, New Jersey 08625-0413

Subject: Base-Wide Glauconitic Soil Sampling Report
Fort Monmouth – Main Post Area
Fort Monmouth, New Jersey 07703

Dear Mr. Quinn:

On October 13, 2010, the U.S. Army Fort Monmouth, Directorate of Public Works (DPW) submitted a *Base-Wide Glauconitic Soil Sampling Plan* to determine if selected Target Analyte List (TAL) metals detected in groundwater at concentrations exceeding the New Jersey Department of Environmental Protection (NJDEP) Ground Water Quality Standards (GWQS) are naturally occurring in soils containing high amounts of glauconite. On October 29, 2010, the NJDEP provided written approval of the *Base-Wide Glauconitic Soil Sampling Plan* **(Attachment 1).**

Background

TAL metals which have been detected in samples collected from onsite groundwater monitoring wells at concentrations exceeding the GWQS include, but are not limited to: arsenic, antimony, beryllium, cadmium, lead, and zinc. There is no documented or confirmed source identified for the detections of these metals in groundwater. Several sites at Fort Monmouth are solid waste landfills containing various materials but most sites are associated with petroleum hydrocarbons resulting from leaking underground storage tanks (USTs).

Dooley (2001) analyzed the composition of naturally-occurring glauconitic soils at seven locations within the New Jersey Coastal Plain physiographic province. This study revealed that glauconitic soils contained arsenic at concentrations ranging from 7 to 31 milligrams per kilogram (mg/kg). There is evidence for a relationship between the type of geologic unit and concentrations of arsenic in the soil found in the New Jersey Coastal Plain (Rutgers, 2002). The geologic creation of arsenic-bearing glauconite is the result of depositions of algae that take up, metabolize, and retain arsenic in surface waters. When the algae dies and settles to the bottom, the arsenic in the dead algae becomes part of the deposit. When this process occurs over thousands of years, arsenic accumulates in estuaries, which are now geologically mapped as glauconite or "greensands". Glauconite is a dull-green, iron-silicate mica mineral found in shallow marine sediments.

Layers of glauconite have been identified in the New Jersey Coastal Plain, southern New Castle County, Delaware, and in the deeper units in southern Delaware. The soils that form over these glauconite-containing units, called greensands, are highly productive agriculturally and have

been determined to contain naturally-occurring arsenic and beryllium as reported by Dooley (2001).

The United States Geological Survey (USGS) reported arsenic concentrations ranging from 4.8 to 23 mg/kg in sediments collected from the Lower Susquehanna River. Similar concentrations of arsenic were found in another USGS study in which the average arsenic soil concentrations were reported as 8.3 mg/kg for New Castle County, Delaware, 4.6 mg/kg for Kent County, Delaware, and 4.9 mg/kg for Sussex County, New Jersey (USGS, 1984).

These studies indicate that the presence of arsenic and other TAL metals (e.g., beryllium, lead) detected in soil and sediment samples are attributed to natural (lithogenic) sources rather than from anthropogenic activities. In an effort to confirm and document that select TAL metals detected in groundwater on the Main Post are naturally associated with glauconitic soils, the DPW conducted a soil sampling investigation. This investigative study was necessary because the DPW believes the presence of naturally-occurring TAL metals in onsite glauconitic soils are adversely affecting groundwater quality conditions as defined by the NJDEP GWQS.

The DPW conducted an exhaustive review of all logs for monitoring wells installed at the Main Post to identify locations where the word 'glauconitic' or variations thereof (e.g. glauconite, green sands) were recorded. Glauconitic sands, silts, and/or clays were positively identified at sites 108, 296, and the M-2 Landfill. A brief summary of each site as described in the U.S. Army's *Environmental Condition of Property Report* (2007) is provided as follows:

- **Site 108** is near Riverside Avenue in the eastern section of the Main Post. The DPW removed five USTs in this area in November 1993. The site was reported to the NJDEP as a discharge to the environment and Incident No. 93-04-12-1939-29 was assigned.

- **Site 296** a former fuel distribution facility on Sherrill Avenue which was abandoned and then rediscovered during a renovation project at Building 296. The facility dates back to the 1940s. The UST system was comprised of ten 1,000-gallon USTs which stored various types of fuel products. These products were distributed from remote pumping islands located >450 feet from the UST field and within 50 feet of Parkers Creek.

- **M-2 Landfill**. The 6.5-acre landfill operated from 1964 until 1968. Materials disposed at the landfill reportedly included: construction debris, scrap metal, asbestos containing materials, vegetative waste, unwashed containers which previously held hazardous materials/wastes, outdated photographic chemicals, small quantities of outdated drugs, sludge from the STP, soot and boiler scale, incinerator ash, oil spill debris, oil filters, batteries, fluorescent tubes, and electronic components.

At each of the above locations, arsenic and lead were detected in groundwater at concentrations exceeding the GWQS of 3 and 5 micrograms per liter (µg/L), respectively. It is important to note that glauconitic-rich soils are more prevalent on the Main Post than the well logs would indicate because the well logs were not properly completed by trained personnel, e.g., soil scientist, geologist, etc. The majority of the well logs were prepared by the well drillers who have little to no training properly classifying soils using an accepted classification scheme (i.e. Unified Soil Classification System, Burmister, etc.).

According to Jablonski (1968), the Cretaceous-age Red Bank and Tinton Sands outcrop at the Main Post. The Red Bank sand conformably overlies the Navesink Formation. The upper member of the Red Bank Sand (Shrewsbury) is a yellowish-gray to reddish-brown, clayey, medium to coarse-grained sand that contains abundant rock fragments, muscovite, and glauconite. The lower member (Sandy Hook) is a dark gray to black, medium to fine-grained sand with abundant clay, muscovite and glauconite.

The Tinton Sand conformably overlies the Red Bank sand and ranges from a clayey medium to very coarse-grained feldspathic quartz and glauconitic coarse sand. The color varies from a yellowish-orange or light brown to light olive to grayish-olive. Glauconite may comprise 60 to 80% of the sand fraction in the upper portion of the Tinton Sand (Minard, 1969).

Soil and Groundwater Investigation

The soil investigation included the collection of soil samples at locations depicted on **Figure 1**. Each soil boring was advanced proximate, but not less than five feet, to the selected groundwater monitoring well where glauconite was observed during well installation activities. Geologic logs, including construction details, for the selected groundwater monitoring wells (108MW04, 296MW04, M2MW13, M2MW18, and M2MW24) are provided in **Attachment 2.**

At each soil boring, a direct-push rig (Geoprobe®) was used to advance a borehole to the depth of the proximate groundwater monitoring well. Continuous soil cores were collected by advancing dedicated acetate sleeves from the ground surface to the depth of the proximate groundwater monitoring well. Discrete soil samples from the saturated zone (water table to the bottom of the well screen as determined from the proximate monitoring well) were collected for laboratory analysis. Additional discrete soil samples were collected from the saturated zone for laboratory analysis based on lithology differing from that containing greenish glauconitic sands and silts. Prior to sample collection, any twigs, roots, and miscellaneous debris (e.g. glass, bricks, etc.) were removed from the soil sample using a decontaminated stainless steel spoon. Soil boring logs and maps showing locations of the soil borings are provided in **Attachment 3.**

All method(s)/procedure(s) for collecting grab soil samples were consistent with the methodology for obtaining Non-Volatile Organic Compound Sample Collection for Soils as per NJDEP's August 2005 *Field Sampling Procedures Manual* (Section 6.2.8). Decontamination of field sampling equipment was conducted in accordance with the DPW's *Standard Operating Procedures* (SOP) and NJDEP's August 2005 *Field Sampling Procedures Manual* (FSPM).

Subsequent to the collection of soil samples, groundwater samples were collected from the proximate monitoring well via the low-flow purging and sampling method. Applicable protocols regarding sampling, handling, storage, preservation, reporting, decontamination of field equipment, and other procedures adhered to the DPW's latest SOP for low-flow groundwater sampling (**Attachment 4**), which complies with the NJDEP FSPM.

All soil and groundwater samples were analyzed at DPW's NJDEP certified laboratory (NJDEP Certification Number 13461) for Target Analyte List (TAL) metals and Accutest Laboratories (NJDEP Certification Number 12129) for Organic Carbon (OC) using United States Environmental Protection Agency approved test methods. Soil samples were analyzed for OC not as part of the glauconitic study. Rather the OC data was used to support the fate and transport modeling effort being conducted by Brinkerhoff Environmental Services, Inc. on the Main Post.

Summary of Soil Results

A total of six soil samples were collected at three locations, namely at locations proximate to groundwater monitoring wells M2MW13, 108MW04, and 296MW06 (**Table 1**). Soil samples were not collected as proposed at M2MW18 and M2MW24 due to refusal at each location.

A review of analytical results indicates that the following metals were detected in the soil samples: aluminum (Al), antimony (Sb), arsenic (As), barium (Ba), beryllium (Be), cadmium (Cd), calcium, chromium (Cr), cobalt, copper, iron, lead, magnesium, manganese (Mn), mercury, nickel (Ni), potassium, silver (Ag), vanadium (V), and zinc (Zn). Selenium, sodium, and thallium were not detected in all soil samples.

Arsenic concentrations were detected at all locations and sample depths. Concentrations of arsenic in samples collected from Sites M-2 and 296 were consistent. Concentrations of arsenic at M-2 and 296 in the shallow (non-glauconitic layer) soil samples were 7 and 5 milligrams/kilogram (mg/kg), respectively. Similarly, concentrations of arsenic at M-2 and 296 in the deeper (glauconite-rich layer) soil samples were 7 and 6 mg/kg, respectively. At Site 108, the concentration of arsenic in the soil sample collected 7.0-8.0 feet below ground surface (bgs) was five times greater than the arsenic concentration in the shallower sample (**Table 1**). Concentrations of TAL metals in the shallow soil samples were within an order of magnitude of concentrations of TAL metals detected in the deeper soil samples (**Table 1**). All TAL metal concentrations were compliant with the NJDEP Soil Remediation Standards (SRS) as promulgated by the NJDEP in June 2008 (New Jersey Administrative Code 7:26D). The laboratory analytical reports are included in **Attachment 5**.

Table 1. Concentrations of Selected TAL Metals and OC in Soil

Sample Depth (feet bgs)	Ag	Al	As	Ba	Be	Cd	Cr	Mn	Ni	Pb	Sb	V	Zn	OC
	mg/kg (dry weight)													
Site M-2														
8.0–12.0	6	9550	7	70	2	2	106	27	15	9	2	45	63	87700
16.0–20.0*	14	11500	7	17	2	4	134	13	10	10	1	25	67	762
Site 108														
6.5–7.0	1	2540	3	5	0.3	0.6	18	9	2	16	ND	11	13	558
7.0–8.0*	2	8110	15	16	0.8	2	65	23	4	16	1	36	29	365
Site 296														
3.5–4.0	1	3560	5	4	0.5	1	73	3	2	11	3	65	13	500
12.0–12.5*	2	4860	6	27	0.8	2	69	17	5	12	2	39	27	1010
NJDEP SRS	390	78000	19	16000	16	78	—	11000	1600	400	31	78	23000	—

* – Glauconitic-rich layer; ND: not detected.

Summary of Groundwater Results

Six groundwater samples were collected from three monitoring wells, namely M2MW13, 108MW04, and 296MW06. Aqueous samples were collected at two different depths as noted in **Table 2**.

A comparison of TAL metal concentrations in the shallow and deep sampling depths show variations but are within an order of magnitude. Arsenic concentrations were detected at all three locations and sample depths. Concentrations of arsenic detected in groundwater samples ranged from 2.21 to 8.77 µg/L. The GWQS for arsenic is 3 µg/L. Arsenic concentrations exceeded the GWQS in three of the six groundwater samples. Concentrations of arsenic were nearly consistent

at both sampling depth intervals at M2MW13 (**Table 2**). The concentration of arsenic reported in the water sample collected from 296MW06 at 3.7 feet bgs (4.38 µg/L) was greater than the arsenic concentration detected in the deeper sample (2.69 µg/L at 12.25 feet bgs). Conversely, the arsenic concentration detected at 6.75 feet bgs at 108MW04 (4.94 µg/L) was less than the arsenic concentration detected in the water sample collected from 7.5 feet bgs (8.77 µg/L). The laboratory analytical reports are included in **Attachment 6**.

Table 2. Concentrations of Selected TAL Metals in Groundwater

Sample Intake (feet bgs)	Ag	Al	As	Ba	Be	Cd	Cr	Mn	Ni	Pb	Sb	V	Zn	OC
						µg/L								
Site M-2 – MW13														
10	3.95	ND	2.21	82.8	ND	1.07	0.87	155	3.07	4.84	5.58	1.80	31.2	—
18	4.24	ND	2.57	70.7	ND	1.13	0.62	149	ND	4.09	ND	1.42	15.3	—
Site 108 – MW04														
6.75	ND	1160	**4.94**	28.8	ND	1.09	7.82	14.6	4.04	**8.76**	ND	5.13	49.6	—
7.5	ND	3630	**8.77**	39.4	ND	1.35	23.0	39.5	7.64	**26.0**	5.48	13.0	118	—
Site 296 – MW06														
3.7	9.71	ND	**4.38**	250	ND	2.65	ND	2220	1.43	**7.96**	ND	1.80	ND	—
12.25	7.56	ND	2.69	202	ND	2.12	ND	1940	ND	**7.83**	ND	2.11	ND	—
NJDEP GWQS	40	200	3	6000	1	4	70	50	100	5	6	—	2000	—

ND: not detected. Concentrations in **bold** type exceed the GWQS.

It appears a correlation exists between the concentrations of arsenic and lead in groundwater, i.e., the concentrations of arsenic and lead are directly proportional to each other. To determine if the concentrations of arsenic and lead are related to each other, a geochemical association was conducted. To illustrate this, the concentration of arsenic in each groundwater sample was plotted against the corresponding concentration of lead to generate an "Arsenic-Lead" scatter plot (**Figure 1**).

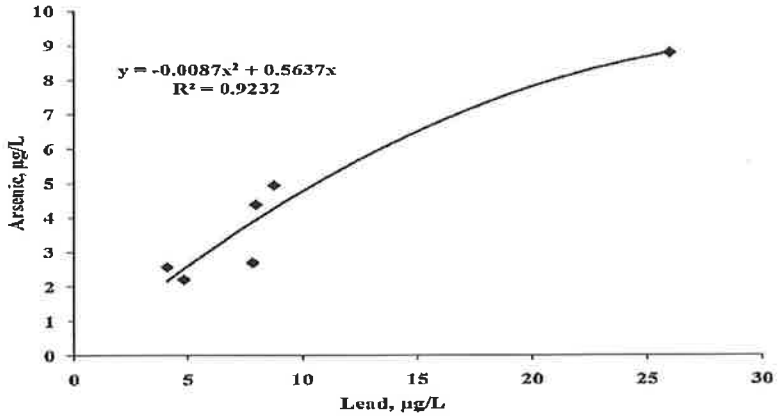

Figure 1. Scatter plot of arsenic and lead concentrations detected in groundwater.
As this figure shows, the concentration of arsenic increases with increases in the lead concentration. A second-order trendline was fitted to the data. The goodness of fit result of R^2 = 0.9232 demonstrates a strong relationship between arsenic and lead given the limited data set.

Thus, it appears that arsenic and lead co-exist as naturally occurring TAL metals, i.e. both metals are non-site related COCs.

Comparison of Arsenic and Lead in Soil and Groundwater

A comparison of TAL metals concentrations in soil and groundwater was completed and no relationship or correlation could be established. In other words, arsenic and lead concentrations in soil are not proportional or inversely proportional to the concentrations of TAL metals identified in groundwater.

Similar to DPW's investigation, Princeton Geoscience, Inc. (PGI) performed a soil and groundwater remedial investigation at a site in the New Jersey Coastal Plain (http://www.princetongeoscience.com/geonew.html). PGI identified natural arsenic concentrations in soil at concentrations up to 100 mg/kg. The elevated metals concentrations in collected groundwater samples resulted mainly from turbidity introduced into the monitoring wells during purging. Low-flow purging and monitoring well redevelopment did not eliminate turbidity in the groundwater samples.

After employing a different approach/technique, PGI compared groundwater concentrations of the trace metals to trace metal concentrations in soil NJDEP acknowledged were of naturally-occurring and identified a correlation for each of the trace metals in question. PGI states that "no remediation has been required to address this issue and Princeton Geoscience has indicated an intention not to include metals as groundwater contaminants in the Classification Exception Area information to be submitted for this site."

Summary

- Arsenic was detected in groundwater at concentrations exceeding the GWQS of 3 µg/L in three of six samples (50%).
- Lead was detected in groundwater at concentrations exceeding the GWQS of 5 µg/L in four of six samples (67%).
- The greatest concentrations of arsenic and lead in groundwater were detected adjacent to the glauconite-rich soil layer at monitoring well 108MW04 (7.5 feet bgs).
- Similarly, the greatest concentrations of arsenic (15 mg/kg) and lead (16 mg/kg) in soil were detected in a sample collected from the glauconitic-rich soil layer proximate to monitoring well 108MW04 (15 mg/kg at 7.0-8.0 feet bgs). Lead was also detected at the same concentration in the shallower soil sample depth (6.5-7.0 feet bgs).
- The greatest concentrations of arsenic in soil were identified at Site 108 where underground storage tanks used to store petroleum products were removed. Arsenic is not associated with refined petroleum products.
- A comparison of TAL metals concentrations in soil and groundwater was completed and no relationship or correlation could be established.

Conclusions

- Given that arsenic was detected at concentrations exceeding the GWQS, this confirms DPW's conclusion in Versar's *Remedial Investigation Report* (2004) that "... arsenic is likely attributable to the native soil characteristics or a non-point source distributed throughout the subsurface soils at Site 108."
- Based on a general knowledge of site historical operations and geology of the Fort Monmouth area, the presence of arsenic and lead co-exist as naturally-occurring TAL metals that are unrelated to anthropogenic activities at the three sites that were investigated.

- It appears arsenic and lead co-exist as naturally occurring TAL metals, i.e. neither metal has been detected and confirmed or documented from a source at any site.
- It appears that the source of arsenic in groundwater is due to natural conditions rather than man-made/anthropogenic sources. Vowinkel et al. (2001) reported that arsenic concentrations greater than 50 µg/L are typically are associated with known contaminated sites. The greatest concentration of arsenic identified in this study is 8.77 µg/L.

Recommendations

- To determine if suspended particles (turbidity) is proportional to detectable concentrations of metals in aqueous samples, filtered and unfiltered samples should be collected and analyzed for TAL metals by a NJ certified laboratory. Filtered samples should provide more consistent analytical results and be more representative of the water quality moving within a water-bearing zone.
- Samples of the glauconite should be collected and chemically analyzed by a certified laboratory for TAL metals to determine if arsenic and other TAL metals are present in its chemical makeup (source material).

References

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If you have any questions or require additional information, please contact John H. Montgomery, Senior Hydrogeologist, at 732-532-7979 or email: john.h.montgomery@us.army.mil.

Sincerely,

Joseph M. Fallon

Joseph M. Fallon, CHMM
Chief, Environmental Division

c: file
Attachments

Attachment 1

Base-Wide Glauconitic Soil Sampling Plan Approval Letter from NJDEP

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
SITE REMEDIATION, PUBLICLY FUNDED REMEDIATION ELEMENT
P.O. BOX 413
TRENTON, NEW JERSEY 08625-0413

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

October 29, 2010

Mr. Joseph Fallon, CHMM
Directorate of Public Works
ATTN: IMNE-MON-PWE
167 Riverside Ave.
Fort Monmouth, NJ 07703

RE: Base-Wide Glauconitic Soil Sampling Plan
Fort Monmouth, NJ

Dear Mr. Fallon:

The NJDEP Site Remediation Program (SRP) has received and reviewed the revised Base-Wide Glauconitic Soil Sampling Plan dated October 13, 2010. The stated intent of the Base-Wide Glauconitic Soil Sampling Plan is to "confirm and document that select TAL metals detected in groundwater on the Main Post are naturally associated with glauconitic soils".

As you know, SRP reviewed prior versions of the sampling plan and provided comments, primarily about the compositing of soil samples. We have also discussed the sampling plan with Chuck Appleby and John Montgomery of your staff. SRP believes that the proposed soil and ground water sampling procedures and methodologies are now technically correct. As such, we are willing to take the results of the proposed sampling into consideration. However, that is not an assurance that we will concur with the conclusions that Fort Monmouth draws from the investigation, or that the results of the proposed glauconitic soil sampling will be a significant factor in any remedial decisions.

You or your staff may contact me at 609-633-0766 with any questions on the enclosed comments, or any other site remediation matters at Fort Monmouth.

Sincerely,

Larry Quinn

Larry Quinn, P.E., Site Manager
Bureau of Investigation, Design and Construction

Attachment 2

Well Logs for 108-MW04, 296-MW04, M2-MW13, M2-MW18, and M2-MW24

Exhibit B
Site Specific Evaluations

SITE SPECIFIC EVALUATION
BUILDINGS 80 AND 166 (FTMM-56)

Sites 80 and 166 were grouped together because their close proximity to each other and minimal number of wells. Site data and 90th Percentile calculations are provided on Table 1 (attached), and summarized as follows:

90th Percentile Analysis Summary
Buildings 80 and 166

80-166	Sb	As	Ba	Be	Cd	Cr	Cu	Pb	Ni	Se*	Tl*
Feb '05 - Aug '10	n=42	n=96	n=157	n=53	n=104	n=80	n=116	n=37	n=108	n=68	n=3
90th Percentile	12.3	28.7	124.1	2.2	5.1	9.4	9.0	9.1	10.9	27.3	3.4
Mean	8.1	12.4	69.5	1.1	3.9	4.7	5.9	5.8	5.9	13.7	2.4
Adjusted Mean	7.05	9.06	48.0	0.76	1.4	2.0	4.7	4.0	4.3	9.2	1.6
NJDEP GWQS (ug/L)	**6**	**3**	**6000**	**1**	**4**	**70**	**1300**	**5**	**100**	**40**	**2**

Results reported in µg/L or parts per billion. Shaded cells indicate values that exceed the GWQS. "n" = population size in the statistical analysis. As a conservative measure, non-detectable results were not included in the statistical analysis, and thus the population size may be biased low when compared to the total number of data points. * Due to possible laboratory inaccuracies, the 90th Percentile Analysis was not used in developing sampling recommendations for these parameters.

90th Percentile Values Meet GWQS:

The 90th percentile values for barium, chromium, copper, nickel, and selenium are below their respective GWQS.

Note that due to possible laboratory inaccuracies affecting selenium and/or thallium results, the 90th Percentile Analysis was not used to determine compliance with the GWQS.

Mean Values, or Adjusted Mean Values, Meet GWQS:

The mean value for cadmium is below its GWQS.

The adjusted mean values for beryllium, lead, and thallium are below their respective GWQS.

Recommendations:

In consideration of the above, the following sampling protocol is recommended for this site:

1. Selenium and Thallium - Due to possible laboratory inaccuracies affecting selenium and/or thallium results, the 90th Percentile Analysis was not used to determine compliance with the GWQS.

Evaluation of the 4th Quarter 2010 and 1st Quarter 2011 sampling should be performed to determine compliance with the GWQS. If exceedances of the GWQS are identified, the sampling protocol specified under item 3 below should be followed.

2. With the exception of selenium and thallium (addressed above), no further sampling/analysis is recommended for metals with 90th percentile values below their respective GWQS.

3. For remaining metals, the collection of ground water samples using the following sampling protocol is recommended.

Collection of samples on a semiannual basis, targeting the times of the year typically exhibiting elevated precipitation amounts (generally 2nd and 4th quarters).

For future sampling events, raw and filtered water sample pairs should be collected from select wells (identified below), to evaluate the input from sample turbidity. Samples should be analyzed by a NJ certified laboratory. Slow-purge methodology should be followed for all sampling events which include metals analyses. Refer to the Concentration Ranking and Monitoring Well Selection Protocol described below.

Concentration Ranking and Monitoring Well Selection Protocol

For the specified sampling events, the monitoring wells recommended for sampling were selected with a bias towards those wells demonstrating the highest concentrations as follows.

For the available data from 4th Quarter 2008 through 3rd Quarter 2010, the highest observed concentrations for the site monitoring wells were ranked for each metal of concern. For larger sites, such as landfills, the highest four concentrations were listed; for smaller sites, the highest two concentrations were deemed adequate. Concentration Rankings and Recommended Well Sampling are summarized in Table 2 (attached).

Based on the specified protocol, monitoring wells 80MW01, 80MW02, and 80MW05 are recommended for sampling with laboratory analysis for antimony, arsenic, beryllium, cadmium, and lead, along with selenium and thallium as required.

Table 1. Summary of Select Metal Concentrations in Groundwater from February 2005 to August 2010 at Site 80_166

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
NJDEP Ground Water Quality Standards (µg/L)			6	3	6000	1	4	70	1300	5	100	40	2
80MW04	02/10/05	50082.06			26.8								
80MW03	02/10/05	50082.05			29.7								
MW03Duplicate	02/10/05	50082.02			28.8								
80MW02	02/10/05	50082.04			43	0.748					5.39		
80MW05*	02/10/05	50082.07		27.9	759	10.1		66.5		11.3	21.3		
80MW01	02/10/05	50082.03											
166MW01	02/10/05	50082.08			13.5								
80MW05	05/09/05	50248.07		11.3	32.5	0.58		52.6	7.14	9.93			
80MW03	05/09/05	50248.05			48.9			16.1					
80MW02	05/09/05	50248.04			44.4	1.26		5.28		6.4	6.2		
80MW04*	05/09/05	50248.06			184	***3.64***	3.8			***19.4***	14.5		
80MW01	05/09/05	50248.03											
MW01Duplicate	05/09/05	50248.02											
166MW01	05/09/05	50248.08			17.1				11.3				
80MW04	08/23/05	50418.07			202								
80MW03	08/23/05	50418.06			36.5								
80MW05	08/23/05	50418.08		***6.87***	47.3		2.7	10.3					
80MW02	08/23/05	50418.05			40.8	***1.07***					5.35		
80MW01	08/23/05	50418.03											
MW01Duplicate	08/23/05	50418.02											
166MW01*	08/23/05	50418.04			33.7		3.76		10.5				
80MW01	11/28/05	50617.04		12.2	57.1								
80MW03	11/28/05	50617.06			24.6			5.04	6.58				
80MW05	11/28/05	50617.08		8.67	54.8			20.7					
MW05Duplicate	11/28/05	50617.02		8.32	58.3			14.4					
80MW02	11/28/05	50617.05			67.9	1.87					7.24		
80MW04	11/28/05	50617.07			78.3						11.5		
166MW01	11/28/05	50617.03			16.8								
80MW05	02/23/06	60089.08			44								
80MW01	02/23/06	60089.04		8.73	75.5				5.15				
80MW03	02/23/06	60089.06			25.8			12.1	7.61				
80MW02	02/23/06	60089.05			49.6	1.42					7.21		
80MW04	02/23/06	60089.07			38.6				5.82		5.81		
166MW01	02/23/06	60089.03			12.5		2.31		6.96				
MW01Duplicate	02/23/06	60089.02			16.2		2.75		8.99				
80MW01	04/27/06	60183.04	4.09		32.1		0.535		1.72				
80MW03	04/27/06	60183.06	4.19		21.3			1.15	3.65				

Table 1. Summary of Select Metal Concentrations in Groundwater from February 2005 to August 2010 at Site 80_166

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
80MW02	04/27/06	60183.05			48.7	0.885	0.461		0.92		5.74		
80MW04	04/27/06	60183.07	3.69		27.1			2.49	8.24		4.63		
80MW05	04/27/06	60183.08	4.38	4.34	50.6			5.71	4.28		1.04		
MW01Duplicate	04/27/06	60183.02	5.09		9.18		2.01		4.75				
166MW01	04/27/06	60183.03	4.5		11		2.44	0.942	5.82				
MW02Duplicate	09/08/06	60391.02			74.3	2.05	0.736		1.91			7.32	
80MW02	09/08/06	60391.05		1.94	73.5	1.97	0.732		2.45		8.42	4.3	
80MW04	09/08/06	60391.07		3.06	60.5		0.31	2.1	7.5		8.14		
80MW05*	09/08/06	60391.08		8.34	176	0.276		42.5	14	1.5	4.28		
80MW03	09/08/06	60391.06		2.03	40.5		0.323	1.38	8.17		1.51		
80MW01	09/08/06	60391.04		5.36	36.7		0.778		2.65		1.14		
166MW01	09/08/06	60391.03		5.67	12.8	0.168	2.4	0.949	7.37		2.53		
MW01Duplicate	12/29/06	60551.02		16.3	54.8		4.66					6.2	
80MW01	12/29/06	60551.04		15.9	55.7		4.57					4.01	
80MW03	12/29/06	60551.06		2.26	14.8				6.56			3.98	
80MW04	12/29/06	60551.07			26.1		0.382		3.92		6.39		
80MW02	12/29/06	60551.05			62.5	1.31	0.593	1.17	1.53		6.37	5.65	
80MW05	12/29/06	60551.08		19	124	0.365	7.25	6.68			2.72	8.4	
166MW01	12/29/06	60551.03			14.1		1.45		3.7			5.01	
80MW03	03/14/07	70094.05			38.2		0.216	0.602	6.98			9.55	
80MW02	03/14/07	70094.04			66.1	0.606	1.25	1.77	6.17		8.62	8.25	
80MW04	03/14/07	70094.06			29.2			0.828	7.8		7.33	7.69	
80MW05	03/14/07	70094.07	1.03	9.09	59.2		1.17	2.83	6.17		2.03	8.12	
MW01Duplicate	03/14/07	70094.02		24.9	77.6		4.26	0.875	3.95	3.03	0.66	10.2	
80MW01	03/14/07	70094.03		22.5	68.9		3.66	0.741	2.06	1.33	0.504	11.7	
166MW01	03/14/07	70094.08			14.8		1.64		9.16		0.437	13.1	
80MW01	05/23/07	70189.04		25	107		3.93	2.2	7.59	7.64		5.88	
80MW02	05/23/07	70189.05		3.4	71.9	1.34	1.13	2.02	3.7	1.29	9.17	6.68	
80MW05*	05/23/07	70189.08		18	197	1.29	6.39	25.9		21	7.86	14.8	
80MW04	05/23/07	70189.07		6.45	39.4		1.12	0.985	3.57	0.737	11.9	6.87	
MW01Duplicate	05/23/07	70189.02		24.1	107		4.02	3.05	7.42	7.63	1.77	12.7	
80MW03	05/23/07	70189.06		5.68	35.3		0.498	0.768	5.05		0.704	8	
166MW01	05/23/07	70189.03		5.62	26.1		2.01	0.847	6.62		1.14	13.4	
MW01Duplicate	09/14/07	70341.02		16.2	125		0.558	0.327	2.4				
80MW01	09/14/07	70341.03		15.8	121		0.968	0.249	3.05				
80MW02	09/14/07	70341.04			90.3	1.62	1.14		1.58		9.47	4.83	
80MW04	09/14/07	70341.06		6.71	43.8			1.52	2.32		6.64		
80MW05	09/14/07	70341.07			196		0.457	3.22	4.25		4.83		

Table 1. Summary of Select Metal Concentrations in Groundwater from February 2005 to August 2010 at Site 80_166

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
80MW03	09/14/07	70341.05			30.4		0.429	1.08	5.91		0.71		
166MW01	09/14/07	70341.08			16.7		0.764	0.571			1.3		
80MW01	12/12/07	70529.04		9.01	73.7		0.385		0.709				
80MW03	12/12/07	70529.06			22.5		0.232	0.604	5.65			5.01	
80MW05	12/12/07	70529.08		4.81	266		0.405	5.56	3.89		4.11		
80MW02	12/12/07	70529.05			123	2.14	1.22		1.26		10.1	3.93	
80MW04	12/12/07	70529.07			50.7		0.605	0.223	4.14		10	4.31	
166MW01	12/12/07	70529.03			21.3		0.738		3.99				
MW01Duplicate	12/12/07	70529.02			26.5		0.86		4.95				
80MW01	03/31/08	80102.04		8.34	52.9	0.117	1.46	0.229	1.7	1.53		4.64	
80MW04	03/31/08	80102.07			23.6	0.176	0.36	0.791	6.41		7.64	8.87	
80MW05	03/31/08	80102.08		23.3	45.2		8.05	3.62		2.37	2.75	5.56	
80MW02	03/31/08	80102.05			120	2.3	1.48	1.62			13	11.6	
80MW03	03/31/08	80102.06	0.937	4.07	17.8	0.109	0.356	0.717	6.53		0.91	8.32	
MW01Duplicate	03/31/08	80102.02		4.94	15.5	0.102	1.39	0.307	5.21		0.69	8.13	
166MW01	03/31/08	80102.03			14	0.128	1.29	0.203	4.05		0.419	10.3	
80MW03	06/12/08	80198.06		4.36	23.9		0.246	2.89	5.47	1.72		8.77	
MW01Dulpicate	06/12/08	80198.02		14.6	61.1		0.796	0.54		2.62		3.67	
80MW01	06/12/08	80198.04		11.8	60.4		0.907	0.432		1.71		5.23	
80MW04	06/12/08	80198.07			32.5			0.951	3.99		9.68	7.09	
80MW02	06/12/08	80198.05			55.1	0.586		2.5	4.39		5.33	5.88	
80MW05*	06/12/08	80198.08		19.7	207		7.44	3.91		8.2	3.52		
166MW01	06/12/08	80198.03		3.38	10.9		1.14	0.318	8.09				
80MW01	08/15/08	80300.04		26.9	75.8		2.12					3.28	
80MW05*	08/15/08	80300.08		12.5	237		9.86	4.58			4.12		
80MW04	08/15/08	80300.07		5.46	50.4	0.247	1.46	0.633			24.3	3.93	
80MW02	08/15/08	80300.05		2.42	109	1.9	1.28	1.43			11.6	5.92	
80MW03	08/15/08	80300.06		3.65	26.7	0.18	0.387	1.41	1.48		1.34	4.05	
166MW01	08/15/08	80300.03		3.44	25.3		1.28	0.448	1.49		1.91	5.41	
MW01Duplicate	08/15/08	80300.02		2.65	25.1	0.124	1.11				1.85	5.24	
80MW05	12/30/08	80483.05		8.74	64.5		4.85	1.63	4.28				
80MW04	12/30/08	80483.04			36.8	0.148	0.528	0.709	3.86		6.79		
80MW03	12/30/08	80483.03		4.21	18.3		0.263	2.77	7.36		0.728	4.78	
80MW01	12/31/08	80484.04	3.57		80.5				6.12				
80MW02	12/31/08	80484.05		4.98	123	2.51	1.26		1.85		10.1		
MW01Duplicate	12/31/08	80484.02		5.79	14.9		1.7		4.92				
166MW01	12/31/08	80484.03			15.6		1.79		6.7		0.644		
80MW04	02/09/09	90040.07			33.6		0.654	1.34	3.78		9.96	9.61	

Table 1. Summary of Select Metal Concentrations in Groundwater from February 2005 to August 2010 at Site 80_166

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
80MW05	02/09/09	90040.08			68.7		8.98	1.86	6.88		2.8	13	
80MW02	02/09/09	90040.05			111	1.91	1.59		1.17		13.7	12.7	
80MW03	02/09/09	90040.06			27.8		0.384	1.86	3.72		1.98	13.3	1.91
80MW01	02/09/09	90040.04			66				3.71		1.32		3.81
166MW01	02/09/09	90040.03			19.2		1.8		5.51		3.06	15.9	
MW01Duplicate	02/09/09	90040.02			18.1		1.68	0.502	5.57		2.72	16.8	1.38
80MW02	06/26/09	90266.08	4.73	25.5	81.7	1.78	1.2	0.452	2.01	2.92	9.88	12.4	
80MW05*	06/26/09	90266.07	1.98	53.9	729	9.47	193	89.6	2.38	28.4	80.1		
MW01Duplicate*	06/26/09	90266.02	2.85	46.7	54.8		1.84	4.21	19.5	3.37	3.09	12.9	
80MW03*	06/26/09	90266.04	4.15	32.3	83		0.383	1.84	17.9	3.3	3.02	8.86	
80MW01*	06/26/09	90266.03	5.49	43.9	53		1.34	4.1	20.8	2.63	2.98	11.1	
80MW04	06/26/09	90266.05		22	48.8	0.105	0.333		4.16		10.2	13.3	
166MW01	06/26/09	90266.06	2.45	30.3	23.6		0.626		8.24		2.38	10.4	
80MW02	08/20/09	90350.05		21.4	87.5	1.88	1		2.33	2.82	9.75	49.6	
80MW05*	08/20/09	90350.08	6.91	29.5	48.1	0.143	5.16	4.77	14.9		5.13	43.7	
80MW01*	08/20/09	90350.04	9.15	63.7	125	0.057	8.53	2.52	8.86	7.53	3.39	17.8	
MW01Duplicate*	08/20/09	90350.02	9.89	61.3	126	0.06	7.79	2.32	7.94	8.83	2.74	33.4	
80MW03*	08/20/09	90350.06	10.5	34.3	110	0.098		1.85	16.7	7.01	2.34	95.3	
80MW04*	08/20/09	90350.07		17.6	65.7	0.119			4.49		15.4	40.7	
166MW01*	08/20/09	90350.03	5.85	33.9	52.5		2.97	3.21	38.1	7.25	2.56	75.1	
80MW01	11/10/09	90442.04		11.2	115								
80MW04	11/10/09	90442.07		2.18	56.9				1.23		7.78	23.9	
80MW03	11/10/09	90442.06		6.53	53.2				6.41		5.58	25.6	
80MW05	11/10/09	90442..08		22.62	101	0.111	13	2.78		9.32	4.37		
80MW02	11/10/09	90442.05		2.33	103	2.19	0.665				10.1		
MW03Duplicate	11/10/09	90442.02		3.29	50.6				3.96		1.34	31.1	
166MW01	11/10/09	90442.03		2.76	22.5						1.27	23	
LF1(1)	03/23/10	10103.04	7.57	1.73	81.3	1.14	0.515		1.06		9.05		
LF3(1)	03/23/10	10102.06	10.5	0.94	33.3				3.07		6.1		
LF3(1)	03/23/10	10102.04	11.6	4.58	24.1		1.62	2.59	5.79	2.96	2.24		
LF3(1) Duplicate	03/23/10	10102.02	10.8	1.72	39.8				7		1.47		
LF1(1)	03/23/10	10102.05	8.19	6.55	442		2.35			4.57	1.05		
LF3(1)	03/23/10	10102.03	10.9	1.01	39.2				7.07		0.554		
LF3(1) Duplicate	03/24/10	10103.02	11.9	1.47	20.6		0.87		4.88		1.84		
LF3(1)	03/24/10	10103.03	10.1	1.31	20.5		0.524		5.09		1.43		
LF2(1)*	06/23/10	10282.05	13.8	9.71	416	0.051	1.71		6.43	3			
LF2(1)	06/23/10	10282.08	9	0.98	76.8	1.23	0.696		4.18		8.68		
LF4(1)	06/23/10	10282.04	8.3	12.66	24.4		1.88	1.47	6.72	2.7	3.28		

Table 1. Summary of Select Metal Concentrations in Groundwater from February 2005 to August 2010 at Site 80_166

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
LF4(1)	06/23/10	10282.06	9.18	3.78	26.3	0.054			6.21		13.8		
LF4(1) Duplicate	06/23/10	10282.02	10.6	0.83	28.4				8.89		1.63		
LF4(1)	06/23/10	10282.03	8.63	1.03	29.8				9.15		1.6		
LF4(1)	06/23/10	10282.07	10.1	2.71	40.8	0.069	0.943		6.03		2.4		
LF5(1)	08/31/10	10374.04	12.6	12.84	39.7	0.066	1.03	9.21	5.08	5.15	4.45		
LF5(1) Duplicate	08/31/10	10374.02	10.8	2.37	28.3				8.12		2.23		
LF5(1)	08/31/10	10374.03	12.3	1.85	26.9				7.44		2.04		
LF5(1)	08/31/10	10374.05	8.29	5.14	28	0.088			2.27	2.84	16.4		
LF3(1)	08/31/10	10374.07	9.03	1.26	95.4	2.42	0.6		1.77		10.3		
LF3(1)*	08/31/10	10374.06	19.7	22.48	193		2		2.4	6.43	1.01		
LF5(1)*	08/31/10	10374.08	20	3.94	40.2				2.65	3.4	1.46		
		Mean	8.1	12.4	69.5	1.1	3.9	4.7	5.9	5.8	5.9	13.7	2.4
		90th Percentile	12.3	28.7	124.1	2.2	5.1	9.4	9.0	9.1	10.9	27.3	3.4
		Adjusted Mean	7.05	9.06	48.0	0.76	1.4	2.0	4.7	4.0	4.3	9.2	1.6

Notes:

Adjusted mean does not include metal concentrations that exceed the 90th Percentile

1) Concentrations bolded and italicized exceed applicable Ground Water Quality Standard (GWQS)
2) Concentrations bolded and italicized in red exceed applicable GWQS and the 90th Percentile
3) Concentrations highlighted in red cells exceed exceed the 90th Percentile and are deemed to be extreme outliers
4) Samples highlighted in yellow contain two or more metal concentrations that exceed the 90th Percentile
5) Blank cells indicate metals were not detected, not analyzed, or not reported due to instrument errors

M: Metal detected in method blank

* Sample contains two or more metals at concentrations exceeding the 90th Percentile

Table 2
Building 80-166
Concentration Rankings and Recommended Monitoring Well Sampling
4th Quarter 2008 - 3rd Quarter 2010

Well ID	Antimony	Arsenic	Beryllium	Cadmium	Lead	Selenium	Thallium
	NJDEP GWQS	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*
	6	*3*	*1*	*4*	*5*	*40*	*2*
80MW01	19.7	63.7		8.53	8.83	*	*
80MW02			2.51			*	*
80MW03							
80MW04							
80MW05	12.6	53.9	9.47	193	28.4	*	*
166MW01							

Notes:

Results reported in µg/L.

Within the reporting period, the two highest concentrations are listed for each parameter.

Shaded rows indicate monitoring wells recommended for metals analysis.

Metals were analyzed during the entire reporting period, 4th Quarter 2008 through 3rd Quarter 2010.

*Based on results from the 4th Quarter 2010 and 1st Quarter 2011 sampling events, analysis of Selenium and Thallium may be required.

SITE SPECIFIC EVALUATION
BUILDING 108 (FTMM-57)

Site data and 90th Percentile calculations are provided on Table 1 (attached), and summarized as follows:

90th Percentile Analysis Summary
Building 108

108	Sb	As	Ba	Be	Cd	Cr	Cu	Pb	Ni	Se*	Tl*
Jan 05 - Aug 10	n=41	n=86	n=112	n=41	N=49	n=90	n=103	n=79	n=68	n=55	n=0
90th Percentile	11.4	32.0	55.1	0.4	1.6	24.0	29.7	16.1	5.6	80.0	NR
Mean	6.8	13.8	34.2	0.3	0.8	9.8	13.1	7.7	2.5	23.8	NR
Adjusted Mean	5.8	8.9	30.0	0.2	0.6	5.7	9.4	6.1	2.1	14.6	NR
NJDEP GWQS (ug/L)	**6**	**3**	**6000**	**1**	**4**	**70**	**1300**	**5**	**100**	**40**	**2**

Results reported in µg/L or parts per billion. Shaded cells indicate values that exceed the GWQS. "n" = population size in the statistical analysis. As a conservative measure, non-detectable results were not included in the statistical analysis, and thus the population size may be biased low when compared to the total number of data points. * Due to possible laboratory inaccuracies, the 90th Percentile Analysis was not used in developing sampling recommendations for these parameters.

90th Percentile Values Meet GWQS:

The 90th percentile values for barium, beryllium, cadmium, chromium, copper, and nickel are below their respective GWQS.

Note that due to possible laboratory inaccuracies affecting selenium and/or thallium results, the 90th Percentile Analysis was not used to determine compliance with the GWQS.

Mean Values, or Adjusted Mean Values, Meet GWQS:

The mean value for selenium is below its GWQS.

The adjusted mean value for antimony is below its GWQS.

Recommendations:

In consideration of the above, the following sampling protocol is recommended for this site:

1. Selenium and Thallium - Due to possible laboratory inaccuracies affecting selenium and/or thallium results, the 90th Percentile Analysis was not used to determine compliance with the GWQS.

Evaluation of the 4th Quarter 2010 and 1st Quarter 2011 sampling should be performed to determine compliance with the GWQS. If exceedances of the GWQS are identified, the sampling protocol specified under item 3 below should be followed.

2. With the exception of selenium and thallium (addressed above), no further sampling/analysis is recommended for metals with 90th percentile values below their respective GWQS.

3. For remaining metals, the collection of ground water samples using the following sampling protocol is recommended.

Collection of samples on a semiannual basis, targeting the times of the year typically exhibiting elevated precipitation amounts (generally 2nd and 4th quarters).

For future sampling events, raw and filtered water sample pairs should be collected from select wells (identified below), to evaluate the input from sample turbidity. Samples should be analyzed by a NJ certified laboratory. Slow-purge methodology should be followed for all sampling events which include metals analyses. Refer to the Concentration Ranking and Monitoring Well Selection Protocol described below.

Concentration Ranking and Monitoring Well Selection Protocol

For the specified sampling events, the monitoring wells recommended for sampling were selected with a bias towards those wells demonstrating the highest concentrations as follows.

For the available data from 4th Quarter 2008 through 3rd Quarter 2010, the highest observed concentrations for the site monitoring wells were ranked for each metal of concern. For larger sites, such as landfills, the highest four concentrations were listed; for smaller sites, the highest two concentrations were deemed adequate. Concentration Rankings and Recommended Well Sampling are summarized in Table 2 (attached).

Based on the specified protocol, monitoring wells 108MW01, 108MW02, 108MW03, and 108MW04 are recommended for sampling with laboratory analysis for antimony, arsenic, and lead, along with selenium and thallium as required.

Table 1. Summary of Select Metal Concentrations in Groundwater from January 2005 to August 2010 at Site 108

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium
NJDEP Ground Water Quality Standard (µg/L)			6	3	6000	1	4	70	1300	5	100	40
MW01 Duplicate	01/31/05	50054.02			41.7			22	6.43	15.7		
108MW01	01/31/05	50054.03			41.5			21.2	6.03	13.7		
108MW02	01/31/05	50054.04		*7.15*	37.8			15.7	10.1	7.91		
108MW04*	01/31/05	50054.06		*13.9*	50.7	[redacted]		118	26.6	40.5	9.93	
108MW03	05/02/05	50233.05			11.4							
108MW01	05/02/05	50233.03			21.5							
MW01 Duplicate	05/02/05	50233.02			20.1							
108MW02	05/02/05	50233.04			44.7			21.4	13	9		
108MW03	08/12/05	50400.05		*18.9*	36.1		2.39					
108MW02	08/12/05	50400.04		*5.9*	49.7				39.1			
108MW01	08/12/05	50400.03			44			9	6.28			
MW01 Duplicate	08/12/05	50400.02		*5.88*	51.6			17.4	9.04	14.7		
108MW04	08/12/05	50400.06			25.9			13.8				
108MW01	11/14/05	50593.03			44.1				6.21	5.43		
MW01 Duplicate	11/14/05	50593.02			43.9				37.1	5.19		
108MW04	11/14/05	50593.06		*9.26*	31.6			60.8	12.6	12.1		
108MW03	11/14/05	50593.05		*9.22*	18.8			6.72	11	6.16		
108MW02*	11/14/05	50593.04		*12.4*	54.8		2.15	23.7	9.76	6.44	5.66	
108MW03	01/20/06	60039.05		*7.03*	14.3							
108MW01	01/20/06	60039.03			21.2							
108MW02	01/20/06	60039.04			39.5			8.12	16.7			
108MW04	01/20/06	60039.06			10.7			7.06	20.9			
MW03 Duplicate	01/20/06	60039.02		*8.17*	17.1			5.51	7.31			
108MW01	04/18/06	60163.03	*6.52*		32	0.172		3.46	2.15			
108MW02*	04/18/06	60163.04		*27*	83.2	0.641	1.41	43.5	36.4	16.1	4.11	
MW02 Duplicate*	04/18/06	60163.02	4.32	*18.3*	69.3	0.453	1.14	33.3	24.1	10.1	3.39	
108MW03*	04/18/06	60163.05	3.08	*4.12*	66.5	0.187	1.74	4.9	38.5	4.38	2.53	
108MW04	04/18/06	60163.06	2.99		19.9	0.324	0.37	13.2	14.5	1.98	1.02	
108MW04	07/19/06	60325.06	5.95	*5.69*	27.3			4.86	33.5	4.37		
108MW03	07/19/06	60325.05	4.25	*15.8*	25.1			3.29	30.8			
108MW01	07/19/06	60325.03	4.91	*7.68*	53.3			12.2	9.59	9.55		
108MW02	07/19/06	60325.04	4.34	*13.2*	53.8	0.11		26.4	11.2	16.1	2.3	
MW01 Duplicate*	07/19/06	60325.02	5.68	*12.1*	58.6	0.122		27.2	12.4	12.8	1.33	
108MW04	10/27/06	60468.06		2.99	19.8	0.312	0.54	6.57	20.9	5.78		7.7
108MW01	10/27/06	60468.03		*5.12*	40	0.324		5.56	0.92	2.32		10.1
108MW03	10/27/06	60468.05		*4.23*	16.6	0.28	0.73	4.93	11.3	3.41		3.57
108MW02	10/27/06	60468.04		*5.96*	50.1	0.318	0.64	4.55	6.97	1.27		7.25
108MW03	01/09/07	70013.05			13.6	0.145	1.01	4.51	15.7	1.85		3.37
108MW01	01/09/07	70013.03		*3.49*	25.1	0.104	0.35	3.79	2.66	1.57		9.58
MW01 Duplicate	01/09/07	70013.02		2.69	25.1		0.41	2.35	3.2	1.7		11.2
108MW04	01/09/07	70013.06			11.6		0.39	1.33	5.79	1.64		5.4
108MW02	01/09/07	70013.04		*3.26*	26.5	0.154	0.7	6.05	9.81	3.07	1.4	6.75

Table 1. Summary of Select Metal Concentrations in Groundwater from January 2005 to August 2010 at Site 108

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium
NJDEP Ground Water Quality Standard (ug/L)			6	3	6000	1	4	70	1300	5	100	40
108MW02	04/25/07	70148.04		***3.49***	35.3	0.321	0.78	0.765	10.4	3.16	2.75	11.4
MW02 Duplicate	04/25/07	70148.02			41.3	0.359	0.87	1.47	13.3	5.26	2.69	10.3
108MW03	04/25/07	70148.05			16.1	0.243	1.36	2.07	3.45		2.51	8.61
108MW04	04/25/07	70148.06			17.4	0.325	0.93	2.85	18.1	14.3	2.25	7.44
108MW01	04/25/07	70148.03		***4.55***	23.4	0.288	0.65	1.11		0.8	1.62	14.1
108MW01	08/03/07	70293.03	0.955	***10.1***	41.8			0.917	3.49			9.86
108MW03	08/03/07	70293.05		***10.6***	24.7		0.23	0.758	11.3			5.3
108MW02	08/03/07	70293.04		***6.33***	42.3		0.48	1.12	9.9	2.05	1.84	7.23
108MW04	08/03/07	70293.06		***6.59***	36.5				30.4		0.665	9.78
MW01 Duplicate	08/03/07	70293.02		***7.67***	40.8			0.259	2.77		0.336	10.3
108MW04	12/03/07	70502.06		***4.17***	9.99			1.81	29.8	6.49		3.9
108MW01	12/03/07	70502.03			22.3			1.29	1.58	0.96		
MW01 Duplicate	12/03/07	70502.02			21.7		0.32	1.19	1.93	1.47		5.03
108MW02	12/03/07	70502.04			26.4			1.15	6.92	3.07		
108MW03	12/03/07	70502.05		***3.13***	13.9		0.39	0.877	18.7	2.69		3.68
108MW02	03/06/08	80070.04	M	***5.52***	38.5		0.41	1.14	19.5	6.73	7.11	
MW01 Duplicate	03/06/08	80070.02	M		29		0.24	1.13	9.91	4.25	6.71	
108MW03	03/06/08	80070.05	0.804 M	***5.86***	31.8		1.33	1.96	29.5	1.19	6.37	
108MW01	03/06/08	80070.03	M	***4.32***	29.6		0.23	1.47	9.84	4.85	6.12	
108MW04	03/06/08	80070.06	M	***4.54***	7.68			1.2	18.3		5.78	
108MW01	04/30/08	80144.03	3.13 M	***3.82***	29.7	0.237 M	0.41	5.39	2.82	5.43	2.74 M	10.2 M
108MW03	04/30/08	80144.05	M	2.47	14.7	0.111 M	0.61	1.32	19.4	5.26	2.55 M	3.92 M
108MW02	04/30/08	80144.04	M		39.5	0.133 M	0.33	0.969	7.75	2.54	2.54 M	6.63 M
MW01 Duplicate	04/30/08	80144.02	1.57 M		3.13	0.282 M	0.35	1.42	4.49	10.9	1.97 M	8.67 M
108MW04	04/30/08	80144.06	M	***9.53***	8.87	0.147 M		0.613	5.25		1.58 M	3.12 M
108MW02	08/06/08	80282.04		***13.8***	53		1.57	1.9	3.5	5.59	2.55	4.6 M
MW01 Duplicate	08/06/08	80282.02		***5.03***	47.6		0.45	0.96	2.35	4.41	0.993	11.2 M
108MW01	08/06/08	80282.03	1.69	***4.5***	46.8		0.37	0.962	1.49	2.45	0.931	11.5 M
108MW04	08/06/08	80282.06		***4.92***	9.76		0.32	1.91	7.9		0.824	3.68 M
108MW03	08/06/08	80282.05		***6.6***	16		0.63	2.52	5.32	1.39	0.631	4 M
108MW03*	10/15/08	80370.05		***13.8***	35.7	0.411 M	1.97	26.8	60.3	12.5	5.43	3.38 M
108MW02	10/15/08	80370.04	1.65	***19.6***	74.3	0.236 M	0.46	14.3	18.1	7.42	2.51	M
108MW01*	10/15/08	80370.03		***7.7***	62.5	0.41 M	0.64	15.8	13.3	30.8	2.12	5.63 M
108MW04	10/15/08	80370.06		***3.23***	18	0.281 M	0.35	9.47	25.3	5.38	1.32	6.99 M
MW01 Duplicate*	10/15/08	80370.02		***6.93***	56.1	0.379 M	0.58	6.62	9.61	20.9	1.18	4.33 M
108MW02*	02/17/09	90057.04	***18.2*** M	***81.2*** M	40.1		M	3.28	9.93	12.6 M		***85.1*** M
108MW04	02/17/09	90057.06	***7.85*** M	***52.9*** M	14.6		M	1.57	18.5	9.74 M		***71.8*** M
108MW01	02/17/09	90057.03	***11.4*** M	***11.7*** M	41.8		M	1.07	7.85	16.1 M		***113*** M
108MW03*	02/17/09	90057.05	***19.5*** M	***124*** M	36.5		0.57 M	0.583	9.81	4.98 M		***107*** M
MW04 Duplicate*	02/17/09	90057.02	***14*** M	***72.9*** M	13.8		0.7 M	2.76	11.7	1.71 M	1.96	***43.4*** M
MW04 Duplicate*	06/30/09	90270.02	***7.37*** M	***22.6***	36.9	0.669	0.38	72.5	59.4	22.7	5.58 M	10.4 M
108MW04*	06/30/09	90270.06	1.35 M	***19.2***	33.1	0.418	0.63	30.4	81.8	25.1	5.16 M	17 M

Table 1. Summary of Select Metal Concentrations in Groundwater from January 2005 to August 2010 at Site 108

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium
NJDEP Ground Water Quality Standard (µg/L)			6	3	6000	1	4	70	1300	5	100	40
108MW02	06/30/09	90270.04	4.62 M	***25.1***	55.1			6.1	11.7	6.2	4.56 M	35.5 M
108MW01	06/30/09	90270.03	***6.94*** M	***28.2***	34.5				5.68	2.9	2.78 M	***40.8*** M
108MW03*	06/30/09	90270.05	***8.73*** M	***35.7***	105		0.54		8.49	1.61	2.48 M	***46.4*** M
108MW02*	08/28/09	90362.04	5.71	***58.2***	94.1	0.337	2.25	5.34	2.72	16	4.69 M	***116***
108MW01	08/28/09	90362.03	***7.06***	***32.1***	43.7	0.06			6.23	10.4	1.01 M	***77.9***
108MW03	08/28/09	90362.05		***37.7***	41.3				2.22	2.43	0.617 M	***73.1***
MW04 Duplicate*	08/28/09	90362.02	***7.4***	***36.1***	44.8			5.85	11.9	4.04	0.572 M	***81.4***
108MW04	08/28/09	90362.06	***7.58***	***31.9***	40.8			6.02	19.1	5.26	0.42 M	***89.2***
108MW01	11/06/09	90439.03	***6.34***	***10.3***	44.7	0.108		5.77	7.58	26	2.32 M	13.6 M
108MW03	11/06/09	90439.05		***6.54***	27.6						1.95 M	M
108MW02	11/06/09	90439.04		***6.42***	67.8				3.25	2.82	1.66 M	9.21 M
MW04 Duplicate	11/06/09	90439.02		***8.69***	11.2			8.51	8.03	2.98	1.58 M	9.61 M
108MW04	11/06/09	90439.06		***9.73***	10.8			3.41	11.7	3.55	1.37 M	8.1 M
LF3(1)	02/19/10	10062.04	***6.48***	***9.18***	50.2	0.11	0.51	16.2	9.64	7.6	2.89	
LF3(1)	02/19/10	10062.05	***8.66***	2.31	32.7				4.27		1.12	
LF3(1)	02/19/10	10062.06		***7.23***	5.72			3.35	7.5		0.89	
LF3(1) Duplicate	02/19/10	10062.02		***6.5***	6.03			3.92	7.22		0.796	
LF3(1)	02/19/10	10062.03		2.33	14.3			2.88	3.11		0.779	
LF4(1) Duplicate	05/07/10	10178.02	***6.41***	***5.19***	17.4	0.07		10.7	10.6 M	4.7	2.46 M	
LF4(1)	05/07/10	10178.03		***5.02***	14.8			7.14	8.56 M	3.72	1.65 M	
LF4(1)	05/07/10	10178.04	***6.32***	2.64	47.3			2.61	4.26 M		1.58 M	
LF4(1)	05/07/10	10178.05	***7.64***	***4.13***	33.4				2.55 M		1.27 M	
LF4(1) Duplicate	05/10/10	10180.02	***10.7***	2.91	23.9			1.75	1.85 M		1.27 M	
LF4(1)	05/10/10	10180.03	***12.1***	2.61	23.7			1.8	1.95 M		1.02 M	
LF5(1)	08/19/10	10352.02	***9.33***	***6.68***	62.1		1.33		7.72	5	4.45	M
LF5(1)	08/19/10	10352.04	***7.97***	***9.1***	27.4				4.7		1.23	M
LF5(1)	08/19/10	10352.03	***8.82***	***3.16***	46.2				3.95	6.91	1.21	M
LF5(1)	08/19/10	10352.01	***7.91***	1.79	29				5.26		1.05	M
		Mean	6.8	13.8	34.2	0.3	0.8	9.8	13.1	7.7	2.5	23.8
		90th Percentile	11.4	32.0	55.1	0.4	1.6	24.0	29.7	16.1	5.6	80.0
		Adjusted Mean	5.8	8.9	30.0	0.2	0.6	5.7	9.4	6.1	2.1	14.6

Notes: Adjusted mean does not include metal concentrations that exceed the 90th Percentile
1) Concentrations bolded and italicized exceed applicable Ground Water Quality Standard (GWQS)
2) Concentrations bolded and italicized in red exceed applicable GWQS and the 90th Percentile
3) Concentrations highlighted in red cells exceed exceed the 90th Percentile and are deemed to be extreme outliers
4) Samples highlighted in yellow contain two or more metal concentrations that exceed the 90th Percentile
5) Blank cells indicate metals were not detected, not analyzed, or not reported due to instrument errors
M: Metal detected in method blank
* Sample contains two or more metals at concentrations exceeding the 90th Percentile

Table 2
Building 108
Concentration Rankings and Recommended Monitoring Well Sampling
4th Quarter 2008 - 3rd Quarter 2010

Well ID	Antimony	Arsenic	Lead	Selenium	Thallium
	NJDEP GWQS	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*
	6	*3*	*5*	*40*	*2*
108MW01			30.8	*	*
108MW02	18.2	81.2		*	*
108MW03	19.5	124		*	*
108MW04			25.1	*	*

Notes:

Results reported in µg/L.

Within the reporting period, the two highest concentrations are listed for each parameter.

Shaded rows indicate monitoring wells recommended for metals analysis.

Metals were analyzed during the entire reporting period, 4th Quarter 2008 through 3rd Quarter 2010.

*Based on results from the 4th Quarter 2010 and 1st Quarter 2011 sampling events, analysis of Selenium and Thallium may be required.

SITE SPECIFIC EVALUATION
BUILDING 283 (FTMM-61)

Site data and 90th Percentile calculations are provided on Table 1 (attached), and summarized as follows:

90th Percentile Analysis Summary
Building 283

283	Sb	As	Ba	Be	Cd	Cr	Cu	Pb	Ni	Se*	Tl*
Jan 05 - Sept 10	n=32	n=98	n=152	n=101	n=68	n=120	n=82	n=76	n=122	n=73	n=7
90th Percentile	10.84	32.23	172.60	1.37	2.07	30.62	11.86	14.49	15.46	20.04	1.87
Mean	5.54	13.68	85.11	0.58	0.82	18.60	4.87	7.28	7.30	11.27	1.55
Adjusted Mean	4.32	9.98	64.56	0.45	0.58	5.36	3.51	5.88	5.90	6.65	1.47
NJDEP GWQS (ug/L)	**6**	**3**	**6000**	**1**	**4**	**70**	**1300**	**5**	**100**	**40**	**2**

Results reported in µg/L or parts per billion. Shaded cells indicate values that exceed the GWQS. "n" = population size in the statistical analysis. As a conservative measure, non-detectable results were not included in the statistical analysis, and thus the population size may be biased low when compared to the total number of data points. * Due to possible laboratory inaccuracies, the 90th Percentile Analysis was not used in developing sampling recommendations for these parameters.

90th Percentile Values Meet GWQS:

The 90th percentile values for barium, cadmium, chromium, copper, nickel, selenium, and thallium are below their respective GWQS.

Note that due to possible laboratory inaccuracies affecting selenium and/or thallium results, the 90th Percentile Analysis was not used to determine compliance with the GWQS.

Mean Values, or Adjusted Mean Values, Meet GWQS:

The mean value for antimony and beryllium are below their respective GWQS.

Recommendations:

In consideration of the above, the following sampling protocol is recommended for this site:

1. Selenium and Thallium - Due to possible laboratory inaccuracies affecting selenium and/or thallium results, the 90th Percentile Analysis was not used to determine compliance with the GWQS.

Evaluation of the 4th Quarter 2010 and 1st Quarter 2011 sampling should be performed to determine compliance with the GWQS. If exceedances of the GWQS are identified, the sampling protocol specified under item 3 below should be followed.

2. With the exception of selenium and thallium (addressed above), no further sampling/analysis is recommended for metals with 90th percentile values below their respective GWQS.

3. For remaining metals, the collection of ground water samples using the following sampling protocol is recommended.

Collection of samples on a semiannual basis, targeting the times of the year typically exhibiting elevated precipitation amounts (generally 2nd and 4th quarters).

For future sampling events, raw and filtered water sample pairs should be collected from select wells (identified below), to evaluate the input from sample turbidity. Samples should be analyzed by a NJ certified laboratory. Slow-purge methodology should be followed for all sampling events which include metals analyses. Refer to the Concentration Ranking and Monitoring Well Selection Protocol described below.

Concentration Ranking and Monitoring Well Selection Protocol

For the specified sampling events, the monitoring wells recommended for sampling were selected with a bias towards those wells demonstrating the highest concentrations as follows.

For the available data from 4th Quarter 2008 through 3rd Quarter 2010, the highest observed concentrations for the site monitoring wells were ranked for each metal of concern. For larger sites, such as landfills, the highest four concentrations were listed; for smaller sites, the highest two concentrations were deemed adequate. Concentration Rankings and Recommended Well Sampling are summarized in Table 2 (attached).

Based on the specified protocol, monitoring wells 283MW01, 283MW02, 283MW03, 283MW04, and 283MW05 are recommended for sampling with laboratory analysis for antimony, arsenic, beryllium, and lead, along with selenium and thallium as required.

NOTE: Above sampling does not include additional wells recommended for installation.

Table 1. Summary of Select Metal Concentrations in Groundwater from January 2005 to September 2010 at Site 283

SiteWELL_ID	Date_Collected	Lab_ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
NJDEP Ground Water Quality Standards (µg/L)			6	3	6000	1	4	70	1300	5	100	40	2
283MW06	1/20/2005	50041.09			52.2								
283MW02	1/20/2005	50041.05		6.91	32					17.7			
283MW05	1/20/2005	50041.08		7.36	73.7			74.4		5.63			
MW04 Duplicate*	1/20/2005	50041.03		28.6	258	1.4		160	7.9	14	9.87		
283MW03	1/20/2005	50041.06			137						7.55		
283MW01*	1/20/2005	50041.04			170	1.39					20.7		
283MW04*	1/20/2005	50041.07		53.5	493	2.71		302	14.5	26	18.2		
283MW02	4/20/2005	50210.05		13.5	34.8			21.3		18.4			
MW02-Duplicate	4/20/2005	50210.03		13.9	34.9			16.4		19.5			
283MW06	4/20/2005	50210.09			54.2			11.8					
283MW03	4/20/2005	50210.06			79.4						7.49		
283MW04	4/20/2005	50210.07		16.4	162	0.934		93	5.02	5.78	6.13		
283MW05	4/20/2005	50210.08		10.7	83.8	0.515		78.9			5.52		
283MW01	4/20/2005	50210.04			141	1.23					17.1		
MW02-Duplicate	8/9/2005	50388.03		19.5	41.1			17.1	5.06	17.1			
283MW02	8/9/2005	50388.05		15.3	40.3			15.2		17.1			
283MW03	8/9/2005	50388.06		6.53	180						8.16		
283MW01*	8/9/2005	50388.04			234	2.17			8.93		23.2		
283MW06*	8/9/2005	50388.09		39.6	98.1	1.15	4.42	176	19.7	6.32	19.7		
283MW05*	8/9/2005	50388.08		23.2	126	0.637		86	12.7		16.5		
283MW04*	8/9/2005	50388.07		40.9	290	1.49	3.29	150	19.5	9	15		
283MW06	11/2/2005	50573.09			58.8								
283MW05	11/2/2005	50573.08			17.1								
283MW04	11/2/2005	50573.07			14.1								
283MW02	11/2/2005	50573.05		6.82	34.5			9.73		12.1			
MW02-Duplicate	11/2/2005	50573.03		6.04	37.7			11.8		12.3			
283MW03	11/2/2005	50573.06			83.3						7.15		
283MW01	11/2/2005	50573.04			143	1.11					13.9		
283MW06	1/13/2006	60030.09			52.5								
283MW02	1/13/2006	60030.05		5.97	34.3					9.2			
MW02-Duplicate	1/13/2006	60030.03		5.34	35.5			6.58		9.76			
283MW04	1/13/2006	60030.07			27.5			13.4					
283MW05	1/13/2006	60030.08			29.9			10.6					
283MW03	1/13/2006	60030.06			107						7.47		
283MW01*	1/13/2006	60030.04			205	1.96			6.81		24.4		

Table 1. Summary of Select Metal Concentrations in Groundwater from January 2005 to September 2010 at Site 283

SiteWELL_ID	Date_Collected	Lab_ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
283MW06*	4/18/2006	60161.09		26	109	0.918		145	13.2	1.74	9.59		
283MW03	4/18/2006	60161.06	2.3	2.67	164	0.13		1.62			7.78		
MW02-Duplicate	4/18/2006	60161.03		12.6	39.2	0.237	0.377	30.8	3.86	7.49	4.56	4.39	
283MW05	4/18/2006	60161.08		7.29	74.9	0.279		29.9	4.58		4.06		
283MW02	4/18/2006	60161.05		13.2	38.6	0.228		27.9	3.94	7.72	3.53	4.76	
283MW01*	4/18/2006	60161.04	3.13		181	1.59	0.93	1.46	3.33		22.2	3.78	
283MW04	4/18/2006	60161.07		5.87	94.3	0.493		42.8	7.77		2.94		
283MW05	7/25/2006	60335.08	2.46		19.6			1.21	1.67				
283MW03	7/25/2006	60335.06	4.73	2.49	150				1.14		6.74		
283MW02	7/25/2006	60335.05		16.2	36.6	0.202	0.863	27.7	7.94	10.4	5.48	5.91	
283MW06*	7/25/2006	60335.09		14.7	121	0.551	0.393	87.9	13.1		4.95		
MW02-Duplicate	7/25/2006	60335.03		13.1	30.2	0.144	0.574	13.2	4.47	7.84	3	4.47	
283MW01*	7/25/2006	60335.04	3.83		173	1.66	0.647	1.99	6.83		17.9		
283MW04	7/25/2006	60335.07			17.8			1.91	2.32		1.08		
283MW04	10/30/2006	60470.07			11.3	0.212	0.469	1.96				3.47	
283MW05	10/30/2006	60470.08			18.2	0.235	0.346	1.96				4.85	
283MW06	10/30/2006	60470.09			37.7	0.21	0.319	1.77				5.98	
283MW03	10/30/2006	60470.06		2.71	91.8	0.189	1.48				6.72	4.13	
283MW01	10/30/2006	60470.04			144	1.71	0.412	0.956	1.39		14.5		
283MW02	10/30/2006	60470.05		14.4	31.4	0.302	0.931	6.99	0.663	5.12	1.59	7.04	
MW02-Duplicate	10/30/2006	60470.03		13.9	30.4	0.377	0.532	5.26		5.57	1.05	7.92	
283MW06	2/1/2007	70042.09		3.91	41	0.155	0.575	2.38	2.38			3.7	
283MW02	2/1/2007	70042.05		26.9	35.7	0.133	1.54	1.87		8.78		7.82	
283MW03*	2/1/2007	70042.06		6.82	280	0.267	3.87				7.93		
283MW05	2/1/2007	70042.08		4.06	75.1	0.277	0.827	2.94	3.45		2.84		
283MW01	2/1/2007	70042.04			114	1.1		0.94	2.58		13.1		
MW02 Duplicate	2/1/2007	70042.03		29.5	37.2	0.133	2.18	2.16	0.813	9.79	1.45	6.05	
283MW04	2/1/2007	70042.07			21.1	0.203	0.958	2.32	1.51		1.27	5.3	
283MW06	5/3/2007	70161.09			22.3			1.21	1.46			4.85	
283MW03	5/3/2007	70161.06		5.2	139		1.52	1.32			7.47	3.03	
283MW01	5/3/2007	70161.04			106	0.897	0.206	0.609	2.77		12.7	5.59	
283MW05	5/3/2007	70161.08			47.1	0.159	0.41	9.88	4.29	0.93	1.61	4.74	
MW02 Duplicate	5/3/2007	70161.03		11.8	44		0.712	1.63	2.26	11.3	1.41	9.44	
283MW02	5/3/2007	70161.05		12.4	45.7		0.562	1.91	2.07	11.8	1.21	8.04	
283MW04	5/3/2007	70161.07			11.5		0.372	0.886	2.49		0.576	3.53	
283MW03	7/27/2007	70283.06		3.98	166		2.06				7.43		

Table 1. Summary of Select Metal Concentrations in Groundwater from January 2005 to September 2010 at Site 283

SiteWELL_ID	Date_Collected	Lab_ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
283MW01	7/27/2007	70283.04			117	1.15		1.02	3.39		12.4	4.07	
283MW05	7/27/2007	70283.08		4.19	45	0.149	0.608	4.68	4.04	1.37	1.98	3.77	
283MW02	7/27/2007	70283.05	3.13	9.41	29.8		0.373	8.61	4.23	5.54	1.7	5.84	
MW02 Duplicate	7/27/2007	70283.03		9.31	29.9		0.392	6.16	4.03	6.68	1.31	4.1	
283MW04	7/27/2007	70283.07			10.7		0.433	1.6	0.905		0.717		
283MW06	7/27/2007	70283.09			21.7			0.387	0.908		0.323		
283MW03	11/20/2007	70477.06			163	0.198				1.06	7.71		
283MW05	11/20/2007	70477.08	1.22	3.18	94.8	0.291	0.375	1.49	3.82	0.9	4.75	5.77	
283MW04	11/20/2007	70477.07	1.8	3.01	54.8	0.283	0.243	5.85	4.25	1.85	3.14	5.49	
283MW01*	11/20/2007	70477.04	3.08		138	1.52	0.927	1.16	2.84	1.72	15.5	4.86	
283MW06	11/20/2007	70477.09			42.5	0.183	0.203	1.16		0.79	1.53	5.73	
283MW02	11/20/2007	70477.05	1.37	4.8	40.2	0.176		1.87		4.13	1.26	7.61	
MW02 Duplicate	11/20/2007	70477.03		6.2	39.6	0.131		2.32		4.05	0.734	8.27	
283MW05	3/6/2008	80069.08			54.7	0.146	0.294	8.56	4.09		6.42		
283MW02	3/6/2008	80069.05		7.67	41.3			4.89	2.04	7.86	5.16	9.64	
283MW04	3/6/2008	80069.07			21.4	0.107		6.84	3.47		4.98		
283MW06	3/6/2008	80069.09			49.6	0.101	0.249	6.07	1.99		4.9	3.65	
283MW01	3/6/2008	80069.04			133	1.14	0.624	0.949	5.77		21.4		
MW01 Duplicate	3/6/2008	80069.03			134	1.16	0.581	1.1	4.08		20	4.2	
283MW03	3/6/2008	80096.06		5.62	227		0.226		1.38		12.3		
283MW05	5/2/2008	80150.08		2.76	41.8	0.224		1.09			3.16	4.24	
283MW02	5/2/2008	80150.05		23.2	38.7	0.205	0.304	2.98		8.05	2.18	9.33	
283MW04	5/2/2008	80150.07			11.8	0.214		2.03			2.15	6.65	
MW01 Duplicate	5/2/2008	80150.03			110	1.15	0.287	0.802	2.01		15.1	6.32	
283MW01	5/2/2008	80150.04			112	1.23		0.532	1.53		14.9	5.65	
283MW03	5/2/2008	80150.06		5.45	168	0.238	2.87			1.43	10.6		
283MW06	5/2/2008	80150.09		4.45	46.3	0.222	0.392	2.57	0.733		1.83	5.86	
283MW05	8/6/2008	80280.08			84	0.204	0.544	3.25	4.96		4.34	3.67	
283MW04	8/6/2008	80280.07			37.1	0.124	0.497	3.66	7.02		2.38	5.98	
283MW01	8/6/2008	80280.04			118	1.28	0.476	1.26	2.14		13.4	8.88	
MW01 Duplicate	8/6/2008	80280.03			117	1.27	0.357	1.23	2.39		12.9	3.9	
283MW03*	8/6/2008	80280.06		4.06	231		2.47				11		
283MW02	8/6/2008	80280.05		8.48	48.9		0.644	2.57		4.73	1.95	9.83	
283MW06	8/6/2008	80280.09			48		0.441	2.36	1.2		0.874	4.39	
283MW03	10/23/2008	80385.06			205	0.208					9.78		1.75
283MW02	10/23/2008	80385.05		13.3	29.7	0.203	0.28	1.8		7.34	2.45	8.33	1.48

Table 1. Summary of Select Metal Concentrations in Groundwater from January 2005 to September 2010 at Site 283

SiteWELL_ID	Date_Collected	Lab_ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
MW01 Duplicate	10/23/2008	80385.02		3.95	113	1.21	0.838	1.08	2.16	2.48	13	6.52	1.6
283MW01	10/23/2008	80385.04			111	1.2	0.866	1.05	1.98		12.9	6.58	
283MW05	10/23/2008	80385.08		6.81	20	0.266	0.326	0.72		2.13	1.34	4.95	1.4
283MW04	10/23/2008	80385.07			6.56	0.202	0.252	0.655		2.37	1.17	7.28	2.05
283MW06	10/23/2008	80385.09			24.8	0.24	0.232	0.659		1.8	0.96	7.72	1.55
283MW06	3/12/2009	90104.09			64.4	0.124	0.29	2.83	3.21	3.42			
283MW04	3/12/2009	90104.07			13.9		0.21	2.02	3.33			5.11	
283MW03	3/12/2009	90104.06	12.1	64	320	0.136		1.11		7.1	7.29	43.3	
MW01 Duplicate*	3/12/2009	90104.03	10.3	10.3	88.3	0.832		1.28	2.32		12.1	50.9	
283MW01	3/12/2009	90104.04		2.98	87.8	0.787		1.43	2.48	1.53	11.2	47.8	
283MW02*	3/12/2009	90104.05	1.29	39.1	37.3			14		10.4	1.64	30.3	
283MW05	3/12/2009	90104.08			49.5	0.151		1.61	2.11		0.985	20.1	
283MW01	5/19/2009	90203.04	1.2	1.2	72.6	0.713	0.606	0.663	2.49	2.62	9.8	5.02	
MW01 Duplicate	5/19/2009	90203.03	2.03	11.9	70.3	0.677	0.404	0.394	2.15		9.33		
283MW02	5/19/2009	90203.05		14.4	29.8		0.472	2.91		6.03	2.05	7.34	
283MW05	5/19/2009	90203.08	1.66	6.54	46.2	1.32	0.554	1.5	3.64		2.03	8.75	
283MW03	5/19/2009	90203.06	1.44	20.5	136		0.453			2.12	10.3	6.11	
283MW04	5/19/2009	90203.07	2.57		15.1	0.118	0.727	3.77	3.62	2.66	0.797	2.57	
283MW06	5/19/2009	90203.09	3.29	5.09	30.2		0.579	1.46	1.7		0.676	6.29	
283MW06	8/19/2009	90348.08		13.8	133	0.792	0.53	12.1	24	6.67	9.01	19.8	
283MW04	8/19/2009	90348.07		10.9	27.7	0.209		6.84	10.6		2.89		
MW06 Duplicate	8/19/2009	90348.03	4.87	11.2	91.9	0.541		11.7	16.8	3.76	2.64	18	
283MW03	8/19/2009	90348.06	4.97	20.9	407	0.279	1.23		1.09		12	8.19	
283MW01	8/19/2009	90348.04		5.48	90.2	1.01		1.58	2.78		11.6	19.3	
283MW02*	8/19/2009	90348.05	10.3	38.2	29.4			17.8	6.55	6.52	1.94	126	
283MW05*	9/17/2009	90387.01		41.6	172	1.48	2.19	272	13.2	14.7	15.4		
283MW02	11/5/2009	90437.05			49			13.5	2.11	5.53	7.75	50.7	
283MW06	11/5/2009	90437.09		30.76	106	0.461		19.2	5.7	5.25	5.3	21.4	
MW04 Duplicate	11/5/2009	90437.03		69.48	36.4	0.26		11.6	9.65		3.33		
283MW05	11/5/2009	90437.08		18.95	44.4	0.12		4.53			2.8		
283MW04	11/5/2009	90437.07		41.87	24	0.2		9.6	5		2		
283MW01	11/5/2009	90437.04		1.27	95.2	1					12.1	18	
283MW03	11/5/2009	90437.06		4.75	227	0.16					10.2		1.03
283MW02	1/26/2010	10035.05		8.38	26.3			6.12		6.95	5.12		
283MW04	1/26/2010	10035.07	5.43	38.13	22.2	0.116		4.96	6.41		4.17		
283MW06	1/26/2010	10035.09		14.32	57.4	0.198		7.7			3.76		

Table 1. Summary of Select Metal Concentrations in Groundwater from January 2005 to September 2010 at Site 283

SiteWELL_ID	Date_Collected	Lab_ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
MW04 Duplicate	1/26/2010	10035.03		26.55	21.5	0.093		8.28	1.32		3.46		
283MW05	1/26/2010	10035.08		4.24	17.6			1.24			2.58		
283MW01	1/26/2010	10035.04	5.09		97.8	0.901					15.5		
283MW03	1/26/2010	10035.06		3.69	307	0.12					11.1		
LF1(1)	5/17/2010	10194.08		1.15	18.5	0.053							
LF1(1)	5/17/2010	10194.07		1.44	3.76								
LF1(1)	5/17/2010	10194.06		2.22	19.1			4.11					
LF3(1)	5/17/2010	10194.04		3.59	92.8	0.054					7.5		
LF3(1) Duplicate	5/17/2010	10194.03		3.95	81.2	0.073					6.89		
LF3(1)	5/17/2010	10194.05		1.34	79.5	0.844			1.54		10.1		
LF3(1) Duplicate	5/20/2010	10204.03	10.2	23.28	23.5			1.44		10.2	2.37		
LF3(1)	5/20/2010	10204.04	6.27	22.61	23.4	0.043		1.44		11.5	2.07		
LF3(1)	9/29/2010	10416.01	14.3	3.69		0.074							
LF3(1)	9/29/2010	10416.02	8.19			0.551							
LF3(1)	9/30/2010	10419.03	10.9	0.67				8.67					
LF3(1)	9/30/2010	10419.04	9.65	1.2				8					
LF3(1)	9/30/2010	10419.06						3.38					
LF3(1)	9/30/2010	10419.07	19.1	12.98				2.84		4.13			
LF3(1)	9/30/2010	10419.05	5.14					2.68					
		Mean	5.54	13.68	85.11	0.58	0.82	18.60	4.87	7.28	7.30	11.27	1.55
		90th Percentile	10.84	32.23	172.60	1.37	2.07	30.62	11.86	14.49	15.46	20.04	1.87
		Adjusted Mean	4.32	9.98	64.56	0.45	0.58	5.36	3.51	5.88	5.90	6.65	1.47

Notes:

Adjusted mean does not include metal concentrations that exceed the 90th Percentile

1) Concentrations bolded and italicized exceed applicable Ground Water Quality Standard (GWQS)
2) Concentrations bolded and italicized in red exceed applicable GWQS and the 90th Percentile
3) Concentrations highlighted in red cells exceed exceed the 90th Percentile and are deemed to be extreme outliers
4) Samples highlighted in yellow contain two or more metal concentrations that exceed the 90th Percentile
5) Blank cells indicate metals were not detected, not analyzed, or not reported due to instrument errors

M: Metal detected in method blank

* Sample contains two or more metals at concentrations exceeding the 90th Percentile

Table 2
Building 283
Concentration Rankings and Recommended Monitoring Well Sampling
4th Quarter 2008 - 3rd Quarter 2010

Well ID	Antimony	Arsenic	Beryllium	Lead	Selenium	Thallium
	NJDEP GWQS	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*
	6	*3*	*1*	*5*	*40*	*2*
283MW01			1.32		*	*
283MW02	19.1			11.5	*	*
283MW03	14.3	64			*	*
283MW04		69.48			*	*
283MW05			1.48	14.7	*	*
283MW06						

Notes:

Results reported in µg/L.

Within the reporting period, the two highest concentrations are listed for each parameter.

Shaded rows indicate monitoring wells recommended for metals analysis.

Metals were analyzed during the following quarters: 4th Quarter 2008 through 3rd Quarter 2010.

*Based on results from the 4th Quarter 2010 and 1st Quarter 2011 sampling events, analysis of Selenium and Thallium may be required.

SITE SPECIFIC EVALUATION
BUILDING 287

Site data and 90th Percentile calculations are provided on Table 1 (attached), and summarized as follows:

90th Percentile Analysis Summary
Building 287

287	Sb	As	Ba	Be	Cd	Cr	Cu	Pb	Ni	Se*	Tl*
Feb 05 - Sept 10	n=4	n=5	n=5	n=0	n=0	n=0	n=5	n=2	n=4	n=1	n=0
90th Percentile	13.6	8.6	58.8	NR	NR	NR	4.9	NR	1.6	1.8	NR
Mean	10.2	5.7	41.9	NR	NR	NR	3.5	NR	1.2	1.8	NR
Adjusted Mean	9.0	5.0	34.0	NR	NR	NR	3.1	NR	1.1	1.8	NR
NJDEP GWQS (ug/L)	**6**	**3**	**6000**	**1**	**4**	**70**	**1300**	**5**	**100**	**40**	**2**

Results reported in µg/L or parts per billion. Shaded cells indicate values that exceed the GWQS. "n" = population size in the statistical analysis. As a conservative measure, non-detectable results were not included in the statistical analysis, and thus the population size may be biased low when compared to the total number of data points. * Due to possible laboratory inaccuracies, the 90th Percentile Analysis was not used in developing sampling recommendations for these parameters.

90th Percentile Values Meet GWQS:

The 90th percentile values for barium, copper, nickel, and selenium are below their respective GWQS.

Note that due to possible laboratory inaccuracies affecting selenium and/or thallium results, the 90th Percentile Analysis was not used to determine compliance with the GWQS.

Recommendations:

In consideration of the above, the following sampling protocol is recommended for this site:

1. Selenium and Thallium - Due to possible laboratory inaccuracies affecting selenium and/or thallium results, the 90th Percentile Analysis was not used to determine compliance with the GWQS.

Evaluation of the 4th Quarter 2010 and 1st Quarter 2011 sampling should be performed to determine compliance with the GWQS. If exceedances of the GWQS are identified, the sampling protocol specified under item 3 below should be followed.

2. With the exception of selenium and thallium (addressed above), no further sampling/analysis is recommended for metals with 90th percentile values below their respective GWQS.

3. For remaining metals, the collection of ground water samples using the following sampling protocol is recommended.

Collection of samples on a semiannual basis, targeting the times of the year typically exhibiting elevated precipitation amounts (generally 2nd and 4th quarters).

For future sampling events, raw and filtered water sample pairs should be collected from select wells (identified below), to evaluate the input from sample turbidity. Samples should be analyzed by a NJ certified laboratory. Slow-purge methodology should be followed for all sampling events which include metals analyses. Refer to the Concentration Ranking and Monitoring Well Selection Protocol described below.

Concentration Ranking and Monitoring Well Selection Protocol

For the specified sampling events, the monitoring wells recommended for sampling were selected with a bias towards those wells demonstrating the highest concentrations as follows.

For the available data from 4th Quarter 2008 through 3rd Quarter 2010, the highest observed concentrations for the site monitoring wells were ranked for each metal of concern. For larger sites, such as landfills, the highest four concentrations were listed; for smaller sites, the highest two concentrations were deemed adequate. Concentration Rankings and Recommended Well Sampling are summarized in Table 2 (attached).

Based on the specified protocol, monitoring well 287MW01 is recommended for sampling with laboratory analysis for antimony and arsenic, along with selenium and thallium as required.

Table 1. Summary of Select Metal Concentrations in Groundwater from February 2005 to September 2010 at Site 287

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
NJDEP Ground Water Quality Standards (µg/L)			6	3	6000	1	4	70	1300	5	100	40	2
287MW01	02/18/05	50094.03											
287MW01	06/10/05	50300.03											
287MW01	09/29/05	50495.03											
287MW01	12/05/05	50630.03											
287MW01	02/17/06	60082.03											
287MW01	06/30/06	60297.04											
MW01 Duplicate	06/30/06	60297.03											
287MW01	09/29/06	60427.03											
287MW01	12/28/06	60550.01											
287MW01	03/14/07	70097.03											
287MW01	03/30/07	70119.01											
287MW01	05/31/07	70197.03											
287MW01	09/17/07	70348.01											
287MW01	12/20/07	70549.04											
MW01 Duplicate	12/20/07	70549.03											
287MW01	03/31/08	80103.04											
MW01 Duplicate	03/31/08	80103.03											
287MW01	06/27/08	80215.03											
287MW01	09/25/08	80344.04											
MW01 Duplicate	09/25/08	80344.03											
MW01 Duplicate	12/29/08	80479.04								2.45			
287MW01	12/29/08	80479.03								2.14			
287MW01	03/27/09	90130.03											
287MW01	06/11/09	90231.04											
MW01 Duplicate	06/11/09	90231.03											
MW01 Duplicate	06/18/09	90244.03											
287MW01	06/18/09	90244.02											
287MW01	09/28/09	90401.03											
MW01 Duplicate	09/28/09	90401.02											
287MW01	11/17/09	90449.04											
MW01 Duplicate	11/17/09	90449.03											
LF1(1) Duplicate	03/22/10	10099.03	***8.89***	***8.79***	31.3				1.1		1.64		
LF1(1)	03/22/10	10099.04	5.6	***8.19***	31.3				4.34		1.48		
LF2(1) Duplicate	06/22/10	10280.03	***14***	1.58	36.9				3.86				
LF2(1)	06/22/10	10280.04	***12.5***	1.99	36.4				5.19		0.847		
LF3(1) Duplicate	09/14/10	10390.02											
LF3(1)	09/14/10	10390.03		***8.04***	73.4				3.04		1.03	1.83	

Table 1. Summary of Select Metal Concentrations in Groundwater from February 2005 to September 2010 at Site 287

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
NJDEP Ground Water Quality Standards (µg/L)			6	3	6000	1	4	70	1300	5	100	40	2
		Mean	10.2	5.7	41.9				3.5		1.2	1.8	
		90th Percentile	13.6	8.6	58.8				4.9		1.6	1.8	
		Adjusted Mean	9.0	5.0	34.0				3.1		1.1	1.8	

Notes:

Adjusted mean does not include metal concentrations that exceed the 90th Percentile

1) Concentrations bolded and italicized exceed applicable Ground Water Quality Standard (GWQS)
2) Concentrations bolded and italicized in red exceed applicable GWQS and the 90th Percentile
3) Concentrations highlighted in red cells exceed exceed the 90th Percentile and are deemed to be extreme outliers
4) Samples highlighted in yellow contain two or more metal concentrations that exceed the 90th Percentile
5) Blank cells indicate metals were not detected, not analyzed, or not reported due to instrument errors

M: Metal detected in method blank

* Sample contains two or more metals at concentrations exceeding the 90th Percentile

Table 2
Building 287
Concentration Rankings and Recommended Monitoring Well Sampling
4th Quarter 2008 - 3rd Quarter 2010

Well ID	Antimony	Arsenic	Selenium	Thallium
	NJDEP GWQS	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*
	6	*3*	*40*	*2*
287MW01	14	8.79	*	*

Notes:

Results reported in µg/L.

Within the reporting period, the highest concentrations are listed for each parameter.

Shaded rows indicate monitoring wells recommended for metals analysis.

Metals were analyzed during the entire reporting period, 4th Quarter 2008 through 3rd Quarter 2010.

*Based on results from the 4th Quarter 2010 and 1st Quarter 2011 sampling events, analysis of Selenium and Thallium may be required.

SITE SPECIFIC EVALUATION
BUILDING 296 (FTMM-54)

Site data and 90th Percentile calculations are provided on Table 1 (attached), and summarized as follows:

90th Percentile Analysis Summary
Building 296

296	Sb	As	Ba	Be	Cd	Cr	Cu	Pb	Ni	Se*	Tl*
June 09 - Sept 10	n=56	n=100	n=174	n=47	n=128	n=103	n=90	n=56	n=154	n=58	n=4
90th Percentile	23.7	53.0	90.0	0.85	8.27	8.72	22.0	19.9	19.3	54.1	2.2
Mean	9.06	16.7	45.1	0.55	4.68	11.8	69.4	28.0	13.1	17.3	1.7
Adjusted Mean	6.31	10.53	25.4	0.19	1.59	2.34	5.1	6.97	5.6	10.2	1.5
NJDEP GWQS (ug/L)	**6**	**3**	**6000**	**1**	**4**	**70**	**1300**	**5**	**100**	**40**	**2**

Results reported in µg/L or parts per billion. Shaded cells indicate values that exceed the GWQS. "n" = population size in the statistical analysis. As a conservative measure, non-detectable results were not included in the statistical analysis, and thus the population size may be biased low when compared to the total number of data points. * Due to possible laboratory inaccuracies, the 90th Percentile Analysis was not used in developing sampling recommendations for these parameters.

90th Percentile Values Meet GWQS:

The 90th percentile values for barium, beryllium, chromium, copper, and nickel are below their respective GWQS.

Note that due to possible laboratory inaccuracies affecting selenium and/or thallium results, the 90th Percentile Analysis was not used to determine compliance with the GWQS.

Mean Values, or Adjusted Mean Values, Meet GWQS:

The mean values for selenium and thallium are below their respective GWQS.

The adjusted mean value for cadmium is below its GWQS.

Recommendations:

In consideration of the above, the following sampling protocol is recommended for this site:

1. Selenium and Thallium - Due to possible laboratory inaccuracies affecting selenium and/or thallium results, the 90th Percentile Analysis was not used to determine compliance with the GWQS.

Evaluation of the 4th Quarter 2010 and 1st Quarter 2011 sampling should be performed to determine compliance with the GWQS. If exceedances of the GWQS are identified, the sampling protocol specified under item 3 below should be followed.

2. With the exception of selenium and thallium (addressed above), no further sampling/analysis is recommended for metals with 90th percentile values below their respective GWQS.

3. For remaining metals, the collection of ground water samples using the following sampling protocol is recommended.

Collection of samples on a semiannual basis, targeting the times of the year typically exhibiting elevated precipitation amounts (generally 2nd and 4th quarters).

For future sampling events, raw and filtered water sample pairs should be collected from select wells (identified below), to evaluate the input from sample turbidity. Samples should be analyzed by a NJ certified laboratory. Slow-purge methodology should be followed for all sampling events which include metals analyses. Refer to the Concentration Ranking and Monitoring Well Selection Protocol described below.

Concentration Ranking and Monitoring Well Selection Protocol

For the specified sampling events, the monitoring wells recommended for sampling were selected with a bias towards those wells demonstrating the highest concentrations as follows.

For the available data from 4th Quarter 2008 through 3rd Quarter 2010, the highest observed concentrations for the site monitoring wells were ranked for each metal of concern. For larger sites, such as landfills, the highest four concentrations were listed; for smaller sites, the highest two concentrations were deemed adequate. Concentration Rankings and Recommended Well Sampling are summarized in Table 2 (attached).

Based on the specified protocol, monitoring wells 296MW02, 296MW03, 296MW04, 296MW06, and 296MW08 are recommended for sampling with laboratory analysis for antimony, arsenic, cadmium, and lead, along with selenium and thallium as required.

Table 1. Summary of Select Metal Concentrations in Groundwater from June 2009 to September 2010 at Site 296

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
NJDEP GWQS (µg/L)			6	3	6000	1	4	70	1300	5	100	40	2
296MW07	02/02/05	50061.09			7.52								
296MW06	02/02/05	50061.08			5.18								
296MW04	02/02/05	50061.07			42.3					***5.47***			
296MW03	02/02/05	50061.06			11.6		2.89						
MW06 Duplicate	02/02/05	50061.03											
296MW02*	02/02/05	50061.05				***2.74***	***6.72***	13.6		***17.3***	46		
296MW08	02/02/05	50061.10		10.7	33.4					***14.9***	16.2		
296MW01	02/02/05	50061.04			49.6						13		
296MW06	05/03/05	50234.08							22				
296MW04	05/03/05	50234.07			22.6								
296MW03	05/03/05	50234.06			8.5		2						
296MW07	05/03/05	50234.09		9	9.7			7.3					
296MW01	05/03/05	50234.04			47.3						8		
296MW02*	05/03/05	50234.05		7		***2.3***	***37.3***	11.9		***52***	29		
296MW08	05/03/05	50234.10		21	49					***25***	16		
MW08 Duplicate	05/03/05	50234.03		20	40.4		2.9			***24***	13		
296MW07	08/11/05	50398.09			6.75								
MW06 Duplicate	08/11/05	50398.03			5.09				10.8				
296MW06	08/11/05	50398.08			8.45			8.77	14.9				
296MW02	08/11/05	50398.05					2.58	6.49	9.73				
296MW01	08/11/05	50398.04			52						9.62		
296MW04	08/11/05	50398.07			93.4						7.24		
296MW03	08/11/05	50398.06			11.4		3.71				6.02		
296MW08*	08/11/05	50398.10		58.2	37.6		***18.5***			***11.5***	5.68		
296MW03	11/10/05	50587.06											
MW06 Duplicate	11/10/05	50587.03							11.8				
296MW07	11/10/05	50587.09			9.74		3.15	5.34					
296MW06	11/10/05	50587.08						10.9	16				
296MW04	11/10/05	50587.07			121						6.84	20.1	
296MW02	11/10/05	50587.05			16.3		2.45	38.2	15.9	***5.98***	6.77		
296MW01	11/10/05	50587.04			57.5						5.77		
296MW08	11/10/05	50587.10		11.3	57.3	0.592	***7.41***		10	***16.6***	10.8		
296MW08	01/19/06	60035.10			9.77		2.3			***7.76***			
296MW04	01/19/06	60035.07			20.8					***5.28***			
296MW03	01/19/06	60035.06											
296MW06	01/19/06	60035.08			6.87			8.51					
MW06 Duplicate	01/19/06	60035.03			6.71			7.1					
296MW01	01/19/06	60035.04			37.1						7.61		
296MW07	01/19/06	60035.09			17.4		2.37				5.28		
296MW02	01/19/06	60035.05			61.3		***7.95***				16.2		

Table 1. Summary of Select Metal Concentrations in Groundwater from June 2009 to September 2010 at Site 296

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
296MW04	04/19/06	60168.07	***9.4***		28.5				0.689				
296MW06	04/19/06	60168.08	4.76		5.13			1.5	13.1				
296MW03	04/19/06	60168.06	2.33		12.5	0.285	2.59	1.61			3.95		
296MW08	04/19/06	60168.10	2.17	13.1	21.5	0.118	0.502	1.3	5.77		2.43		
296MW07	04/19/06	60168.09	4.88		11.5	0.133	0.596	2.7			2.05		
296MW01	04/19/06	60168.04	2.81		69.7	0.235	0.873		0.786		17		
296MW02*	04/19/06	60168.05	4.86	5.04	106	0.787	***22.5***	6.05	14.7	***18.1***	15.4		
MW08 Duplicate	04/19/06	60168.03	***6.69***	9.76	21		0.607		5.88		1.6		
296MW01	08/11/06	60355.04	4.95		62.6		0.776				20.8		
296MW02	08/11/06	60355.05	3.56	6.28	4.87		0.487	4.8	3.29		2.09		
296MW04	08/11/06	60355.07	***7.64***		66.7		1.81	6.53	8.07	1.96	2.04		
296MW08	08/11/06	60355.10	2.9	45.6	27.6			1.59	4.2		1.32		
MW06 Duplicate	08/11/06	60355.03	4.45	4.17	4.12	0.12		17.4	11.7		1.31		
296MW03	08/11/06	60355.06	2.61		4.44		0.523	1.41			1.27		
296MW06	08/11/06	60355.08	3.89	3.3		0.145		20	14.7		1.22		
296MW07	08/11/06	60355.09	2.55	2.35	10.4		0.332	1.21			1.13		
MW06 Duplicate	12/13/06	60529.03			5.47		0.866	3.26	5.09			3.4	
296MW06	12/13/06	60529.06					0.56	2.4	3.7			4.51	
296MW04	12/13/06	60529.05		3.86	64.9		***4.86***				7.94	10.2	
296MW03	12/13/06	60529.04					2.17	1.33			2.5		
296MW02	12/15/06	60534.05		2.45	6		1.31		5.47		2.5		
296MW08	12/15/06	60534.07		36.8	46.1		***10.8***				14.8	4.16	
296MW01	12/15/06	60534.04			51.7		0.714		1.06		13.2	6.14	
MW07 Duplicate	12/15/06	60534.03		3.15	6.44		1				1.41	3.33	
296MW07	12/15/06	60534.06		2.25	7.65		1.68		0.663		1.38		
296MW04	03/05/07	70081.07	2.6		8.09		0.521	0.793	4.24			7.27	
296MW06	03/05/07	70081.08	0.912		7.71		0.789	0.765	4.23			6.06	
MW06 Duplicate	03/05/07	70081.03	1.91		8.51		0.809	10.7	6.39		6.85	5.18	
296MW01	03/05/07	70081.04			30.1		0.37	0.509	4.17		6.65	8.47	
296MW02*	03/05/07	70081.05			172		***28***	4.1	30.7		55.5	22.2	
296MW08	03/05/07	70081.10		3.09	11.1		3.92	4.48	5.13	***8.51***	2.65	4.02	
296MW07	03/05/07	70081.09		3.08	11.4		2.57	1.17	5.34		2.11	4.62	
296MW03	03/05/07	70081.06	0.755		5.97		1.6	0.948	2.26		1.82	4.9	
296MW01	06/07/07	70206.04		2.81	51.6		0.67	0.633	0.671		8.91	5.33	
296MW02	06/07/07	70206.05			9.66		3.2	1.87	5.48	1.91	7.07	3.86	
296MW08	06/07/07	70206.10		20.4	17		***8.16***	1.01		***10.9***	3.11		
296MW03	06/07/07	70206.06			11.4	0.172	2.61	1.06			3	3.51	
296MW06	06/07/07	70206.08		4.36	6.1		0.579	1.91	33.3	1.92	2.51		
MW06 Duplicate	06/07/07	70206.03		3.33	6.34		0.558	2.81	34.4	2.14	2.49	3.83	
296MW07	06/07/07	70206.09			9.86		1.21	2.12			1.66	5	
296MW04	06/07/07	70206.07		4.6	25.1		0.461	0.685	0.8		1.05	3.73	

Table 1. Summary of Select Metal Concentrations in Groundwater from June 2009 to September 2010 at Site 296

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
296MW01	09/07/07	70327.04			44.8	0.119	0.962	1.53	0.543		7.68	5.8	
MW01 Duplicate	09/07/07	70327.03		3.68	44.5	0.114	1.23	2.38	1.01	1.29	7.45	5.92	
296MW08*	09/07/07	70327.08		75.3	29.8		***11.7***			***14.6***	7.13		
296MW02*	09/07/07	70327.05		12.3	356	***1.79***	***12.1***	15.4		***16.1***	***233***		
296MW03	09/07/07	70327.06			6.02	0.155	1.85	1.31			2.88		
296MW06	09/07/07	70327.07			6.09		0.545	1.31	3.57	1.47	0.898	4.14	
MW07 Duplicate	09/17/07	70346.03			12.1		0.886	2.97	2.26		2.34		
296MW04	09/17/07	70346.04			53.4		0.291	1.26	1.06		2.15		
296MW07	09/17/07	70346.05		2.93	14.6		0.9	3.35	1.91		1.88		
296MW01	11/14/07	70466.04			43.9	0.136	0.464				6.94	5.63	
296MW02	11/14/07	70466.05			80.2	0.687	1.21	6.37	1.87		50.4		
296MW03	11/14/07	70466.06			11.7	0.439	2.13	1.91	0.98		4.77		
296MW08	11/14/07	70466.10		8.36	19.9	0.11	1.51	0.735	4.59		3.62		
MW03 Duplicate	11/14/07	70466.03			6.53	0.192	1.9	1.09			3.39		
296MW04	11/14/07	70466.07			63.6		0.497		1.14		1.47		
296MW07	11/14/07	70466.09			8.56	0.104	0.677	2.16	0.615		1.19		
296MW06	11/14/07	70466.08			4.14		0.229	3.31	3.33		1.18		
MW03 Duplicate	03/04/08	80065.03			4.29	0.108	1.5	1.56	2		6.87		
296MW03	03/04/08	80065.06			3.53		1.22	1.76	1.31		5.61		
296MW06	03/04/08	80065.08			8.19			0.587	2.35		5.33		
296MW07	03/04/08	80065.09			7.29		0.819	1.35	1.75		5.22		
296MW02*	03/04/08	80065.05		5.75	106	0.716	***13.1***	5.21		***21.7***	44		1.69
296MW04	03/04/08	80065.07			11.2		0.59	0.609	1.19	1.1	4.03		
296MW08	03/04/08	80065.10		18.7	56.3	0.109	1.01		2.08		19.6		
296MW01	03/04/08	80065.04			40.2		0.374		1.39		12.8		
296MW01	05/14/08	80161.04	1.67 M		39.9	0.135	0.294	1.27			8.53 M	4.38 M	
296MW02	05/14/08	80161.05	1.89 M	4.59	7.46		1.58	0.986	10.5	1.96	4.82 M	4.8 M	
296MW03	05/14/08	80161.06	M			0.214	1.86	0.98			4 M	4.83 M	
296MW08	05/14/08	80161.10	M	48.8	40.6	0.193	***10.1***			***11.8***	11.2 M	M	
296MW07	05/14/08	80161.09	M	4.24	7.83	0.132	1	1.24			1.88 M	M	
MW06 Duplicate	05/14/08	80161.03	1.85 M		3.18		0.239	1.42	7.33		1.56 M	M	
296MW04	05/14/08	80161.07	1.29 M		27		0.579	0.758	1.4	4.2	1.49 M	M	
296MW06	05/14/08	80161.08	M		3.09		0.265	1.04	7.03		1.48 M	3.13 M	
MW01 Duplicate	08/13/08	80295.03	M		39.2		0.54	0.571			8.96	4.67 M	
296MW01	08/13/08	80295.04	M		39		0.743	0.47			8.64	5.41 M	
296MW08*	08/13/08	80295.10	M	135	23.7		***14.2***			***11.9***	7.24	M	
296MW03	08/13/08	80295.06	M		10.4	0.167	3.91	1.46			5.59	M	
296MW02	08/13/08	80295.05	M	3.15	7.59		0.654	1.63	12.3		3.16	3.58 M	
296MW04	08/13/08	80295.07	M	2.57	112		0.94				2.01	10.6 M	
296MW06	08/13/08	80295.08	M	2.51	4.73		0.395	4.35	3.06		1.56	M	
296MW07	08/13/08	80295.09	M	5.22	22.3		1.05	0.973			0.989	M	

Table 1. Summary of Select Metal Concentrations in Groundwater from June 2009 to September 2010 at Site 296

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
296MW06	10/24/08	80386.08	M		49.6				0.959			M	
296MW08	10/24/08	80386.10	3.06 M	42.3	30.9				2.35		8.24	M	
296MW03	10/24/08	80386.06	M	3.55	5.71		1.71	1.85			2.81	M	
296MW02	10/24/08	80386.05	M	5.21	6.75		0.49	2.45	22.4		2.54	M	
MW01 Duplicate	10/24/08	80386.03	M		40.8		0.527	0.734			10.4	M	
296MW01	10/24/08	80386.04	M	2.66	40.6		0.479				10.3	M	
296MW04	10/24/08	80386.07	M		180		0.725		1.71		1.69	M	
296MW07	10/24/08	80386.09	M	3.82	41.6		0.773				0.874	M	
296MW06*	03/25/09	90122.05	***38.1*** M	67.6	102					***7.43*** M		68.9	
MW03 Duplicate	03/25/09	90122.03	***9.54*** M	19	3.42		1.41	1.57		***7.33*** M	2.01	51.5	
296MW03	03/25/09	90122.04	***9.1*** M	21.9	3.55		1.39	2.3		***5.51*** M	1.31	46.8	
296MW04*	03/26/09	90124.06	***19.4*** M	67	26.5			1.38 M	2.23	***7.39*** M		117 M	M
296MW07	03/26/09	90124.07	***21.2*** M	33.1	57.7		0.962	0.848 M		***8.39*** M		39.9 M	M
296MW02	03/26/09	90124.05	***7.54*** M	26.7	8.58		1.17	4.49 M	30.7	***7.34*** M	3.6	42.7 M	M
296MW08*	03/26/09	90124.08	***25*** M	54.3	56.2			M		***13.2*** M	17.2	45.1 M	M
MW01 Duplicate	03/26/09	90124.03	***14.6*** M	52.9	40.5		0.54	0.519 M		***7.06*** M	12.7	74.6 M	M
296MW01*	03/26/09	90124.04	***22.7*** M	56	42.2		0.206	0.342 M		***5.9*** M	12.1	92.7 M	M
MW01 Duplicate	06/02/09	90217.03	2.29	7.64	39.4	0.126			0.998		9.82		1.45 M
296MW02	06/02/09	90217.05	2.43	5.01	14.3		0.729	2.46	15.5		5.14		M
296MW08*	06/02/09	90217.10	2.53	57.1	64.5	0.178	1.03		0.921	4.25	22.6	4.46	M
296MW06	06/02/09	90217.08	2.94	6.66	4.97			2.24	17.6	1.81	2.44		M
296MW03	06/02/09	90217.06	3.05		2.09		0.689	1.98		2.56	2.1		M
296MW01	06/02/09	90217.04	1.89	11	38.8	0.101			1.34	***9.32***	10.1		1.36 M
296MW04	06/02/09	90217.07	4.06	20.3	33.3					3.92	1.91	4.8	M
296MW07*	06/02/09	90217.09	2.3	15.1	114	0.103	2.02	0.365	4.55	1.56	1.14		2.41 M
296MW03	09/17/09	90384.06	***6.05*** M	8.49	6.91	0.122	3.53	1.45	M		5.51	22.1	
296MW08	09/17/09	90384.10	M	81.1	63.5	0.083	3.88	2.63	M	***10***	16.7		
296MW01	09/17/09	90384.04	M	12.4	40.9				M		13.1	19.9	
296MW02*	09/17/09	90384.05	M	7.47	39.7	0.107	2.86	12.2	128 M	***36.1***	10.3		
296MW06*	09/17/09	90384.08	***11.0*** M	35.2	102		1.41	1.13	4.17 M	***6.43***	1.68	60.3	
MW07 Duplicate	09/17/09	90384.03	M	16.3	17.3		0.808	2.56	M		1.41		
296MW07	09/17/09	90384.09	M	11.1	14.4		0.524	2.33	M		0.925	13.4	
296MW04	09/17/09	90384.07	***7.82*** M	28	62.8				M		0.642	63.2	
296MW02	11/23/09	90456.05		2.6	15.9			1.86	62.3	2.73	6.45	11.8	
296MW03	11/23/09	90456.06		0.71	6.64		1.63				4.52		
MW07 Duplicate	11/23/09	90456.03		3.28	36.7						3.5		
296MW07	11/23/09	90456.09		2.91	37.4		0.556				3.12		
296MW08	11/23/09	90456.10		23.8	53	0.051				***6.1***	15.3		
296MW01	11/23/09	90456.04	5.41	0.74	32.9						10.9	8.29	
296MW04	11/23/09	90456.07		1.76	71.2						1.78		
296MW06	11/23/09	90456.08		1.34	10			3.21			1.21		

Table 1. Summary of Select Metal Concentrations in Groundwater from June 2009 to September 2010 at Site 296

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
296MW02*	02/02/10	10045.05		75.08	1270	***9.99***	***184***	***840***	***5440***	***1060***	***514*** M		
296MW03	02/02/10	10045.06		0.72	4.73		1.18	1.93	1.4		4.17 M		
296MW08*	02/02/10	10045.10		22.53	107	0.11	2.57			***8.58***	38.4 M		
296MW04	02/02/10	10045.07		1.48	21.1			2.1		2.4	3.05 M		
296MW07	02/02/10	10045.09		2.61	24.8			3.2			3.01 M		
MW07 Duplicate	02/02/10	10045.03		2.69	29			3.58			2.72 M		
296MW06	02/02/10	10045.08			7.39				1.22		2.66 M		
296MW01	02/02/10	10045.04		1.3	38.2						11.8 M		
LF3(1)	05/20/10	10205.01		1.31	61.4	0.075 M	0.692				18.3		
LF3(1)	05/20/10	10205.02		3.01	7.47	M			1.52		0.61		
LF3(1)	05/21/10	10208.08	***10.7***	22.9	0.73	0.044 M	2.04			4.5			
LF3(1)*	05/21/10	10208.06	***10.0***	8.84	133	0.297 M	***4.02***				46.7		
LF3(1)*	05/21/10	10208.07	***11.8***	0.83	210	0.067 M	***8.51***		47.1	4.51	23		
LF3(1) Duplicate	05/21/10	10208.03			2.33	M	0.874				1.46		
LF3(1)	05/21/10	10208.04			2.1	M					0.974		
LF3(1)	05/21/10	10208.05		13.59	5.8	0.048 M		5.79	1.17		0.716		
LF4(1)	09/10/10	10385.01	***13.6***	0.93	53.9	0.077	0.908				18.6	M	
LF4(1)*	09/13/10	10386.08	***26.6***	7.05	102	0.946	***46.2*** M		3.84	M	56.7 M	1.93 M	
LF4(1)*	09/13/10	10386.07	***17.0***	2.92	122		1.78 M		11.6	4.83 M	20.8 M	2.13 M	
LF4(1)	09/13/10	10386.05	***9.95***	19.4	73.2	0.181	3.1 M		4.02	3.38 M	20.6 M	1.57 M	
LF4(1)*	09/13/10	10386.06	***40.1***	13.46	379		2.63 M	6.61	4.92	***7.24*** M	14 M	4.72 M	
LF4(1)	09/13/10	10386.04		2.29	7.79		M		1.11	M	1.78 M	1.57 M	
LF4(1)	09/13/10	10386.09	***24.6***	2.38	82.1		1.19 M		6.8	M	1.59 M	1.98 M	
LF4(1) Duplicate	09/13/10	10386.03	***37.5***	2.68	7.6		M		1.44	M	1.23 M	1.37 M	
		Mean	9.06	16.7	45.1	0.55	4.68	11.8	69.4	28.0	13.1	17.3	1.7
		90th Percentile	23.7	53.0	90.0	0.85	8.27	8.72	22.0	19.9	19.3	54.1	2.2
		Adjusted Mean	6.31	10.53	25.4	0.19	1.59	2.34	5.1	6.97	5.6	10.2	1.5

Notes: Adjusted mean does not include metal concentrations that exceed the 90th Percentile

1) Concentrations bolded and italicized exceed applicable Ground Water Quality Standard (GWQS)
2) Concentrations bolded and italicized in red exceed applicable GWQS and the 90th Percentile
3) Concentrations highlighted in red cells exceed exceed the 90th Percentile and are deemed to be extreme outliers
4) Samples highlighted in yellow contain two or more metal concentrations that exceed the 90th Percentile
5) Blank cells indicate metals were not detected, not analyzed, or not reported due to instrument errors

M: Metal detected in method blank

* Sample contains two or more metals at concentrations exceeding the 90th Percentile

Table 2
Building 296
Concentration Rankings and Recommended Monitoring Well Sampling
4th Quarter 2008 - 3rd Quarter 2010

Well ID	Antimony	Arsenic	Cadmium	Lead	Selenium	Thallium
	NJDEP GWQS	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*
	6	*3*	*4*	*5*	*40*	*2*
296MW01						
296MW02		75.08	184	1060	*	*
296MW03			46.2		*	*
296MW04	40.1				*	*
296MW05						
296MW06	38.1				*	*
296MW07						
296MW08		81.1		13.2	*	*

Notes:

Results reported in µg/L.

Within the reporting period, the two highest concentrations are listed for each parameter.

Shaded rows indicate monitoring wells recommended for metals analysis.

Metals were analyzed during the entire reporting period, 4th Quarter 2008 through 3rd Quarter 2010.

*Based on results from the 4th Quarter 2010 and 1st Quarter 2011 sampling events, analysis of Selenium and Thallium may be required.

SITE SPECIFIC EVALUATION
BUILDING 699 (FTMM-53)

Site data and 90th Percentile calculations are provided on Table 1 (attached), and summarized as follows:

90th Percentile Analysis Summary
Building 699

699	Sb	As	Ba	Be	Cd	Cr	Cu	Pb	Ni	Se*	Tl*
March 10 - Sept 10	n=31	n=32	n=17	n=37	n=31	n=20	n=12	n=11	n=44	n=5	n=0
90th Percentile	14.0	9.6	154.6	2.8	7.1	35.0	12.5	29.3	48.6	2.7	NR
Mean	9.2	3.9	84.5	1.4	3.2	14.2	6.7	12.0	72.9	2.2	NR
Adjusted Mean	8.5	2.2	56.8	0.9	1.9	7.0	5.3	10.1	15.8	2.1	NR
NJDEP GWQS (ug/L)	**6**	**3**	**6000**	**1**	**4**	**70**	**1300**	**5**	**100**	**40**	**2**

Results reported in µg/L or parts per billion. Shaded cells indicate values that exceed the GWQS. "n" = population size in the statistical analysis. As a conservative measure, non-detectable results were not included in the statistical analysis, and thus the population size may be biased low when compared to the total number of data points. * Due to possible laboratory inaccuracies, the 90th Percentile Analysis was not used in developing sampling recommendations for these parameters.

90th Percentile Values Meet GWQS:

The 90th percentile values for barium, chromium, copper, nickel, and selenium are below their respective GWQS.

Note that due to possible laboratory inaccuracies affecting selenium and/or thallium results, the 90th Percentile Analysis was not used to determine compliance with the GWQS.

Mean Values, or Adjusted Mean Values, Meet GWQS:

The mean value for cadmium is below its GWQS.

The adjusted mean values for arsenic and beryllium are below their respective GWQS.

Recommendations:

In consideration of the above, the following sampling protocol is recommended for this site:

1. Selenium and Thallium - Due to possible laboratory inaccuracies affecting selenium and/or thallium results, the 90th Percentile Analysis was not used to determine compliance with the GWQS.

Evaluation of the 4th Quarter 2010 and 1st Quarter 2011 sampling should be performed to determine compliance with the GWQS. If exceedances of the GWQS are identified, the sampling protocol specified under item 3 below should be followed.

2. With the exception of selenium and thallium (addressed above), no further sampling/analysis is recommended for metals with 90th percentile values below their respective GWQS.

3. For remaining metals, the collection of ground water samples using the following sampling protocol is recommended.

Collection of samples on a semiannual basis, targeting the times of the year typically exhibiting elevated precipitation amounts (generally 2nd and 4th quarters).

For future sampling events, raw and filtered water sample pairs should be collected from select wells (identified below), to evaluate the input from sample turbidity. Samples should be analyzed by a NJ certified laboratory. Slow-purge methodology should be followed for all sampling events which include metals analyses. Refer to the Concentration Ranking and Monitoring Well Selection Protocol described below.

Concentration Ranking and Monitoring Well Selection Protocol

For the specified sampling events, the monitoring wells recommended for sampling were selected with a bias towards those wells demonstrating the highest concentrations as follows.

For the available data from 4th Quarter 2008 through 3rd Quarter 2010, the highest observed concentrations for the site monitoring wells were ranked for each metal of concern. For larger sites, such as landfills, the highest four concentrations were listed; for smaller sites, the highest two concentrations were deemed adequate. Concentration Rankings and Recommended Well Sampling are summarized in Table 2 (attached).

Based on the specified protocol, monitoring wells 699MW01, 699MW02, 699MW04, 699MW05, 699MW06, 699MW08, 699MW15, 699RW03, 699RW05, 699RW11, and 616MW01 are recommended for sampling with laboratory analysis for antimony, arsenic, beryllium, cadmium, and lead, along with selenium and thallium as required.

Table 1. Summary of Select Metal Concentrations in Groundwater from March 2010 to September 2010 at Site 699

Well ID	SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
NJDEP Ground Water Quality Standards (µg/L)				6	3	6000	1	4	70	1300	5	100	40	2
MW08	LF1 (1)	03/24/10	10105.06	***9.45***			0.885	3.16				42.9		
MW05	LF1 (1)	03/24/10	10105.04	5.38	1.76				1.87			4.49		
MW05	LF(1)	03/24/10	10105.03	***9.89***	0.84	59.5			1.77	9.08		4.17		
MW12	LF1 (1)	03/24/10	10105.05	5.04			***1.03***	1.68				37.5		
MW01	699MW01	03/25/10	10108.06	5.65	***4.49***		0.428	2.13				9.24		
MW15	699MW15	03/25/10	10108.04		***4.64***				32.9		***31.1***	8.68		
MW15	Duplicate	03/25/10	10108.03		***4.25***		0.26		53.8		***19.7***	6.39		
MW02	699MW02	03/26/10	10109.04		***4.64***			1.19				5.82		
MW02	MW02	03/26/10	10109.03	***7.2***	0.67			0.938				5.25		
MW04	LF (1)	03/26/10	10109.05	***7.88***	1.11		***1.46***	***7.09***				46.7		
MW16	LF1 (1)	03/26/10	10109.07				0.654					27.5		
MW06*	699MW06	03/26/10	10109.06	***7.69***	***10.16***		0.819	1.84	***104***		***8.68***	18.7		
MW09	LF1 (1)	03/26/10	10109.08		0.65		***1.02***		2.48			10.7		
RW03	699RW03	03/31/10	10116.01	5.94		11.4	0.063	0.548	5.28	12		4.35		
RW11*	699RW11	03/31/10	10116.02				***2.46***	***17.7***			2.85	***365***		
MW02	699 MW02	06/15/10	10265.05	***7.15***	1.92		0.158	0.572			3.05	9.75		
MW12	699MW12	06/15/10	10265.07	***6.01***			***1.88***	1.75	1.3			49.4		
MW15	699MW15	06/15/10	10265.06		2.06		0.469	0.649	1.46		3.5	2.14		
MW06	699MW06	06/16/10	10268.08		2.2		0.066		7.27			4.11		
MW08	699MW08	06/16/10	10268.04	***10.5***			***2.46***	2.77				30.4		
MW08	Duplicate	06/16/10	10268.03	***12.3***	1.5		***2.51***	2.88			2.74	30.2		
MW04	699MW04	06/16/10	10268.07	***9.37***	1.18		***1.33***	1.39				14		
MW01	699MW01	06/16/10	10268.06	***7.44***	***3.07***		***1.65***					12.4		
MW09	699MW09	06/16/10	10268.09		0.77		***1.31***	0.793				11.9		
MW05	699MW05	06/16/10	10268.05	***6.14***				0.579				1.37		
RW11*	699RW11	06/17/10	10271.06	***14***	2.34		***3.96***	***14.4***	22.8		***24.2***	***663***		
RW05	699RW05	06/17/10	10271.07	***7.85***	2.02		0.069		7.97			3.45		
MW16	Duplicate	06/17/10	10271.03		1.76		0.524		1.03			20.7		
MW16	LF2 (1)	06/17/10	10271.04		1.74		0.544		1.21			20.1		
RW03*	699RW03	06/17/10	10271.05	***7.49***	***19.42***	36.9	***10.5***	***13.5***	17.2		***29.3***	***1430***		
MW15	LF3(1)	09/16/10	10396.03	***8.17***	2.27	63.6	0.088		4.15	12.6		4.07		
MW08*	LF3(1)	09/16/10	10396.05	***14.6***	1.19	405	***3.31***	3.01				34.8		
MW05*	LF3(1)	09/16/10	10396.04	***10***	1.44	181	***3.59***	1.98		1.38		19.1		
MW02	LF3(1)	09/16/10	10396.01	***15.4***	2.77	15.1	0.157	1.44		2.11		12.2		
MW12	LF3(1)	09/17/10	10398.04	***6.33***		137	***1.98***	1.67				44.3		
MW12	LF3(1)	09/17/10	10398.03			128	***1.86***	1.07		2.89		42.7	1.8	
MW06	LF3(1)	09/17/10	10398.07	***13.2***	2.04	19.9		0.552	8.12	6.86		4.6	2.62	
MW16	LF3(1)	09/17/10	10398.09			19.7	0.682	0.981		2.31		25.6		
MW09	LF3(1)	09/17/10	10398.08	***6.6***		90.5	***1.35***	1.22	1.95			12.1		

Table 1. Summary of Select Metal Concentrations in Groundwater from March 2010 to September 2010 at Site 699

Well ID	SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
NJDEP Ground Water Quality Standards (µg/L)				6	3	6000	1	4	70	1300	5	100	40	2
MW04	LF3(1)	09/17/10	10398.06	***12.8***	***4.18***	15.1	0.078	1.4				1.95	1.77	
MW01*	LF3(1)	09/17/10	10398.05	***6.88***	***11.79***	41.9	0.1	0.835		1.28		1.49	2.7	
RW11*	699RW11	09/27/10	10413.02	***17.6***	1.61	66.7	0.585	***4.39***		2.66		83.9		
RW03	699RW03	09/27/10	10413.01	***8.4***	1.74	111	0.86	3.71	2.21	12	2.82	16.4	2.07	
RW05*	699RW05	09/30/10	10420.01	***12.8***	***23.95***	35	0.214		5.08	15.6	4.12	3.37		
			Mean	9.2	3.9	84.5	1.4	3.2	14.2	6.7	12.0	72.9	2.2	
			90th percentile	14.0	9.6	154.6	2.8	7.1	35.0	12.5	29.3	48.6	2.7	
			Adjusted Mean	8.5	2.2	56.8	0.9	1.9	7.0	5.3	10.1	15.8	2.1	

Notes: Adjusted mean does not include metal concentrations that exceed the 90th Percentile

1) Concentrations bolded and italicized exceed applicable Ground Water Quality Standard (GWQS)
2) Concentrations bolded and italicized in red exceed applicable GWQS and the 90th Percentile
3) Concentrations highlighted in red cells exceed exceed the 90th Percentile and are deemed to be extreme outliers
4) Samples highlighted in yellow contain two or more metal concentrations that exceed the 90th Percentile
5) Blank cells indicate metals were not detected, not analyzed, or not reported due to instrument errors

M: Metal detected in method blank

* Sample contains two or more metals at concentrations exceeding the 90th Percentile

Table 2
Building 699
Concentration Rankings and Recommended Monitoring Well Sampling
4th Quarter 2008 - 3rd Quarter 2010

Well ID	Antimony	Arsenic	Beryllium	Cadmium	Lead	Selenium	Thallium
	NJDEP GWQS	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*
	6	*3*	*1*	*4*	*5*	*40*	*2*
699MW01		11.79				*	*
699MW02	15.4					*	*
699MW04				7.09		*	*
699MW05			3.59			*	*
699MW06	13.2	10.16				*	*
699MW08	14.6		3.31			*	*
699MW09							
699MW12							
699MW15					31.1	*	*
699MW16							
699RW03		19.42	10.5	13.5	29.3	*	*
699RW05		23.95			64.1	*	*
699RW11	17.6		3.96	17.7	24.2	*	*
616MW01				5.51		*	*

Notes:

Results reported in µg/L.

Within the reporting period, the four highest concentrations are listed for each parameter.

Shaded rows indicate monitoring wells recommended for metals analysis.

Metals were analyzed during the following quarters: 1st, 2nd, & 3rd Quarters 2010.

*Based on results from the 4th Quarter 2010 and 1st Quarter 2011 sampling events, analysis of Selenium and Thallium may be required.

SITE SPECIFIC EVALUATION
BUILDING 750

Site data and 90th Percentile calculations are provided on Table 1 (attached), and summarized as follows:

90th Percentile Analysis Summary
Building 750

750	Sb	As	Ba	Be	Cd	Cr	Cu	Pb	Ni	Se*	Tl*
Jan 05 - Aug 10	n=29	n=62	n=111	n=58	n=41	n=77	n=67	n=18	n=77	n=86	n=2
90th Percentile	10.64	21.05	156.00	0.89	5.43	40.62	21.14	49.26	19.70	28.58	5.28
Mean	6.72	9.47	85.59	0.82	1.90	26.80	18.84	24.85	8.35	16.98	3.62
Adjusted Mean	5.61	5.73	58.65	0.46	1.07	9.90	6.00	9.76	4.36	9.85	1.54
NJDEP GWQS (ug/L)	**6**	**3**	**6000**	**1**	**4**	**70**	**1300**	**5**	**100**	**40**	**2**

Results reported in µg/L or parts per billion. Shaded cells indicate values that exceed the GWQS. "n" = population size in the statistical analysis. As a conservative measure, non-detectable results were not included in the statistical analysis, and thus the population size may be biased low when compared to the total number of data points. * Due to possible laboratory inaccuracies, the 90th Percentile Analysis was not used in developing sampling recommendations for these parameters.

90th Percentile Values Meet GWQS:

The 90th percentile values for barium, beryllium, chromium, copper, nickel, and selenium are below their respective GWQS.

Note that due to possible laboratory inaccuracies affecting selenium and/or thallium results, the 90th Percentile Analysis was not used to determine compliance with the GWQS.

Mean Values, or Adjusted Mean Values, Meet GWQS:

The mean value for cadmium is below its GWQS.

The adjusted mean values for antimony and thallium are below their respective GWQS.

Recommendations:

In consideration of the above, the following sampling protocol is recommended for this site:

1. Selenium and Thallium - Due to possible laboratory inaccuracies affecting selenium and/or thallium results, the 90th Percentile Analysis was not used to determine compliance with the GWQS.

Evaluation of the 4th Quarter 2010 and 1st Quarter 2011 sampling should be performed to determine compliance with the GWQS. If exceedances of the GWQS are identified, the sampling protocol specified under item 3 below should be followed.

2. With the exception of selenium and thallium (addressed above), no further sampling/analysis is recommended for metals with 90th percentile values below their respective GWQS.

3. For remaining metals, the collection of ground water samples using the following sampling protocol is recommended.

Collection of samples on a semiannual basis, targeting the times of the year typically exhibiting elevated precipitation amounts (generally 2nd and 4th quarters).

For future sampling events, raw and filtered water sample pairs should be collected from select wells (identified below), to evaluate the input from sample turbidity. Samples should be analyzed by a NJ certified laboratory. Slow-purge methodology should be followed for all sampling events which include metals analyses. Refer to the Concentration Ranking and Monitoring Well Selection Protocol described below.

Concentration Ranking and Monitoring Well Selection Protocol

For the specified sampling events, the monitoring wells recommended for sampling were selected with a bias towards those wells demonstrating the highest concentrations as follows.

For the available data from 4th Quarter 2008 through 3rd Quarter 2010, the highest observed concentrations for the site monitoring wells were ranked for each metal of concern. For larger sites, such as landfills, the highest four concentrations were listed; for smaller sites, the highest two concentrations were deemed adequate. Concentration Rankings and Recommended Well Sampling are summarized in Table 2 (attached).

Based on the specified protocol, monitoring wells 750MW02, 750MW03, and 750MW04 are recommended for sampling with laboratory analysis for antimony, arsenic, cadmium, and lead, along with selenium and thallium as required.

Table 1. Summary of Select Metal Concentrations in Groundwater from January 2005 to August 2010 at Site 750

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
** NJDEP Ground Water Quality Standards (µg/L)			6	3	6000	1	4	70	1300	5	100	40	2
750MW01	01/13/05	50023.04			108	0.65							
MW01 Duplicate	01/13/05	50023.03			106	0.665							
750MW03	01/13/05	50023.06			12.6			21.4					
750MW04	01/13/05	50023.07			13			13.1					
750MW02*	01/13/05	50023.05		*21.8*	441	*4.83*	*5.43*	*551*	106	*59.2*	36.6		
750MW01	04/15/05	50203.04			102	0.585							
750MW04	04/15/05	50203.07		*16.1*	83.6			*91.4*	20.1	*33.4*	7.2		
750MW03	04/15/05	50203.06		*14.6*	53.8	0.868		*126*	13.6	*22.7*	7.06		
750MW02	04/15/05	50203.05		*5.37*	75.3	0.697		*77.6*	15		6.3		
750MW01*	07/07/05	50339.04			236	*1.5*							
750MW02	07/07/05	50339.05			49				16				
750MW03	07/07/05	50339.06		*12*	13			28.4					
MW04 Duplicate	07/07/05	50339.03			28.6			19.2	7				
750MW04	07/07/05	50339.07			27.1			18.4	6				
750MW04	11/01/05	50571.07			24.9				7.31				
750MW03	11/01/05	50571.06			28.7								
750MW02	11/01/05	50571.05			86.4				12.3				
MW01 Duplicate*	11/01/05	50571.03			183	0.974					5.21		
750MW01*	11/01/05	50571.04			183	1					5.18		
750MW01	01/17/06	60032.04			111	0.785							
750MW04	01/17/06	60032.07			38.8								
MW04 Duplicate	01/17/06	60032.03			39.7								
750MW03	01/17/06	60032.06			19.7			31.8					
750MW02	01/17/06	60032.05		*12.6*	647	*3.04*	*5.97*	8.59		*45*	21.4		
750MW03	04/14/06	60155.06		*5.73*	10.5			44.1					
750MW04	04/14/06	60155.07	3.03		27.3			24.9	124	*14.4*			
750MW02	04/14/06	60155.05	2.63		13.4	0.356	0.378	31.3	36.5	*7.09*	5.21		
750MW01	04/14/06	60155.04	5.09		128	0.695		0.993			3.8		
MW01 Duplicate	04/14/06	60155.03	4.22		129	0.679					2.95		
750MW03	07/17/06	60320.06	2.86	*6*	14.4			19.4	3.71				
MW03 Duplicate	07/17/06	60320.03	4.78		14.2			19.2	3.78				
750MW04	07/17/06	60320.07	5.75	2.06	28.1			13.7	7.53				
750MW01	07/17/06	60320.04	*6.74*	2.26	138	0.511			2.8		3.11		
750MW02*	07/17/06	60320.05	*8.26*	*7.25*	197		0.779	3.46	30.8		23		
MW04 Duplicate	10/30/06	60471.03			24.3	0.201		5.3	3.12			9.44	
750MW02*	10/30/06	60471.05		*21.3*	275	0.346	*9.55*	12.6	11.2		57	10.9	*5.7*
750MW01	10/30/06	60471.04			111	0.743	0.623				2.07	5.13	
750MW04	10/30/06	60471.07			23	0.241	0.515	4.98	3.06		1.38	13.2	
750MW03	10/30/06	60471.06		2.41	17.5	0.247	0.457	14.6			1.21	11.9	

Table 1. Summary of Select Metal Concentrations in Groundwater from January 2005 to August 2010 at Site 750

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
** NJDEP Ground Water Quality Standards (µg/L)			6	3	6000	1	4	70	1300	5	100	40	2
750MW01	02/28/07	70077.04			59.1	0.311						4.13	
MW01 Duplicate	02/28/07	70077.03			59.2	0.366			0.685			4.76	
750MW03	02/28/07	70077.06			13.1			14.9	2.36			8.76	
750MW02*	02/28/07	70077.05			264	0.859	2.94	1.7	22.7	1.74	40.6	8.91	
750MW04	02/28/07	70077.07			25.9			11.1	6.1		4.96	9.95	
750MW04	05/24/07	70191.07		*5.74*	24			9.86	3.02			11.5	
750MW02*	05/24/07	70191.05		*3.82*	207	0.752	2.3	1.05	17.9	2.05	32.7	7.41	
750MW01	05/24/07	70191.04			80.5	0.342	0.442	0.611	0.718		2.11	6.44	
MW01 Duplicate	05/24/07	70191.03		*3.42*	81.7	0.318	0.484	0.972	1.14		2.1	6.42	
750MW03	05/24/07	70191.06		*8.51*	16.9		0.412	27.9	12.3		0.743	7.78	
750MW04	07/26/07	70282.07			24.6			17.7	6.43			10.7	
750MW03	07/26/07	70282.06			122	0.467	1.42	0.942	7.6	0.712	20.3	5.6	
750MW01	07/26/07	70282.04			114	0.796	0.414	0.204			2.17	3.71	
MW01 Duplicate	07/26/07	70282.03	0.776		114	0.77	0.353	0.55			2.06		
750MW02	07/26/07	70282.05			13		1.17	1.68	3.9	1.01	0.726		
750MW04	01/02/08	80001.07			24.6		0.337	4.23	9.01		6.55	4.16	
750MW02	01/02/08	80001.05			77.7	0.228	0.68		9.31		11.7		
750MW01	01/02/08	80001.04			113	0.732	0.309		0.686		1.63	4.4	
750MW03	01/02/08	80001.06			18.6		0.403	3.22	3.08		1.22	4.55	
750MW01	04/30/08	80143.04			152	0.664	0.301	0.355			4.98		
MW01 Duplicate	04/30/08	80143.03		2.97	151	0.675	0.212	0.367			4.43		
750MW04	04/30/08	80143.07			22			9.59	4.64		2.17	10.5	
750MW03	04/30/08	80143.06		*4.26*	11.4			38.5	2.6		2.04	7.32	
750MW02	04/30/08	80143.05			82.3	0.228	0.671	1.88	60.1		11.4	4.45	
750MW03	08/12/08	80292.06		*6.54*	6.21			32.6	0.978			4.43	
750MW04	08/12/08	80292.07		*5.23*	17.7			19.9	1.45			6.55	
750MW02	08/12/08	80292.05			54.8		0.678	0.569	1.44		6.09		
MW01 Duplicate	08/12/08	80292.03		2.5	135	0.513	0.489	0.407			3.05		
750MW01	08/12/08	80292.04			138	0.505	0.373	0.41			2.97		
MW01 Duplicate	10/31/08	80396.03		*6.19*	125	0.768	0.288	15.1	3.52		4.08	4.79	
750MW03	10/31/08	80396.06		*3.71*	8.88		0.333	20	1.53		2.12	7.82	
750MW02*	10/31/08	80396.05	*10.5*	*18.2*	845	*12.9*	*13.6*	*367*	522	*232*	*110*		
750MW04	10/31/08	80396.07			28.8		0.418	3.93	2.43		0.864	7.04	
750MW03*	03/31/09	90135.06	*21.1*	*73*	16.7			9.83	19.7	*6.68*		*99.3*	
750MW04*	03/31/09	90135.07	*16.8*	*79.3*	31.9			2.73	6.32			*89.6*	
750MW02	03/31/09	90135.05	1.82	*8.63*	39.8			5.31	6.42	2.03	3.16	26.8	
750MW01	03/31/09	90135.04	*7.19*	*15.6*	94.5	0.342		1.18			2.25	28.9	
MW01 Duplicate	03/31/09	90135.03	*6.6*	*17.3*	96	0.368		2.21			1.9	27.3	
750MW02	05/22/09	90210.05	2.82	*8.11*	74.9	0.2	0.314	2.04	12.1	3.67	7.62		1.54

Table 1. Summary of Select Metal Concentrations in Groundwater from January 2005 to August 2010 at Site 750

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
** NJDEP Ground Water Quality Standards (µg/L)			6	3	6000	1	4	70	1300	5	100	40	2
MW01 Duplicate	05/22/09	90210.03		***5.89***	65.6	0.327			0.839		2.42		
750MW03	05/22/09	90210.06	1.43	***18.8***	15.5			38.2	5.49		2.05	6.1	
750MW01	05/22/09	90210.04		***6.97***	63.1	0.318				1.75	2.02		
750MW04	05/22/09	90210.07		***22.4***	28.3			9.17	6.02	1.93	0.897	8.84	
750MW04*	08/28/09	90361.07	***6.94***	***28***	20.9			10.2	1.39			***63.7***	
750MW02	08/28/09	90361.05		***11.4***	74	0.192	***9.21***	14.7	6.86		7.83	16.2	
MW01 Duplicate	08/28/09	90361.03		***11.1***	77.7	0.251	2.36				3.2	24.1	
750MW01	08/28/09	90361.04		***11***	84.2	0.289	3.3				2.5	17.2	
750MW03*	08/28/09	90361.06	***7.72***	***25.7***	19.5			5.16	1.29		2.06	***74.4***	
750MW03	09/24/09	90397.06											
750MW02	09/24/09	90397.05											
750MW01	09/24/09	90397.04											
MW01 Duplicate	09/24/09	90397.03											
750MW04	09/24/09	90397.07											
MW05 Duplicate	11/03/09	90434.12											
750MW08	11/03/09	90434.11											
750MW07	11/03/09	90434.1											
750MW06	11/03/09	90434.09											
750MW05	11/03/09	90434.08											
750MW01	11/03/09	90434.04		1.66	97.1	0.497		4.97			5.59		
MW01 Duplicate	11/03/09	90434.03		2.22	97.2	0.408		3.1			4.94		
750MW02	11/03/09	90434.05		***3.84***	67.8	0.62	2.22	***80.1***	17.3	***5.5***	10.9		
750MW04	11/03/09	90434.07		1.31	21			6.38	1.22		1.46	21.1	
750MW03	11/03/09	90434.06	5.68	1.99	11.4			8.55	2.03		1.2	14	
750MW08	11/17/09	90447.07											
750MW07	11/17/09	90447.06											
750MW06	11/17/09	90447.05											
750MW05	11/17/09	90447.04											
MW05 Duplicate	11/17/09	90447.03											
MW01 Duplicate	01/27/10	10038.03		1.37	91.5	0.472					4.59		
750MW01	01/27/10	10038.04		1.79	86.4	0.449					3.61		
750MW03	01/27/10	10038.06		1.09	23.5			2.56			2.5		
750MW02	01/27/10	10038.05		***5.12***	128	0.402	2.65	6.54	15.8	***6.51***	14		
750MW04	01/27/10	10038.07	***7.21***		31.9						1.93		
LF1(1) Duplicate	05/04/10	10175.03		0.85	76.9	0.079					3.13		
LF1(1)	05/04/10	10175.04			72.5	0.049					2.3		
LF1(1)	05/04/10	10175.05	5.72	***3.15***	8.25			43.8	1.49		1.41		
750MW05	05/06/10	10176.06	***11.2***	2.43	62.1						4.55		
750MW06	05/06/10	10176.07	***9.05***	1.39	38.2						2.8		

Table 1. Summary of Select Metal Concentrations in Groundwater from January 2005 to August 2010 at Site 750

SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Selenium	Thallium
** NJDEP Ground Water Quality Standards (µg/L)			6	3	6000	1	4	70	1300	5	100	40	2
750MW07	05/06/10	10176.08		0.72	109	0.442					19.3		
LF1(1) Duplicate	05/06/10	10176.03		1.06	157	0.324	1.62	1.29	3.99		16		
LF1(1)	05/06/10	10176.04		1.24	156	0.31	1.82	1.19	3.33		15.5		
LF1(1)	05/06/10	10176.05	***6.26***	2.13	15.2			2.72	1.33		0.911		
LF2(1)	08/18/10	10350.05	***9.15***	2.16	17.3			5.81	2.47				
LF2(1)	08/18/10	10350.06		1.61	107	0.143	0.641				4.16		
LF2(1)	08/18/10	10350.07		0.95	96.5	0.211	1.12		5.31		10.3		
LF2(1) Duplicate	08/18/10	10350.03	***7.33***	2.67	16.1			3.81	1.95		0.637		
LF2(1)	08/18/10	10350.04	***6.25***	2.4	17.1			3.62	1.87		0.526		
		AVG	6.72	9.47	85.59	0.82	1.90	26.80	18.84	24.85	8.35	16.98	3.62
		90th Percentile	10.64	21.05	156.00	0.89	5.43	40.62	21.14	49.26	19.70	28.58	5.28
		Adjusted Mean	5.61	5.73	58.65	0.46	1.07	9.90	6.00	9.76	4.36	9.85	1.54

Notes:

Adjusted mean does not include metal concentrations that exceed the 90th Percentile

1) Concentrations bolded and italicized exceed applicable Ground Water Quality Standard (GWQS)

2) Concentrations bolded and italicized in red exceed applicable GWQS and the 90th Percentile

3) Concentrations highlighted in red cells exceed exceed the 90th Percentile and are deemed to be extreme outliers

4) Samples highlighted in yellow contain two or more metal concentrations that exceed the 90th Percentile

5) Blank cells indicate metals were not detected, not analyzed, or not reported due to instrument errors

M: Metal detected in method blank

* Sample contains two or more metals at concentrations exceeding the 90th Percentile

Table 2
Building 750
Concentration Rankings and Recommended Monitoring Well Sampling
4th Quarter 2008 - 3rd Quarter 2010

Well ID	Antimony	Arsenic	Cadmium	Lead	Selenium	Thallium
	NJDEP GWQS	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*
	6	*3*	*4*	*5*	*40*	*2*
750MW01						
750MW02			13.6	232	*	*
750MW03	21.1	73		6.68	*	*
750MW04	16.8	79.3			*	*
750MW05						
750MW06						
750MW07						
750MW08						

Notes:

Results reported in µg/L.

Within the reporting period, the two highest concentrations are listed for each parameter.

Shaded rows indicate monitoring wells recommended for metals analysis.

Metals were analyzed during the entire reporting period, 4th Quarter 2008 through 3rd Quarter 2010.

*Based on results from the 4th Quarter 2010 and 1st Quarter 2011 sampling events, analysis of Selenium and Thallium may be required.

SITE SPECIFIC EVALUATION
BUILDING 812 (FTMM-64)

Site data and 90th Percentile calculations are provided on Table 1 (attached), and summarized as follows:

90th Percentile Analysis Summary
Building 812

812	Sb	As	Ba	Be	Cd	Cr	Cu	Pb	Ni	Se*	Tl*
May 10 - Aug 10	n=18	n=14	n=20	n=9	n=7	n=0	n=13	n=3	n=18	n=0	n=0
90th Percentile	11.88	4.85	185.30	1.57	29.82	NR	10.51	4.06	34.20	NR	NR
Mean	8.97	1.88	83.62	0.91	10.76	NR	4.61	3.37	14.24	NR	NR
Adjusted Mean	8.51	1.23	59.08	0.83	3.56	NR	2.99	2.95	9.92	NR	NR
NJDEP GWQS (ug/L)	**6**	**3**	**6000**	**1**	**4**	**70**	**1300**	**5**	**100**	**40**	**2**

Results reported in µg/L or parts per billion. Shaded cells indicate values that exceed the GWQS. "n" = population size in the statistical analysis. As a conservative measure, non-detectable results were not included in the statistical analysis, and thus the population size may be biased low when compared to the total number of data points. * Due to possible laboratory inaccuracies, the 90th Percentile Analysis was not used in developing sampling recommendations for these parameters.

90th Percentile Values Meet GWQS:

The 90th percentile values for barium, copper, lead, and nickel are below their respective GWQS.

Note that due to possible laboratory inaccuracies affecting selenium and/or thallium results, the 90th Percentile Analysis was not used to determine compliance with the GWQS.

Mean Values, or Adjusted Mean Values, Meet GWQS:

The mean values for arsenic and beryllium are below their respective GWQS.

The adjusted mean value for cadmium is below its GWQS.

Recommendations:

In consideration of the above, the following sampling protocol is recommended for this site:

1. Selenium and Thallium - Due to possible laboratory inaccuracies affecting selenium and/or thallium results, the 90th Percentile Analysis was not used to determine compliance with the GWQS.

Evaluation of the 4th Quarter 2010 and 1st Quarter 2011 sampling should be performed to determine compliance with the GWQS. If exceedances of the GWQS are identified, the sampling protocol specified under item 3 below should be followed.

2. With the exception of selenium and thallium (addressed above), no further sampling/analysis is recommended for metals with 90th percentile values below their respective GWQS.

3. For remaining metals, the collection of ground water samples using the following sampling protocol is recommended.

Collection of samples on a semiannual basis, targeting the times of the year typically exhibiting elevated precipitation amounts (generally 2nd and 4th quarters).

For future sampling events, raw and filtered water sample pairs should be collected from select wells (identified below), to evaluate the input from sample turbidity. Samples should be analyzed by a NJ certified laboratory. Slow-purge methodology should be followed for all sampling events which include metals analyses. Refer to the Concentration Ranking and Monitoring Well Selection Protocol described below.

Concentration Ranking and Monitoring Well Selection Protocol

For the specified sampling events, the monitoring wells recommended for sampling were selected with a bias towards those wells demonstrating the highest concentrations as follows.

For the available data from 4th Quarter 2008 through 3rd Quarter 2010, the highest observed concentrations for the site monitoring wells were ranked for each metal of concern. For larger sites, such as landfills, the highest four concentrations were listed; for smaller sites, the highest two concentrations were deemed adequate. Concentration Rankings and Recommended Well Sampling are summarized in Table 2 (attached).

Based on the specified protocol, monitoring wells 812MW01, 812MW04, 812MW05, 812MW08, and, 812MW14 are recommended for sampling with laboratory analysis for antimony, arsenic, beryllium, and cadmium, along with selenium and thallium as required.

Table 1. Summary of Select Metal Concentrations in Groundwater from May 2010 to August 2010 at Site 812

Site ID	Well ID	SiteWELL ID	Date Collected	Lab ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Copper	Lead	Nickel	Selenium	Thallium
NJDEP Ground Water Quality Standards (µg/L)					6	3	6000	1	4	1300	5	100	40	2
812	MW07	LF1(1)	05/11/10	10186.07	5.97	1.61	154	0.483				38.4		
812	MW06	LF1(1) Duplicate	05/11/10	10186.03	***7.91***		96.5	0.462				17.8		
812	MW06	LF1(1)	05/11/10	10186.04			97	0.481				17.6		
812*	MW08	LF1(1)	05/11/10	10186.05	***12.3***	1.1	90.6	***1.34***	***54***	3.22	2.48	15.5		
812	MW14	LF1(1)	05/11/10	10186.06			27.5		***13.7***			1.32		
812	MW02	LF1(1)	05/13/10	10191.05	***9.56***	1.41	17							
812	MW05	LF1(1)	05/13/10	10191.06	***6.29***		287	***1.1***		8.54		31.9		
812	MW01	LF1(1)	05/13/10	10191.04	***11.7***	1.24	7.68			1.09		1.15		
812	MW04	LF1(1)	05/13/10	10191.07	***8.73***	***3.34***	23.2			16.1		1.06		
812	MW01	LF1(1) Duplicate	05/13/10	10191.03	***6.21***	0.78	6.78					0.855		
812	MW02	LF2(1)	07/28/10	10323.05	***9.96***	1.36	19.1			1.71				
812	MW06	LF2(1)	07/28/10	10323.07	*7*		102	0.5		2		17		
812	MW08	LF2(1)	07/28/10	10323.06	***8.69***	0.63	108	***1.59***	3.09	3.89	3.41	16.1		
812	MW01	LF2(1)	07/28/10	10323.04	***11***	0.91	8.6			3		1		
812	MW01	LF2(1) Duplicate	07/28/10	10323.03	***8.04***	***6.04***	6.84					0.712		
812*	MW07	LF2(1)	08/03/10	10326.05	***7.94***	1.12	174	0.702	1.09	1.58	4.22	59.1		
812	MW05	LF2(1)	08/03/10	10326.06	***8.09***		322	***1.56***		4.5		32.4		
812*	MW04	LF2(1)	08/03/10	10326.07	***13***	***5.49***	34.7		1.1	11		2.46		
812	MW14	LF2(1) Duplicate	08/03/10	10326.03	***9.31***	0.65	45.7		1.15	1.76		1		
812	MW14	LF2(1)	08/03/10	10326.04	***9.83***	0.65	44.2		1.22	1.55		0.928		
				Mean	8.97	1.88	83.62	0.91	10.76	4.61	3.37	14.24		
				90th Percentile	11.88	4.85	185.30	1.57	29.82	10.51	4.06	34.20		
				Adjusted Mean	8.51	1.23	59.08	0.83	3.56	2.99	2.95	9.92		

Notes: Adjusted mean does not include metal concentrations that exceed the 90th Percentile

1) Concentrations bolded and italicized exceed applicable Ground Water Quality Standard (GWQS)
2) Concentrations bolded and italicized in red exceed applicable GWQS and the 90th Percentile
3) Concentrations highlighted in red cells exceed exceed the 90th Percentile and are deemed to be extreme outliers
4) Samples highlighted in yellow contain two or more metal concentrations that exceed the 90th Percentile
5) Blank cells indicate metals were not detected, not analyzed, or not reported due to instrument errors

M: Metal detected in method blank

* Sample contains two or more metals at concentrations exceeding the 90th Percentile

Table 2
Building 812
Concentration Rankings and Recommended Monitoring Well Sampling
4th Quarter 2008 - 3rd Quarter 2010

Well ID	Antimony	Arsenic	Beryllium	Cadmium	Selenium	Thallium
	NJDEP GWQS	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*	*NJDEP GWQS*
	6	*3*	*1*	*4*	*40*	*2*
812MW01		6.04			*	*
812MW02						
812MW04	13	5.49			*	*
812MW05			1.56		*	*
812MW06						
812MW07						
812MW08	12.3		1.59	54	*	*
812MW14				13.7	*	*

Notes:

Results reported in µg/L.

Within the reporting period, the two highest concentrations are listed for each parameter.

Shaded rows indicate monitoring wells recommended for metals analysis.

Metals were analyzed during the following quarters: 2nd & 3rd Quarters 2010.

*Based on results from the 4th Quarter 2010 and 1st Quarter 2011 sampling events, analysis of Selenium and Thallium may be required.

Remedial Action Workplan Addendum

Building 699
Main Post Area
Fort Monmouth, New Jersey

NJDEP UST Registration No. 0081533-112
NJDEP Incident # 89-10-19-1329

June 10, 1999

Prepared For
United States Army
Directorate of Public Works
Fort Monmouth, New Jersey
Building 173
Fort Monmouth, New Jersey 07703

Prepared By
Groundwater & Environmental Services, Inc.
1340 Campus Parkway
PO Box 1740
Wall, New Jersey 07719

CERTIFICATION

For: Remedial Action Workplan Addendum Building 699 site, NJDEP Incident # 89-10-19-1329, Fort Monmouth, New Jersey

"I certify under penalty of law that the information provided in this document is true, accurate, and complete to the best of my knowledge. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

Charles Appleby
Environmental Protection Specialist
NJDEP Subsurface Evaluator Cert# 2056
Fort Monmouth, New Jersey 07703
Name, Title

Signature

6/23/99
Date

"I certify that under penalty of law that I have personally examined and am familiar with the information submitted herein and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete to the best of my knowledge. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

Mark H. Johnson
LTC, MI
Garrison Commander
Name, Title

Signature

6/23/99
Date

This Remedial Action Workplan Addendum has been reviewed and approved.

Ian Curtis
Case Manager
NJDEP, Bureau of Federal Management
Name, Title

Signature

6/23/99
Date

ENCLOSURE #1
BUREAU OF UNDERGROUND STORAGE TANKS
ADMINISTRATIVE CHECKLIST FOR REMEDIAL ACTION WORKPLANS

Facility Name: United States Army, Fort Monmouth

Case #: 89-10-19-1329

UST #: 0081533-112

General	Check one: yes	no	n/a
1. Table of Contents	X		
Environmental Setting			
1. USGS topographic map	X		
2. Scaled site map w/ all site features	X		
3. Background conditions summary, including discussion on all potential receptors, source mitigation, etc.	X		
4. Effectiveness Analysis and Certification (as per P.L. 1993, c. 139, Section 35)	X		
5. Soil remediation plan			
a. Summary of sampling results to date, including all sample locations and concentration on a scaled site map and in tabular form (i.e. Remedial Investigation Report)	X		
b. Detailed description of remedial action and remedial technology for each area of concern	X		
c. Post-remedial sampling plan		X	
d. Cleanup goals (compound specific)	X		
e. Soil disposal/soil re-use plan			X
f. Permit requirements/applications	X		
g. Scaled site maps per N.J.A.C. 7:26E-4.9 and 6.2(a)6i-v	X		
h. Soil erosion and sediment control plan			X
6. Ground water remediation plan	X		
a. Summary of sampling results to date, including contaminant isopleth maps and tabular	X		

presentation (i.e. RIR)

	Check one: yes	no	n/a
b. Plume delineated	X		
c. Wells properly constructed	X		
d. Flow direction defined, including ground water contour maps	X		
e. Detailed description of remedial action and remedial technology	X		
f. Cleanup goals (compound specific)	X		
g. System specifications	X		
h. Remedial monitoring plan/effectiveness evaluation plan	X		
i. Hydraulic control information/maintenance	X		
j. Treated water discharge location	X		
k. Permit requirements/applications	X		
7. Data presentation format	X		
8. Site restoration plan and remedial system dismantling plan		X	
9. Schedule of implementation	X		
10. Cost estimate	X		
11. Site specific Health and Safety Plan		X	

Note: all "no" and "n/a" responses must be accompanied by supporting rational.

5c. A post remedial soil sampling plan will be submitted at a later date.

5e. Soil vapor extraction is proposed as a remedial alternative for soil.

5h. Soil erosion to surface waters is not expected to occur at this site.

8. A remedial system dismantling plan will be submitted at a later date.

11. A site specific health and safety plan is located in GES files and will be available for review upon request. As per OSHA, any and all contractors will complete a Health and Safety Plan as contracts are awarded.

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APPENDICES

EXECUTIVE SUMMARY

Groundwater & Environmental Services, Inc. (GES) was contracted by Fort Monmouth, (through TECOM-Vinell Services, Inc. PO #98-0017 and #99-838) to prepare a Remedial Action Workplan Addendum (RAWA) for Building 699 (site), Main Post area of United States (U.S.) Army Fort Monmouth, Fort Monmouth, Monmouth County, New Jersey. On October 19, 1989, the Main Post gasoline station at Fort Monmouth contacted the New Jersey Department of Environmental Protection (NJDEP), to report an apparent release of gasoline from the piping system. Incident # 89-10-19-1329 was assigned to the site for the gasoline release. A separate-phase product (SPP) recovery pump was installed in a monitoring well immediately downgradient of the source in an attempt to recover remaining SPP. The Fort Monmouth Directorate of Public Works (DPW) submitted a Remedial Action Workplan (RAW) on October 12, 1993. In response to the 1989 gasoline discharge, seventeen (17) monitoring wells, and three (3) recovery wells have been installed at the site. The horizontal extent of the groundwater plume has been delineated.

On June 9, 1998, a 2,000 gallon No. 2 fuel oil fiberglass underground storage tank (UST) was removed in accordance with the New Jersey Department of Environmental Protection (NJDEP) underground storage tank procedures at the Main Post area of the U.S. Army Fort Monmouth, Fort Monmouth, New Jersey. The UST, NJDEP Registration No. 0081533-112 (Fort Monmouth ID No. 699), was located southwest of Building 699. A No Further Action was proposed for the 2,000-gallon fuel oil UST.

The Krydon Group, Inc. (Krydon) was contracted to determine the extent of gasoline contamination at the site. Krydon conducted a soil boring program on July 23 – 24, 1993, and collected a total of 27 soil samples. Benzene soil concentrations were found to be ranging between non-detect and 60 milligrams per kilogram (mg/Kg).

The existing groundwater recovery and treatment system extracts groundwater from one (1) recovery well (RW-11). GES has been contracted to operate and maintain the existing groundwater system since January 1998. The treatment system consists of one (1) sediment filter, and three (3) one hundred and eighty (180) pound (lb) liquid-phase granular activated carbon (GAC) units installed in series. The GAC units provide the necessary treatment for the removal of volatile organic compounds (VOCs). The treated groundwater is discharged via the sanitary sewer in accordance with the existing Treatment Works Approval (TWA) permit the Northeast Monmouth County Regional Sewerage Authority

Historically, groundwater samples have been collected at the site since 1989, and quarterly since 1995. Currently, depth to groundwater measurements were collected from all monitoring and recovery wells at the Main Post site by GES, on a bi-weekly basis from April 1998 through

February 1999, with the exception of May and December 1998. The Fort Monmouth DPW personnel collected groundwater samples on January 15, 1998, June 8, 1998, July 29, 1998, and December 30, 1998 from various monitoring wells located at the site.

A remedial action pilot test was performed on April 17, 1998 utilizing GES' data acquisition and processing laboratory (DAPL) vehicle. Pilot testing was performed at this site to evaluate remedial options to address impacted soil. Based on an evaluation of the pilot test data, a low-vacuum soil vapor extraction (SVE) system with groundwater extraction and optional air sparge system has been determined to be a technically feasible, and the most cost effective remedial technology to address this site.

The proposed remedial system will utilize SVE and groundwater pumping to extract soil vapor and groundwater from existing monitoring wells and proposed vapor extraction laterals and wells. Soil vapor extraction will apply vacuum to the subsurface soils to volatilize and extract VOCs. In addition, in-situ air stripping (air sparging) may be utilized in the future to remediate groundwater in the saturated zone. The extracted soil vapor and groundwater will be treated and discharged in accordance with the applicable discharge permits. The Classification Exception Area (CEA) will encompass the capture zone of the proposed remedial system.

The proposed remedial system complies with the NJDEP regulations and guidelines. GES estimates that the proposed system will be required to operate for a period of approximately 5 years. This estimate is based on GES' extensive experience in the operation and maintenance of similar remedial systems. The actual time as well as efficiency of the system will be determined by site-specific conditions. Modeling has been done to the best of GES' ability and satisfies the regulatory intent.

1.0 INTRODUCTION

Groundwater & Environmental Services, Inc. (GES) was contracted by Fort Monmouth, (through TECOM-Vinelli Services) to prepare a Remedial Action Workplan Addendum (RAWA) for Building 699 (site), Main Post area of U.S. Army Fort Monmouth, Fort Monmouth, Monmouth County, New Jersey. The site is situated on Saltzman Avenue, a thoroughfare through Fort Monmouth. Figure 1 is an annotated U.S. Geological Survey (USGS) 7.5-minute series quadrangle map depicting the site location, topography, and drainage patterns.

On October 19, 1989, the Main Post gasoline station at Fort Monmouth contacted the New Jersey Department of Environmental Protection (NJDEP), to report an apparent release of gasoline from the piping system. Incident # 89-10-19-1329 was assigned to the site for the gasoline release. Approximately 11,000-gallons of gasoline was discharged into the soil surrounding the underground storage tanks (USTs) and piping (Krydon 1993). After the gasoline release, the Main Post gasoline station has replaced the piping system connecting the USTs and the fuel pumps with equipment compliant with the NJDEP Bureau of Underground Storage Tanks (BUST). A separate-phase product (SPP) recovery pump was installed in a monitoring well immediately downgradient of the source in an attempt to recover remaining SPP. In response to the NJDEP letter, the United States Army submitted *A Discharge Investigation and Corrective Action Report* (DICAR), dated July 3, 1990 prepared by GES.

In a letter dated June 18, 1993, the NJDEP requested the submission of a Remedial Action Workplan (RAW). The United States Army submitted a RAW on October 12, 1993 (Krydon 1993). This RAWA presents a brief history of the site and area of concern, a performance summary of the current groundwater remedial system, a summary of groundwater monitoring and sampling data and the design and specifications of the proposed remedial system upgrade.

1.1 Site History

The loss of product was discovered as a result of an inventory discrepancy found during routine inventory control. Pressure testing of the gasoline system indicated that the leak was located in the product line between the tanks and the pumps. A Phase Two Vapory Recovery system was subsequently installed. In response to the 1989 gasoline discharge, seventeen (17) monitoring wells, and three (3) recovery wells have been installed at the site. Two monitoring wells (MW-10, MW-A) were abandoned at a later date. Copies of selected well logs and Forms A are included in Appendix I

On June 10, 1998 one 2,000-gallon fiberglass diesel UST, (Registration No. 0081533-112) was closed at Building 699, by the United States Army Directorate of Public Works (DPW). Based on tank inspection, field screening of subsurface soils and review of analytical results of

collected soil samples, it was concluded that no significant historical discharges were associated with the UST or associated piping. Results of tank closure activities are presented in the *Tank Closure Report*, dated June 1998. This UST Closure and Site Investigation Report was prepared by SMC Environmental Services Group, to assist the DPW in complying with the NJDEP-BUST regulations.

1.2 Health and Safety Procedures

A site specific Health and Safety Plan (HASP) was prepared by GES for all site activities. The HASP outlines the required field monitoring equipment, protective clothing, action levels, anticipated compounds, and emergency response procedures. The HASP is retained in GES' files and is available upon request. Based on the field air monitoring data and an evaluation of the potential hazards, site activities were conducted in level "D" protection. Air monitoring was conducted throughout sampling and drilling activities utilizing a photo-ionization detector (PID). All GES field personnel are trained and certified in accordance with Occupational Safety and Health Administration (OSHA) requirements. Per OSHA, any contractor working on the site is required to complete a site specific HASP prior to commencement of work.

2.0 PHYSICAL SETTING

2.1 Site Description

The site is approximately one acre, and serves as the only on-base Main Post location for non-military vehicles to obtain fuel. The station has six 10,000-gallon, fiberglass USTs which store various grades of gasoline products. These products are distributed from two remote pumping islands, with a total of four dispensers. The remainder of the pump islands do not have any dispensers. A former fuel oil UST, and waste oil UST were located east of the building in the immediate vicinity of MW-12. The building was historically utilized as an automobile service garage. However, automobile servicing has been discontinued since 1997. There are four bays located at the eastern side of the building. The site is approximately ninety percent covered by impervious surfaces including pavement, concrete islands and a service station. Large paved parking areas exist to the east and west of the site. A large grassey area is found to the north across Saltzman Avenue. Building 699A is located approximately 750 feet northwest of Husky Brook, which empties into Oceanport Creek. The nearest water body is Parkers Creek, located approximately 1,000 feet north of the site. Topography at the site is relatively flat, sloping gradually to the southeast.

2.2 Geology/Hydrogeology

The following description of regional and local geology was taken in part from Smith, 1998.

Regional Geology

Monmouth County lies within the New Jersey Section of the Atlantic Coastal Plain Physiographic province. The site is located in what may be referred to as the Outer Coastal Plain subprovince, or the Outer Lowlands.

In general, New Jersey Coastal Plain formations consist of a seaward-dipping wedge of unconsolidated deposits of clay, silt, and gravel. These formations typically strike northeast-southwest with a dip ranging from 10 to 60 feet per mile and were deposited on Precambrian and lower Paleozoic rocks (Zapecza, 1989). These sediments, predominantly derived from deltaic, shallow marine, and continental shelf environments, date from Cretaceous through the Quaternary Periods. The mineralogy ranges from quartz to glauconite.

The New Jersey Coastal Plain formations record several major transgressive/regressive cycles and contain units which are generally thicker to the southeast and reflect a deeper water environment. Over 20 regional geologic units are present within the sediments of the Coastal Plain. Regressive, upward coarsening deposits are usually aquifers (e.g., Englishtown and Kirkwood Formations, and the Cohansey Sand) while the transgressive deposits act as confining units (e.g., the Merchantville, Marshalltown, and Navesink Formations). The individual thicknesses for these units vary greatly (i.e., from several feet to several hundred feet). The Coastal Plain deposits thicken to the southeast from the Fall Line to greater than 6,500 feet in Cape May County (Brown and Zapecza, 1990).

Local Geology

Based on the regional geologic map (Jablonski, 1968), the Cretaceous age Red Bank and Tinton Sands outcrop at the Main Post area. The Red Bank sand conformably overlies the Navesink Formation and dips to the southeast at 35 feet per mile. The upper member (Shrewsbury) of the Red Bank sand is a yellowish-gray to reddish brown clayey, medium-to-coarse-grained sand that contains abundant rock fragments, minor mica and glauconite (Jablonski). The lower member (Sandy Hook) is a dark gray to black, medium-to-fine grained sand with abundant clay, mica, and glauconite. The Tinton sand conformably overlies the Red Bank Sand and ranges from a clayey medium to very coarse grained feldspathic quartz and glauconite sand to a glauconitic coarse sand. The color varies from dark yellowish orange or light brown to moderate brown and from light olive to grayish olive. Glauconite may constitute 60 to 80 percent of the sand fraction in the

upper part of the unit (Minard, 1969). The upper part of the Tinton is often highly oxidized and iron oxide encrusted (Minard).

The upper soils at the site consist of Udorthents as described in the U.S. Department of Agriculture Soil Survey of Monmouth County New Jersey. Udorthents consists of well drained to somewhat poorly drained soils that have no horizonation. These soils were formed in stratified or graded, sandy or loamy fill material that has as much as 35 percent gravel by volume. Slopes range from 0 to 3 percent. These soils have been altered in some way. In some areas the altering resulted from filling over or excavating excessively drained to very poorly drained areas. These soils differ greatly from place to place. In filled areas the soils may be more than 20 inches deep to undisturbed material. They are strongly acidic to extremely acidic.

The hydrogeologic characteristics of the area are typical of the Atlantic Coastal Plain. The interbedded sequences of sand and clay transmit water under both confined and unconfined conditions. The intermittent clay strata serve as semi-confining beds where present. The Atlantic Coastal Plain receives recharge from precipitation and vertical leakage between aquifers through semi-confining beds.

The general flow of groundwater in the Atlantic Coastal Plain is southeasterly, following the dip of the strata. Local flow variations have been reported in the vicinity of pumping wells and surface bodies. The Hornerstown Sand, being mostly clay, serves as an aquiclude either independently or in conjunction with adjacent formations. It serves as an aquiclude independently where Red Bank Sand is present, separating this aquifer from the overlying Vincentown Formation. Down dip, where the aquifer in the Red Bank Sand has been removed, the Hornerstown Sand serves as a composite aquiclude with the Navesink Formation and the lower member of the Red Bank Sand, separating the Mount Laurel Sand from the Vincentown or Kirkwood aquifers. Although considered an aquiclude, the Hornerstown Sand may yield enough water in some parts of the formation to satisfy domestic needs.

Due to the limited horizontal extent and variable thickness of the Tinton bed, it is not considered a significant groundwater source and probably serves as a composite aquiclude with the overlying Hornerstown Sand.

Hydrogeology

The water table aquifer at the site is identified as part of the "composite 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.

Due to the proximity Fort Monmouth to the Atlantic Ocean, shallow groundwater may be tidally influenced and may flow toward creeks and brooks as the tide goes out, and away from creeks and brooks as the tide comes in. However, an abundance of clay lenses and sand deposits were noted in borings installed throughout Fort Monmouth. Therefore, the direction of shallow groundwater should be determined locally on a case-by-case basis.

Shallow groundwater may be locally influenced at the site by the following factors:

- tidal influence (based on proximity to the Atlantic Ocean, rivers, and tributaries),
- topography,
- nature of the fill material within the Main Post area,
- presence of clay and silt lenses in the natural overburden deposits, and
- local groundwater recharge areas (i.e., streams, lakes).

Due to the fluvial nature of the overburden deposits (i.e., sand and clay lenses), shallow groundwater flow direction is best determined on a case-by-case basis. This is consistent with lithologies observed in borings installed within the Main Post area, which primarily consisted of fine-to-medium grained sands, with occasional lenses or laminations of gravel silt and/or clay.

Aquifer Characteristics

Henderson, Breen & Hess developed and performed pump tests to study aquifer characteristics at the site. The aquifer characteristics studied included hydraulic conductivity, transmissivity and storage coefficient. These characteristics were calculated using data obtained from groundwater elevations observed on the 4-inch diameter monitoring wells between July 7 and August 13, 1992 while under the influence of the pumping 10" recovery well. Henderson, Breen & Hess calculated that the average coefficient of transmissivity was 418 gallons per day per foot (gpd/ft), the coefficient of storage for the study period was 0.06, and the hydraulic conductivity was 32.15 gpd/ft^2. Copies of the pumping test data tables compiled by Henderson, Breen, & Hess are included in Appendix II.

2.3 Local Water Supply/Well Search

Based on records of wells drilled in the Main Post area, water is typically encountered at depths of 2 to 9 feet below ground surface (bgs). According to Jablonski, wells drilled in the Red Bank and Tinton Sands may produce 2 to 25 gallons per minute (gpm). Some well owners have reported acidic water that requires treatment to remove iron.

According to the New Jersey Pollution Discharge Elimination System (NJPDES 1992 - 1993), 2.9 percent (%) of the population of Eatontown receives its water from domestic wells. In 1993,

a manual well search was conducted by Roy F. Weston Inc., a contractor of the US Army. A copy of the well search results is included in Appendix III.

3.0 PRODUCT RECOVERY

GES was contracted in October 1989 by the US Army at Fort Monmouth to remove SPP present at the site. Two 4-inch wells were installed from which a total of 4,506 gallons of SPP were removed (Krydon 1993). In December 1989, a dual pump recovery system was installed to maintain hydraulic control and to increase SPP recovery. A second dual phase recovery system was installed in March 1990 to expedite the product recovery process. A total of 6,733 gallons of SPP were recovered by summer 1990 (Krydon 1993). Currently, product recovery is not being conducted at the site.

4.0 GROUNDWATER MONITORING AND SAMPLING

4.1 Groundwater Elevations

Depth to groundwater measurements were collected from all monitoring and recovery wells at the Main Post site by GES, on a bi-weekly basis from April 1998 through February 1999, with the exception of May and December 1998. Groundwater monitoring events were conducted on April 2, 1989, April 9, 1998, May 27, 1998, June 11, 1998, June 26, 1998, July 2, 1998, July 8, 1998, July 29, 1998, August 8, 1998, August 18, 1998, September 4, 1998, September 17, 1998, October 2, 1998, October 16, 1998, November 12, 1998, November 25, 1998, December 4, 1998, January 22, 1999, January 29, 1999, February 12, 1999, and February 19, 1999. Measurements for depth to water, SPP thickness (when SPP was detected), and adjusted groundwater elevations are included in Table 1. Groundwater contours were generated from groundwater elevation data and the maps were submitted to Fort Monmouth DPW. Selected Contour Maps are included in this RAWA: July 2, 1998 (Figure 2), November 12, 1998 (Figure 3), January 22, 1999 (Figure 4), and February 19, 1999 (Figure 5).

4.2 Groundwater Sampling

Groundwater sampling has been conducted previously at the site at various intervals. Historical groundwater data from 1995 are presented in Appendix IV, in the form of hydrographs. The hydrographs include time versus groundwater concentration. Fort Monmouth DPW conducted groundwater sampling on January 15, 1998, June 8, 1998, and July 29, 1998, from monitoring wells MW-1 through MW-9, RW-11, MW-12, MW-15, MW-16, and MW616-1. Groundwater samples were also collected on December 30, 1998 from monitoring wells MW-2, MW-5, MW-

8, MW-9, MW-12, MW-15, MW-16, and MW616-1. All samples were submitted to US Army Fort Monmouth Environmental Laboratory (New Jersey Certification # 13461), and analyzed for Volatile Organic Compounds (VOCs) by Method 624, and lead by Method 3120B. The Site Information Plan for June 8, 1998 is included as Figure 6. A Benzene Isopleth Map for July 29, 1998, is included as Figure 7.

5.0 SOIL BORING PROGRAM

The Krydon Group, Inc. (Krydon) was contracted by Serv-Air, Inc. (Serv-Air), a designated contractor for the US Army at Fort Monmouth, to determine the extent of gasoline contamination and to provide an appropriate remediation recommendation at the site for Building 699. Krydon conducted a soil boring program on July 23 – 24, 1993, at the site. A total of 27 soil samples were collected by Krydon at a depth of 5.5 feet below grade (the soil-groundwater interface) and submitted to 21st Century Environmental and Fort Monmouth Environmental Laboratory for analysis. All soil samples collected on July 23 - 24, 1993 were analyzed for total petroleum hydrocarbons (TPH), VOCs with a forward library search of ten compounds (VOCs+10), and lead. The method numbers for analyses were not provided in the October 11, 1993 RAW by Krydon. The July 23 – 24, 1993, soil sampling locations are shown on a Figure provided by the US Army, a copy of which is included in Appendix V. The soil sampling results are included in Table 3, also provided by the US Army, a copy of which is included in Appendix V.

Soil Analytical Results

A review of the analytical results of the July 23 – 24, 1993, soil sampling indicates that the soil in the vicinity of the tankfield and pump islands has not been delineated. However, the biodegradation of gasoline components is widely documented. It is likely that the concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX) has degraded by advection, diffusion, dispersion, and bioremediation mechanisms. In addition, the areas in the vicinity of the tankfield and the pump island as identified during the soil boring program have been included in the Vapor Enhanced Groundwater Extraction (VEGE) treatment system being proposed for this site (See Section 8.0 for details).

6.0 SUMMARY OF REMEDIAL SYSTEM PERFORMANCE

The existing groundwater recovery and treatment system is installed within the existing fiberglass groundwater treatment system enclosure. Utilizing an electric submersible pump, groundwater extraction is ongoing from one (1) recovery well (RW-11). The treatment system consists of one sediment filter, which is utilized for solids removal, and three (3) one hundred

and eighty (180) pound (lb) liquid-phase Granular Activated Carbon (GAC) units installed in series. The GAC units provide the necessary treatment for the removal of VOCs. The existing groundwater system operates intermittently at a flowrate of approximately one (1) gpm. The treated groundwater is discharged to the Northeast Monmouth County Sewerage Authority via the sanitary sewer.

A Remedial System Performance Summary from January 2, 1998 through April 9, 1999, is included in Appendix VI. A total of 454,981 gallons have been discharged during this period.

7.0 PILOT TESTING

A remedial action pilot test was performed on April 17, 1998 utilizing GES' data acquisition and processing laboratory (DAPL) vehicle. The DAPL vehicles' computer-controlled telemetry permits the collection and instant analysis of real-time pilot test data. If required by site-specific conditions, the DAPL vehicle can be utilized to perform low-vacuum soil vapor extraction (SVE), high-vacuum SVE, SVE enhanced with groundwater recovery, dual phase vapor/groundwater extraction, and air sparge pilot tests.

Pilot testing was performed at this site to evaluate remedial options. Vapor point VP-1 and recovery well RW-2 were utilized as extraction wells for pilot testing activities. Five monitoring points, MP1, MP2, MP3, MP4, and MP5 were installed in the vicinity of RW-2 and VP-1. The monitoring points were utilized to measure both pneumatic and hydraulic influence during pilot testing.

The first pilot test utilizing low-vacuum SVE with groundwater extraction was performed utilizing VP-1 as the target well. Due to a problem with the construction of VP-1, pilot testing activities were terminated after a period of ten minutes. No useful data was acquired during this portion of the pilot test. The pilot test data is included in Appendix VII.

The second pilot test utilized low-vacuum SVE with groundwater extraction with RW-2 as the target well. At an applied vacuum of approximately 68 inches-H_2O and an air flowrate of approximately 9 standard cubic foot per minute (scfm), an effective radius of influence of 20 feet was generated. An effective radius of vacuum influence is empirically assumed to be the distance in feet from the extraction well under a minimum vacuum of 0.1 inches of water column.

Influent VOC concentrations were measured at greater than 100 percent of the lower explosive limit (% LEL) during this phase of the pilot test. This equates to greater than 13,000 parts per

million (ppm) based on a conversion factor of 130 ppm/% LEL. Off-gas treatment utilized two (2) one hundred and eighty (180) pound (lb) vapor phase GAC units.

During the pilot test on RW-2, groundwater was recovered at a rate of five (5) gpm. Recovered groundwater was conveyed to the existing groundwater treatment system for treatment and discharge.

Air injection into a temporary sparge point installed in the vicinity of VP-1 was attempted. However, the sparge point was located nineteen (19) feet from the operating target well RW-2. Due to the distance between the sparge point and RW-2, it was not possible to effectively capture the air injected into the sparge point. The sparge test indicated that with properly located sparge points and vapor extraction points, air injection would be a feasible method to target impacted soil below the water table.

Based on an evaluation of the pilot test data, a low-vacuum SVE system with groundwater extraction and optional air sparge system has been determined to be a technically feasible remedial technology to address this site.

8.0 REMEDIAL ACTION WORKPLAN ADDENDUM

The proposed remedial system is based on the site-specific hydrogeologic conditions discussed above, the physical extent and chemical characteristics of the impacted soil, as well as technical feasibility and cost effectiveness. In addition, the DPW provided historical background information that was utilized in the design of the remedial system. The proposed remedial system will utilize SVE and groundwater pumping to extract soil vapor and groundwater from existing monitoring wells and proposed vapor extraction laterals and wells. Soil vapor extraction will apply vacuum to the subsurface soils to volatilize and extract VOCs. In addition, in-situ air stripping (air sparging) may be utilized in the future to remediate groundwater in the saturated zone. The extracted soil vapor and groundwater will be treated and discharged in accordance with the applicable discharge permits. Previous experience with numerous soil vapor extraction/groundwater pump and treat systems has demonstrated the effectiveness of this technology.

The SVE/Air Sparge system may induce and/or enhance biological degradation of the organic compounds in the impacted soil by the introduction of atmospheric oxygen in the subsurface. The combined approach described above can accomplish the overall site remediation goals by providing both source removal and residual reduction strategies.

The process and instrumentation diagram for the proposed remedial system is depicted in Figure 8. As indicated in this Figure, groundwater extraction is proposed from one (1) existing monitoring well (RW-11) and two (2) proposed recovery wells (RW-3 and RW-4). Soil vapor extraction is proposed from one (1) existing recovery well (RW-11), two (2) proposed recovery wells (RW-3 and RW-4), and nine (9) proposed horizontal SVE laterals. The below-grade piping will be installed for eight (8) proposed air sparge points. The sparge points may be installed at a later date to introduce air in the saturated zone in order to volatize dissolved phase volatile organic compounds in the groundwater. The locations of the existing and proposed recovery wells, sparge points, and laterals are shown on the Proposed Remedial System Layout, Figure 9. A general description of the proposed remedial system is presented below.

8.1 Soil Vapor Extraction System

The design of the proposed SVE system is based on the data collected during the April 17, 1998 pilot test. The SVE lateral/extraction well radius of influence was calculated utilizing Johnson's equation and pilot test data. The SVE laterals have been designed to operate between 60 to 70 inches of water column vacuum yielding a radius of influence of approximately 20 feet. Design calculations and pilot test data are presented in Appendix VIII.

A sufficiently sized regenerative blower will be used to generate the moderate vacuum required for the extraction of soil vapor from the three (3) recovery wells and nine (9) SVE laterals. The recovery wells will be constructed with approximately 3 feet of casing as indicated in Figure 10. The SVE laterals will be constructed with approximately 5 feet of screen as indicated in Figure 11. SVE laterals are located in proximity to a series of eight (8) **proposed** sparge points in order to enhance the removal of contaminated soil vapor volatilizing from the impacted groundwater. The sparge points will also enhance remediation of the groundwater in the saturated zone beyond the reach of the groundwater pumps. A Sparge Well Head Detail is shown on Figure 12. The remedial system will be installed as indicated in Figure 9.

Individual polyvinyl chloride (PVC) extraction pipes will be installed within utility trenches to connect the extraction/treatment system to each of the SVE wells and laterals through an influent manifold located within the extraction/treatment system compound. The vacuum blower will pull the soil vapor from each SVE well/lateral through an influent manifold, then through a moisture separator before the blower. In the moisture separator, condensate will be removed. The blower discharges to the vapor phase treatment system. The condensate will be automatically pumped from the moisture separator to the groundwater treatment system as required. As indicated in Figure 13, the SVE and sparge systems will be installed in a fenced compound. Inside the fenced compound, several weatherized enclosures will be constructed to house the equipment and piping as indicated. Construction of the fenced compound, which will house the SVE, vapor phase treatment, and sparge systems, will be in accordance with all

applicable US Army, and National Fire Protection Association, Inc. (NFPA) codes, standards, and regulations.

8.2 Vapor Phase Treatment System

Vapor phase treatment will be implemented in stages as required to treat declining concentrations of VOCs. Specifically, as VOC concentrations decrease, the British Thermal Unit (BTU) equivalent fuel value associated with the extracted soil vapor decreases, requiring different technologies to optimize treatment. It is anticipated that the initial mode of vapor phase treatment will be catalytic oxidation. Due to economic and operational considerations, it is expected that catalytic oxidation and granular activated carbon will be the only two modes of vapor phase treatment utilized on this project.

8.2.1 Catalytic Oxidation

The use of a platinum group metal catalyst reduces the temperature required for the oxidation of organic compounds to 600 degrees Fahrenheit (°F). This results in a destruction efficiency equivalent to a thermal oxidizer operating at 1400 °F while significantly reducing the costs associated with a supplemental fuel. Furthermore, the reduced energy requirements allow electricity to be utilized as the supplemental fuel in addition to either propane or natural gas. Typically, the catalytic oxidation treatment process is implemented when influent vapor concentrations range from 6 to 25 % LEL. During catalytic oxidation, influent and effluent temperature of the process gas will be continuously monitored at the catalyst to regulate the supplemental fuel source. Dilution air will be added as necessary to maintain influent vapor concentrations below 25 % LEL. The catalytic oxidation unit may be equipped with a heat exchanger in order to recover a portion of the exhaust stack heat. At concentrations below 6 % LEL, the catalytic oxidizer operates inefficiently and vapor phase treatment is better accomplished using GAC for adsorption of volatile organic compounds.

8.2.2 Adsorption With Granulated Activated Carbon

Treatment with GAC is achieved by passing the extracted soil vapor flow through a number of carbon vessels arranged in series. Both the size and total number of carbon vessels will be dependent upon the anticipated design flowrate and VOC concentration of the soil vapor, as well as the desired carbon changeout frequency. Typically, a maximum influent concentration of 6 % LEL is assumed for design purposes since this corresponds to the approximate maximum concentration at which GAC treatment is considered cost effective. The minimum quantity of GAC contained in the initial vessel(s) should correspond to a breakthrough time of approximately seven (7) days under the assumed design conditions. This will reduce the required number of operation and maintenance visits to one visit per week. A minimum of one

additional GAC vessel should be located between the initial vessel(s) and the discharge stack. This will ensure compliance with the discharge limitations in the event that breakthrough of the initial vessel(s) occurs.

A hydrocarbon gas detection system will be used to continually monitor the performance of the carbon treatment system. A gas sensor will be used to monitor the % LEL of the combined influent to the initial vessel(s). If influent concentrations exceed 6 % LEL, or some other selected limit, the remedial system will be automatically shutdown. A second gas sensor will monitor the % LEL at the inlet to the second carbon vessel. This sensor will be used to shutdown the remedial system when any breakthrough of the initial vessel(s) is detected.

The temperature of the combined influent to the initial vessel(s) will be continuously monitored. The maximum influent temperature should remain below approximately 120 °F to efficiently utilize the adsorption capacity of the carbon. As a result, the remedial system will be automatically shutdown if the influent temperature alarm set point is exceeded.

Over time, influent VOC concentrations from the individual SVE wells will typically fluctuate. A flow control valve on each extraction line connected to the manifold system allows the influent flowrates to be independently controlled. This feature allows remedial efforts to be concentrated in the areas of highest impact while balancing the combined influent flowrates and concentrations to maintain conditions suitable for the applicable treatment technologies. As influent concentrations decrease with time, the influent manifold system will provide the ability to "pulse vent." Specifically, the valves allow individual wells to be closed off while vapor extraction continues at the remaining wells. This allows areas with low soil vapor concentrations to be closed off so that VOC concentrations can recover to levels amenable to the available treatment process prior to resuming the extraction process. In addition, the vapor flow paths between the extraction wells can be varied to influence stagnant or "dead" zones and optimize performance.

The SVE system will follow the required NJDEP monitoring frequency after start-up. The monitoring frequency for the SVE system utilizing catalytic oxidation as an off-gas treatment will be as follows:
Week 1: once per day for days 1 and 2, and one additional day in week 1.
Week 2: twice at least 3 days apart.
Weeks 3 - 10: weekly
Weeks 11+: monthly

8.3 Groundwater Pump and Treat

Currently, a groundwater pump and treat system is operational at this site. It utilizes an electric submersible pump, sediment filter, and three (3) GAC units to pump and treat groundwater from RW-11. The existing groundwater system discharges to the sanitary sewer via a subsurface discharge line. This system is not sufficient to treat the projected groundwater flow rate of the proposed system. The proposed groundwater pump and treat system will incorporate a low-profile air stripper, large GAC units, and additional sediment filtration.

The design of the proposed groundwater system is based on the data collected during the April 17, 1998 pilot test, periodic monitoring well testing results, and operational data collected during the operation of the current groundwater system. The groundwater system is designed to handle a flowrate of fifteen (15) gpm. The design flowrate is based on a flowrate of five (5) gpm per well as observed during the above referenced pilot test. It should be noted that the design flow rate is significantly greater than the current one to two (1-2) gpm of the existing groundwater system. The increase in flow rate is attributable to the effect of VEGE. By applying a vacuum to the recovery well, both subsurface vapors and groundwater are mobilized through the subsurface to the recovery well. VEGE will result in higher groundwater recovery rates for the proposed system.

Influent VOC concentrations for the proposed groundwater system are based on monitoring well testing results for MW-1 and RW-11 and analytical results for the existing groundwater system. Design calculations for the groundwater pump and treat system are presented in Appendix VIII.

Sufficiently sized submersible, electric pumps such as Grundfos 5E5 pumps will be used to pump groundwater from one (1) retrofitted monitoring well (RW-11) and two (2) proposed recovery wells (RW-3 and RW-4) in order to maintain hydraulic control of the site. Because of the relatively low permeability of the soil at this site, low groundwater flowrates are anticipated under normal pumping conditions. However, it is also anticipated that the SVE system will provide vacuum enhancement of groundwater extraction. The groundwater will flow from each extraction well through an influent manifold into a transfer tank and then to the groundwater treatment system.

The groundwater will be pumped through a pair of sediment filters to an appropriately sized, low-profile type air stripper for the removal of suspended solids and dissolved phase VOCs, respectively. Following the air stripping process, the treated groundwater will gravity drain into the air stripper sump.

A transfer pump, which will be controlled by liquid level sensors in the air stripper sump, will be used to pump the groundwater through to the next phase of the treatment, which consists of an

iron removal filter/clarifier unit and a transfer tank. A transfer pump, which will be controlled by liquid level sensors in the transfer tank, will be used to pump groundwater through to the final phase of the treatment to the local storm sewer system. The final phase of treatment includes a pair of sediment filters followed by three (3) GAC units in series. Flow through the liquid phase treatment system will be continuously monitored by flowmeter/totalizers located at the air stripper inlet and the effluent discharge. The proposed treatment system has been designed to comply with all applicable discharge limitations.

It should be noted that the Northeast Monmouth County Sewerage Authority has a moratorium on new discharges to its system. Therefore, the proposed remedial design incorporates a New Jersey Pollutant Discharge Elimination System - Discharge to Surface Water (NJPDES-DSW) rather than continue discharging to sanitary sewer.

Individual PVC extraction pipes will be installed within utility trenches to connect the extraction/treatment system to each of the extraction wells through an influent manifold located within the extraction/treatment system enclosure. In addition to the existing groundwater system enclosure, a second groundwater system enclosure will be constructed to house additional equipment. Both enclosures will be weather-tight, heated, and ventilated to protect against freezing conditions in the winter and overheating in the summer. Enclosure Compound Elevations are shown on Figure 14, and Trenching Cross-sections are shown on Figure 15. A small-insulated pipe chase will be installed to connect the two enclosures together. Construction of the enclosure, which will house the liquid phase treatment system, will be in accordance with all applicable, NFPA and Army codes, standards, and regulations. An Electrical One-Line Diagram is shown on Figure 16.

Effluent samples from the proposed groundwater pump-and-treat system will be collected for analysis in accordance with the requirements of the NJPDES-DSW permit requirements. The frequency of sampling and the analytical parameters will be specified in the NJPDES-DSW permit. The proposed groundwater pump-and-treat system will be monitored on a weekly basis.

8.4 Proposed Groundwater Cleanup Levels

Groundwater

The US Army proposes to remediate groundwater within the area of concern (i.e. service station) using the proposed ground water pump and treat system in combination with the soil vapor extraction system. Hydraulic control will be maintained via operation of the groundwater pump and treat system by utilizing three pumping wells RW-11 (existing), RW-3, and RW-4).

When influent concentrations of petroleum hydrocarbons (i.e. BTEX) and methyl *tertiary* butyl ether (MTBE) reach asymptotic levels for at least two consecutive quarters, the US Army proposes to place the treatment system off-line. The remaining *de minimus* concentrations in soil and groundwater will be remediated by natural attenuation/biodegradation (passive remediation) as part of the Natural Remediation Compliance Program. The US Army will request for passive remediation when the influent concentrations reach asymptotic levels, or if requirements of the Mann-Whitney U test are met. The US Army will request No Further Action or investigation when all targeted VOCs concentrations are at or below the applicable Ground Water Quality Standards (GWQS) for Class II-A aquifers. For this site, the applicable GWQS are as follows:

Compound of Concern	GWQS, µg/L
Benzene[1]	1
Toluene[1]	1,000
Ethylbenzene[1]	700
Xylenes[2]	1,000
MTBE[2]	70
TBA[2]	100

1. The most recent GWQS pursuant to N.J.A.C. 7:9-6.

2 Interim Specific Groundwater Criteria listed in an NJDEP correspondence from Mr. Rick Gimello, Assistant Commissioner, dated February 5, 1997.

Following system shut-down, the US Army will continue to monitor groundwater quality in accordance with the schedule as outlined in Section 6.4. Groundwater sampling will be suspended when concentrations of individual BTEX and MTBE concentrations are at or below the applicable NJDEP's GWQS for at least two consecutive groundwater sampling events.

Soil

The US Army proposes to remediate soil to the NJDEP proposed Unrestricted Site Use Soil Cleanup Criteria in the source area. Soil will be considered remediated when SVE vapor concentrations of BTEX attenuate to an asymptotic level. Post-remedial soil sampling will be conducted pursuant to N.J.A.C. 7:26E-6.4. Post-remedial soil samples will be analyzed for VOCs via USEPA test methods 8240+10 utilizing the recently adopted methanol preservation pursuant to N.J.A.C. 7:26E-2.1(a)4. In addition, soil is considered remediated when the total volatile organic contaminants and Total Organic Carbon (TOC) are less than 1,000 and 10,000 parts per million (ppm), respectively. All future soil quality data submissions will be evaluated using the applicable NJDEP soil cleanup criteria.

If the laboratory analytical results do not indicate the presence of any organic compound concentrations above the applicable NJDEP soil cleanup criteria, the US Army will propose to the NJDEP that no further soil remediation be required, and that the facility be granted a No Further Action declaration for soil.

8.5 Proposed Groundwater Monitoring and Sampling Program

Fort Monmouth DPW is currently conducting a quarterly groundwater gauging and sampling program utilizing on-site and off-site monitoring wells. Utilizing historical groundwater quality data, the DPW proposes to continue monitoring groundwater quality on-site, in accordance with the sampling schedule outlined below.

SAMPLING MONTH	MONITORING WELLS SAMPLED
January, June, August, December	MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-8, MW-9, RW-11, MW-12, MW-15, MW-16, MW616-1

A *Remedial Action Progress Report* (RAPR) will be submitted as requested by the NJDEP. Information including groundwater contour maps, groundwater quality, tabulated laboratory analytical results and laboratory deliverables will be included in each RAPR. Moreover, each RAPR will contain a summary of the operation performance of both the groundwater and SVE remedial treatment systems. Data will be summarized in appropriate tables (e.g., historical groundwater quality, influent and effluent concentrations) and figures (e.g., cumulative mass of BTEX removed versus time, mass of BTEX removed to date).

9.0 CAPTURE ZONE ANALYSIS

GES modeled the overall capture zone of RW-11 using a computer model entitled "A Modular Semi-Analytical Model for the Delineation of Wellhead Protection Areas (WHPA)" (Blandford and Huyakorn, 1991). This modeling was simulated under an assumed, two-dimensional, homogeneous, steady-state flow condition. Input parameters for the simulation were based on site-specific conditions, field data acquired during site investigative activities and published values for conditions that approximate those reported for this site. The objective of this simulation is to conservatively estimate the overall capture zone of the existing groundwater extraction (pump and treat) system.

The WHPA computer model consists of four independent computation modules that may be used to delineate capture zones. Three of the four modules contain semi-analytical capture zone solutions. Multiple pumping and injection wells may also be simulated. Barrier stream

boundary conditions which exist over the entire aquifer depth also may be simulated. The fourth module is general particle tracking that may be used as a post-processor for two-dimensional numerical models of groundwater flow. One of the semi-analytical models, RESSQC, was used to simulate the capture zone of the existing groundwater recovery system.

RESSQC was selected due to the model's widespread acceptance and the ability to simulate time-related capture zones around one or more pumping wells in homogeneous aquifers of infinite aerial extent with steady and uniform ambient groundwater flow.

9.1 Capture Zone Modeling

Based on the VEGE pilot test conducted on April 17, 1998, using RW-11 and the groundwater treatment system, and the transmissivity value of 64.5 ft^2/day calculated by Henderson, Breen & Hess, an assumed aquifer thickness of 15 feet, and the hydraulic conductivity of the water-bearing zone onsite of 4.3 ft/day. The hydraulic gradient used in the computer simulation was 0.03 feet. The effective porosity was set at 0.25 based on site geological conditions.

Based on the calculated hydraulic conductivity of 4.3 ft/day, the predicted groundwater capture zones at steady-state generated from the output RESSQC are presented on Figure 17. Based on the calculated capture zones as presented on Figure 17, it is concluded that groundwater on-site will be captured using the three pumping wells (RW-11, RW-2, and RW-3). Because no compound of concern within the capture zone will migrate offsite, Fort Monmouth DPW requests the predicted capture zone also serve as a Classification Exception Area (CEA) for the onsite groundwater plume.

10.0 QUALITY ASSURANCE PROJECT PLAN

A field sampling activities will be conducted in accordance with NJDEP Field Sampling Manual. All analyses will be conducted in accordance with the NJ Laboratory Certification Program. A separate Quality Assurance Project Plan will not be submitted by the US Army for this site.

11.0 REQUIRED PERMITS

The following permits will be required:

- NJDEP New Jersey Pollutant Discharge Elimination System – Discharge to Surface Water (NJPDES-DSW) Permit
- NJDEP Permit to construct/install/alter Air Quality Apparatus/Equipment

- NJDEP Certification to operate Air Quality Apparatus/Equipment
- NJDEP Treatment Works Approval
- NJDEP Well Permits

In addition to meeting the NJDEP permitting requirements, the US Army permitting requirements will also be met.

12.0 EFFECTIVENESS ANALYSIS AND CERTIFICATION

In conducting this investigation, different remedial approaches were examined and evaluated. The selection of pump and treat/soil vapor extraction/air-spraging system to remediate soil and groundwater is based upon technical and site-specific criteria presented in this RAWA and historical data contained therein. It is our judgment that the development, selection and implementation of this remedial action will be effective and will be protective of the public health, safety and the environment as outlined in Section 35(g) of P.L. 1993, c.139 (S-1070) of the Industrial Site Recovery Act.

13.0 EROSION, DUST, AND ODOR CONTROL

If required, a Sediment and Erosion Control Plan will be prepared in accordance with the US Army requirements.

14.0 IMPLEMENTATION SCHEDULE

Within 90 days upon written NJDEP approval of this RAW, the Fort Monmouth DPW will solicit and award a contract for completion of work described herein. Any requests or recommendations to modify or alter the groundwater monitoring and sampling program will be completed in writing to the assigned NJDEP case manager.

15.0 SITE RESTORATION PLAN

Upon receipt of a No Further Action declaration from the NJDEP regarding the remediated soils, the US Army will contract to dismantle and remove the aboveground portions of the SVE system. The below ground sections of the SVE systems will be sealed and abandoned in-place following generally accepted procedures.

Once the groundwater quality has attenuated to concentrations below the applicable NJDEP GWQS and a No Further Action statement is provided by the NJDEP, the US Army will implement proper well abandonment procedures as part of the site restoration plan. All monitoring wells and vacuum monitoring points on-site and off-site will be properly abandoned by a New Jersey-licensed well driller. The wells will be sealed via a tremie pipe with a grout/cement mixture. The concrete flushmount pads will be removed and the former well locations will be restored to near pre-construction conditions.

16.0 ESTIMATED COST

The estimated cost comparison for the proposed remedial system upgrade is presented in Appendix VIII. The cost comparison indicates that the total costs to operate the remedial system with a catalytic oxidizer are lesser compared to the costs to operate with GAC as an off-gas treatment. Initially, the catalytic oxidizer is being proposed to be utilized as an off-gas treatment for the SVE (and optional sparge). However, in the event that the soil vapor and/or soil concentrations reach asymptotic levels, a decision may be made to switch to GAC as an off-gas treatment. A cost comparison between catalytic oxidation versus GAC as an off-gas treatment is included in Appendix IX.

17.0 REFERENCES

Blandford, T.N. and P.S. Huyakorn. 1991. "A Modular Semi-Analytical Model for the Delineation of Wellhead Protection Areas. Version 2.0," Office of Ground-Water Protection, USEPA, Washington, DC.

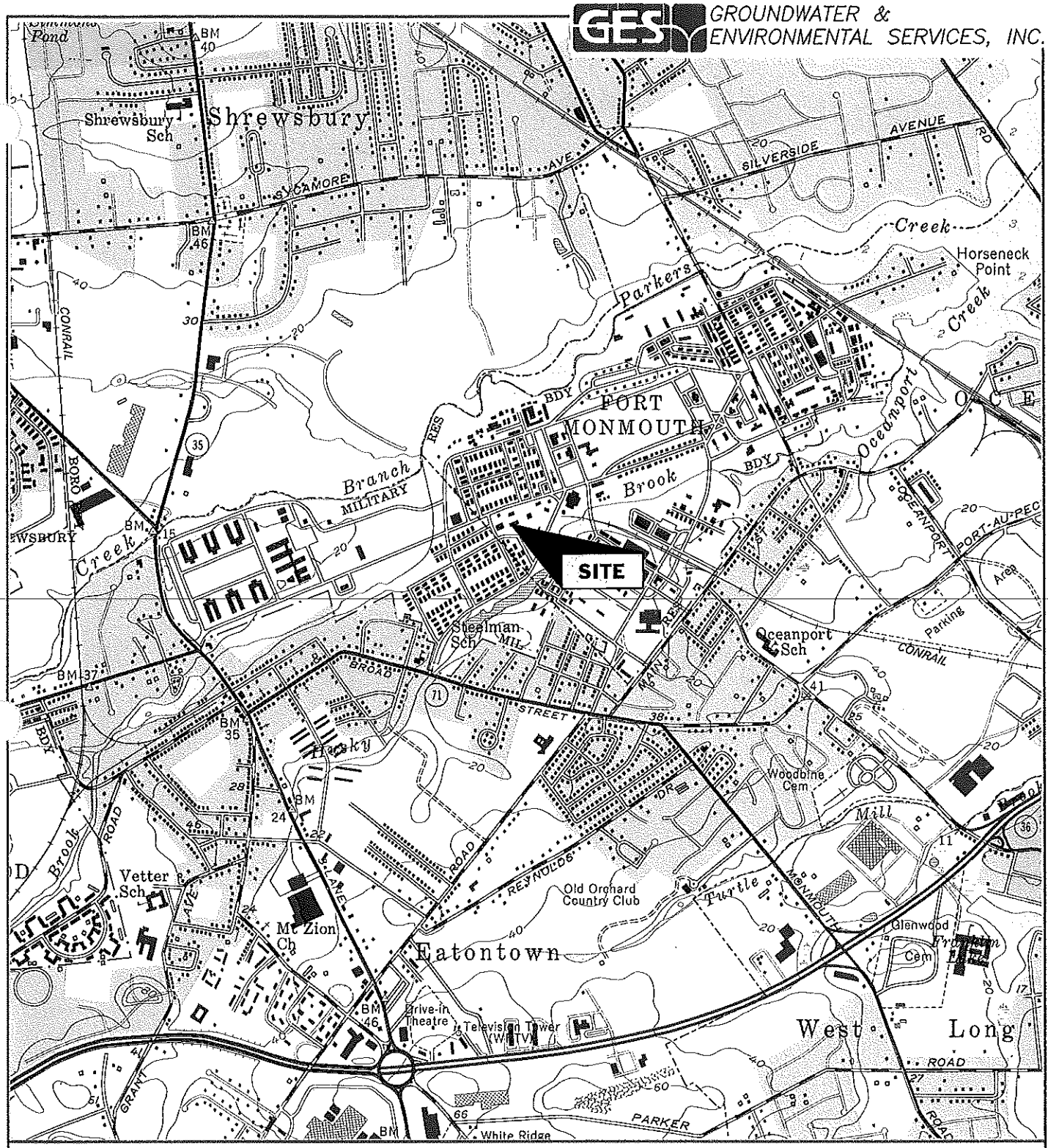
Krydon 1993. *Remedial Action Workplan*, Fort Monmouth Military Installation Service Station, Fort Monmouth, New Jersey. October 1993.

NJDEP. 1990. New Jersey Pollutant Discharge Elimination System 1992-93 Annual Fee Report and Assessment of Fees, Trenton, NJ.

Smith 1998. *Underground Storage Tank Closure and Site Investigation Report.* SMC Environmental Services Group. June 1998.

FIGURES

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.



SOURCE: USGS 7.5 MINUTE SERIES
TOPOGRAPHIC QUADRANGLE 1981
LONG BRANCH, NEW JERSEY
CONTOUR INTERVAL = 20'

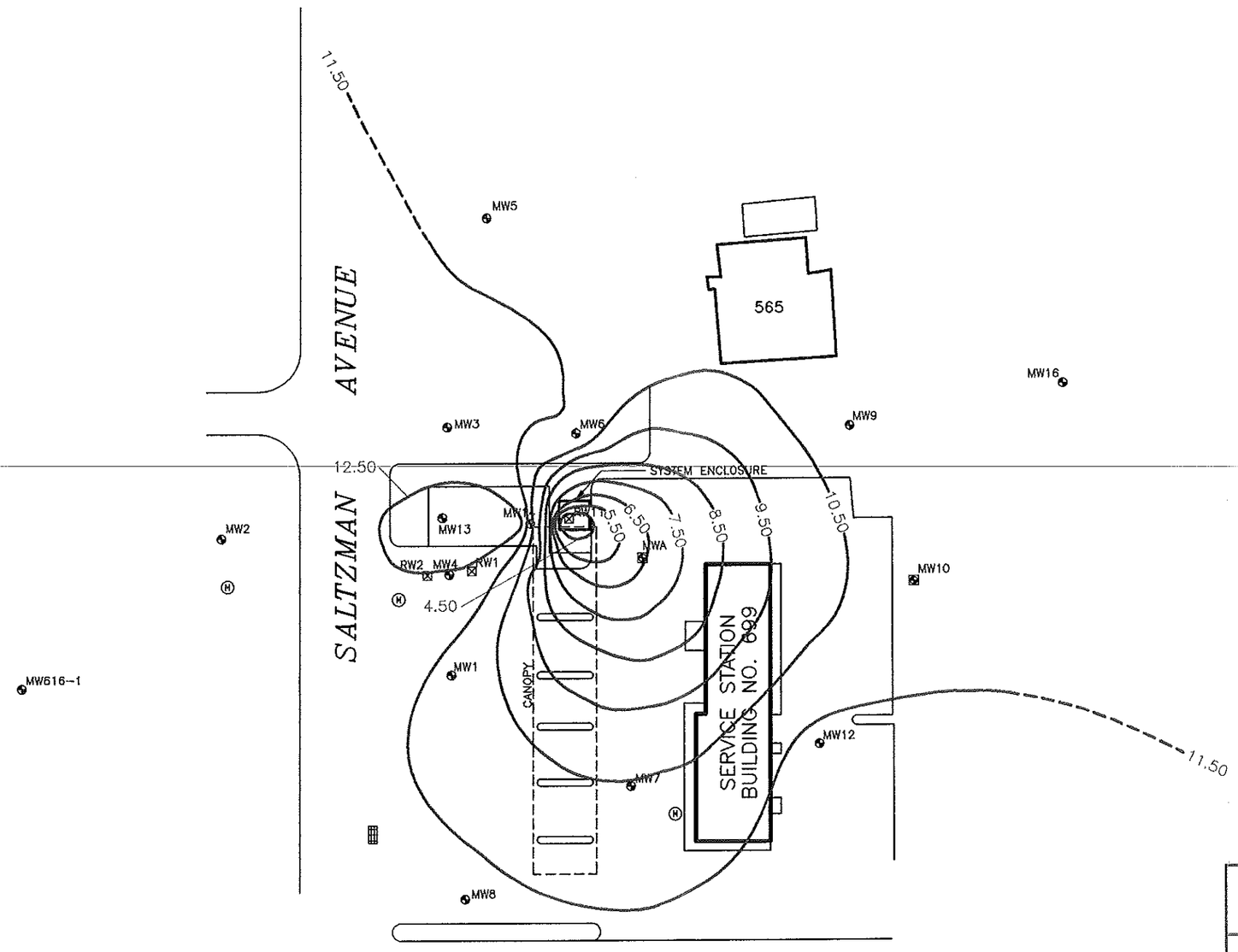
NORTH

0 2,000
FEET

QUADRANGLE LOCATION

FIGURE 1
SITE LOCATION MAP
US ARMY
BUILDING 699
FORT MONMOUTH
EATONTOWN, NEW JERSEY

GROUNDWATER &
ENVIRONMENTAL SERVICES, INC.



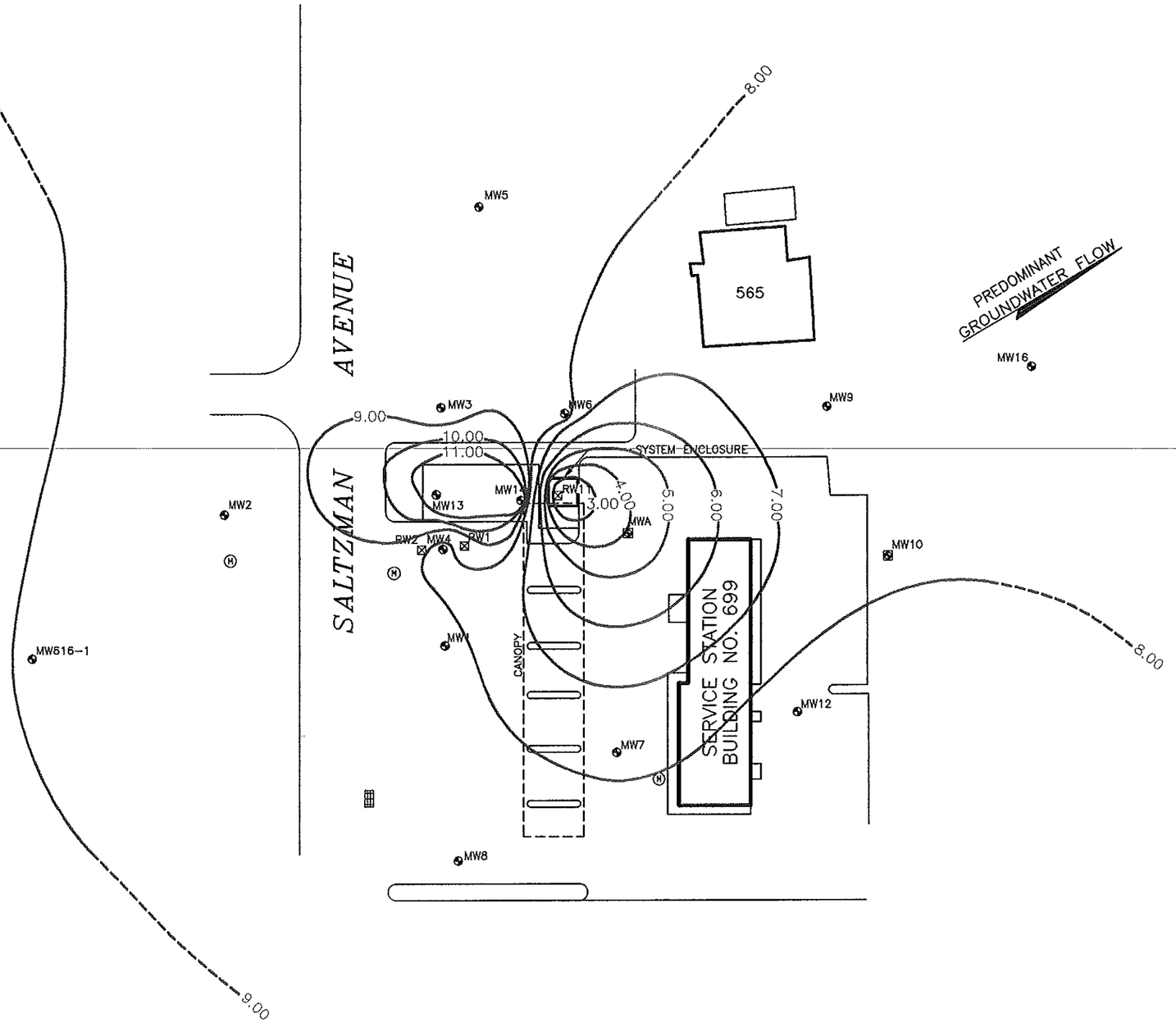
NOTE:
GROUNDWATER ELEVATION CONTOURS IN FEET.

GROUNDWATER CONTOUR MAP
2 JULY 1998

US ARMY
BUILDING 699
FORT MONMOUTH
EATONTOWN, NEW JERSEY

NORTH	SCALE IN FEET	DATE	SOURCE
	0 30 60	5-14-99	NJ
		DWG # FORT MON	FIGURE 2

GROUNDWATER &
ENVIRONMENTAL SERVICES, INC.



LEGEND

	STORM SEWER INLET
Ⓜ	UTILITY MANHOLE
	PUMP ISLAND
— · —	FENCE
⊠	RECOVERY WELL
⊕	MONITORING WELL
⊠	ABANDONED MONITORING WELL
CAS EL	CASING ELEVATION (feet)
DTW	DEPTH TO WATER (feet)
GW EL	GROUNDWATER ELEVATION (feet)

WELL	CAS EL	DTW	ADJUSTED GW EL
RW2	16.09	7.58	8.58
MW1	15.81	8.50	8.22
MW2	16.64	8.17	8.47
MW3	15.80	7.63	8.17
MW4	15.92	8.57	7.85
MW5	15.48	7.10	8.38
MW6	15.78	7.74	8.04
MW8	16.20	7.51	8.69
MW9	15.96	7.84	8.12
MW11	17.14	15.72	1.43
MW12	16.66	8.09	8.57
MW13	16.21	3.51	12.70
MW14	15.98	3.35	12.63
MW15	17.04	7.50	9.54
MW16	15.27	8.07	7.20
616-1	18.92	10.01	8.91

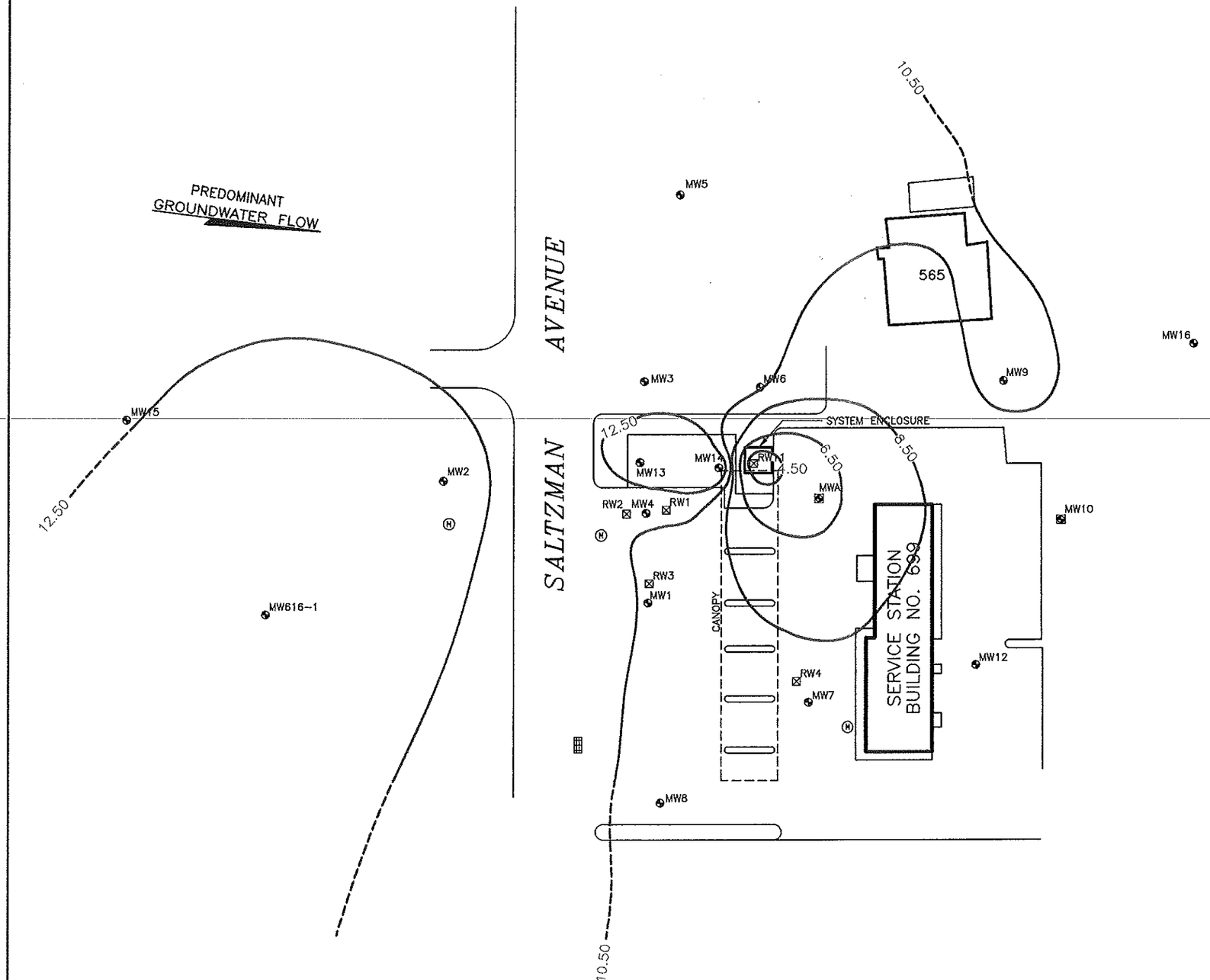
NOTE:
GROUNDWATER ELEVATION CONTOURS IN FEET.
MW9 NOT USED WHEN DETERMINING CONTOUR ELEVATIONS.

GROUNDWATER CONTOUR MAP
12 NOVEMBER 1998

US ARMY
BUILDING 699
FORT MONMOUTH
EATONTOWN, NEW JERSEY

NORTH	SCALE IN FEET	DATE	SOURCE
	0 30 60	5-14-99	NJ
		DWG # FORT MON	FIGURE 6

GROUNDWATER &
ENVIRONMENTAL SERVICES, INC.



LEGEND

	STORM SEWER INLET
Ⓗ	UTILITY MANHOLE
	PUMP ISLAND
— · —	FENCE
⊠	RECOVERY WELL
●	MONITORING WELL
⊠	ABANDONED MONITORING WELL
CAS EL	CASING ELEVATION (feet)
DTW	DEPTH TO WATER (feet)
GW EL	GROUNDWATER ELEVATION (feet)

WELL	CAS EL	DTW	ADJUSTED GW EL
RW2	16.09	5.22	10.87
MW1	15.81	5.62	10.28
MW2	16.64	3.87	12.77
MW3	15.80	4.89	10.91
MW4	15.92	5.14	10.78
MW5	15.48	4.89	10.59
MW6	15.78	4.85	10.93
MW8	16.20	6.10	10.10
MW9	15.96	5.09	10.87
MW11	17.14	14.20	2.94
MW12	16.66	6.61	10.05
MW13	16.21	2.25	13.96
MW14	15.98	2.12	13.86
MW15	17.04	4.58	12.46
MW16	15.27	5.64	9.63
616-1	18.92	4.90	14.02

NOTE:
GROUNDWATER ELEVATION CONTOURS IN FEET.

GROUNDWATER CONTOUR MAP
22 JANUARY 1999

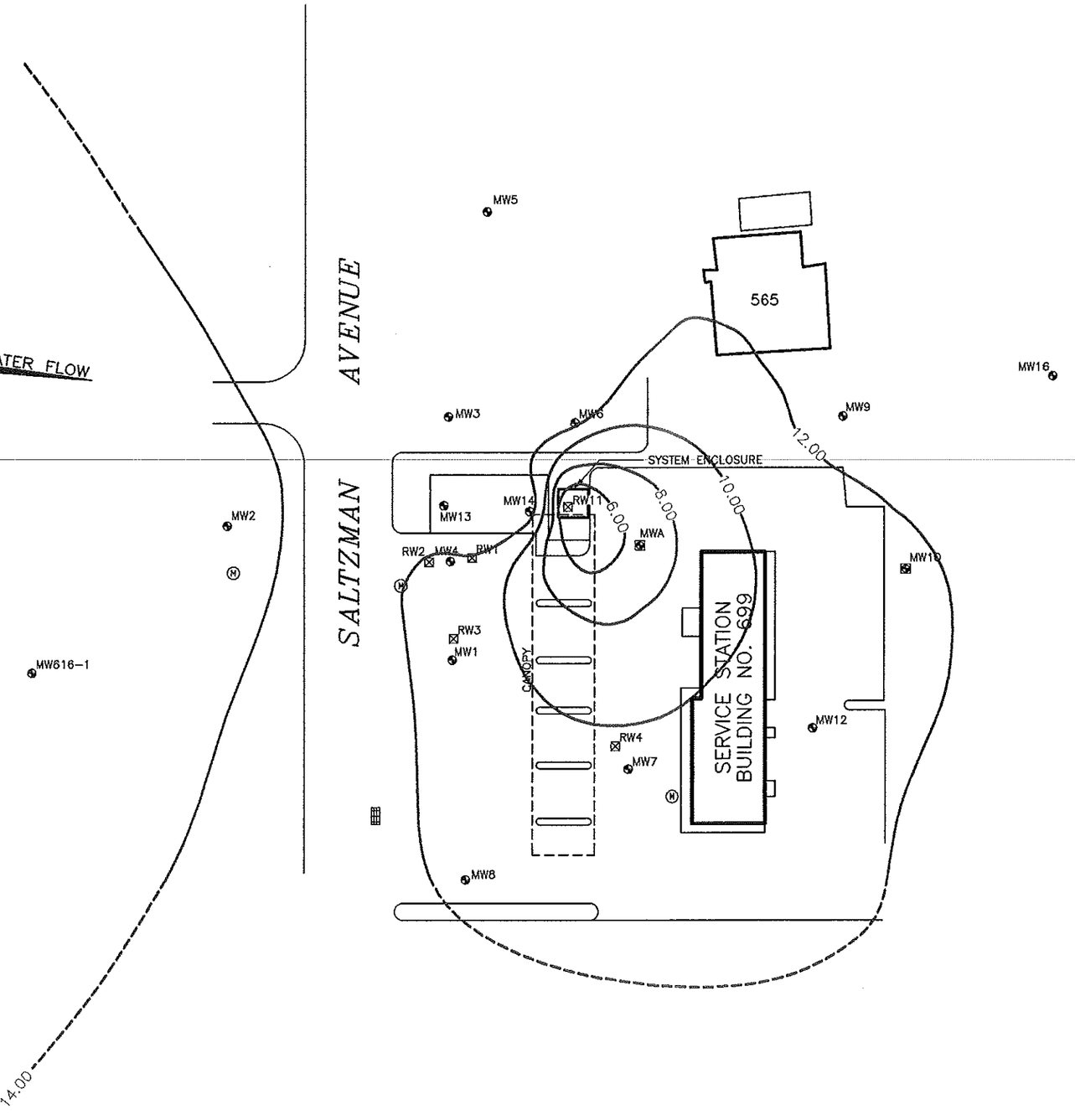
US ARMY
BUILDING 699
FORT MONMOUTH
EATONTOWN, NEW JERSEY

NORTH

SCALE IN FEET
0 30 60

DATE	SOURCE
5-14-99	NJ
DWG # FORT MON	FIGURE 4

GROUNDWATER &
ENVIRONMENTAL SERVICES, INC.



LEGEND

	STORM SEWER INLET
Ⓜ	UTILITY MANHOLE
	PUMP ISLAND
— · —	FENCE
⊠	RECOVERY WELL
⊕	MONITORING WELL
⊠	ABANDONED MONITORING WELL
CAS EL	CASING ELEVATION (feet)
DTW	DEPTH TO WATER (feet)
GW EL	GROUNDWATER ELEVATION (feet)

WELL	CAS EL	DTW	ADJUSTED GW EL
RW2	16.09	4.36	11.73
MW1	15.81	4.20	11.61
MW2	16.64	1.79	14.85
MW3	15.80	3.98	11.82
MW4	15.92	4.18	11.74
MW5	15.48	3.41	12.07
MW6	15.78	3.65	12.13
MW8	16.20	4.47	11.73
MW9	15.96	3.44	12.52
MW11	17.14	14.37	2.77
MW12	16.66	5.00	11.66
MW13	16.21	2.11	14.10
MW14	15.98	1.98	14.00
MW15	17.04	1.99	15.05
MW16	15.27	2.85	12.42
616-1	18.92	3.51	15.41

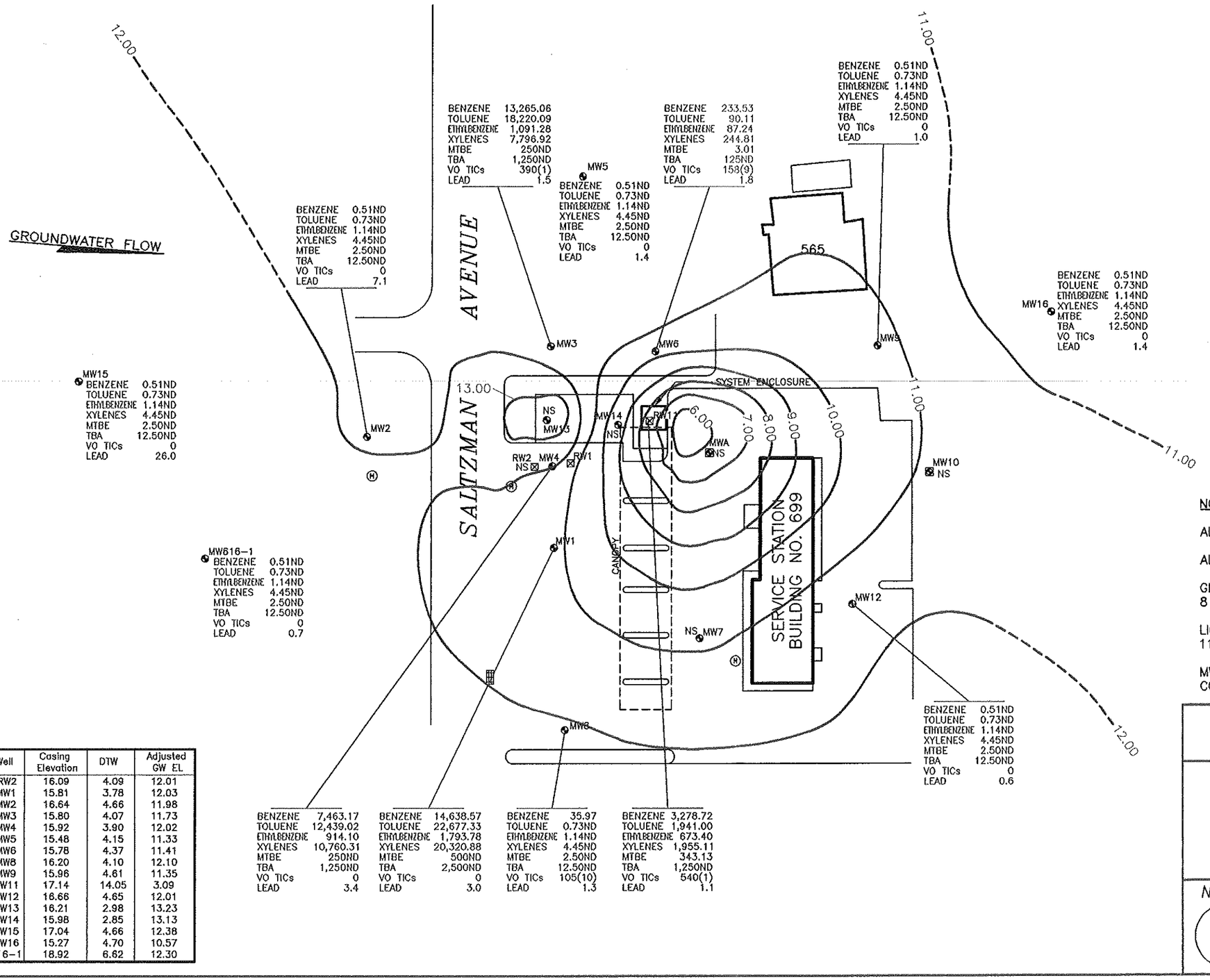
NOTE:
GROUNDWATER ELEVATION CONTOURS IN FEET.

GROUNDWATER CONTOUR MAP
19 FEBRUARY 1999

US ARMY
BUILDING 699
FORT MONMOUTH
EATONTOWN, NEW JERSEY

NORTH	SCALE IN FEET	DATE	SOURCE
	0 30 60	5-14-99	NJ
		DWG # FORT MON	FIGURE 5

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.



LEGEND

	STORM SEWER INLET
Ⓗ	UTILITY MANHOLE
	PUMP ISLAND
— · —	FENCE
⊠	RECOVERY WELL
⊕	MONITORING WELL
⊠	ABANDONED MONITORING WELL
MTBE	METHYL *tert*–BUTYL ETHER
TBA	*tert*–BUTYL ALCOHOL
DTW	DEPTH TO WATER (feet)
GW EL	GROUNDWATER ELEVATION (feet)
NS	NOT SAMPLED
ND	NOT DETECTED, METHOD DETECTION LIMIT PROVIDED
VO TICs	VOLATILE ORGANICS TENTATIVELY TENTATIVELY IDENTIFIED COMPOUNDS
(#)	INDICATES NUMBER OF COMPOUNDS FOUND IN LIBRARY SEARCH

NOTES:

ALL GROUNDWATER ELEVATION DATA IN FEET.

ALL ANAYLTICAL RESULTS IN PARTS PER BILLION.

GROUNDWATER SAMPLES WERE COLLECTED ON 8 JUNE 1998.

LIQUID LEVEL MEASUREMENTS WERE OBTAINED ON 11 JUNE 1998.

MW11, MW13 AND MW14 NOT USED TO DRAW CONTOUR LINES.

Well	Casing Elevation	DTW	Adjusted GW EL
RW2	16.09	4.09	12.01
MW1	15.81	3.78	12.03
MW2	16.64	4.66	11.98
MW3	15.80	4.07	11.73
MW4	15.92	3.90	12.02
MW5	15.48	4.15	11.33
MW6	15.78	4.37	11.41
MW8	16.20	4.10	12.10
MW9	15.96	4.61	11.35
MW11	17.14	14.05	3.09
MW12	16.66	4.65	12.01
MW13	16.21	2.98	13.23
MW14	15.98	2.85	13.13
MW15	17.04	4.66	12.38
MW16	15.27	4.70	10.57
616–1	18.92	6.62	12.30

SITE INFORMATION PLAN
8 JUNE 1998

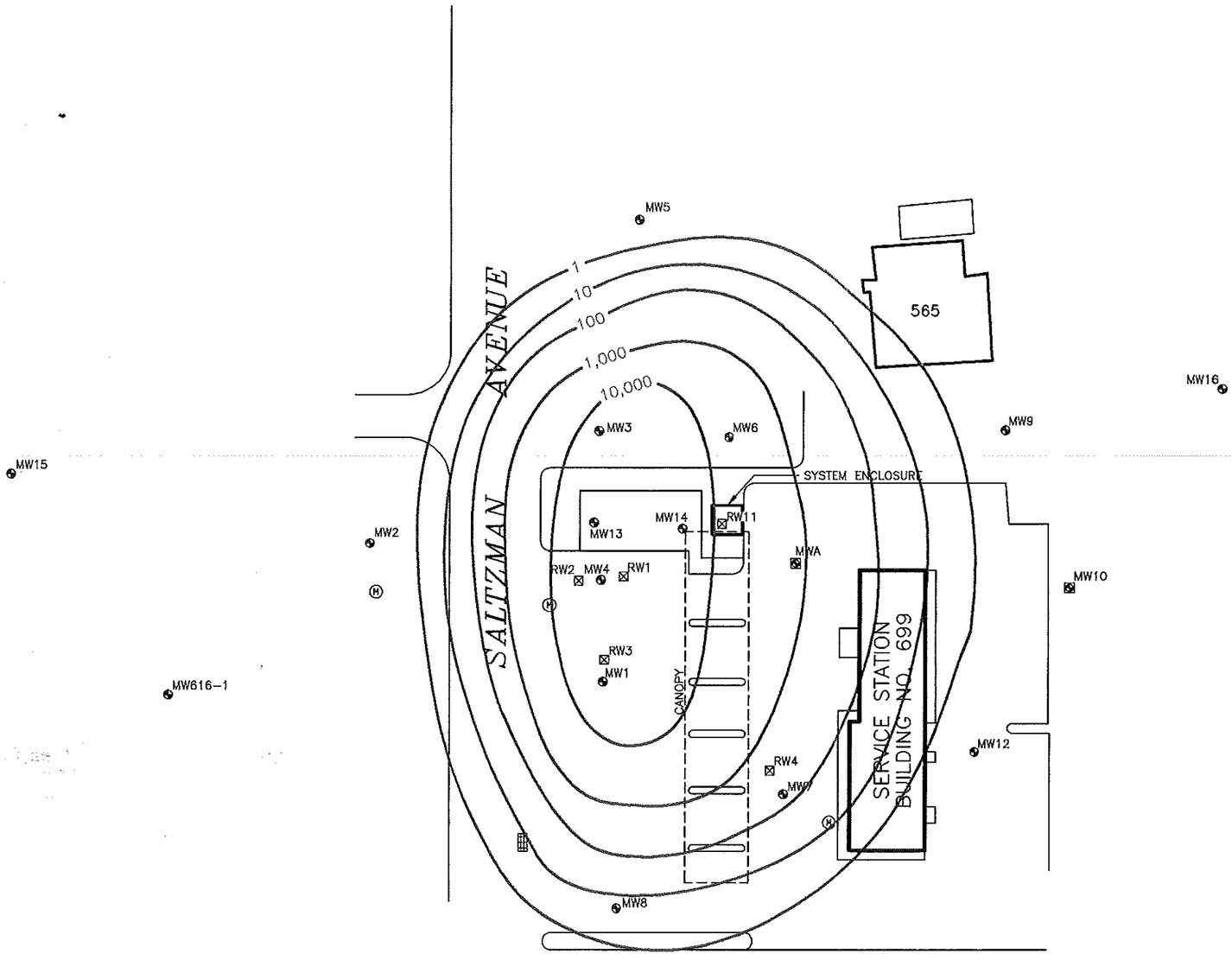
US ARMY
BUILDING 699
FORT MONMOUTH
EATONTOWN, NEW JERSEY

NORTH

SCALE IN FEET
0 30 60

DATE	SOURCE
5–14–99	NJ
DWG # FORT MON	FIGURE 6

GROUNDWATER &
ENVIRONMENTAL SERVICES, INC.



LEGEND

	STORM SEWER INLET
Ⓜ	UTILITY MANHOLE
	PUMP ISLAND
— · —	FENCE
⊠	RECOVERY WELL
●	MONITORING WELL
⊡	ABANDONED MONITORING WELL
ppb	PARTS PER BILLION
D	SECONDARY DILUTION
ND	NOT DETECTED
NS	NOT SAMPLED

MW	BENZENE CONCENTRATION (ppb)
1	22,227.82 D
2	ND
3	23,686.26 D
4	13,224.65 D
5	ND
7	NS
8	2.03
9	ND
10	NS
11	4,110.10
12	ND
15	ND
16	ND
616-1	ND

NOTE:
ANALYTICAL RESULTS IN PARTS PER BILLION.

BENZENE ISOPLETH SITE MAP (ppb)
29 JULY 1998

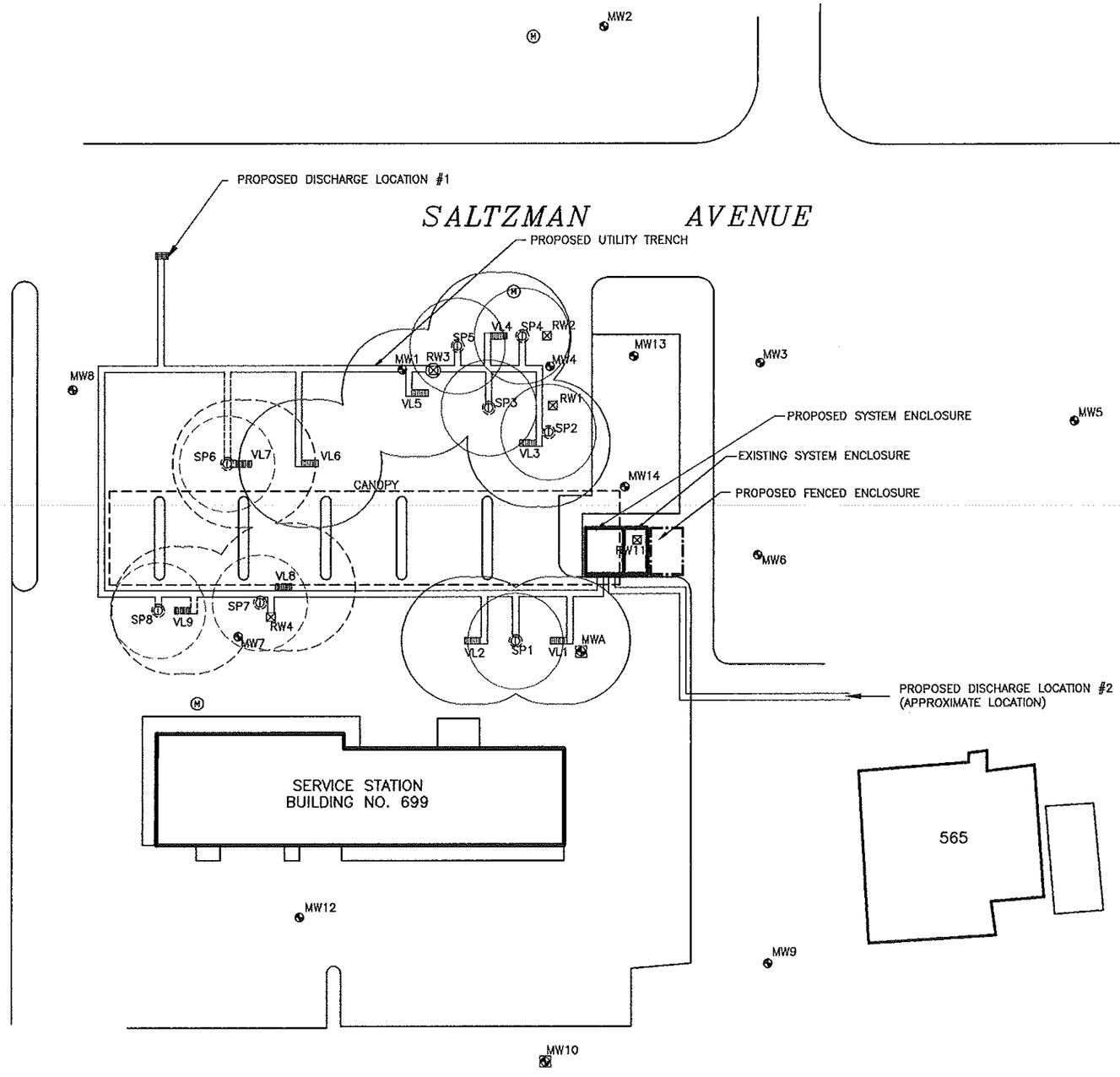
US ARMY
BUILDING 699
FORT MONMOUTH
EATONTOWN, NEW JERSEY

NORTH

SCALE IN FEET
0 30 60

DATE	SOURCE
5-17-99	NJ
DWG # FORT MON	FIGURE

GROUNDWATER &
ENVIRONMENTAL SERVICES, INC.



LEGEND

- STORM SEWER INLET
- UTILITY MANHOLE
- ABANDONED MONITORING WELL
- RECOVERY WELL
- MONITORING WELL
- PUMP ISLAND
- FENCE
- PROPOSED RECOVERY WELL
- PROPOSED SOIL VAPOR EXTRACTION 5' LATERAL
- PROPOSED UTILITY TRENCH
- PROPOSED OPTIONAL UTILITY TRENCH
- PROPOSED OPTIONAL SOIL VAPOR EXTRACTION 5' LATERAL
- PROPOSED OPTIONAL AIR SPARGE POINT
- PROPOSED 15' AIR SPARGE RADIUS OF INFLUENCE
- PROPOSED 20' SOIL VAPOR EXTRACTION RADIUS OF INFLUENCE

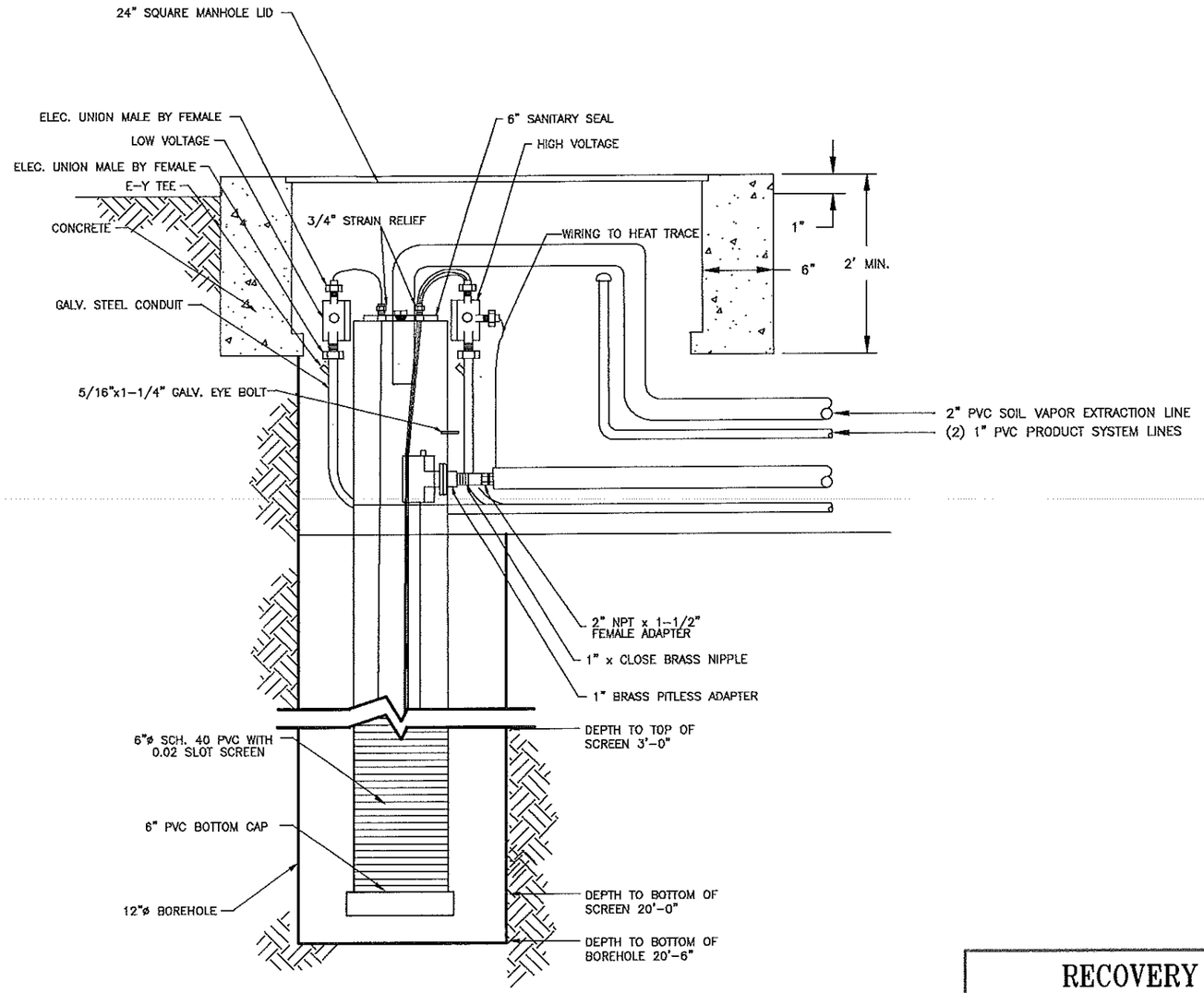
NOTES:

1) INDIVIDUAL PNEUMATIC SUPPLY LINE AND CORRESPONDING PRODUCT RECOVERY LINE SHALL BE RUN TO EACH OF THE RECOVERY WELLS (MW11, RW3 AND RW4). THE LINES SHALL BE CAPPED AND TERMINATED IN THE RECOVERY WELL MANHOLES FOR POTENTIAL FUTURE USE.
2) 2" SCH. 40 PVC PIPE SVE LINES WILL BE INSTALLED TO MW11, RW3, RW4 RECOVERY WELL MANHOLES.
3) AREAL EXTENT OF VACUUM INFLUENCE WITH OPTIONAL LATERALS (VL7, VL8, & VL9) = 11,553 sq. ft.
4) AREAL EXTENT OF VACUUM INFLUENCE WITHOUT OPTIONAL LATERALS (VL7, VL8, & VL9) = 7,928 sq. ft.

PROPOSED REMEDIAL SYSTEM LAYOUT

US ARMY
BUILDING 699
FORT MONMOUTH
EATONTOWN, NEW JERSEY

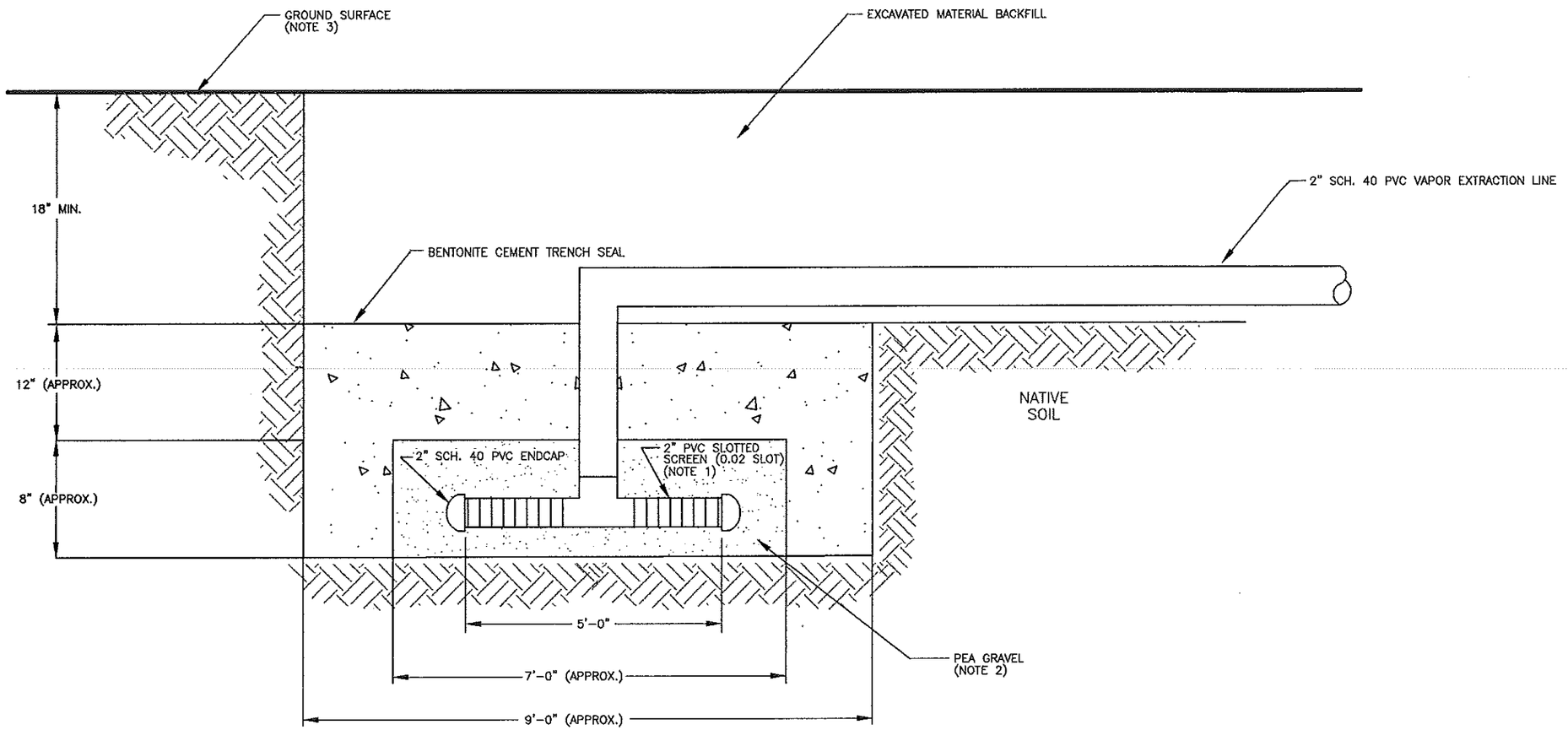
NORTH	SCALE IN FEET	DATE	SOURCE
	0 20 40	5-11-99	NJ
		DWG # FORT MON	FIGURE 9



GROUNDWATER RECOVERY WELL DETAIL

(NOT TO SCALE)

RECOVERY WELL DETAIL			
US ARMY BUILDING 699 FORT MONMOUTH EATONTOWN, NEW JERSEY			
	NOT TO SCALE	DATE 4-29-99	SOURCE NJ
		DWG # FORT MO	FIGURE **10**



NOTES:

1. SVE LATERAL CONSISTS OF APPROX. 5' OF 2" PVC SLOTTED SCREEN BISECTED BY A FITTING CONNECTING THE LATERAL TO ITS VAPOR EXTRACTION LINE.

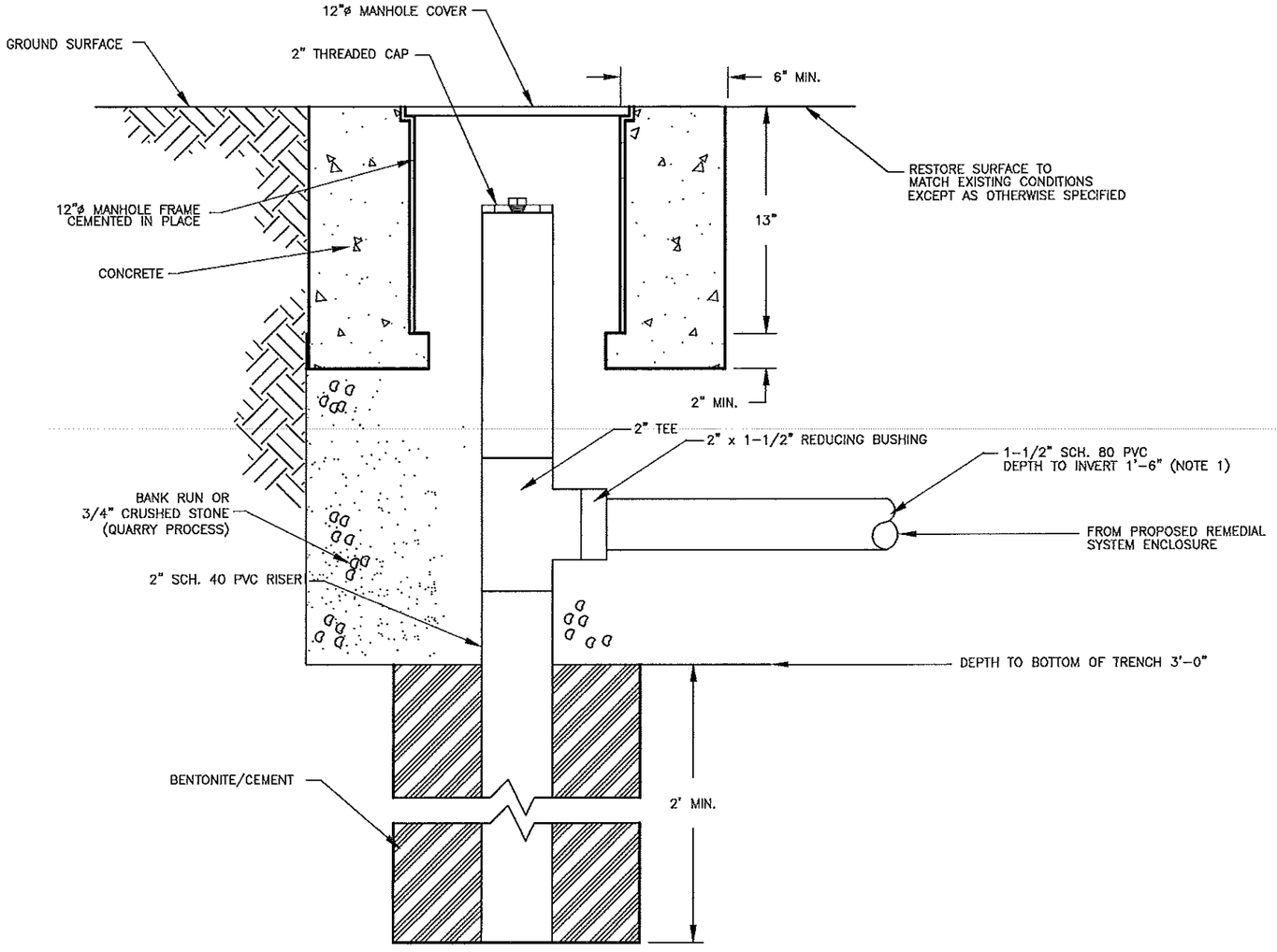
2. PEA GRAVEL SURROUNDING THE SCREENED LATERAL EXTENDS APPROXIMATELY 1 FOOT LATERALLY AND 4 INCHES ABOVE ANG BELOW THE SCREENED LATERAL.

3. GROUND SURFACE WILL BE RESTORED TO PRE-EXCAVATION CONDITION, INCLUDING ASPHALTIC PAVING OR CONCRETE PAVING IF APPLICABLE.

SOIL VAPOR EXTRACTION LATERAL DETAIL

U.S. ARMY
BUILDING 699
FORT MONMOUTH
EATONTOWN, NEW JERSEY

	NOT TO SCALE	DATE 4-19-99	SOURCE NJ
		DWG # FORT MO	FIGURE 1

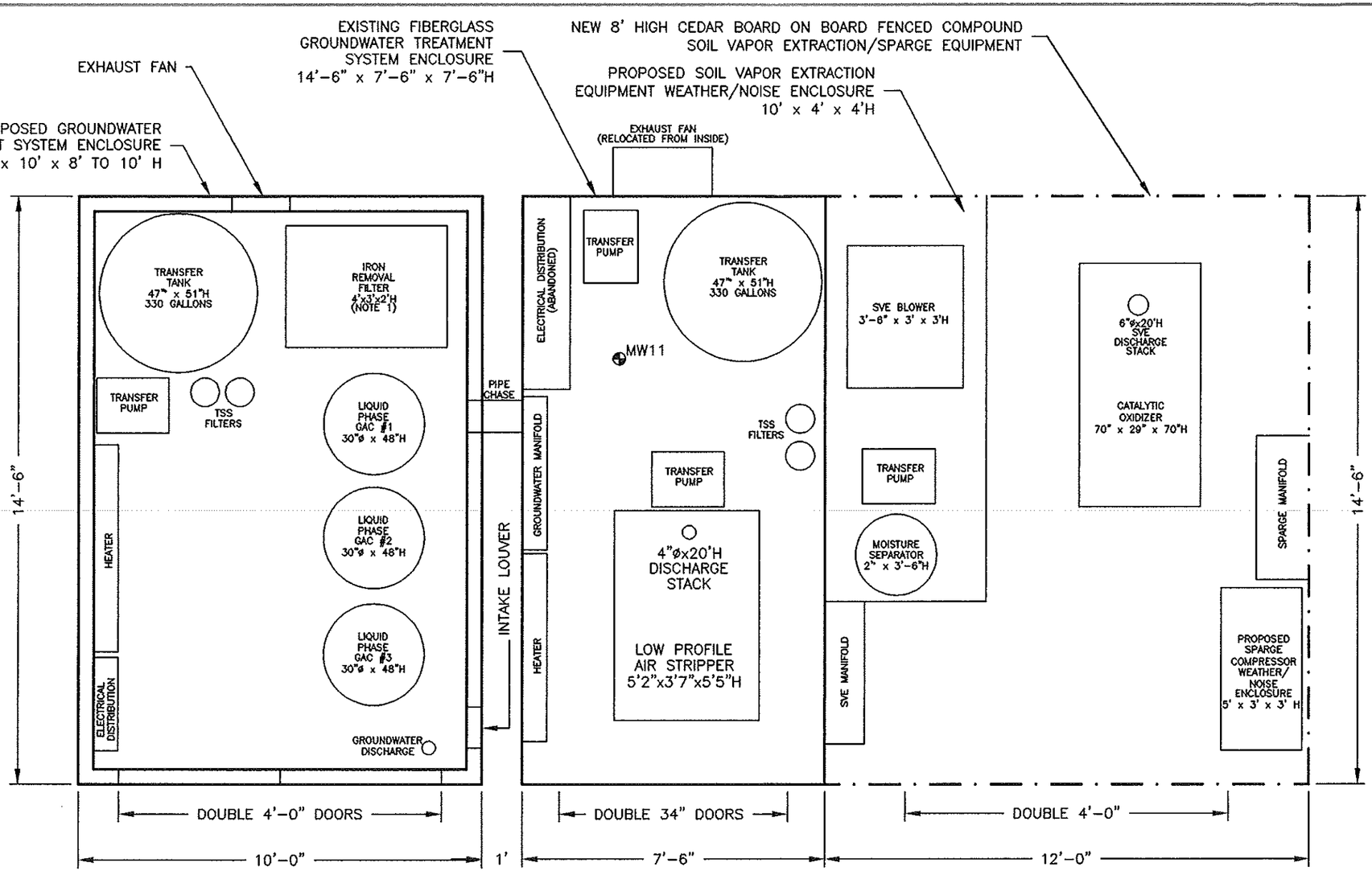


WELL HEAD DETAIL
AIR SPARGE WELL
(TYPICAL OF SP1 – SP9)
(NOT TO SCALE)

AIR SPARGE WELL HEAD DETAIL

U.S. ARMY
BUILDING 699
FORT MONMOUTH
EATONTOWN, NEW JERSEY

	NOT TO SCALE	DATE 4-19-99	SOURCE NJ
		DWG # FORT M	FIGURE **12**



NOTES:

1. IRON REMOVAL FILTER IS INSTALLED ON A 4' HIGH ELEVATED PLATFORM TO ALLOW FILTER TO GRAVITY DRAIN TO TRANSFER TANK.

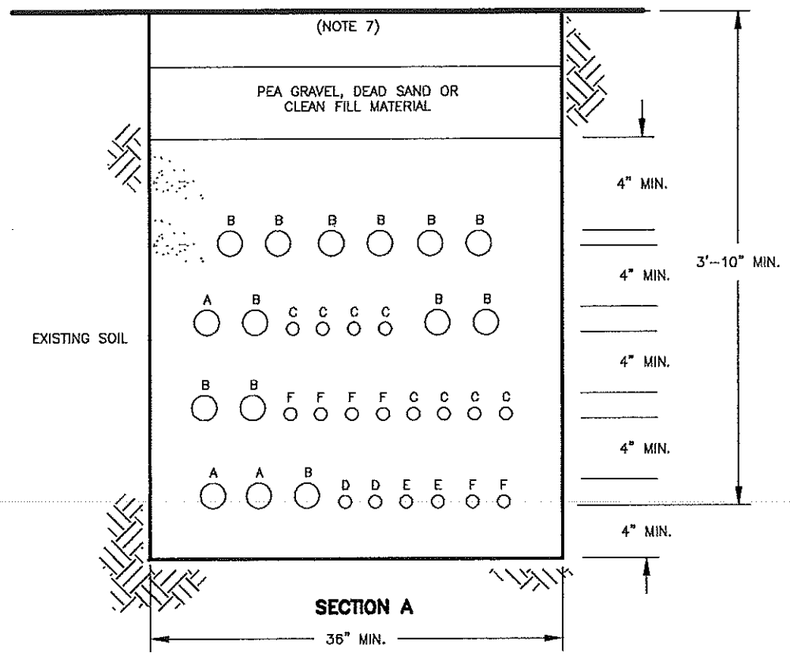
2. ELECTRICAL DISTRIBUTION RELOCATED FOR EASIER ACCESS.

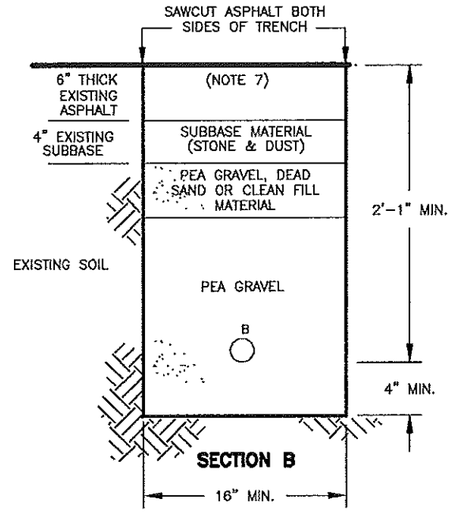
3. PIPE CHASE IS INSULATED 12" SCH. 40 PVC INSTALLED BETWEEN BUILDINGS.

EQUIPMENT FOOTPRINT
REMEDIAL SYSTEM ENCLOSURE

US ARMY
BUILDING 699
FORT MONMOUTH
EATONTOWN, NEW JERSEY

SCALE	DATE	SOURCE
0 1.5' 3'	4-23-99	NJ
	DWG # FORT MON	FIGURE 13





NOTES:

1) ALL 90° TURNS SHALL BE ACHIEVED WITH 22.5° OR 45° ANGLE ELBOWS OR 12" MINIMUM RADIUS SWEEPS FOR THIN WALL ELECTRICAL CONDUIT.

2) ALL PVC PIPE IS SCH. 40 PVC, SOLVENT WELD. SLOPE SVE PIPING TOWARD THE FENCED COMPOUND AT A SLOPE OF 1" PER 50 FEET. GROUNDWATER AND SPARGE PIPING SLOPED TOWARD WELLS AT AT A SLOPE OF 1" PER 50 FEET.

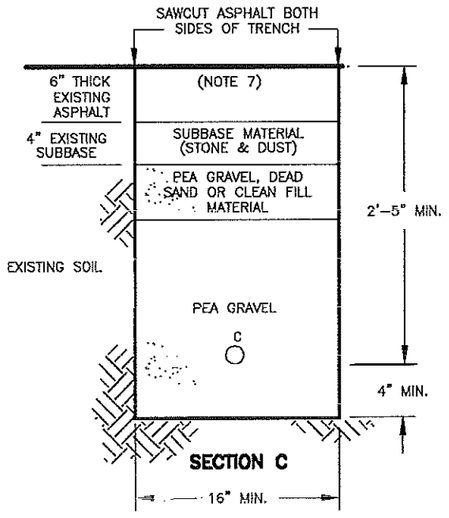
3) WHEN APPROPRIATE (BASED ON THE MATERIAL UTILIZED) BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY AASHTO TEST DESIGNATION T-180 OR ASTM TEST DESIGNATION D--1557.

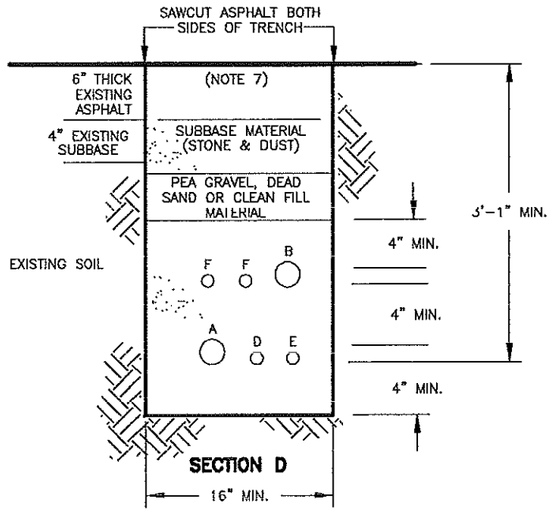
4) BACKFILL AND COMPACT EXCAVATION IN 6 INCH LIFTS.

5) THREE CONTINGENCY SVE PIPES SHALL BE INSTALLED IN TRENCH, ONE TO RW3, ONE TO RW4, AND THE OTHER TO END OF TRENCH NEAR MW4.

6) PRODUCT RECOVERY AND PRODUCT PUMP AIR SUPPLY LINES SHALL BE INSTALLED TO RW3 AND RW4 RESPECTIVELY.

7) REFER TO RESTORATION PLAN FOR FINAL EXCAVATION RESTORATION DETAILS.





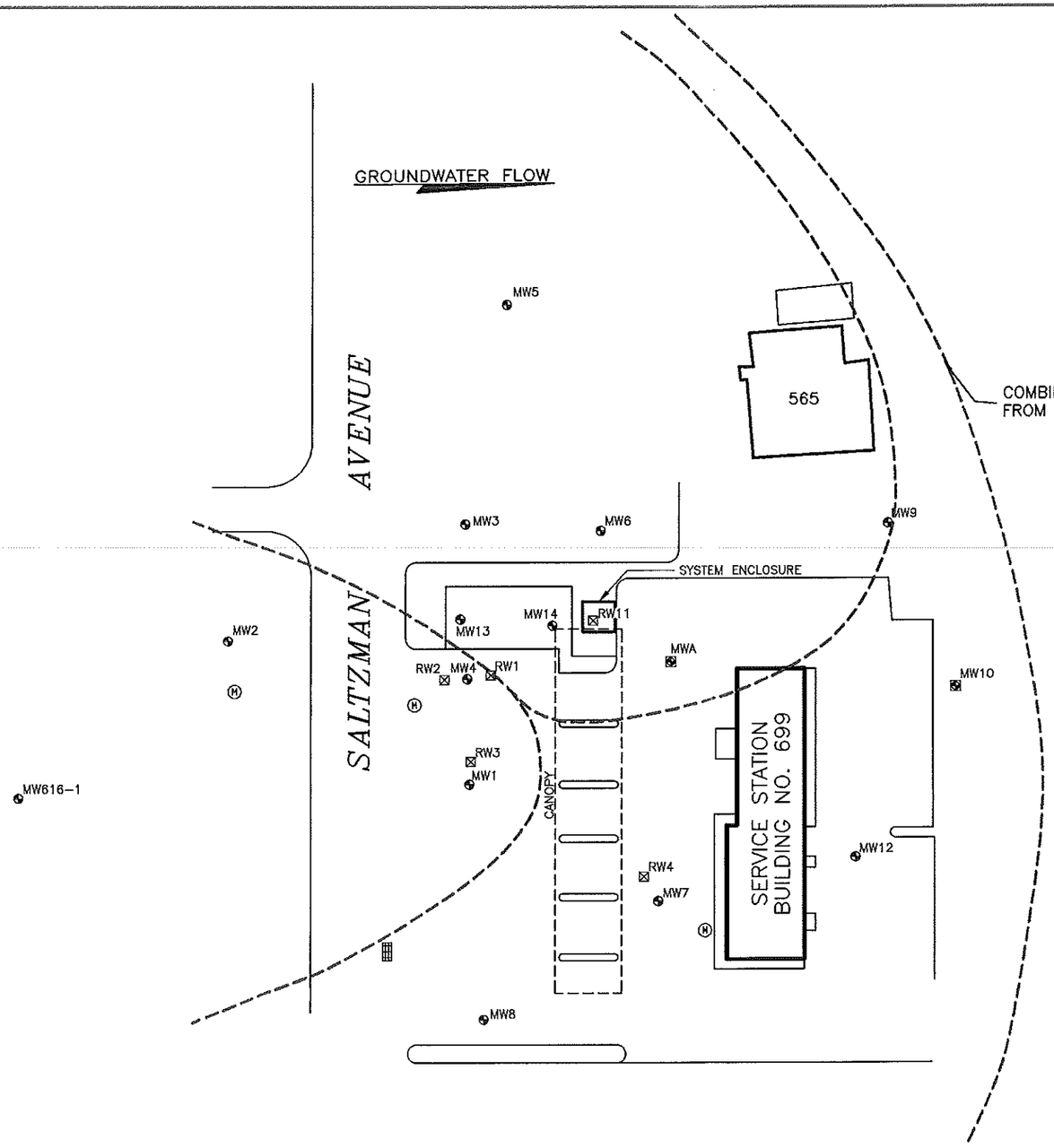
ITEM	SIZE	MATERIAL	DESCRIPTION
F	3/4"	THIN WALL METAL	ELECTRICAL CONDUIT
E	1"	SCH. 40 PVC	PRODUCT RECOVERY
D	1"	SCH. 40 PVC	PRODUCT PUMP AIR SUPPLY
C	1-1/2"	SCH. 40 PVC	AIR SPARGE
B	2"	SCH. 40 PVC	SOIL VAPOR EXTRACTION
A	2"	SCH. 40 PVC	GROUNDWATER RECOVERY

TRENCHING CROSS SECTIONS A THROUGH D

U.S. ARMY
BUILDING 699
FORT MONMOUTH
EATONTOWN, NEW JERSEY

		DATE	SOURCE
	NOT TO SCALE	4-19-99	NJ
		DWG # FORT MO	FIGURE 15

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.



LEGEND

- STORM SEWER INLET
- UTILITY MANHOLE
- PUMP ISLAND
- FENCE
- RECOVERY WELL
- MONITORING WELL
- ABANDONED MONITORING WELL

NOTES:

AN AVERAGE PUMPING RATE OF 5 gpm AT EACH OF RW11, RW3 AND RW4 WAS USED TO CALCULATE THE CAPTURE ZONE.

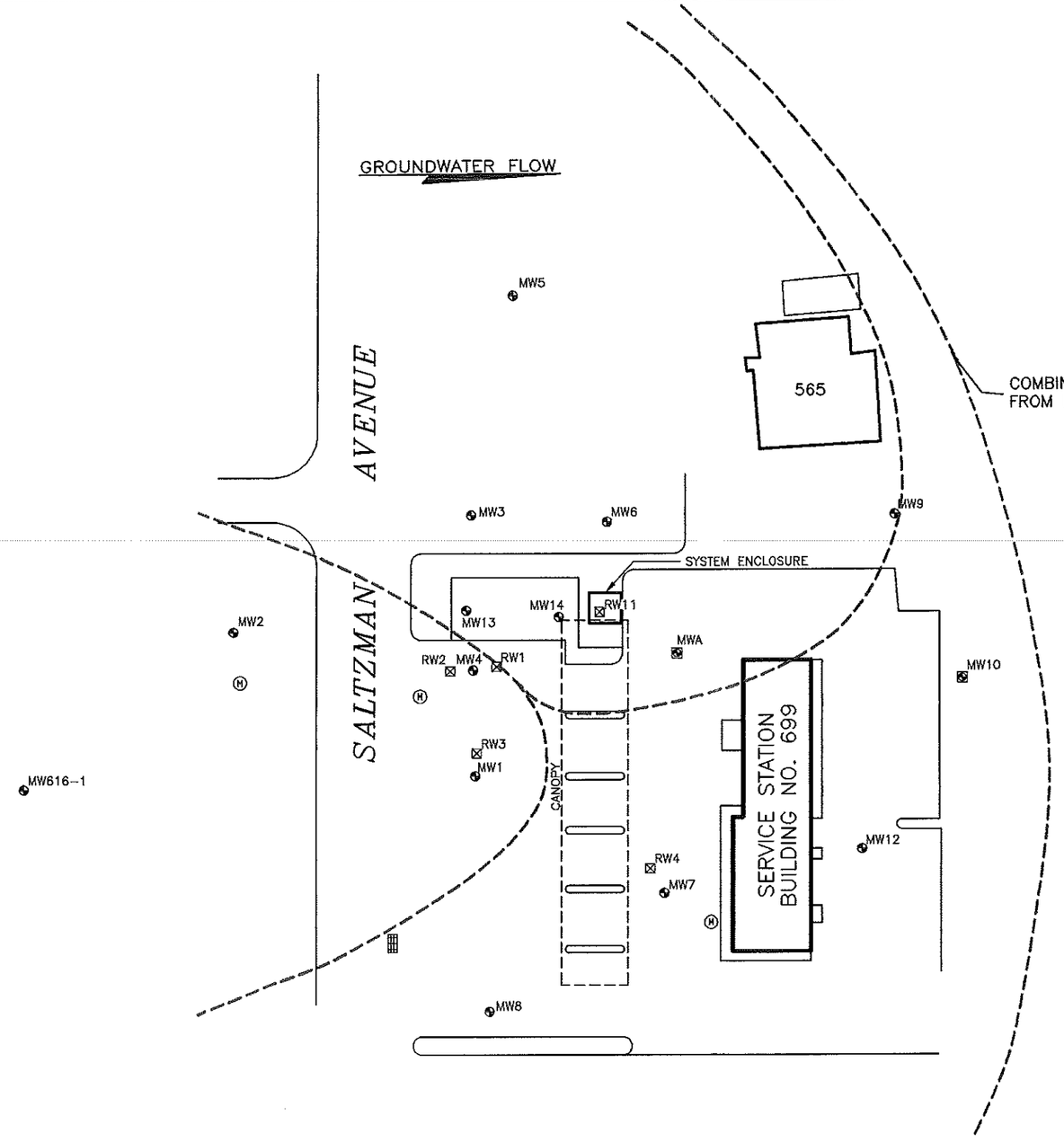
INDIVIDUAL CAPTURE ZONE FROM RW4 IS NOT SHOWN.

CALCULATED CAPTURE ZONE

US ARMY
BUILDING 699
FORT MONMOUTH
EATONTOWN, NEW JERSEY

NORTH	SCALE IN FEET	DATE	SOURCE
	0 30 60	5-17-99	NJ
		DWG # FORT MON	FIGURE 11

GROUNDWATER & ENVIRONMENTAL SERVICES, INC.



LEGEND

- STORM SEWER INLET
- UTILITY MANHOLE
- PUMP ISLAND
- FENCE
- RECOVERY WELL
- MONITORING WELL
- ABANDONED MONITORING WELL

NOTES:

AN AVERAGE PUMPING RATE OF 5 gpm AT EACH OF RW11, RW3 AND RW4 WAS USED TO CALCULATE THE CAPTURE ZONE.

INDIVIDUAL CAPTURE ZONE FROM RW4 IS NOT SHOWN.

CALCULATED CAPTURE ZONE

US ARMY
BUILDING 699
FORT MONMOUTH
EATONTOWN, NEW JERSEY

NORTH	SCALE IN FEET	DATE	SOURCE
	0 30 60	5-17-99	NJ
		DWG # FORT MON	FIGURE 17

TABLES

TABLE 1
GROUNDWATER MONITORING DATA
U.S. ARMY
FORT MONMOUTH - BUILDING 699 AREA
EATONTOWN, NEW JERSEY

4/2/98

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	2.89	2.91	0.02	13.18	13.20
MW1	15.81	---	2.65	---	13.16	13.16
MW2	16.64	---	2.85	---	13.79	13.79
MW3	15.80	---	2.80	---	13.00	13.00
MW4	15.92	---	2.72	---	13.20	13.20
MW5	15.48	---	2.69	---	12.79	12.79
MW6	15.78	---	2.88	---	12.90	12.90
MW8	15.96	---	3.13	---	12.83	12.83
MW9	16.20	---	3.10	---	13.10	13.10
RW11	17.14	---	13.57	---	3.57	3.57
MW12	16.66	---	3.51	---	13.15	13.15
MW13	16.21	---	1.70	---	14.51	14.51
MW14	15.98	---	1.56	---	14.42	14.42
MW15	17.04	---	3.19	---	13.85	13.85
MW16	15.27	NM	NM	NM	NM	NM
616-1	18.92	---	4.70	---	14.22	14.22

4/9/98

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	3.45	3.46	0.02	12.63	12.65
MW1	15.81	---	3.11	---	12.70	12.70
MW2	16.64	---	3.50	---	13.14	13.14
MW3	15.80	---	3.34	---	12.46	12.46
MW4	15.92	---	3.22	---	12.70	12.70
MW5	15.48	---	3.34	---	12.14	12.14
MW6	15.78	---	3.56	---	12.22	12.22
MW8	15.96	---	3.50	---	12.46	12.46
MW9	16.20	---	3.68	---	12.52	12.52
RW11	17.14	---	13.12	---	4.02	4.02
MW12	16.66	---	3.99	---	12.67	12.67
MW13	16.21	---	2.32	---	13.89	13.89
MW14	15.98	---	2.19	---	13.79	13.79
MW15	17.04	---	3.80	---	13.24	13.24
MW16	15.27	---	3.34	---	11.93	11.93
616-1	18.92	---	5.39	---	13.53	13.53

TABLE 1
GROUNDWATER MONITORING DATA
U.S. ARMY
FORT MONMOUTH - BUILDING 699 AREA
EATONTOWN, NEW JERSEY

5/27/98

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	3.20	3.22	0.02	12.87	12.89
MW1	15.81	---	2.93	---	12.88	12.88
MW2	16.64	---	3.51	---	13.13	13.13
MW3	15.80	---	3.20	---	12.60	12.60
MW4	15.92	NM	NM	NM	NM	NM
MW5	15.48	---	3.21	---	12.27	12.27
MW6	15.78	---	3.44	---	12.34	12.34
MW8	15.96	---	3.40	---	12.56	12.56
MW9	16.20	---	3.72	---	12.48	12.48
RW11	17.14	13.69	13.70	0.01	3.44	3.45
MW12	16.66	---	3.88	---	12.78	12.78
MW13	16.21	---	1.88	---	14.33	14.33
MW14	15.98	---	1.76	---	14.22	14.22
MW15	17.04	---	3.94	---	13.10	13.10
MW16	15.27	NM	NM	NM	NM	NM
616-1	18.92	---	5.64	---	13.28	13.28

6/11/98

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	4.08	4.09	0.01	12.00	12.01
MW1	15.81	---	3.78	---	12.03	12.03
MW2	16.64	---	4.66	---	11.98	11.98
MW3	15.80	---	4.07	---	11.73	11.73
MW4	15.92	---	3.90	---	12.02	12.02
MW5	15.48	---	4.15	---	11.33	11.33
MW6	15.78	---	4.37	---	11.41	11.41
MW8	16.20	---	4.10	---	12.10	12.10
MW9	15.96	---	4.61	---	11.35	11.35
RW11	17.14	---	14.05	---	3.09	3.09
MW12	16.66	---	4.65	---	12.01	12.01
MW13	16.21	---	2.98	---	13.23	13.23
MW14	15.98	---	2.85	---	13.13	13.13
MW15	17.04	---	4.66	---	12.38	12.38
MW16	15.27	---	4.70	---	10.57	10.57
616-1	18.92	---	6.62	---	12.30	12.30

TABLE 1
GROUNDWATER MONITORING DATA
U.S. ARMY
FORT MONMOUTH - BUILDING 699 AREA
EATONTOWN, NEW JERSEY

6/26/98

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	---	4.98	---	11.11	11.11
MW1	15.81	---	4.80	---	11.01	11.01
MW2	16.64	---	5.21	---	11.43	11.43
MW3	15.80	---	4.89	---	10.91	10.91
MW4	15.92	---	4.82	---	11.10	11.10
MW5	15.48	---	4.82	---	10.66	10.66
MW6	15.78	---	5.16	---	10.62	10.62
MW8	16.20	---	5.14	---	11.06	11.06
MW9	15.96	---	5.50	---	10.46	10.46
RW11	17.14	---	14.05	---	3.09	3.09
MW12	16.66	---	5.68	---	10.98	10.98
MW13	16.21	---	3.81	---	12.40	12.40
MW14	15.98	---	3.71	---	12.27	12.27
MW15	17.04	---	3.09	---	13.95	13.95
MW16	15.27	---	5.44	---	9.83	9.83
616-1	18.92	---	7.03	---	11.89	11.89

7/2/98

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	---	NM	NM	NM	NM
MW1	15.81	---	4.07	---	11.74	11.74
MW2	16.64	---	4.72	---	11.92	11.92
MW3	15.80	---	4.29	---	11.51	11.51
MW4	15.92	---	NM	NM	NM	NM
MW5	15.48	---	4.18	---	11.30	11.30
MW6	15.78	---	4.52	---	11.26	11.26
MW8	16.20	---	4.39	---	11.81	11.81
MW9	15.96	---	4.79	---	11.17	11.17
RW11	17.14	---	13.98	---	3.16	3.16
MW12	16.66	---	4.84	---	11.82	11.82
MW13	16.21	---	3.15	---	13.06	13.06
MW14	15.98	---	3.05	---	12.93	12.93
MW15	17.04	---	4.54	---	12.50	12.50
MW16	15.27	---	4.81	---	10.46	10.46
616-1	18.92	---	6.54	---	12.38	12.38

TABLE 1
GROUNDWATER MONITORING DATA
U.S. ARMY
FORT MONMOUTH - BUILDING 699 AREA
EATONTOWN, NEW JERSEY

7/8/98

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	---	4.62	---	11.47	11.47
MW1	15.81	---	4.28	---	11.53	11.53
MW2	16.64	---	4.97	---	11.67	11.67
MW3	15.80	---	4.55	---	11.25	11.25
MW4	15.92	---	4.46	---	11.46	11.46
MW5	15.48	---	4.41	---	11.07	11.07
MW6	15.78	---	4.80	---	10.98	10.98
MW8	16.20	---	4.57	---	11.63	11.63
MW9	15.96	---	5.05	---	10.91	10.91
RW11	17.14	---	14.03	---	3.11	3.11
MW12	16.66	---	5.07	---	11.59	11.59
MW13	16.21	---	3.48	---	12.73	12.73
MW14	15.98	---	3.25	---	12.73	12.73
MW15	17.04	---	4.83	---	12.21	12.21
MW16	15.27	---	5.13	---	10.14	10.14
616-1	18.92	---	6.88	---	12.04	12.04

7/29/98

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	---	---	---	---	---
MW1	15.81	---	5.13	---	10.68	10.68
MW2	16.64	---	5.77	---	10.87	10.87
MW3	15.80	---	5.35	---	10.45	10.45
MW4	15.92	---	5.38	---	10.54	10.54
MW5	15.48	---	5.27	---	10.21	10.21
MW6	15.78	---	4.21	---	11.57	11.57
MW8	16.20	---	5.25	---	10.95	10.95
MW9	15.96	---	5.99	---	9.97	9.97
RW11	17.14	---	---	---	---	---
MW12	16.66	---	5.89	---	10.77	10.77
MW13	16.21	---	---	---	---	---
MW14	15.98	---	---	---	---	---
MW15	17.04	---	5.63	---	11.41	11.41
MW16	15.27	---	6.23	---	9.04	9.04
616-1	18.92	---	7.84	---	11.08	11.08

TABLE 1
GROUNDWATER MONITORING DATA
U.S. ARMY
FORT MONMOUTH - BUILDING 699 AREA
EATONTOWN, NEW JERSEY

8/5/98

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	---	NM	NM	NM	NM
MW1	15.81	---	5.36	---	10.45	10.45
MW2	16.64	---	6.03	---	10.61	10.61
MW3	15.80	---	5.64	---	10.16	10.16
MW4	15.92	---	NM	NM	NM	NM
MW5	15.48	---	5.44	---	10.04	10.04
MW6	15.78	---	5.90	---	9.88	9.88
MW8	16.20	---	5.51	---	10.69	10.69
MW9	15.96	---	6.12	---	9.84	9.84
RW11	17.14	---	14.73	---	2.41	2.41
MW12	16.66	---	6.12	---	10.54	10.54
MW13	16.21	---	3.37	---	12.84	12.84
MW14	15.98	---	3.22	---	12.76	12.76
MW15	17.04	---	5.73	---	11.31	11.31
MW16	15.27	---	6.54	---	8.73	8.73
616-1	18.92	---	8.09	---	10.83	10.83

8/18/98

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	---	6.27	---	9.82	9.82
MW1	15.81	---	5.83	---	9.98	9.98
MW2	16.64	---	6.39	---	10.25	10.25
MW3	15.80	---	6.14	---	9.66	9.66
MW4	15.92	---	6.12	---	9.80	9.80
MW5	15.48	---	5.85	---	9.63	9.63
MW6	15.78	---	6.32	---	9.46	9.46
MW8	16.20	---	5.96	---	10.24	10.24
MW9	15.96	---	6.65	---	9.31	9.31
RW11	17.14	---	14.60	---	2.54	2.54
MW12	16.66	---	6.58	---	10.08	10.08
MW13	16.21	---	3.45	---	12.76	12.76
MW14	15.98	---	3.31	---	12.67	12.67
MW15	17.04	---	6.15	---	10.89	10.89
MW16	15.27	---	7.02	---	8.25	8.25
616-1	18.92	---	8.55	---	10.37	10.37

TABLE 1
GROUNDWATER MONITORING DATA
U.S. ARMY
FORT MONMOUTH - BUILDING 699 AREA
EATONTOWN, NEW JERSEY

9/4/98

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	---	6.71	---	9.38	9.38
MW1	15.81	---	6.27	---	9.54	9.54
MW2	16.64	---	6.85	---	9.79	9.79
MW3	15.80	---	6.57	---	9.23	9.23
MW4	15.92	---	6.51	---	9.41	9.41
MW5	15.48	---	6.23	---	9.25	9.25
MW6	15.78	---	6.76	---	9.02	9.02
MW8	16.20	---	6.42	---	9.78	9.78
MW9	15.96	---	7.00	---	8.96	8.96
RW11	17.14	---	14.64	---	2.50	2.50
MW12	16.66	---	7.02	---	9.64	9.64
MW13	16.21	---	3.51	---	12.70	12.70
MW14	15.98	---	3.36	---	12.62	12.62
MW15	17.04	---	6.56	---	10.48	10.48
MW16	15.27	---	7.44	---	7.83	7.83
616-1	18.92	---	8.99	---	9.93	9.93

9/17/98

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	---	6.97	---	9.12	9.12
MW1	15.81	---	6.57	---	9.24	9.24
MW2	16.64	---	7.16	---	9.48	9.48
MW3	15.80	---	6.82	---	8.98	8.98
MW4	15.92	---	6.80	---	9.12	9.12
MW5	15.48	---	6.48	---	9.00	9.00
MW6	15.78	---	7.00	---	8.78	8.78
MW8	16.20	---	6.75	---	9.45	9.45
MW9	15.96	---	7.25	---	8.71	8.71
RW11	17.14	---	14.51	---	2.63	2.63
MW12	16.66	---	7.30	---	9.36	9.36
MW13	16.21	---	3.32	---	12.89	12.89
MW14	15.98	---	3.18	---	12.80	12.80
MW15	17.04	---	6.79	---	10.25	10.25
MW16	15.27	---	7.61	---	7.66	7.66
616-1	18.92	---	9.25	---	9.67	9.67

TABLE 1
GROUNDWATER MONITORING DATA
U.S. ARMY
FORT MONMOUTH - BUILDING 699 AREA
EATONTOWN, NEW JERSEY

10/2/98

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	---	7.21	---	8.88	8.88
MW1	15.81	---	6.85	---	8.96	8.96
MW2	16.64	---	7.31	---	9.33	9.33
MW3	15.80	---	7.12	---	8.68	8.68
MW4	15.92	---	7.02	---	8.90	8.90
MW5	15.48	---	6.70	---	8.78	8.78
MW6	15.78	---	7.27	---	8.51	8.51
MW8	16.20	---	7.06	---	9.14	9.14
MW9	15.96	---	7.47	---	8.49	8.49
RW11	17.14	---	14.62	---	2.52	2.52
MW12	16.66	---	7.61	---	9.05	9.05
MW13	16.21	---	3.62	---	12.59	12.59
MW14	15.98	---	3.43	---	12.55	12.55
MW15	17.04	---	7.00	---	10.04	10.04
MW16	15.27	---	7.88	---	7.39	7.39
616-1	18.92	---	9.45	---	9.47	9.47

10/16/98

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	---	7.19	---	8.90	8.90
MW1	15.81	---	6.72	---	9.09	9.09
MW2	16.64	---	7.75	---	8.89	8.89
MW3	15.80	---	7.21	---	8.59	8.59
MW4	15.92	6.90	6.91	0.01	9.01	9.02
MW5	15.48	---	6.82	---	8.66	8.66
MW6	15.78	---	7.30	---	8.48	8.48
MW8	16.20	---	7.24	---	8.96	8.96
MW9	15.96	---	7.48	---	8.48	8.48
RW11	17.14	SHEEN	14.55	SHEEN	2.59	2.59
MW12	16.66	---	7.74	---	8.92	8.92
MW13	16.21	---	3.26	---	12.95	12.95
MW14	15.98	---	3.11	---	12.87	12.87
MW15	17.04	---	7.90	---	9.14	9.14
MW16	15.27	---	7.73	---	7.54	7.54
616-1	18.92	---	9.41	---	9.51	9.51

TABLE 1
GROUNDWATER MONITORING DATA
U.S. ARMY
FORT MONMOUTH - BUILDING 699 AREA
EATONTOWN, NEW JERSEY

11/12/98

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	7.49	7.58	0.09	8.51	8.58
MW1	15.81	7.29	8.50	1.21	7.31	8.22
MW2	16.64	---	8.17	---	8.47	8.47
MW3	15.80	---	7.63	---	8.17	8.17
MW4	15.92	7.91	8.57	0.66	7.35	7.85
MW5	15.48	---	7.10	---	8.38	8.38
MW6	15.78	---	7.74	---	8.04	8.04
MW8	16.20	---	7.51	---	8.69	8.69
MW9	15.96	---	7.84	---	8.12	8.12
RW11	17.14	15.71	15.72	0.01	1.42	1.43
MW12	16.66	---	8.09	---	8.57	8.57
MW13	16.21	---	3.51	---	12.70	12.70
MW14	15.98	---	3.35	---	12.63	12.63
MW15	17.04	---	7.50	---	9.54	9.54
MW16	15.27	---	8.07	---	7.20	7.20
616-1	18.92	---	10.01	---	8.91	8.91

11/25/98

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	---	7.60	---	8.49	8.49
MW1	15.81	7.41	8.65	1.24	7.16	8.09
MW2	16.64	---	8.31	---	8.33	8.33
MW3	15.80	---	7.71	---	8.09	8.09
MW4	15.92	7.97	8.51	0.54	7.41	7.82
MW5	15.48	---	7.23	---	8.25	8.25
MW6	15.78	---	7.87	---	7.91	7.91
MW8	16.20	---	7.78	---	8.42	8.42
MW9	15.96	---	7.95	---	8.01	8.01
RW11	17.14	---	15.53	---	1.61	1.61
MW12	16.66	---	8.27	---	8.39	8.39
MW13	16.21	---	4.32	---	11.89	11.89
MW14	15.98	---	3.50	---	12.48	12.48
MW15	17.04	---	7.70	---	9.34	9.34
MW16	15.27	---	7.73	---	7.54	7.54
616-1	18.92	---	10.14	---	8.78	8.78

TABLE 1
GROUNDWATER MONITORING DATA
U.S. ARMY
FORT MONMOUTH - BUILDING 699 AREA
EATONTOWN, NEW JERSEY

12/4/98

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	---	7.60	---	8.49	8.49
MW1	15.81	7.42	8.71	1.29	7.10	8.07
MW2	16.64	---	8.41	---	8.23	8.23
MW3	15.80	---	7.69	---	8.11	8.11
MW4	15.92	7.85	8.82	0.97	7.10	7.83
MW5	15.48	---	7.29	---	8.19	8.19
MW6	15.78	---	7.80	---	7.98	7.98
MW8	16.20	---	7.85	---	8.35	8.35
MW9	15.96	---	7.91	---	8.05	8.05
RW11	17.14	15.53	15.54	0.01	1.60	1.61
MW12	16.66	---	8.36	---	8.30	8.30
MW13	16.21	---	4.20	---	12.01	12.01
MW14	15.98	---	3.47	---	12.51	12.51
MW15	17.04	---	7.57	---	9.47	9.47
MW16	15.27	---	7.61	---	7.66	7.66
616-1	18.92	---	10.00	---	8.92	8.92

1/22/99

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	---	5.22	---	10.87	10.87
MW1	15.81	5.50	5.62	0.12	10.19	10.28
MW2	16.64	---	3.87	---	12.77	12.77
MW3	15.80	---	4.89	---	10.91	10.91
MW4	15.92	---	5.14	---	10.78	10.78
MW5	15.48	---	4.89	---	10.59	10.59
MW6	15.78	---	4.85	---	10.93	10.93
MW8	16.20	---	6.10	---	10.10	10.10
MW9	15.96	---	5.09	---	10.87	10.87
RW11	17.14	---	14.20	---	2.94	2.94
MW12	16.66	---	6.61	---	10.05	10.05
MW13	16.21	---	2.25	---	13.96	13.96
MW14	15.98	---	2.12	---	13.86	13.86
MW15	17.04	---	4.58	---	12.46	12.46
MW16	15.27	---	5.64	---	9.63	9.63
616-1	18.92	---	4.90	---	14.02	14.02

TABLE 1
GROUNDWATER MONITORING DATA
U.S. ARMY
FORT MONMOUTH - BUILDING 699 AREA
EATONTOWN, NEW JERSEY

1/29/99

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	---	4.77	---	11.32	11.32
MW1	15.81	5.00	5.11	0.11	10.70	10.78
MW2	16.64	---	3.47	---	13.17	13.17
MW3	15.80	---	4.50	---	11.30	11.30
MW4	15.92	---	4.69	---	11.23	11.23
MW5	15.48	---	4.00	---	11.48	11.48
MW6	15.78	---	4.40	---	11.38	11.38
MW8	16.20	---	5.30	---	10.90	10.90
MW9	15.96	---	4.38	---	11.58	11.58
RW11	17.14	---	14.23	---	2.91	2.91
MW12	16.66	---	5.84	---	10.82	10.82
MW13	16.21	---	2.48	---	13.73	13.73
MW14	15.98	---	2.36	---	13.62	13.62
MW15	17.04	---	4.20	---	12.84	12.84
MW16	15.27	---	5.02	---	10.25	10.25
616-1	18.92	---	4.51	---	14.41	14.41

2/12/99

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	---	4.47	---	11.62	11.62
MW1	15.81	---	4.47	---	11.34	11.34
MW2	16.64	---	2.98	---	13.66	13.66
MW3	15.80	---	4.08	---	11.72	11.72
MW4	15.92	---	4.22	---	11.70	11.70
MW5	15.48	---	3.55	---	11.93	11.93
MW6	15.78	---	4.01	---	11.77	11.77
MW8	16.20	---	4.60	---	11.60	11.60
MW9	15.96	---	4.08	---	11.88	11.88
RW11	17.14	---	14.30	---	2.84	2.84
MW12	16.66	---	5.15	---	11.51	11.51
MW13	16.21	---	2.74	---	13.47	13.47
MW14	15.98	---	2.60	---	13.38	13.38
MW15	17.04	---	2.86	---	14.18	14.18
MW16	15.27	---	3.21	---	12.06	12.06
616-1	18.92	---	4.05	---	14.87	14.87

TABLE 1
GROUNDWATER MONITORING DATA
U.S. ARMY
FORT MONMOUTH - BUILDING 699 AREA
EATONTOWN, NEW JERSEY
2/19/99

Well ID	Casing Elevation (feet)	Depth to Product (feet)	Depth to Groundwater (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Adjusted GW Elevation (feet)
RW2	16.09	---	4.36	---	11.73	11.73
MW1	15.81	---	4.20	---	11.61	11.61
MW2	16.64	---	1.79	---	14.85	14.85
MW3	15.80	---	3.98	---	11.82	11.82
MW4	15.92	---	4.18	---	11.74	11.74
MW5	15.48	---	3.41	---	12.07	12.07
MW6	15.78	---	3.65	---	12.13	12.13
MW8	16.20	---	4.47	---	11.73	11.73
MW9	15.96	---	3.44	---	12.52	12.52
RW11	17.14	---	14.37	---	2.77	2.77
MW12	16.66	---	5.00	---	11.66	11.66
MW13	16.21	---	2.11	---	14.10	14.10
MW14	15.98	---	1.98	---	14.00	14.00
MW15	17.04	---	1.99	---	15.05	15.05
MW16	15.27	---	2.85	---	12.42	12.42
616-1	18.92	---	3.51	---	15.41	15.41

APPENDIX I

SERIAL # 46248 038 616mw1

DWR-133M (10/93)

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION AND ENERGY
TRENTON, NJ

Mail to
DEPE
Bureau Water Allocation
26
Trenton, NJ 08625

MONITORING WELL PERMIT

Permit No. 29 337 60

VALID ONLY AFTER APPROVAL BY THE D.E.P.E.

COORD # : 29 . 14 . 444

Owner U.S. Army - Ft Monmouth
Address Bldg 1167 DEH Envir
Ft Monmouth NJ
Name of Facility Bldg 616
Address Same as above

Driller Shine Drilling
Address 23 Branch Ave
Oceanport NJ

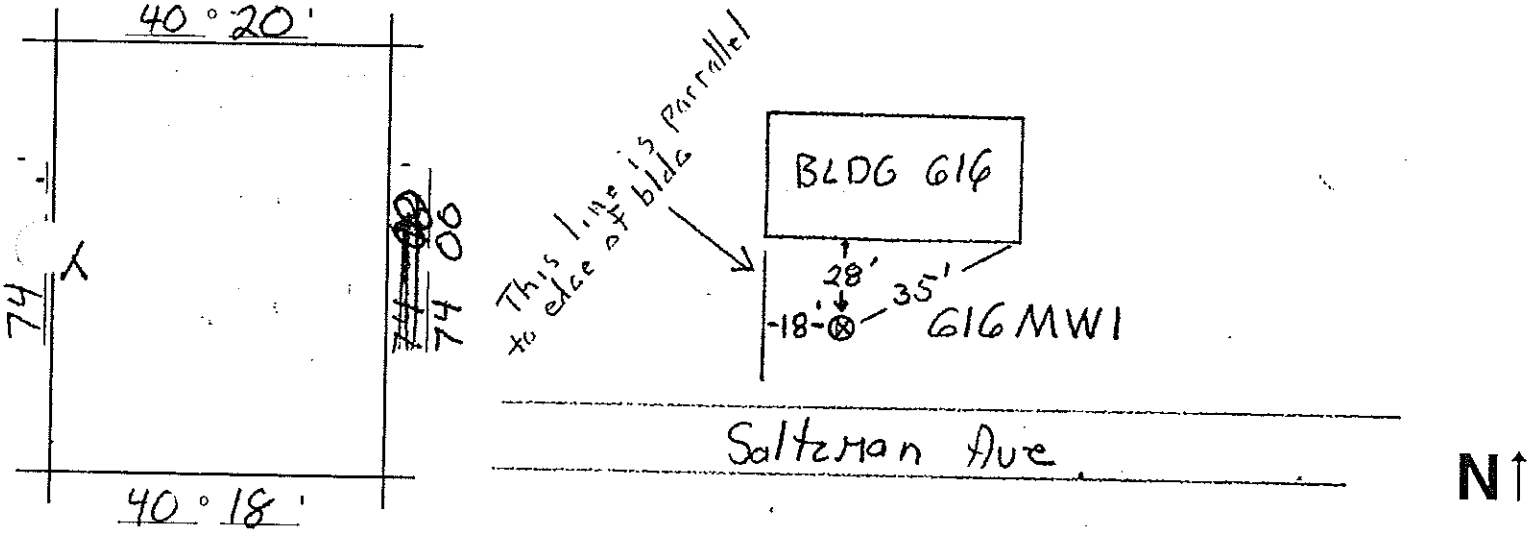
Diameter of Well(s) 4 Inches		Proposed Depth of Well(s) 20 Feet	
# of Wells Applied for (max. 10) 1		Will pumping equipment be installed? YES ☐ NO ☒	
Type of Well (see reverse) Monitor		If Yes, give pump capacity NA GPM	

LOCATION OF WELL(S)

Lot #	Block #	Municipality	County
NA	NA	Ft Monmouth	Monmouth

State Atlas Map No. 29

Draw sketch of well(s) nearest roads, buildings, etc. with marked distances in feet. Each well MUST be labeled with a name and/or number on the sketch.



FOR MONITORING WELLS, RECOVERY WELLS, OR PIEZOMETERS, THE FOLLOWING MUST BE COMPLETED BY THE APPLICANT. PLEASE INDICATE WHY THE WELLS ARE BEING INSTALLED:

- ☒ ~~Spill Site~~
- ☐ ISRA Site
- ☐ CERCLA (Superfund) Site
- ☐ RCRA Site
- ☒ Underground Storage Tank Site
- ☐ Operational Ground Water Permit Site
- ☐ Pretreatment and Residuals Site
- ☐ Water and Hazardous Waste Enforcement Case
- ☐ Water Supply Aquifer Test Observation Well
- ☐ Other (explain) _____

RECEIVED JUL 27 1995 NORTH JERSEY REGIONAL HEALTH COMMISSION

CASE I.D. Number 94-12-8-1040-10

This Space for Approval Stamp

WELL PERMIT APPROVED
NJDEP
19 1995
BUREAU OF WATER ALLOCATION

FOR D.E.P.E. USE
- ☐ Issuance of this permit is subject to the conditions attached. (see next page)
- ☐ For monitoring purposes only
- ☐ The well(s) may not be completed with more than 25 feet of total screen or uncased borehole.
- ☐ _____

SEE REVERSE SIDE FOR IMPORTANT PROVISIONS AND REGULATIONS PERTAINING TO THIS PERMIT.

In compliance with N.J.S.A. 58:4A-14, application is made for a permit to drill a well as described above.

Date 7/10/95

Signature of Driller _____ License # 1275

Signature of Owner _____ SELFM-PWSEV

COPIES: Water Allocation — White and Pink Health Dept — Yellow

DWR-138 M
11/94

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER ALLOCATION

MONITORING WELL RECORD

Well Permit No. _____ - _____
Atlas Sheet Coordinates _____ : _____ : _____ ☐

OWNER IDENTIFICATION - Owner _____
Address _____
City _____ State _____ Zip Code _____

WELL LOCATION - If not the same as owner please give address. Owner's Well No. _____
County _____ Municipality _____ Lot No. _____ Block No. _____
Address _____

TYPE OF WELL (as per Well Permit Categories) _____ Date well completed ____/____/____
Regulatory Program Requiring Well _____ Case I.D. # _____
CONSULTING FIRM/FIELD SUPERVISOR (if applicable) _____ Tele. # _____

WELL CONSTRUCTION

Total depth drilled _____ ft.
Well finished to _____ ft.
Borehole diameter:
Top _____ in.
Bottom _____ 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

	Depth to Top (ft.) [From land surface]	Depth to Bottom (ft.) [From land surface]	Diameter (inches)	Type and Material
Inner Casing				
Outer Casing (Not Protective Casing)				
Screen (Note slot size)				
Tail Piece				
Gravel Pack				
Annular Seal/Grout				
Method of Grouting				

Static water level after drilling _____ ft.
Water level was measured using _____
Well was developed for _____ hours at _____ gpm
Method of development _____
Was permanent pumping equipment installed? ☐ Yes ☑ No
Pump capacity _____ gpm
Pump type: _____
Drilling Method _____
Drilling Fluid _____ Type of Rig _____
Name of Driller _____
Health and Safety Plan submitted? ☐ Yes ☑ No
Level of Protection used on site (circle one) None D C B A
N.J. License No. _____
Name of Drilling Company _____

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

tify 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.

THIS FORM MUST BE COMPLETED BY THE PERMITTEE AND/OR SURVEYOR

MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of Permittee:
Name of Facility: FORT MONMOUTH
Location:
NJPDES Number: NJ00 ; or ECRA Case Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number:
This number must be permanently affixed to the well casing. 29-33760-

Longitude (to nearest second): West 74°-02'48"

Latitude (to nearest second): North 40°-18'-47"

Elevation of Top of Inner Casing (cap off) (one-hundredth of a foot): 18.92

Source of elevation datum (benchmark, nail, etc.) and year. (If an alternate datum has been approved by the Department, identify here, assume datum of 100', and give approximated actual elevation.) Source: GEODETIC FM-10

[x] 1927 [ ] 1983

Elev.:

Owners Well Number (As shown on application or plans): 616 MW-1 SU

Elevations are to be determined by double run, three wire leveling methods using balanced sights, commencing from a well marked and described point. This beginning point shall either be derived from Federal or State benchmarks if not more than 1000 feet from the site or from an alternate datum approved by the Department. Tolerances should meet third order standards, which are 0.05 ft x $(\text{mile})^{1/2}$. For sections less than 0.1 mile, let miles = 0.1.

AUTHENTICATION

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

Thomas Pianetti
PROFESSIONAL LAND SURVEYOR'S SIGNATURE

THOMAS PIANETTI
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

GE 38975
PROFESSIONAL LAND SURVEYOR'S LICENSE #

U.S. ARMY
FORT MONMOUTH
SELFM PW EV

LOG OF BORING 616-MW1

Produced for Charles Appleby

Project Name	: BLDG. 616	Completion Date	: 8/17/95
NJDEP Case #	: 29-33760	Northing	: N 539584.356
Logged By	: Shore Drilling	Easting	: E 2172306.050
Start Date	: 8/17/95	Driller	: R. Barnes

Depth in Feet	29-33760 ELEV: 18.92	DESCRIPTION	GRAPHIC	USCS	Samples	Blows/Ft	Well Construction Information
0	.5	Topsoil and Roots					
2	2.5	Brown clayey, dry moist		CL	1 2	15 12	
4	4	Green + black silty clay, mottled moist		CL	3 4 5	14 16 16	
8							
10					6	15	
12		Iron stained area		CL			
14	14						
16							

8/95

Well Construction

Date Completed	: 8/17/95
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

NOTES
Well #1 is 616 MW1

2-21-1996 C:\616\GEO\616-mw.gpj

Groundwater & Environi ıtal Services, Inc.

Project: Fort Monmouth
Location: Bldg 616
Well number: 616 MW1
Casing Elevation:
Screen Dia.: 4"
Casing Dia.: 4"
Drilling Method: H.S.A.
Completion Details: Stick-up
Driller: SHORE
Log By: R. BARNES
Date: 8-17-95

Owner: DPW
Permit No: 2933760
Total Depth: 14.0
Diameter: 4"
Water Level: Init: ___ Static: ___
Length: 10.0'
Slot Size: 20
Length: ≈6.5'
Type: PVC
Sample Method: Split Spoon

Boring Log — Sketch Map

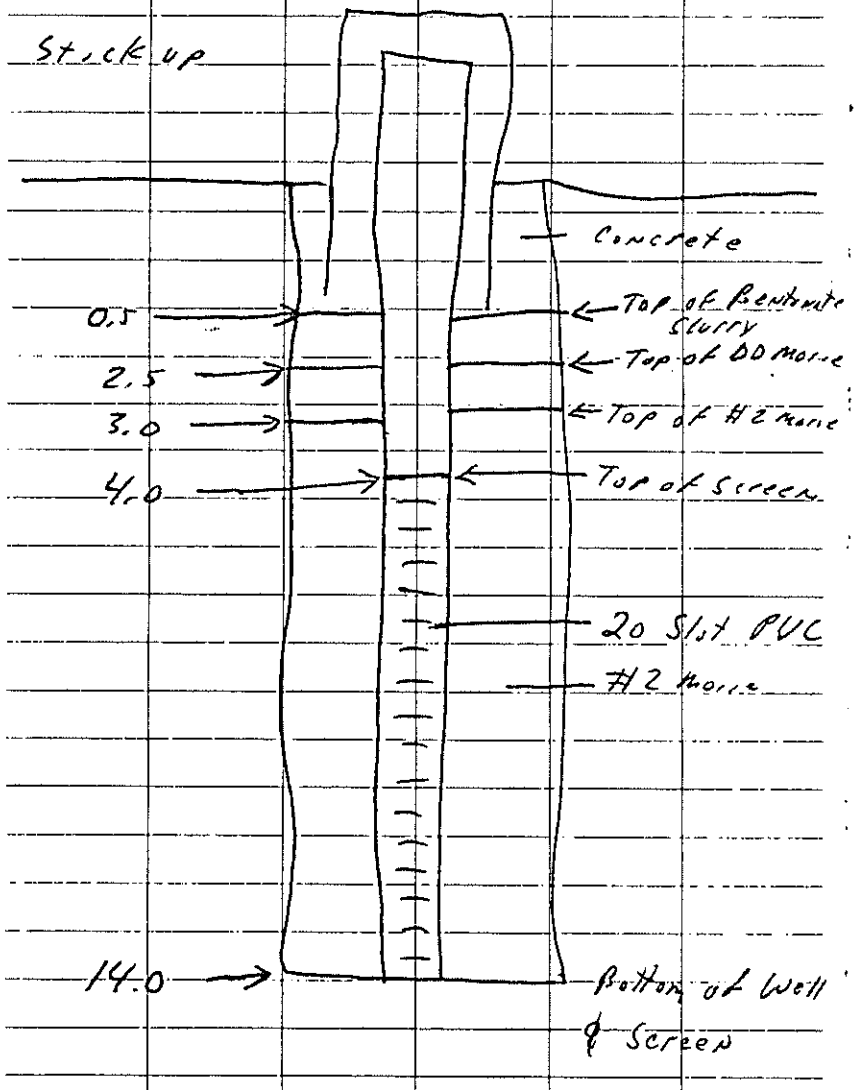
Blows Per Ft	Depth (feet)	Sample No.	Well Const.	PID (ppm)	Blow Count	Rec. (ft)	Lithology	Unified Symbol
15	1–2			0	8, 6 / 9, 6	1.6	Topsoil & Roots — Dry Br Clayey [illegible] — Dry, moist	[illegible] ML-SM
12	3–4			0	8, 5 / 7, 6	6.0		
14	5–6	X		0	5, 7 / 7, 7	1.2	Green & Blk silty Clay, [illegible] mottled, Moist	[illegible]-ML
16	7–8			0	9, 7 / 9, 9	1.5	wet at 6'	
16	9–10			0	9, [illegible] / 8, 8	1.4		
15	11–12			0	4, 7 / 3, 8	1.6	OR [illegible] at [illegible] Ft	
	13				Auger			
	14							
	15						E.O.B. at [illegible]	
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
	24							
	25							
	26							
	27							
	28							
	29							

(44): 8-17-95 Notes

Fort Monmouth

Well Construction For WKCL

"616_MW1"



1446
1450
1455
1509
1515
1610

WELL ID NO. 699/1

DWR-138 M
6/89

New Jersey Department of Environmental Protection
Division of Water Resources

MONITORING WELL RECORD

Well Permit No. 29 . 23677
Atlas Sheet Coordinates 29 : 13 : 665

OWNER IDENTIFICATION - Owner US ARMY
Address 167 RIVERSIDE DR.
City FORT MONMOUTH State NJ Zip Code 07703

WELL LOCATION - If not the same as owner please give address. Owner's Well No. 1
County Monmouth Municipality ~~OCEANPORT BORO~~ Lot No. ~~TAXEXEMPT~~ Block No. ~~TAX~~
Address Bldg 699, Saltzman Ave, Fort Monmouth NJ 07703

TYPE OF WELL (as per Well Permit Categories) ~~MONITORING~~ Date well completed 11/21/89
Regulatory Program Requiring Well — Case I.D. # —
CONSULTING FIRM/FIELD SUPERVISOR (if applicable) Groundwater Environmental Tele. # 201-530-4787

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

	Depth to Top (ft.) [From land surface]	Depth to Bottom (ft.)	Diameter (inches)	Type and Material
Inner Casing	0	2	4	Sch 40 PVC Flush Joint Solid
Outer Casing (Not Protective Casing)	—	—		
Screen (Note slot size)	2	15	4	Sch 40 PVC Flush Joint .02
Tail Piece	—	—		
Gravel Pack	2	15		#2 Morie Gravel
Annular Seal/Grout	.5	1.5		Bentonite Pellets
Method of Grouting	0 - .5 Slurry			

Static water level after drilling _____ ft.
Water level was measured using interface probe
Well was developed for 1 hours at 2-3 gpm
Method of development Purged with Pump
Was permanent pumping equipment installed? ☐ Yes ☒ No
Pump capacity NA gpm
Pump type: ~~Centrifugal Pump~~ NA
Drilling Method Auger
Drilling Fluid None Type of Rig IH-10
Name of Driller Gregg Myers
Health and Safety Plan submitted? ☐ Yes ☒ No
Level of Protection used on site (circle one) None (D) C B A
N.J. License No. J 1472
Name of Drilling Company B.L. MYERS BROS., INC.

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

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 Theresa DeFino for Gregg Myers Date 2/15/90

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

GES GROUNDWATER AND ENVIRONMENTAL SERVICES, INC.

Sketch Map

Project Fort Monmouth Owner E-Systems, Inc.

Location Fort Monmouth Eatontown Permit No 2923677-1

Well Number 1 Total Depth 15' Diameter 10"

Casing Elevation Water Level: Initial 4' Static

Screen Diameter 4" Length 13' Slot Size .020"

Casing Diameter 4" Length 2' Type Sch 40 PVC

Drilling Method Auger Sample Method Continuous Split Spoon

Completion Details Flush mount, cement collar, inner locking cap

Driller B.L. Myers Log By J. Gallagher Date Drilled 11/2/89

Depth (Ft)	Well Constr	HNu ppm	Lithological Description	Comments
1			ASPHALT & BALLAST	
2			SAND Dark green medium (-) to fine SAND trace silt. Orange-tan-brown medium to fine SAND, little clay.	PHC odor, slightly moist
3				
4				
5			Dark green fine SAND, trace silt alternating with orange brown medium to fine SAND.	PHC odor, saturated
6				
7				
8			CLAY Gray-orange: CLAY, trace fine sand	
9			SAND Orange-brown medium to fine SAND some clay, trace silt. Changing to Dark green-orange-medium to fine sand, little clay at 11.0'	
10				
11				PHC odor, saturated
12				
13		10		
14				
15			END HOLE	
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

WELL ID NO. 699

DWR-138 M
6/89

New Jersey Department of Environmental Protection
Division of Water Resources

MONITORING WELL RECORD

Well Permit No. 29 . 23678
Atlas Sheet Coordinates 29 : 13 : 665

OWNER IDENTIFICATION - Owner DS ARMY
Address 167 RIVERSIDE DR.
City FORT MONMOUTH State NJ Zip Code 07703

WELL LOCATION - If not the same as owner please give address. Owner's Well No. 2
County Monmouth Municipality ~~OCEANPORT BORO~~ Lot No. ~~TAXEXEMPT~~ Block No. ~~TAX~~
Address Bldg 699, Saltzman Ave, Fort Monmouth NJ 07703

TYPE OF WELL (as per Well Permit Categories) ~~MONITORING~~ Date well completed 11/2/89
Regulatory Program Requiring Well _____ Case I.D. # _____
CONSULTING FIRM/FIELD SUPERVISOR (if applicable) Groundwater Environ Svcs, Inc Tele. # 201-530-4787

WELL CONSTRUCTION
Total depth drilled 17 ft.
Well finished to 17 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

	Depth to Top (ft.) [From land surface]	Depth to Bottom (ft.)	Diameter (inches)	Type and Material
Inner Casing	0	2	4	Sch40 PVC FJT Solid
Outer Casing (Not Protective Casing)	—	—		
Screen (Note slot size)	1.5	17	4	Sch40 PVC FJT .02
Tail Piece	—	—		
Gravel Pack	1.5	17		#2 Morie Gravel
Annular Seal/Grout	.5	1.5		Bentonite Pellets
Method of Grouting	0 — .5 Slurry			

Static water level after drilling _____ ft.
Water level was measured using interface probe
Well was developed for 1 hours at 2-3 gpm
Method of development purged with pump
Was permanent pumping equipment installed? ☐ Yes ☒ No
Pump capacity NA gpm
Pump type: NA
Drilling Method Auger
Drilling Fluid None Type of Rig TH-10
Name of Driller Greg Myers
Health and Safety Plan submitted? ☐ Yes ☒ No
Level of Protection used on site (circle one) None (D) C B A
N.J. License No. 14702 Name of Drilling Company B.L. MYERS BROS., INC.

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

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 Theresa Delfino for Greg Myers Date 2/15/90

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

GROUNDWATER AND ENVIRONMENTAL SERVICES, INC.

Coordinates - 29 13 G-G 5

Sketch Map

29 13 G-G 5
2-9-23 G/1 4

Project Fort Monmouth Owner E-Systems, Inc

Location Fort Monmouth Eatontown Permit No 2923678-9

Well Number 2 Total Depth 17' Diameter 10"

Casing Elevation Water Level: Initial 5' Static

Screen Diameter 4" Length 15.5' Slot Size .020"

Casing Diameter 4" Length 1.5' Type Sch 40 PVC

Drilling Method Auger Sample Method Split Spoon every 5'

Completion Details Flush mount, cement collar, inner locking cap

Driller B.L. Myers Log By J. Gallagher Date Drilled 11/2/89

Depth (Ft)	Well Constr	HNu ppm	Lithological Description		Comments
1			SAND	Dark brown to black SAND trace clay and silt	
2					
3					
4		0	SAND	Dark green to black fine SAND, little silt, trace clay.	Slightly moist, no odor.
5					
6					
7					
8				Dark green-fine SAND, some clay	Saturated
9					
10		0			
11					
12			CLAY	Black CLAY, little silt, trace fine sand	Saturated
13					
14		0			
15					
16					
17			END HOLE		
18					
19					
20					
21					
22					
23					
24					
25					

WELL ID NO. 699/3

DWR-138 M
6/89

New Jersey Department of Environmental Protection
Division of Water Resources

MONITORING WELL RECORD

Well Permit No. 29 . 23679
Atlas Sheet Coordinates 29 : 13 : 665

OWNER IDENTIFICATION - Owner US ARMY
Address 167 RIVERSIDE DR.
City FORT MONMOUTH State NJ Zip Code

WELL LOCATION - If not the same as owner please give address. Owner's Well No. 3
County Monmouth Municipality ~~OCEANPORT BORO~~ Lot No. ~~TAXEXEMP~~ Block No. ~~TAX~~
Address Bldg 699 Saltzman Ave, Fort Monmouth NJ 07703

TYPE OF WELL (as per Well Permit Category) MONITORING Date well completed 11/21/89
Regulatory Program Requiring Well — Case I.D. # —
CONSULTING FIRM/FIELD SUPERVISOR (if applicable) Groundwater & Environ Svcs, Inc Tele. #201-530-4787

WELL CONSTRUCTION
Total depth drilled 15 ft.
Well finished to 15 ft.
ehole 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

	Depth to Top (ft.) [From land surface]	Depth to Bottom (ft.)	Diameter (inches)	Type and Material
Inner Casing	0	1.5	4	Sch 40 PVC FJT solid
Outer Casing (Not Protective Casing)	—	—		
Screen (Note slot size)	~~0.02~~ 2	15	4	Sch 40 PVC FJT .020
Tail Piece	—			
Gravel Pack	1.5	15		#Morie Gravel
Annular Seal/Grout	.5	1.5		Bentonite Pellets
Method of Grouting	0-.5 Slurry			

Static water level after drilling _____ ft.
Water level was measured using interface probe
Well was developed for 1 hours at 2-3 gpm
Method of development purged with pump
Was permanent pumping equipment installed? ☐ Yes ☒ No
Pump capacity NA gpm
Pump type: ~~Centrifugal Pump~~ NA
Drilling Method Auger
Drilling Fluid None Type of Rig TH-10
Name of Driller Greg Myers
Health and Safety Plan submitted? ☐ Yes ☒ No
Level of Protection used on site (circle one) None (D) C B A
N.J. License No. J 1472
me of Drilling Company B.L. MYERS BROS., INC.

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

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 Theresa DeFino for Greg Myers Date 2/15/90

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

GES GROUNDWATER AND ENVIRONMENTAL SERVICES, INC.

Sketch Map

29-13(-65)
2923679-1

Project Fort Monmouth Owner E-Systems, Inc.

Location Fort Monmouth Eatontown Permit No 2923679-1

Well Number 3 Total Depth 15' Diameter 10"

Casing Elevation Water Level: Initial 4' Static

Screen Diameter 4" Length 13' Slot Size .020"

Casing Diameter 4" Length 2' Type Sch. 40 PVC

Drilling Method Auger Sample Method Split Spoon every 5'

Completion Details Flush mount with manhole cover, inner locking cap

Driller B.L. Myers Log By J. Gallagher Date Drilled 11/2/89

Depth (Ft)	Well Constr	HNu ppm	Lithological Description	Comments
1			ASPHALT, BALLAST STONE	
2			SAND Dark green SAND, some clay.	PHC odor
3			SAND Dark green-gray medium to fine SAND, little clay	Water encountered @ 4'
4				
5				
6				
7				
8				
9				
10				
11				
12			SAND Dark green-orange med to fine SAND, some clay.	
13				
14				
15			END HOLE	
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

GROUNDWATER AND ENVIRONMENTAL SERVICES, INC.

Sketch Map

Project Fort Monmouth Owner E-System Inc.

Location Fort Monmouth Eatontown Permit No 2923680-7

Well Number 4 Total Depth 20' Diameter 10"

Casing Elevation Water Level: Initial 3' Static

Screen Diameter 4" Length 18' Slot Size .020"

Casing Diameter 4" Length 2' Type Sch 40 PVC

Drilling Method Auger Sample Method Continuous Split Spoon

Completion Details Flush mount with manhole, inner locking cap

Driller B.L. Myers Log By J. Gallagher Date Drilled 11/2/89

Depth (Ft)	Well Constr	HNu ppm	Lithological Description		Comments
1			ASPHALT, BALLAST		
2			SAND	Dark green SAND, some clay, odor	PHC odor
3			SAND	Dark green fine SAND, little clay	Saturated PHC odor
4					
5		185			
6					
7					
8					
9					
10					
11		170	SAND	Dark green to orange medium to fine SAND little clay	Saturated PHC odor
12					
13					
14					
15					Saturated, PHC odor
16			CLAY	Black CLAY, little fine sand	
17					
18					
19					
20			END HOLE		
21					
22					
23					
24					
25					

WELL ID NO. 699/5

WR-138 M
89

New Jersey Department of Environmental Protection
Division of Water Resources

MONITORING WELL RECORD

Well Permit No. 29 - 23808
Atlas Sheet Coordinates 29 : 13 : 629

OWNER IDENTIFICATION - Owner DS ARMY
Address 167 RIVERSIDE DR.
City FORT MONMOUTH State NJ Zip Code

WELL LOCATION - If not the same as owner please give address. Owner's Well No. 5
County Monmouth Municipality OCEANPORT BORO Lot No. TAX 07703 Block No. EXEMPT
Address Bldg 699, Saltzman Ave, Fortmonmouth, N.J

TYPE OF WELL (as per Well Permit Categories) Date well completed 11,30,89
Regulatory Program Requiring Well MONITORING Case I.D. #
CONSULTING FIRM/FIELD SUPERVISOR (if applicable) Groundwater & Environ Svcs, Inc Tele. # 201-530-4787

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

	Depth to Top (ft.) [From land surface]	Depth to Bottom (ft.)	Diameter (inches)	Type and Material
Inner Casing	0	3	4	PVC Sch 40, FJT
Outer Casing (Not Protective Casing)	—	—		
Screen (Note slot size)	3	15	4	Sch 40 PVC, FJT .02
Tail Piece	—	—		
Gravel Pack	3	15		#2 Morie Gravel
Annular Seal/Grout	1	3		Bentonite Pellets
Method of Grouting	0-1 Slurry			

Static water level after drilling ft.
Water level was measured using interface probe
Well was developed for 1 hours at 2 gpm
Method of development Pegged with pump
Was permanent pumping equipment installed? ☐ Yes ☒ No
Pump capacity NA gpm
Pump type: NA
Drilling Method Auger
Drilling Fluid None Type of Rig TH-10
Name of Driller ~~Anthony Kull~~ Anthony Kull
Hearth and Safety Plan submitted? ☐ Yes ☒ No
Level of Protection used on site (circle one) None (D) C B A
N.J. License No. J1317
Name of Drilling Company ANTHONY A. KULL

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

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 Theresa Dellino for Anthony Kull Date 2/15/90

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

GROUNDWATER AND ENVIRONMENTAL SERVICES, INC.

Sketch Map

Project Fort Monmouth Owner E-Systems, Inc.

Location Fort Monmouth Eatontown Permit No. 2923808-1

Well Number 5 Total Depth 15' Diameter 10"

Casing Elevation Water Level: Initial 5.0' Static

Screen Diameter 4" Length 12' Slot Size .020"

Casing Diameter 4" Length 3' Type Sch. 40 PVC

Drilling Method Auger Sample Method Split Spoon

Completion Details Flush mount with manhole cover, inner locking cap

Driller B.L. Myers Log By J. Gallagher Date Drilled 11/30/89

Depth (Ft)	Well Constr	HNu ppm	Lithological Description	Comments
			ASPHALT	
1			SILT Dark Brown-Black SILT, some clay, trace fine sand	No odor or sheen
2				
3			SAND Dark green-orange fine SAND, little(-) clay	Blows 3,4,4,10 No odor or sheen
4				
5				Groundwater encountered @ 5'
6				
7				Blows 2,4,4,5
8				
9				
10				
11			Black coarse (-) to fine SAND	No odor
12			SAND Dark green fine SAND, some (-) clay	Blows 4,4,6,8
13				
14				
15			END HOLE @ 15'	
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

WELL ID NO. 699/6

DWR-138 M
6/89

New Jersey Department of Environmental Protection
Division of Water Resources

MONITORING WELL RECORD

Well Permit No. ~~29~~ ~~23809~~
Atlas Sheet Coordinates ~~29~~ : ~~13~~ : ~~629~~ ☐

OWNER IDENTIFICATION - Owner _____
Address US ARMY ~~187 RIVERSIDE DR.~~
City ~~FORT MONMOUTH~~ State NJ Zip Code _____

WELL LOCATION - If not the same as owner please give address. Owner's Well No. 6
County Monmouth Municipality _____ Lot No. _____ Block No. _____
Address Bldg 699, Saltzman Ave OCEANPORT BORO, Fort Monmouth TAX MS EXEMPT

TYPE OF WELL (as per Well Permit Categories) _____ Date well completed 12/1/89
Regulatory Program Requiring Well MONITORING Case I.D. # _____
CONSULTING FIRM/FIELD SUPERVISOR (if applicable) Groundwater Svcs Tele. # 201-530-4787

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

	Depth to Top (ft.) (From land surface)	Depth to Bottom (ft.)	Diameter (inches)	Type and Material
Inner Casing	0	2	4	Sch 40 PVC FJT Solid
Outer Casing (Not Protective Casing)	—	—		
Screen (Note slot size)	2	15	4	Sch 40 PVC FJT .020
Tail Piece	—	—		
Gravel Pack	1	15		#2 Morie Gravel
Annular Seal/Grout	15	1		Bentonite Pellets
Method of Grouting	Slurry 0-15			

Static water level after drilling _____ ft.
Water level was measured using interface probe
Well was developed for 1 hours at 1 gpm
Method of development purged with pump
Was permanent pumping equipment installed? ☐ Yes ☒ No
Pump capacity NA gpm
Pump type: NA
Drilling Method Auger
Drilling Fluid None Type of Rig TH-10
Name of Driller ~~Anthony A. Kull~~ Anthony A. Kull
Health and Safety Plan submitted? ☐ Yes ☒ No
Level of Protection used on site (circle one) None (D) C B A
N.J. License No. J1317
Name of Drilling Company ANTHONY A. KULL

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

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 Russ Nelson for Anthony A. Kull Date 2/15/90

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

GES GROUNDWATER AND ENVIRONMENTAL SERVICES, INC.

Project Fort Monmouth Owner E-Systems Inc.

Location Fort Monmouth Eatontown Permit No 2923803.9

Well Number 6 Total Depth 15' Diameter 10"

Casing Elevation Water Level: Initial 4.5' Static

Screen Diameter 4" Length 14' Slot Size .020"

Casing Diameter 4" Length 1' Type Sch 40 PVC

Drilling Method Auger Sample Method Split Spoon

Completion Details Flush mount with manhole cover, Inner locking cap

Sketch Map

Driller B.L. Myers Log By J. Gallagher Date Drilled 12/1/89

Depth (Ft)	Well Constr	HNu ppm	Lithological Description	Comments
1			ASPHALT	
2			FINE Dark green fine SAND, little clay	
3			SAND Dark green fine SAND, some clay	PHC odor water contacted at 4.5' Blows 7,4,4,5
4				
5				
6				
7				
8			Light green-brown med (-) to fine SAND, trace clay	
9				
10				
11				
12			Dark green-Black fine SAND little clay	Blows 5,4,5,8
13				
14				
15			END HOLE @ 15'	
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

DEC 15 1989

WELL ID NO. 699/7

DWR-138 M
6/89

New Jersey Department of Environmental Protection
Division of Water Resources

MONITORING WELL RECORD

Well Permit No. 29 - 23810
Atlas Sheet Coordinates 29 : 13 : 629

OWNER IDENTIFICATION - Owner US ARMY
Address 167 RIVERSIDE DR.
City FORT MONMOUTH State NJ Zip Code

WELL LOCATION - If not the same as owner please give address. Owner's Well No. 7
County Bldg 699 Municipality Lot No. Block No.
Address Saltzman Ave. OCEANPORT BORO Fort Monmouth NJ 07703 TAX EXEMPT

TYPE OF WELL (as per Well Permit Categories) Date well completed 12/1/89
Regulatory Program Requiring Well MONITORING Case I.D. #
CONSULTING FIRM/FIELD SUPERVISOR (if applicable) Groundwater & Environ Svcs Inc Tele. # 201-530-4787

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

	Depth to Top (ft.) (From land surface)	Depth to Bottom (ft.)	Diameter (inches)	Type and Material
Inner Casing	0	3	4	Sch 40 PVC FJ Sold
Outer Casing (Not Protective Casing)	—	—		
Screen (Note slot size)	3	15	4	Sch 40 PVC FJ Solid
Tail Piece	—	—		
Gravel Pack	3	15		#0 Morie Gravel
Annular Seal/Grout	1.5	3		Bentonite Pellets
Method of Grouting	Slurry 0-1.5			

Static water level after drilling ft.
Water level was measured using interface probe
Well was developed for 1 hours at 2-3 gpm
Method of development Purged with pump
Was permanent pumping equipment installed? ☐ Yes ☒ No
Pump capacity N/A gpm
Pump type: N/A
Drilling Method Auger
Drilling Fluid None Type of Rig 7ft-10
Name of Driller [redacted] Anthony Kull
Health and Safety Plan submitted? ☐ Yes ☒ No
Level of Protection used on site (circle one) None (D) C B A
N.J. License No. 13177
Name of Drilling Company ANTHONY A. KULL

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

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 Theresa Sellino for Anthony A. Kull Date 2/15/90

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

GROUNDWATER AND ENVIRONMENTAL SERVICES, INC.

Sketch Map

29 13.229
20 23210-2

Project Ft. Monmouth Owner E-Systems, Inc.

Location Fort Monmouth Eatontown Permit No. 2923810-2

Well Number 7 Total Depth 15' Diameter 10"

Casing Elevation Water Level: Initial 3' Static

Screen Diameter 4" Length 12' Slot Size .020"

Casing Diameter 4" Length 3' Type Sch 40 PVC

Drilling Method Auger Sample Method Split Spoon

Completion Details Flush mount with manhole cover, inner locking cap

Driller B.L. Myers Log By J. Gallagher Date Drilled 12/1/89

Depth (Ft)	Well Constr	HNu ppm	Lithological Description	Comments
1			ASPHALT	
2			SILT & SAND — Black SILT & Fine SAND, Some gravel, trace cobbles	Blows 7,8,7,8 Water @ 3'
3			Fine SAND — Dark-green-black fine SAND, Trace Clay fine (-) gravel	
4				
5				
6			Fine SAND — Light gray to orange med (-) to fine SAND, little clay	Blows 3,3,4,4, Saturated PHC odor
7			Green fine SAND, some clay	
8				
9				
10				
11				
12				
13				
14				
15			END HOLE @ 15'	
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

WELL ID NO. 699/8

DWR-138 M
6/89

New Jersey Department of Environmental Protection
Division of Water Resources

MONITORING WELL RECORD

Well Permit No. 29 23811
Atlas Sheet Coordinates 29 : 13 : 629

OWNER IDENTIFICATION - Owner ~~US ARMY~~
Address 167 RIVERSIDE DR.
City FORT MONMOUTH State NJ Zip Code

WELL LOCATION - If not the same as owner please give address. Owner's Well No. 8
County Monmouth Municipality ~~OCEANPORT BORO~~ Lot No. ~~TAX~~ Block No. ~~MAP~~
Address Bldg 699 Saltzman Ave, Fort Monmouth NJ

TYPE OF WELL (as per Well Permit Categories) ~~MONITORING~~ Date well completed 12/1/89
Regulatory Program Requiring Well Case I.D. #
CONSULTING FIRM/FIELD SUPERVISOR (if applicable) Groundwater & Environ Svcs, Inc Tele. # 201-530-4887

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

	Depth to Top (ft.) [From land surface]	Depth to Bottom (ft.) [From land surface]	Diameter (inches)	Type and Material
Inner Casing	0	2	4	Sch 40 PVC FJT Slid
Outer Casing (Not Protective Casing)	—	—		
Screen (Note slot size)	2	15	4	Sch 40 PVC FJT .02
Tail Piece	—	—		
Gravel Pack	2	15		#2 Morie Gravel
Annular Seal/Grout	1	2		Bentonite Pellets
Method of Grouting	Slurry 0-1'			

Static water level after drilling ____ ft.
Water level was measured using interface probe
Well was developed for 1 hours at 2-3 gpm
Method of development purged with pump
Was permanent pumping equipment installed? ☐ Yes ☒ No
Pump capacity NA gpm
Pump type: NA
Drilling Method Auger
Drilling Fluid None Type of Rig TH-10
Name of Driller Anthony A. Kull
Health and Safety Plan submitted? ☐ Yes ☒ No
Level of Protection used on site (circle one) None (D) C B A
N.J. License No. 13117
Name of Drilling Company ANTHONY A. KULL

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

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 Theresa DeFino for Anthony Kull Date 2/15/90

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

GROUNDWATER AND ENVIRONMENTAL SERVICES, INC.

Sketch Map

Project Fort Monmouth Owner E-Systems, Inc.

Location Fort Monmouth Eatontown Permit No 2923811-1

Well Number 8 Total Depth 15' Diameter 10"

Casing Elevation Water Level: Initial 4' Static

Screen Diameter 4" Length 13' Slot Size .020"

Casing Diameter 4" Length 2' Type Sch 40 PVC

Drilling Method Auger Sample Method Split Spoon

Completion Details Flush mount with manhole cover, inner locking cap

Driller B.L. Myers Log By J. Gallagher Date Drilled 12/1/89

Depth (Ft)	Well Constr	HNU ppm	Lithological Description	Comments
1			ASPHALT	
2			Fine SAND — Light brown coarse (-) to fine SAND, little coarse to fine gravel, trace cobbles	
3		232		
4			Fine SAND — Light brown-green Fine SAND, little Silt, trace clay	PHC odor Blows 8,8,4,5
5				
6			Dark green-gray med to fine SAND	water encountered @ 4'
7				
8			Light brown-orange Fine SAND, trace clay	odor
9				
10				odor
11				
12				
13			SAND — Dark green-orange med to fine SAND, some clay.	
14				
15			END HOLE @ 15'	
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

DWR-138 M
6/89

New Jersey Department of Environmental Protection
Division of Water Resources

6&9 MW-09

MONITORING WELL RECORD

Well Permit No. 29 , 24639
Atlas Sheet Coordinates 29 : 13 6855

OWNER IDENTIFICATION - Owner US ARMY
Address 167 RIVERSIDE DRIVE
City PORT MONMOUTH State NJ Zip Code

WELL LOCATION - If not the same as owner please give address. Owner's Well No.
County Municipality OCEANPORT BORO Lot No. NA Block No NA
Address

TYPE OF WELL (as per Well Permit Categories) MONITORING Date well completed 5/1/90
Regulatory Program Requiring Well UST Case I.D. # —
CONSULTING FIRM/FIELD SUPERVISOR (if applicable) G.E.S. - Tony Kull Tele. # (201) 530-4787

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

	Depth to Top (ft.) [From land surface]	Depth to Bottom (ft.)	Diameter (inches)	Type and Material
Inner Casing	0	2	4	PVC Sch40 FJT
Outer Casing (Not Protective Casing)				
Screen (Note slot size)	2	15	4	PVC Sch40 FJT .02
Tail Piece				
Gravel Pack	2	15		#2 Morie
Annular Seal/Grout	1	2		BENTONITE
Method of Grouting	0	1		PorHANDI Slurry

Static water level after drilling 3 ft.
Water level was measured using Meter
Well was developed for ____ hours at ____ gpm
Method of development
Was permanent pumping equipment installed? ☐ Yes ☐ No
Pump capacity ____ gpm
Pump type
Drilling Method AUGER
Drilling Fluid NONE Type of Rig TH-10
Name of Driller Gregg Myers
Health and Safety Plan submitted? ☐ Yes ☒ No
Level of Protection used on site (circle one) None (D) C B A
N.J. License No. J 1472
Name of Drilling Company B.L. MYERS BROS., INC.

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

0 - 15' BROWN to GREEN SAND
15' BLACK CLAY.

Driller used this form.

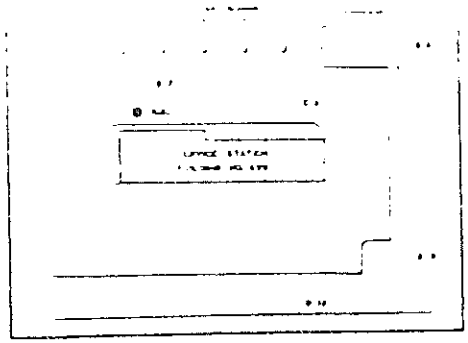
I certify that I have drilled the above-referenced well in accordance with all well permit requirements and all applicable State rules and regulations

Driller's Signature Gregg Myers Date 5/3/90

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

WELL ID NO. 699/9

Location Map



Fort Monmouth Eatontown Permit No. 2324633

Well Number 3 Total Depth 15' Diameter 12"

Casing Elevation Water Level: Initial 5.0' Static

Screen Diameter 4" Length 13' Slot Size .020"

Casing Diameter 4" Length 2' Type Sch 40 PVC

Drilling Method Auger Sample Method Split Spoon

Completion Details Flush mount, with manhole cover, inner locking cap

Driller B.L. Myers Log By J. Gallagher Date Drilled 5/1/90

Depth (ft)	Well Constr	HNu ppm	Lithological Description	Comments
1			0-2' SAND Brown-black Silt, medium (-) to fine SAND trace fine Gravel	No odor slightly moist
2				
3			2-4' SAND Brown fine SAND, trace Silt	
4				Groundwater encountered @ 4'
5		0	4-8' SAND Light Brown fine SAND, some Silt little Clay	
7			SAND Green-brown SAND, some clay	No odor or sheen
8				
9		0	9-10' CLAY Gray, some orange fine Sand	
10			10 - 12' SAND Green-gray to orange coarse to fine SAND, some Clay	
12			12-15' CLAY Light-brown, some fine Sand	
13				
14		0		
15			END HOLE @ 15'	
16				
17				
18				
19				
20				
21				
22				
24				
25				

WELL ID NO. 699/4

DWR-138 M
6/89

New Jersey Department of Environmental Protection
Division of Water Resources

MONITORING WELL RECORD

Well Permit No. 29 - 23680
Atlas Sheet Coordinates 29 : 13 : 665

OWNER IDENTIFICATION - Owner US ARMY
Address 167 RIVERSIDE DR.
City FORT MONMOUTH State NJ Zip Code

WELL LOCATION - If not the same as owner please give address. Owner's Well No. 4
County Monmouth Municipality ~~OCEANPORT BORO~~ Lot No. ~~TAXEXEMP~~ Block No. ~~TAX~~
Address Bldg 699, Saltzman Ave, Fort Monmouth NJ 07703

TYPE OF WELL (as per Well Permit Categories) ~~MONITORING~~ Date well completed 11 / 2 / 89
Regulatory Program Requiring Well — Case I.D. #
CONSULTING FIRM/FIELD SUPERVISOR (if applicable) Groundwater & Environ Svcs, Inc Tele. # 201-531-4787

WELL CONSTRUCTION
Total depth drilled 20 ft.
Well finished to 20 ft.
Whole 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

	Depth to Top (ft.) [From land surface]	Depth to Bottom (ft.) [From land surface]	Diameter (inches)	Type and Material
Inner Casing	0	2	4	SCH40 PVC Solid
Outer Casing (Not Protective Casing)	—	—		
Screen (Note slot size)	2	20	4	SCH40 PVC .02
Tail Piece	—	—		
Gravel Pack	1.5	20		#2 Morie Gravel
Annular Seal/Grout	1.5	1.5		Bentonite Pellets
Method of Grouting	0 - .5 slurry			

Static water level after drilling ____ ft.
Water level was measured using interface probe
Well was developed for 1 hours at 2-3 gpm
Method of development purged with pump
Was permanent pumping equipment installed? ☐ Yes ☒ No
Pump capacity NA gpm
Pump type: ~~Centrifugal Pump~~ NA
Drilling Method Auger
Drilling Fluid none Type of Rig TH-10
Name of Driller Greg Myers
Health and Safety Plan submitted? ☐ Yes ☒ No
Level of Protection used on site (circle one) None (D) C B A
N.J. License No. 31472
Name of Drilling Company B.L. MYERS BROS., INC.

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

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 Theresa Helfino for Greg Myers Date 2/15/90

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

DWR 138 M
6/89

New Jersey Department of Environmental Protection
Division of Water Resources

MONITORING WELL RECORD

Well Permit No. 29 - 24640
Atlas Sheet Coordinates 29 : 13 : 665

OWNER IDENTIFICATION - Owner US ARMY
Address 167 RIVERSIDE DRIVE
City FORT MONMOUTH State NJ Zip Code

WELL LOCATION - If not the same as owner please give address. Owner's Well No.
County Municipality OCEANPORT BORO Lot No. NA Block No. NA
Address

TYPE OF WELL (as per Well Permit Categories) MONITORING Date well completed 5/1/90
Regulatory Program Requiring Well UST Case I.D. # —
CONSULTING FIRM/FIELD SUPERVISOR (if applicable) G.E.S. Tony Kull Tele. # (201) 530-4787

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

	Depth to Top (ft.) [From land surface]	Depth to Bottom (ft.)	Diameter (inches)	Type and Material
Inner Casing	0	1	4	PVC SCH40 FJT
Outer Casing (Not Protective Casing)				
Screen (Note slot size)	1	14	4	PVC SCH40 FJT.02
Tail Piece				
Gravel Pack	1	14		#2 Morie
Annular Seal/Grout	15'	1		BENTONITE
Method of Grouting	0	.5		PORTLAND + SACrete (Manhole) Slurry.

Static water level after drilling 3 ft.
Water level was measured using METER
Well was developed for ____ hours at ____ gpm
Method of development
Was permanent pumping equipment installed? ☐ Yes ☐ No
Pump capacity ____ gpm
Pump type:
Drilling Method AUGER
Drilling Fluid NONE Type of Rig TH-10
Name of Driller Gregg Myers
Health and Safety Plan submitted? ☐ Yes ☒ No
Level of Protection used on site (circle one) None (D) C B A
N.J. License No. J 1472
Name of Drilling Company R. L. MYERS BROS., INC.

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

0 - 14' Brown to Green Sand
14' Black Clay.

WELL SEALED 10/14/92

DRILLER USED THIS FORM.

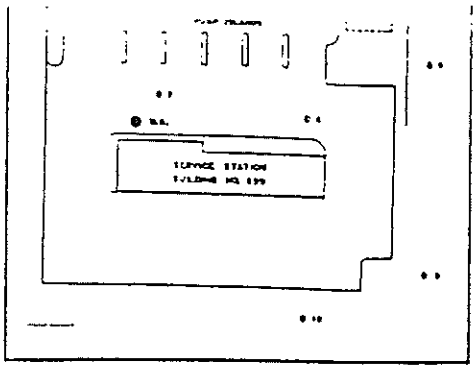
I certify that I have drilled the above-referenced well in accordance with all well permit requirements and all applicable State rules and regulations.

Driller's Signature Gregg Myers Date 5/3/90

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

WELL ID NO. 699/10

Sketch Map



Project Fort Monmouth Owner E-Systems, Inc.

Location Fort Monmouth Eatontown Permit No 2924640

Well Number 10 Total Depth 15' Diameter 10"

Casing Elevation Water Level: Initial 5.0' Static

Screen Diameter 4" Length 13' Slot Size .020"

Casing Diameter 4" Length 2' Type Sch .40 PVC

Drilling Method Auger Sample Method: Split Spoon

Completion Details Flush mount, with manhole cover, inner locking cap

Driller B.L. Myers Log By J. Gallagher Date Drilled 5/1/90

Depth (Ft)	Well Constr	HNu ppm	Lithological Description	Comments
1			0-2' SAND Brown, fine SAND little Gravel	No odor or sheen
2			2-3' SILT Black SILT & fine Sand, trace Gravel	
3				
4			3-4' SILT Brown, fine Sand, some SILT trace Clay	Groundwater encountered @4'
5		0		
			4-7' SAND Light green coarse to fine SAND little Clay	
8		0	7-12' CLAY Orange CLAY & fine Sand	Saturated, no odor
9				
10			12-15' CLAY Light green CLAY, some fine Sand	
11				
12			Black CLAY, little Sand	No odor
13		0		
14				
15				
16			END HOLE @ 15'	
17				
18				
19				
20				
21				
22				
25				

DWR 136 M
12/91

New Jersey Department of Environmental Protection and Energy
Bureau of Water Allocation

MONITORING WELL RECORD

Well Permit No. 29 28907
Atlas Sheet Coordinates 29 11 444

OWNER IDENTIFICATION - Owner U.S. ARMY FORT MONMOUTH
Address BLDG. 167 D & H ENVIRONMENTAL
City FORT MONMOUTH State NJ Zip Code

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

TYPE OF WELL (as per Well Permit Category) MONITORING Date well completed 10/14/92
Regulatory Program Requiring Well UST Case I.D. #
CONSULTING FIRM/FIELD SUPERVISOR (if applicable) E-Systems 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

	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	15	4	PVC .020
Tail Piece				
Gravel Pack	3	5		Morie #2
Annular Seal/Grout	1	2		Portland
Method of Grouting				

Static water level after drilling 7.1 ft.
Water level was measured using Electric tape
Well was developed for 1 hours at 2 gpm
Method of development Submersible
Was permanent pumping equipment installed? ☐ Yes ☒ No
Pump capacity N/A gpm
Pump type: N/A
Drilling Method H.S.A.
Drilling Fluid None Type of Rig Auger
Name of Driller Karl D. Hitchburger
Health and Safety Plan submitted? ☐ Yes ☒ No
Level of Protection used on site (circle one) None D C B A
N.J. License No. 33930
Name of Drilling Company TARGET DRILLING CORP.

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

0'
Tight sands & silts Tan to Brown
ALMOST Clay like as deeper GREEN To Black in color
15'

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 K.D. Hitch Date 10/16/92

COPIES: White & Green - DEPE Canary - Driller Pink - Owner Goldenrod - Health Dept.

SERIAL # 46232 38

DWR-133M (10/93)

Mail to

DEPE
eau Water Allocation
26
on, NJ 08625

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION AND ENERGY
TRENTON, NJ

Permit No. 29 33753

MONITORING WELL PERMIT

VALID ONLY AFTER APPROVAL BY THE D.E.P.E.

COORD # : 29 . 14 . 442

Owner US Army - Fort Monmouth
Address Bldg 167 DEH Envir
Ft Monmouth NJ
Name of Facility Bldg 699
Address
Same as Above

Driller Shore Drilling
Address 23 Branch Ave
Oceanport NJ

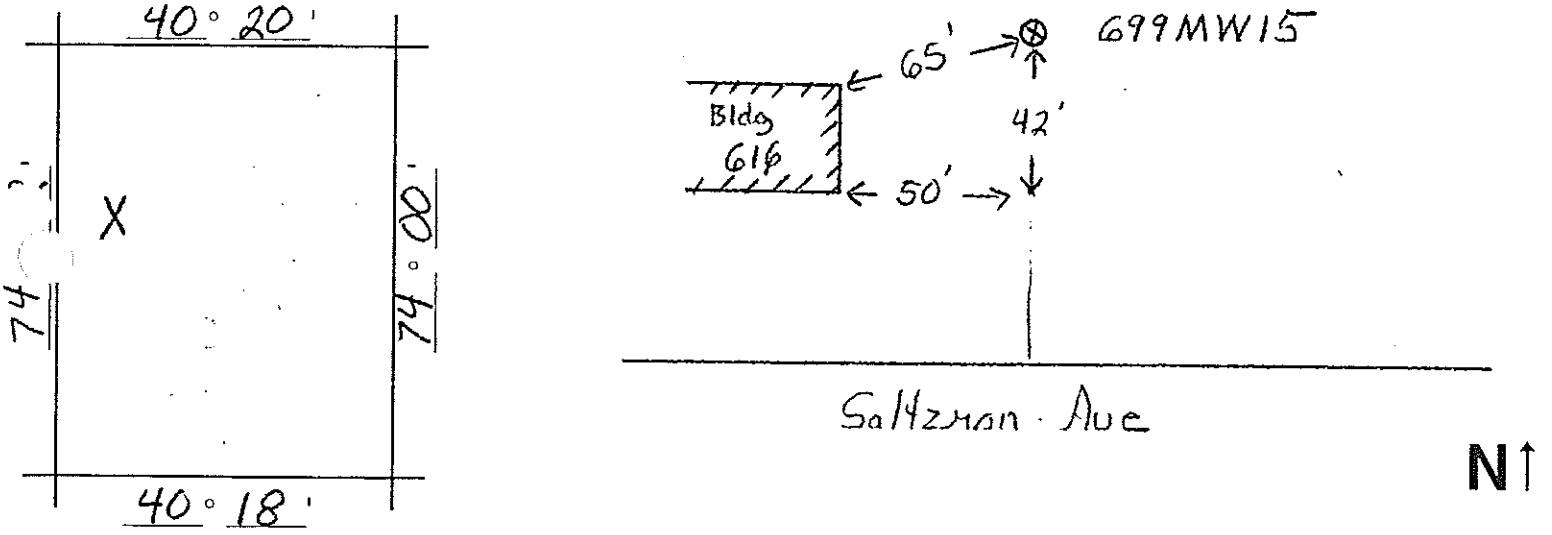
Diameter of Well(s)	4 Inches	Proposed Depth of Well(s)	20 Feet
# of Wells Applied for (max. 10)	1	Will pumping equipment be installed? YES ☐ NO ☒	
Type of Well (see reverse)	Monitor	If Yes, give pump capacity	N/A GPM

LOCATION OF WELL(S)

Lot #	Block #	Municipality	County
N/A	N/A	Ft Monmouth	Monmouth

State Atlas Map No. 29

Draw sketch of well(s) nearest roads, buildings, etc. with marked distances in feet. Each well MUST be labeled with a name and/or number on the sketch.



FOR MONITORING WELLS, RECOVERY WELLS, OR PIEZOMETERS, THE FOLLOWING MUST BE COMPLETED BY THE APPLICANT. PLEASE INDICATE WHY THE WELLS ARE BEING INSTALLED:

- ~~☒ Spill Site~~
- ☐ ISRA Site
- ☐ CERCLA (Superfund) Site
- ☐ RCRA Site
- ☒ Underground Storage Tank Site
- ☐ Operational Ground Water Permit Site
- ☐ Pretreatment and Residuals Site
- ☐ Water and Hazardous Waste Enforcement Case
- ☐ Water Supply Aquifer Test Observation Well
- ☐ Other (explain) _____

RECEIVED
JUL 27 1995
MONMOUTH COUNTY
REGIONAL HEALTH COMM.

89-10-19-1329
CASE I.D. Number
~~E91-2844 CA~~
~~13-4-12-1139-29~~

This Space for Approval Stamp

WELL PERMIT APPROVED
N J D E P
AUG 19 1995
BUREAU OF WATER ALLOCATION

FOR D.E.P.E. USE
- ☐ Issuance of this permit is subject to the conditions attached. (see next page)
- ☒ For monitoring purposes only
- ☒ The well(s) may not be completed with more than 25 feet of total screen or uncased borehole.
- ☐ _____

SEE REVERSE SIDE FOR IMPORTANT PROVISIONS AND REGULATIONS PERTAINING TO THIS PERMIT.

In compliance with N.J.S.A. 58:4A-14, application is made for a permit to drill a well as described above.

Date 7/10/95
Signature of Driller [signature] License # 1275
Signature of Owner [signature] SELFM-PW-EV

COPIES: Water Allocation White and Pink

U.S. ARMY
FORT MONMOUTH
SELFM PW EV

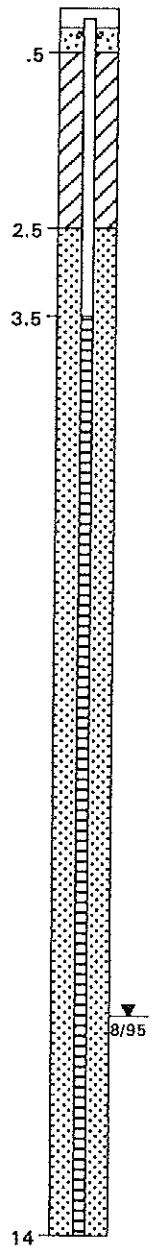
LOG OF BORING 699-MW15

Produced for Chuck Appleby

Project Name	: BLDG. 699	Completion Date	: 8/17/95
NJDEP Case #	: 89-10-19-1329	Northing	: N 539685.549
Logged By	: Shore Drilling	Easting	: E 2172905.342
Start Date	: 8/17/95	Driller	: R. Barnes

Depth in Feet

29-33753
ELEV: 17.04



DESCRIPTION	GRAPHIC	USCS	Samples	Blows/Ft
Topsoil and roots, dry				
Fill, brown-green clayey, dry			1	9
Black-green clayey moist, mottled		SM	2	13
			3	10
			4	13
Green-black clay and silt		CL	5	18
			6	15

Well Construction Information

Well Construction

Date Completed	: 8/17/95
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

NOTES

Well #1 is 699 MW15

2-28-1996 C:\699\GEO\699 mw15.gp3

DWR-138 M
11/94

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER ALLOCATION

MONITORING WELL RECORD

Well Permit No. _____ - _____
Atlas Sheet Coordinates _____ : _____ : _____ ☐

OWNER IDENTIFICATION - Owner _____
Address _____
City _____ State _____ Zip Code _____

WELL LOCATION - If not the same as owner please give address. Owner's Well No. _____
County _____ Municipality _____ Lot No. _____ Block No. _____
Address _____

TYPE OF WELL (as per Well Permit Categories) _____ Date well completed ____/____/____
Regulatory Program Requiring Well _____ Case I.D. # _____
CONSULTING FIRM/FIELD SUPERVISOR (if applicable) _____ Tele. # _____

WELL CONSTRUCTION

Total depth drilled _____ ft.
Well finished to _____ ft.
Borehole diameter:
Top _____ in.
Bottom _____ 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

	Depth to Top (ft.) [From land surface]	Depth to Bottom (ft.) [From land surface]	Diameter (inches)	Type and Material
Inner Casing				
Outer Casing (Not Protective Casing)				
Screen (Note slot size)				
Tail Piece				
Gravel Pack				
Annular Seal/Grout				
Method of Grouting				

Static water level after drilling _____ ft.
Water level was measured using _____
Well was developed for _____ hours at _____ gpm
Method of development _____
Was permanent pumping equipment installed? ☐ Yes ☐ No
Pump capacity _____ gpm
Pump type: _____
Drilling Method _____
Drilling Fluid _____ Type of Rig _____
Name of Driller _____
Health and Safety Plan submitted? ☐ Yes ☐ No
Level of Protection used on site (circle one) None D C B A
N.J. License No. _____
Name of Drilling Company _____

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

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.

THIS FORM MUST BE COMPLETED BY THE PERMITTEE AND/OR SURVEYOR

MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of Permittee:
Name of Facility: FORT MONMOUTH
Location:
NJPDES Number: NJ00 ; or ECRA Case Number:

LAND SURVEYOR'S CERTIFICATION

33753
29-33753

Well Permit Number:
This number must be permanently affixed to the well casing.

Longitude (to nearest second): West 74°-02'-48"

Latitude (to nearest second): North 40°-18'-48"

Elevation of Top of Inner Casing (cap off) (one-hundredth of a foot): 17.04

Source of elevation datum (benchmark, nail, etc.) and year. (If an alternate datum has been approved by the Department, identify here, assume datum of 100', and give approximated actual elevation.)

Source: GEODETIC FM-1(

[x] 1927 [ ] 1983

Elev.:

Owners Well Number (As shown on application or plans): 699 MW-15

Elevations are to be determined by double run, three wire leveling methods using balanced sights, commencing from a well marked and described point. This beginning point shall either be derived from Federal or State benchmarks if not more than 1000 feet from the site or from an alternate datum approved by the Department. Tolerances should meet third order standards, which are 0.05 ft x $(\text{mile})^{1/2}$. For sections less than 0.1 mile, let miles = 0.1.

AUTHENTICATION

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

Thomas Pianetti
PROFESSIONAL LAND SURVEYOR'S SIGNATURE

THOMAS PIANETTI
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

GE 38975
PROFESSIONAL LAND SURVEYOR'S LICENSE #

Groundwater & Environ. ntal Services, Inc.

Project: FORT MONMOUTH Owner: DPW

Location: Bldg 616/617 Permit No: 293375 3

Well number: 679MW15 Total Depth: 14.0 Diameter: 4"

Casing Elevation: Water Level: Init: 11.1 Static:

Screen Dia.: 4" Length: 10.0' Slot Size: 20

Casing Dia.: 4" Length: ± 3.5 Type: PVC

Drilling Method: H.S.A. Sample Method: SPLIT-SPOON

Completion Details: FLUSH MOUNT

Driller: SHORK Log By: R. BARNES Date: 3-[illegible]-95

Boring Log

Sketch Map

Blows Per Ft	Depth (feet)	Sample No.	Well Const.	PID (ppm)	Blow Count	Rec. (Ft)	Lithology	Unified Symbol
9	1			0	4, 4	1.5	TOPSOIL & [illegible]	TOPSOIL
	2				5, 4		BROWN SILT, SOME FINE SAND, TRACE CLAY, DRY	ML-SM
7	3			0	4, 7	1.2	BLACK [illegible]	
	4				8, 6		[illegible] CLAYEY SILT, [illegible] MOIST	
10	5	1		0	3, 5	1.1	[illegible]	
	6				5, 3			
7	7			0	3, 6	1.2		
	8				4, 6			
10	9			0	[illegible]	1.1		
	10				[illegible]			
15	11			0	5, 6	1.9	DARK GRAY CLAYEY SILT [illegible]	ML
	12				9, 9			
	13				Auger		SAME AS ABOVE	CL
	14							
	15						END OF BORING AT 14'	
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
	24							
	25							
	26							
	27							
	28							
	29							

(4C)

Fort Monmouth

0645 Arrive at GES Mons Equip

0700 Leave for site

0730 Arrive on-site and sign in

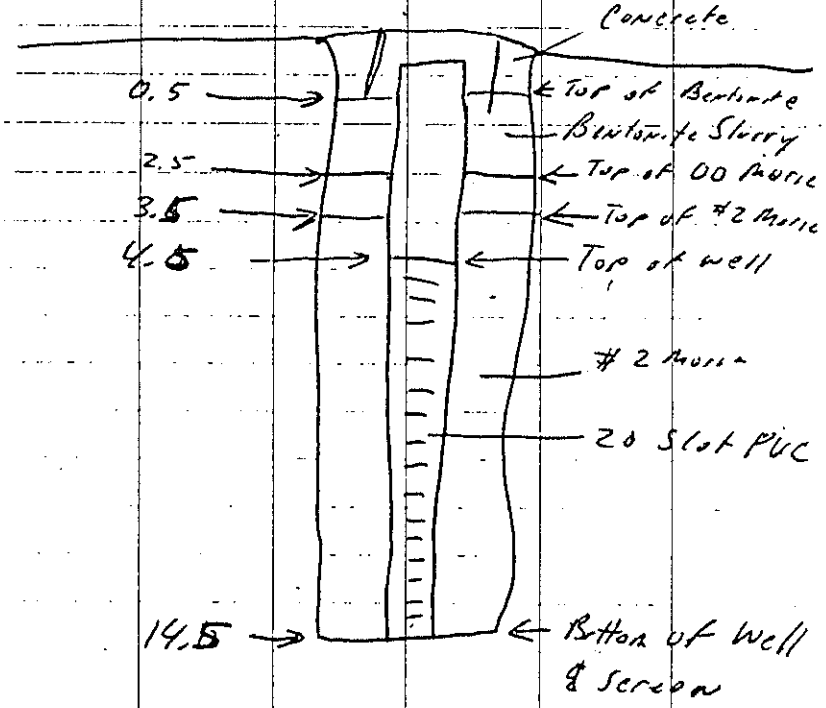
0800 Set up on well 699 MW 16 & START Driving Spoons Collect Sample at 0815 (6-8)

0830 Finish Driving Spoons, START (6-8) INSTALLING Well to 14.0 ft Below Grade

Well 699 MW 16 & ~~MW~~ Flush mounts

AND 699 MW 15

Both the same construction



SERIAL # 46235 38

DWR-133M (10/93)

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION AND ENERGY
TRENTON, NJ

Mail to
DEPE
eau Water Allocation
26
nton, NJ 08625

MONITORING WELL PERMIT

Permit No. 293375

VALID ONLY AFTER APPROVAL BY THE D.E.P.E.

COORD #: 29.14.442

Owner U.S. Army - Ft Monmouth
Address Bldg 167 DEH Envir
Ft Monmouth NJ
Name of Facility Bldg 699
Address
Same as Above

Driller Shore Drilling
Address 23 Branch Ave
Crawford NJ

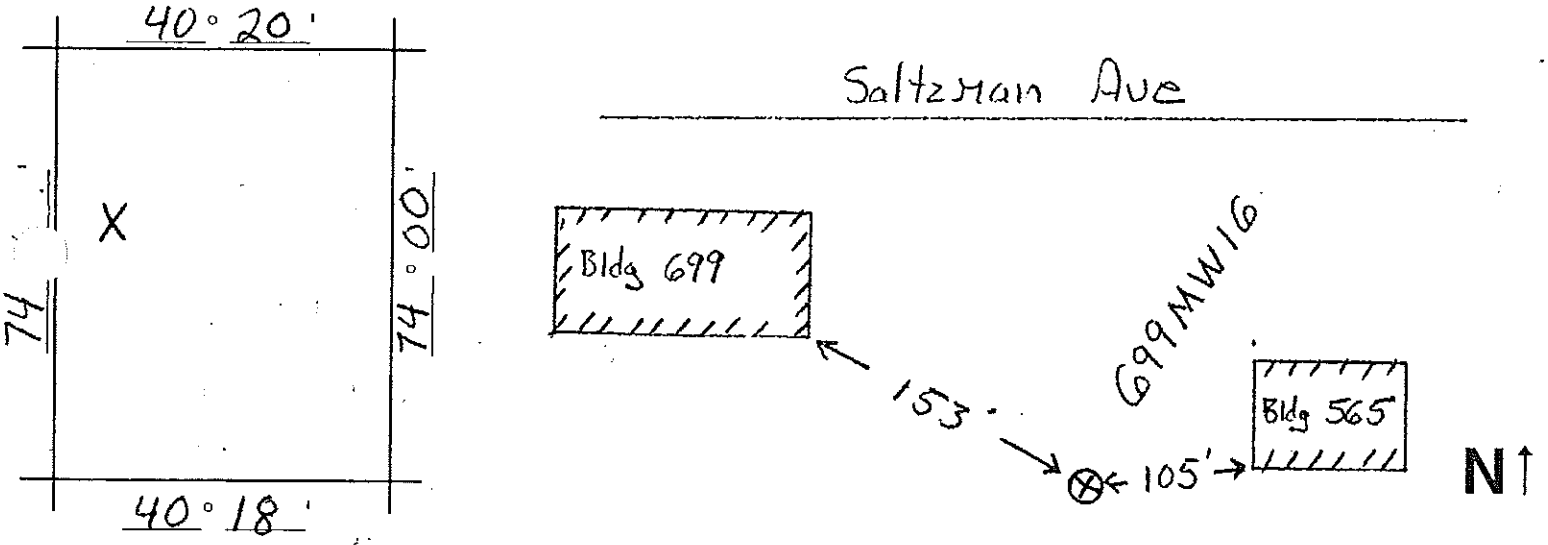
Diameter of Well(s)	4 Inches	Proposed Depth of Well(s)	20 Feet
# of Wells Applied for (max. 10)	7	Will pumping equipment be installed? YES ☐ NO ☒	
Type of Well (see reverse)	Monitor	If Yes, give pump capacity	NA GPM

LOCATION OF WELL(S)

Lot #	Block #	Municipality	County
N/A	N/A	Ft Monmouth	Monmouth

State Atlas Map No. 29

Draw sketch of well(s) nearest roads, buildings, etc. with marked distances in feet. Each well MUST be labeled with a name and/or number on the sketch.



FOR MONITORING WELLS, RECOVERY WELLS, OR PIEZOMETERS, THE FOLLOWING MUST BE COMPLETED BY THE APPLICANT. PLEASE INDICATE WHY THE WELLS ARE BEING INSTALLED:

- ☒ ~~Spill Site~~
- ☐ ISRA Site
- ☐ CERCLA (Superfund) Site
- ☐ RCRA Site
- ☒ Underground Storage Tank Site
- ☐ Operational Ground Water Permit Site
- ☐ Pretreatment and Residuals Site
- ☐ Water and Hazardous Waste Enforcement Case
- ☐ Water Supply Aquifer Test Observation Well
- ☐ Other (explain) _____

RECEIVED
JUL 27 1995
MONMOUTH COUNTY
REGIONAL HEALTH COMMISSION #1

CASE I.D. Number 89-10-19-1329

This Space for Approval Stamp

WELL PERMIT APPROVED
N.J.D.E.P.
19 1995
BUREAU OF WATER ALLOCATION

FOR D.E.P.E. USE

☐ Issuance of this permit is subject to the conditions attached. (see next page)
☒ For monitoring purposes only
☐ _____
☒ The well(s) may not be completed with more than 25 feet of total screen or uncased borehole.

SEE REVERSE SIDE FOR IMPORTANT PROVISIONS AND REGULATIONS PERTAINING TO THIS PERMIT.

In compliance with N.J.S.A. 58:4A-14, application is made for a permit to drill a well as described above.

Date 7/10/95

Signature of Driller [signature] License # 1275

Signature of Owner [signature] SELFM-PW-EV

COPIES: Water Allocation ... Well ... Health Dept. ... Owner ... Driller

U.S. ARMY
FORT MONMOUTH
SELFM PW EV

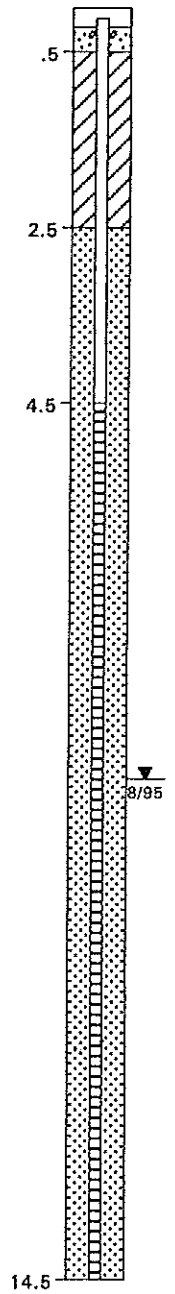
LOG OF BORING 699-MW16

Produced for Chuck Appleby

Project Name	: BLDG. 699	Completion Date	: 8/17/95
NJDEP Case #	: 89-10-19-1329	Northing	: N 539080.021
Logged By	: Shore Drilling	Easting	: E 2173141.399
Start Date	: 8/17/95	Driller	: R. Barnes

Depth in Feet

29-33757
ELEV: 15.27



DESCRIPTION	GRAPHIC	USCS	Samples	Blows/Ft
Topsoil and roots, dry				
Fill, brown-green clayey, dry			1	13
Black-green clayey moist, mottled			2	14
		CL	3	9
			4	5
Green-black clay and silt			5	9
		CL	6	12
Black clay				
		CL		

Well Construction Information

Well Construction
Date Completed : 8/17/95
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

NOTES
Well #1 is 699 MW16

2-28-1996 C:\699\GEO\699 mw16.ge3

DWR-138 M
11/94

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER ALLOCATION

MONITORING WELL RECORD

Well Permit No. _____ - _____
Atlas Sheet Coordinates _____ : _____ : _____ ☐

OWNER IDENTIFICATION - Owner _____
Address _____
City _____ State _____ Zip Code _____

WELL LOCATION - If not the same as owner please give address. Owner's Well No. _____
County _____ Municipality _____ Lot No. _____ Block No. _____
Address _____

TYPE OF WELL (as per Well Permit Categories) _____ Date well completed ____/____/____
Regulatory Program Requiring Well _____ Case I.D. # _____
CONSULTING FIRM/FIELD SUPERVISOR (if applicable) _____ Tele. # _____

WELL CONSTRUCTION

Total depth drilled _____ ft.
Well finished to _____ ft.
Borehole diameter:
Top _____ in.
Bottom _____ 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

	Depth to Top (ft.) [From land surface]	Depth to Bottom (ft.)	Diameter (inches)	Type and Material
Inner Casing				
Outer Casing (Not Protective Casing)				
Screen (Note slot size)				
Tail Piece				
Gravel Pack				
Annular Seal/Grout				
Method of Grouting				

Static water level after drilling _____ ft.
Water level was measured using _____
Well was developed for _____ hours at _____ gpm
Method of development _____
Was permanent pumping equipment installed? ☐ Yes ☐ No
Pump capacity _____ gpm
Pump type: _____
Drilling Method _____
Drilling Fluid _____ Type of Rig _____
Name of Driller _____
Health and Safety Plan submitted? ☐ Yes ☐ No
Level of Protection used on site (circle one) None D C B A
N.J. License No. _____
Name of Drilling Company _____

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

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.

THIS FORM MUST BE COMPLETED BY THE PERMITTEE AND/OR SURVEYOR

MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of Permittee:
Name of Facility: FORT MONMOUTH
Location:
NJPDES Number: NJ00 or ECRA Case Number:

LAND SURVEYOR'S CERTIFICATION

Well Permit Number:
This number must be permanently affixed to the well casing. 29-337577-

Longitude (to nearest second): West 74°-02'-45"

Latitude (to nearest second): North 40°-18'-42"

Elevation of Top of Inner Casing (cap off) (one-hundredth of a foot): 15.27

Source of elevation datum (benchmark, nail, etc.) and year. (If an alternate datum has been approved by the Department, identify here, assume datum of 100', and give approximated actual elevation.) Source: GEODETIC FM-105

[x] 1927 [ ] 1983

Elev.:

Owners Well Number (As shown on application or plans): 699 MW-16

Elevations are to be determined by double run, three wire leveling methods using balanced sights, commencing from a well marked and described point. This beginning point shall either be derived from Federal or State benchmarks if not more than 1000 feet from the site or from an alternate datum approved by the Department. Tolerances should meet third order standards, which are $0.05 \text{ ft} \times (\text{mile})^{1/2}$. For sections less than 0.1 mile, let miles = 0.1.

AUTHENTICATION

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

Thomas Pianetti
PROFESSIONAL LAND SURVEYOR'S SIGNATURE

THOMAS PIANETTI
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

GE 38975
PROFESSIONAL LAND SURVEYOR'S LICENSE #

Groundwater & Environi. .ıtal Services, Inc.

Project: Fort Monmouth Owner: DPW

Location: Bldg 699/565 Permit No: 2933757

Well number: 699MW16 Total Depth: 40 Diameter: 4"

Casing Elevation: Water Level: Init: 8.3 Static:

Screen Dia.: 4" Length: 10' Slot Size: 20

Casing Dia.: 4" Length: Type: PVC

Drilling Method: H.S.A. Sample Method: Split-Spoon

Completion Details: Flush Mount

Driller: Shore Log By: R. Barnes Date: 8-17-95

Boring Log

Sketch Map

Blows Per Ft	Depth (feet)	Sample No.	Well Const.	PID (ppm)	Blow Count	Rec. (ft)	Lithology	Unified Symbol
13	1			0	5, 7 6, 6	1.7	[illegible]	Topsoil & Roots SM
	2							
14	3			0	7 5 9 8	1.2	[illegible]	
	4							
9	5			0	5 4 5 4	1.4	[illegible] SILT [illegible]	
	6							
5	7	Y		0	2 3 2 3	1.5	[illegible]	ML/SC-CL
	8							
9	9			0	3 4 5, 2	1.7		
	10							
12	11			0	4, 5 7, 7	1.8		
	12							
	13				[illegible]			
	14							
	15						[illegible]	
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
	24							
	25							
	26							
	27							
	28							
	29							

RW-11

DWR-138 M
12/91

New Jersey Department of Environmental Protection and Energy
Bureau of Water Allocation

MONITORING WELL RECORD

Well Permit No. 29 - 28031
Atlas Sheet Coordinates 29 : 14 : 444

OWNER IDENTIFICATION - Owner U S ARMY
Address EVANS AREA BLDG. 600
City FORT MONMOUTH State NJ Zip Code

WELL LOCATION - If not the same as owner please give address. Owner's Well No R-1 (EA-24-699)
County Municipality OCEANPORT BORO Lot No. N/A Block No N/A
Address

TYPE OF WELL (as per Well Permit Categories) Date well completed 5/20/92
Regulatory Program Requiring Well recovery Case I.D. #
CONSULTING FIRM/FIELD SUPERVISOR (if applicable) US Army / CHUCK APPLEBY Tele. #

WELL CONSTRUCTION

Total depth drilled 20 ft.
Well finished to 20 ft.
Borehole diameter:
Top 16 in.
Bottom 16 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

	Depth to Top (ft.) [From land surface]	Depth to Bottom (ft.)	Diameter (inches)	Type and Material
Inner Casing	0	5	10	PVC SCH. 40
Outer Casing (Not Protective Casing)				
Screen (Note slot size)	5	20	10	PVC SCH 80 .020 SLOT
Tail Piece				
Gravel Pack	4	20	16	#0 SAND #2
Annular Seal/Grout	0	4	16	BENT/CEMENT-GROUT
Method of Grouting	TREMIE			

Static water level after drilling 6 ft.
Water level was measured using WELL SOUNDER
Well was developed for — hours at — gpm
Method of development N/A
Was permanent pumping equipment installed? ☐ Yes ☑ No
Pump capacity N/A gpm
Pump type:
Drilling Method HSA
Drilling Fluid Type of Rig DRESSER D-120
Name of Driller WILLIAM SHAW
Health and Safety Plan submitted? ☑ Yes ☐ No
Level of Protection used on site (circle one) None (D) C B A
N.J. License No. 1289
Name of Drilling Company TARASCO DRILLING CORP

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

0
BRN F-C SAND, LITTLE F. GRAVEL, TR SILT.
4
BLK F. SAND, SOME SILT.
20 BLK CLAYEY SILT (MOIST)

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 5-20-92

COPIES: White & Green - DEPE Canary - Driller Pink - Owner Goldenrod - Health Dept.

DWR-1 3M (7/92) SERIAL # 37092

STATE OF NEW JERSEY
DEPAR ENT OF ENVIRONMENTAL PROTECTION AND E GY
TRENTON, NJ

Mail to
Water Allocation
CN 029
Trenton, N.J. 08625

Permit No. 2930963

MONITORING WELL PERMIT

38

VALID ONLY AFTER APPROVAL BY THE D.E.P.E.

COORD #: 29.13656

Owner US ARMY FORT MONMOUTH
Address FORT MONMOUTH, NJ 07703
Name of Facility GENERAL SITE (MAIN POST)
Address BUILDING T-600
FORT MONMOUTH, NJ 07703

Driller TYREE ORGANIZATION, LTD
Address 1350 RT. 130 S
BURLINGTON, NJ

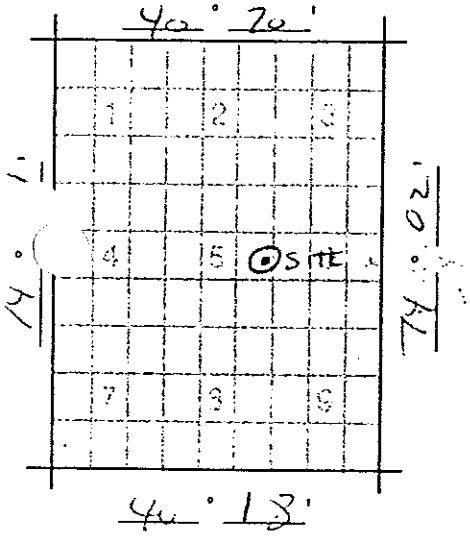
Diameter of Well(s)	4 Inches	Proposed Depth of Well(s)	15 Feet
# of Wells Applied for (max. 10)	1	Will pumping equipment be installed? YES ☐ NO ☒	
Type of Well (see reverse)	MONITOR/OBSERVE	If Yes, give pump capacity	GPM

LOCATION OF WELL(S)

Lot #	Block #	Municipality	County
		FORT MONMOUTH	MONMOUTH

State Atlas Map No. 29

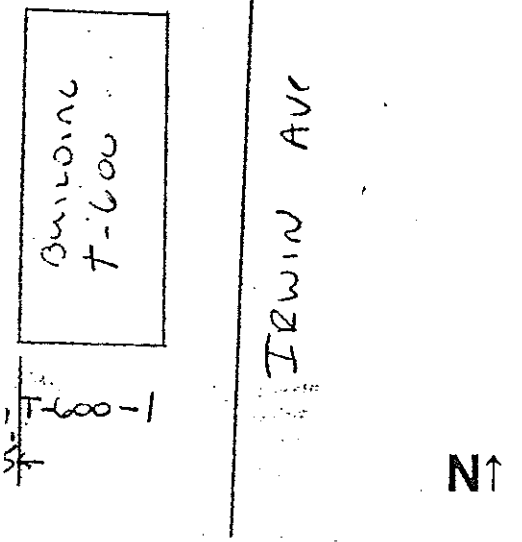
Draw sketch of well(s) nearest roads, buildings, etc. with marked distances in feet. Each well MUST be labeled with a name and/or number on the sketch.



This well will be granted in the near future. Well casing is broken @ the screen.

Mark Jam

To be Abandoned.



FOR MONITORING WELLS, RECOVERY WELLS, OR PIEZOMETERS, THE [illegible] APPLICANT. PLEASE INDICATE WHY THE WELLS ARE BEING INSTALLED:

- ☐ Spill Fund Case
- ☐ ECRA Case
- ☐ CERCLA (Superfund) Site
- ☐ RCRA Site
- ☒ Underground Storage Tank
- ☐ NJPDES Municipal Discharge Permit
- ☐ NJPDES Industrial Discharge Permit
- ☐ Water and Hazardous Waste Enforcement Case
- ☐ Water Supply Aquifer Test Observation Well
- ☐ Other (explain) _____

Case I.D. Number
93-11-9-0923-00

This Space for Approval Stamp

WELL PERMIT APPROVED
Dept. of Environmental Protection
Water Resources/Water Allocation
APR 5 1994

FOR D.E.P.E. USE
- ☐ Issuance of this permit is subject to the conditions attached. (see next page)
- ☒ For monitoring purposes only
- ☒ The well(s) may not be completed with more than 25 feet of total screen or uncased borehole.
- ☐ _____

SEE REVERSE SIDE FOR IMPORTANT PROVISIONS AND REGULATIONS PERTAINING TO THIS PERMIT.

In compliance with N.J.S.A. 58:4A-14, application is made for a permit to drill a well as described above.

Date MARCH 25, 1994

Signature of Driller _____ License # 1421

Signature of Owner _____ SELFM-PW-EV

COPIES: Water Allocation — White and Pink; Health Dept. — Yellow; Owner — Blue; Driller — White

DWR-138 M
12/91

New Jersey Department of Environmental Protection and Energy
Bureau of Water Allocation

MONITORING WELL RECORD

Well Permit No. 29 - [illegible]
Atlas Sheet Coordinates [illegible]

OWNER IDENTIFICATION - Owner U S ARMY FORT MONMOUTH
Address
City FORT MONMOUTH State NJ Zip Code

WELL LOCATION - If not the same as owner please give address. Owner's Well No. Bldg 600 MW-1
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 7/8/94
Regulatory Program Requiring Well DEP Case I.D. # 93 119 0000 00
CONSULTING FIRM/FIELD SUPERVISOR (if applicable) Tele. #

WELL CONSTRUCTION

Total depth drilled 15 ft.
Well finished to 15 ft.
Borehole diameter:
Top 8 in.
Bottom 8 in.
Well was finished: ☐ above grade ☑ flush mounted
Finished above grade, casing height (stick up) above land surface 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	2"	2'	4"	PVC
Outer Casing (Not Protective Casing)	15'			
Screen (Note slot size)	2'	15' slot	4"	SCH 40 PVC
Tail Piece				
Gravel Pack	1'	15'	-	#2
Annular Seal/Grout	6"	1'		Bentonite
Method of Grouting	Poured			

Static water level after drilling 4' ft.
Water level was measured using TAPE
Well was developed for 1 hours at 10 gpm
Method of development Pump
Was permanent pumping equipment installed? ☐ Yes ☑ No
Pump capacity gpm
Pump type:
Drilling Method Auger
Drilling Fluid Type of Rig B-80
Name of Driller Michael E Beck
Health and Safety Plan submitted? ☑ Yes ☐ No
Level of Protection used on site (circle one) None D C B A
N.J. License No. 1421
Name of Drilling Company TYLER ENVIRONMENTAL CORP

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

0-1' Concrete
1'-4' Brown Sand + Silt
4'-6' Greenish Gray - Silt
6'-15' Brown and Med to Fine

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 Michael E Beck Date 7-11-94

COPIES: White & Green - DEPE Canary - Driller Pink - Owner Goldenrod - Health Dept.

MONITORING WELL CERTIFICATION-FORM B-LOCATION CERTIFICATION

Name of Permittee: U.S. ARMY
Name of Facility: FORT MONMOUTH
Location: MONMOUTH COUNTY, NJ
Case ~~NJPDES~~ Number: 93-11-9-0903-00

LAND SURVEYOR'S CERTIFICATION

Well Permit Number:
This number must be permanently affixed to the well casing. 29-309168-

Longitude (to nearest second): West 74° 02' 42.88"

Latitude (to nearest second): North 40° 18' 48.90"

Elevation of Top of Inner Casing (cap off) (one-hundredth of a foot): 16.36

Elevation of ground level (1/100th ft.) 16.71

Source of elevation datum (benchmark, nail, etc.) and year. (If an alternate datum has been approved by the Department, identify here, assume datum of 100', and give approximated actual elevation.) Source: FM-106

☑ 1927 ☐ 1983

Elev.:

Owners Well Number (As shown on application or plans): BLDG 600 MW-1

Elevations are to be determined by double run, three wire leveling methods using balanced sights, commencing from a well marked and described point. This beginning point shall either be derived from Federal or State benchmarks if not more than 1000 feet from the site or from an alternate datum approved by the Department. Tolerances should meet third order standards, which are 0.05 ft x (mile)$^{1/2}$. For sections less than 0.1 mile, let miles = 0.1.

AUTHENTICATION

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

Wayne W Burgett
PROFESSIONAL LAND SURVEYOR'S SIGNATURE

WAYNE W BURGETT
PROFESSIONAL LAND SURVEYOR'S NAME
(Please print or type)

SEAL

31654
PROFESSIONAL LAND SURVEYOR'S LICENSE #

U.S. ARMY
FORT MONMOUTH
SELFM PW EV

LOG OF BORING 600-mw1

Produced for Charles Appleby

Project Name	: BLDG. 600	Completion Date	: 7/8/94
NJDEP Case #	: 93-11-9-0923-00	Northing	: N 539779.403
Logged By	: TYREE INC.	Easting	: E 2173301.334
Start Date	: 7/8/94	Driller	: M. Beck

Depth in Feet	29-30968 ELEV: 16.36	DESCRIPTION	GRAPHIC	USCS	Samples	Blows/Ft	Well Construction Information
0	.6	Concrete		14			
2	1 / 2	Brown sand and silt		SM			
4	7/94	Green clay-silt		CL			
6		Brown sand medium to fine		SW			
8							
10							
12							
14							
15							
16							

Well Construction

Date Completed	: 7/15/94
Hole Diameter	: 8 in
Drill Method	: HSA
Company Rep	: M. Beck

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

NOTES
Well #1 is 600 MW1

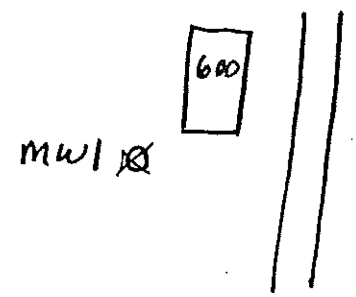
2-28-1996 C:\600\GEO\600 mw1.gp3

/

FIELD LOG OF BORING

SHEET 1 OF 1

LOCATION OF BORING: Ft Monmouth Bldg 600



PROJECT:	US Army Fort Monmouth.
BORING NO:	1
TOTAL DEPTH:	15
JOB NO:	SELF PWEV
LOGGED BY:	V Swanson
PROJ. MGR.:	J Capritti
EDITED BY:	C. Appleby
DRILLING CONTRACTOR:	Tyree
DRILL RIG TYPE:	Mobil B 80
DRILLERS NAME:	Mike Beck
SAMPLING METHODS:	Split Spoon
HAMMER WT.:	140
DROP:	30"
STARTED, TIME:	1100
DATE:	7/8/94
COMPLETED, TIME:	1400
DATE:	7/8/94
BORING DEPTH (ft):	15
CASING DEPTH (ft):	2
WATER DEPTH (ft):	5
TIME:	1300
DATE:	7/8/94
BACKFILLED, TIME:	1300 DATE: 7/8/94 BY: Tyree MB
SURFACE ELEV:	DATUM:

SAMPLE DEPTH	SAMPLER TYPE	BLOWS / 6 IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE (min./ft.)	PID READING (ppm)	ODOR (Y / N ?)	GRAPHIC WELL CONST.	DEPTH IN FEET	GRAPHIC LOG	CONDITIONS:
0-2	SS	12	6	24			0	N	Casing / grout / bentonite			Red Clay and Fine Sand.
		8	6									
		11	6							1	SC	
		19	6									
2-4	SS	25	6	24			0	N	Screen	2		Fine Brown Sand.
		12	6									
		11	6							3	SW	4' water level
		23	6				0	N				
4-6		6	6	18						4		Fine ~~Brown~~ Sand (damp)
		2	6									sample at 6', took sample
		4	6							5		to 8', then Fine Green
		7	6				0					Sand and Till and Some
6-8										6		clay
								Y		7	SC	Fine Green Sand and Till
8-10							0	Y				and some clay
										8		Same 8-10' slight smell
												took extra VO sample.
										9	SC	
10-12 / 15							0					
										10		Same.
							6					Same to 15'

TYREE ENVIRONMENTAL TECHNOLOGIES

APPENDIX II

TABLE 1
PUMP TEST RESULTS
OF 6/23/92 & 6/25/92
OUR FILE #5068-9201

WELL#	STATIC LEVEL (FT. BELOW GRADE).	MAX YIELD (GPM)	RECOVERY	RECHARGE FT./MIN.	DEPTH OF WELL(FT.)	DRAWDOWN (FT.)	SPECIFIC CAPACITY (GPM/FT.)
1	5.3	1.807	23 MIN.	0.18	14.4	7.4	0.24
2	4.35	.709	3HR. 48 MIN. TO 5.9*	DND	16.5	11.85	0.06
3	5.1	1.961	1 HR. 12 MIN. (5.2)*	0.14	14.4	9.3	0.21
4	4.7	.217	2 HR. 35 MIN. (5.3)*	0.09	6.6	1.5	0.14
5	4.3	1.11	52 MIN. (4.5)*	0.18	14.5	10.2	0.11
6	4.75	.792	1 HR. 54 MIN. (5.0)*	0.16	14.0	7.75	0.10
7	4.9	COULD NOT DEVELOP	----------	------	13.0	8.1	-------
8	5.2	2.273	46 MIN.	0.74	13.5	6.8	0.33
9	5.1	1.176	57 MIN. (5.3)*	0.08	13.75	7.4	0.16
10	5.0	COULD NOT DEVELOP	----------	------	14.25	19.25	-------

*WELL RECOVERED TO THE LEVEL INDICATED IN FEET BELOW GRADE

TABLE 2
MONITORING WELL COMMENTS

WELL DESIGNATION	DIAMETER (INCHES)	RECOMMENDATION/ POTENTIAL USE
MW A	3	CLOSURE
MW C	3	CLOSURE
MW 1	4	FUTURE WATER INJECTION
MW 2	4	CLOSURE
MW 3	4	FREE PRODUCT RECOVERY
MW 4	4	FREE PRODUCT RECOVERY
MW 5	4	OBSERVATION
MW 6	4	OBSERVATION
MW 7	4	CLOSURE
MW 8	4	OBSERVATION
MW 9	4	OBSERVATION
MW 10	4	CLOSURE
RW -1	4	FUTURE WATER INJECTION
RW -2	4	FUTURE WATER INJECTION

TABLE 3

AQUIFER CHARACTERICS

Well #	R (ft)	T (gpd/ft)	S
1	91	404	.062
2	160.5	330	.016
3	69.5	289	.068
4	59.5	N/A	N/A
5	146.1	440	.025
6	41	542	.218
8	183.1	528	.019
9	135.3	460	.023
10	163.5	455	.018
RW-2	70	314	.087
AVG.	**N/A**	**418**	**.060**

R - Distance to observation well from pumping well

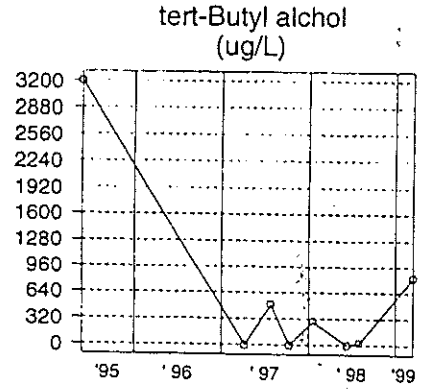
T - Transmissivity

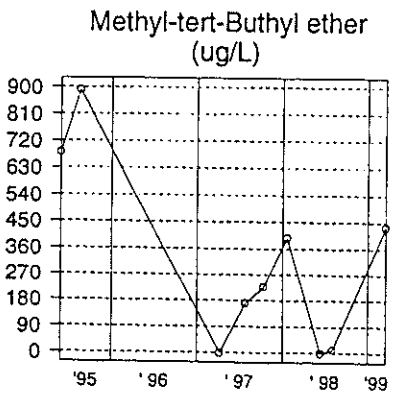
S - Coefficient of Storage

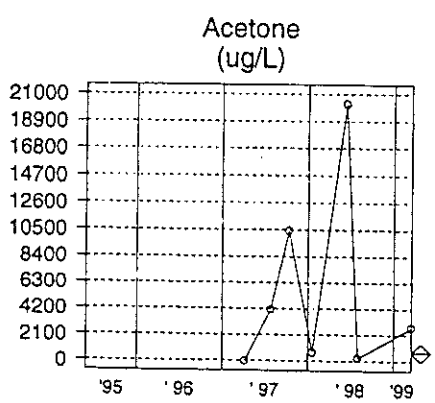
K - Hydraulic Conductivity = T ave/b = 32.15

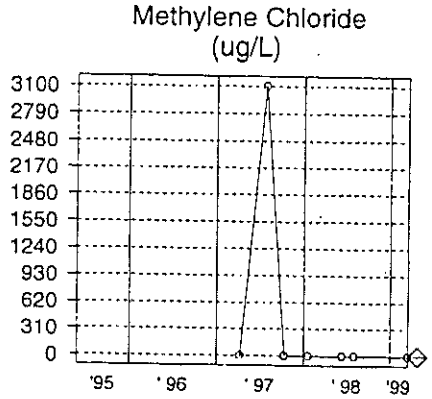
APPENDIX III

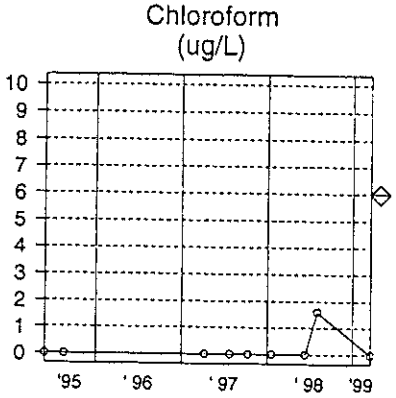
APPENDIX IV

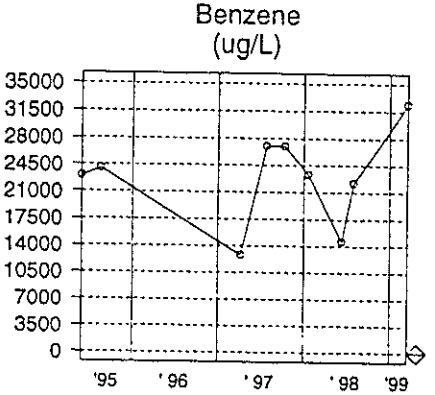


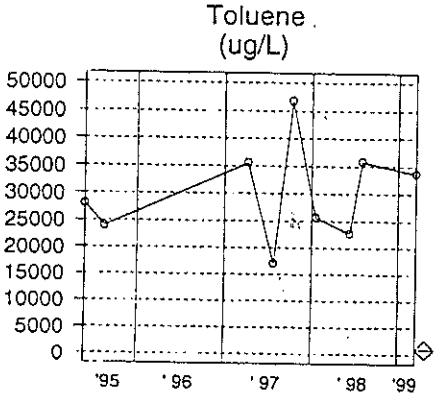


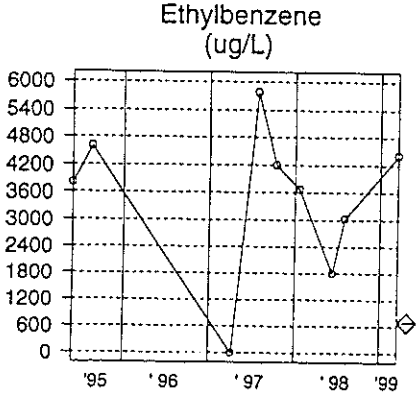


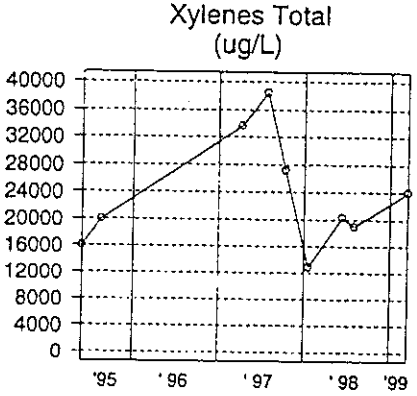












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05/24/95 - 03/11/99

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PARAMETER

o = Date Sampled

NJDEP Criteria

FORT MONMOUTH

GW MONITORING
Bldg. 699

Well 1 of 13, Graph

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

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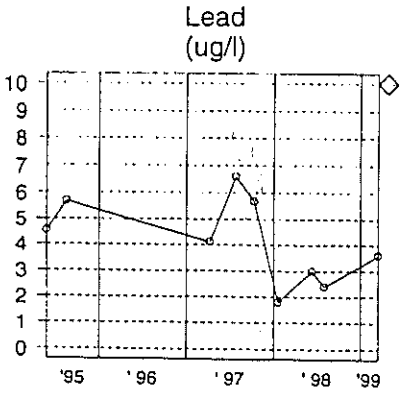

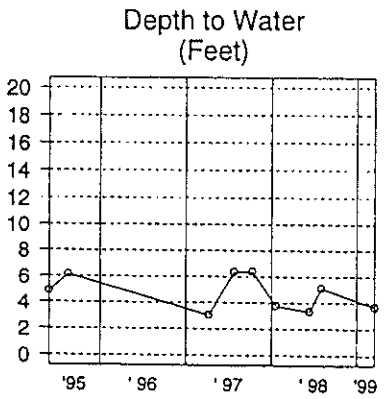

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o = Date Sampled

NJDEP Criteria

FORT MONMOUTH

GW MONITORING
Bldg. 699

Well 1 of 13, Graph

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

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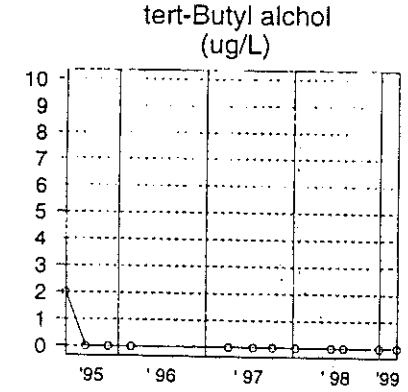

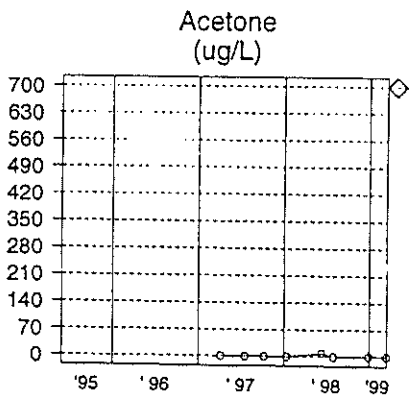

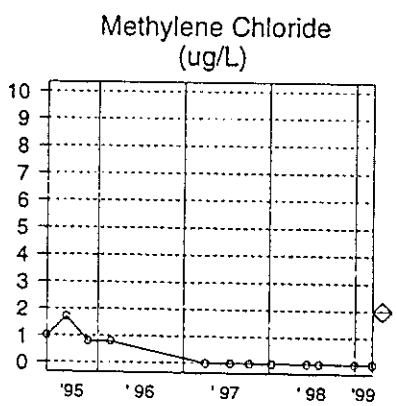

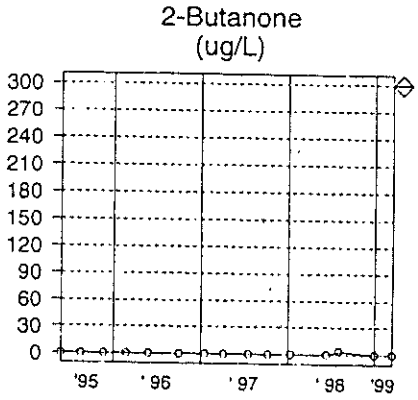

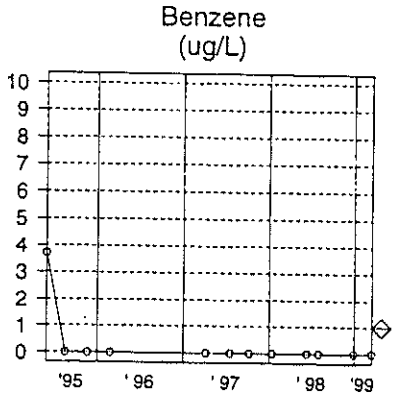

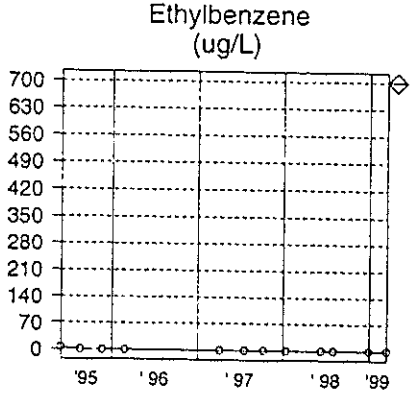

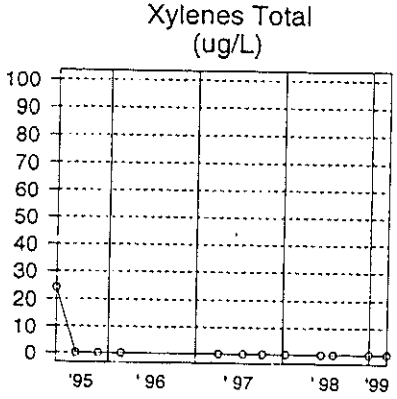

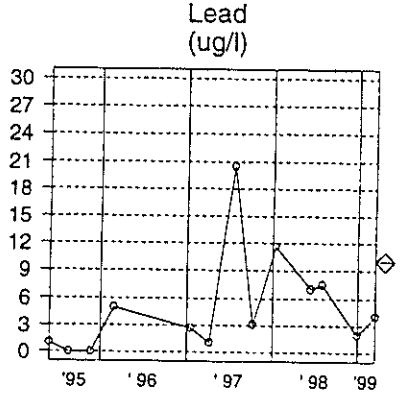

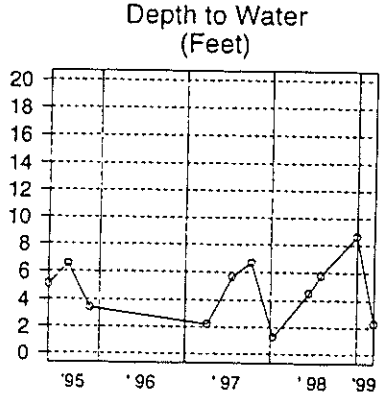

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NJDEP Criteria

FORT MONMOUTH

GW MONITORING
Bldg. 699

Well 2 of 13, Graph

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

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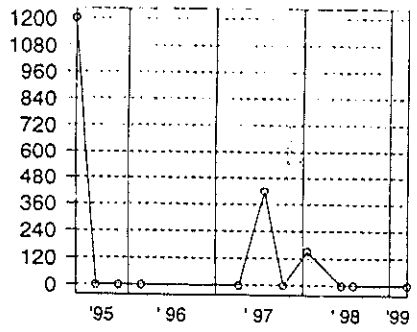
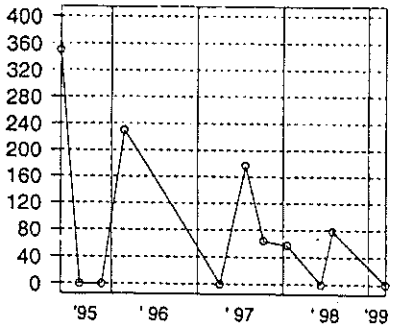
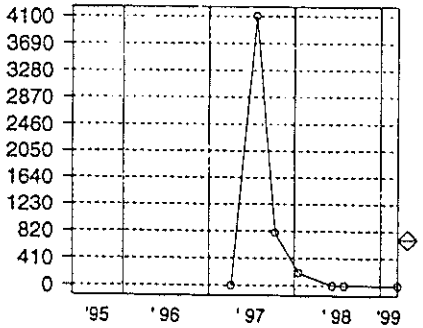
tert-Butyl alchol
(ug/L)



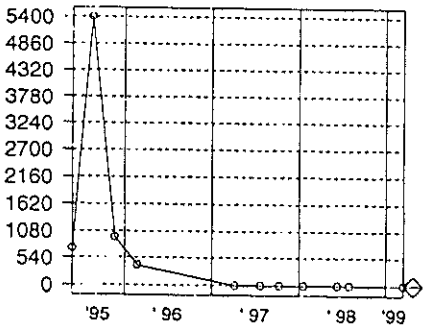
Methyl-tert-Buthyl ether
(ug/L)



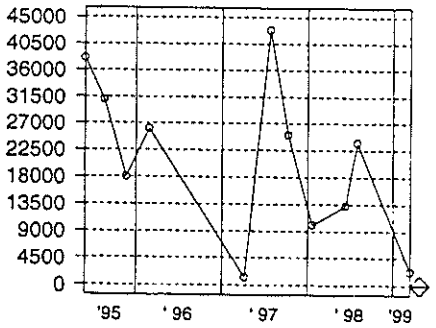
Acetone
(ug/L)



Methylene Chloride
(ug/L)



Benzene
(ug/L)



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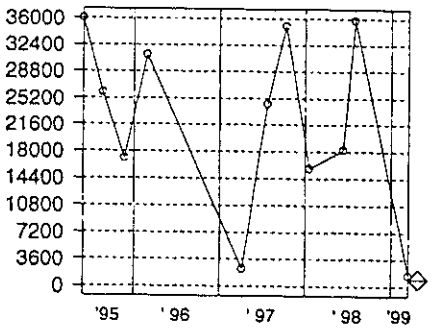

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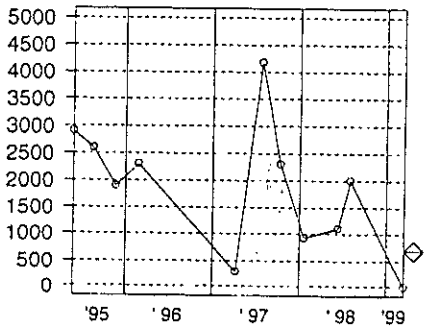
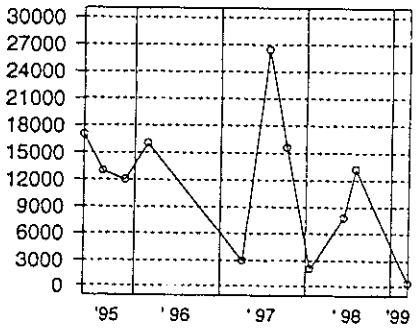


Xylenes Total
(ug/L)



Lead
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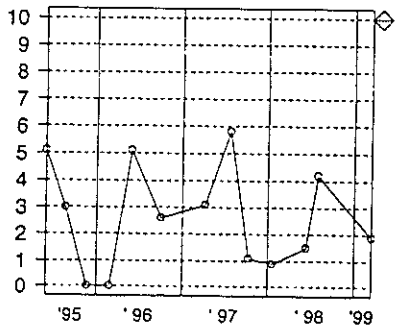

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o = Date Sampled

NJDEP Criteria

FORT MONMOUTH

GW MONITORING
Bldg. 699

Well 3 of 13, Graph

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

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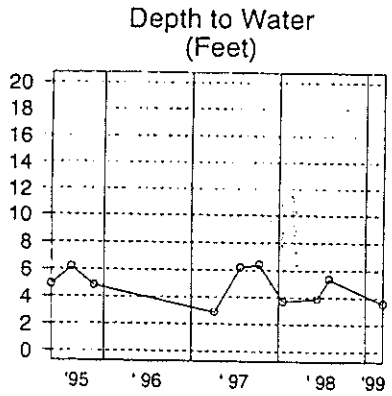

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◇ NJDEP Criteria

FORT MONMOUTH

GW MONITORING
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Well 3 of 13, Graph

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

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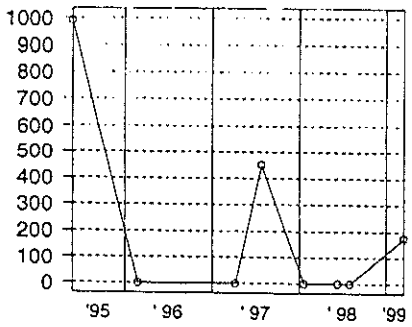
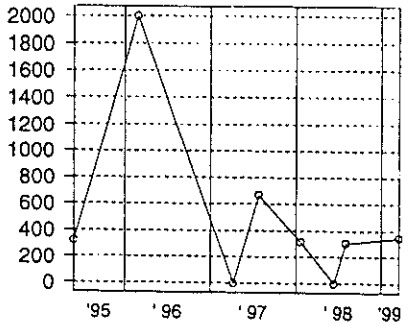
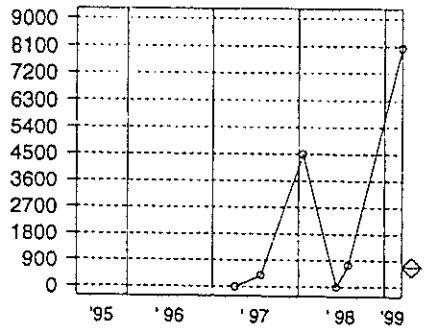
tert-Butyl alchol
(ug/L)



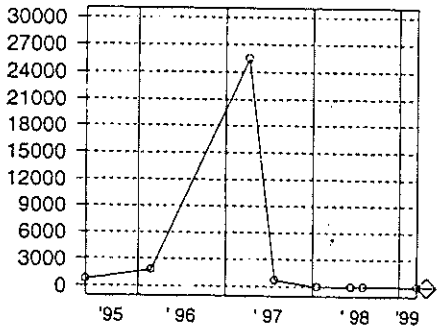
Methyl-tert-Buthyl ether
(ug/L)



Acetone
(ug/L)



Methylene Chloride
(ug/L)



Benzene
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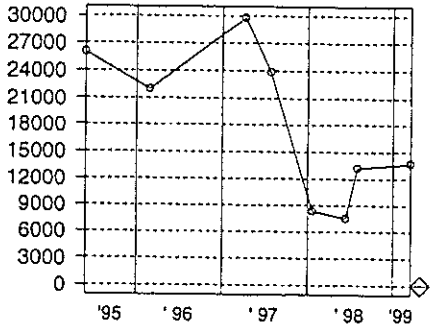
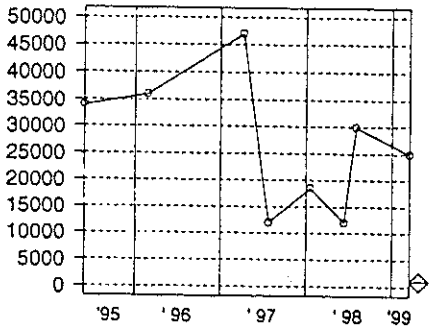
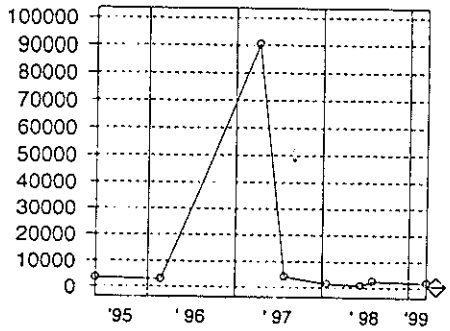


Toluene
(ug/L)



Ethylbenzene
(ug/L)



Xylenes Total
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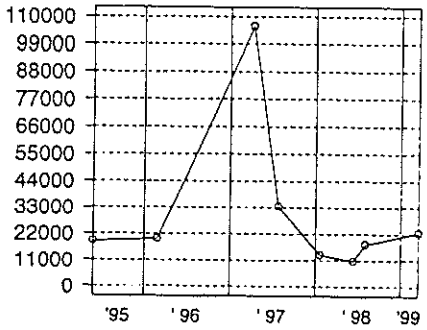
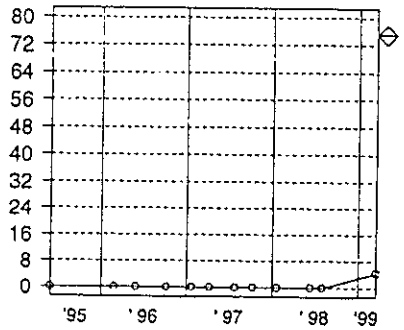


1,4-Dichlorobeneze
(ug/L)



SOURCE: 0699MW04

Sampling Dates:
05/24/95 - 03/11/99

LEGEND:

PARAMETER

o = Date Sampled

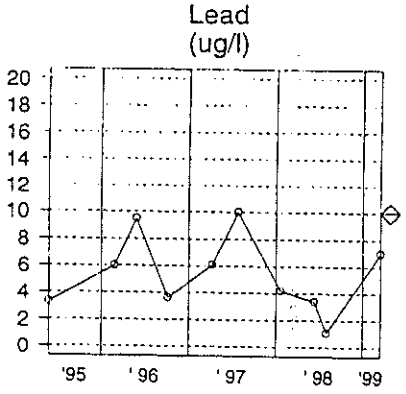
NJDEP Criteria

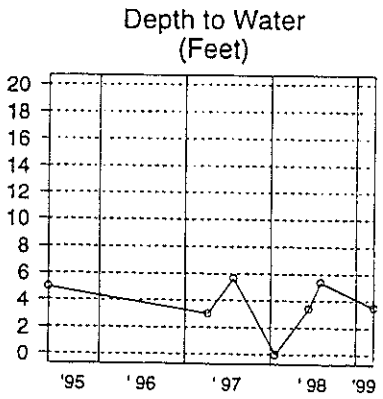
FORT MONMOUTH

GW MONITORING
Bldg. 699

Well 4 of 13, Graph

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





SOURCE: 0699MW04

Sampling Dates:
05/24/95 - 03/11/99

LEGEND:

PARAMETER

o = Date Sampled

NJDEP Criteria

FORT MONMOUTH

GW MONITORING
Bldg. 699

Well 4 of 13, Graph

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

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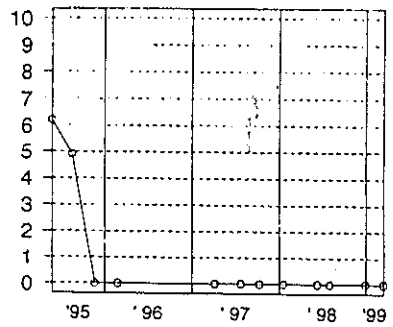
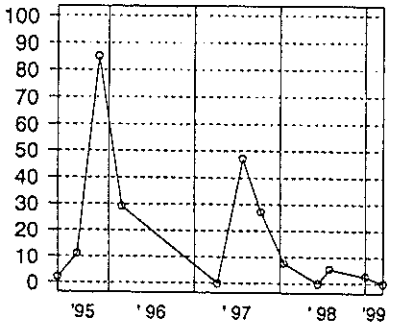
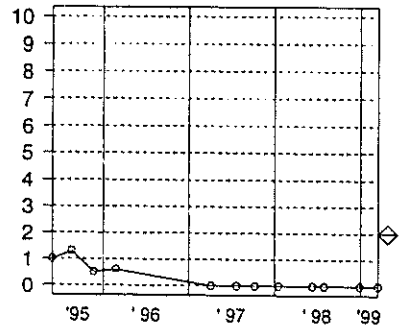
tert-Butyl alchol
(ug/L)



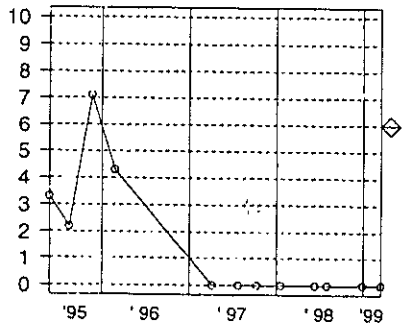
Methyl-tert-Buthyl ether
(ug/L)



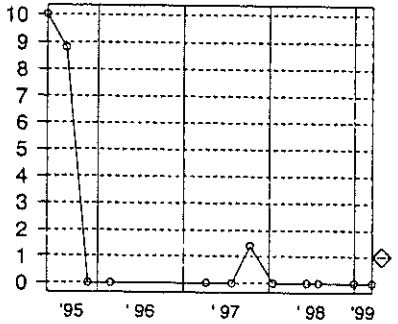
Methylene Chloride
(ug/L)



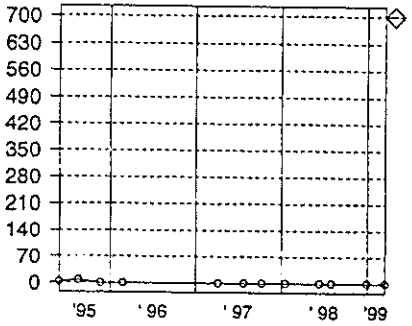
Chloroform
(ug/L)



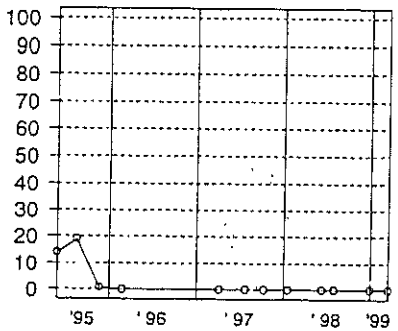
Benzene
(ug/L)



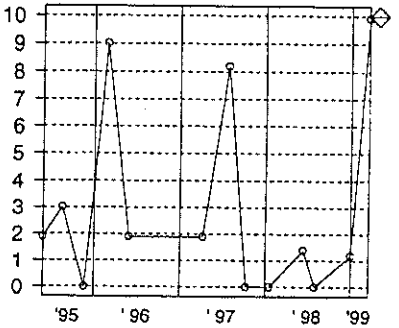
Ethylbenzene
(ug/L)



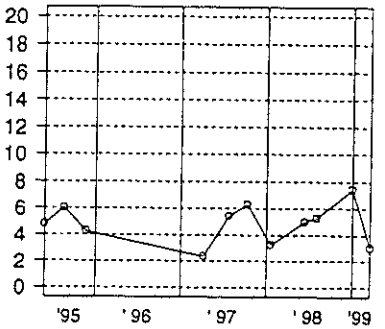
Xylenes Total
(ug/L)



Lead
(ug/l)



Depth to Water
(Feet)



SOURCE: 0699MW05

Sampling Dates:
05/24/95 - 03/11/99

LEGEND:

PARAMETER

o = Date Sampled

NJDEP Criteria

FORT MONMOUTH

GW MONITORING
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Well 5 of 13, Graph

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

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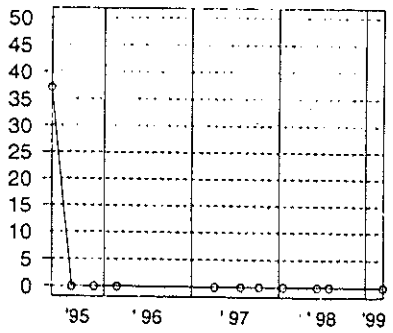
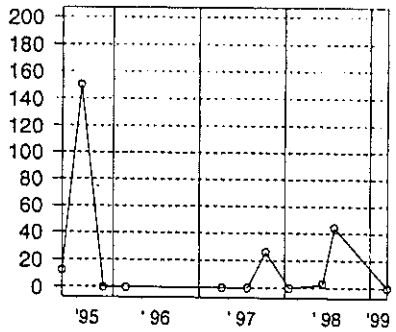
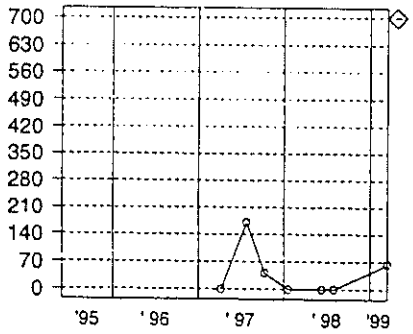
tert-Butyl alchol
(ug/L)



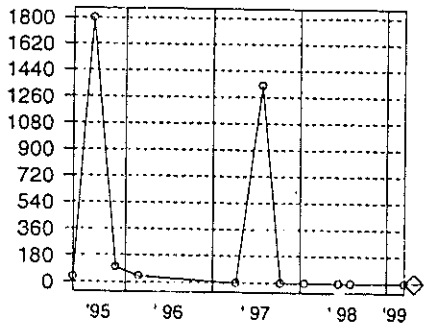
Methyl-tert-Buthyl ether
(ug/L)



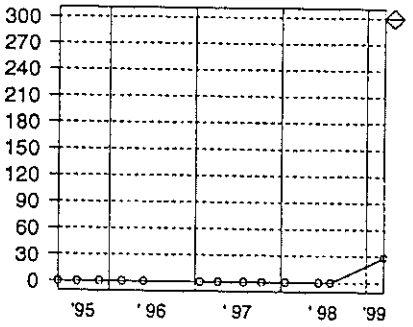
Acetone
(ug/L)



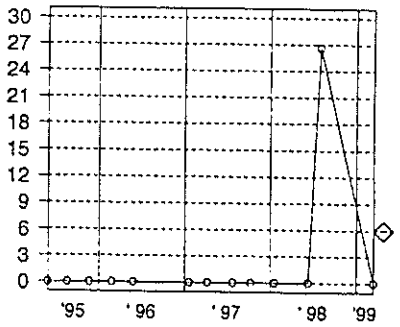
Methylene Chloride
(ug/L)



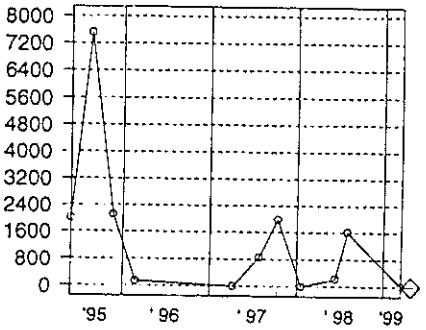
2-Butanone
(ug/L)



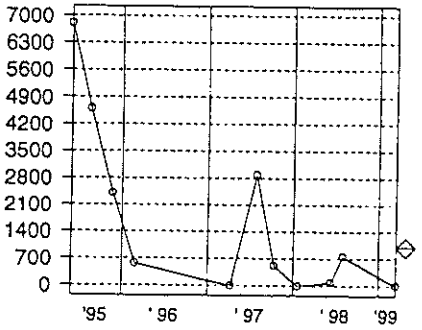
Chloroform
(ug/L)



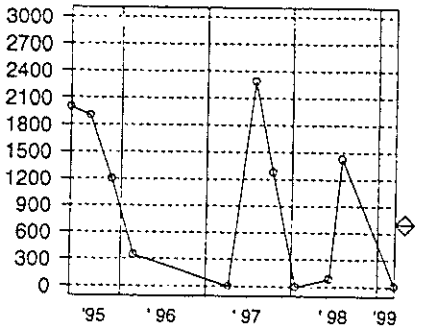
Benzene
(ug/L)



Toluene
(ug/L)



Ethylbenzene
(ug/L)



SOURCE: 0699MW06

Sampling Dates:
05/24/95 - 03/10/99

LEGEND:

PARAMETER

o = Date Sampled

NJDEP Criteria

FORT MONMOUTH

GW MONITORING
Bldg. 699

Well 6 of 13, Graph

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

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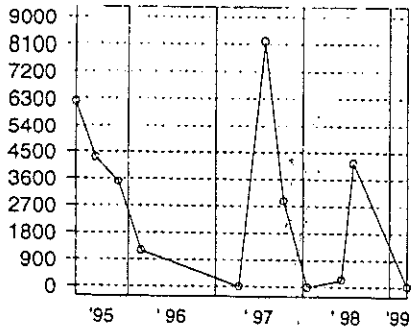
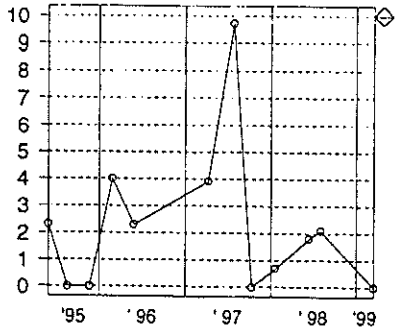
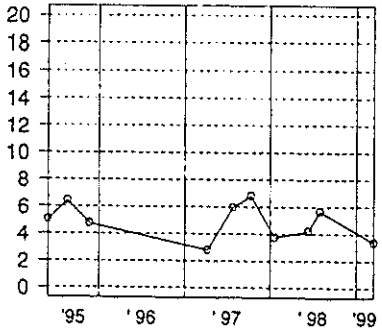
Xylenes Total
(ug/L)



Lead
(ug/l)



Depth to Water
(Feet)



SOURCE: 0699MW06

Sampling Dates:
05/24/95 - 03/10/99

LEGEND:

PARAMETER

o = Date Sampled

◇ NJDEP Criteria

FORT MONMOUTH

GW MONITORING
Bldg. 699

Well 6 of 13, Graph

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

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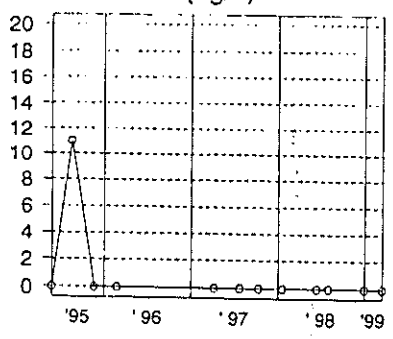
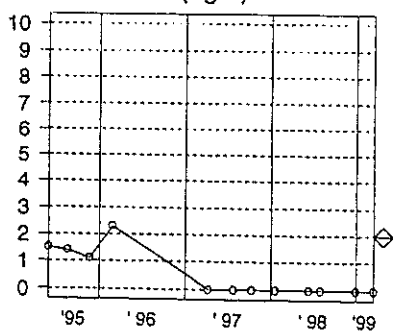
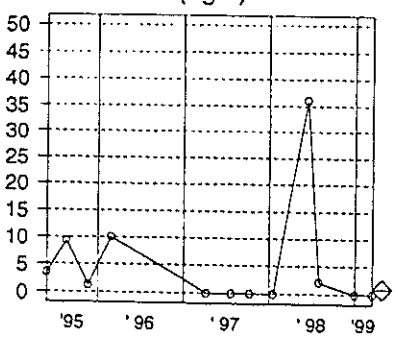
tert-Butyl alchol
(ug/L)



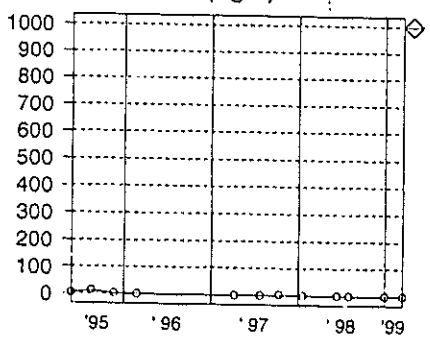
Methylene Chloride
(ug/L)



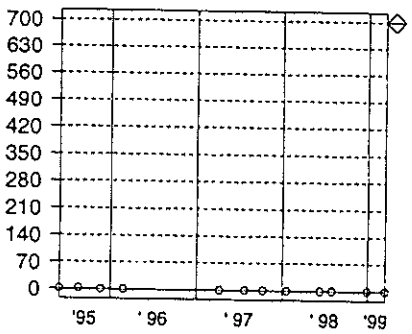
Benzene
(ug/L)



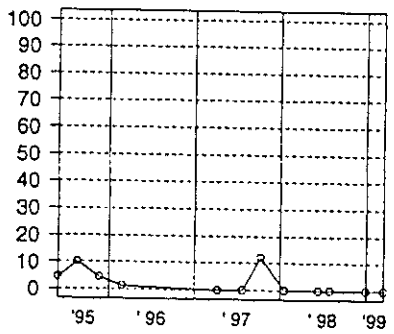
Toluene
(ug/L)



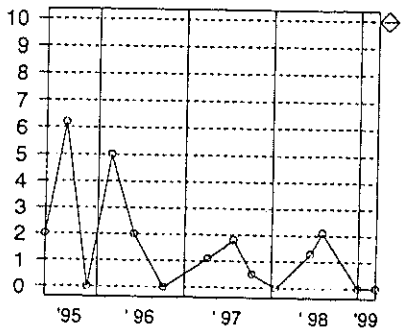
Ethylbenzene
(ug/L)



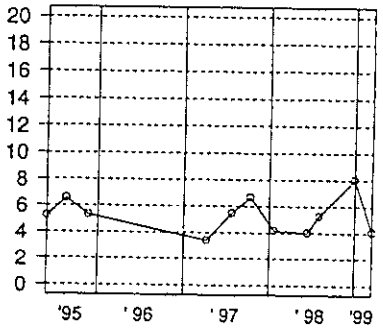
Xylenes Total
(ug/L)



Lead
(ug/l)



Depth to Water
(Feet)



SOURCE: 0699MW08

Sampling Dates:
05/24/95 - 03/10/99

LEGEND:

PARAMETER

o = Date Sampled

NJDEP Criteria

FORT MONMOUTH

GW MONITORING
Bldg. 699

Well 7 of 13, Graph

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

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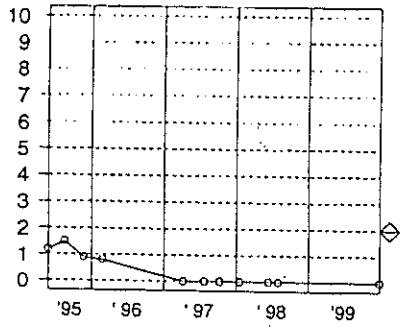
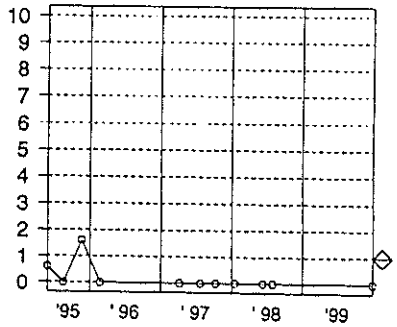
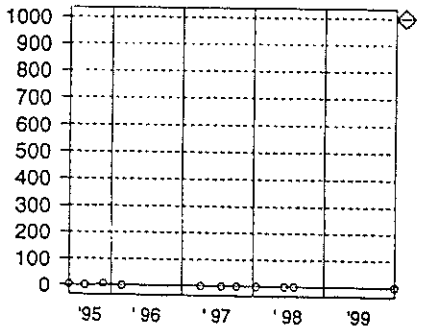
Methylene Chloride (ug/L)



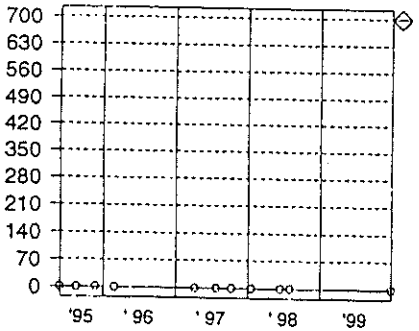
Benzene (ug/L)



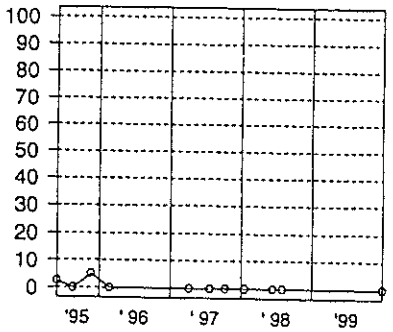
Toluene (ug/L)



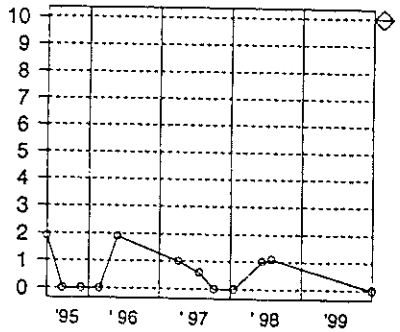
Ethylbenzene (ug/L)



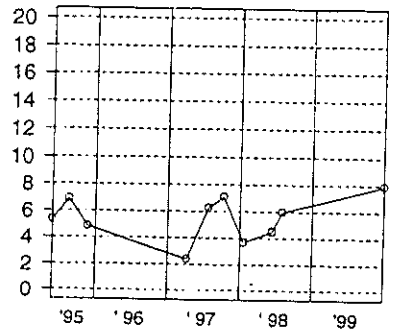
Xylenes Total (ug/L)



Lead (ug/l)



Depth to Water (Feet)



SOURCE: 0699MW09

Sampling Dates:
05/24/95 - 12/30/99

LEGEND:

PARAMETER

o = Date Sampled

NJDEP Criteria

FORT MONMOUTH

GW MONITORING
Bldg. 699

Well 8 of 13, Graph

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

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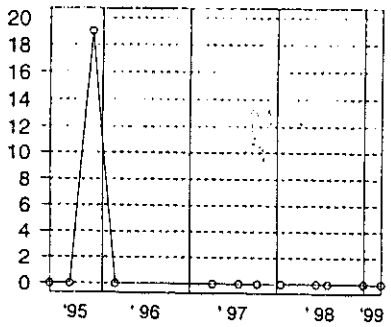

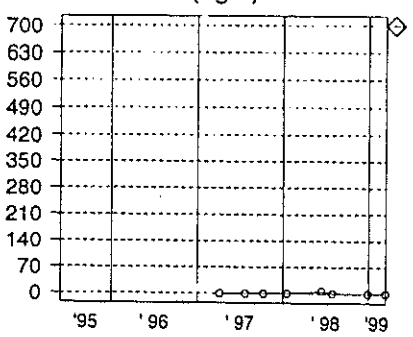

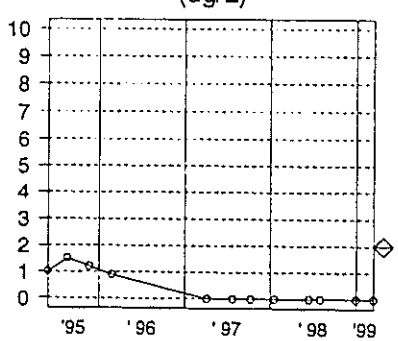

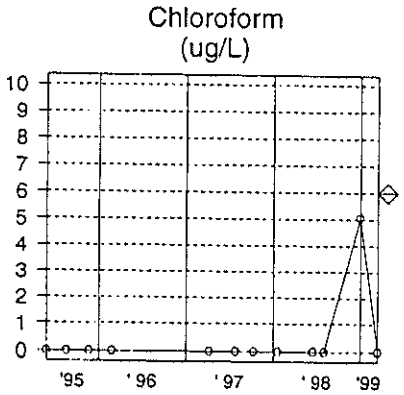

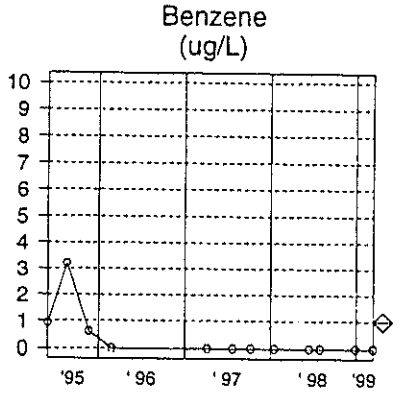

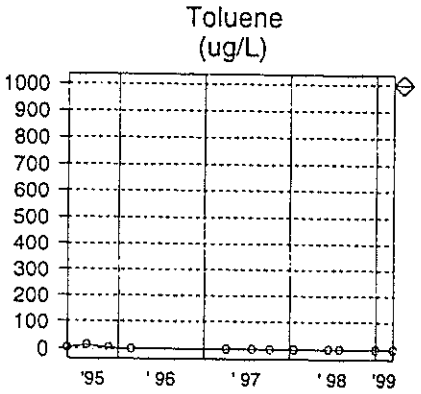

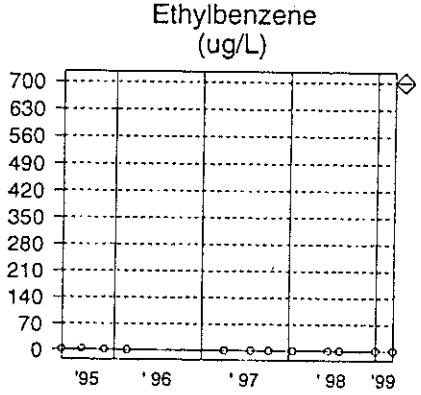

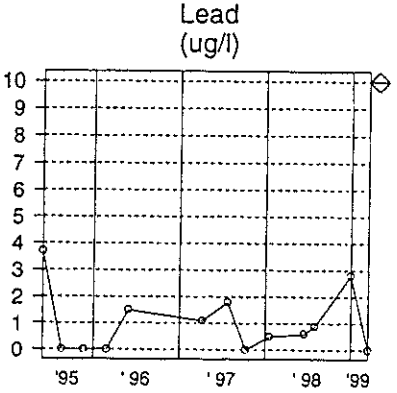

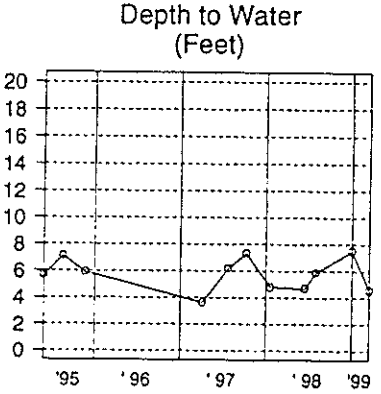

SOURCE: 0699MW12

Sampling Dates:
05/24/95 - 03/09/99

LEGEND:

PARAMETER

o = Date Sampled

NJDEP Criteria

FORT MONMOUTH

GW MONITORING
Bldg. 699

Well 9 of 13, Graph

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

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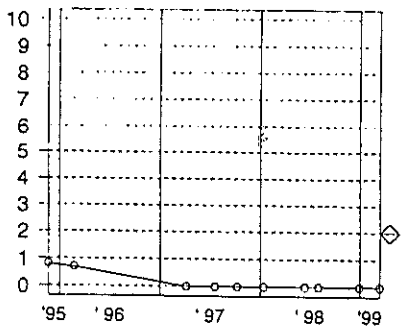
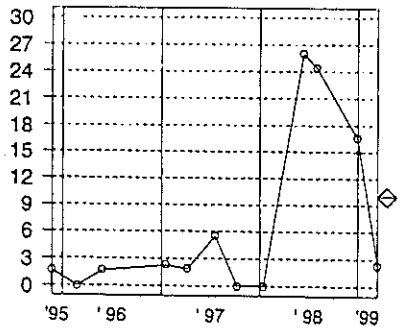
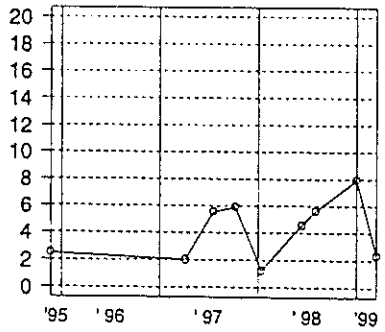
Methylene Chloride
(ug/L)



Lead
(ug/l)



Depth to Water
(Feet)



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Sampling Dates:
11/21/95 - 03/09/99

LEGEND:

PARAMETER

o = Date Sampled

◇ NJDEP Criteria

FORT MONMOUTH

GW MONITORING
Bldg. 699

Well 10 of 13, Graph

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

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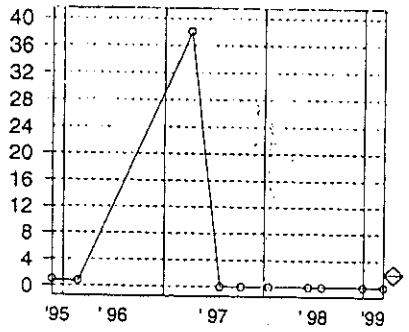
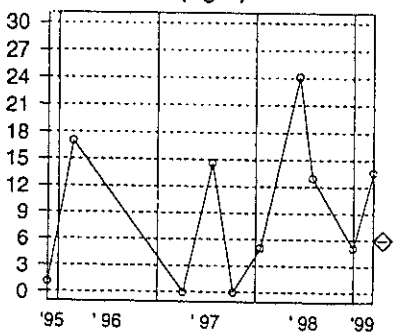
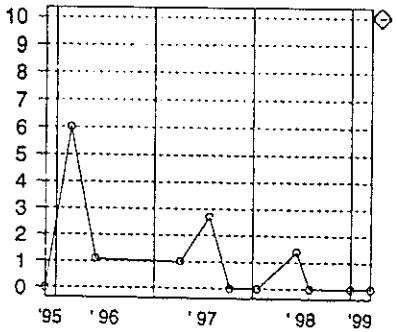
Methylene Chloride
(ug/L)



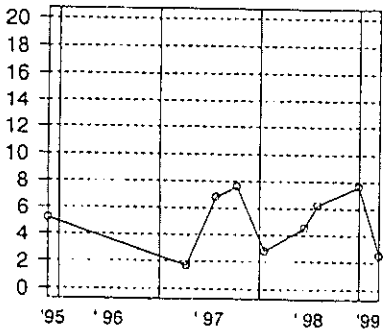
Chloroform
(ug/L)



Lead
(ug/l)



Depth to Water
(Feet)



SOURCE: 0699MW16

Sampling Dates:
11/21/95 - 03/09/99

LEGEND:

PARAMETER

o = Date Sampled

◇ NJDEP Criteria

FORT MONMOUTH

GW MONITORING
Bldg. 699

Well 11 of 13, Graph

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

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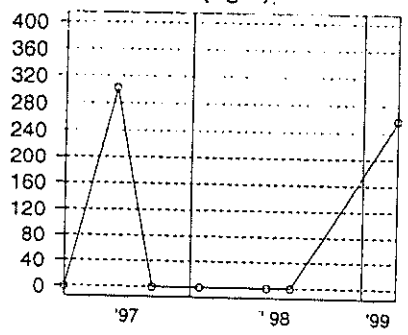

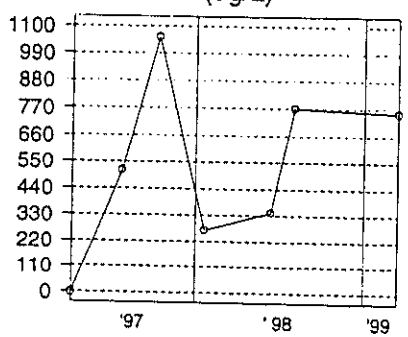

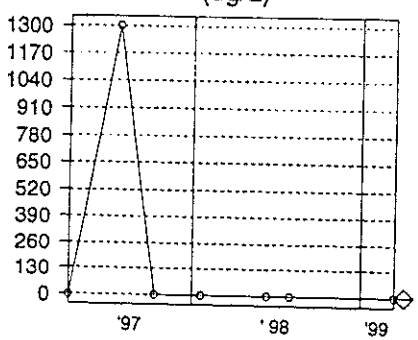

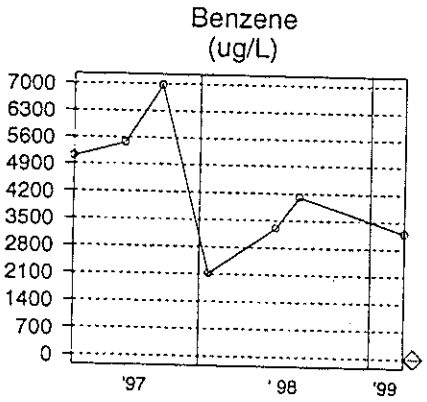

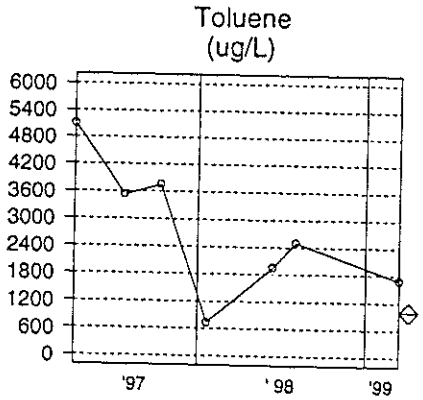

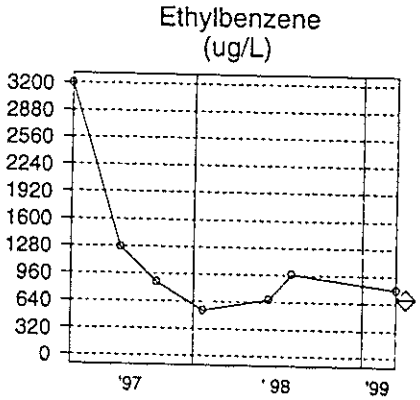

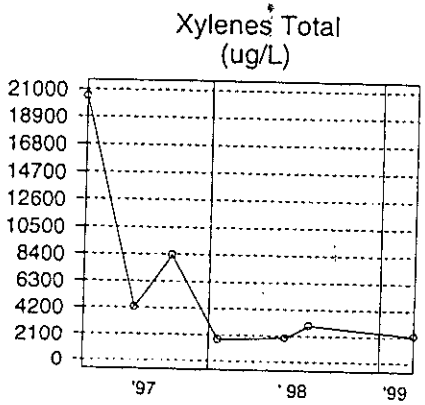

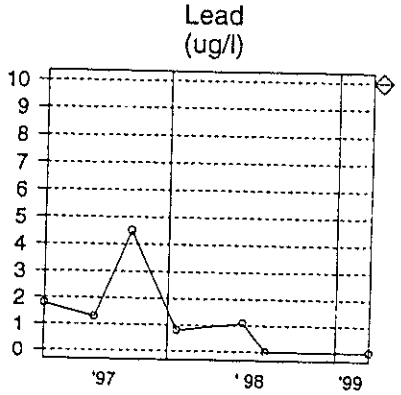

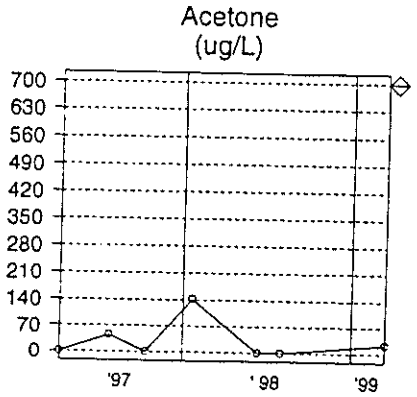

SOURCE: 0699RW11

Sampling Dates:
04/04/97 - 03/09/99

LEGEND:

PARAMETER

o = Date Sampled

NJDEP Criteria

FORT MONMOUTH

GW MONITORING
Bldg. 699

Well 12 of 13, Graph

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

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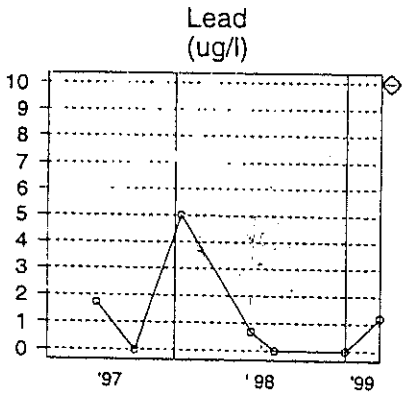

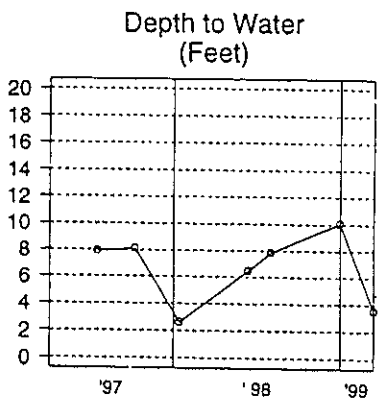

SOURCE: 0616MW01

Sampling Dates:
04/02/97 - 03/09/99

LEGEND:

PARAMETER

c = Date Sampled

NJDEP Criteria

FORT MONMOUTH

GW MONITORING
Bldg. 699

Well 13 of 13, Graph

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

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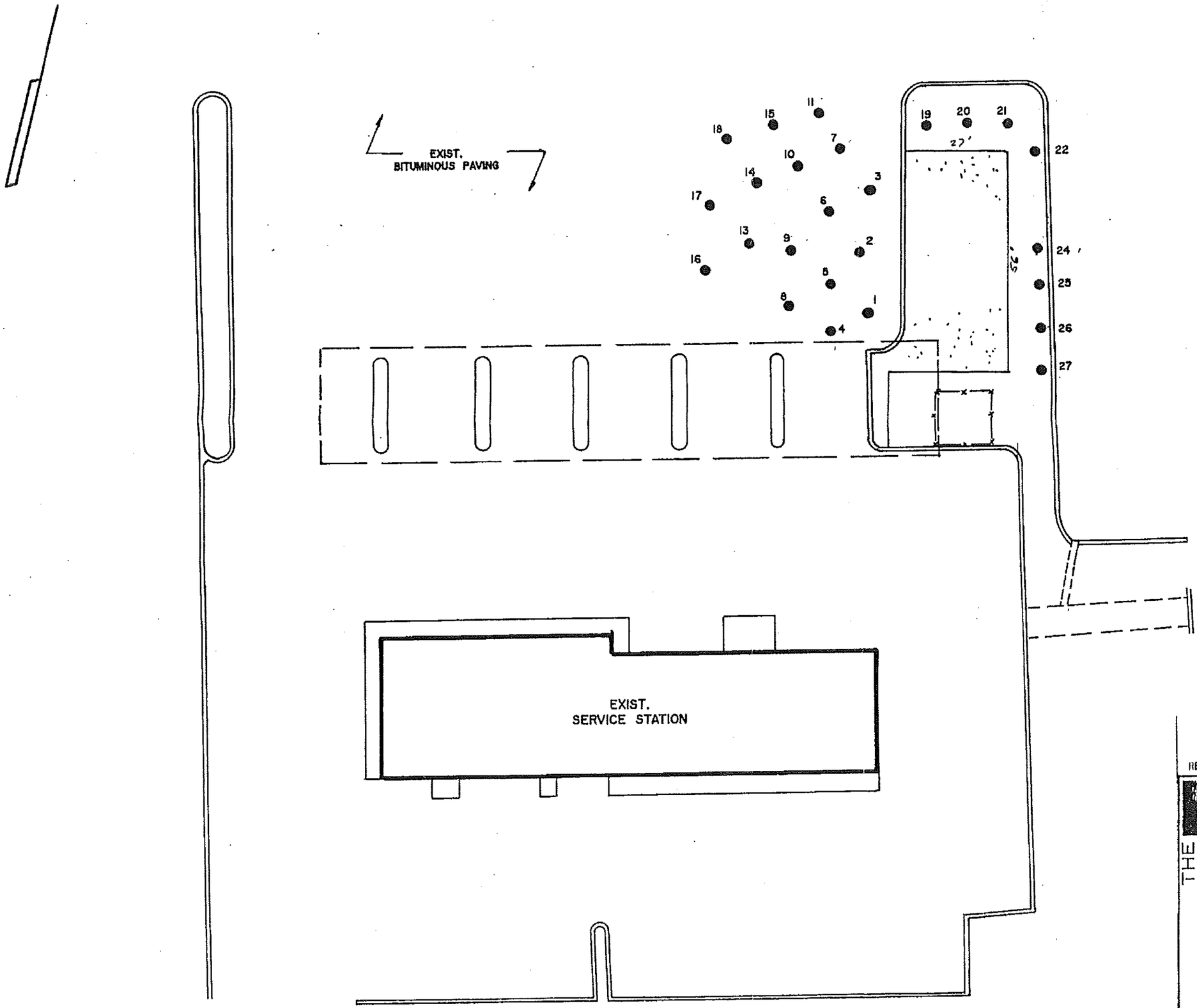
APPENDIX V

TABLE 3
Soil Analysis Summary Data
May 30, 1993

SAMPLE	BENZENE	TOLUENE	XYLENES	ETHYLBENZENE	LEAD	TICs	VOCs*
3701	14	200	500	100	ND	814	1451
3702	5.3	77	232	33	8.89	347.3	675
3703	~10	16	470	63	ND	693	1331
3704	~.73	37	142	28	9.56	287	743.2
3705	9	98	233	38	8.79	378	598
3706	ND	40	147.9	22	9.40	209	442.8
3707	22	220	510	88	8.54	820	1465
3708	~12	140	349	54	12.0	543	980
3709	~5.8	60	139	20	11.4	219	364.3
3710	54	470	900	140	ND	1584	2481
3711	32	300	570	90	9.06	992	1892
3712	ND	100	314	50	12.5	464	912
3713	ND	110	326	51	16.6	487	968
3714	ND	92	287	43	9.2	422	870
3715	~9.3	180	470	78	8.79	728	1288
3716	ND	59	199	32	8.80	290	577.8
3717	ND	51	200	29	8.33	280	657
3718	90	680	1200	200	9.30	2170	2877
3719	20	230	500	77	6.12	827	1242
3720	~3.7	68	184	27	17.9	279	516
3721	ND	71	257	36	ND	364	714
3722	~9.4	200	540	80	17.2	820	1277
3723	60	530	1000	160	11.2	1354	2137
3724	ND	26	130	18	ND	174	493
3725	ND	25	85	15	ND	125	306.7
3726	ND	ND	ND	ND	ND	ND	ND
3727	ND	ND	ND	ND	ND	ND	ND

Results reported in milligrams per kilogram; mg/kg.

* -Does not include J and B compounds.



REV.	DATE	DWN. BY	CHK'D BY	DESC

THE KRYDON GROUP
ENGINEERS . SCIENTIST & PLANNERS
221 W. CLEMENTS BRIDGE RD. BARRINGTON, N.J. 08007
(609) 546 - 5305

SITE PLAN
"SERVICE STATION BLDG. N

FORT MONMOUTH, MONMOUTH COUNTY, NE

DANIEL T. DRISCOLL
N.J. PROFESSIONAL ENGINEER LIC. #GE31990
P.A. PROFESSIONAL ENGINEER LIC. #034664-E

APPENDIX VI

Department of the Army
Fort Monmouth
Main Post Gas Station
Building 699
Eatontown, New Jersey

Pump and Treat System
Performance Summary
January 1998 to April 1999

Date of Visit	1/2/98	1/6/98	1/22/98	2/5/98	2/17/98	3/19/98	3/26/98	4/2/98	4/9/98	5/29/98	6/5/98	6/11/98	6/18/98	6/26/98	7/2/98	7/8/98	7/14/98	7/24/98
GROUNDWATER SYSTEM																		
Interval (Days)	0	4	16	14	12	32	7	7	7	30	7	6	7	8	6	6	6	10
System Status (Up / Down / Off)																		
On Arrival	O	D	D	U	U	U	U	U	U	O	U	U	U	U	U	U	D	U
On Departure	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
FLOW RATES (gpm)																		
Flow Rate on Arrival																		
MW-11 (Total Influent)	0.00	0.00	0.00	2.34	2.51	2.21	1.15	0.82	0.74	0.00	3.76	3.87	3.89	3.79	3.87	3.97	0.00	3.23
GAC Effluent	0.00	0.00	0.00	2.34	2.51	2.21	1.15	0.82	0.74	0.00	3.76	3.87	3.89	3.79	3.87	3.97	0.00	3.23
Flow Rate on Departure																		
MW-11 (Total Influent)	2.21	2.35	2.38	2.34	2.51	2.33	1.55	0.82	0.74	3.81	3.76	3.87	3.89	3.79	3.87	3.97	3.94	3.23
GAC Effluent	2.21	2.35	2.38	2.34	2.51	2.33	1.55	0.82	0.74	3.81	3.76	3.87	3.89	3.79	3.87	3.97	3.94	3.23
Total Gallons Pumped	0	396	710	22,934	44,532	101,261	112,708	123,458	127,346	133,813	145,455	152,953	162,104	173,582	180,721	188,598	190,846	198,788
Gallons Pumped Since Last Visit	0	396	314	22,224	21,598	56,729	11,447	10,750	3,888	6,467	11,642	7,498	9,151	11,478	7,139	7,877	2,248	7,942
Daily Average Flow (gpd)	0	198	39	1,587	1,800	1,773	1,635	1,536	555	808	1,663	1,250	1,307	1,435	1,190	1,313	749	794
SYSTEM PRESSURES (psi)																		
Pressure on Arrival																		
Sediment Filter	9.0	8.0	7.0	7.0	6.0	6.0	5.0	4.0	4.0	N/A	34.0	37.0	36.0	N/A	36.0	36.0	36.0	38.0
GAC1 Influent	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.0	2.0
GAC1 Effluent	2.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	N/A	2.0	2.0	2.0	2.0
GAC2 Influent	2.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	N/A	2.0	2.0	2.0	2.0
GAC2 Effluent	2.0	4.0	4.0	2.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	2.0	2.0	N/A	2.0	2.0	2.0	2.0
GAC3 Influent	2.0	4.0	4.0	2.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	2.0	2.0	N/A	2.0	2.0	2.0	2.0
GAC3 Effluent	0.0	2.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	N/A	0.0	0.0	0.0	0.0
Pressure on Departure																		
Sediment Filter	9.0	8.0	7.0	7.0	6.0	6.0	5.0	4.0	4.0	30.0	34.0	37.0	36.0	N/A	36.0	36.0	36.0	38.0
GAC1 Influent	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.0	2.0
GAC1 Effluent	2.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	N/A	2.0	2.0	2.0	2.0
GAC2 Influent	2.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	N/A	2.0	2.0	2.0	2.0
GAC2 Effluent	2.0	4.0	4.0	2.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	2.0	2.0	N/A	2.0	2.0	2.0	2.0
GAC3 Influent	2.0	4.0	4.0	2.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	2.0	2.0	N/A	2.0	2.0	2.0	2.0
GAC3 Effluent	0.0	2.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	N/A	0.0	0.0	0.0	0.0
GW ANALYTICAL RESULTS (ppb)																		
Influent (ppb)																		
Benzene										4,765.75	4,623.64				5,011.03			
Toluene										3,042.45	2,806.56				2,785.15			
Ethylbenzene										945.67	1,017.51				1,029.23			
Xylene										2,881.72	2,764.26				2,688.37			
Total BTEX										11,635.59	11,211.97				11,513.78			
Effluent (ppb)																		
Benzene										ND	ND				ND			
Toluene										ND	ND				ND			
Ethylbenzene										ND	ND				ND			
Xylene										ND	ND				ND			
Total BTEX										ND	ND				ND			
Mass Removal (lbs/hr)																		
Monthly Mass Removal Rate (gpd)																		
Cumulative Mass Removed (gal)																		

Department of the Army
Fort Monmouth
Main Post Gas Station
Building 699
Eatontown, New Jersey

Pump and Treat System
Performance Summary
January 1998 to April 1999

Date of Visit	7/28/98	8/5/98	8/12/98	8/18/98	8/25/98	9/4/98	9/11/98	9/17/98	9/23/98	10/2/98	10/9/98	10/16/98	10/22/98	10/30/98	11/4/98	11/12/98	11/19/98	11/25/98
GROUNDWATER SYSTEM																		
Interval (Days)	4	8	7	6	7	9	7	6	6	9	7	7	6	8	4	8	7	6
System Status (Up / Down / Off)																		
On Arrival	D	U	U	U	U	U	U	U	U	U	U	U	D	U	U	U	U	U
On Departure	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
FLOW RATES (gpm)																		
Flow Rate on Arrival																		
MW-11 (Total Influent)	0.00	2.90	3.37	3.51	3.58	3.44	3.41	3.35	3.41	3.33	3.34	3.34	0.00	3.45	3.36	3.42	2.96	2.67
GAC Effluent	0.00	2.90	3.37	3.51	3.58	3.44	3.41	3.35	3.41	3.33	3.34	3.34	0.00	3.45	3.36	3.42	2.96	2.67
Flow Rate on Departure																		
MW-11 (Total Influent)	3.20	2.90	3.37	3.51	3.58	3.44	3.41	3.35	3.41	3.33	3.34	3.42	3.32	3.45	3.36	3.42	2.96	2.67
GAC Effluent	3.20	2.90	3.37	3.51	3.58	3.44	3.41	3.35	3.41	3.33	3.34	3.42	3.32	3.45	3.36	3.42	2.96	2.67
Total Gallons Pumped	198,900	209,522	219,192	227,747	237,167	250,709	259,507	266,762	274,149	284,044	291,680	299,596	299,778	307,891	312,934	320,863	326,919	332,029
Gallons Pumped Since Last Visit	112	10,622	9,670	8,555	9,420	13,542	8,798	7,255	7,387	9,895	7,636	7,916	182	8,113	5,043	7,929	6,056	5,110
Daily Average Flow (gpd)	56	1,328	1,381	1,426	1,346	1,505	1,257	1,209	1,231	1,099	1,091	1,131	61	1,014	1,261	991	865	852
SYSTEM PRESSURES (psi)																		
Pressure on Arrival																		
Sediment Filter	40.0	38.0	36.0	36.0	34.0	32.0	32.0	33.0	34.0	34.0	34.0	32.0	34.0	32.0	34.0	32.0	36.0	34.0
GAC1 Influent	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
GAC1 Effluent	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
GAC2 Influent	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
GAC2 Effluent	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
GAC3 Influent	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
GAC3 Effluent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pressure on Departure																		
Sediment Filter	40.0	38.0	36.0	36.0	34.0	32.0	32.0	33.0	34.0	34.0	34.0	32.0	34.0	32.0	34.0	32.0	36.0	34.0
GAC1 Influent	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
GAC1 Effluent	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
GAC2 Influent	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
GAC2 Effluent	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
GAC3 Influent	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
GAC3 Effluent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GW ANALYTICAL RESULTS (ppb)																		
Influent (ppb)																		
Benzene		4,496.13				3,077.36				3,296.54					4,227.78			
Toluene		2,799.17				1,693.03				1,238.67					1,397.20			
Ethylbenzene		1,051.45				692.19				768.98					810.93			
Xylene		3,174.47				2,049.41				1,757.07					1,873.96			
Total BTEX		11,521.22				7,511.99				7,061.26					8,309.87			
Effluent (ppb)																		
Benzene		0.91				ND				ND					ND			
Toluene		ND				ND				ND					ND			
Ethylbenzene		ND				ND				ND					ND			
Xylene		ND				ND				ND					ND			
Total BTEX		0.91				ND				ND					ND			
Mass Removal (lbs/hr)																		
Monthly Mass Removal Rate (gpd)																		
Cumulative Mass Removed (gal)																		

Departme[illegible] the Army
Fort M[illegible]mouth
Main Post Gas Station
Building 699
Eatontown, New Jersey

Pump and Treat System
Performance Summary
January 1998 to April 1999

Date of Visit	12/4/98	12/15/98	1/22/99	1/29/99	2/5/99	2/12/99	2/19/99	2/24/99	3/4/99	3/11/99	3/19/99	3/26/99	3/30/99	4/9/99
GROUNDWATER SYSTEM														
Interval (Days)	9	11	38	7	7	7	7	5	8	7	7	7	4	10
System Status (Up / Down / Off)														
On Arrival	U	D	O	U	U	U	U	U	U	O	U	U	U	U
On Departure	U	O	U	U	U	U	U	U	U	U	U	U	U	U
FLOW RATES (gpm)														
Flow Rate on Arrival														
MW-11 (Total Influent)	3.16	0.00	0.00	2.45	2.57	2.96	2.91	2.92	2.78	0.00	2.87	2.99	3.07	3.08
GAC Effluent	3.16	0.00	0.00	2.45	2.57	2.96	2.91	2.92	2.78	0.00	2.87	2.99	3.07	3.08
Flow Rate on Departure														
MW-11 (Total Influent)	3.16	0.00	2.75	2.45	2.57	2.96	2.91	2.92	2.78	2.82	2.87	2.99	3.07	3.08
GAC Effluent	3.16	0.00	2.75	2.45	2.57	2.96	2.91	2.92	2.78	2.82	2.87	2.99	3.07	3.08
Total Gallons Pumped	337,681	337,869	337,877	345,956	355,194	365,709	377,248	385,917	399,598	410,461	424,631	434,518	440,621	454,981
Gallons Pumped Since Last Visit	5,652	188	8	8,079	9,238	10,515	11,539	8,669	13,681	10,863	14,170	9,887	6,103	14,360
Daily Average Flow (gpd)	628	17	8	1,154	1,320	1,502	1,648	1,734	1,710	1,552	2,024	1,412	1,526	1,436
SYSTEM PRESSURES (psi)														
Pressure on Arrival														
Sediment Filter	30.0	N/A	38.0	38.0	36.0	36.0	36.0	35.0	36.0	38.0	38.0	36.0	25.0	30.0
GAC1 Influent	2.0	N/A	4.0	2.0	2.0	2.0	2.0	2.0	2.0	N/A	5.0	2.0	2.0	2.0
GAC1 Effluent	2.0	N/A	3.0	2.0	2.0	2.0	2.0	2.0	2.0	N/A	5.0	2.0	2.0	2.0
GAC2 Influent	2.0	N/A	3.0	2.0	2.0	2.0	2.0	2.0	2.0	N/A	5.0	2.0	2.0	2.0
GAC2 Effluent	2.0	N/A	2.0	2.0	2.0	2.0	2.0	2.0	2.0	N/A	5.0	2.0	2.0	2.0
GAC3 Influent	2.0	N/A	2.0	2.0	2.0	2.0	2.0	2.0	2.0	N/A	5.0	2.0	2.0	2.0
GAC3 Effluent	0.0	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	N/A	0.0	0.0	0.0	0.0
Pressure on Departure														
Sediment Filter	30.0	N/A	38.0	38.0	36.0	36.0	36.0	35.0	36.0	38.0	23.0	36.0	25.0	30.0
GAC1 Influent	2.0	N/A	4.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0	2.0
GAC1 Effluent	2.0	N/A	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0	2.0
GAC2 Influent	2.0	N/A	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0	2.0
GAC2 Effluent	2.0	N/A	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0	2.0
GAC3 Influent	2.0	N/A	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0	2.0
GAC3 Effluent	0.0	N/A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0
GW ANALYTICAL RESULTS (ppb)														
Influent (ppb)														
Benzene			2,619.55		3,500.40				3,141.57					
Toluene			616.31		1,136.56				1,369.48					
Ethylbenzene			347.89		738.96				718.54					
Xylene			2,327.21		1,611.62				1,731.08					
Total BTEX			5,910.96		6,987.54				6,960.67					
Effluent (ppb)														
Benzene			ND		ND				ND					
Toluene			ND		ND				ND					
Ethylbenzene			ND		ND				ND					
Xylene			ND		ND				ND					
Total BTEX			ND		ND				ND					
Mass Removal (lbs/hr)														
Monthly Mass Removal Rate (gpd)														
Cumulative Mass Removed (gal)														

APPENDIX VII

Data Log — Ft Monmouth

Test Start: 4/17/98 11:19:45 — GW Pump/VEGE/Air Sparge — Test 2

elapsed time (sec)	MP-3(15ft) Press Resp (in WC)	MP-5(12ft) Press Resp (in WC)	MP-4 (9ft) Press Resp (in WC)	MP-2(6ft) Press Resp (in WC)	MP-1(3ft) Press Resp (in WC)	Casing Vacuum (inHg)	Pw+ (psi)	MP-3(15ft) GW DD (feet)	MP-5(12ft) GW DD (feet)	MP-4 (9ft) GW DD (feet)	MP-2(6ft) GW DD (feet)	MP-1 GW DD (feet)	RW-2 GW DD (feet)	IW Flow (scfm)	LoVac Air Flow (scfm)
5	0.00	0.01	0.05	-0.24	-0.29	0.04	0.00	0.61	0.72	0.68	0.00	-0.04	0.11	0.00	104.13
10	0.00	0.01	0.05	-0.23	-0.29	0.05	0.00	0.61	0.72	0.68	0.00	-0.04	0.17	0.00	103.84
15	0.00	0.01	0.05	-0.24	-0.30	0.04	0.00	0.61	0.72	0.68	0.01	-0.04	1.81	0.00	121.05
20	0.00	0.01	0.05	-0.24	-0.30	0.04	0.00	0.61	0.72	0.68	0.01	-0.04	2.33	0.00	203.02
25	0.00	0.01	0.05	-0.22	-0.29	0.03	0.00	0.61	0.71	0.68	0.00	-0.06	1.31	0.00	202.96
30	0.00	0.01	0.05	-0.22	-0.29	0.05	0.00	0.61	0.72	0.68	0.00	-0.04	0.66	0.00	199.17
35	0.00	0.01	0.05	-0.22	-0.29	0.05	0.00	0.61	0.72	0.68	0.00	-0.04	0.50	0.00	173.15
40	0.00	0.01	0.05	-0.22	-0.31	0.05	0.00	0.61	0.71	0.68	0.00	-0.06	0.53	0.00	150.39
45	0.00	0.01	0.05	-0.23	-0.32	0.02	0.00	0.61	0.72	0.68	0.00	-0.05	0.35	0.00	132.04
50	0.00	0.01	0.05	-0.24	-0.34	5.63	0.00	0.61	0.71	0.68	0.00	-0.05	0.22	0.00	121.19
55	0.01	0.01	0.05	-0.26	-0.35	5.63	0.00	0.60	0.71	0.67	-0.01	-0.05	0.25	0.00	100.60
60	0.01	0.01	0.05	-0.28	-0.40	5.59	0.00	0.61	0.72	0.68	0.01	-0.05	0.16	0.00	82.00
65	0.01	0.01	0.05	-0.30	-0.43	5.54	0.00	0.61	0.71	0.67	0.01	-0.06	0.11	0.00	66.05
70	0.01	0.01	0.05	-0.30	-0.43	5.54	0.00	0.61	0.72	0.68	0.00	-0.06	0.15	0.00	51.91
75	0.01	0.01	0.05	-0.35	-0.48	5.55	0.00	0.60	0.71	0.68	0.01	-0.06	0.16	0.00	38.59
80	0.01	0.01	0.05	-0.38	-0.55	5.52	0.00	0.61	0.72	0.68	0.01	-0.06	0.17	0.00	31.81
85	0.01	0.01	0.05	-0.41	-0.56	5.47	0.00	0.61	0.72	0.68	0.01	-0.06	0.11	0.00	17.24
90	0.01	0.01	0.05	-0.44	-0.60	5.49	0.00	0.61	0.71	0.67	0.00	-0.09	0.10	0.00	0.00
95	0.01	0.01	0.05	-0.48	-0.64	5.48	0.00	0.60	0.71	0.68	0.00	-0.08	0.15	0.00	0.00
100	0.01	0.01	0.05	-0.51	-0.68	5.46	0.00	0.60	0.72	0.68	0.02	-0.09	0.13	0.00	0.00
105	0.01	0.01	0.05	-0.54	-0.72	5.46	0.00	0.61	0.72	0.68	0.01	-0.09	0.14	0.00	0.00
110	0.01	0.01	0.05	-0.58	-0.76	5.45	0.00	0.61	0.72	0.68	0.03	-0.09	0.12	0.00	0.00
115	0.01	0.01	0.05	-0.61	-0.79	5.39	0.00	0.60	0.72	0.68	0.02	-0.09	0.11	0.00	0.00
120	0.01	0.01	0.05	-0.64	-0.83	5.25	0.00	0.61	0.72	0.68	0.03	-0.09	0.00	0.00	0.00
125	0.01	0.01	0.05	-0.64	-0.83	5.25	0.00	0.60	0.71	0.68	0.02	-0.10	0.12	0.00	0.00
130	0.01	0.01	0.05	-0.70	-0.89	5.39	0.00	0.60	0.71	0.68	0.02	-0.10	0.12	0.00	0.00
135	0.01	0.01	0.05	-0.72	-0.91	5.40	0.00	0.61	0.72	0.68	0.04	-0.10	0.17	0.00	0.00
140	0.01	0.01	0.05	-0.75	-0.94	5.38	0.00	0.61	0.72	0.68	0.03	-0.10	0.11	0.00	0.00
145	0.01	0.01	0.05	-0.78	-0.97	5.39	0.00	0.60	0.71	0.68	0.04	-0.11	0.12	0.00	0.00
150	0.01	0.01	0.05	-0.81	-1.01	5.40	0.00	0.60	0.71	0.67	0.04	-0.11	0.12	0.00	0.00
155	0.01	0.01	0.05	-0.83	-1.03	5.37	0.00	0.61	0.72	0.67	0.04	-0.11	0.10	0.00	0.00
160	0.01	0.01	0.05	-0.86	-1.06	5.38	0.00	0.61	0.72	0.68	0.04	-0.12	0.18	0.00	0.00
165	0.00	0.01	0.05	-0.88	-1.10	5.29	0.00	0.61	0.72	0.68	0.05	-0.11	0.10	0.00	0.00
170	0.00	0.01	0.05	-0.90	-1.11	5.29	0.00	0.61	0.72	0.67	0.05	-0.12	0.10	0.00	0.00
175	0.01	0.01	0.05	-0.92	-1.14	5.29	0.00	0.61	0.71	0.67	0.06	-0.12	0.12	0.00	0.00
180	0.01	0.01	0.05	-0.94	-1.16	5.31	0.00	0.60	0.71	0.66	0.06	-0.12	0.15	0.00	0.00
185	0.01	0.01	0.05	-0.94	-1.16	5.31	0.00	0.60	0.71	0.66	0.06	-0.12	0.16	0.00	0.00
190	0.01	0.01	0.05	-0.97	-1.20	5.27	0.00	0.60	0.71	0.65	0.06	-0.13	0.10	0.00	0.00
195	0.01	0.01	0.05	-0.99	-1.19	5.08	0.00	0.60	0.71	0.66	0.07	-0.14	-0.01	0.00	0.00
200	0.01	0.01	0.05	-1.00	-1.21	5.27	0.00	0.60	0.71	0.64	0.07	-0.14	0.23	0.00	0.00
205	0.01	0.01	0.05	-1.02	-1.23	5.28	0.00	0.60	0.72	0.65	0.07	-0.14	0.19	0.00	0.00
210	0.01	0.01	0.05	-1.03	-1.25	5.28	0.00	0.60	0.71	0.64	0.09	-0.13	0.18	0.00	0.00
215	0.01	0.01	0.05	-1.05	-1.26	5.23	0.00	0.61	0.72	0.63	0.09	-0.14	0.11	0.00	0.00
220	0.01	0.01	0.05	-1.06	-1.29	5.25	0.00	0.60	0.71	0.63	0.09	-0.14	0.16	0.00	0.00
225	0.01	0.01	0.05	-1.08	-1.29	5.23	0.00	0.61	0.72	0.63	0.10	-0.15	0.17	0.00	0.00
230	0.00	0.01	0.05	-1.10	-1.33	5.25	0.00	0.60	0.72	0.62	0.09	-0.14	0.23	0.00	0.00
235	0.00	0.01	0.05	-1.12	-1.36	5.23	0.00	0.61	0.72	0.63	0.11	-0.14	0.18	0.00	0.00
240	0.00	0.01	0.05	-1.13	-1.38	5.23	0.00	0.61	0.72	0.62	0.11	-0.14	0.15	0.00	0.00
245	-0.01	0.01	0.05	-1.15	-1.38	4.84	0.00	0.61	0.72	0.63	0.13	-0.14	-0.13	0.00	0.00
250	0.00	0.01	0.05	-1.16	-1.39	5.17	0.00	0.61	0.72	0.61	0.13	-0.14	0.22	0.00	0.00
255	0.00	0.01	0.05	-1.16	-1.39	5.17	0.00	0.61	0.72	0.61	0.13	-0.15	0.23	0.00	0.00
260	-0.01	0.01	0.05	-1.18	-1.43	5.20	0.00	0.61	0.72	0.61	0.13	-0.15	0.24	0.00	0.00
265	-0.01	0.01	0.05	-1.18	-1.43	5.20	0.00	0.61	0.72	0.60	0.13	-0.14	-0.23	0.00	0.00
270	-0.01	0.01	0.05	-1.20	-1.45	5.16	0.00	0.60	0.72	0.60	0.14	-0.15	0.24	0.00	0.00
275	-0.02	0.01	0.05	-1.22	-1.47	5.16	0.00	0.61	0.72	0.59	0.14	-0.16	0.20	0.00	0.00
280	-0.02	0.01	0.05	-1.24	-1.49	5.17	0.00	0.60	0.72	0.59	0.14	-0.15	0.26	0.00	0.00
285	-0.02	0.01	0.05	-1.25	-1.49	5.16	0.00	0.60	0.71	0.59	0.15	-0.15	0.21	0.00	5.43
290	-0.02	0.01	0.05	-1.25	-1.51	5.17	0.00	0.60	0.71	0.59	0.15	-0.15	0.28	0.00	8.58
295	-0.02	0.01	0.05	-1.27	-1.53	5.18	0.00	0.61	0.72	0.58	0.15	-0.15	0.31	0.00	0.00
300	-0.03	0.01	0.05	-1.29	-1.54	5.14	0.00	0.60	0.71	0.57	0.16	-0.15	0.28	0.00	0.00
305	-0.03	0.01	0.05	-1.29	-1.55	5.14	0.00	0.60	0.71	0.57	0.16	-0.15	0.33	0.00	0.00
310	-0.03	0.01	0.05	-1.30	-1.56	5.15	0.00	0.60	0.71	0.56	0.17	-0.14	0.29	0.00	0.00
315	-0.04	0.00	0.05	-1.32	-1.59	5.11	0.00	0.60	0.71	0.56	0.17	-0.13	0.32	0.00	0.00
320	-0.04	0.00	0.05	-1.34	-1.61	5.12	0.00	0.61	0.71	0.56	0.18	-0.13	0.30	0.00	0.00
325	-0.04	0.00	0.05	-1.34	-1.61	5.12	0.00	0.61	0.71	0.56	0.18	-0.13	0.12	0.00	0.00
330	-0.05	-0.01	0.05	-1.37	-1.64	5.06	0.00	0.61	0.72	0.55	0.20	-0.12	0.35	0.00	0.00
335	-0.05	-0.01	0.05	-1.38	-1.66	5.09	0.00	0.61	0.72	0.55	0.20	-0.12	0.40	0.00	0.00
340	-0.05	-0.01	0.05	-1.38	-1.66	5.11	0.00	0.61	0.72	0.55	0.20	-0.12	0.43	0.00	0.00
345	-0.05	-0.01	0.05	-1.40	-1.67	5.10	0.00	0.61	0.72	0.54	0.21	-0.13	0.41	0.00	0.00
350	-0.06	-0.01	0.05	-1.41	-1.69	5.08	0.00	0.59	0.71	0.54	0.20	-0.13	0.41	0.00	0.00
355	-0.06	-0.01	0.05	-1.42	-1.70	5.06	0.00	0.60	0.71	0.53	0.21	-0.12	0.41	0.00	0.00
360	-0.07	-0.01	0.05	-1.44	-1.73	5.10	0.00	0.61	0.72	0.53	0.22	-0.11	0.46	0.00	0.00
365	-0.07	-0.01	0.05	-1.45	-1.73	5.07	0.00	0.61	0.72	0.53	0.23	-0.11	0.52	0.00	0.00
370	-0.07	-0.02	0.05	-1.45	-1.74	5.05	0.00	0.60	0.72	0.53	0.24	-0.11	0.49	0.00	0.00
375	-0.07	-0.02	0.05	-1.46	-1.75	5.03	0.00	0.60	0.72	0.52	0.24	-0.11	0.49	0.00	0.00
380	-0.07	-0.02	0.05	-1.47	-1.75	5.05	0.00	0.60	0.71	0.51	0.23	-0.12	0.53	0.00	0.00
385	-0.07	-0.02	0.05	-1.48	-1.76	5.05	0.00	0.60	0.71	0.51	0.24	-0.11	0.52	0.00	0.00
390	-0.07	-0.02	0.05	-1.48	-1.78	5.03	0.00	0.60	0.73	0.51	0.25	-0.10	0.54	0.00	7.66
395	-0.07	-0.02	0.05	-1.48	-1.78	5.03	0.00	0.60	0.72	0.50	0.25	-0.10	0.56	0.00	12.12
400	-0.08	-0.02	0.05	-1.51	-1.80	5.05	0.00	0.61	0.71	0.50	0.25	-0.10	0.59	0.00	0.00
405	-0.08	-0.01	0.05	-1.51	-1.80	5.04	0.00	0.61	0.72	0.49	0.26	-0.10	0.59	0.00	0.00

Data Log — Ft Monmouth

Test Start: 4/17/98 11:19:45 GW Pump/VEGE/Air Sparge Test 2

elapsed time (sec)	MP-3(15ft) Press Resp (in WC)	MP-5(12ft) Press Resp (in WC)	MP-4 (9ft) Press Resp (in WC)	MP-2(6ft) Press Resp (in WC)	MP-1(3ft) Press Resp (in WC)	Casing Vacuum (inHg)	Pw+ (psi)	MP-3(15ft) GW DD (feet)	MP-5(12ft) GW DD (feet)	MP-4 (9ft) GW DD (feet)	MP-2(6ft) GW DD (feet)	MP-1 GW DD (feet)	RW-2 GW DD (feet)	IW Flow (scfm)	LoVac Air Flow (scfm)
410	-0.08	-0.01	0.05	-1.52	-1.83	5.03	0.00	0.61	0.71	0.49	0.26	-0.10	0.59	0 00	0.00
415	-0.08	-0.01	0.05	-1.52	-1.83	5.03	0.00	0.60	0.71	0.48	0.26	-0.10	0.60	0 00	0.00
420	-0.09	-0.01	0.05	-1.55	-1.85	4.79	0.00	0.60	0.71	0.48	0.26	-0.10	0.38	0 00	0.00
425	-0.09	-0.01	0.05	-1.56	-1.86	5.01	0.00	0.61	0.72	0.48	0.27	-0.09	0.65	0.00	0.00
430	-0.09	-0.01	0.05	-1.56	-1.86	5.01	0.00	0.61	0.72	0.49	0.28	-0.09	0.63	0.00	0.00
435	-0.09	-0.01	0.05	-1.57	-1.88	5.02	0.00	0.60	0.71	0.47	0.28	-0.10	0.65	0 00	0.00
440	-0.09	-0.01	0.05	-1.58	-1.88	5.00	0.00	0.59	0.72	0.47	0.28	-0.10	0.65	0 00	0.00
445	-0.10	-0.01	0.05	-1.59	-1.88	5.00	0.00	0.60	0.71	0.46	0.28	-0.10	0.66	0 00	0.00
450	-0.10	-0.01	0.05	-1.60	-1.92	5.02	0.00	0.60	0.71	0.47	0.28	-0.09	0.70	0 00	0.00
455	-0.11	-0.02	0.05	-1.62	-1.95	4.99	0.00	0.60	0.71	0.46	0.29	-0.09	0.69	0.00	0.00
460	-0.11	-0.02	0.05	-1.63	-1.94	4.98	0.00	0.59	0.72	0.45	0.30	-0.09	0.71	0 00	0 00
465	-0.11	-0.02	0.05	-1.62	-1.95	4.97	0.00	0.59	0.72	0.45	0.30	-0.08	0.71	0.00	0.00
470	-0.11	-0.02	0.05	-1.63	-1.95	5.00	0.00	0.58	0.71	0.44	0.30	-0.08	0.71	0 00	0 00
475	-0.12	-0.03	0.05	-1.65	-1.98	4.97	0.00	0.57	0.71	0.44	0.30	-0.09	0.74	0 00	0.00
480	-0.12	-0.03	0.05	-1.66	-1.99	4.99	0.00	0.57	0.72	0.44	0.30	-0.08	0.74	0.00	0.00
485	-0.12	-0.03	0.05	-1.66	-1.98	4.98	0.00	0.57	0.72	0.44	0.32	-0.07	0.60	0.00	0 00
490	-0.12	-0.03	0.05	-1.66	-1.98	4.98	0.00	0.55	0.71	0.43	0.31	-0.07	0.77	0.00	0.00
495	-0.13	-0.03	0.05	-1.68	-2.00	4.96	0.00	0.54	0.72	0.42	0.31	-0.07	0.81	0 00	0.00
500	-0.13	-0.03	0.04	-1.70	-2.04	4.95	0.00	0.54	0.71	0.42	0.32	-0.07	0.79	0.00	0.00
505	-0.14	-0.04	0.04	-1.58	-1.98	4.95	0.00	0.53	0.72	0.42	0.33	-0.06	0.81	0.00	0.00
510	-0.14	-0.03	0.05	-1.41	-1.92	4.96	0.00	0.53	0.71	0.41	0.33	-0.06	0.82	0.00	0.00
515	-0.14	-0.03	0.05	-1.33	-1.92	4.95	0.00	0.51	0.71	0.41	0.34	-0 06	0.84	0.00	0.00
520	-0.14	-0.04	0.04	-1.24	-1.90	4.84	0.00	0.51	0.71	0.40	0.36	-0.05	0.78	0.00	0.00
525	-0.14	-0.06	0.05	-1.20	-1.88	4.94	0.00	0.50	0.72	0.40	0.37	-0 06	0.87	0.00	0 00
530	-0.14	-0.06	0.05	-1.21	-1.92	4.95	0.00	0.50	0.71	0.39	0.37	-0.05	0.88	0.00	0.00
535	-0.14	-0.06	0.04	-1.15	-1.90	4.95	0.00	0.49	0.72	0.39	0.38	-0.03	0.89	0 00	0 00
540	-0.15	-0.06	0.04	-1.12	-1.89	4.94	0.00	0.48	0.72	0.39	0.38	-0.04	0.90	0 00	0 00
545	-0.15	-0.06	0.04	-1.12	-1.89	4.92	0.00	0.48	0.71	0.39	0.38	-0 04	0.90	0 00	0 00
550	-0.15	-0.05	0.04	-1.09	-1.89	4.94	0.00	0.47	0.72	0.39	0.39	-0.04	0.98	0.00	0.00
555	-0.15	-0.05	0.04	-1.06	-1.90	4.93	0.00	0.46	0.71	0.37	0.39	-0 04	1.02	0 00	0 00
560	-0.15	-0.05	0.04	-1.04	-1.88	4.44	0.00	0.46	0.72	0.38	0.41	-0.04	0.59	0 00	0.00
565	-0.15	-0.05	0.04	-1.03	-1.89	4.94	0.00	0.44	0.71	0.37	0.41	-0.03	1.04	0.00	0 00
570	-0.16	-0.05	0.03	-1.03	-1.90	4.77	0.00	0.44	0.72	0.37	0.41	-0.02	0.88	0 00	19.83
575	-0.16	-0.05	0.03	-1.02	-1.90	4.95	0.00	0.43	0.71	0.36	0.41	-0.03	1.05	0 00	0 00
580	-0.16	-0.05	0.03	-1.02	-1.90	4.92	0.00	0.43	0.72	0.36	0.42	-0.03	1.02	0 00	26.77
585	-0.16	-0.04	0.03	-1.01	-1.91	4.95	0.00	0.42	0.72	0.35	0.43	-0.02	1.01	0 00	27.32
590	-0.16	-0.04	0.03	-1.02	-1.93	4.94	0.00	0.41	0.71	0.35	0.42	-0.03	1.04	0.00	22.95
595	-0.17	-0.04	0.02	-1.03	-1.94	4.93	0.00	0.41	0.73	0.35	0.44	-0 01	1.07	0 00	20.24
600	-0.17	-0.04	0.03	-1.03	-1.94	4.93	0.00	0.40	0.71	0.34	0.44	-0.03	1.02	0 00	14 31
660	-0.18	-0.07	0.02	-1.11	-2.06	4.89	0.00	0.31	0.72	0.30	0.48	0.01	1.23	0 00	0.00
720	-0.18	-0.05	0.02	-1.07	-2.44	4.85	0.00	0.22	0.71	0.25	0.51	0.00	1.50	0.00	3.82
780	-0.19	-0.05	0.03	-1.16	-2.74	4.82	0.00	0.14	0.71	0.20	0.54	0.03	1.76	0.00	0.00
840	-0.19	-0.06	0.02	-1.25	-2.97	4.83	0.00	0.06	0.72	0.15	0.59	0.06	2.15	0.00	15.28
900	-0.21	-0.06	0.01	-1.72	-3.26	4.78	0.00	-0.03	0.72	0.11	0.59	0.07	2.66	0 00	6.61
960	-0.23	-0.07	0.01	-2.00	-3.59	4.80	0.00	-0.10	0.72	0.06	0.59	0.06	2.90	0.00	6.61
1020	-0.22	-0.06	0.03	-2.00	-3.82	4.76	0.00	-0.18	0.72	0.01	0.59	0.09	3.06	0 00	0.00
1080	-0.20	-0.05	0.05	-2.00	-4.10	4.75	0.00	-0.26	0.72	-0.02	0.59	0.11	3.05	0.00	12.65
1140	-0.17	-0.04	0.05	-2.00	-4.29	4.75	0.00	-0.34	0.67	-0.07	0.60	0.11	2.08	0.00	0.00
1200	-0.18	-0.05	0.05	-2.00	-4.43	4.73	0.00	-0.42	0.58	-0.12	0.61	0.12	2.13	0.00	0.00
1260	-0.22	-0.07	0.05	-2.00	-4.68	4.74	0.00	-0.48	0.48	-0.17	0.62	0.13	2 01	0 00	10.79
1320	-0.22	-0.07	0.05	-2.00	-4.80	4.70	0.00	-0.56	0.39	-0.23	0.63	0 14	2.84	0.00	0.00
1380	-0.26	-0.09	0.05	-0.02	-5.00	4.72	0.00	-0.62	0.31	-0.27	0.65	0.17	3.10	0.00	0.00
1440	-0.27	-0.02	0.05	-2.00	-5.14	4.71	0.00	-0.69	0.23	-0.32	0.66	0.19	3.10	0.00	0.00
1500	-0.28	-0.07	0.05	-4.55	-5.25	4.69	0.00	-0.75	0.12	-0.36	0.67	0.20	3.08	0.00	5.39
1560	-0.27	-0.07	0.05	-4.64	-5.34	4.70	0.00	-0.82	0.03	-0.40	0.68	0.23	2.85	0.00	17 88
1620	-0.28	-0.08	0.05	-4.77	-5.49	4.71	0.00	-0.88	-0.05	-0.45	0.70	0.25	3 12	0.00	0 00
1680	-0.31	-0.08	0.05	-4.89	-5.65	4.70	0.00	-0.94	-0.14	-0.50	0.70	0.26	2.56	0.00	0 00
1740	-0.32	-0.08	0.05	-5.02	-5.71	4.69	0.00	-1.00	-0.22	-0.53	0.71	0 28	3.10	0.00	0 00
1800	-0.32	-0.07	0.05	-5.04	-5.74	4.66	0.00	-1.07	-0.30	-0.58	0.73	0 29	3.09	0.00	0.00
1860	-0.31	-0.07	0.05	-5.06	-5.82	4.69	0.00	-1.12	-0.40	-0.61	0.74	0.31	3.07	0 00	5.39
1920	-0.32	-0.07	0.05	-5.20	-5.91	4.65	0.00	-1.17	-0.48	-0.66	0.75	0.33	2.76	0.00	0.00
1980	-0.34	-0.07	0.05	-5.23	-6.02	4.69	0.00	-1.24	-0.58	-0.70	0.75	0.35	3.07	0 00	9.33
2040	-0.34	-0.07	0.05	-5.30	-6.11	4.66	0.00	-1.29	-0.66	-0.74	0.76	0.35	2.59	0 00	0.00
2100	-0.35	-0.08	0.05	-5.37	-6.18	4.66	0.00	-1.34	-0.74	-0.77	0.78	0.38	3.08	0.00	0 00
2160	-0.36	-0.07	0.05	-5.36	-6.10	4.68	0.00	-1.39	-0.84	-0.81	0.78	0.39	3.09	0.00	0 00
2220	-0.36	-0.08	0.05	-5.33	-6.11	4.66	0.00	-1.44	-0.90	-0.85	0.80	0.41	3.00	0.00	0.00
2280	-0.38	-0.08	0.05	-5.38	-6.19	4.70	0.00	-1.49	-0.99	-0.88	0.81	0.42	2.56	0.00	0 00
2340	-0.38	-0.08	0.04	-5.45	-6.39	4.71	0.00	-1.54	-1.07	-0.92	0.82	0 43	2.36	0.00	17.88
2400	-0.39	-0.07	0.05	-5.52	-6.45	4.68	0.00	-1.59	-1.15	-0.96	0.82	0.44	2.84	0.00	0.00
2460	-0.39	-0.07	0.04	-5.66	-6.57	4.65	0.00	-1.63	-1.21	-0.99	0.82	0.44	3.08	0.00	0.00
2520	-0.39	-0.07	0.05	-5.73	-6.67	4.70	0.00	-1.69	-1.30	-1.03	0.83	0.46	2 74	0.00	0 00
2580	-0.39	-0.07	0.03	-5.81	-6.79	4.71	0.00	-1.72	-1.37	-1.06	0.84	0.46	2.42	0.00	17 05
2640	-0.40	-0.07	0.03	-5.90	-6.91	4.73	0.00	-1.77	-1.44	-1.10	0.83	0.47	2.09	0.00	20.18
2700	-0.39	-0.06	0.04	-6.01	-7.03	4.72	0.00	-1.81	-1.51	-1.13	0.83	0.47	1.95	0.00	0.00
2760	-0.40	-0.07	0.03	-6.07	-7.20	4.73	0.00	-1.86	-1.56	-1.17	0.84	0.47	1.85	0.00	0.00
2820	-0.41	-0.07	0.02	-6.15	-7.28	4.72	0.00	-1.90	-1.63	-1.20	0.84	0 48	1.77	0 00	0 00
2880	-0.42	-0.07	0.01	-6.25	-7.41	4.75	0.00	-1.92	-1.68	-1.22	0.85	0.49	1.70	0.00	0.00
2940	-0 44	-0.08	-0.01	-6.32	-7.56	4.74	0.00	-1.95	-1.75	-1.25	0.87	0.52	1.66	0.00	0 00
3000	-0.45	-0.08	-0.01	-6.42	-7.72	4.76	0.00	-2.00	-1.79	-1.29	0.86	0.52	1.61	0.00	0 00
3060	-0.47	-0.08	-0.02	-6.53	-7.82	4.74	0.00	-2.01	-1.83	-1.30	0.88	0.52	1.56	0.00	0 00
3120	-0.49	-0.09	-0.04	-6.66	-8.01	4.78	0.00	-2.06	-1.89	-1.34	0.87	0 53	1.51	0 00	0 00

Data Log — Ft Monmouth

Test Start: 4/17/98 11:19:45 GW Pump/VEGE/Air Sparge Test 2

elapsed time (sec)	MP-3(15ft) Press Resp (in WC)	MP-5(12ft) Press Resp (in WC)	MP-4 (9ft) Press Resp (in WC)	MP-2(6ft) Press Resp (in WC)	MP-1(3ft) Press Resp (in WC)	Casing Vacuum (inHg)	Pw+ (psi)	MP-3(15ft) GW DD (feet)	MP-5(12ft) GW DD (feet)	MP-4 (9ft) GW DD (feet)	MP-2(6ft) GW DD (feet)	MP-1 GW DD (feet)	RW-2 GW DD (feet)	IW Flow (scfm)	LoVac Air Flow (scfm)
3180	-0.50	-0.09	-0.04	-6.19	-8.09	4.76	0.00	-2.07	-1.94	-1.37	0.90	0.55	1.46	0.00	0.00
3240	-0.50	-0.08	0.00	-6.07	-8.12	4.76	0.00	-2.11	-1.98	-1.41	0.91	0.55	1.52	0.00	0.00
3300	-0.50	-0.09	-0.03	-6.02	-8.26	4.74	0.00	-2.14	-2.02	-1.44	0.93	0.55	1.46	0.00	0.00
3360	-0.50	-0.09	-0.04	-6.03	-8.34	4.75	0.00	-2.17	-2.06	-1.47	0.94	0.55	1.49	0.00	0.00
3420	-0.50	-0.08	-0.03	-5.99	-8.42	4.77	0.00	-2.19	-2.11	-1.50	0.94	0.55	1.48	0.00	0.00
3480	-0.50	-0.07	-0.03	-6.00	-8.48	4.76	0.00	-2.22	-2.16	-1.53	0.94	0.55	1.50	0.00	0.00
3540	-0.50	-0.09	-0.05	-6.04	-8.60	4.77	0.00	-2.25	-2.17	-1.57	0.94	0.56	1.49	0.00	0.00
3600	-0.50	-0.08	-0.02	-6.02	-8.64	4.77	0.00	-2.26	-2.22	-1.59	0.96	0.56	1.46	0.00	0.00
3660	-0.50	-0.09	-0.06	-6.06	-8.69	4.76	0.00	-2.29	-2.25	-1.62	0.95	0.57	1.46	0.00	0.00
3720	-0.50	-0.07	-0.03	-6.06	-8.74	4.78	0.00	-2.31	-2.29	-1.65	0.95	0.54	1.46	0.00	0.00
3780	-0.50	-0.06	-0.03	-6.10	-8.79	4.77	0.00	-2.33	-2.32	-1.68	0.95	0.56	1.42	0.00	0.00
3840	-0.50	-0.07	-0.03	-6.07	-8.73	4.79	0.00	-2.36	-2.34	-1.70	0.96	0.56	1.48	0.00	0.00
3900	-0.50	-0.06	-0.03	-6.06	-8.70	4.76	0.00	-2.38	-2.38	-1.72	0.97	0.57	1.49	0.00	0.00
3960	-0.50	-0.04	0.00	-6.02	-8.72	4.79	0.00	-2.39	-2.40	-1.74	0.97	0.58	1.46	0.00	0.00
4020	-0.50	-0.05	-0.02	-6.04	-8.78	4.79	0.00	-2.41	-2.43	-1.77	0.98	0.57	1.45	0.00	3.82
4080	-0.50	-0.06	-0.02	-6.20	-8.82	4.80	0.00	-2.42	-2.46	-1.80	0.97	0.57	1.45	0.00	5.40
4140	-0.50	-0.04	0.00	-6.18	-8.82	4.79	0.00	-2.44	-2.47	-1.81	0.97	0.56	1.46	0.00	0.00
4200	-0.50	-0.05	-0.02	-6.23	-8.90	4.79	0.00	-2.46	-2.50	-1.84	0.97	0.57	1.45	0.00	0.00
4260	-0.50	-0.05	-0.03	-6.24	-8.98	4.79	0.00	-2.47	-2.51	-1.86	0.97	0.56	1.45	0.00	0.00
4320	-0.50	-0.04	-0.02	-6.25	-9.00	4.81	0.00	-2.49	-2.54	-1.88	0.98	0.57	1.46	0.00	0.00
4380	-0.50	-0.04	-0.02	-6.23	-8.98	4.81	0.00	-2.50	-2.55	-1.89	0.98	0.58	1.44	0.00	0.00
4440	-0.50	-0.02	-0.01	-6.16	-8.99	4.82	0.00	-2.51	-2.57	-1.90	0.98	0.57	1.44	0.00	0.00
4500	-0.50	-0.05	-0.02	-6.21	-9.05	4.80	0.00	-2.51	-2.59	-1.92	0.99	0.57	1.44	0.00	0.00
4560	-0.50	-0.04	-0.02	-6.24	-9.08	4.82	0.00	-2.53	-2.60	-1.93	0.98	0.58	1.44	0.00	0.00
4620	-0.50	-0.04	-0.02	-6.29	-9.15	4.81	0.00	-2.53	-2.62	-1.96	0.99	0.57	1.45	0.00	3.82
4680	-0.50	-0.04	-0.02	-6.27	-9.21	4.81	0.00	-2.54	-2.63	-1.98	0.99	0.57	1.47	0.00	0.00
4740	-0.50	-0.05	-0.02	-6.26	-9.26	4.83	0.00	-2.55	-2.63	-1.99	0.99	0.57	1.44	0.00	0.00
4800	-0.50	-0.05	-0.03	-6.18	-9.37	4.80	0.00	-2.55	-2.64	-2.00	1.02	0.58	1.44	0.00	0.00
4860	-0.50	-0.05	-0.03	-6.07	-9.48	4.82	0.00	-2.55	-2.65	-2.01	1.02	0.57	1.46	0.00	8.54
4920	-0.50	-0.06	-0.04	-6.20	-9.51	4.84	0.00	-2.57	-2.65	-2.04	1.02	0.57	1.43	0.00	0.00
4980	-0.50	-0.06	-0.03	-6.31	-9.55	4.81	0.00	-2.57	-2.66	-2.06	1.01	0.56	1.39	0.00	3.82
5040	-0.50	-0.05	-0.03	-4.51	-9.49	4.79	0.00	-2.57	-2.65	-2.07	1.11	0.58	1.38	0.00	0.00
5100	-0.50	-0.06	-0.04	-4.04	-9.47	4.81	0.00	-2.57	-2.66	-2.08	1.16	0.59	1.39	0.00	0.00
5160	-0.50	-0.06	-0.04	-4.01	-9.50	4.81	0.00	-2.57	-2.66	-2.10	1.17	0.59	1.38	0.00	0.00
5220	-0.50	-0.05	-0.03	-4.14	-9.51	4.81	0.00	-2.55	-2.67	-2.11	1.16	0.58	1.38	0.00	0.00
5280	-0.50	-0.05	-0.03	-4.22	-9.53	4.84	0.00	-2.58	-2.68	-2.12	1.15	0.59	1.37	0.00	0.00
5340	-0.50	-0.05	-0.03	-4.33	-9.54	4.82	0.00	-2.57	-2.68	-2.13	1.16	0.60	1.38	0.00	0.00
5400	-0.50	-0.04	-0.03	-4.45	-9.54	4.81	0.00	-2.58	-2.69	-2.14	1.15	0.59	1.37	0.00	0.00
5460	-0.50	-0.05	-0.04	-4.55	-9.62	4.83	0.00	-2.58	-2.69	-2.15	1.14	0.59	1.36	0.00	0.00
5520	-0.50	-0.03	-0.02	-4.55	-9.62	4.84	0.00	-2.58	-2.69	-2.17	1.15	0.58	1.38	0.00	0.00
5580	-0.50	-0.03	-0.02	-4.61	-9.58	4.83	0.00	-2.58	-2.70	-2.17	1.14	0.59	1.37	0.00	0.00
5640	-0.50	-0.03	-0.03	-4.69	-9.58	4.83	0.00	-2.58	-2.70	-2.17	1.15	0.62	1.37	0.00	0.00
5700	-0.50	-0.03	-0.03	-4.74	-9.62	4.80	0.00	-2.59	-2.70	-2.18	1.14	0.59	1.37	0.00	0.00
5760	-0.50	-0.02	-0.02	-4.81	-9.66	4.82	0.00	-2.58	-2.70	-2.19	1.15	0.60	1.36	0.00	0.00
5820	-0.50	-0.03	-0.03	-4.92	-9.70	4.84	0.00	-2.57	-2.70	-2.19	1.14	0.59	1.36	0.00	0.00
5880	-0.50	-0.03	-0.03	-4.95	-9.72	4.82	0.00	-2.57	-2.71	-2.19	1.14	0.60	1.36	0.00	0.00
5940	-0.50	-0.03	-0.03	-5.07	-9.78	4.84	0.00	-2.58	-2.70	-2.20	1.14	0.60	1.38	0.00	0.00
6000	-0.50	-0.03	-0.02	-5.11	-9.81	4.82	0.00	-2.58	-2.71	-2.20	1.13	0.60	1.35	0.00	0.00
6060	-0.50	-0.03	-0.02	-5.16	-9.85	4.83	0.00	-2.57	-2.70	-2.22	1.13	0.60	1.32	0.00	0.00
6120	-0.50	-0.03	-0.02	-5.21	-9.84	4.81	0.00	-2.58	-2.70	-2.22	1.12	0.60	1.35	0.00	0.00
6180	-0.50	-0.02	-0.02	-5.30	-9.89	4.83	0.00	-2.58	-2.70	-2.22	1.13	0.60	1.35	0.00	0.00
6240	-0.50	-0.03	-0.02	-5.34	-9.92	4.84	0.00	-2.57	-2.71	-2.22	1.13	0.60	1.37	0.00	9.36
6420	-2.22	-0.03	-0.03	-5.63	-9.93	4.81	0.00	-2.52	-2.70	-2.23	1.09	0.62	1.35	0.00	0.00
6480	-2.25	-0.03	-0.02	-5.71	-10.01	4.83	0.00	-2.53	-2.71	-2.24	1.10	0.60	1.34	0.00	0.00
6540	-1.67	-0.03	-0.02	-5.78	-10.01	4.83	0.00	-2.52	-2.71	-2.24	1.10	0.61	1.36	0.00	0.00
6600	-1.70	-0.03	-0.03	-5.84	-10.05	4.84	0.00	-2.51	-2.70	-2.24	1.08	0.60	1.36	0.00	0.00
6660	-1.71	-0.02	-0.02	-5.91	-10.09	4.82	0.00	-2.52	-2.70	-2.24	1.08	0.60	1.34	0.00	0.00
6720	-1.78	-0.02	-0.02	-5.98	-10.12	4.83	0.00	-2.51	-2.69	-2.25	1.08	0.61	1.37	0.00	0.00
6780	-1.83	-0.01	-0.01	-6.02	-10.13	4.84	0.00	-2.51	-2.70	-2.25	1.08	0.60	1.33	0.00	8.54
6840	-1.88	-0.02	-0.14	-6.12	-10.18	4.83	0.00	-2.51	-2.69	-2.25	1.07	0.60	1.34	0.00	0.00
6900	-1.92	-0.02	-0.04	-6.18	-10.21	4.83	0.00	-2.51	-2.69	-2.25	1.08	0.61	1.34	0.00	0.00
6960	-1.94	-0.02	-0.03	-6.19	-10.25	4.83	0.00	-2.49	-2.69	-2.26	1.07	0.60	1.32	0.00	0.00
7020	-1.99	-0.02	-0.02	-6.27	-10.29	4.84	0.00	-2.49	-2.67	-2.26	1.06	0.60	1.34	0.00	0.00
7080	-2.01	-0.02	-0.03	-6.38	-10.32	4.82	0.00	-2.49	-2.69	-2.25	1.07	0.61	1.35	0.00	0.00
7140	-1.99	-0.02	-0.03	-6.41	-10.36	4.84	0.00	-2.49	-2.69	-2.25	1.06	0.60	1.36	0.00	0.00
7200	-2.02	-0.02	-0.02	-6.42	-10.38	4.82	0.00	-2.49	-2.68	-2.26	1.07	0.60	1.32	0.00	0.00
7260	-2.01	-0.02	-0.02	-6.45	-10.42	4.84	0.00	-2.49	-2.68	-2.26	1.06	0.60	1.35	0.00	0.00
7320	-2.00	-0.01	-0.02	-6.53	-10.44	4.85	0.00	-2.49	-2.69	-2.26	1.06	0.60	1.33	0.00	9.36
7380	-2.02	-0.02	-0.02	-6.55	-10.46	4.84	0.00	-2.48	-2.69	-2.25	1.06	0.62	1.38	0.00	0.00
7440	-1.72	-0.02	-0.02	-6.55	-10.51	4.83	0.00	-2.48	-2.68	-2.26	1.06	0.60	1.36	0.00	0.00
7500	-1.73	-0.02	-0.03	-6.62	-10.54	4.85	0.00	-2.48	-2.68	-2.26	1.06	0.60	1.34	0.00	0.00
7560	-1.75	-0.01	-0.02	-6.62	-10.57	4.84	0.00	-2.47	-2.69	-2.26	1.06	0.59	1.35	0.00	7.64
7620	-1.77	-0.01	-0.03	-6.56	-10.62	4.84	0.00	-2.46	-2.69	-2.25	1.07	0.60	1.34	0.00	0.00
7680	-1.18	-0.01	-0.02	-6.51	-10.61	4.87	0.00	-2.47	-2.68	-2.25	1.07	0.60	1.38	0.00	3.82
7740	-1.24	-0.01	-0.02	-6.58	-10.65	4.84	0.00	-2.46	-2.68	-2.25	1.06	0.59	1.35	0.00	0.00
7800	-1.28	0.00	-0.01	-6.59	-10.67	4.84	0.00	-2.45	-2.67	-2.25	1.06	0.59	1.38	0.00	0.00
7860	-1.35	-0.01	-0.02	-6.64	-10.70	4.84	0.00	-2.45	-2.65	-2.24	1.07	0.61	1.36	0.00	0.00
7920	-1.38	-0.01	-0.02	-6.68	-10.72	4.84	0.00	-2.46	-2.66	-2.25	1.07	0.60	1.36	0.00	0.00
7980	-1.43	-0.01	-0.02	-6.71	-10.74	4.85	0.00	-2.46	-2.67	-2.24	1.06	0.60	1.37	0.00	0.00
8040	-1.47	-0.02	-0.03	-6.74	-10.80	4.84	0.00	-2.45	-2.66	-2.24	1.07	0.60	1.36	0.00	0.00
8100	-1.16	-0.02	-0.03	-6.76	-10.80	4.83	0.00	-2.44	-2.66	-2.23	1.07	0.60	1.37	0.00	0.00

Data Log — Ft Monmouth

Test Start: 4/17/98 11:19:45 — GW Pump/VEGE/Air Sparge — Test 2

elapsed time (sec)	MP-3(15ft) Press Resp (in WC)	MP-5(12ft) Press Resp (in WC)	MP-4 (9ft) Press Resp (in WC)	MP-2(6ft) Press Resp (in WC)	MP-1(3ft) Press Resp (in WC)	Casing Vacuum (inHg)	Pw+ (psi)	MP-3(15ft) GW DD (feet)	MP-5(12ft) GW DD (feet)	MP-4 (9ft) GW DD (feet)	MP-2(6ft) GW DD (feet)	MP-1 GW DD (feet)	RW-2 GW DD (feet)	IW Flow (scfm)	LoVac Air Flow (scfm)
8160	-0.64	-0.01	-0.02	-6.81	-10.82	4.73	0.00	-2.44	-2.66	-2.24	1.06	0.60	1.35	0.00	0.00
8220	-0.54	-0.03	-0.01	-6.81	-10.83	4.74	0.00	-2.44	-2.65	-2.24	1.07	0.60	1.36	0.00	0.00
8280	-0.46	0.00	-0.02	-6.83	-10.87	4.73	0.00	-2.43	-2.64	-2.23	1.07	0.60	1.38	0.00	0.00
8340	-0.44	0.00	-0.02	-6.85	-10.85	4.92	0.00	-2.43	-2.65	-2.23	1.07	0.60	1.45	0.00	26.22
8400	-0.43	0.00	-0.02	-6.86	-10.85	4.84	0.00	-2.43	-2.65	-2.22	1.06	0.61	1.37	0.00	0.00
8460	-0.48	-0.02	-0.05	-6.94	-10.93	4.86	0.00	-2.43	-2.64	-2.22	1.07	0.60	1.37	0.00	6.62
8520	-0.46	-0.01	-0.03	-6.97	-10.97	4.85	0.00	-2.41	-2.64	-2.22	1.06	0.60	1.41	0.00	0.00
8580	-0.43	-0.02	-0.02	-7.01	-10.96	4.84	0.00	-2.42	-2.64	-2.22	1.07	0.61	1.37	0.00	0.00
8640	-0.45	-0.02	-0.02	-7.04	-11.00	4.84	0.00	-2.41	-2.64	-2.22	1.06	0.60	1.37	0.00	0.00
8700	-0.46	0.01	0.05	-6.70	-10.59	4.84	2.50	-2.41	-2.64	-2.23	0.94	0.60	1.38	17.40	0.00
8760	-0.44	0.01	0.05	-5.60	-6.19	4.85	3.07	-2.42	-2.62	-2.25	0.95	0.68	1.38	5.83	0.00
8820	-0.39	0.01	0.00	-4.13	-5.93	4.84	2.93	-2.42	-2.59	-2.25	0.99	0.77	1.41	1.21	0.00
8880	-0.33	0.01	0.05	-1.30	-2.05	4.84	4.92	-2.42	-2.58	-2.26	0.80	0.83	1.39	0.00	0.00
8940	-0.21	0.01	0.05	0.19	0.50	4.88	4.77	-2.42	-2.53	-2.29	0.69	1.01	1.39	0.00	0.00
9000	-0.09	0.01	0.05	0.19	0.50	4.72	4.71	-2.44	-2.58	-2.33	0.64	1.14	1.41	0.00	0.00
9060	-0.02	0.01	0.05	0.19	0.51	4.81	4.62	-2.46	-2.63	-2.38	0.65	1.20	1.35	0.00	27.80
9120	0.09	0.01	0.05	0.19	0.51	4.88	4.59	-2.47	-2.68	-2.41	0.69	1.25	1.39	0.00	0.00
9180	0.18	0.01	0.29	0.19	0.51	4.91	4.52	-2.51	-2.75	-2.44	0.74	1.28	1.38	0.00	0.00
9240	0.22	0.01	0.24	9.78	12.01	4.87	4.48	-2.53	-2.87	-2.49	0.76	1.28	1.38	0.00	0.00
9300	0.23	0.28	0.20	10.00	12.63	4.77	4.47	-2.55	-2.94	-2.54	0.83	1.29	1.38	0.78	0.00
9360	0.45	0.38	0.17	10.00	13.05	4.92	4.42	-2.57	-2.99	-2.58	0.88	1.28	1.36	0.00	31.54
9420	0.49	0.32	0.13	10.00	13.38	4.91	4.43	-2.59	-3.01	-2.61	0.92	1.26	1.33	0.00	0.00
9480	0.53	0.27	0.11	10.00	13.76	4.92	4.39	-2.64	-3.09	-2.65	0.97	1.26	1.33	0.00	0.00
9540	0.54	0.23	0.09	10.00	14.10	4.88	4.36	-2.66	-3.23	-2.68	1.03	1.25	1.30	0.00	0.00
9600	0.55	0.20	0.07	10.00	14.44	4.80	4.35	-2.69	-3.27	-2.72	1.10	1.24	1.34	0.94	0.00
9660	0.53	0.18	0.09	10.00	14.80	4.91	4.31	-2.72	-3.33	-2.75	1.16	1.24	1.30	0.00	15.77
9720	0.51	0.16	0.09	0.03	1.02	4.91	4.30	-2.75	-3.21	-2.76	1.25	1.24	1.27	0.00	0.00
9780	0.49	0.16	0.13	10.00	15.24	4.90	4.29	-2.78	-3.40	-2.79	1.26	1.22	1.27	0.00	0.00
9840	0.53	0.15	0.15	10.00	15.65	4.89	4.28	-2.81	-3.44	-2.83	1.32	1.23	1.27	0.00	0.00
9900	0.56	0.17	0.19	10.00	15.59	4.82	4.41	-2.84	-3.49	-2.87	1.31	1.21	1.26	0.72	13.23
9960	0.53	0.17	0.14	10.00	15.57	4.93	4.43	-2.86	-3.51	-2.88	1.35	1.20	1.25	0.00	3.83
10020	0.55	0.19	0.18	10.00	15.68	4.91	4.41	-2.90	-3.54	-2.91	1.35	1.19	1.25	0.00	0.00
10080	0.56	0.17	0.22	10.00	15.73	4.95	4.37	-2.93	-3.60	-2.93	1.34	1.17	1.20	0.00	0.00
10140	0.62	0.16	0.21	10.00	15.90	4.79	4.37	-2.95	-3.61	-2.96	1.36	1.17	1.22	0.68	0.00
10200	0.57	0.14	0.15	10.00	16.00	4.90	4.35	-2.98	-3.64	-2.99	1.37	1.17	1.14	0.30	36.07
10260	0.60	0.16	0.20	10.00	16.16	4.96	4.32	-3.00	-3.67	-3.01	1.38	1.16	1.18	0.00	0.00
10320	0.66	0.16	0.90	10.00	16.23	4.94	4.33	-3.03	-3.69	-3.02	1.40	1.16	1.15	0.00	0.00
10380	0.60	0.18	0.26	10.00	16.29	4.95	4.31	-3.04	-3.74	-3.04	1.41	1.14	1.15	0.00	0.00
10440	0.56	0.18	0.33	10.00	16.37	4.81	4.29	-3.07	-3.79	-3.04	1.41	1.14	1.15	0.86	0.00
10500	0.54	0.11	0.40	10.00	16.37	4.95	4.28	-3.08	-3.69	-3.04	1.42	1.14	1.16	0.00	31.33
10560	0.53	0.07	0.52	10.00	16.42	4.94	4.26	-3.12	-3.82	-3.09	1.41	1.14	1.13	0.00	0.00
10620	0.51	0.10	0.45	10.00	16.50	4.94	4.25	-3.12	-3.87	-3.10	1.42	1.13	1.11	0.00	0.00
10680	0.53	0.07	0.38	10.00	16.54	4.92	4.24	-3.15	-3.84	-3.13	1.43	1.14	1.08	0.00	0.00
10740	0.53	0.09	0.48	10.00	16.58	4.82	4.24	-3.16	-3.90	-3.16	1.43	1.11	1.06	0.80	0.00
10800	0.54	0.05	0.39	10.00	16.58	4.95	4.24	-3.18	-3.88	-3.17	1.44	1.13	1.08	0.00	13.80
10860	0.63	0.08	0.54	10.00	16.65	4.92	4.22	-3.19	-3.91	-3.19	1.45	1.13	1.06	0.00	0.00
10920	0.59	0.10	0.40	10.00	16.66	4.91	4.21	-3.20	-3.97	-3.20	1.45	1.13	1.03	0.00	0.00
10980	0.66	0.11	0.43	10.00	16.64	4.95	4.21	-3.22	-3.94	-3.20	1.47	1.13	1.07	0.00	7.65
11040	0.49	0.01	0.62	10.00	16.60	4.85	4.20	-3.23	-3.99	-3.20	1.47	1.12	1.03	0.77	0.00
11100	0.53	-0.01	0.61	10.00	16.64	4.94	4.18	-3.24	-4.01	-3.22	1.47	1.12	1.03	0.00	0.00
11160	0.62	0.02	0.45	10.00	16.64	4.94	4.17	-3.25	-4.03	-3.24	1.48	1.12	1.00	0.00	0.00
11220	0.60	-0.01	0.65	10.00	16.64	4.95	4.16	-3.26	-4.03	-3.25	1.49	1.14	1.02	0.00	7.65
11280	0.65	0.02	0.60	10.00	16.65	4.94	4.16	-3.27	-4.06	-3.27	1.49	1.14	1.00	0.00	0.00
11340	0.65	0.02	0.56	10.00	16.61	4.85	4.18	-3.28	-4.03	-3.28	1.49	1.14	0.98	0.91	0.00
11400	0.62	0.40	0.60	10.00	16.58	4.95	4.16	-3.28	-4.03	-3.28	1.50	1.15	0.98	0.00	0.00
11460	0.66	0.49	0.80	10.00	16.57	4.99	4.17	-3.29	-4.08	-3.29	1.50	1.16	1.00	0.00	10.13
11520	0.63	0.49	0.81	10.00	16.51	4.95	4.15	-3.30	-4.09	-3.29	1.48	1.16	0.97	0.00	0.00
11580	0.69	0.47	0.75	10.00	16.45	4.89	4.14	-3.31	-4.10	-3.29	1.50	1.17	1.01	0.77	0.00
11640	0.72	0.49	0.85	10.00	16.53	4.99	4.11	-3.31	-4.05	-3.29	1.52	1.18	0.98	0.64	49.48
11700	0.63	0.47	0.83	10.00	16.46	4.95	4.11	-3.31	-4.06	-3.31	1.53	1.19	0.94	0.21	0.00
11760	0.71	0.50	0.87	10.00	16.44	4.95	4.12	-3.32	-4.10	-3.32	1.53	1.19	0.93	0.21	0.00
11820	0.77	0.50	0.81	10.00	16.40	4.98	4.08	-3.31	-4.12	-3.31	1.54	1.20	0.93	0.21	0.00
11880	0.69	0.45	0.77	10.00	16.28	4.85	4.08	-3.31	-4.09	-3.31	1.54	1.21	0.93	0.96	3.82
11940	0.83	0.48	0.85	10.00	16.36	4.98	4.09	-3.31	-4.10	-3.31	1.55	1.22	0.94	0.52	31.33
12000	0.83	0.49	0.88	10.00	16.29	4.95	4.07	-3.32	-4.13	-3.32	1.54	1.22	0.88	0.30	0.00
12060	0.82	0.50	0.88	10.00	16.28	4.95	4.08	-3.32	-4.10	-3.32	1.56	1.22	0.88	0.48	0.00
12120	0.82	0.50	0.88	10.00	16.23	4.96	4.05	-3.31	-4.13	-3.31	1.57	1.23	0.91	0.30	0.00
12180	0.80	0.50	0.89	10.00	16.17	4.87	4.05	-3.32	-4.10	-3.29	1.57	1.25	0.90	0.88	0.00
12240	0.74	0.48	0.86	10.00	16.14	4.96	4.05	-3.32	-4.10	-3.31	1.58	1.24	0.88	0.37	11.48
12300	0.75	0.50	0.89	10.00	16.07	4.97	4.04	-3.30	-4.12	-3.30	1.58	1.24	0.89	0.21	8.56
12360	0.76	0.49	0.89	10.00	16.01	4.96	4.01	-3.30	-4.10	-3.29	1.59	1.26	0.87	0.37	0.00

Data Log — Ft Monmouth

Test Start: 4/17/98 10:51:05 SVE — Test 1

elapsed time (sec)	MP-3 Vac Resp (in WC)	MP-5 Vac Resp (in WC)	MP-4 Vac Resp (in WC)	MP-2 Vac Resp (in WC)	MP-1 Vac Resp (in WC)	Casing Vacuum (inHg)	MP-3 GW DD (feet)	MP-5 GW DD (feet)	MP-4 GW DD (feet)	MP-2 GW DD (feet)	MP-1 GW DD (feet)	VP-1 GW DD (feet)	LoVac Air Flow (scfm)
5	-0.01	-0.01	-0.05	-0.02	-0.06	0.02	0.60	0.70	0.67	0.00	-0.06	-0.31	104.21
10	-0.01	-0.01	-0.05	-0.02	-0.05	0.00	0.60	0.71	0.67	0.00	-0.07	-0.30	104.48
15	-0.01	-0.01	-0.05	-0.02	0.89	4.80	0.59	0.71	0.67	0.01	-0.08	1.65	200.83
20	-0.01	-0.01	-0.05	0.04	3.00	4.78	0.59	0.70	0.67	-0.01	-0.15	1.29	218.47
25	-0.01	-0.01	-0.05	0.14	4.27	4.73	0.58	0.71	0.67	-0.01	-0.24	0.76	218.32
30	-0.01	-0.01	-0.05	0.28	5.15	5.16	0.57	0.70	0.67	0.00	-0.32	0.75	196.28
35	-0.01	-0.01	-0.05	0.40	5.83	5.16	0.57	0.71	0.68	-0.01	-0.38	0.62	175.67
40	-0.01	-0.01	-0.05	0.52	6.38	5.68	0.57	0.71	0.68	-0.02	-0.42	0.69	161.36
45	-0.01	-0.01	-0.05	0.63	6.77	5.60	0.57	0.70	0.67	-0.03	-0.46	0.53	140.42
50	-0.01	-0.01	-0.05	0.73	7.12	5.63	0.57	0.70	0.67	-0.05	-0.51	0.46	118.39
55	-0.01	-0.01	-0.05	0.82	7.27	5.62	0.57	0.70	0.67	-0.05	-0.52	0.38	99.62
60	-0.01	-0.01	-0.05	0.88	7.42	5.59	0.57	0.71	0.67	-0.05	-0.54	0.39	80.81
65	-0.01	-0.01	-0.05	0.94	7.64	5.62	0.57	0.71	0.68	-0.05	-0.55	0.25	63.94
70	-0.01	-0.01	-0.05	1.00	7.78	5.60	0.58	0.71	0.68	-0.05	-0.57	0.28	54.62
75	-0.01	-0.01	-0.05	1.05	7.93	5.60	0.57	0.71	0.68	-0.06	-0.57	0.39	42.46
80	-0.01	-0.01	-0.05	1.08	8.01	5.44	0.57	0.71	0.68	-0.06	-0.58	0.52	28.83
85	-0.01	-0.01	-0.05	1.11	8.08	5.57	0.57	0.71	0.68	-0.06	-0.59	0.70	25.31
90	-0.01	-0.01	-0.05	1.14	8.16	5.43	0.57	0.70	0.67	-0.06	-0.60	0.73	0.00
95	-0.01	-0.01	-0.05	1.16	8.19	5.54	0.58	0.72	0.68	-0.06	-0.62	0.80	0.00
100	-0.01	-0.01	-0.05	1.18	8.25	5.48	0.58	0.71	0.68	-0.07	-0.61	0.81	0.00
105	-0.01	-0.01	-0.05	1.20	8.27	5.48	0.57	0.70	0.67	-0.06	-0.62	0.86	0.00
110	-0.01	-0.01	-0.05	1.22	8.29	5.48	0.57	0.71	0.67	-0.06	-0.63	0.88	0.00
115	-0.01	-0.01	-0.05	1.25	8.83	5.43	0.56	0.70	0.67	-0.08	-0.62	0.89	0.00
120	0.00	-0.01	-0.05	1.29	9.45	5.49	0.60	0.70	0.68	-0.07	-0.67	0.88	0.00
125	0.00	-0.01	-0.05	1.34	9.46	5.41	0.56	0.71	0.67	-0.07	-0.70	0.89	0.00
130	0.00	-0.01	-0.05	1.36	9.46	5.44	0.56	0.70	0.67	-0.07	-0.71	0.90	0.00
135	0.01	-0.01	-0.05	1.39	9.38	5.48	0.55	0.70	0.67	-0.07	-0.70	0.91	0.00
140	0.02	-0.01	-0.05	1.41	9.37	5.44	0.56	0.70	0.66	-0.08	-0.71	0.85	0.00
145	0.02	-0.01	-0.05	1.43	9.42	5.41	0.60	0.70	0.67	-0.08	-0.71	0.84	0.00
150	0.03	-0.01	-0.05	1.44	9.58	5.38	0.57	0.70	0.67	-0.07	-0.71	0.89	0.00
155	0.04	-0.01	-0.05	1.46	9.73	5.38	0.56	0.71	0.67	-0.07	-0.74	0.86	0.00
160	0.04	-0.01	-0.05	1.48	9.69	5.38	0.55	0.70	0.67	-0.07	-0.74	0.88	0.00
165	0.05	-0.01	-0.05	1.50	9.69	5.32	0.60	0.70	0.67	-0.07	-0.73	0.81	0.00
170	0.05	-0.01	-0.05	1.50	9.69	5.32	0.57	0.71	0.68	-0.07	-0.74	0.92	0.00
175	0.05	-0.01	-0.05	1.51	9.63	5.38	0.59	0.71	0.67	-0.07	-0.74	0.88	0.00
180	0.05	-0.01	-0.05	1.52	9.59	5.40	0.56	0.70	0.67	-0.07	-0.74	0.90	0.00
185	0.06	-0.01	-0.05	1.52	9.50	5.42	0.56	0.70	0.68	-0.06	-0.73	0.90	0.00
190	0.06	-0.01	-0.05	1.52	9.50	5.42	0.56	0.71	0.67	-0.07	-0.73	0.87	0.00
195	0.07	-0.01	-0.05	1.53	9.44	5.46	0.57	0.70	0.67	-0.06	-0.74	0.90	0.00
200	0.07	-0.01	-0.05	1.53	9.44	5.46	0.57	0.70	0.67	-0.07	-0.74	0.87	0.00
205	0.07	-0.01	-0.05	1.51	9.38	5.32	0.56	0.70	0.67	-0.07	-0.74	0.89	0.00
210	0.08	-0.01	-0.05	1.49	9.32	5.40	0.56	0.70	0.66	-0.07	-0.74	0.87	0.00
215	0.09	-0.01	-0.05	1.49	9.28	5.37	0.55	0.70	0.67	-0.07	-0.74	0.86	0.00
220	0.10	-0.01	-0.05	1.49	9.23	5.36	0.57	0.70	0.68	-0.06	-0.74	0.86	0.00
225	0.10	-0.01	-0.05	1.49	9.16	5.40	0.57	0.71	0.67	-0.06	-0.74	0.87	0.00
230	0.11	-0.01	-0.05	1.49	9.15	5.34	0.57	0.71	0.67	-0.06	-0.73	0.88	0.00
235	0.12	-0.01	-0.05	1.49	9.05	5.31	0.56	0.70	0.67	-0.07	-0.74	0.82	0.00
240	0.13	-0.01	-0.05	1.48	8.86	5.38	0.57	0.70	0.67	-0.06	-0.73	0.83	0.00
245	0.14	-0.01	-0.05	1.47	8.89	5.35	0.56	0.70	0.67	-0.06	-0.73	0.77	0.00
250	0.15	-0.01	-0.05	1.47	8.85	5.27	0.57	0.70	0.67	-0.06	-0.73	0.71	0.00
255	0.18	-0.01	-0.05	1.48	8.92	5.22	0.57	0.70	0.67	-0.05	-0.72	0.67	0.00
260	0.22	-0.01	-0.05	1.48	8.99	5.38	0.57	0.71	0.68	-0.05	-0.73	0.74	0.00
265	0.28	-0.01	-0.05	1.48	8.86	5.27	0.57	0.71	0.67	-0.05	-0.73	0.67	0.00
270	0.33	-0.01	-0.05	1.48	8.71	5.28	0.57	0.70	0.67	-0.05	-0.74	0.64	0.00
275	0.37	-0.01	-0.05	1.48	8.66	5.27	0.57	0.70	0.67	-0.05	-0.73	0.59	0.00
280	0.39	-0.01	-0.05	1.47	8.64	5.24	0.57	0.71	0.67	-0.06	-0.73	0.57	0.00
285	0.40	-0.01	-0.05	1.48	8.59	5.30	0.57	0.71	0.68	-0.05	-0.73	0.58	0.00
290	0.40	-0.01	-0.05	1.47	8.56	5.26	0.56	0.70	0.67	-0.05	-0.71	0.53	0.00
295	0.40	-0.01	-0.05	1.47	8.56	5.26	0.56	0.70	0.66	-0.05	-0.72	0.52	0.00
300	0.40	-0.01	-0.05	1.47	8.51	5.27	0.57	0.71	0.67	-0.05	-0.72	0.50	0.00
305	0.40	-0.01	-0.05	1.47	8.51	5.27	0.57	0.71	0.67	-0.05	-0.72	0.46	0.00
310	0.40	-0.01	-0.05	1.46	8.46	5.22	0.57	0.71	0.68	-0.05	-0.71	0.42	0.00
315	0.40	-0.01	-0.05	1.47	8.46	5.23	0.56	0.71	0.67	-0.05	-0.72	0.38	0.00
320	0.40	-0.01	-0.05	1.47	8.56	5.26	0.56	0.70	0.67	-0.06	-0.71	0.41	0.00
325	0.40	-0.01	-0.05	1.47	8.58	5.20	0.57	0.70	0.67	-0.04	-0.73	0.38	0.00
330	0.40	-0.01	-0.05	1.48	8.59	5.27	0.57	0.72	0.68	-0.03	-0.73	0.36	0.00
335	0.40	-0.01	-0.05	1.48	8.65	5.23	0.57	0.70	0.67	-0.03	-0.74	0.33	0.00
340	0.40	-0.01	-0.05	1.48	8.59	5.18	0.56	0.70	0.67	-0.04	-0.74	0.31	0.00
345	0.39	-0.01	-0.05	1.48	8.55	5.22	0.57	0.71	0.68	-0.04	-0.73	0.31	0.00

Data Log — Ft Monmouth

Test Start: 4/17/98 10:51:05 SVE Test 1

elapsed time (sec)	MP-3 Vac Resp (In WC)	MP-5 Vac Resp (In WC)	MP-4 Vac Resp (In WC)	MP-2 Vac Resp (In WC)	MP-1 Vac Resp (In WC)	Casing Vacuum (inHg)	MP-3 GW DD (feet)	MP-5 GW DD (feet)	MP-4 GW DD (feet)	MP-2 GW DD (feet)	MP-1 GW DD (feet)	VP-1 GW DD (feet)	LoVac Air Flow (scfm)
350	0.39	-0.01	-0.05	1.48	8.52	5.23	0.57	0.70	0.67	-0.05	-0.74	0.27	0.00
355	0.39	-0.01	-0.05	1.48	8.54	5.21	0.57	0.71	0.67	-0.05	-0.74	0.25	0.00
360	0.39	-0.01	-0.05	1.48	8.54	5.20	0.58	0.71	0.67	-0.03	-0.74	0.23	0.00
365	0.39	-0.01	-0.05	1.48	8.52	5.23	0.57	0.70	0.67	-0.04	-0.75	0.22	0.00
370	0.39	-0.01	-0.05	1.48	8.53	5.24	0.57	0.71	0.67	-0.03	-0.74	0.19	0.00
375	0.39	-0.01	-0.05	1.48	8.53	5.18	0.57	0.71	0.68	-0.03	-0.74	0.16	0.00
380	0.39	-0.01	-0.05	1.49	8.58	5.18	0.57	0.71	0.67	-0.05	-0.75	0.16	0.00
385	0.39	-0.01	-0.05	1.49	8.63	5.20	0.56	0.70	0.67	-0.03	-0.75	0.12	0.00
390	0.39	-0.01	-0.05	1.49	8.64	5.22	0.57	0.71	0.67	-0.03	-0.75	0.11	7.68
395	0.39	-0.01	-0.05	1.49	8.66	5.18	0.56	0.71	0.67	-0.04	-0.76	0.05	0.00
400	0.39	-0.01	-0.05	1.49	8.68	5.18	0.56	0.70	0.67	-0.03	-0.76	0.06	0.00
405	0.39	-0.01	-0.05	1.50	8.76	5.18	0.57	0.71	0.67	-0.03	-0.76	0.02	0.00
410	0.39	-0.01	-0.05	1.50	8.74	4.67	0.56	0.70	0.67	-0.03	-0.76	-0.24	0.00
415	0.39	-0.01	-0.05	1.50	8.72	5.21	0.57	0.71	0.68	-0.03	-0.76	-0.02	0.00
420	0.39	-0.01	-0.05	1.50	8.71	5.16	0.57	0.71	0.67	-0.03	-0.77	-0.04	0.00
425	0.39	-0.01	-0.05	1.50	8.71	5.22	0.56	0.71	0.67	-0.03	-0.78	-0.01	0.00
430	0.39	-0.01	-0.04	1.51	8.71	5.19	0.57	0.71	0.68	-0.02	-0.79	-0.08	0.00
435	0.39	-0.01	-0.04	1.51	8.71	5.14	0.55	0.70	0.67	-0.03	-0.79	0.04	0.00
440	0.39	-0.01	-0.05	1.50	8.71	5.20	0.57	0.71	0.67	-0.03	-0.76	0.06	0.00
445	0.38	-0.01	-0.05	1.49	8.68	5.10	0.56	0.70	0.67	-0.03	-0.76	-0.08	0.00
450	0.38	-0.01	-0.05	1.49	8.69	5.07	0.57	0.70	0.67	-0.02	-0.77	-0.09	19.17
455	0.38	-0.01	-0.05	1.49	7.75	0.08	0.87	0.71	0.68	0.02	0.77	2.33	0.00

APPENDIX VIII

LOPRO DESIGN UTILITY REPORT

Contaminant	Influent	Required Effluent	Calculated Effluent	Excess Level	Removal Efficiency
BENZENE	13169	7	72.58	65.58	0.9945
TOLUENE	19177	19.2	85.38	66.18	0.9956
ETHYLBENZENE	1996	2	11.07	9.07	0.9944
XYLENE	10987	11	44.49	33.49	0.996
MTBE	623	70	170.56	100.56	0.7262

Date: 4/30/99
Time: 2:35:54 PM
Name: Paul Clark
Project Name:
Ft. Monmouth Bldg 699
Project Number:
Model Run #1
Program Mode: Automatic

Classification: Class 1, Div 2
Blower Type: 5 HP TEFC Rotron
Voltage: 208 - 230 Volts, 3 Ph, 60 Hz
Temperature: 50.00 Degrees F
Start at: 233 Cubic Feet/Minute
Clean trays at: 223 Cubic Feet/Minute
Number Trays: 8
Tray height: 10 Inches
Flow rate: 15 Gallons/Minute
Air/Water ratio: 111.19

NOTE: all influent/effluent values are in ppb.

LOPRO DESIGN UTILITY REPORT

Contaminant	Influent	Required Effluent	Calculated Effluent	Excess Level	Removal Efficiency
BENZENE	13169	7	6.82	0.0	0.9995
TOLUENE	19177	19.2	7.98	0.0	0.9996
ETHYLBENZENE	1996	2	1.04	0.0	0.9995
XYLENE	10987	11	4.15	0.0	0.9996
MTBE	623	70	28.88	0.0	0.9536

Date: 4/30/99
Time: 2:36:09 PM
Name: Paul Clark
Project Name:
Ft. Monmouth Bldg 699
Project Number:
Model Run #2
Program Mode: Automatic

Classification: Class 1, Div 2
Blower Type: 10 HP Spencer
Voltage: 220 - 240 Volts, 3 Ph, 60 Hz
Temperature: 50.00 Degrees F
Start at: 1112 Cubic Feet/Minute
Clean trays at: 732 Cubic Feet/Minute
Number Trays: 3
Tray height: 13 Inches
Flow rate: 15 Gallons/Minute
Air/Water ratio: 365.

NOTE: all influent/effluent values are in ppb.

ShallowTray™
low profile air strippers

System Performance Estimate

Client and Proposal Information:

Ft. Monmouth
Bldg 699
Model Run 3

Model Chosen:	1300
Water Flow Rate:	15.0 gpm
Air Flow Rate:	150 cfm
Water Temp:	50.0 F
Air Temp:	50.0 F
A/W Ratio:	74.8
Safety Factor:	10%

Contaminant	Untreated Influent Effluent Target	Model 1311 Effluent Water Air(lbs/hr) % removal	Model 1321 Effluent Water Air(lbs/hr) % removal	Model 1331 Effluent Water Air(lbs/hr) % removal	Model 1341 Effluent Water Air(lbs/hr) % removal
Benzene	**13169 ppb** 7 ppb	**2638 ppb** 0.079017 79.9714%	**529 ppb** 0.094842 95.9886%	**106 ppb** 0.098016 99.1966%	**22 ppb** 0.098646 99.8391%
Toluene	**19177 ppb** 19 ppb	**4218 ppb** 0.112242 78.0085%	**928 ppb** 0.136928 95.1637%	**204 ppb** 0.142360 98.9364%	**45 ppb** 0.143553 99.7661%
Ethyl Benzene	**1996 ppb** 2 ppb	**370 ppb** 0.012200 81.4811%	**69 ppb** 0.014459 96.5705%	**13 ppb** 0.014879 99.3649%	**3 ppb** 0.014954 99.8824%
p-Xylene	**10987 ppb** 11 ppb	**2156 ppb** 0.066262 80.3839%	**423 ppb** 0.079265 96.1521%	**83 ppb** 0.081816 99.2452%	**17 ppb** 0.082311 99.8519%
MTBE	**623 ppb** 70 ppb	**499 ppb** 0.000930 19.9999%	**399 ppb** 0.001681 35.9998%	**319 ppb** 0.002281 48.7998%	**256 ppb** 0.002754 59.0398%

This report has been generated by ShallowTray Modeler software version 2.1W. This software is designed to assist a skilled operator in predicting the performance of a ShallowTray air stripping system. North East Environmental Products, Inc. is not responsible for incidental or consequential damages resulting from the improper operation of either the software or the air stripping equipment.

Report generated: 4/30/1999

ShallowTray™
low profile air strippers

System Performance Estimate

Client and Proposal Information:

Ft. Monmouth

Model Chosen:	2300
Water Flow Rate:	15.0 gpm
Air Flow Rate:	300 cfm
Water Temp:	50.0 F
Air Temp:	50.0 F
A/W Ratio:	149.6
Safety Factor:	10%

Contaminant	Untreated Influent Effluent Target	Model 2311 Effluent Water Air(lbs/hr) % removal	Model 2321 Effluent Water Air(lbs/hr) % removal	Model 2331 Effluent Water Air(lbs/hr) % removal	Model 2341 Effluent Water Air(lbs/hr) % removal
Benzene	**13169 ppb** 7 ppb	**924 ppb** 0.091878 92.9903%	**65 ppb** 0.098323 99.5086%	**5 ppb** 0.098773 99.9656%	**1 ppb** 0.098804 99.9976%
Toluene	**19177 ppb** 19 ppb	**1564 ppb** 0.132156 91.8467%	**128 ppb** 0.142930 99.3352%	**11 ppb** 0.143808 99.9458%	**1 ppb** 0.143883 99.9956%
Ethyl Benzene	**1996 ppb** 2 ppb	**124 ppb** 0.014046 93.8243%	**8 ppb** 0.014917 99.6186%	**1 ppb** 0.014969 99.9764%	**<1 ppb** 0.014976 99.9985%
p-Xylene	**10987 ppb** 11 ppb	**745 ppb** 0.076849 93.2221%	**51 ppb** 0.082056 99.5406%	**4 ppb** 0.082409 99.9689%	**<1 ppb** 0.082437 99.9979%
MTBE	**623 ppb** 70 ppb	**313 ppb** 0.002326 49.8908%	**157 ppb** 0.003497 74.8906%	**79 ppb** 0.004082 87.4179%	**40 ppb** 0.004374 93.6952%

This report has been generated by ShallowTray Modeler software version 2.1W. This software is designed to assist a skilled operator in predicting the performance of a ShallowTray air stripping system. North East Environmental Products, Inc. is not responsible for incidental or consequential damages resulting from the improper operation of either the software or the air stripping equipment.

Report generated: 4/30/1999

GROUNDWATER TREATMENT SYSTEM
INFLUENT CONCENTRATION CALCULATIONS

Department of the Army
Fort Monmouth
Main Post Gas Station
Building 699
Eatontown, New Jersey

Well	Sample Date	Benzene	Toluene	Ethylbenzene	Xylene	MTBE
MW-1	7/29/99	22228	35849	3025	19011	12
MW-11	7/29/99	4110	2504	967	2962	1233
		13169	**19177**	**1996**	**10987**	**623**

GROUNDWATER TREATMENT SYSTEM DESIGN CALCULATIONS

Department of the Army
Fort Monmouth
Main Post Gas Station
Building 699
Eatontown, New Jersey

I. Influent Concentrations (Design)[1]

Benzene =	13,169 ppb[2]
Toluene =	19,177 ppb[2]
Ethylbenzene =	1,996 ppb[2]
Xylene =	10,987 ppb[2]
MTBE =	623 ppb[2]

1 - Groundwater will be recovered via electric, submersible pumps from one (1) existing recovery well and two (2) proposed recovery wells in order to enhance vapor extraction.
2 - In order to estimate the influent concentrations of the BTEX compounds, groundwater samples from MW-1 and MW-11 and influent groundwater system samples from MW-11 were utilized. MW-1 is close to the proposed location of RW-3 and MW-11 is the existing recovery well.

II. Effluent Concentrations (Permit Limitation)

	Monthly Average	Daily Maximum
Total Suspended Solids (mg/L)[3]	---	40
Petroleum Hydrocarbons (mg/L)[3]	10	15
Total Organic Carbon (mg/L)[3]	---	20
pH Range (S.U.)[3]	6.0 Min. - 9.0 Max.	
Benzene (ug/L)[3]		7
MTBE (ug/L)[3]	85% Removal or 70 ppb	
Naphthalene (ug/L)[3]	22	59

3 - Based on typical New Jersey Pollutant Discharge Elimination System / Discharge to Surface Water (NJPDES / DSW) permit limitations.

III. Treatment System Flowrate

A maximum of 3 wells shall be utilized for groundwater recovery.

Estimated Flowrate =	5.00 gpm/well[4] * 3 wells	≅	15.0	gpm (System Total)
Peak Flowrate (Design) =	15.0 gpm			

4 - Based on the groundwater recovery rates measured under vacuum enhanced groundwater extraction during the pilot test conducted on pril 17, 1998. Historical pumping data from the existing groundwater system indicates that a much lower flowrate might be expected erhaps 3 to 6 gpm total). It is expected that soil vapor extraction (SVE) will enhance groundwater extraction as it did in the pilot test

IV. Granular Activated Carbon Design Calculations When Air Stripping Is Not Included In The Treatment System

1) Size Carbon Units

Determine Minimum Diameter Of Carbon Units

Design Flowrate (Peak Flow) =	15.0	gpm			
Maximum Acceptable Hydraulic Loading[5] =	4	gpm/sq. ft.			
Minimum Cross-Sectional Area Of Carbon Units =	15 gpm / 4 gpm/sq. ft.		=	3.75	sq. ft.
Minimum Diameter Of Carbon Units =	26	inches			

5 - Empirical value supplied by Cetco, Arlington Heights, IL and Norit Americas, Inc., Atlanta, GA.

Determine Contact Time

For 99.9% Removal Of BTEX Compounds[6]:

Contact Time = 15-20 minutes

For 99.99% Removal Of BTEX Compounds[6]:

Contact Time = 20-25 minutes

For 99.9% Removal Of BTEX Compounds and MTBE[6]:

Contact Time = 20-25 minutes

For 99.99% Removal Of BTEX Compounds and MTBE[6]:

Contact Time = 25-30 minutes

) - Empirical value supplied by Cetco, Arlington Heights, IL

Calculate Bed Volume

A 30-minute contact time is chosen for design purposes. Based on the information provided above, this should correspond to a removal efficiency of approximately 99.99% for BTEX and MTBE.

15 gpm x 30 min = 450 gal = 60 cu. ft.

Recommended Granular Activated Carbon Units

Number Of Carbon Units In Series =	3	units	
Diameter Of Carbon Units =	42	inches	
42 inches	>	26	inches
Weight Of Carbon Per Unit =	750	lbs	
Volume Of Carbon Per Unit =	27	cu. ft.	
Total Volume of Carbon =	81	cu. ft.	
81 cu. ft.	>	60	cu. ft.

Since granular activated carbon (GAC) would be the primary treatment technology, the first two GAC vessels (the primary unit) are sized to provide the required contact time for 99.99% removal of BTEX and MTBE. The third vessel is provided for safety.

2) Estimate Carbon Usage

Calculate Pounds Of Total Adsorbable Organics (TAO) Per Day

Estimated organic loading (Section I)

Benzene = 13,169 ppb

Toluene = 19,177 ppb

Ethyl Benzene = 1,996 ppb

Xylene = 10,987 ppb

MTBE = 623 ppb

TAO = 51,058 ppb[7]

7 - Assumes BTEX and MTBE account for 90% of the total adsorbable organics (TAO).

$$\text{TAO (lb/day)} = 51.06 \text{ ppm} \times 15 \text{ gpm} \times 0.012 \frac{\text{lb/day}}{\text{gpm - ppm}} = 9.19 \text{ lb/day}$$

Calculate Pounds Of MTBE Per Day

$$\text{MTBE (lb/day)} = \frac{623 \text{ ppb}}{51{,}058 \text{ ppb}} \times 9.19 \text{ lb/day} = 0.11 \text{ lb/day}$$

Calculate Granular Activated Carbon Usage For MTBE

MTBE = 623 ppb

Adsorption Capacity From MTBE Isotherm[8] = 0.42 %

$$\frac{0.11 \text{ lb/day}}{0.42 \%} = 26.71 \text{ lb/day}$$ Granular Activated Carbon Required For MTBE Adsorption

8 - Freundlich coefficients deduced from Freundlich isotherm supplied by Norit Americas, Inc., Atlanta, GA, (k = .308, 1/n = .406) The isotherm provided is valid for a residual concentration range of 10 to 10,000 ug/L. As a conservative estimate of the adsorption capacity for concentrations above this range, the value for a concentration of 10,000 ug/L is used as opposed to extrapolating the isotherm to the specific value.

Calculate Granular Activated Carbon Usage For Remainder of TAO

Assume that the benzene isotherm is adequate for characterizing the remaining TAO

Remaining TAO = TAO - MTBE

Remaining TAO (lb/day) = 9.19 lb/day - 0.11 lb/day = 9.08 lb/day

Remaining TAO (ppb) = 51,058 ppb - 623 ppb = 50,435 ppb

Remaining TAO (ppb) = 50,435 ppb

Adsorption Capacity From Benzene Isotherm[9] = 21.27 %

$$\frac{9.08 \text{ lb/day}}{21.27 \%} = 42.68 \text{ lb/day}$$ Granular Activated Carbon Required For Remaining TAO Adsorption

9 - Based on Freundlich isotherm supplied by Norit Americas, Inc., Atlanta, GA, (k = 2.021, 1/n = 0.43). The isotherm provided is valid for a residual concentration range of 0.1 to 100,000 ug/L. As a conservative estimate of the adsorption capacity for concentrations above this range, the value for a concentration of 100,000 ug/L is used as opposed to extrapolating the isotherm to the specific value.

Total Granular Activated Carbon Usage

Total Carbon Usage = Carbon Usage For Remaining TAO + Carbon Usage For MTBE

Total Carbon Usage = 42.68 lb/day + 26.71 lb/day = 69.39 lbs

Increase carbon usage by an additional 5% due to adsorption interference from background organics. This assumes naturally occurring background organics are at a concentration of 1 - 2 ppm in the groundwater. (Based on information provided by Cetco, Arlington Heights, IL.)

1.05 x 69.39 lb/day = 73 lb/day Total Granular Activated Carbon Usage

3) Estimate Breakthrough Time Per 1,500 Pounds Of Carbon

1,500 lbs / 73 lb/day = 20.6 Days Until Breakthrough For 1,500 lbs of Carbon

4) Estimate Carbon Costs

Assume a carbon rebed cost of $1.76/lb (Price based on Carbon Service & Equipment Company, 1999 GES pricing.)

Carbon Costs = $1.76 /lb x 73 lb/day = $128 /day = $3,975 /month

V. Air Stripper Design Calculations

The air stripper was sized using the Lopro Design Utility software version 3.13, provided by ORS Environmental Systems, Denver, CO, and the ShallowTray Modeler software version 2.1W, provided by North East Environmental Products, Inc., West Lebanon, NH (NEEP). The Lopro Design Utility was run for the Lopro II and Lopro III series air strippers. The ShallowTray Modeler was run in the automatic mode with a 10% safety factor. Four different model air runs were performed to determine the most cost-effective solution. The model runs are summarized below and the corresponding reports generated by the software are provided at the end of this section.

The models were run for the influent concentrations described below. The effluent limitation for benzene input into the models corresponds to the required effluent concentration for a typical New Jersey Pollutant Discharge Elimination System / Discharge to Surface Water (NJPDES / DSW) permit. This provides a safety factor in the event the carbon adsorption units break through. Since it is unlikely that benzene will be desorbed from a spent carbon bed, the effluent concentration should be less than the influent concentration to the carbon units. Therefore the treatment process is designed in order to meet these requirements. The effluent limitations input for toluene, ethylbenzene and xylene correspond to 99.99% removal, though the removal is typically higher due to the stringent benzene requirement. Since MTBE is not readily removed by the air stripping process, even the low influent concentration anticipated for this site would significantly increase the size of the air stripper if the monthly average NJPDES / DSW permit limitation was used for design of the air stripper. However, carbon adsorption is very effective in removing MTBE, therefore there will be no difficulty in meeting the effluent limitation. Therefore, the granular activated carbon will be used to reduce the remaining MTBE in the air stripper effluent to below the permit limitation.

Since it is desirable to operate the air stripping system without off-gas treatment, the maximum emissions of toxic compounds (TOX) must be limited to 0.1 lb/hr and the maximum emissions of non-methane volatile organic compounds (VOC) must be limited to 0.5 lb/hr as per the New Jersey Department of Environmental Protection Bureau of New Source Review (BNSR). The following equation is utilized to convert the influent TOX and VOC concentrations to pounds per hour. It is then assumed, as is required by the BNSR, that 100% of the liquid phase influent TOX and VOC are exchanged to the vapor phase.

Process Rate (lb/hr) = Flow Rate (gpm) x Concentration (ug/L) x Conversion Factor

Conversion Factor = (60 mins/hr) x (2.2×10^{-9} lb/ug) x (3.788 L/gal) = 5.0×10^{-7} min-lb-L/hr-ug-gal

Concentration (ug/L) = Process Rate (lb/hr) / [Flowrate (gpm) x 5.0×10^{-7}]

Maximum Concentration = 0.1 lb/hr / (15.0 gpm x 5E-07)

Maximum Concentration = 13,169 ug/L Benzene (TOX)

Maximum Concentration = 0.5 lb/hr / (15.0 gpm x 5E-07)

Maximum Concentration = 66,667 ug/L Total Non-Methane VOC

Estimated organic loading to the air stripper based on maximum air emissions of 0.1 and 0.5 lb/hr TOX and non-methane VOC, respectively:

Since the concentrations determined above are greater than the influent design concentrations indicated in Section I, the total system flowrate will not need to be adjusted in order to reduce the total mass flow of benzene and total VOC to less than 0.1 lb/hr and 0.5 lb/hr, respectively.

Benzene =	13,169 ppb
Toluene =	19,177 ppb
Ethyl Benzene =	1,996 ppb
Xylene =	10,987 ppb
MTBE =	623 ppb
TAO =	51,058 ppb[10]

10 - Assumes BTEX and MTBE account for 90% of the total adsorbable organics (TAO).

Model Run Summaries:

All model runs utilize a design water flowrate of 15 gpm, the influent concentrations, and effluent limitations detailed above. Based on model runs 1 and 3, neither the Lopro II or the Series 1300 Shallowtray air strippers are able to achieve the effluent limits. As indicated in model run 2, the Lopro III is able to achieve the desired effluent limitation for benzene by a mere 0.18 ppb. The Lopro III is able the achieve all the desired effluent limitations for the other compounds including MTBE. Model Run 4 indicates that the ShallowTray 2341 air stripper is capable of achieving the desired effluent limitations for all the compounds.

Based on the above information, the air stripper model selected is the NEEP ShallowTray 2341-P. The granular activated carbon system described in Section VI of this report will be utilized to provide secondary treatment and polishing of the groundwater treatment system discharge. The "P" suffix on the model number indicates a polyethylene unit, as opposed to the standard stainless steel unit, will be utilized; VOC removal efficiencies for the two units are identical, while the capital cost of the polyethylene unit is significantly less than the stainless steel unit.

RUN 1

Flowrate: 15 gpm
Influent Concentrations: Design Concentrations Provided Above
Effluent Concentrations: Permit Limitations For Volatile Organic Compounds (VOC) Provided in Section II
Software Model: Automatic - Air Stripper Limited to Lopro II Series
Air Stripper Model Selected: Lopro II (Eight 10-inch Trays) Unable to achieve effluent limitations on VOCs and MTBE

RUN 2

Flowrate: 15 gpm
Influent Concentrations: Design Concentrations Provided Above
Effluent Concentrations: Permit Limitations For Volatile Organic Compounds (VOC) Provided in Section II
Software Model: Automatic - Air Stripper Size Limited to Lopro III Series
Air Stripper Model Selected: Lopro III (Three 13-inch Trays) Able to achieve effluent limitations

RUN 3

Flowrate: 15 gpm
Influent Concentrations: Design Concentrations Provided Above
Effluent Concentrations: Permit Limitations For Volatile Organic Compounds (VOC) Provided in Section II
Software Model: Automatic - Air Stripper Limited to 1300 Series
Air Stripper Model Selected: 1341 (Four 10-inch Trays) Unable to achieve effluent limitations on VOC's and MTBE

RUN 4

Flowrate: 15 gpm
Influent Concentrations: Design Concentrations Provided Above
Effluent Concentrations: Permit Limitations For Volatile Organic Compounds (VOC) Provided in Section II
Software Model: Automatic - Air Stripper Limited to 2300 Series
Air Stripper Model Selected: 2341 (Four 9-inch Trays) Able to achieve effluent limitations

VI. Granular Activated Carbon Design Calculations When Air Stripping Is Included In The Treatment System

1) Size Carbon Units

Minimum Diameter of Carbon Units

Based on a design flowrate of 15 gpm, as indicated in section III above, the minimum diameter of the carbon units is 26 inches.

Contact Time and Bed Volume

When air stripping is utilized the contact time will be reduced to 20 minutes in order to achieve 99.9% reduction of BTEX and MTBE.

15 gpm x 20 min = 300 gal = 40 cu. ft.

Recommended Granular Activated Carbon Units

Number Of Carbon Units In Series =	3	units	
Diameter Of Carbon Units =	30	inches	
30 inches	>	26	inches
Weight Of Carbon Per Unit =	500	lbs	
Volume Of Carbon Per Unit =	18	cu. ft.	
Total Volume of Carbon =	54	cu. ft.	
54 cu. ft.	>	40	cu. ft.

Since granular activated carbon (GAC) provides secondary treatment, the first two GAC vessels combined are sized to provide the required contact time for 99.9% removal of BTEX and MTBE. The third vessel is provided for safety.

2) Estimate Carbon Usage

Calculate Pounds Of Total Adsorbable Organics (TAO) Per Day

Estimated organic loading following air stripping with the North East Environmental Products, Inc., Model 2341-P Air Stripper (Model Run 4).

Benzene =	1 ppb
Toluene =	1 ppb
Ethyl Benzene =	1 ppb
Xylene =	1 ppb
MTBE =	40 ppb
TAO =	49 ppb(11)

11 - Assumes BTEX and MTBE account for 90% of the total adsorbable organics (TAO).

$$\text{TAO (lb/day)} = 0.05 \text{ ppm} \times 15 \text{ gpm} \times \frac{0.012 \text{ lb/day}}{\text{gpm} \cdot \text{ppm}} = 0.009 \text{ lb/day}$$

Calculate Pounds Of MTBE Per Day

$$\text{MTBE (lb/day)} = \frac{40 \text{ ppb}}{49 \text{ ppb}} \times 0.0088 \text{ lb/day} = 0.0072 \text{ lb/day}$$

Calculate Granular Activated Carbon Usage For MTBE

MTBE = 40 ppb

Adsorption Capacity From MTBE Isotherm[12] = 0.14 %

$$\frac{0.007 \text{ lb/day}}{0.14 \%} = 5.23 \text{ lb/day}$$ Granular Activated Carbon Required For MTBE Adsorption

12 - Freundlich coefficients deduced from Freundlich isotherm supplied by Norit Americas, Inc., Atlanta, GA, (k = .308, 1/n = .406) The isotherm provided is valid for a residual concentration range of 10 to 10,000 ug/L. As a conservative estimate of the adsorption capacity for concentrations above this range, the value for a concentration of 10,000 ug/L is used as opposed to extrapolating the isotherm to the specific value.

Calculate Granular Activated Carbon Usage For Remainder of TAO

Assume that the benzene isotherm is adequate for characterizing the remaining TAO

Remaining TAO = TAO - MTBE

Remaining TAO (lb/day) = 0.0088 lb/day - 0.0072 lb/day = 0.0016 lb/day

Remaining TAO (ppb) = 49 ppb - 40 ppb = 9 ppb

Remaining TAO (ppb) = 9 ppb

Adsorption Capacity From Benzene Isotherm[13] = 0.52 %

$$\frac{0.002 \text{ lb/day}}{0.52 \%} = 0.31 \text{ lb/day}$$ Granular Activated Carbon Required For Remaining TAO Adsorption

13 - Based on Freundlich isotherm supplied by Norit Americas, Inc., Atlanta, GA, (k = 2.021, 1/n = 0.43). The isotherm provided is valid for a residual concentration range of 0.1 to 100,000 ug/L. As a conservative estimate of the adsorption capacity for concentrations above this range, the value for a concentration of 100,000 ug/L is used as opposed to extrapolating the isotherm to the specific value.

Total Granular Activated Carbon Usage

Total Carbon Usage = Carbon Usage For Remaining TAO + Carbon Usage For MTBE

Total Carbon Usage = 0.31 lb/day + 5.23 lb/day = 5.54 lbs

Increase carbon usage by an additional 40% due to adsorption interference from background organics. This assumes naturally occurring background organics are at a concentration of 1 - 2 ppm in the groundwater. (Based on information provided by Cetco, Arlington Heights, IL.)

1.4 x 5.54 lb/day = 7.8 lb/day Total Granular Activated Carbon Usage

3) Estimate Breakthrough Time Per 1,000 Pounds Of Carbon

1,000 lbs / 7.8 lb/day = 129.0 Days Until Breakthrough For 1,000 lbs of Carbon

4) Estimate Carbon Costs

Assume a carbon rebed cost of $1.76/lb (Price based on Carbon Service & Equipment Company, 1999 GES pricing.)

Carbon Costs = $1.76 /lb x 7.8 lb/day = $13.64 /day = $423 /month

VII. Solids Removal and Sediment Filtration

Assuming the total solids are made up exclusively of iron (dissolved and suspended), influent solids loading is based on the results of March 9-10, 1999 groundwater sampling for MW-1 and MW-11.

Daily Loading (lbs/day) = Concentration (mg/l) x Flow (MGD) x 8.34 (lbs/gal)

Daily Loading = 50 mg/l x 0.0216 MGD x 8.34 lbs/gal

Daily Loading = 9.01 lbs/day

Weekly Loading = 63.05 lbs/week

VIII. Recommended Treatment System

Based on the design calculations provided above the recommended treatment system will utilize the air stripping process and granular activated carbon adsorption for the removal volatile organic compounds. A clarifier/filter unit and multiple bag filters will be utilized for the removal of suspended solids, including any dissolved iron precipitated from solution due to the oxidation process occurring in the air stripper. The operational cost to provide granular activated carbon with air stripping is $3,552 less per month than without the air stripper. Based on the estimated cost of the specified air stripper, the additional capital costs will be offset within a period of 4 months by the projected savings in carbon costs.

SOIL VAPOR EXTRACTION SYSTEM DESIGN CALCULATIONS

Department of The Army
Fort Monmouth
Main Post Gas Station
Building 699
Eatontown, New Jersey

CALCULATION OF SOIL PERMEABILITY AND THEORETICAL RADIUS OF INFLUENCE

Extraction Test 1:
Test Condition 1:

Test Date: April 17, 1998
Extraction Point: RW-2
Observation Point: MP-3
Screened Interval At Extraction Point: 2' - 12'
Depth To Water At Extraction Point: 4.18 (2.68 static)

Low-vacuum soil vapor extraction (SVE) with a jet pump and drop tube utilized for groundwater extraction from RW-2.

Determination of soil permeability (k) in darcys:

The governing equation[1] is:

$$k = \frac{Q * u * \ln(Rw/Ro)}{H * pi * Pw[1-(Po/Pw)^2]} \qquad (1)$$

Where:
- Q = air flow at the extraction well[2] (cm^3/sec)
- u = viscosity of air in centipoise
- Rw = radius of extraction well (cm)
- Ro = distance to observation well (cm)
- H = height of screen affected by applied vacuum (cm)
- Pw = pressure at the extraction well (atm)
- Po = pressure at the observation well (atm)

1 - As described by P. C. Johnson et al, Groundwater, Vol. 28, No. 3, May-June 1990
2 - Johnson's equation requires air flow in actual, not standard conditions. Field measurements are reported in standard cubic feet per minute (scfm). Thus for the calculation of k, the soil permeability, it is necessary to convert to actual cubic feet per minute (acfm):

$$Q\,(acfm) = Q\,(scfm) * \frac{391.95\ "H_2O}{391.95\ "H_2O - \text{Applied Vacuum}\ ("H_2O)} \qquad (2)$$

Test Data Representative of Steady-State Conditions:

Q =	8.9	scfm		
Q =	10.769852	acfm	=	5082.804 cm^3/sec
u =	0.018	Centipoise	=	0.018 centipoise
Rw =	0.083	feet	=	2.540 cm
Ro =	15	feet	=	457.200 cm
H =	2.18	feet	=	66.446 cm
Vacuum at RW-2 =	68.1	inches-H_2O	=	0.8328 atm
Vacuum at MP-3 =	0.5	inches-H_2O	=	0.9988 atm

Given the above conditions, the permeability of the formation is:

k = 6.24 Darcy

Determination of the distance, Ri, to a vacuum of 0.1 inches H_2O:

The governing equation[3] is:

$$Po = Pw[1+(1-(Pi/Pw)^2)*\ln(Ro/Rw)/\ln(Rw/Ri)]^{1/2} \quad (3)$$

Where: Ri = radial extent of vacuum influence (ft)
Pi = pressure at the radial extent of vacuum influence (inches H_2O)

3 - As described by P. C. Johnson et al, Groundwater, Vol. 28, No. 3, May-June 1990

Rearranging Equation (3) and solving for Ri results in the following:

$$Ri = Rw(Ro/Rw)\ ^\wedge\ -[(1-(Pi/Pw)^2)/((Po/Pw)^2-1)] \quad (4)$$

Solving Equation (4) for the conditions summarized above results in the following value of Ri:

Ri= 15.5 ft.

RECOVERY SYSTEM DESIGN (All Proposed Laterals)

Flowrate Per Unit Length Of Exposed Screen, Q/H

Extraction Test 1: Q/H = 4.08 scfm/ft

Total Vapor Phase (Design) Flow From Extraction Wells

Table 1
Extraction Well Screen Detail

Extraction Lateral	Length of Lateral[4] (ft)	Operational DTW[5] (ft)	Available Screen (ft)	Anticipated Flow (scfm) (Q/H * Avail. Screen)
MW-11[6]	-	6	3	12.2
RW-3[6]	-	6	3	12.2
RW-4[6]	-	6	3	12.2
VL-1	5	4	5	20.4
VL-2	5	4	5	20.4
VL-3	5	4	5	20.4
VL-4	5	4	5	20.4
VL-5	5	4	5	20.4
VL-6	5	4	5	20.4
VL-7	5	4	5	20.4
VL-8	5	4	5	20.4
VL-9	5	4	5	20.4
Total			54	220.2

4 - All laterals are proposed, the construction of which is anticipated to be as shown.
5 - Approximate water elevations based on static water levels observed in nearby monitoring wells 1991 to present and an estimated 2-foot drawdown in each of the recovery wells.
6 - The groundwater recovery wells will be outfitted for soil vapor extraction and are estimated to have 3 feet of casing.

Total Length of Available Screen = 54.0 ft

Total Design Flow = Q/H * Total Available Screen = 220.2 scfm

Flowrate Required To Extract The Equivalent Of Four Pore Volumes Per Day

Areal Extent of Vacuum Influence[7] =	12,053 sq. ft
Average Vertical Extent of Vacuum Influence[8] =	4.0 ft
Assumed Soil Porosity =	0.30

7 - Based on the theoretical calculations provided above, and the actual extent of vacuum influence observed during the pilot study, a vacuum radius of influence (design) of 20 ft is assumed when a vacuum of 68.1 inches H_2O is applied at the wells.

8 - The Johnson equation assumes radial flow; however, as a factor of safety, the vertical extent of vacuum influence is assumed to extend from ground surface to the average operational water level.

Estimated Pore Volume Influenced = Porosity * Areal Extent of Influence* Vertical Extent of Vacuum Influence

Estimated Pore Volume Influenced = 14,464 cu. ft.

Required Daily Volumetric Flow = 4 * Pore Volume Influenced = 57,854 cu. ft./day

Approximate Required Vapor Flowrate = 40 scfm

Total system vapor flowrate = 4.08 scfm/ft x 54 ft of avail. screen = 220

220 scfm	>	40 scfm

RECOVERY SYSTEM DESIGN (Without Optional Laterals)

Flowrate Per Unit Length Of Exposed Screen, Q/H

Extraction Test 1: Q/H = 4.08 scfm/ft

Total Vapor Phase (Design) Flow From Extraction Wells

Table 1
Extraction Well Screen Detail

Extraction Lateral	Length of Lateral[4] (ft)	Operational DTW[5] (ft)	Available Screen (ft)	Anticipated Flow (scfm) (Q/H * Avail. Screen)
MW-11[6]	-	6	3	12.2
RW-3[6]	-	6	3	12.2
RW-4[6]	-	6	3	12.2
VL-1	5	4	5	20.4
VL-2	5	4	5	20.4
VL-3	5	4	5	20.4
VL-4	5	4	5	20.4
VL-5	5	4	5	20.4
VL-6	5	4	5	20.4
Total			39	159.2

Total Length of Available Screen = 39.0 ft

Total Design Flow = Q/H * Total Available Screen = 159.2 scfm

Flowrate Required To Extract The Equivalent Of Four Pore Volumes Per Day

Areal Extent of Vacuum Influence[7] =	7,928 sq. ft
Average Vertical Extent of Vacuum Influence[8] =	4.0 ft
Assumed Soil Porosity =	0.30

Estimated Pore Volume Influenced = Porosity * Areal Extent of Influence* Vertical Extent of Vacuum Influence

Estimated Pore Volume Influenced = 9,514 cu. ft.

Required Daily Volumetric Flow = 4 * Pore Volume Influenced = 38,054 cu. ft./day

Approximate Required Vapor Flowrate = 26 scfm

Total system vapor flowrate = 4.08 scfm/ft x 39 ft of avail. screen = 159

159 scfm	> 26 scfm

The system (with or without the optional laterals) is therefore capable of extracting greater than 4 pore volumes per day. A summary of the data from the feasibility test is presented in the table on the following page.

SOIL VAPOR EXTRACTION BLOWER DESIGN CALCULATIONS

Department of the Army
Fort Monmouth
Main Post Gas Station
Building 699
Eatontown, New Jersey

I. Determination Of The Maximum Frictional Loss In 2-Inch Pipe (Vacuum Side)

In order to determine the maximum frictional losses associated with the individual extraction wells, similar calculations were performed for each well. Based on the anticipated flowrate as calculated in the *Soil Vapor Extraction System Design Calculations* section of this report and the length and diameter of the individual extraction lines, VL-3 will generate the greatest frictional losses and is therefore utilized in the subsequent blower design calculations.

SVE System Design Flow[1] =	220	scfm
Maximum Number of Extraction Laterals/Wells =	12	laterals/wells
Approximate Flowrate from VL-3 =	20.4	scfm
Diameter of Vapor Extraction Pipe to Individual Laterals =	2	inch
Frictional Loss per Unit Length of Pipe[2] =	0.01	inches H_2O/ft (@ 20.4 scfm)
Distance to VL-3 =	440	ft

Frictional Loss = 440 ft x 0.01 inches H_2O/ft = 4.4 inches H_2O

II. Determination Of The Frictional Loss In 2-Inch Pipe Fittings (Vacuum Side)

Number of 45 Degree Elbows =	0	
Equivalent Length of Pipe[3] =	0	ft
Number of 90 Degree Elbows =	6	
Equivalent Length of Pipe[3] =	30	ft
Total Equivalent Length of Pipe =	30	ft

Frictional Loss = 30.0 ft x 0.01 inches H_2O/ft = 0.3 inches H_2O

III. Frictional Loss at Moisture Separator[4]

Total Design System Flow =	220 scfm
Maximum System Flow Including Dilution Air =	300 scfm
MS350BS Moisture Separator Operating at 300 scfm =	1.8 inches H_2O

IV. Frictional Loss Due to Manifold & Valving[5]

1.0 inch H_2O

V. Total Losses on Vacuum Side of the Blower

Maximum Frictional Losses in 2-inch Pipe =	4.4 inches H_2O
Frictional Losses in 2-inch Pipe Fittings =	0.3 inches H_2O
Frictional Loss Across Moisture Separator =	1.8 inches H_2O
Frictional Losses in Manifold & Valving =	1.0 inch H_2O
Total Vacuum Losses =	7.5 inches H_2O

VI. Determination Of The Frictional Loss In Process Pipe (Pressure Side)

Frictional Loss per Unit Length of Pipe[2] = 0.21 inches H_2O/ft (3" Pipe @ 300 scfm)
Total Length of Pipe (Assumed) = 10 ft

Frictional Loss = 10 ft x 0.21 inches H_2O/ft = 2.1 inches H_2O

Frictional Loss per Unit Length of Pipe[2] = 0.01 inches H_2O/ft (6" Pipe @ 300 scfm)
Total Length of Pipe[6] = 20 ft

Frictional Loss = 20 ft x 0.01 inches H_2O/ft = 0.2 inches H_2O

Total Frictional Loss in Process Pipe = 2.3 inches H_2O

VII. Determination Of The Frictional Loss In 3-Inch Pipe Fittings (Pressure Side)

Number of 90 Degree Elbows = 2
Equivalent Length of Pipe[3] = 14.0 ft

Frictional Loss = 14.0 ft x 0.21 inches H_2O/ft = 2.9 inches H_2O

VIII. Frictional Loss at Catalytic Oxidizer[7] 31.0 inches H_2O

The frictional losses due to GAC treatment of the SVE offgas are expected to be less than the frictional losses due to the catalytic oxidizer. So, when the offgas treatment technology changes the SVE blower will not have to be resized.

IX. Total Losses on Pressure Side of Blower

Total Frictional Losses in Process Pipe =	2.3 inches H_2O
Frictional Losses in 3-inch Pipe Fittings =	2.9 inches H_2O
Frictional Loss at Catalytic Oxidizer =	31.0 inches H_2O
Total Pressure Side Losses =	36.2 inches H_2O

X. Vacuum Required (Design) at Extraction Well[1] 68.1 inches H_2O

XI. Summary of SVE Blower Performance Requirements

Vacuum Requirements = Vacuum at Extraction Well + Losses on Vacuum Side of Blower

68.1 inches H_2O + 7.5 inches H_2O = 75.6 inches H_2O

Pressure Requirements = Losses on Pressure Side of Blower

36.2 inches H_2O = 36.2 inches H_2O

Total Vacuum and Pressure Requirements = 111.8 inches H_2O

Since the vacuum requirements for the blower are greater than the pressure requirements, the blower was sized using the vacuum performance curve[3].

Design Requirements: 300 scfm @ 112 inches H_2O

XII. SVE Blower Selection

Blower selected:

Model:	MD Competitor 4005[8]	300 scfm @ 125 inches H_2O
Manufacturer:	TUTHILL Corporation	230V/3PH/15HP
	M-D Pneumatics Division	
	Springfield, Missouri	

The MD Competitor 4005 shall have the capability to operate the entire system at the required flow and vacuum. To operate within safe influent concentrations for the Falco 300, it may become necessary to introduce dilution air into the system. Therefore, it may become necessary to pulse vent the SVE system, especially during the initial phase of operation when concentrations are elevated. Experience with similar remedial systems has shown the trend that concentrations usually decrease rapidly from the initial levels. After the drop in concentrations, it should then be possible to operate additional extraction points simultaneously.

1 - Based on information provided in the *Soil Vapor Extraction System Design Calculations* section of this report.

2 - Based on nomagraph provided by EG&G Rotron, Saugerties, NY

3 - Based on information provided by EG&G Rotron, Saugerties, NY

4 - Based on equipment specifications provided by EG&G Rotron, Saugerties, NY

5 - Assumed frictional losses through the vapor extraction manifold and valves.

6 - Accounts for catalytic oxidizer discharge stack.

7 - Based on equipment specifications provided by Falmouth Products, Inc., Falmouth, MA.

APPENDIX IX

VAPOR PHASE TREATMENT OPERATIONAL COST ANALYSIS
FALCO 300 CATALYTIC OXIDIZER

PARAMETERS	
FUEL:	ELECTRIC
COST[1] ($/kW-h):	$0.0943
FLOW (scfm):	300
INFLUENT TEMP:	100 'F
OPERATING TEMP:	
Without Heat Exchanger	600 'F
With Heat Exchanger	600 'F
POWER REQUIREMENT[2] (kW):	
With Heat Exchanger	20.3

ASSUMPTIONS / NOTES

1 - It is assumed that the extracted soil vapor is composed primarily of benzene, toluene, ethylbenzene and xylenes (BTEX).

2 - The molecular weight of weathered gasoline is 108 g/mole, P. C. Johnson et al, Groundwater, Vol. 28, No. 3, May-June 1990.

3 - The fuel value of the extracted soil vapor is assumed to be 20,260 BTU/lb (Lowest value for gasoline).

4 - Based on information provided by PSE&G.

5 - Based on information supplied by Falmouth Products, Falmouth, MA, for the Falco 300.

6 - 100 percent of the lower explosive limit (LEL) of gasoline is equivalent to 13000 ppm_v.

7 - Mass flow (lbs/hr) = (scfm x ppm_v x 108 g/mole) x [(1.55×10^{-7}) (mole/ft3)(min/hr)(lb/g)(ppm^{-1})].

8 - Power available in extracted soil vapor (kW) = BTU/lb * lbs/hr * 2.93×10^{-4} kW-hr/BTU.

9 - Due to the significant fluctuation in the influent BTEX concentrations over time in the extracted soil vapor, only general trends can be established. It is therefore difficult to predict a finite duration of system operation to remove a given quantity of hydrocarbons. Consequently, the costs are presented on a unit mass/volume basis.

10 - Supplemental Power Requirement = Power Requirement of Unit (kW) - Power Available in Soil Vapor (kW).

11 - At or above an influent soil vapor non-methane volatile organic compound (VOC) concentration of approximately 780 ppm_v, the heat recovered from the effluent heat exchanger is great enough to heat the influent air stream to the minimum required destruction temperature, therefore no supplemental power requirements are indicated, since the pre-heater does not have to operate. Slight power usage will be required upon starting/restarting the unit in the event of a shut down as the unit must be warmed up slowly. In addition, the pre-heater will activate during normal operation in this concentration range in order to compensate for variations in the influent soil vapor concentrations. In addition, the maximum allowable influent VOC concentration to the Falmouth catalytic oxidizer is 2400 ppm_v. Operation of the unit when influent VOC concentrations are higher than this value will require the introduction of dilution air to reduce the combined influent to the oxidizer to less than 2400 ppm_v.

12 - Granular activated carbon consumption supplied by Calgon, Arlington Heights, IL.

13 - Assumes $0.98/lb for granular activated carbon, including vac/rebed charges.

CATALYTIC OXIDATION W/ HEAT EXCHANGER

EXTRACTED SOIL VAPOR				Days of Operation/ 1000 gal BTEX[9]	POWER REQUIREMENT (kW)[5]	SUPPLEMENTAL POWER (kW)[10]	*Catalytic Oxidizer*			*Granular Activated Carbon*			
% LEL	(ppm_v)[6]	(lbs/hr)[7]	(kW)[8]				$/Month[11]	$/lb BTEX	$/gal BTEX	lb/Month[12]	$/Month[13]	$/lb BTEX	$/gal BTEX
0%	0	0.00	0.0	-	20.3	20.3	$1,397.44	-	-	-	-	-	-
1%	130	0.65	3.9	399.21	20.3	16.4	$1,130.65	$2.37	$14.84	3976	$3,896.40	$8.17	$51.08
2%	260	1.31	7.8	199.60	20.3	12.5	$863.86	$0.91	$5.67	6865	$6,727.60	$7.05	$44.10
3%	390	1.96	11.6	133.07	20.3	8.7	$597.08	$0.42	$2.61	9704	$9,509.86	$6.64	$41.56
4%	520	2.61	15.5	99.80	20.3	4.8	$330.29	$0.17	$1.08	12079	$11,837.16	$6.20	$38.80
5%	650	3.26	19.4	79.84	20.3	0.9	$63.51	$0.03	$0.17	14680	$14,386.70	$6.03	$37.72
6%	780	3.92	23.3	66.53	20.3	0.0	$0.00	-	-	17455	$17,106.14	$5.98	$37.38
7%	910	4.57	27.1	57.03	20.3	0.0	$0.00	-	-	19646	$19,252.80	$5.76	$36.06
8%	1,040	5.22	31.0	49.90	20.3	0.0	$0.00	-	-	22127	$21,684.31	$5.68	$35.54
10%	1,300	6.53	38.8	39.92	20.3	0.0	$0.00	-	-	27263	$26,718.16	$5.60	$35.03
15%	1,950	9.79	58.1	26.61	20.3	0.0	$0.00	-	-	39322	$38,535.81	$5.38	$33.68
18%	2,340	11.75	69.8	22.18	20.3	0.0	$0.00	-	-	45439	$44,530.27	$5.19	$32.43
20%	2,600	13.06	77.5	19.96	20.3	0.0	$0.00	-	-	50222	$49,217.67	$5.16	$32.26
25%	3,250	16.32	96.9	15.97	20.3	0.0	$0.00	-	-	61168	$59,944.60	$5.03	$31.44
30%	3,900	19.59	116.3	13.31	20.3	0.0	$0.00	-	-	71567	$70,135.18	$4.90	$30.65
35%	4,550	22.85	135.6	11.41	20.3	0.0	$0.00	-	-	80671	$79,057.37	$4.73	$29.61
40%	5,200	26.11	155.0	9.98	20.3	0.0	$0.00	-	-	90878	$89,060.55	$4.67	$29.19

10 Location BLDG. 699 SALTZMAN Date 8-26,27-99

Project / Client

8-26-99 REMOVED FROM GROUND 5 X 12 CY LOADS OF CONTAMINATED SOIL FROM ABOVE AND AROUND SIDES OF USTs

8-27-99
HAD WATER REMOVED FROM USTs PRIOR TO REMOVAL FROM GROUND. VAC TRUCK (CHASE-PRO TANK) REMOVED 2,850 GALLONS OF WATER FROM USTs REMOVED TANKS FROM GROUND AFTER WATER WAS PUMPED OUT. T9 IS APPROX 1/4 FULL OF SAND @ N. END (TANK FILLS WERE APPARENTLY FILLED WITH SAND).

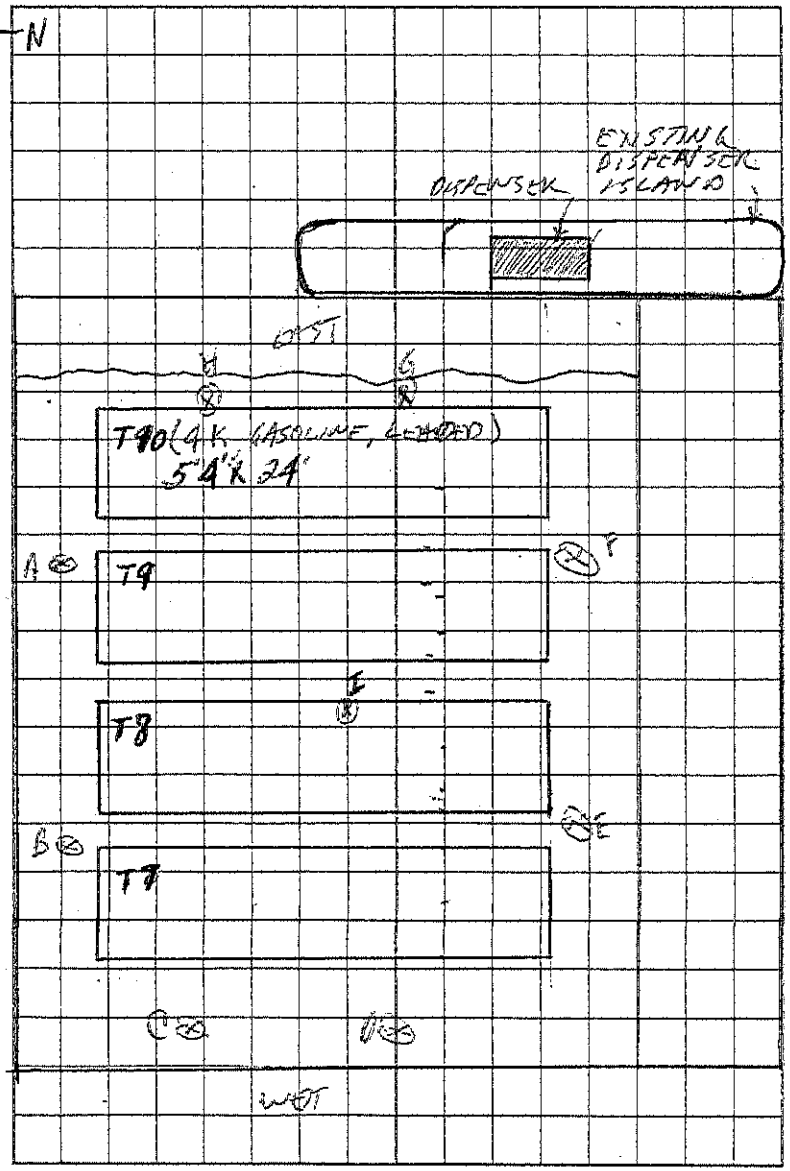
CONDITION OF TANKS
T7: RUST, PITING, CORROSION, SCALE, HOLES
T8: " " " " "
T9: " " " " NO HOLES
T10: " " " " HOLES

Location BLDG. 699 SALTZMAN Date

11

Project / Client (SERVICE STATION)

SCALE 1 IN. = 10 FT.



Location [illegible] SERVICE STATION Date 8-5-11

Project / Client SERVICE STATION

DECOMMISSIONED UST'S. CHECKED WITH MSA METER (LEL, O2, TOX) AND TANKS WERE CUT OPEN W/ RIVET BUSTER.

9-31-99 TANKS LOADED ONTO DUMP TRUCKS AND FLATBED TRAILER AND DELIVERED TO MAZZA RECYCLING. EXCAVATED CONTAMINATED SOILS FROM IMMEDIATE UST AREA TO A DEPTH OF 9-9.5 FT. GW @ 8.5-9.0 FT

9-1-99

SAMPLE #	LOCATION	DEPTH	PID	TIME	VOA #
699 A	NORTH WALL (E)	8.0-8.5'	430	0915	736
B	NORTH WALL (W)		420	0900	737
C	WEST WALL (M)		510	0935	738
D	WEST WALL (S)		450	0945	739
E	SOUTH WALL (M)		36	1120	740
F	SOUTH WALL (E)		20	1140	741
G	EAST WALL (S)		280	1200	742
H	EAST WALL (M)		350	0925	743
699 D (DUP)	WEST WALL (S)	↓	450	0945	744
I	BOTTOM	9.5-10.0	20	1000	740
					745 TRIP BLANK

Location [illegible] Date 7-21-11 13

Project / Client LORCO 800-734-0910

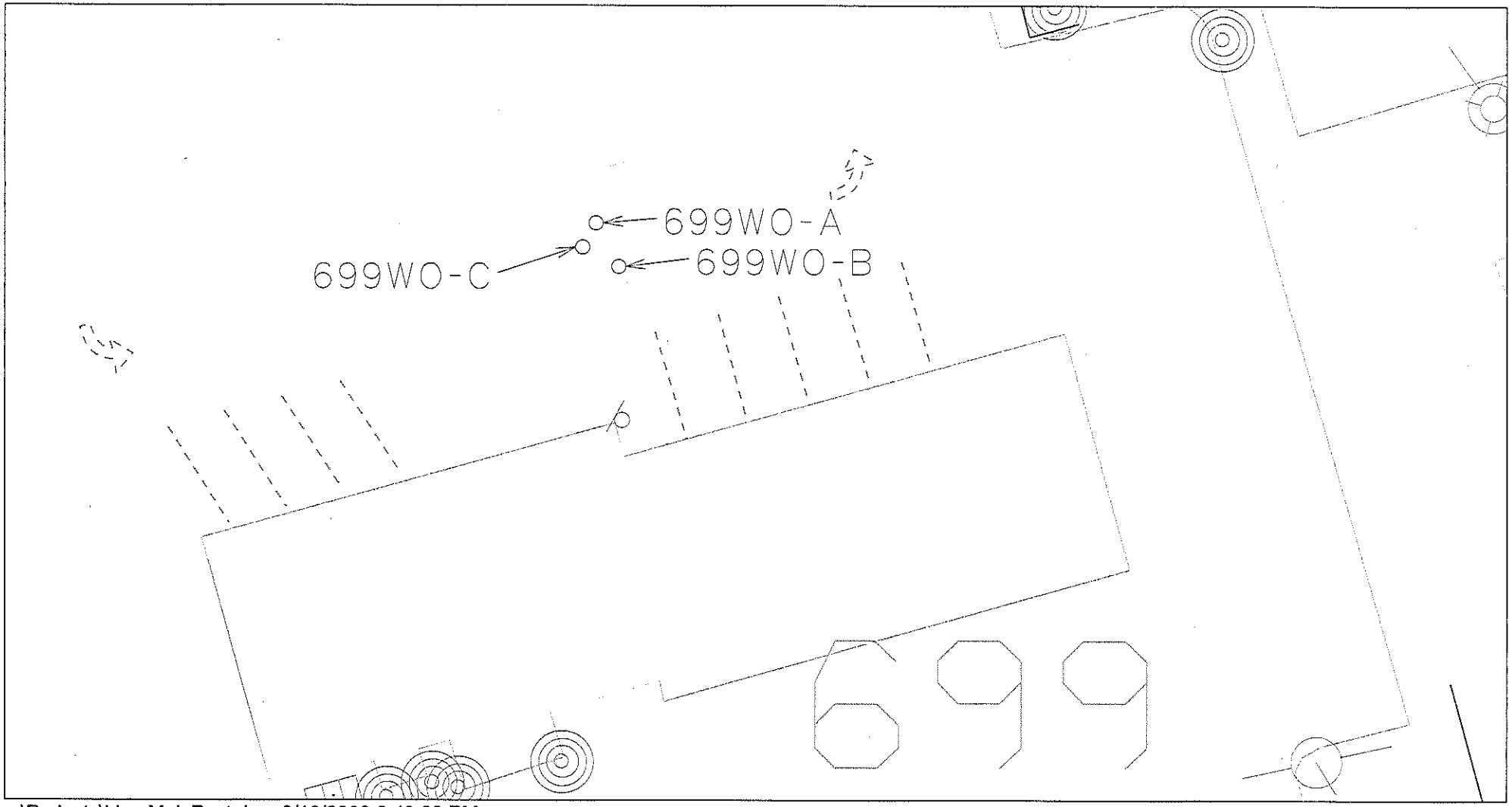
AM 59 BOB SOLOLEWSKI

STEWART ARC 914-567-4212

- 2 FLOOR DRAINS (15" Ø 1'+1' DEEP) FILL W/ CONCRETE.
- UST (550 G. VAC OUT REMOVE) FILL W/ STONE, BLEND
- OIL/H2O SEPARATOR, PUMP OUT SAME VAC OUT H2O IN VAULT (8'x4'x4') FILL VAULT W/ STONE, BLEND ON TOP, REMOVE FRAMES (2) + COVERS
- BACKHOE, VAC TRUCK, LOAD OF CRUSHED STONE
- ORDER CONCRETE & BLEND
- CAP/SEAL SEPARATOR INLET/OUTLET PIPES (4" Ø)

KINGSTON FOUNDRY

- CONCRETE FOR FLOOR PIT - FILL W/ (30'x3'x.5') CONCRETE
- WASH PAD: 12" THICK, DEMO + USE BROKEN CONCRETE TO FILL OUT HOLE; REMOVE GRATE + PLUG PIPE
- BRING 1000 G. NIKEN AST BACK TO FT. MON → FT. MIX



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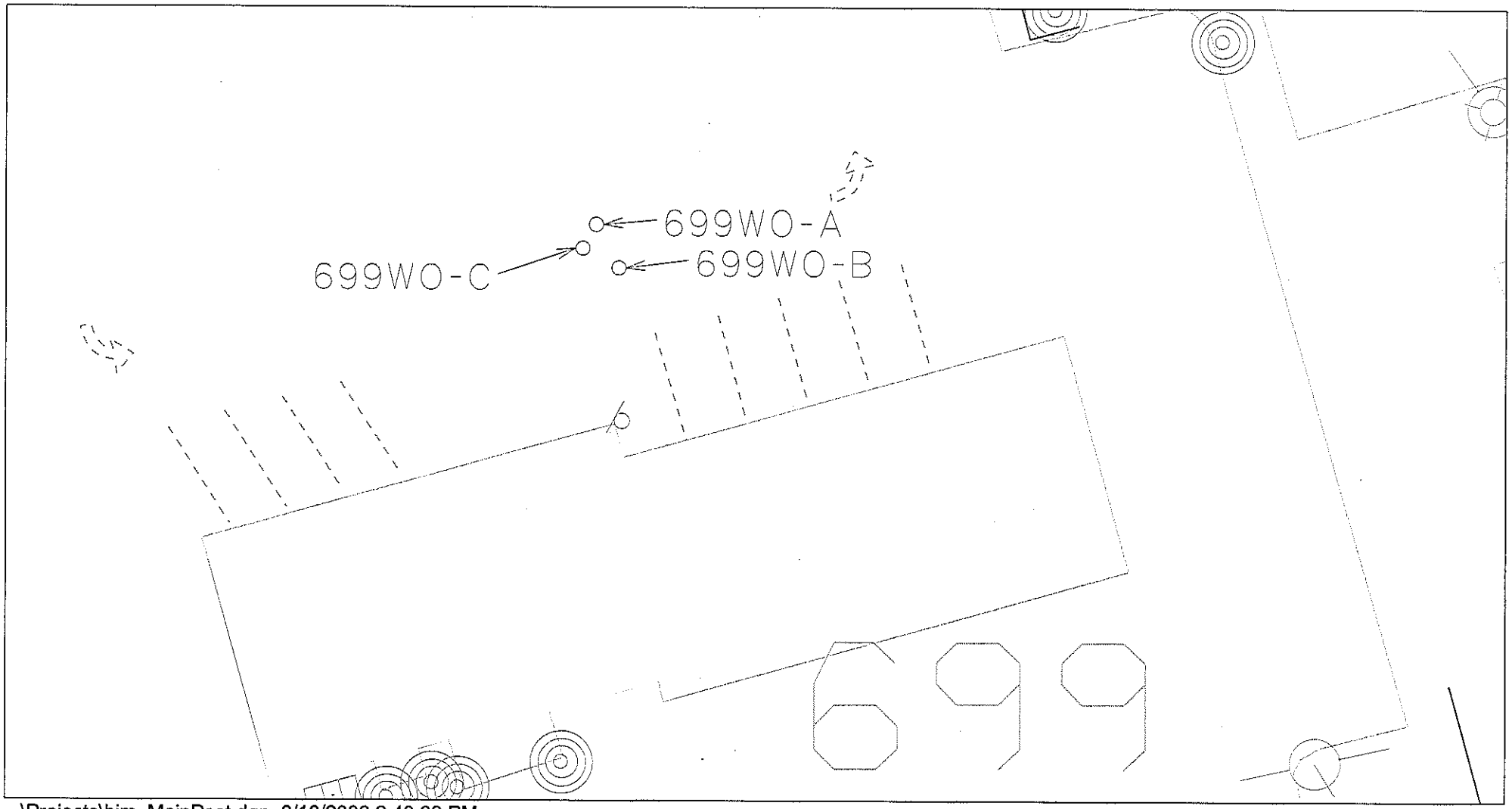

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Bldg. 699 UST Fuel Station Soil and Ground Water Sample Position & Coordinates

US STATE PLANE 1983 NJ (NY EAST) 2900 NAD 1983 (CONUS)

(IN US SURVEY FEET)

Sample Points

Position / Desc.	Y Coord. (Northing)	X Coord. (Easting)
	09/29/99 & 09/30/99 & 10/4-5/99	
PS 1	539061.449	618636.113
PS 2	539065.522	618629.674
PS 3	539073.135	618643.278
PS 4	539081.433	618643.573
PS 5	539078.617	618627.579
PS 6	539095.171	618625.5
PS 7	539089.344	618643.424
PS 8	539105.318	618645.995
PS 9	539102.53	618632.82
	10/17/2000	
699WO-A North End	539021.286	618699.655
699WO-B South End	539014.391	618703.216
699WO-C Piping	539017.46	618697.56
	09/01/1999	
A	539054.456	618624.314
B	539055.001	618603.039
C	539048.103	618589.703
D	539037.067	618589.703
E	539028.329	618604.878
F	539028.789	618628.332
G	539037.067	618636.149
H	539048.103	618636.609
I	539042.585	618611.777

Reference Points

Position / Desc.	Y Coord. (Northing)	X Coord. (Easting)
SW CORNER	538930.131	618652.633
NW CORNER	538967.823	618637.626
NE CORNER	539001.83	618767.295

96 Location BLDG. 699 Date 10-17-00

Project / Client UST # 81533-239

REMOVAL OF ONE 500 G. SINGLE WALL STEEL WASTE OIL TANK. TOP OF TANK @ 2.5 FT. BELOW EXISTING GRADE. TANK CONDITION: FAIR - RUSTING SCALING, PITTING, CORROSION, NO APPARENT HOLES.

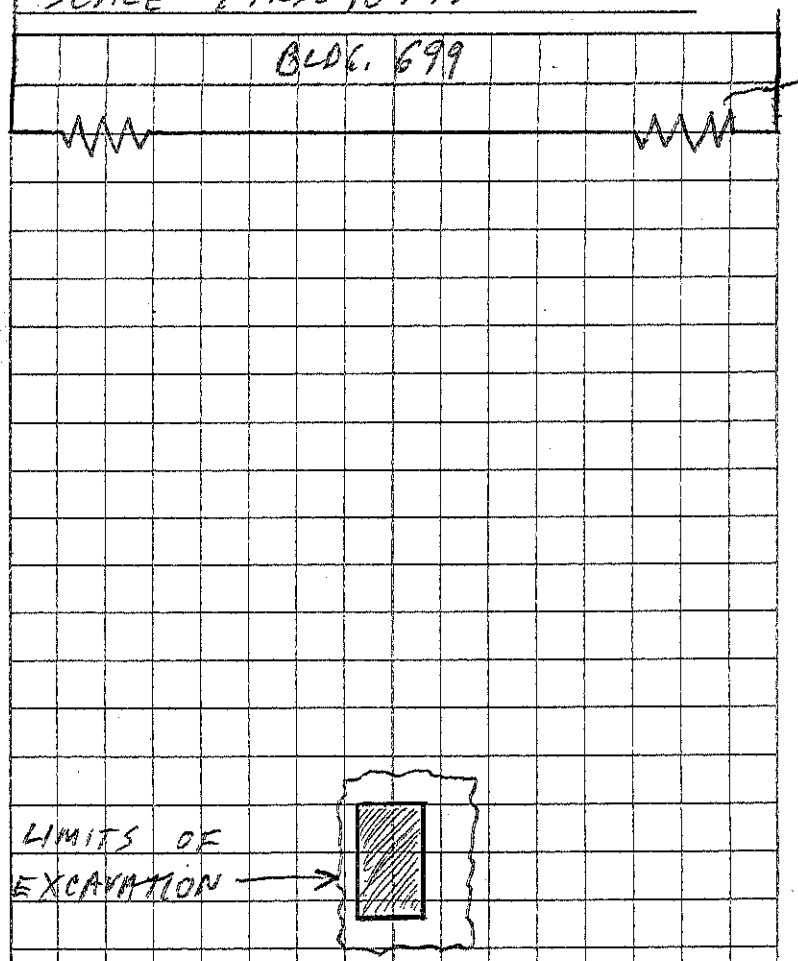
SAMPLE #	LOCATION	DEPTH	PID
699WO-A	NORTH END	6.5-7	420
699WO-B	SOUTH END	6.5-7	330
699WO-C	PIPING	1.5-2	130
699WO-D	DUPL(B)	6.5-7	340

Location BLDG. 699 Date

97

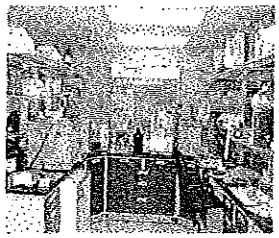
Project / Client

SCALE 1 IN. = 10 FT.



FORT MONMOUTH ENVIRONMENTAL TESTING LABORATORY

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



ANALYTICAL DATA REPORT
Fort Monmouth Environmental Laboratory
ENVIRONMENTAL DIVISION
Fort Monmouth, New Jersey
PROJECT: IJO# 100004

Bldg. 699

Field Sample Location	Laboratory Sample ID#	Matrix	Date and Time Of Collection	Date Received
699WO-A North End 6.5-7'	5801.01	Soil	17-Oct-00 13:20	10/17/00
699WO-B South End 6.5-7'	5801.02	Soil	17-Oct-00 13:40	10/17/00
699WO-C Piping 1.5-2'	5801.03	Soil	17-Oct-00 14:00	10/17/00
699WO-D Duplicate	5801.04	Soil	17-Oct-00 13:40	10/17/00
Trip Blank	5801.05	Methanol	17-Oct-00	10/17/00

ANALYSIS:
FORT MONMOUTH ENVIRONMENTAL LAB
VOA+15, BN+15, PCB's, TPHC
PP METALS, %SOLIDS

ENCLOSURE:
CHAIN OF CUSTODY
RESULTS

11-10-00
Daniel Wright/Date
Laboratory Director

CHAIN OF CUSTODY

Fort Monmouth Environmental Testing Laboratory

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

Chain of Custody Record

Customer: Dinker Desai
Project No: 100004
Phone #: X21475
Location: BLDG. 699
( )DERA (X)OMA UST Assessment
UST# 81533-239
Samplers Name / Company : Frank Accorsi/TVS

Analysis Parameters; * = Samples Kept <4°C

Lab Sample I.D.	Sample Location	Depth	Date	Time	Sample Type	# Bottles	P.P. METALS TPHC* PCBS	BN+15 % SOLIDS	VOA+10	VOA ID #	PID Reading	Remarks / Preservation Method
5801. 01	699WO-A, NORTH END	6.5-7	10-17-00	1320	SOIL	3	X	X	X	2103	470	ICE
02	699WO-B, SOUTH END	6.5-7	↓	1340	↓	3	X	X	X	2104	330	↓
03	699WO-C, PIPING	1.5-2	↓	1400	↓	3	X	X	X	2105	130	↓
04	699WO-D, DUPL.	6.5-7	↓	1340	↓	3	X	X	X	2107	340	↓
05	TRIP BLANK	–	↓	–	AQ.	1			X	2109	–	↓

OVM sn#580U-64455.343 was calibrated with zero air & w/ 245 ppm Isobutylene read 245 ppm. 1110 10-17-00 FA (time/date & initial)

Relinquished by (signature): Frank Accorsi
Date/Time: 10-17-00 1600
Received by (signature): [signature]

Relinquished by (signature):
Date/Time:
Received by (signature):

Comments: ~~* PAH on 25% of samples >100 ppm TPH, min. one on highest~~ TPH ON ALL SAMPLES, OTHER PARAMETERS ON 25% WHERE TPH IS DETECTED, MIN. ONE, ON HIGHEST,

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

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

Change of Chain of Custody

Lab Project ID#: 5801 Site/Project Name: Bldg 699

Date Received: 10/17/00 Date of Change: 10/23/00

Requested by: *print* Brian Finch Sign: _____

Turnaround Time: Standard

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

Received by: *print* _____ Sign: _____

Sample ID#	New Analysis		Sample ID#	New Analysis
5801.01	PP Metals PCB's BNO+15, VOA+15'			

Comments: _____

VOLATILE ORGANICS

1A

Lab ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

Vblk251

Lab Name: FMETL Project: 100004

NJDEP#: 13461 Case No.: 5801 Location: B699 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk251

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB008565.D

Level: (low/med) MED Date Received: 10/17/00

% Moisture: not dec. 0 Date Analyzed: 10/24/00

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1800	U
107131	Acrylonitrile	1800	U
75650	tert-Butyl alcohol	3200	U
1634044	Methyl-tert-Butyl ether	750	U
108203	Di-isopropyl ether	500	U
	Dichlorodifluoromethane	1000	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	750	U
74-83-9	Bromomethane	500	U
75-00-3	Chloroethane	750	U
75-69-4	Trichlorofluoromethane	500	U
75-35-4	1,1-Dichloroethene	250	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-09-2	Methylene Chloride	500	U
156-60-5	trans-1,2-Dichloroethene	500	U
75-35-3	1,1-Dichloroethane	250	U
108-05-4	Vinyl Acetate	750	U
78-93-3	2-Butanone	750	U
	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
75-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	500	U
71-43-2	Benzene	250	U
107-06-2	1,2-Dichloroethane	500	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
110-75-8	2-Chloroethyl vinyl ether	500	U
10061-01-5	cis-1,3-Dichloropropene	250	U
108-10-1	4-Methyl-2-Pentanone	500	U
108-88-3	Toluene	250	U
10061-02-6	trans-1,3-Dichloropropene	500	U
79-00-5	1,1,2-Trichloroethane	500	U
127-18-4	Tetrachloroethene	250	U
591-78-6	2-Hexanone	500	U
126-48-1	Dibromochloromethane	500	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	500	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab ID. **Vblk251**

Lab Name: FMETL Project: 100004

NJDEP#: 13461 Case No.: 5801 Location: B699 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk251

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB008565.D

Level: (low/med) MED Date Received: 10/17/00

% Moisture: not dec. 0 Date Analyzed: 10/24/00

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	750	U
1330-20-7	o-Xylene	500	U
100-42-5	Styrene	500	U
75-25-2	Bromoform	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U
541-73-1	1,3-Dichlorobenzene	750	U
106-46-7	1,4-Dichlorobenzene	750	U
95-50-1	1,2-Dichlorobenzene	750	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab ID. **Vblk251**

Lab Name: FMETL Project: 100004

NJDEP#: 13461 Case No.: 5801 Location: B699 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk251

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB008565.D

Level: (low/med) MED Date Received: 10/17/00

% Moisture: not dec. 0 Date Analyzed: 10/24/00

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

1A

Lab ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699WO-A

Lab Name: FMETL Project: 100004

NJDEP#: 13461 Case No.: 5801 Location: B699 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 5801.01

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB008567.D

Level: (low/med) MED Date Received: 10/17/00

% Moisture: not dec. 15.87 Date Analyzed: 10/24/00

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	2100	U
107131	Acrylonitrile	2100	U
75650	tert-Butyl alcohol	3900	U
1634044	Methyl-tert-Butyl ether	890	U
108203	Di-isopropyl ether	600	U
	Dichlorodifluoromethane	1200	U
74-87-3	Chloromethane	300	U
75-01-4	Vinyl Chloride	890	U
74-83-9	Bromomethane	600	U
75-00-3	Chloroethane	890	U
75-69-4	Trichlorofluoromethane	600	U
75-35-4	1,1-Dichloroethene	300	U
67-64-1	Acetone	2400	
75-15-0	Carbon Disulfide	300	U
75-09-2	Methylene Chloride	600	U
156-60-5	trans-1,2-Dichloroethene	600	U
75-35-3	1,1-Dichloroethane	300	U
108-05-4	Vinyl Acetate	890	U
78-93-3	2-Butanone	890	U
	cis-1,2-Dichloroethene	300	U
67-66-3	Chloroform	300	U
75-55-6	1,1,1-Trichloroethane	300	U
56-23-5	Carbon Tetrachloride	600	U
71-43-2	Benzene	14000	
107-06-2	1,2-Dichloroethane	600	U
79-01-6	Trichloroethene	300	U
78-87-5	1,2-Dichloropropane	300	U
75-27-4	Bromodichloromethane	300	U
110-75-8	2-Chloroethyl vinyl ether	600	U
10061-01-5	cis-1,3-Dichloropropene	300	U
108-10-1	4-Methyl-2-Pentanone	600	U
108-88-3	Toluene	61000	E
10061-02-6	trans-1,3-Dichloropropene	600	U
79-00-5	1,1,2-Trichloroethane	600	U
127-18-4	Tetrachloroethene	300	U
591-78-6	2-Hexanone	600	U
126-48-1	Dibromochloromethane	600	U
108-90-7	Chlorobenzene	300	U
100-41-4	Ethylbenzene	49000	E

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab ID. **699WO-A**

Lab Name: FMETL Project: 100004

NJDEP#: 13461 Case No.: 5801 Location: B699 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 5801.01

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB008567.D

Level: (low/med) MED Date Received: 10/17/00

% Moisture: not dec. 15.87 Date Analyzed: 10/24/00

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	130000	E
1330-20-7	o-Xylene	71000	E
100-42-5	Styrene	600	U
75-25-2	Bromoform	600	U
79-34-5	1,1,2,2-Tetrachloroethane	600	U
541-73-1	1,3-Dichlorobenzene	890	U
106-46-7	1,4-Dichlorobenzene	890	U
95-50-1	1,2-Dichlorobenzene	890	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab ID. **699WO-A**

Lab Name: FMETL Project: 100004

NJDEP#: 13461 Case No.: 5801 Location: B699 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 5801.01

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB008567.D

Level: (low/med) MED Date Received: 10/17/00

% Moisture: not dec. 15.87 Date Analyzed: 10/24/00

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 15

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	18.59	75000	J
2. 000565-75-3	Pentane, 2,3,4-trimethyl-	21.26	54000	JN
3. 000560-21-4	Pentane, 2,3,3-trimethyl-	21.64	62000	JN
4. 000589-81-1	Heptane, 3-methyl-	22.13	56000	JN
5. 000111-65-9	Octane	23.27	43000	JN
6. 003221-61-2	Octane, 2-methyl-	25.79	63000	JN
7.	unknown	26.12	51000	J
8.	unknown	29.21	64000	J
9. 000103-65-1	Benzene, propyl-	30.79	46000	JN
10.	unknown	31.02	170000	J
11. 000095-36-3	1,2,4-Trimethylbenzene	31.17	68000	JN
12.	unknown	31.78	59000	J
13.	unknown	32.11	150000	J
14. 000526-73-8	Benzene, 1,2,3-trimethyl-	33.21	54000	JN
15.	unknown	33.72	51000	J

1A

Lab ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699WO-Adl

Lab Name: FMETL Project: 100004

NJDEP#: 13461 Case No.: 5801 Location: B699 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 5801.01dl

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB008568.D

Level: (low/med) LOW Date Received: 10/17/00

% Moisture: not dec. 15.87 Date Analyzed: 10/24/00

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 10.0

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

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	21000	U
107131	Acrylonitrile	21000	U
75650	tert-Butyl alcohol	39000	U
1634044	Methyl-tert-Butyl ether	8900	U
108203	Di-isopropyl ether	6000	U
	Dichlorodifluoromethane	12000	U
74-87-3	Chloromethane	3000	U
75-01-4	Vinyl Chloride	8900	U
74-83-9	Bromomethane	6000	U
75-00-3	Chloroethane	8900	U
75-69-4	Trichlorofluoromethane	6000	U
75-35-4	1,1-Dichloroethene	3000	U
67-64-1	Acetone	6000	U
75-15-0	Carbon Disulfide	3000	U
75-09-2	Methylene Chloride	6000	U
156-60-5	trans-1,2-Dichloroethene	6000	U
75-35-3	1,1-Dichloroethane	3000	U
108-05-4	Vinyl Acetate	8900	U
78-93-3	2-Butanone	8900	U
	cis-1,2-Dichloroethene	3000	U
67-66-3	Chloroform	3000	U
75-55-6	1,1,1-Trichloroethane	3000	U
56-23-5	Carbon Tetrachloride	6000	U
71-43-2	Benzene	15000	D
107-06-2	1,2-Dichloroethane	6000	U
79-01-6	Trichloroethene	3000	U
78-87-5	1,2-Dichloropropane	3000	U
75-27-4	Bromodichloromethane	3000	U
110-75-8	2-Chloroethyl vinyl ether	6000	U
10061-01-5	cis-1,3-Dichloropropene	3000	U
108-10-1	4-Methyl-2-Pentanone	6000	U
108-88-3	Toluene	250000	D
10061-02-6	trans-1,3-Dichloropropene	6000	U
79-00-5	1,1,2-Trichloroethane	6000	U
127-18-4	Tetrachloroethene	3000	U
591-78-6	2-Hexanone	6000	U
126-48-1	Dibromochloromethane	6000	U
108-90-7	Chlorobenzene	3000	U
100-41-4	Ethylbenzene	47000	D

1A

Lab ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699WO-Adl

Lab Name: FMETL Project: 100004

NJDEP#: 13461 Case No.: 5801 Location: B699 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 5801.01dl

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB008568.D

Level: (low/med) LOW Date Received: 10/17/00

% Moisture: not dec. 15.87 Date Analyzed: 10/24/00

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 10.0

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

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	150000	D
1330-20-7	o-Xylene	69000	D
100-42-5	Styrene	6000	U
75-25-2	Bromoform	6000	U
79-34-5	1,1,2,2-Tetrachloroethane	6000	U
541-73-1	1,3-Dichlorobenzene	8900	U
106-46-7	1,4-Dichlorobenzene	8900	U
95-50-1	1,2-Dichlorobenzene	8900	U

SEMI-VOLATILE ORGANICS

1B

Field ID:

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Sblk431

Lab Name: FMETL Lab Code 13461

Project: 000004 Case No.: 5801 Location: Bl.699 SDG No:

Matrix: (soil/water) SOIL Lab Sample ID: Sblk431

Sample wt/vol: 10 (g/ml) G Lab File ID: BN04618.D

Level: (low/med) LOW Date Received: 10/17/00

% Moisture: 0 decanted:(Y/N) N Date Extracted: 10/24/00

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/25/00

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
110-86-1	Pyridine	1000	U
62-75-9	N-nitroso-dimethylamine	1000	U
62-53-3	Aniline	1000	U
111-44-4	bis(2-Chloroethyl)ether	1000	U
541-73-1	1,3-Dichlorobenzene	1000	U
106-46-7	1,4-Dichlorobenzene	1000	U
100-51-6	Benzyl alcohol	1000	U
95-50-1	1,2-Dichlorobenzene	1000	U
108-60-1	bis(2-chloroisopropyl)ether	1000	U
621-64-7	n-Nitroso-di-n-propylamine	1000	U
67-72-1	Hexachloroethane	1000	U
98-95-3	Nitrobenzene	1000	U
78-59-1	Isophorone	1000	U
111-91-1	bis(2-Chloroethoxy)methane	1000	U
120-82-1	1,2,4-Trichlorobenzene	1000	U
91-20-3	Naphthalene	1000	U
106-47-8	4-Chloroaniline	1000	U
87-68-3	Hexachlorobutadiene	1000	U
91-57-6	2-Methylnaphthalene	1000	U
77-47-4	Hexachlorocyclopentadiene	1000	U
91-58-7	2-Chloronaphthalene	1000	U
88-74-4	2-Nitroaniline	1000	U
131-11-3	Dimethylphthalate	1000	U
208-96-8	Acenaphthylene	1000	U
606-20-2	2,6-Dinitrotoluene	1000	U
99-09-2	3-Nitroaniline	1000	U
83-32-9	Acenaphthene	1000	U
132-64-9	Dibenzofuran	1000	U
121-14-2	2,4-Dinitrotoluene	1000	U
84-66-2	Diethylphthalate	1000	U
86-73-7	Fluorene	1000	U
7005-72-3	4-Chlorophenyl-phenylether	1000	U
100-01-6	4-Nitroaniline	1000	U
86-30-6	n-Nitrosodiphenylamine	1000	U
103-33-3	Azobenzene	1000	U
101-55-3	4-Bromophenyl-phenylether	1000	U
118-74-1	Hexachlorobenzene	1000	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Field ID: **Sblk431**

Lab Name: FMETL Lab Code 13461

Project: 000004 Case No.: 5801 Location: Bl.699 SDG No:

Matrix: (soil/water) SOIL Lab Sample ID: Sblk431

Sample wt/vol: 10 (g/ml) G Lab File ID: BN04618.D

Level: (low/med) LOW Date Received: 10/17/00

% Moisture: 0 decanted:(Y/N) N Date Extracted: 10/24/00

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/25/00

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
85-01-8	Phenanthrene	1000	U
120-12-7	Anthracene	1000	U
84-74-2	Di-n-butylphthalate	480	J
206-44-0	Fluoranthene	1000	U
92-87-5	Benzidine	1000	U
129-00-0	Pyrene	1000	U
85-68-7	Butylbenzylphthalate	1000	U
56-55-3	Benzo[a]anthracene	1000	U
91-94-1	3,3'-Dichlorobenzidine	1000	U
218-01-9	Chrysene	1000	U
117-81-7	bis(2-Ethylhexyl)phthalate	1000	U
117-84-0	Di-n-octylphthalate	1000	U
205-99-2	Benzo[b]fluoranthene	1000	U
207-08-9	Benzo[k]fluoranthene	1000	U
50-32-8	Benzo[a]pyrene	1000	U
193-39-5	Indeno[1,2,3-cd]pyrene	1000	U
53-70-3	Dibenz[a,h]anthracene	1000	U
191-24-2	Benzo[g,h,i]perylene	1000	U

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Field ID: **Sblk431**

Lab Name: FMETL Lab Code 13461

Project: 000004 Case No.: 5801 Location: Bl.699 SDG No:

Matrix: (soil/water) SOIL Lab Sample ID: Sblk431

Sample wt/vol: 10 (g/ml) G Lab File ID: BN04618.D

Level: (low/med) LOW Date Received: 10/17/00

% Moisture: 0 decanted: (Y/N) N Date Extracted: 10/24/00

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/25/00

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	6.63	610	J
2.	unknown	23.84	2600	J
3. 001599-67-3	1-Docosene	30.18	960	JN

1B

Field ID:

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

699WO-A

Lab Name: FMETL Lab Code 13461

Project: 000004 Case No.: 5801 Location: Bl.699 SDG No:

Matrix: (soil/water) SOIL Lab Sample ID: 5801.01

Sample wt/vol: 10.02 (g/ml) G Lab File ID: BN04620.D

Level: (low/med) LOW Date Received: 10/17/00

% Moisture: 15.82 decanted:(Y/N) N Date Extracted: 10/24/00

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/25/00

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND		Q
110-86-1	Pyridine	1200	U
62-75-9	N-nitroso-dimethylamine	1200	U
62-53-3	Aniline	1200	U
111-44-4	bis(2-Chloroethyl)ether	1200	U
541-73-1	1,3-Dichlorobenzene	1200	U
106-46-7	1,4-Dichlorobenzene	1200	U
100-51-6	Benzyl alcohol	1200	U
95-50-1	1,2-Dichlorobenzene	1200	U
108-60-1	bis(2-chloroisopropyl)ether	1200	U
621-64-7	n-Nitroso-di-n-propylamine	1200	U
67-72-1	Hexachloroethane	1200	U
98-95-3	Nitrobenzene	1200	U
78-59-1	Isophorone	1200	U
111-91-1	bis(2-Chloroethoxy)methane	1200	U
120-82-1	1,2,4-Trichlorobenzene	1200	U
91-20-3	Naphthalene	16000	E
106-47-8	4-Chloroaniline	1200	U
87-68-3	Hexachlorobutadiene	1200	U
91-57-6	2-Methylnaphthalene	15000	E
77-47-4	Hexachlorocyclopentadiene	1200	U
91-58-7	2-Chloronaphthalene	1200	U
88-74-4	2-Nitroaniline	1200	U
131-11-3	Dimethylphthalate	1200	U
208-96-8	Acenaphthylene	1200	U
606-20-2	2,6-Dinitrotoluene	1200	U
99-09-2	3-Nitroaniline	1200	U
83-32-9	Acenaphthene	280	J
132-64-9	Dibenzofuran	1200	U
121-14-2	2,4-Dinitrotoluene	1200	U
84-66-2	Diethylphthalate	1200	U
86-73-7	Fluorene	620	J
7005-72-3	4-Chlorophenyl-phenylether	1200	U
100-01-6	4-Nitroaniline	1200	U
86-30-6	n-Nitrosodiphenylamine	1200	U
103-33-3	Azobenzene	1200	U
101-55-3	4-Bromophenyl-phenylether	1200	U
118-74-1	Hexachlorobenzene	1200	U

1C

Field ID:

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

699WO-A

Lab Name: FMETL Lab Code 13461

Project: 000004 Case No.: 5801 Location: Bl.699 SDG No:

Matrix: (soil/water) SOIL Lab Sample ID: 5801.01

Sample wt/vol: 10.02 (g/ml) G Lab File ID: BN04620.D

Level: (low/med) LOW Date Received: 10/17/00

% Moisture: 15.82 decanted:(Y/N) N Date Extracted: 10/24/00

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/25/00

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
85-01-8	Phenanthrene	1400	
120-12-7	Anthracene	280	J
84-74-2	Di-n-butylphthalate	1200	U
206-44-0	Fluoranthene	1200	U
92-87-5	Benzidine	1200	U
129-00-0	Pyrene	170	J
85-68-7	Butylbenzylphthalate	1200	U
56-55-3	Benzo[a]anthracene	1200	U
91-94-1	3,3'-Dichlorobenzidine	1200	U
218-01-9	Chrysene	1200	U
117-81-7	bis(2-Ethylhexyl)phthalate	180	J
117-84-0	Di-n-octylphthalate	1200	U
205-99-2	Benzo[b]fluoranthene	1200	U
207-08-9	Benzo[k]fluoranthene	1200	U
50-32-8	Benzo[a]pyrene	1200	U
193-39-5	Indeno[1,2,3-cd]pyrene	1200	U
53-70-3	Dibenz[a,h]anthracene	1200	U
191-24-2	Benzo[g,h,i]perylene	1200	U

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Field ID: **699WO-A**

Lab Name: FMETL Lab Code 13461

Project: 000004 Case No.: 5801 Location: Bl.699 SDG No: _____

Matrix: (soil/water) SOIL Lab Sample ID: 5801.01

Sample wt/vol: 10.02 (g/ml) G Lab File ID: BN04620.D

Level: (low/med) LOW Date Received: 10/17/00

% Moisture: 15.82 decanted: (Y/N) N Date Extracted: 10/24/00

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/25/00

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1B

Field ID:

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

699WO-A

Lab Name: FMETL Lab Code 13461

Project: 000004 Case No.: 5801 Location: Bl.699 SDG No:

Matrix: (soil/water) SOIL Lab Sample ID: 5801.01 (1:5)

Sample wt/vol: 10.02 (g/ml) G Lab File ID: BN04627.D

Level: (low/med) LOW Date Received: 10/17/00

% Moisture: 15.87 decanted:(Y/N) N Date Extracted: 10/24/00

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/27/00

Injection Volume: 1.0 (uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
110-86-1	Pyridine	5900	U
62-75-9	N-nitroso-dimethylamine	5900	U
62-53-3	Aniline	5900	U
111-44-4	bis(2-Chloroethyl)ether	5900	U
541-73-1	1,3-Dichlorobenzene	5900	U
106-46-7	1,4-Dichlorobenzene	5900	U
100-51-6	Benzyl alcohol	5900	U
95-50-1	1,2-Dichlorobenzene	5900	U
108-60-1	bis(2-chloroisopropyl)ether	5900	U
621-64-7	n-Nitroso-di-n-propylamine	5900	U
67-72-1	Hexachloroethane	5900	U
98-95-3	Nitrobenzene	5900	U
78-59-1	Isophorone	5900	U
111-91-1	bis(2-Chloroethoxy)methane	5900	U
120-82-1	1,2,4-Trichlorobenzene	5900	U
91-20-3	Naphthalene	18000	D
106-47-8	4-Chloroaniline	5900	U
87-68-3	Hexachlorobutadiene	5900	U
91-57-6	2-Methylnaphthalene	16000	D
77-47-4	Hexachlorocyclopentadiene	5900	U
91-58-7	2-Chloronaphthalene	5900	U
88-74-4	2-Nitroaniline	5900	U
131-11-3	Dimethylphthalate	5900	U
208-96-8	Acenaphthylene	5900	U
606-20-2	2,6-Dinitrotoluene	5900	U
99-09-2	3-Nitroaniline	5900	U
83-32-9	Acenaphthene	5900	U
132-64-9	Dibenzofuran	5900	U
121-14-2	2,4-Dinitrotoluene	5900	U
84-66-2	Diethylphthalate	5900	U
86-73-7	Fluorene	610	JD
7005-72-3	4-Chlorophenyl-phenylether	5900	U
100-01-6	4-Nitroaniline	5900	U
86-30-6	n-Nitrosodiphenylamine	5900	U
103-33-3	Azobenzene	5900	U
101-55-3	4-Bromophenyl-phenylether	5900	U
118-74-1	Hexachlorobenzene	5900	U

1C

Field ID:

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

699WO-A

Lab Name: FMETL Lab Code 13461

Project: 000004 Case No.: 5801 Location: Bl.699 SDG No:

Matrix: (soil/water) SOIL Lab Sample ID: 5801.01 (1:5)

Sample wt/vol: 10.02 (g/ml) G Lab File ID: BN04627.D

Level: (low/med) LOW Date Received: 10/17/00

% Moisture: 15.87 decanted:(Y/N) N Date Extracted: 10/24/00

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/27/00

Injection Volume: 1.0 (uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH:

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
85-01-8	Phenanthrene	1300	JD
120-12-7	Anthracene	5900	U
84-74-2	Di-n-butylphthalate	5900	U
206-44-0	Fluoranthene	5900	U
92-87-5	Benzidine	5900	U
129-00-0	Pyrene	5900	U
85-68-7	Butylbenzylphthalate	5900	U
56-55-3	Benzo[a]anthracene	5900	U
91-94-1	3,3'-Dichlorobenzidine	5900	U
218-01-9	Chrysene	5900	U
117-81-7	bis(2-Ethylhexyl)phthalate	5900	U
117-84-0	Di-n-octylphthalate	5900	U
205-99-2	Benzo[b]fluoranthene	5900	U
207-08-9	Benzo[k]fluoranthene	5900	U
50-32-8	Benzo[a]pyrene	5900	U
193-39-5	Indeno[1,2,3-cd]pyrene	5900	U
53-70-3	Dibenz[a,h]anthracene	5900	U
191-24-2	Benzo[g,h,i]perylene	5900	U

PCB's

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

Client :	U.S. Army	**Lab. ID # :**	PBLK612
	DPW. SELFM-PW-EV	**Date Rec'd:**	
	Bldg. 173	**Extraction Date:**	10/24/00
	Ft. Monmouth, NJ 07703	**Analysis Date:**	10/24/00
Analysis:	SW-846 Method 8082	**Location :**	
Matrix:	Soil		
Analyst:	T. Frankovich	**Field ID:**	

Pesticide/PCB	Dilution Factor	% Solid	MDL (mg/kg)	Result (mg/kg)	Cleanup Criteria (mg/kg)	Weight (g)
Arochlor 1016	1	100.00	0.0112	ND	0.49	10.00
Arochlor 1221	1	100.00	0.0206	ND	0.49	10.00
Arochlor 1232	1	100.00	0.0140	ND	0.49	10.00
Arochlor 1242	1	100.00	0.0160	ND	0.49	10.00
Arochlor 1248	1	100.00	0.0064	ND	0.49	10.00
Arochlor 1254	1	100.00	0.0040	ND	0.49	10.00
Arochlor 1260	1	100.00	0.0036	ND	0.49	10.00

ND = Not Detected
MDL = Method Detection Limit

Column-Primary: Rtx-5 30m/.32mmID/.25um
Column-Confirmation: Rtx-1701 30m/.32mmID/.25um

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

Client :	U.S. Army	**Lab. ID # :**	5801.01
	DPW. SELFM-PW-EV	**Date Rec'd:**	10/23/00
	Bldg. 173	**Extraction Date:**	10/24/00
	Ft. Monmouth, NJ 07703	**Analysis Date:**	10/24/00
Analysis:	SW-846 Method 8082	**Location :**	BLDG. 699
Matrix:	Soil		81533-239
Analyst:	T. Frankovich	**Field ID:**	699WO-A, NORTH END

Pesticide/PCB	Dilution Factor	% Solid	MDL (mg/kg)	Result (mg/kg)	Cleanup Criteria (mg/kg)	Weight (g)
Arochlor 1016	1	84.13	0.0131	ND	0.49	10.14
Arochlor 1221	1	84.13	0.0241	ND	0.49	10.14
Arochlor 1232	1	84.13	0.0164	ND	0.49	10.14
Arochlor 1242	1	84.13	0.0188	ND	0.49	10.14
Arochlor 1248	1	84.13	0.0075	ND	0.49	10.14
Arochlor 1254	1	84.13	0.0047	ND	0.49	10.14
Arochlor 1260	1	84.13	0.0042	ND	0.49	10.14

ND = Not Detected
MDL = Method Detection Limit

Column-Primary: Rtx-5 30m/.32mmID/.25um
Column-Confirmation: Rtx-1701 30m/.32mmID/.25um

TPHC

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

Client :	US. Army	**Project # :**	5801
	DPW. SELFM-PW-EV	**Location :**	Bldg.699
	Bldg. 173	**UST Reg. # :**	
	Ft. Monmouth, NJ 07703		

Analysis :	OQA-QAM-025	**Date Received :**	17-Oct-00
Matrix :	Soil	**Date Extracted :**	19-Oct-00
Inst. ID. :	GC TPHC INST. #1	**Extraction Method :**	Shake
Column Type :	RTX-5, 0.32mm ID, 30M	**Analysis Complete :**	19-Oct-00
Injection Volume :	1uL	**Analyst :**	B.Patel

Sample	Field ID	Dilution Factor	Weight (g)	% Solid	MDL (mg/kg)	TPHC Result (mg/kg)
5801.01	699WO-A	1.00	10.30	84.13	271	4194.14
5801.02	699WO-B	1.00	10.02	83.59	281	879.79
5801.03	699WO-C	1.00	10.24	88.17	260	ND
5801.04	699WO-D	1.00	10.19	82.51	280	1043.48
METHOD BLANK	TBLK431	1.00	15.00	100.00	157	ND

ND = Not Detected

MDL = Method Detection Limit

METALS

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

Client: U.S. Army
DPW, SELFM-PW-EV
Bldg. 173
Ft. Monmouth, NJ 07703

Lab ID #: 5801
Sample Prepared: 11/07/00

Site: Bldg. 699

Field ID#: Method Blank

Method of Digestion: EPA SW-846 Method 3051A
Method of Analysis: EPA SW-846 Method 6010B, 7471A

PP-METALS RESULTS SUMMARY (mg/L)

Element	Date of Analysis	Result	MDL
Antimony	11/07/00	ND	0.002
Arsenic	11/07/00	ND	0.002
Beryllium	11/07/00	ND	0.0005
Cadmium	11/07/00	ND	0.0005
Chromium	11/07/00	ND	0.0005
Copper	11/07/00	ND	0.002
Lead	11/07/00	ND	0.001
Mercury	11/06/00	ND	0.0001
Nickel	11/07/00	ND	0.001
Selenium	11/07/00	ND	0.003
Silver	11/07/00	ND	0.001
Thallium	11/07/00	ND	0.002
Zinc	11/07/00	ND	0.005

ND = Not Detected, MDL = Method Detection Limit

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

Client: U.S. Army
DPW, SELFM-PW-EV
Bldg. 173
Ft. Monmouth, NJ 07703

Lab ID #: 5801.01
Sample Received: 10/17/00
Sample Matrix: Solid

Site: Bldg. 699

Field ID: 699 WO-A, North End

Method of Digestion: EPA SW-846 Method 3051A
Method of Analysis: EPA SW-846 Method 6010B, 7471A

PP-METALS RESULTS SUMMARY (mg/Kg)

Element	Date Analysis	Result	Soil Cleanup Criteria	MDL
Antimony	11/07/00	ND	14	0.475
Arsenic	11/07/00	2.61	20	0.475
Beryllium	11/07/00	0.502	2	0.119
Cadmium	11/07/00	ND	39	0.119
Chromium	11/07/00	47.2	NLE	0.119
Copper	11/07/00	4.09	600	0.713
Lead	11/07/00	8.56	400	0.475
Mercury	11/06/00	ND	14	0.024
Nickel	11/07/00	4.14	250	0.119
Selenium	11/07/00	0.731	63	0.713
Silver	11/07/00	ND	110	0.713
Thallium	11/07/00	1.28	2	0.713
Zinc	11/07/00	19.9	1500	0.238

ND = Not Detected, MDL = Method Detection Limit, NLE = No Limit Established
* Residential Direct Contact Soil Cleanup as per N.J.A.C. 7:26:D 5/12/99

United States Army
Fort Monmouth, New Jersey

Underground Storage Tank Closure and Site Investigation Report

Building 699A
Main Post-West Area

NJDEP UST Registration No. 0081533-112
DICAR No. 89-10-19-1329

SEPTEMBER 2000

UNDERGROUND STORAGE TANK
CLOSURE AND SITE INVESTIGATION REPORT

BUILDING 699A

MAIN POST-WEST AREA
NJDEP UST REGISTRATION NO. 0081533-112

SEPTEMBER 2000

PREPARED FOR:

UNITED STATES ARMY, FORT MONMOUTH, NEW JERSEY
DIRECTORATE OF PUBLIC WORKS
BUILDING 167
FORT MONMOUTH, NJ 07703

PREPARED BY:

VERSAR
1900 FROST ROAD
SUITE 110
BRISTOL, PA 19007

PROJECT NO. 4435-043

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EXECUTIVE SUMMARY

UST Closure

On June 9, 1998, a fiberglass underground storage tank (UST) was closed by removal in accordance with the New Jersey Department of Environmental Protection (NJDEP) underground storage tank procedures at the Main Post-West area of the U.S. Army Fort Monmouth, Fort Monmouth, New Jersey. The UST, NJDEP Registration No. 0081533-112 (Fort Monmouth ID No. 699A), was located southwest of Building 699A. UST No. 0081533-112 was a 2,000-gallon No. 2 fuel oil UST.

Site Assessment

The site assessment was performed by U.S. Army personnel in accordance with the NJDEP *Technical Requirements for Site Remediation* (N.J.A.C. 7:26E) and the NJDEP *Field Sampling Procedures Manual*. The sampling and laboratory analysis conducted during the site assessment were performed in accordance with Section 7:26E-2.1 of the *Technical Requirements for Site Remediation*. Soils surrounding the tank were screened visually and with air monitoring equipment for evidence of contamination. Following removal, the UST was inspected for corrosion holes or punctures. No holes or punctures were noted in the UST. Groundwater was encountered at 5.0 feet below ground surface. No evidence of potentially contaminated soil or groundwater was observed surrounding the tank. Soil samples contained TPHC concentrations ranging from non-detect to 346.04 mg/kg. The NJDEP DICAR No. 89-10-19-1329 is an existing case number associated with the 699 area.

Site Restoration

Following receipt of all post-excavation soil sampling results, the excavation was backfilled to grade with crushed stone, sand, and native backfill and restored to its original condition.

Conclusions and Recommendations

Based on the post-excavation soil sampling results, soils with TPHC concentrations exceeding the NJDEP soil cleanup criteria for total organic contaminants of 10,000 mg/kg, do not exist in the former location of the UST or associated piping.

No further action is proposed in regard to the closure and site assessment of UST No. 0081533-112 at Building 699A.

1.0 UNDERGROUND STORAGE TANK DECOMMISSIONING ACTIVITIES

1.1 OVERVIEW

One underground storage tank (UST), New Jersey Department of Environmental Protection (NJDEP) Registration No. 0081533-112, was closed at Building 699A at the Main Post-West area of U.S. Army Fort Monmouth, Fort Monmouth, New Jersey on June 9, 1998. Refer to site location map on Figure 1. This report presents the results of the Department of Public Works (DPW) implementation of the UST Decommissioning/Closure Plan approved by the NJDEP. The UST was a fiberglass 2,000-gallon tank containing No. 2 fuel oil.

Decommissioning activities for UST No. 0081533-112 complied with all applicable Federal, State and Local laws and ordinances in effect at the date of decommissioning. These laws included but were not limited to N.J.A.C. 7:14B-1 et seq., N.J.A.C. 5:23-1 et seq., and Occupational Safety and Health Administration (OSHA) 1910.146 & 1910.120. All permits including but not limited to the NJDEP-approved Decommissioning/Closure Plan were posted onsite for inspection. The decommissioning activities were conducted by DPW personnel who are registered and certified by the NJDEP for performing UST closure activities. Closure of UST No. 0081533-112 proceeded under the approval of the NJDEP Bureau of Federal Case Management (NJDEP-BFCM). The Standard Reporting Form and signed Site Assessment Summary form for UST No. 0081533-112 are included in Appendices A and B, respectively.

Based on inspecting the UST, field screening of subsurface soils and groundwater, and reviewing analytical results of collected soil samples, the DPW has concluded that no significant historical discharges are associated with the UST or associated piping.

This UST Closure and Site Investigation Report has been prepared by SMC Environmental Services Group, to assist the United States Army Directorate of Public Works (DPW) in complying with the NJDEP regulations. The applicable NJDEP regulations at the date of closure were the *Interim Closure Requirements for Underground Storage Tank Systems* (N.J.A.C. 7:14B-1 et seq. October 1990 and revisions dated November 1, 1991).

This report was prepared using information collected at the time of closure. Section 1 of this UST Closure and Site Investigation Report provides a summary of the UST decommissioning activities. Section 2 of this report describes the site investigation activities. Conclusions and recommendations, including the results of the soil sampling investigation, are presented in the final section of this report.

1.2 SITE DESCRIPTION

Building 699A is located in the Main Post-West area of the Fort Monmouth Army Base. UST No. 0081533-112 was located southwest of Building 699A and appurtenant copper piping ran approximately sixteen (16) feet northeast from the excavation to Building 699A. A site map is provided on Figure 2.

1.2.1 Geological/Hydrogeological Setting

The following is a description of the geological/hydrogeological setting of the area surrounding Building 699A. Included is a description of the regional geology of the area surrounding Fort Monmouth as well as descriptions of the local geology and hydrogeology of the Main Post area.

Regional Geology

Monmouth County lies within the New Jersey Section of the Atlantic Coastal Plain physiographic province. The Main Post, Charles Wood, and the Evans areas are located in what may be referred to as the Outer Coastal Plain subprovince, or the Outer Lowlands.

In general, New Jersey Coastal Plain formations consist of a seaward-dipping wedge of unconsolidated deposits of clay, silt, and gravel. These formations typically strike northeast-southwest with a dip ranging from 10 to 60 feet per mile and were deposited on Precambrian and lower Paleozoic rocks (Zapecza, 1989). These sediments, predominantly derived from deltaic, shallow marine, and continental shelf environments, date from Cretaceous through the Quaternary Periods. The mineralogy ranges from quartz to glauconite.

The formations record several major transgressive/regressive cycles and contain units which are generally thicker to the southeast and reflect a deeper water environment. Over 20 regional geologic units are present within the sediments of the Coastal Plain. Regressive, upward coarsening deposits are usually aquifers (e.g., Englishtown and Kirkwood Formations, and the Cohansey Sand) while the transgressive deposits act as confining units (e.g., the Merchantville, Marshalltown, and Navesink Formations). The individual thicknesses for these units vary greatly (i.e., from several feet to several hundred feet). The Coastal Plain deposits thicken to the southeast from the Fall Line to greater than 6,500 feet in Cape May County (Brown and Zapecza, 1990).

Local Geology

Based on the regional geologic map (Jablonski, 1968), the Cretaceous age Red Bank and Tinton Sands outcrop at the Main Post area. The Red Bank sand conformably overlies the Navesink Formation and dips to the southeast at 35 feet per mile. The upper member (Shrewsbury) of the Red Bank sand is a yellowish-gray to reddish brown clayey, medium-to-coarse-grained sand that contains abundant rock fragments, minor mica and glauconite (Jablonski). The lower member (Sandy Hook) is a dark gray to black, medium-to-fine grained sand with abundant clay, mica, and glauconite.

The Tinton sand conformably overlies the Red Bank Sand and ranges from a clayey medium to very coarse grained feldspathic quartz and glauconite sand to a glauconitic coarse sand. The color varies from dark yellowish orange or light brown to moderate brown and from light olive to grayish olive. Glauconite may constitute 60 to 80 percent of the sand fraction in the upper part of the unit (Minard, 1969). The upper part of the Tinton is often highly oxidized and iron oxide encrusted (Minard).

Hydrogeology

The water table aquifer in the Main Post area is identified as part of the "composite 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.

Based on records of wells drilled in the Main Post area, water is typically encountered at depths of 2 to 9 feet below ground surface (bgs). According to Jablonski, wells drilled in the Red Bank and Tinton Sands may produce 2 to 25 gallons per minute (gpm). Some well owners have reported acidic water that requires treatment to remove iron.

Due to the proximity of the Atlantic Ocean to Fort Monmouth, shallow groundwater may be tidally influenced and may flow toward creeks and brooks as the tide goes out, and away from creeks and brooks as the tide comes in. However, an abundance of clay lenses and sand deposits were noted in borings installed throughout Fort Monmouth. Therefore, the direction of shallow groundwater should be determined on a case-by-case basis.

Shallow groundwater is locally influenced within the Main Post area by the following factors:

- tidal influence (based on proximity to the Atlantic Ocean, rivers, and tributaries)
- topography
- nature of the fill material within the Main Post area
- presence of clay and silt lenses in the natural overburden deposits
- local groundwater recharge areas (i.e., streams, lakes)

Due to the fluvial nature of the overburden deposits (i.e., sand and clay lenses), shallow groundwater flow direction is best determined on a case-by-case basis. This is consistent with lithologies observed in borings installed within the Main Post area, which primarily consisted of fine-to-medium grained sands, with occasional lenses or laminations of gravel silt and/or clay.

Building 699A located approximately 800 feet northwest of Husky Brook, the nearest water body. Based on the Main Post topography, the groundwater flow in the area of Building 699A is anticipated to be to the southeast.

1.3 HEALTH AND SAFETY

Before, during, and after all decommissioning activities, hazards at the work site which may have posed a threat to the Health and Safety of all personnel who were involved with, or were affected by, the decommissioning of the UST system were minimized. All areas, which posed, or may have been suspected to pose a vapor hazard were monitored by a qualified individual utilizing an organic vapor analyzer (OVA). The individual ascertained if the area was properly vented to render the area safe, as defined by OSHA.

1.4 REMOVAL OF UNDERGROUND STORAGE TANK

1.4.1 General Procedures

- All underground obstructions (utilities, etc.) were identified by the contractor performing the closure prior to excavation activities.
- All activities were carried out with the greatest regard to safety and health and the safeguarding of the environment.
- All excavated soils were visually examined and screened with an OVA for evidence of contamination. Potentially contaminated soils were identified and logged during closure activities.
- Surface materials (i.e., asphalt, concrete, etc.) were excavated and staged separately from all soil and recycled in accordance with all applicable regulations and laws.
- A Sub-Surface Evaluator from the DPW was present during all site assessment activities.

1.4.2 Underground Storage Tank Excavation and Cleaning

Prior to UST decommissioning activities, surficial soil was removed to expose the UST and associated piping. All free product present in the piping was drained into the UST, and the UST was purged to remove vapors prior to cutting and removal of the piping. After removal of the associated piping, a manway was made in the UST to allow for proper cleaning. The UST was completely emptied of all liquids prior to removal from the ground. Approximately 300 gallons of liquid from the UST and its associated piping were transported by Casie Protank to Casie Ecology Oil Salvage, Inc. facility, a NJDEP-approved petroleum recycling and disposal company located in Vineland, New Jersey. Refer to Appendix C for the waste manifest.

The UST was cleaned prior to removal from the excavation in accordance with the NJDEP regulations. After the UST was removed from the excavation, it was staged on polyethylene sheeting and examined for holes. No holes or punctures were observed during the inspection by the Sub-Surface Evaluator. Soils surrounding the UST were screened visually and with an OVA for evidence of contamination. No evidence of contamination was observed. Soil screening was also performed along the piping run associated with the UST closure. No contamination was noted anywhere along the piping length. Groundwater was encountered at 5.0 feet below ground surface and no sheen was observed. See Figure 3 for a cross-sectional view of the excavated area.

1.5 UNDERGROUND STORAGE TANK TRANSPORTATION AND DISPOSAL

The tank was transported to Mazza and Sons, Inc., Metal Recyclers. See Appendix D for a copy of the UST disposal certificate. The transportation of the UST was in compliance with all applicable regulations and laws.

The UST was labeled prior to transport with the following information:

- Site of origin
- Contact person
- NJDEP UST Facility ID number
- Former contents

1.6 MANAGEMENT OF EXCAVATED SOILS

Based on OVA air monitoring and TPHC analysis results from the post-excavation soil samples, no soils exhibited signs of contamination. Therefore, the excavated soils were used as backfill following removal of the UST.

2.0 SITE INVESTIGATION ACTIVITIES

2.1 OVERVIEW

The Site Investigation was managed and carried out by U.S. Army DPW personnel. All analyses were performed and reported by U.S. Army Fort Monmouth Environmental Laboratory, a NJDEP-certified testing laboratory. All sampling was performed under the direct supervision of a NJDEP Certified Sub-Surface Evaluator according to the methods described in the NJDEP *Field Sampling Procedures Manual* (1992). Sampling frequency and parameters analyzed complied with the NJDEP document *Interim Closure Requirements for Underground Storage Tank Systems* (October 1990 and revisions dated November 1, 1991) which was the applicable regulation at the date of the closure. All records of the Site Investigation activities are maintained by the Fort Monmouth DPW Environmental Office.

The following Parties participated in Closure and Site Investigation Activities:

- Subsurface Evaluator: Charles Appleby
  Employer: U.S. Army, Fort Monmouth
  Phone Number: (732) 532-6224
  NJDEP Certification No.: 2056

- Analytical Laboratory: U.S. Army Fort Monmouth Environmental Laboratory
  Contact Person: Daniel K. Wright
  Phone Number: (908) 532-4359
  NJDEP Company Certification No.: 13461

- Hazardous Waste Hauler: Casie Protank Environmental Services
  Contact Person: Bob Corsiglia
  Phone Number: (609) 696-4401

2.2 FIELD SCREENING/MONITORING

Field screening was performed by a NJDEP Certified Sub-Surface Evaluator using an OVA and visual observations to identify potentially contaminated material. Soil excavated from around the tank and appurtenant piping, as well as the UST excavation sidewalls and bottom, did not exhibit any evidence of potential contamination. Groundwater was encountered at 5.0 feet below ground surface and no sheen was observed.

2.3 SOIL SAMPLING

On June 10, 1998, following the removal of the UST, post-excavation soil samples A, B, C, D, E, F, G, H, and DUP A were collected from a total of eight (8) locations of the UST excavation. Samples A and B were collected along the excavation floor at a depth of 9.0 feet bgs for sample A, and 8.0 feet bgs for sample B. Sidewall samples C, D, E and F were collected at a depth of 4.5 feet bgs. Samples G and H were collected along the former piping length of the excavation, which was approximately sixteen (16) feet in length. The piping samples were collected at a depth of 2.0 feet bgs. All samples were analyzed for total petroleum hydrocarbons (TPHC) and total solids.

U.S. Army personnel in accordance with the NJDEP Technical Requirements and the NJDEP Field Sampling Procedures Manual performed the site assessment. A summary of sampling activities including parameters analyzed is provided in Table 1. The post-excavation soil samples were collected using NJDEP *Field Sampling Procedures Manual* (1992) standard sampling procedures. Following soil sampling activities, the samples were chilled and delivered to U.S. Army Fort Monmouth Environmental Laboratory located in Fort Monmouth, New Jersey, for analysis.

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 SOIL SAMPLING RESULTS

To evaluate soil conditions following removal of the UST, post-excavation soil samples were collected on June 10, 1998, from a total of eight (8) locations. All samples were analyzed for TPHC and total solids. The post-excavation sampling results were compared to the NJDEP residential direct contact total organic contaminants soil cleanup criteria of 10,000 mg/kg (N.J.A.C. 7:26D and revisions dated February 3, 1994). A summary of the analytical results and comparison to the NJDEP soil cleanup criteria is provided in Table 2 and the soil sampling locations are shown on Figure 4. The analytical data package is provided in Appendix E.

All post-excavation soil samples collected on June 10, 1998, from the UST excavation and from below piping associated with the UST contained concentrations of TPHC below the NJDEP soil cleanup criteria. Samples contained levels of TPHC ranging in concentration from non-detect to 346.04 mg/kg.

3.2 CONCLUSIONS AND RECOMMENDATIONS

The analytical results for all post-excavation soil samples collected from the UST closure excavation at Building 699A were below the NJDEP soil cleanup criteria for total organic contaminants.

Based on the post-excavation sampling results, soils with TPHC concentrations exceeding the NJDEP soil cleanup criteria for total organic contaminants of 10,000 mg/kg, do not exist in the former location of the UST or associated piping.

No further action is proposed in regard to the closure and site assessment of UST No. 0081533-112 at Building 699A.

TABLES

TABLE 1

SUMMARY OF POST-EXCAVATION SAMPLING ACTIVITIES
BUILDING 699A, MAIN POST-WEST AREA
FORT MONMOUTH, NEW JERSEY

Sample ID	Date of Collection	Date Analysis Started	Matrix	Sample Type	Analytical Parameters*	Analysis Method
A	6/10/98	6/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
B	6/10/98	6/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
C	6/10/98	6/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
D	6/10/98	6/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
E	6/10/98	6/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
F	6/10/98	6/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
G	6/10/98	6/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
H	6/10/98	6/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025
DUPA	6/10/98	6/11/98	Soil	Post-Excavation	TPHC	OQA-QAM-025

Note:
* TPHC Total Petroleum Hydrocarbons

TABLE 2

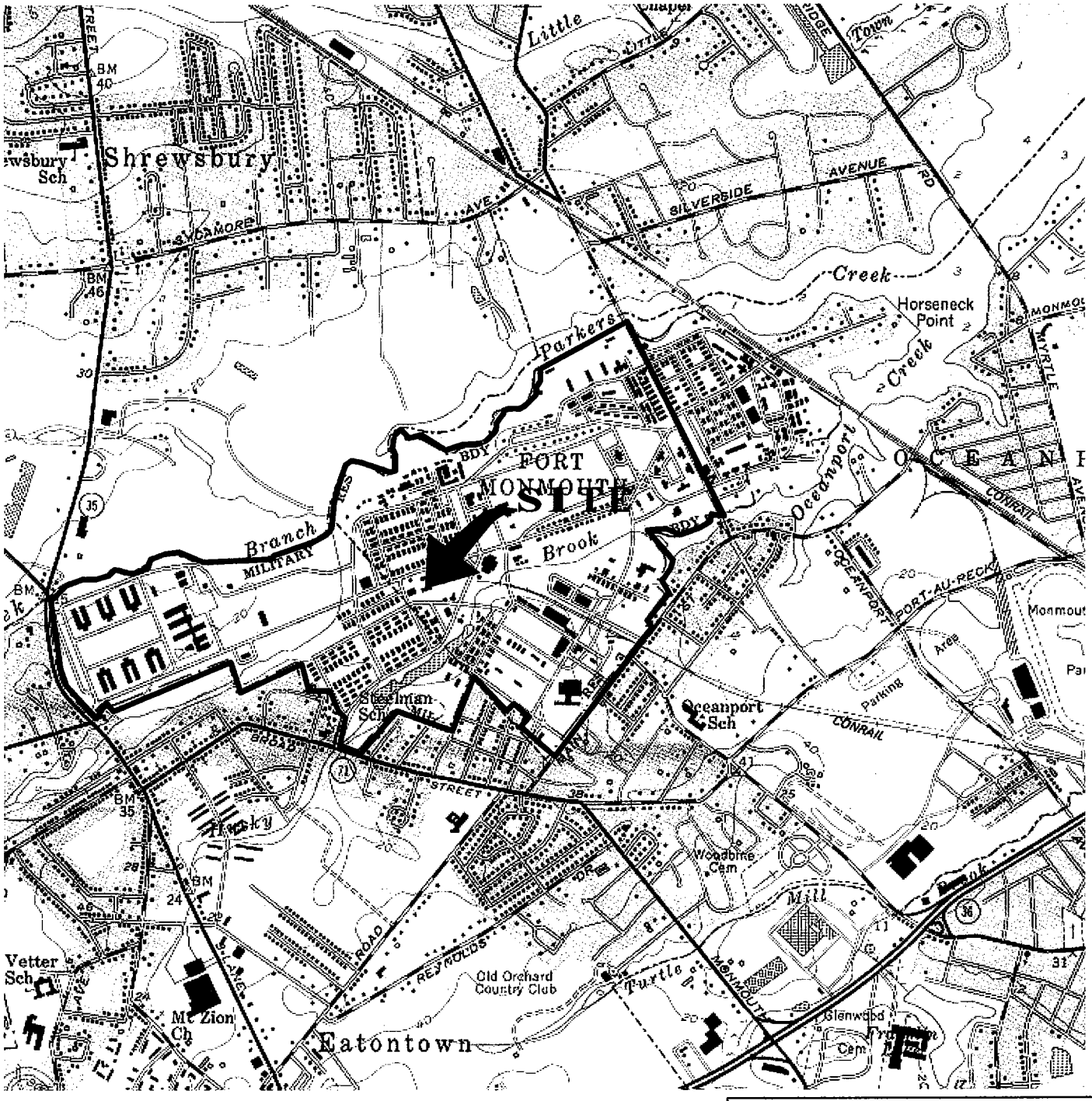
POST-EXCAVATION SOIL SAMPLING RESULTS
BUILDING 699A, MAIN POST-WEST AREA
FORT MONMOUTH, NEW JERSEY

Sample ID/ Depth	Sample Laboratory ID	Sample Date	Analysis Date	Analytical Method Used	Method Detection Limit (mg/kg)	Compound of Concern	Result (mg/kg) *	NJDEP Soil Cleanup Criteria ** (mg/kg)	Exceeds Cleanup Criteria
A/9.0'=	3635.01	6/10/98	6/11/98	Total Solid	--	--	83.65	--	--
				TPHC	184	yes	ND	10,000	No
B/8.0'=	3635.02	6/10/98	6/11/98	Total Solid	--	--	84.77	--	--
				TPHC	181	yes	ND	10,000	No
C/4.5'=	3635.03	6/10/98	6/11/98	Total Solid	--	--	80.93	--	--
				TPHC	191	yes	ND	10,000	No
D/4.5'=	3635.04	6/10/98	6/11/98	Total Solid	--	--	92.84	--	--
				TPHC	162	yes	ND	10,000	No
E/4.5'=	3635.05	6/10/98	6/11/98	Total Solid	--	--	86.29	--	--
				TPHC	180	yes	ND	10,000	No
F/4.5'=	3635.06	6/10/98	6/11/98	Total Solid	--	--	88.00	--	--
				TPHC	175	yes	ND	10,000	No
G/2.0'=	3635.07	6/10/98	6/11/98	Total Solid	--	--	88.14	--	--
				TPHC	172	yes	ND	10,000	No
H/2.0'=	3635.08	6/10/98	6/11/98	Total Solid	--	--	85.01	--	--
				TPHC	183	yes	346.04	10,000	No
DUPA/9.0'=	3635.09	6/10/98	6/11/98	Total Solid	--	--	82.84	--	--
				TPHC	181	yes	ND	10,000	No

Note:

*	Total Solid results are expressed as a percentage.
**	NJDEP Residential Direct Contact soil cleanup criteria for total organics
--	Not detected above stated sample quantitation limit
TPHC	Total Petroleum Hydrocarbons

FIGURES



LONG BRANCH, N. J.

40073-C8-TF-024

1954

PHOTOREVISED 1981

DMA 6164 I SE-SERIES V822

QUADRANGLE LOCATION

Mapped, edited and published by the Geological Survey

FIGURE 1

LOCATION MAP
Building 699A
Main-Post West
Fort Monmouth Army Base
Monmouth County, NJ

VERSAR
Engineers, Managers, Scientists, & Planners
Bristol, PA

Scale: 1" = 2000'	Date: June 1998

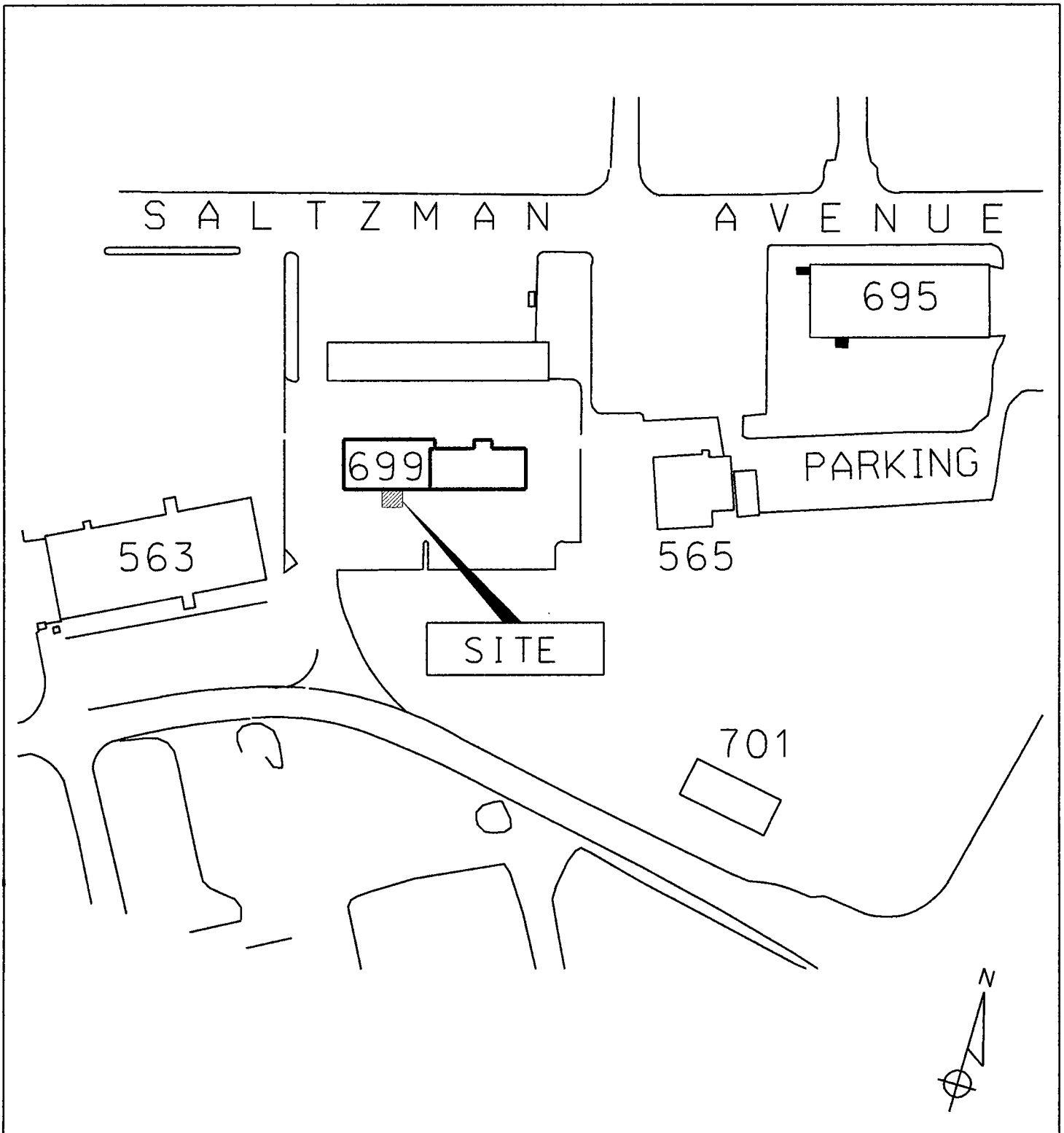


FIGURE 2
SITE MAP
BUILDING 699A
FORT MONMOUTH ARMY BASE
MONMOUTH COUNTY, NJ

VERSAR
ENGINEERS, MANAGERS, SCIENTISTS & PLANNERS
BRISTOL, PA.

SCALE: 1"=100'

DATE: JUNE 1998

699A FIG2

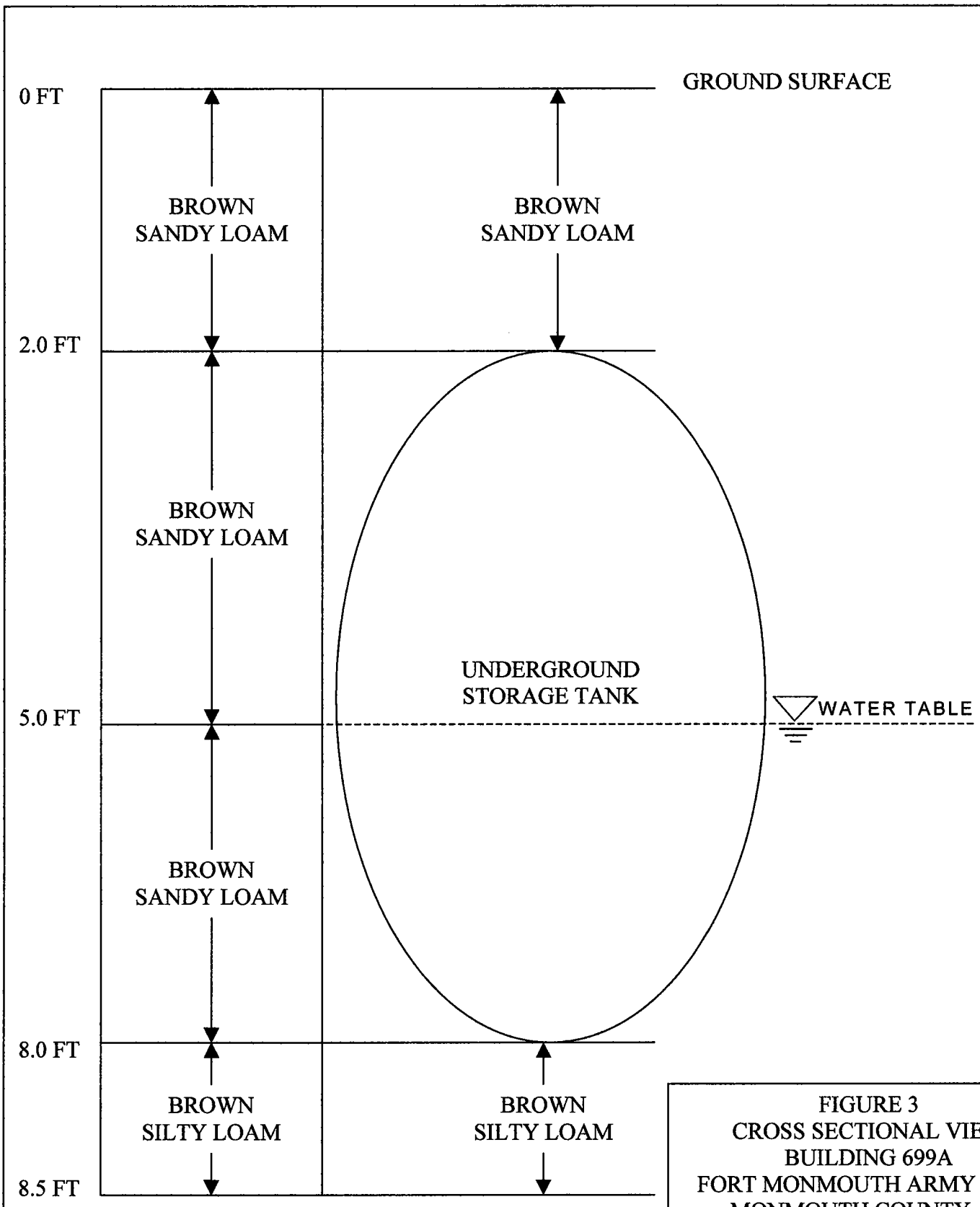
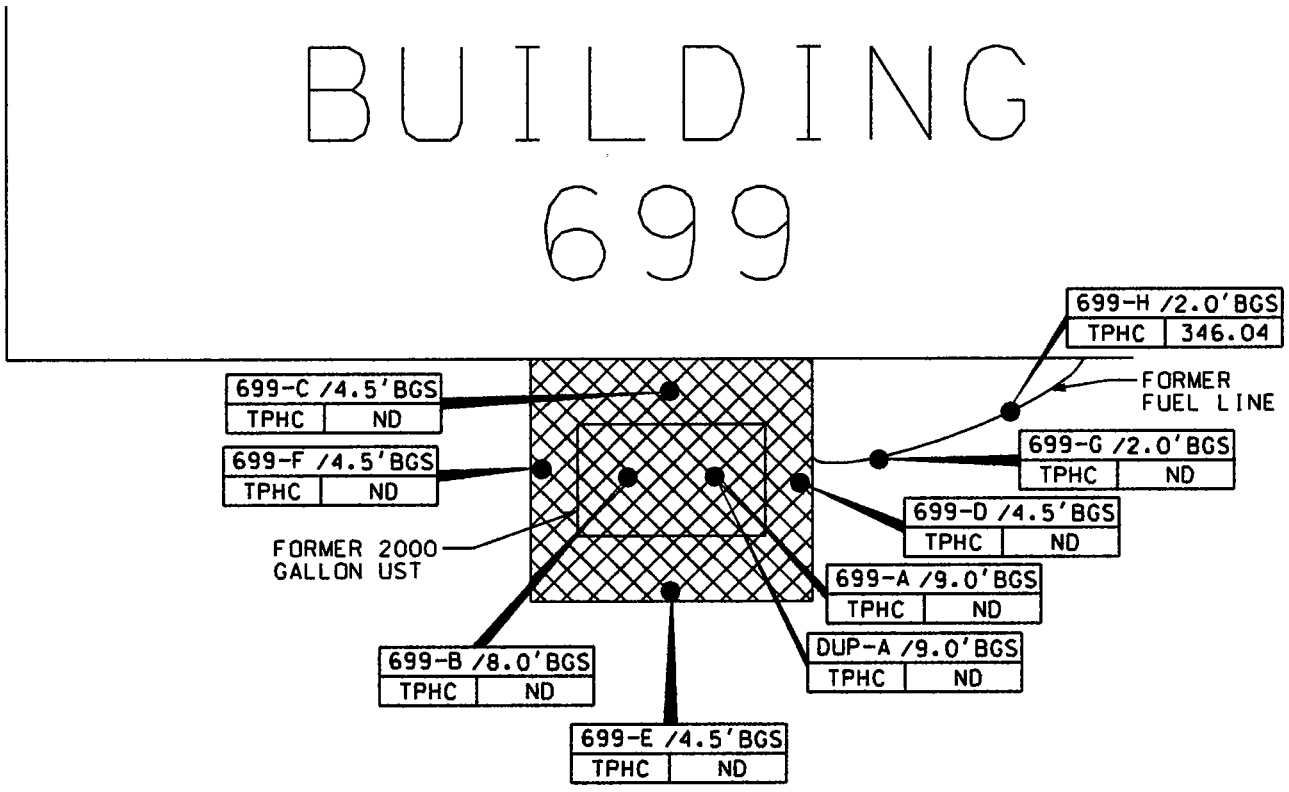


FIGURE 3
CROSS SECTIONAL VIEW
BUILDING 699A
FORT MONMOUTH ARMY BASE
MONMOUTH COUNTY, NJ

VERSAR
Engineers, Managers, Scientists & Planners
Bristol, Pennsylvania

SCALE: NTS	DATE: June 1998



LEGEND

- SOIL SAMPLE LOCATION (JUNE 10, 1998)
- LIMIT OF EXCAVATION (JUNE 10, 1998)

NOTES:

1. ALL RESULTS IN MG/KG.
2. SEE TABLE 2 FOR NJDEP SOIL CLEANUP CRITERIA
3. BGS = BELOW GROUND SURFACE

FIGURE 4
SOIL SAMPLING LOCATION MAP
BUILDING 699A
FORT MONMOUTH ARMY BASE
MONMOUTH COUNTY, NJ

VERSAR
ENGINEERS, MANAGERS, SCIENTISTS & PLANNERS
BRISTOL, PA.

SCALE: 1"=10' | DATE: JUNE 1998

699A FIG4

APPENDIX A

NJDEP-STANDARD REPORTING FORM

1st Fld Cgy CA

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF RESPONSIBLE PARTY SITE REMEDIATION
BUREAU OF APPLICABILITY AND COMPLIANCE
Registration and Billing Unit
CN 028, Trenton, N.J. 08625-0028
1-609-984-3156

FOR STATE USE ONLY

Check In ☐ Yes ☐

STATUS Active ☐ Inactive ☐ COMCODE ☐☐☐☐

UNDERGROUND STORAGE TANK FACILITY QUESTIONNAIRE

FACILITY UST # 0081533 Bldg 698 (A)

Completion of this Registration Questionnaire will satisfy the registration requirements of the Underground Storage of Hazardous Substances Act, N.J.S.A. 58:10A-21, and the Registration and Billing Regulations N.J.A.C. 7:14B-2.

[Check appropriate box(es)]

A. ☐ Is this a registration of a proposed or newly installed underground storage tank? (This form must be filed at least 30 days prior to operation
B. ☐ Is this a registration of an existing underground storage tank not presently registered?
C. ☒ Is this a correction or amendment to an existing facility registration? UST # 0081533
D. ☐ There have been no changes to the facility registration since last submittal. UST #_____ (Go to certification page for signatures)

If "C" is checked above, please check the appropriate type of change(s) below

☐ Facility Name and/or Address Change	☐ Type of Product(s) Stored	☐ Financial Responsibility Change
☐ Owner Name and/or Address Change	☐ Spills, Leaks, Releases	☐ Substantial Modification(s)
☐ Facility Operator and/or Address Change	☐ Tank(s) and/or Piping Changes	☐ Sale or Transfer (Complete Questions 4,5,6 & 13
☐ Owner Contact Person Change	☒ Closure (Complete Question #13)	☐ Other *(please specify)*

SECTION A - GENERAL FACILITY INFORMATION

1. Facility Name: MAIN POST West
2. Facility Location: Ft Monmouth
   NUMBER AND STREET
   CITY OR MUNICIPALITY
   COUNTY | STATE: NJ | ZIP CODE | BLOCK | LOT
3. Facility Operator
   PERSON OR TITLE
   Contact Tele. No. (Area Code) (Extension)
   Operator Address (if different than #2)
   NUMBER AND STREET
   CITY OR MUNICIPALITY
   STATE | ZIP CODE
4. Tank Owner
5. Tank Owner Address
   NUMBER AND STREET
   CITY OR MUNICIPALITY
   STATE | ZIP CODE
   Contact Person (Tank Owner)
   Contact Tele. No. (Area Code) (Extension)
7. EPA ID # ☐☐☐☐☐☐☐☐☐☐☐☐
8. Total number of regulated underground storage tanks at facility ☐☐☐☐

Bldg. 699(A)

9. Total regulated underground storage capacity at facility (gallons) [| | | | | ,]

10. Facility Type: A ☐ State B ☐ Commercial/ Industrial C ☐ County/Municipal D ☐ Federal E ☐ Charitable / Public School F ☐ Residence G ☐ Other H ☐ Farm (as defined in N.J.S. 54:4-23.1 et seq.)

11. Is a copy of the facility site plan submitted with this registration pursuant to N.J.A.C. 7:14B-2? ☐ YES ☐ NO

SECTION B - SPECIFIC TANK INFORMATION

ALL underground tanks, including those taken out of operation (UNLESS THE TANK WAS REMOVED FROM THE GROUND PRIOR TO 9/3/86) must be registered. Report all tank/piping status changes unless previously submitted.

	TANK NO.	TANK NO.	TANK NO.	TANK NO.	TANK NO.
1. Tank Identification Number					
2. CAS Number (hazardous substances only)					
3. Date Tank Installed (Month/Day/Year)	Mo. Day Year	Mo. Day Year	Mo. Day Year	Mo. Day Year	Mo. Day Year
4. Tank Size (gallons)					
5. Tank Contents (Mark one "X" for each tank)					
A. Leaded gasoline					
B. Unleaded gasoline					
C. Alcohol endriched gasoline					
D. Light diesel fuel (No. 1-D)					
E. Medium diesel fuel (No. 2-D)					
F. Waste Oil					
G. Kerosene (No. 1)					
H. Home heating oil (No. 2)					
J. Heating oil (No. 4)					
K. Heavy heating oil (No. 6)					
L. Aviation fuel					
M. Motor oil					
N. Lubricating oil					
P. Sewage					
Q. Sewage sludge					
R. Other hazardous substances (specify)					
S. Hazardous waste (specify ID number)					
T. Mixtures (please specify)					
U. Emergency spill tank (specify substance)					
V. Other petroleum products (please specify)					
W. Other (please specify)					
6. Tank & Piping Construction (Mark one each for both tank & piping)	Tank Piping	Tank Piping	Tank Piping	Tank Piping	Tank Piping
A. Bare Steel					
B. Cathodically protected steel					
C. Fiberglass-coated steel					
D. Fiberglass-reinforced plastic					
E. Internally lined					
F. Other (please specify)					
7. Tank & Piping Structure (Mark one each for both tank & piping)	Tank Piping	Tank Piping	Tank Piping	Tank Piping	Tank Piping
A. Single wall					
B. Double wall					
C. Other (please specify)					
8. Type of Monitoring/Detection System (Mark all that apply for both tank & piping)	Tank Piping	Tank Piping	Tank Piping	Tank Piping	Tank Piping
A. Statistical Inventory Reconciliation					
B. Manual Tank Gauging					
C. Inventory Control					
D. Interstitial					
E. Precision Test					
F. Ground water observation wells					
G. Vapor observation wells					
H. In-tank (automatic) monitoring gauge					
J. Periodic Tank Test					

Tank Identification Number	TANK NO.	TANK NO.	TANK NO.	TANK NO.	TANK NO.
8. Type of Monitoring/Detection System	Tank Piping	Tank Piping	Tank Piping	Tank Piping	Tank Piping
K. None					
L. Other (please specify)					
9. Overfill Protection (tank only) (Mark one X for each tank)					
A. Yes					
B. No					
10. Spill Containment Around Fill Pipe (Mark one X for each tank)					
A. Yes					
B. No					
11. Tank Status (Mark one X for each tank)	Tank Piping	Tank Piping	Tank Piping	Tank Piping	Tank Piping
A. In-use					
B. Empty less than 12 months					
C. Empty 12 months or more					
D. Emergency spill tank (sump)					
E. Emergency backup generator tank					
F. Abandoned in Place					
G. Removed					
H. Other (please specify)					
12. If box 11B, C, or D above has been marked, indicate the estimated date last used (month/day/year)	Mo. Day Year	Mo. Day Year	Mo. Day Year	Mo. Day Year	Mo. Day Year
13. Closure Information - Tank ID No. B/A 699 (A)	TANK NO. 1 1 2	TANK NO.	TANK NO.	TANK NO.	TANK NO.
	Mo. Day Year	Mo. Day Year	Mo. Day Year	Mo. Day Year	Mo. Day Year
A. Date abandoned in place					
B. Date taken temporarily out of service					
C. Date removed	06/09/1998				
D. Date of Sale or Transfer					
E. TMS # (if applicable)					
F. ISRA # (if applicable)					

SECTION C - FINANCIAL RESPONSIBILITY

Does this facility have a Financial Responsibility Assurance Mechanism as required in 40 CFR 280? ☐ YES ☐ NO
Please list the appropriate financial information below:

Type _____ Carrier / Issuing Agency _____

Effective Date ____/____/____ Expiration Date ____/____/____ Policy Number _____ $ Amount _____

SECTION D - MONITORING SYSTEMS

Does this facility have a release detection monitoring system which is in compliance with N.J.A.C. 7:14B-6? ☐ YES ☐ NO
If "No", please be aware that the facility must meet the appropriate deadline. (See "Dates to Know" on Page 4)

SECTION E - RECORDKEEPING/COMPLIANCE

Please answer all the questions in this section on a facility basis. Any one tank not in compliance requires a "NO" answer for the entire facility.

1. Does this facility have cathodic protection systems for all steel tanks and piping? ☐ YES ☐ NO
   If "Yes", are the systems properly operated and maintained pursuant to N.J.A.C. 7:14B-5? ☐ YES ☐ NO
2. Are the performance claims and documentation of monitoring systems maintained by the owner or operator pursuant to N.J.A.C. 7:14B-5? ☐ YES ☐ NO
3. Are the proper monitoring, testing, sampling, repair and inventory records kept on-site pursuant to N.J.A.C. 7:14B-5 and 6? ☐ YES ☐ NO
4. Is the proper Release Response Plan kept on-site pursuant to N.J.A.C. 7:14B-5? ☐ YES ☐ NO
5. Does the facility have spill and over fill protection systems pursuant to N.J.A.C. 7:14B-4? ☐ YES ☐ NO
6. Have all Fill Ports been permanently marked as per API #1637

IMPORTANT INFORMATION

FEE:	Please make checks payble to: **"Treasurer, State of New Jersey"**. Use of the enclosed return envelope will expedite processing. Registration and Billing Schedule can be found in N.J.A.C. 7:14B. All Initial Registration fees are $100 per facility.
PENALTY:	Failure by owner or operator of a regulated underground storage tank to comply with any requirement of the State UST Act or regulations may result in the penalties set forth in N.J..S.A. 58:10A-10.
EMERGENCY:	If a discharge or spill occurs, the NJDEP Hotline at (609) 292-7172 must be called IMMEDIATELY - 24 hours a day.
UPGRADE EXEMPTION:	Residential heating oil underground storage tanks are exempt from all upgrade requirements.

DATES TO KNOW (critical deadlines)

December 22, 1988	—	All new federally regulated tank systems must have cathodic protection and spill/overfill protection.
September 4, 1990	—	All new State-only regulated tank systems must have cathodic protection and spill/overfill protection.
December 22, 1990	—	All federally regulated piping must have begun leak detection.
February 19, 1993	—	All federally regulated tank systems must maintain financial responsibility assurance.
December 22, 1993	—	All federally regulated tank systems must have begun leak detection.
December 22, 1998	—	All regulated tanks shall install cathodic protection and spill/overfill protection.

CERTIFICATIONS

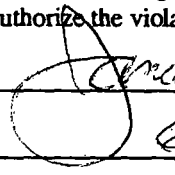
NOTE: IF THE PERSON SIGNING CERTIFICATION NO. 2 IS THE SAME AS THE PERSON SIGNING CERTIFICATION NO. 1, THEN CERTIFICATION NO. 2 NEED NOT BE SIGNED. (If different persons are required to sign No. 1 and No. 2, then they must do so.)

CERTIFICATION NO. 1:

Must be signed by the highest ranking individual at the facility with overall responsibility

"I certify under penalty of law that the information provided in this document is true, accurate and complete to the best of my knowledge, information and belief. I am aware that there are significant civil and criminal penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

MR. James OTT — (Typed / Printed Name)



(Signature)

Director of Public Works — (Title)

6/9/98 — (Date)

CERTIFICATION NO. 2:

Must be signed as follows:

- For a corporation, by a principal executive officer of at least the level of vice president
- For a partnership or sole proprietorship, by a general partner or the proprietor, respectively
- For a municipality, State, Federal or other public agency, by either a principal executive officer or ranking elected official
- For persons other than indicated above, by the person with legal responsibility for the site

"I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information. I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil and criminal penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

(Typed / Printed Name)

(Signature)

(Title)

(Date)

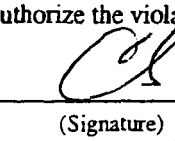
CERTIFICATION NO. 3:

If applicable, must be signed by the individual who is certified to perform services.

"I certify under penalty of law that the information provided in this document is true, accurate and complete to the best of my knowledge, information and belief. I am aware that there are significant civil and criminal penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

MR. Charles Appleby — (Typed / Printed Name)

Env. Pro. Spec — (Title)



(Signature)

6/9/98 — (Date)

U.S. Army — (Name of Firm, if applicable)

20576 — (N.J. Certification Number)

APPENDIX B

SITE ASSESSMENT SUMMARY

(12/97) **New Jersey Department of Environmental Protection**

Site Remediation Program

UST Site/Remedial Investigation Report Certification Form

A. Facility Name : U.S. Army Fort Monmouth New Jersey

Facility Street Address : Directorate of Public Works Building 173

Municipality: Oceanport County : Monmouth

Block: Lot(s): Telephone Number : 732-532-6224

B. Owner (RP)'s Name:

Street Address: City :

State: Zip: Telephone Number :

C. (Check as appropriate)

___ Site Investigation Report (SIR) $500 Fee

___ Remedial Investigation Report (RIR) $1000 Fee

_X_ NA – Federal Agreement

D. (Complete all that apply)

- Assigned Case Manager : Ian Curtis, Federal Case Manager
- UST Registration Number : 81533-112 (7 digits)
- Incident Report Number 89 – 10 – 19 – 1329 (10 or 12 digits)

___–___–___–___–___–___

- Tank Closure Number : Federal Case Manager

E. Certification by the Subsurface Evaluator:

The attached report conforms to the specific reporting requirements of N.J.A.C. 7:26E .....Yes No

Name: Charles Appleby Signature: See signed subsurface removal log UST Cert. No.: 2056

Firm: U.S. Army Fort Monmouth Firm's UST Cert. Number: NA-U.S. Army

Firm Address: Directorate of Public Works Building 173 City: Fort Monmouth

State: NJ Zip: 07703 Telephone Number : 732-532-6224

(NOTE: Certification numbers required only if work was conducted on USTs regulated per N.J.S.A. 58:10A-21 et seq.)

F. Certification by the Responsible Party(ies) of the Facility:

The following certification shall be signed [according to the requirements of N.J.A.C. 7:14B-1.7(b)]as follows:

1. For a Corporation by a person authorized by a resolution of the board of directors to sign the document. A copy of the resolution, certified as a true copy by the secretary of the corporation, shall be submitted along with the certification; or
2. For a partnership or sole proprietorship, by a general partner or the proprietor, respectively; or
3. For a municipality, State, federal or other public agency by either a principal executive officer or ranking elected Official.

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attached documents, and that based on my inquiry of those individuals responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate, or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

Name (Print or Type): James Ott Title: Directorate of Public Works

Signature:

Company Name: U.S. Army Fort Monmouth Date:

US ARMY, SELFM-PW-EV

DAILY UST SUBSURFACE REMOVAL LOG

BLDG.#: 699 (A) REG.#: 81533 - 112 CLOSURE#:
DATE: 6/10/98 TOA: 945 TOD: 1045
GOV. SSE: Charles Appleby NJDEP CERT.#: 2056
REMOVAL CONTRACTOR:
CLOSURE SUPERVISOR: Gary DeMartino NJDEP CERT.#: _____
WEATHER: Sunny & Warm

ACTIVITY	YES / NO
THE SUPERVISOR (CLOSURE CERT.) WAS ON-SITE DURING ALL CLOSURE RELATED ACTIVITIES	YES
THE SSE WAS ON-SITE DURING UST REMOVAL AND SITE SCREENING AND SAMPLING ACTIVITIES	YES
ALL ON-SITE PERSONNEL HAD TRAINING IAW ALL SAFETY REQUIREMENTS (E.G. 29CFR)	YES
A CONFINED ENTRY PERMIT WAS COMPLETED AND POSTED ON-SITE BY THE CONTRACTOR	NA
THE UST WAS PLACED ONTO PLASTIC, SCRAPED OFF, INSPECTED FOR HOLES AND PHOTOGRAPHED	YES
A DISCHARGE WAS REPORTED TO THE NJDEP (609-292-7172), CASE# Eatontown Bldg Case #	NA
PHOTOS HAVE UST#, BLDG. #, DATE, TIME, NAME OF SSE AND DESCR. WRITTEN ON BACK	YES
GROUNDWATER WAS ENCOUNTERED AT 5 FEET BG, A SHEEN (WAS/WAS NOT) OBSERVED ON GW	
IF OVA/Hnu WAS USED: WAS IT CAL. AND FOUND TO BE OPERATIONAL (cal. data on COC)	YES
IF SAMPLES WERE TAKEN: COC, SCALED SITE MAP (VERT. SOIL HORIZONS AND PLOT PLAN)	YES
ALL SAMPLE COLLECTION ACTIVITIES WERE AS DESCRIBED IN THE NJDEP FSPM, 1992	YES
ALL SAMPLING WAS BIASED TOWARD HIGHEST OVA/FID RECORDED SITES IAW 7:26E-3.6 et seq.	YES
ALL PETROL. CONT. SOILS WERE SECURED FROM THE WEATHER BY CLOSE OF BUSINESS TODAY	NA
THE SSE AUTHORIZED BACKFILLING THE EXCAVATION (STONE TO 1" ABOVE GROUNDWATER)	YES
ADDITIONAL NOTES WERE TAKEN AND ARE RECORDED ON THE BACK OF THIS FORM Booth	YES
THE FOLLOWING DOCUMENTS WERE ADDED TO THE PROJECT FOLDER TODAY: (CIRCLE EACH) SCRAP TICKET, CSE PERMIT, ACCIDENT REPORT, HAZ. WASTE MANIFEST, DAILY UST CLOSURE LOG, SCALED SITE MAP (SAMPLING), SRF-CLOSURE, CHAIN OF CUSTODY, SOIL ANALYTICAL RESULTS, CLEAN FILL TICKETS (IN YDS^3), PHOTOGRAPHS (UST, EXCAVATION, SAMPLING POINTS)	

CHECK ALL BOXES, LEAVE NO BLANKS

I certify under penalty of law that tank decommissioning activities were performed in compliance with N.J.A.C. 7:14B-9.2(b)3 and 7:26 et seq.. I am aware that there are significant penalties for submitting false, inaccurate, or incomplete information, including fines and/or imprisonment.

SIGNATURE: _____ DATE: 6/10/98

ca\ms\ust\removal\sitessls.doc

- UST Site Assessment.
- TVS had to visit - Jim off needed immediate entry Re: Funds.
- All Samples Analyzed for VOA + BS note: TBA & Pb.
- Clean-Site.

APPENDIX C

WASTE MANIFEST

CASIE / PROTANK
ENVIRONMENTAL SERVICES

699

Please type or print in block letters. (Form designed for use on elite (12-pitch) typewriter.)

NON-HAZARDOUS MANIFEST

1. Generator's US EPA ID No. NJ3210020597 Document No. 12322
2. Page 1 of 1

3. Generator's Name and Mailing Address U.S. Army Com. Elec.Command
Main Post Bldg 173/Attn:
Fort Monmouth NJ 07703

A. Non-hazardous Manifest Document Number NHZ020 16448

4. Generator's Phone (732) 532-6223

B. State Generator's ID c/o ~~Lance Shirghio~~ Joe Fallon

5. Transporter 1 Company Name: Casie Ecology Oil Salvage, Inc. 6. US EPA ID Number: NJD045995693

C. State Trans. ID 16931

7. Transporter 2 Company Name 8. US EPA ID Number

D. Transporter's Phone (609) 696-4401

E. State Trans. ID

9. Designated Facility Name and Site Address
Casie Ecology Oil Salvage, Inc. T/A
3209 N. Mill Rd / Casie Protank
Vineland NJ 08360

10. US EPA ID Number: NJD045995693

F. Transporter's Phone ( )

G. State Facility's 0614D1HP05

H. Facility's Phone (609) 696-4401

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	L Waste No.
a. Combustible liquid, n.o.s.(Fuel Oil) NA1993, PGIII	001	TT	X3370 ~~00001~~	G	ID72
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above
L,T %oil/sed. %wtr.

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
a.24 Hr. Emergency Response #609 696-4401 K. Ambrosia NAERG# 127

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

I hereby certify that the above-named material is not hazardous waste as defined by 40 CFR Part 261, 264 and 279 or any applicable state law.

GENERATOR — Printed/Typed Name: Charles Appleby SEL Fm-Pw-Ev | Signature | Month Day Year: 04 01 98

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Bob Consiglio | Signature | Month Day Year: 04 01 98

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of non-hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name | Signature | Month Day Year

1–GENERATOR COPY

SIGNATURE AND INFORMATION *MUST* BE LEGIBLE ON ALL COPIES

APPENDIX D

UST DISPOSAL CERTIFICATE

B. 699-A

M. ZZA & SONS, INC.

Metal Recyclers
3230 Shafto Rd.
Tinton Falls, NJ
(908) 922-9292

NO. 891

DATE. 12 June 98

Customer's Name Team Vinnell

Address

	Weight	Price
Cast Iron		
Steel		
Tin	212 35	
Lt. Iron		
Copper #1		
Copper #2		

14040 LB
12 50
1540

	Weight	Price
Lt. Copper		
Brass		
Alum Clean		
Lead		
Stainless		
Battery		
	5	
	42.35	

TOTAL AMOUNT:

Weigher

Customer

12

Ck# 1910

THIS CHECK IS DELIVERED FOR PAYMENT ON THE FOLLOWING ACCOUNTS.

DATE		AMOUNT	
TOTAL OF INVOICES			
LESS ___ % DISCOUNT			
LESS FREIGHT			
LESS			
TOTAL DEDUCTIONS			
AMOUNT OF CHECK			

© DELUXE VS

1910

MAZZA & SONS, INC.
RECYCLING DIVISION
P.O. BOX 246
OAKHURST, NJ 07755

55-7233/2212

DATE 6/11/98

PAY TO THE ORDER OF Team Vinnell $194.75

One Hundred Ninety Four + 75/100 DOLLARS

Security features included. Details on back.

Sovereign Bank

MP

⑈001910⑈ ⑆221272332⑆000 10910992⑈

APPENDIX E

SOIL ANALYTICAL DATA PACKAGE

US ARMY FT. MONMOUTH ENVIRONMENTAL LABORATORY
NJDEPE # 13461

REPORT OF ANALYSIS

Client: U.S. Army
DPW, SELFM-PW-EV
Bldg. 173
Ft. Monmouth, NJ 07703

Project: Total Petroleum Hydrocarbons
98-0001
Bldg. 699-A

Project # 3635
Date Rec. 06/10/98
Date Compl. 06/12/98
Released by:

Daniel K. Wright Date: 7-6-98
Laboratory Director

Table of Contents

Method Summary

NJDEP Method OQA-QAM-025-10/97

Gas Chromatographic Determination of Total Petroleum Hydrocarbons in Soil

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

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

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

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

PHC Conformance/Non-conformance Summary Report

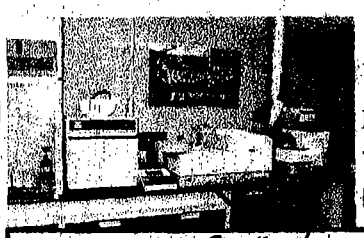
	No	Yes
1. Method Detection Limits provided.	__	✓
2. Method Blank Contamination - If yes, list the sample and the corresponding concentrations in each blank.	✓	__
3. Matrix Spike Results Summary Meet Criteria. (If not met, list the sample and corresponding recovery which falls outside the acceptable range).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

Additional Comments:_____

Laboratory Authentication Statement

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

Daniel K. Wright
Laboratory Manager



Fort Monmouth Environmental Testing Laboratory

Bldg. 173, SELFM-PW-EV, Fort Monmouth, NJ 07703
Tel (732)532-4359 Fax (732)532-3484 EMail:appleby@doim6.monmouth.army.mil
NJDEP Certification #13461

Chain of Custody Record

Customer: C. Appleby-DPW
Phone #: 26224
( )DERA (X)OMA ( )Other:_____

Project No: 98-0201
Location: B.699-A (2,000 GAL #2 OIL TANK)

Samplers Name / Company : GARY DIMARTINIS - TUS

Lab Sample I.D.	Sample Location	Date	Time	Sample Type	# bottles	TPHC	O&G SGT-HEM	VOA 8150	LEAD	TO INCLUDE MTBE, TBA, DIPE	OJA	Remarks / Preservation Method
3635.01	699-A	6-10-98	0959	SOIL	1	X	X	X	X		ND	EXC. FLOOR @ 9.0' *
02	B		1010								ND	EXC. FLOOR @ 8.0'
03	C		1031								ND	SIDEWALL @ 4.5'
04	D		1017								ND	
05	E		1021								ND	
06	F		1038								ND	
07	G		0946								ND	PIPING RUN @ 2.0'
08	H		0953								ND	
09	DUP		—	↓		↓	↓	↓	↓		—	FIELD DUPLICATE
10	TB	↓	—	METHANOL	↓			↓			—	TRIP BLANK

NOTE: OJA (#A52114) CALIBRATED 4/95 ppm CH4 + ZERO (0) AIR @ 0805 HRS. ON 6/10/98 by G. DIMARTINIS.

Comments: * = SAMPLES KEPT BELOW 4°C.

Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):
[signature]	6-10-98 1307	[signature]			
Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):
[signature]		[signature]			

Report Type: (_)Full, (X)Reduced, (_)Standard, (_)Screen / non-certified
Turnaround time: (_)Standard 4 wks, (X)Rush 3 Days, (_)ASAP Verbal ____ Hrs.
NJ 3-DAY TAT ORDERED BY C. Appleby.

Remarks: DEDICATED SAMPLING TOOLS USED.

print legibly

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

Client :	U.S. Army	**Lab. ID # :**	3635
	DPW. SELFM-PW-EV	**Date Rec'd:**	10-Jun-98
	Bldg. 173	**Analysis Start:**	11-Jun-98
	Ft. Monmouth, NJ 07703	**Analysis Complete:**	12-Jun-98
Analysis:	OQA-QAM-025	**UST Reg. #:**	
Matrix:	Soil	**Closure #:**	
Analyst:	D.DEINHARDT	**DICAR #:**	
Ext. Meth:	Shake	**Location #:**	B.699-A

Sample	Field ID	Dilution Factor	Weight (g)	% Solid	MDL (mg/kg)	TPHC Result (mg/kg)
3635.01	699-A	**1.00**	15.26	83.65	184	**ND**
3635.02	699-B	**1.00**	15.35	84.77	181	**ND**
3635.03	699-C	**1.00**	15.22	80.93	191	**ND**
3635.04	699-D	**1.00**	15.62	92.84	162	**ND**
3635.05	699-E	**1.00**	15.09	86.29	180	**ND**
3635.06	699-F	**1.00**	15.28	88.00	175	**ND**
3635.07	699-G	**1.00**	15.46	88.14	172	**ND**
3635.08	699-H	**1.00**	15.08	85.01	183	**346.04**
3635.09	699-DUP	**1.00**	15.69	82.84	181	**ND**
METHOD BLANK	TBLK 113	**1.00**	15.00	100.00	157	**ND**

ND = Not Detected

MDL = Method Detection Limit

Daniel K. Wright
Laboratory Director

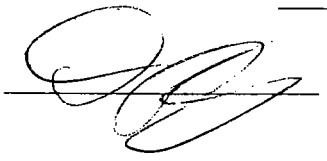
LABORATORY DELIVERABLES CHECKLIST AND NON-CONFORMANCE SUMMARY

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

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

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

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

Laboratory Manager or Environmental Consultant's Signature 

Date 7/6/94

Laboratory Certification #13461

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

APPENDIX F

ELECTRONIC DATA DELIVERABLES

CERTIFICATION

For: Enzyme-Enhanced Bioremediation at the Main Post Gas Station, Building 699, Fort Monmouth, New Jersey

" I certify under penalty of law that the information provided in this document is true, accurate, and complete to the best of my knowledge. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

Joseph Fallon
Environmental Protection Specialist

Name, Title	Signature	Date
	Joseph Fallon	10/11/00

" I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete to the best of my knowledge. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

Stephen N. Wood LTC, MI
Garrison Commander

Name, Title	Signature	Date
		10/16/00

This Second Addendum to the Remedial Action Workplan for the Main Post Gas Station, Building 699, Fort Monmouth, New Jersey has been reviewed and approved.

Ian Curtis, Case Manager
NJDEP, Bureau of Case Management

Name, Title	Signature	Date

FINAL

REMEDIAL ACTION WORKPLAN, 2nd ADDENDUM

Enzyme-Enhanced Bioremediation At the AAFES Main Post Gas Station, Building 699 Fort Monmouth, New Jersey

U.S. Army Garrison
Fort Monmouth, New Jersey

Directorate of Public Works

October 2000

1900 Frost Road, Suite 110
Bristol, Pennsylvania 19007

Contract No. DACA51-00-D-0004
Delivery Order No. 0002

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  - Method Blanks
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- Lead

LIST OF ACRONYMS AND ABBREVIATIONS

AMC	U.S. Army Material Command
A2	TPH Bacterial Consortium
BTEX	Benzene, Toluene, Ethylbenzene, and Xylene
BUST	Bureau of Underground Storage Tanks
CADD	Computer Aided Drafting and Design
CBN	Custom Blend Nutrients
CEA	Classification Exception Area
CECOM	U.S. Army Communications and Electronics Command
COC	Constituent of Concern
COR	Contracting Officer's Representative
CY	cubic yard
DICAR	Discharge Investigation and Corrective Action Report
DPW	Directorate of Public Works
EA	Enzyme Accelerator
EEB	Enhanced-Enzyme Bioremediation
ETEC	Enzyme Technologies, Inc.
HASP	Health and Safety Plan
GAC	Granular Activated Carbon
GES	Groundwater & Environmental Systems, Inc.
GPS	Global Positioning System
GWQS	Ground Water Quality Standards
MSDS	Material Safety Data Sheet
MDL	Method Detection Limit
mg/Kg	milligram per Kilogram
MZC	Multi-Enzyme Complexes
NJDEP	New Jersey Department of Environmental Protection
ppm	Part per million
PID	Photoionization Detector
QAPP	Quality Assurance Project Plan
RAW	Remedial Action Workplan
RAWA	Remedial Action Workplan Addendum
RDCSCC	(NJDEP) Residential Direct Contact Soil Cleanup Criteria
RW	Recovery Well
SA	Second Addendum
SOW	Statement of Work
SPP	Separate-phase Product
SVE	Soil Vapor Extraction
TES	Technical Evaluation and Summary
TPHC	Total Petroleum Hydrocarbons

LIST OF ACRONYMS AND ABBREVIATIONS
(continued)

TVS	TECOM-Vinell Services, Inc.
TWA	Treatment Works Approval
UST	Underground Storage Tank
US	United States
VOC	Volatile Organic Compound
WP	Workplan

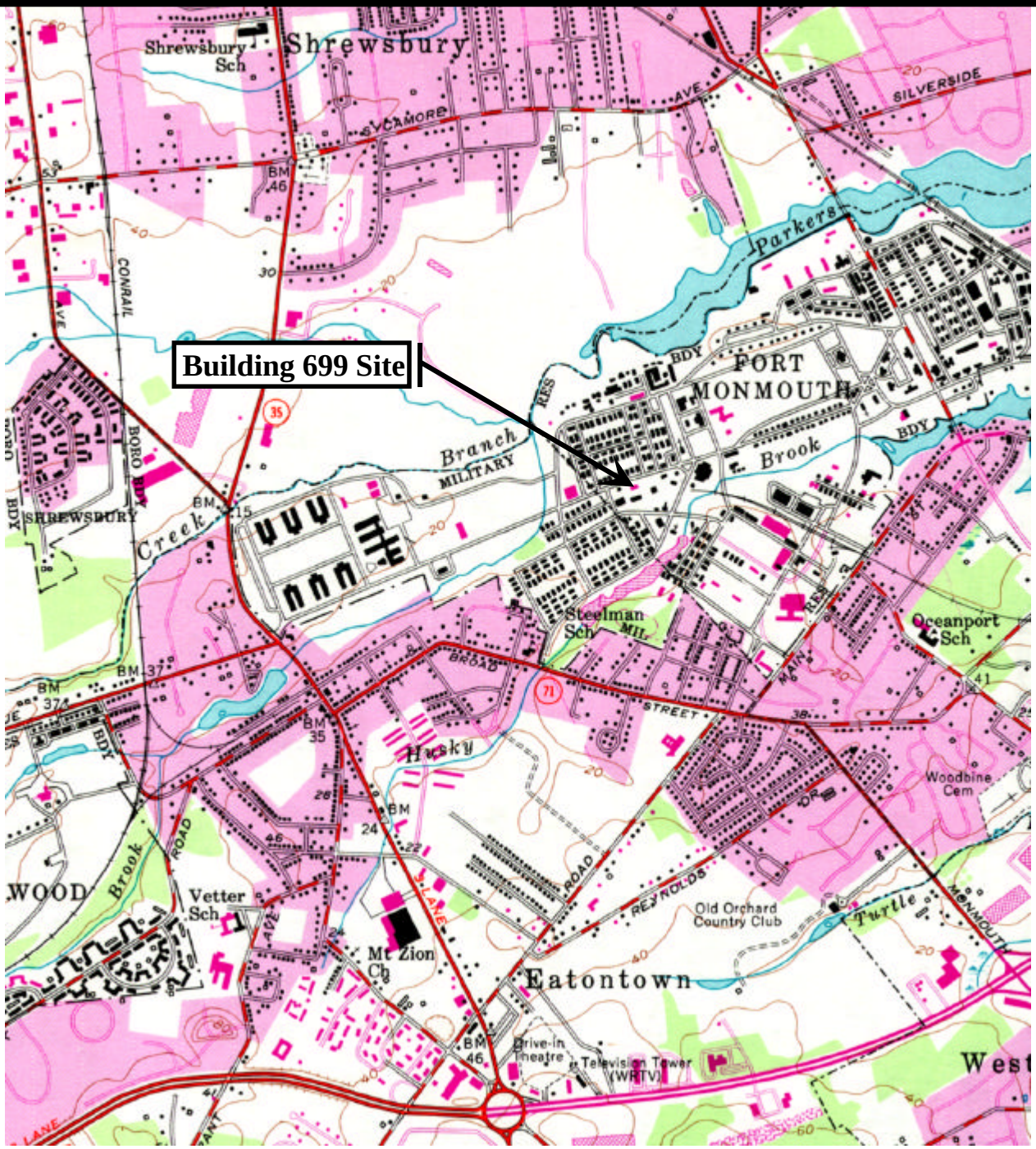
1.0 INTRODUCTION

Versar, Inc. (Versar) has been contracted by the United States (U.S.) Army Fort Monmouth (Fort Monmouth), Directorate of Public Works (DPW), Fort Monmouth, New Jersey to prepare a second addendum (SA) to the Remedial Action Workplan (RAW) for the AAFES Main Post Gas Station, Building No. 699 located in the Main Post area of Fort Monmouth. This SA addresses the planned implementation of enzyme-enhanced bioremediation (EEB) as a supplement to the previously proposed remedial system upgrade for the Main Post Gas Station, Building 699. The proposed system upgrade was presented in the Remedial Action Workplan Addendum (RAWA), dated 10 June 1999 and prepared by Groundwater & Environmental Systems, Inc. (GES). This SA has been prepared in partial fulfillment of Contract No. DACA 51-00-D-004, Delivery Order No. 0002 for submittal to the New Jersey Department of Environmental Protection (NJDEP) for review and approval.

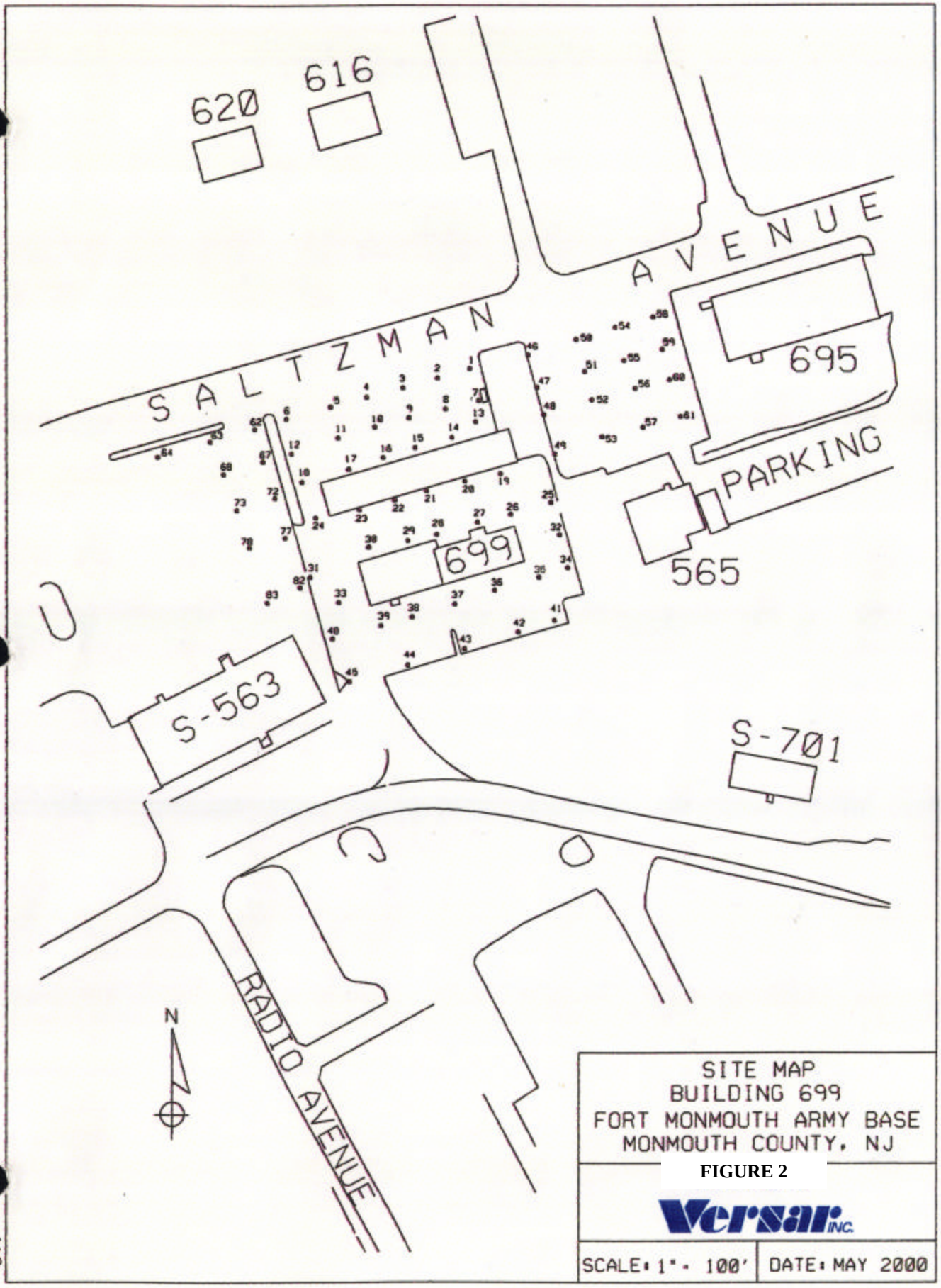
1.1 Background

Fort Monmouth is located in the central-eastern portion of New Jersey in Monmouth County, approximately 45 miles south of New York City and 70 miles northeast of Philadelphia. In addition to the Main Post, the installation includes two subposts, the Charles Wood Area and the Evans Area. The Main Post (Figure 1) encompasses approximately 630 acres and is generally bounded by State Highway 35, Parkers Creek, Lafetra Brook, the New Jersey Transit Railroad, and a residential area to the south. The post was established during WW I, in 1918, as an Army Signal Corps training center. The Main Post currently provides supporting administrative, training, and housing functions, as well as many of the community facilities for Fort Monmouth. The primary mission of Fort Monmouth is to provide command, administrative, and logistical support for Headquarters, U.S. Army Communications and Electronics Command (CECOM). CECOM is a major subordinate command of the U.S. Army Material Command (AMC) and is the host tenant at Fort Monmouth. The Main Post Gas Station – Building 699 ("the site") is approximately one acre in size and serves as the only on-base Main Post location for non-military vehicles to obtain fuel. Figure 2 shows the layout of the site.

On October 19, 1989, the DPW contacted NJDEP to report an apparent release of gasoline from the piping system at the gas station. The loss of product was discovered as a result of an inventory discrepancy found during routine inventory control. Subsequent pressure testing of the gasoline system indicated that the leak was located in the product line between the tanks and pumps. An Incident Number was assigned to the site by the NJDEP (#89-10-19-1329) for the gasoline release. Following the release, the DPW replaced the piping system connecting the USTs and the fuel pumps with equipment that was compliant with NJDEP Bureau of Underground Storage Tanks (BUST) requirements.



Building 699 Site **Fort Monmouth, New Jersey**	**FIGURE 1**
	Site Location Map
U.S.G.S Topographic Map Long Branch, NJ Quadrangle 7.5-Minute Series	Versar INC.



SITE MAP
BUILDING 699
FORT MONMOUTH ARMY BASE
MONMOUTH COUNTY, NJ

FIGURE 2

Versar INC.

SCALE: 1" = 100' | DATE: MAY 2000

A separate-phase product (SPP) recovery pump was then installed in a monitoring well immediately downgradient of the source in an attempt to recover remaining SPP. In response to NJDEP's request, Fort Monmouth submitted a Discharge Investigation and Corrective Action Report (DICAR), dated 3 July 1990.

The Krydon Group, Inc. (Krydon) was contracted to determine the extent of gasoline contamination at the site by means of a soil boring program conducted in July 1993. Additionally, in response to the 1989 release, seventeen (17) monitoring wells and three (3) recovery wells were installed at the site. Further, in a letter dated June 18, 1993, the NJDEP requested submission of a RAW, which was submitted by the U.S. Army on October 12, 1993 (Krydon, 1993).

The existing groundwater recovery and treatment system extracts groundwater from one (1) recovery well (RW-11). TECOM-Vinell Services, Inc. (TVS) personnel currently operate and maintain the existing groundwater recovery and treatment system. The current treatment system consists of one (1) sediment filter, and three (3) one hundred and eighty (180) pound liquid-phase granular activated carbon (GAC) units installed in series. The GAC units provide the necessary treatment for the removal of volatile organic compounds (VOCs) from the extracted groundwater. The treated groundwater is then discharged to the sanitary sewer in accordance with Fort Monmouth's existing Treatment Works Approval (TWA) Permit with the Northeast Monmouth County Regional Sewerage Authority.

GES was contracted by DPW (through TVS) to prepare a Remedial Action Workplan Addendum (RAWA) for the site. As part of this effort, GES performed remedial action pilot tests to evaluate potential remedial options. The RAWA (GES, 1999), dated 10 June 1999 was submitted to NJDEP and provided a brief history of the site and area of concern, a performance summary of the current groundwater remedial system, a summary of groundwater monitoring and sampling data, and the design and specifications of a proposed remedial system upgrade. As described in the RAWA, the proposed remedial system upgrade utilized soil vapor extraction (SVE) and groundwater pumping to extract soil vapor and groundwater from existing monitoring wells and proposed extraction laterals and wells. Furthermore, it proposed VOC removal from the groundwater using in-situ air stripping (air sparging). The extracted soil vapor and groundwater were to be treated and discharged in accordance with applicable discharge permits. The RAWA also established a proposed Classification Exception Area (CEA) encompassing the estimated capture zone of the proposed upgraded remedial system.

Subsequent to submission of the RAWA, further characterization and evaluation of site conditions identified the potential existence of clays in the upper horizon at the site. It was presumed that these soils would not be effectively addressed by the proposed SVE system, which is typically designed to remediate permeable sandy soils, such as those underlying the upper clay unit at the site. EEB was therefore proposed to attempt to remediate the contaminated soils in the upper soil horizon within an estimated depth of 3-

4 feet (ft.). EEB involves the process of transforming hazardous constituents to non-hazardous ones in a biological system, and is the result of complex biochemical reactions in which microorganisms (bacteria) convert the hazardous constituents to energy and cell mass. To initiate this process, high levels of target-specific, petroleum-degrading biological enhancements (enzymes, bacteria, nutrients) and oxygen need to be provided to the targeted contaminated soils.

To further delineate the horizontal and vertical extent of soil contamination at the site and to identify "hot spot" areas that could be addressed by the EEB, as well as to support design of the proposed SVE system, supplemental soil sampling was performed at the site in March and April 2000 by DPW and TVS personnel over a sampling grid encompassing eighty-three (83) locations. The borings were installed with a Geoprobe®, and soil samples were collected at 6-inch alternating intervals to a depth of twelve (12) ft. for a total of twelve (12) samples per location. The samples were analyzed for VOCs, total petroleum hydrocarbons (TPHC), lead, and percent (%) solids.

1.2 Objective

The objective of this SA to the RAW is to summarize the additional characterization performed at the site, and present a supplemental site remediation (EEB) for the impacted clay-rich soils beneath the Main Post Gas Station. The purpose of the planned supplemental activities is to inject biological enhancements into the shallow subsurface soils at identified "hot spot" areas to accelerate remediation of "petroleum" contaminants that might not be effectively addressed by the proposed SVE and air sparging system, thereby improving overall remedial performance at the site.

The activities addressed in this SA to the RAW include:

- Presenting and summarizing the results of the additional soil sampling performed in March/April 2000 to identify "hot spot" areas and determine the areal extent of low-permeable soils;
- Planning the application of EEB to "hot spot" areas using a Geoprobe® delivery system;
- Providing procedures for applying the biological enhancements;
- Conducting post-injection soil sampling to evaluate effectiveness of the supplemental site remediation activities; and
- Preparing a Technical Evaluation and Summary Report to document findings.

Construction of the proposed remedial system upgrade, including the SVE system extraction laterals and extraction and sparge wells, will be completed prior to implementing the EEB application. These activities will involve the excavation and removal of subsurface soils some of which may be within the delineated "hot spot"

locations. The EEB application will then be directed toward contaminated shallow subsurface soils within the remaining “hot spot” locations.

2.0 SITE SETTING

2.1 Site Description

As reported in the RAWA, the site is located on Saltzman Avenue, a thoroughfare through Fort Monmouth. The site is approximately one acre in size and serves as the only on-base Main Post location for non-military vehicles to obtain fuel. The site consists of a service station building (Bldg. 699) and two active pump islands under canopy. The station has six 10,000-gallon, fiberglass USTs that store various grades of gasoline products. Building 699 was historically utilized as an automotive service garage, and there are four bays located at the eastern side of the building. However, limited auto servicing is still performed. The site is approximately ninety percent covered by impervious surfaces including pavement, concrete islands, and the service station. Large paved parking areas exist to the east and west of the site. A large grassy area is found to the north across Saltzman Avenue. Building 699 is located approximately 750 ft. northwest of Husky Brook, which empties into Oceanport Creek. Topography at the site is relatively flat, sloping gradually to the southeast.

The current groundwater treatment system is located within an enclosure area on the concrete island that borders the eastern side of the site. As previously discussed, restoration/reconfiguration of the site is planned for implementation. Existing facilities will be demolished, and new refueling facilities and an overhead canopy will be constructed. The proposed remedial system upgrade will be located in a separate fenced enclosure, adjacent to the current treatment system enclosure.

2.2 Regional Geology

As reported in the RAWA (GES, 1999), Monmouth County lies within the New Jersey Section of the Atlantic Coastal Plain Physiographic province. The site is located in what may be referred to as the Outer Coastal Plain subprovince, or the Outer Lowlands. In general, New Jersey Coastal Plain formations consist of a seaward-dipping wedge of unconsolidated deposits of clay, silt, and gravel. The mineralogy ranges from quartz to glauconite. The New Jersey Coastal Plain formations record several major transgressive/regressive cycles and contain units, which are generally thicker to the southeast and reflect a deeper water environment. Over twenty (20) regional geologic units are present within the sediments of the Coastal Plain. Regressive, upward coarsening deposits are usually aquifers (e.g., Englishtown and Kirkwood Formations, and the Cohansey Sand), while the transgressive deposits act as confining units (e.g., the Merchantville, Marshaltown, and Navensink Formations). The individual thickness for these units varies greatly (i.e., from several ft. to several hundred ft.). The lithologies observed in borings installed within the Main Post area have reportedly consisted of fine-to-medium grained sands, with occasional lenses or lamentations of gravel silt and/or clay.

Based on past drilling, the depth to bedrock is greater than twenty (20) ft. A generalized stratigraphic sequence at the site (progressing upward) includes a lower (Sandy Hook) and upper (Shrewsbury) member of the Red Bank sand. The lower member is a dark gray to black, medium-to-fine grained sand with abundant clay, mica, and glauconite. The upper is a yellowish-gray to reddish brown clayey, medium-to-coarse grained sand that contains abundant rock fragments, minor mica, and glauconite.

2.3 Hydrogeology

Groundwater has been encountered at depths of between two (2) and fourteen (14) ft. across the site. During soil sampling at the site, unsaturated soils were reportedly encountered up to twelve (12) ft. below ground surface (bgs). Seasonal water table fluctuations are expected to be limited to two (2) to three (3) ft. Fluctuations may also be locally influenced by tidal influence (based on proximity to the Atlantic Ocean, rivers, tributaries), the nature of fill material, presence of clay and silt lenses in the overburden, and local recharge areas (streams and lakes). The interbedded sequences of sand and clay transmit water under both confined and unconfined conditions. The intermittent clay strata serve as semi-confining beds, where present. Based on GES groundwater elevation data from July 1998 to February 1999, the predominant groundwater flow direction is northeast to east.

3.0 SITE CHARACTERIZATION

3.1 Previous Soil Sampling Summary

In 1993, samples were collected to further define the extent of gasoline contamination on the east side of the site. A total of twenty-seven (27) soil samples were collected at 5.5 ft. below grade (the soil-groundwater interface). Based on the soil analytical data, total benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations ranged from 125 to 2170 milligrams per Kilogram (mg/Kg), and total VOCs ranged from 307 to 2877 mg/Kg (GES, 1999). However, the extent of contamination was not completely defined. In September 1999, four USTs were discovered below the pump island area on the west side of the site. The USTs and associated contaminated soil were removed, and soil sampling was conducted by DPW and TVS. The data indicated that total BTEX concentrations in the soils beneath the USTs ranged from 2 to 1487 mg/Kg, and total VOCs ranged from 26 to 1728 mg/Kg (DPW, 1999).

3.2 March/April 2000 Geoprobe Sampling

As previously discussed, supplemental soil sampling was performed at the site in March and April 2000 by DPW and TVS personnel to further delineate the horizontal and vertical extent of soil contamination, and to identify "hot spot" areas that could be addressed by EEB, as well as to support design of the proposed SVE system. TVS collected soil samples using a Geoprobe® on a sampling grid established across the site at 30-foot intervals, totaling 83 potential sampling locations. Figure 2 shows the sampling grid for the Geoprobe® soil sampling. Soil samples were collected at alternating 6-inch intervals from ground surface to a depth of 12 ft. at each location for a total of 12 samples per boring. Each boring location was then surveyed using a Global Positioning System (GPS). The collected samples were analyzed at the Fort Monmouth Environmental Testing Laboratory (DPW, 2000) for VOCs (EPA SW-846 Method 8260), Total Petroleum Hydrocarbons (TPHC) (NJDEP Method OQA-QAM-025, 10/97), lead (EPA SW-846 Method 3051A/ Method 3111B FLAA PB), and percent solids. Appendix A provides a copy of Fort Monmouth Standard Operating Procedure (SOP) No. SAM-0221 entitled: Geoprobe Sampling Methods for the AAFES Main Post Gas Station, Building 600, dated 24 February 2000. SAM-0221 documents the procedure used to collect samples to delineate the extent of gasoline contamination at Building 699.

Table 3-1 (following page 19) presents a summary of the analytical results in mg/Kg for the March/April 2000 soil Geoprobe® sampling. The analytes listed include: TPHC, lead (Pb) and the VOCs detected above the respective analytical method detection limits (MDLs) (2-Butanone, 2-Chloroethyl vinyl ether, trichloroethylene (TCE) benzene, perchloroethylene (PCE), ethyl-benzene, xylene, methylene chloride, acetone, toluene, and chloroform). Table 3-1 also lists the NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC) in mg/Kg for each of the listed constituents of concern (COCs).

(Note: The Method Detection Limit or MDL for each analyte is either at or below the respective RDCSCC.) Each sample that exceeded the respective RDCSCC has been shown in bold print and the table cell has been shaded (e.g., **9.4**). If there was no detection for any COC at a sampling interval, the interval has not been listed in Table 3-1 for the respective boring location. As can be seen in Table 3-1, COCs were detected in fifty-three (53) of the eighty-three (83) boring locations. There were no detections for analyzed constituents at nineteen (19) boring locations: Nos. 37, 39, 40 and 40D (duplicate sample), 41, 42, 44, 51, 52, 53, 54, 55, 56, 57, 59, 60 and 60D (duplicate sample), 63, 64, 73, and 83. At eleven (11) boring locations: Nos. 65, 66, 69, 70, 71, 74, 75, 76, 79, 80, and 81, no samples were collected. In evaluation of the preliminary field investigation efforts, these borings were determined to be out of the area of concern and no samples were taken.

As can be expected in characterizing a site following a release of gasoline, the detected COCs at a majority of the borings were TPHC and BTEX. TPHC was detected at forty-one (41) boring locations with nineteen (19) locations containing detections above the RDCSCC of 1000 mg/Kg. The detections ranged to a maximum of 8,739.63 mg/Kg at Boring No. 21. Benzene was detected at twenty-two (22) boring locations with twenty (20) locations containing detections above the RDCSCC of 3 mg/Kg. The detections ranged to a maximum of 590 mg/Kg at Boring No. 48. Toluene was detected at twenty-four (24) boring locations with six (6) locations containing detections above the RDCSCC of 1000 mg/Kg. The detections ranged to a maximum of 2500 mg/Kg at Boring No. 48. Ethyl-benzene was detected at twenty-eight (28) boring locations with two (2) locations containing detections above the RDCSCC of 1000 mg/Kg. The detections ranged to a maximum of 1200 mg/Kg at Boring No. 48. Xylene was detected at twenty-seven (27) boring locations with eighteen (18) locations containing detections above the RDCSCC of 410 mg/Kg. The detections ranged to a maximum of 6900 mg/Kg at Boring No. 48. Except for four (4) detections at Boring Nos. 13, 16, and 32 that were above the RDCSCC for Methylene Chloride of 49 mg/Kg, there were no detections of the remaining VOCs/SVOCs (2-Butanone, 2-Chloroethyl vinyl ether, TCE, PCE, Acetone, and Chloroform) above the respective RDCSCCs. Methylene Chloride was detected in one (1) of the Laboratory Method Blanks and is generally a laboratory contaminant. Lead was detected in twenty-nine (29) borings, but none of the detections exceeded the RDCSCC of 400 mg/Kg.

Figures 3, 4, 5, 6, and 7 (provided in Appendix B) provide a graphical representation of the analytical results for TPHC, benzene, toluene, ethyl-benzene, and xylene, respectively for each boring location by sampling interval. At sampling intervals where the detection exceeded the RDCSCC, the detection has been "boxed" or outlined in "red". Not detected (ND) has been listed for results observed below the MDL for the respective analyte. As can be seen from Figures 3 through 7, the majority of the detections that exceed the respective RDCSCCs are located in an area encompassing approximately 22,000 square feet to the north of the existing fuel islands and bordered (to the north) by Saltzman Avenue.

For the purposes of this effort, detections of benzene and xylene in the shallow subsurface (e.g., 0 – 3 ft.) will be used to delineate "hot spot" areas to focus the EEB application. Table 3-2 presents a summary of results for benzene and xylene at the twenty (21) borings with detections (for both benzene and xylene) above the RDCSCC. As can be seen in Table 3-2, there are thirteen (13) boring locations (Nos. 1, 2, 5, 7, 8, 11, 13, 15, 19, 20, 21, 46, and 47) with benzene or xylene detections above the RDCSCC within the shallow subsurface (0 – 3 ft. bgs). In addition, Boring Nos. 3, 9, and 14 are in close proximity to the initially identified boring locations and contain detections above the RDCSCC just below the 3 ft. depth. Further, Boring No. 48 contained the maximum detections for benzene, toluene, ethyl-benzene, and xylene from the March/April 2000 soil sampling and while the detections were at depths greater than the established target depth of 3 ft., has been included to evaluate the effectiveness of the EEB application in the deeper zones. These seventeen (17) total boring locations will be the focus of the EEB implementation.

A secondary objective of the supplemental soil sampling performed in March and April 2000 was to attempt to confirm the existence of clays or a confining clay layer in the upper horizon at the site. It was presumed that these soils would not be effectively addressed by the proposed SVE system, which is typically designed to remediate permeable sandy soils, such as those found beneath the clays at the site. Review of the boring logs generated during the Geoprobe® sampling conducted in March and April 2000 showed a number of observed locations with silty clay conditions. These clays ranged primarily from 0.5 ft. to 10 ft. in depth, often occurring as clay lenses, confirming the feasibility of implementing EEB as a supplement to the previously proposed remedial system upgrade.

Table 3-2

Main Post Gas Station - Bldg. 699

Summary of Soil Analytical Results for Benzene and Xylene at Borings with Detections Above NJDEP Soil Cleanup Criteria

(mg/Kg)

BENZENE																					
Boring No.	1	2	3	5	7	8	9	10	11	13	14	15	16	18	19	20	21	22	46	47	48
Depth																					
6-12"	ND	ND	ND		ND	**5.9**	ND	ND	ND	**5.2**	ND	ND	1.5	ND	ND	ND	ND	ND	**3.9**	**3.7**	1.2
18-24"	0.66	1.1	ND		ND	**14**	ND	ND	ND	**6.5**	ND	ND	0.35	**4.4**	ND	ND	ND	ND	**3**	**3.3**	1.1
30-36"	**9.4**	**3.4**	ND		**39**	**35**	ND	ND	**7.6**	**77**	ND	**14**	1.1	ND	**19**	**26**	**22**	**17**	**19**	ND	0.86
42-48"	**7.4**	**9.4**	**60**		**14**	**34**	ND	ND	**7.8**	**35**	**13**	**17**	ND	ND	**16**	**55**	**25**	ND	**30**	**23**	1.5
54-60"	**18**	**49**	**220**		**20**	**110**	**14**	ND	**9.9**	**64**	ND	**84**	**9.2**	ND	**30**	**41**	**25**	2.3J	**49**	**30**	**5.2**
66-72"	**11**	**54**	**43**		**3**	**230**	**6.1**	ND	ND	**44**	**7.5**	ND	**51**	ND	**16**	**21**	**100**	ND	**28**	**69**	**110**
78-84"	**8.2**	**63**	**25**		**6.5**	**54**	**12**	ND	ND	**24**	**12**	**34**	**18**	ND	**38**	**46**	**15**	ND	**48**	**13**	0.67
90-96"	**2.2**	**15**	**3.3**		**12**	**17**	ND	ND	ND	**11**	**7.6**	**16**	**61**	ND	ND	**44**	**6.3**	ND	**41**	**21**	1.5
102-108"	ND	**46**	**18**		ND	ND	**15**	ND	ND	**47**	**11**	**9.5**	**43**	ND	**13**	**81**	**38**	ND	**48**	**15**	**150**
114-120"	ND	**15**	**11**		ND	ND	**21**	ND	ND	**54**	**9.5**	**14**	**110**	ND	**25**	**58**	ND	ND	**31**	**36**	**590**
126-132"	ND	**4.2**	**6.5**		ND	ND	**12**	0.78	ND	**15**	**13**	ND	**8.9**	ND	**13**	**140**	ND	ND	**67**	**33**	**200**
138-144"	0.38	1.1	**3.7**		ND	ND	ND	**6.9**	ND	**10**	**11**	ND	ND	ND	ND	ND	ND	ND	**18**	**3.6**	**260**
	Residential Direct Contact Soil Cleanup Criteria for Benzene = 3 mg/Kg																				
XYLENE																					
Boring No.	1	2	3	5	7	8	9	10	11	13	14	15	16	18	19	20	21	22	46	47	48
Depth																					
6-12"	ND	ND	0.35J	6.2J	ND	323			16J	24	ND	16J	1.5		5J	ND	16J	ND	17.8	22.1	8.62
18-24"	0.66J	0.36J	0.38J	202	ND	127			47	35	ND	ND	0.67J		27.4	ND	204	36.3	7	10.8	4.73
30-36"	262	1.76	8.9	**730**	**850**	360			**920**	**880**	ND	**680**	8.72		**670**	**490**	**1420**	**1070**	262	9.5J	2.57
42-48"	360	198	**1610**	**1030**	380	**450**			**810**	**470**	**1390**	**840**	210		**600**	**1060**	**1970**	271	400	400	5.8
54-60"	**680**	**460**	**3890E**	257	**690**	**750**			**900**	**780**	**860**	**3590E**	339		**850**	**800**	**1330**	12J	**510**	**590**	173
66-72"	360	348	**410**	243	155	**1670**			116	**540**	**610**	16J	**2300**		400	340	**5200E**	12J	360	**1490**	**2870**
78-84"	222	360	285	**880E**	**460**	350			267	294	289	**1390**	**690**		**730**	**750**	**880**	ND	**640**	225	33.1
90-96"	62	41	5.4J	67	**820**	**1100**			ND	96	38	**620**	**1020**		80	**730**	364	77	**560**	370	50
102-108"	3.65	329	184	230	140	ND			400	**580**	**1170**	355	**840**		207	**1370**	**2410**	96	**640**	358	**1780**
114-120"	0.65J	40	76	150	**700**	ND			330	**750**	**480**	**550**	**1640**		**460**	**960**	116	ND	303	**550**	**6900**
126-132"	0.56J	8.7	21	95	**1190**	ND			329	167	47	72	63		208	**2480**	ND	ND	**870**	**440**	**2990**
138-144"	ND	1.47	3.4J	2.06J	208	19J			ND	114	40	ND	ND		32.9J	16J	ND	ND	183	6.4	**1340**
	Residential Direct Contact Soil Cleanup Criteria for Xylene = 410 mg/Kg																				
KEY:	- Detection above the respective Residential Direct Contact Soil Cleanup Criteria																				
	- Target depth for EEB application																				
	- Selected boring locations for EEB application																				

4.0 ENZYME-ENHANCED BIOREMEDIATION

4.1 Overview of Proposed EEB Implementation

Fort Monmouth proposes to implement EEB to remediate the impacted clay-rich soils in the shallow subsurface beneath Main Post Gas Station and supplement the previously proposed remedial system upgrade. Enzyme Technologies, Inc. (ETEC), Portland, Oregon will support the project. Background information from their Web Site (www.enzymetech.com) has been summarized below to provide an overview of the proposed EEB implementation.

The key to any bioremediation process is the control of specific microorganisms under specific environmental conditions to achieve specific chemical transformations. Bioremediation requires this control be performed in complex hydrogeological settings to transform often complex mixtures of compounds to carbon dioxide and water in a process call "mineralization". The process of transforming a hazardous chemical to a non-hazardous compound in a biological system is a result of complex biochemical reaction in which microorganisms (bacteria) convert the hazardous compound to energy and cell mass. Bioremediation processes are catalyzed chemical reactions in which the microorganism provides the catalyst (enzyme) to transform a specific compound (contaminant) in an oxygen-reduction (redox) reaction. Enzyme production and the subsequent reaction will not occur unless suitable environmental conditions are carefully maintained. The primary components required to sustain a bioremediation process are: a bacteria species capable of producing "target-specific enzymes" to degrade the contaminant, an energy source (contaminant), and an electron acceptor for the redox reaction. Components of secondary importance are: nutrients, moisture, pH, and temperature. The absence or the imbalance of these components may limit the biological process and result in a lack of contaminant transformation. ETEC has developed proprietary methods to enhance the bioremediation process.

Oxygenation is extremely important in the performance of an in-situ bioremediation process, often controlling both the overall rate of contaminant degradation as well as the cleanup levels attainable. Maximizing the available oxygen is critical in order to maximize the degradation rates achievable using the proposed biological enhancement products. There are two common methods for oxygenation of groundwater: 1) air injection, and 2) oxygen (or oxygen-augmented air) injection. With both of these methods, the air or oxygen is forced below the surface into the groundwater to subsequently migrate upward, creating an oxygenated volume of water surrounding the injection location. With air injection, the dissolved oxygen saturation point is approximately 8 to 12 ppm, depending on elevation and temperature. With pure oxygen injection, the dissolved oxygen can typically be increased to 15 to 20 ppm. ETEC manufactures and will provide a BioBox for use at the site that incorporates a unique oxygen mixing process to achieve dissolved oxygen concentrations in the water of 40 ppm or greater, achieving full solubility of the oxygen into the water.

Table 4-1

Procedures for preparing, mixing, and delivering the biological enhancement products

The biological enhancement products will be prepared prior to injection into the soils as follows:

1. Prepare BioBox
   a. Obtain 30 Amp, 110 Volt generator.
   b. Connect mobile BioBox to vehicle.
   c. Connect generator and check operating status of BioBox.

2. Determine injection volumes
   a. Fill BioBox tank (included on trailer) with water.
   b. Read flowmeter totalizer.
   c. Inject water into a geoprobe hole using injection assembly until water flows out of hole or is no longer being accepted.
   d. Read flowmeter totalizer.
   e. Subtract reading in step (d) from reading in step (b): this is the total expected injection volume per well. If the hole continues to take water, a field determination needs to be made regarding injection volume per hole (recommend 20 to 50 gallons, or as much as possible).
   f. Determine the total injection volume required for the entire site by multiplying the volume from (2)(e) by the planned number of geoprobe holes.
   g. If the total estimated volume from 2(f) exceeds the BioBox tank volume, calculate the number of tanks required for the entire project site by dividing the total volume by the useable tank volume (approximately 300 gallons).

3. Prepare for inoculation with Enzyme Accelerator (EA) and Multi-Enzyme Complexes (MZC)
   a. Fill the BioBox tank with water.
   b. Turn on the BioBox and circulate water in the tank with oxygenation system ON.
   c. Circulate water for 10 minutes or until oxygen reaches a minimum of 35 parts per million (ppm).
   d. Add EA and MZC to the tank in relative percentages (FOR EXAMPLE: if the total expected injection volume is 3,000 gallons and the tank volume is 300 gallons, this means that there will be 10 tanks of water injected into the site; therefore, $1/10^{th}$ of the total volume of EA and MZC should be used per batch). The total volume of EA and MZC will be approximately 50 and 25 gallons, respectively.

4. Inoculate the site with EA and MZC
   a. Inject the volume of water determined in step (6)(e) into each hole; monitor the injection volume by using the flowmeter on the BioBox

b. Repeat steps (3) and (4) until entire site is inoculated. ALL EA and MZC should be used after completion of these tasks.

5. Prepare for inoculation with Custom Blend Nutrients (CBN) and TPH Bacterial Consortium (A2)
    a. Fill the BioBox tank with water.
    b. Turn on the BioBox and circulate the water in the tank with the oxygenation system ON.
    c. Circulate the water for 10 minutes or until oxygen reaches a minimum of 35 ppm.
    d. Add CBN to the tank in relative percentages as described in step (3)(d). The total volume of CBN and A2 will be approximately 1,000 lbs. and 50 gallons, respectively.
        i. CBN is a dry product and should be apportioned according to weight.
        ii. Use caution when adding to tank to avoid splashing.
        iii. Add CBN to water ONLY, do NOT add water to CBN.
        iv. NOTE: If the formation will only take a small volume of water per injection point, all of the biological products may be injected, but the nutrient volume may need to be reduced.
    e. Add A2 to the tank in relative percentage as described in step (3)(d). The total volume of A2 will be approximately 50 gallons.

6. Inoculate the site with CBN and A2
    a. Inject the estimated volume of water into each hole; monitor the injection volume using the flowmeter on BioBox.
    b. Repeat steps (5) and (6) until the entire site is inoculated. ALL CBN and A2 should be used after completion of these tasks.

The proposed biological enhancements consist of four different products: Enzyme Accelerator (EA), Multi-Enzyme Complexes (MZC), TPH Bacterial Consortium (A2), and Custom Blend Nutrients (CBN). A description of each of the proposed enhancements is provided below:

- EA acts as a pre-treatment agent for enzyme and bacterial applications. EA is a liquid biosurfactant that increases the surface area for enzymes and bacteria, thereby increasing the cleanup rate.
- MZC is a concentrated liquid extract of mono- and dehydroxygenase compounds that are responsible for over 90% of the bioremediation process.
- A2 is a liquid multi-strain bacterial consortium specifically designed to degrade long-chain petroleum hydrocarbons.
- CBN is dry mixture of proprietary nitrogen, phosphorus and potassium compounds with micronutrients.

Material Safety Data Sheets (MSDS) for EA, MZC, and A2 are provided in Appendix C. Water will be oxygenated using an oxygen generator located inside the BioBox and utilized as a transport agent for the biological enhancements.

4.2 EEB Implementation Approach

The application of biological enhancements will be accomplished by using one Geoprobe® rig to install an array of temporary injection points for introduction of the biological enhancements. Injection of the biological products will be continuous from ground surface to three to four ft. in depth. The injection points will be established on 5-foot centers from each of the seventeen (17) selected boring locations for a total of nine (9) injection points per location or one hundred fifty-three (153) total injections. The EEB implementation will be performed following excavation and construction of the planned SVE extraction laterals and wells. Injection points will not be located in backfilled SVE trench areas, or in clean fill areas associated with former USTs. If required, the planned injection pattern will be adjusted away from these areas.

The biological enhancements will be injected in two stages. During stage one, the EA and MZC will be mixed in the Biobox and injected into the ground. During stage two, the CBN and A2 will be mixed in the Biobox and then injected into the same locations. During the initial Geoprobe® installation, a PVC “injection stinger” will be placed in the borehole to keep the hole open until the 2nd injection stage. A production rate of twenty (20) injection points per day has been estimated with penetration depths of 3-4 ft. per borehole. Based on this rate, the 1st stage of biological enhancements will be injected at two (2) boring locations during one day (9 injections per location) followed by the 2nd

stage the next day. This will minimize the treatment area requiring restricted access until the injection process is complete.

Injection of the biological products will be accomplished using a mobile BioBox (Model 10-M). The biological enhancements and BioBox will be supplied by ETEC. Water and electricity for the EEB implementation will be provided by DPW. Assuming an injection volume of ten (10) gallons per well and a total of one hundred and fifty-three (153) injection points, 1,530 total gallons of biological enhancements will be required or five (5) tank volumes (@300 gallons per tank) for each stage. Assuming a product mixture of 5 gallons of EA and 2.5 gallons of MZC per tank for stage 1 and 5 gallons of A2 and 100 pounds of CBN per tank for stage 2, a total of 25 gallons of EA, 12.5 gallons of MZC, 25 gallons of A2, and 500 pounds of CBN will be required.

The injection procedure will be conducted as follows:

- Based on the established grid system from the March/April 2000 soil sampling and the selected boring locations, the planned injection points will be marked on the ground/pavement.
- Required contacts for utility clearances will be made and performed. This information will be confirmed in the daily site logs.
- The Geoprobe® rig will be positioned at the proposed injection location and a concrete core will be used to clear the ground surface/asphalt for the Geoprobe®. The Geoprobe® will then be advanced to the selected application depth.
- Once the probe is inserted to the desired depth and the injection stinger is installed, the BioBox injection hose will be connected to the Geoprobe® assembly using an adapted union.
- Procedures for preparing, mixing, and delivering the biological enhancement products are provided in Table 4-1. Note: Use of high pressure (>40 psi) pumps will ruin the biological products; therefore, the biological enhancement products will be injected using ONLY the pump on the BioBox unit.
- After both stages of enhancement injection have occurred, each Geoprobe® borehole will be abandoned by filling with sand.

During performance of the injection program, an observation of increasing injection pressures and decreasing flow rates should indicate an impermeable boundary. Should this situation be observed, a decision will be made regarding relocation of the proposed injection point.

4.3 Post-Injection Soil Sampling

The objective of post-injection soil sampling is to attempt to determine the extent of biodegradation of contaminants within the treatment zone. Based on NJDEP Technical Requirements for Site Remediation, for in-situ remediation of soils, the minimum post-

remediation sampling frequency is one sample per 900 square foot. Additionally, in accordance with the Technical Requirements, the sample locations are to be biased towards areas that previously exhibited highest contamination.

Post-injection soil sampling will be performed directly adjacent to the seventeen (17) boring locations established as the proposed zones of Geoprobe® enzyme injection (Boring Nos. 1, 2, 3, 5, 7, 8, 9, 11, 13, 14, 15, 19, 20, 21, 46, 47, and 48). The initial boring locations were surveyed using GPS; this should allow the post-injection sampling to be performed directly adjacent to the initial sampling locations. The post-injection soil sampling will be performed 180-days following the completion of the injection program. The soil samples will be collected at alternating 6-inch intervals from ground surface to a depth of 6 ft. at each location for a total of six (6) samples per boring (i.e., 6-12 inches, 18-24 inches, 30-36 inches, 42-48 inches, 54-60 inches, and 66-72 inches). The post injection soil sampling has been proposed to a depth of six (6) ft. to evaluate the direct impact of EEB on the shallow subsurface soils (the primary focus of this effort). The samples will be collected using standard Fort Monmouth DPW Geoprobe® sampling procedures and analyzed for VOCs + 10, TPHC, and percent solids.

4.4 Technical Evaluation and Summary Report

A Technical Evaluation and Summary (TES) Report will be prepared following performance of the post-injection soil sampling and receipt of analytical data. The TES Report will include the analytical data collected prior to the implementation of the EEB program at the site. This data delineates the vertical and horizontal extent of soil contamination. The results of the confirmation sampling will then be presented, and comparisons will be established regarding estimated contaminant reductions.

5.0 PROJECT ORGANIZATION

The Contracting Officer's Representative (COR) for this project is Mr. Kevin Dooney, Chief, Engineering Plans & Services Div., DPW, Fort Monmouth, NJ. The DPW Environmental Coordinator is Mr. Joseph Fallon, CHMM, Fort Monmouth, NJ.

6.0 QUALITY ASSURANCE PROJECT PLAN

Field sampling activities will be conducted in accordance with the NJDEP Field Sampling Manual. All analyses will be conducted in accordance with the NJ Laboratory Certification Program by the Fort Monmouth Environmental Testing Laboratory (NJDEP Certification #13461). A separate Quality Assurance Project Plan will not be submitted for the planned EEB implementation.

7.0 SOIL AND SEDIMENT EROSION

As described within this document, the application of biological enhancements will be accomplished using a Geoprobe® following initial installation of the planned SVE system extraction laterals and extraction and sparge wells. Required soil and sediment erosion control and dust and odor control measures will be implemented as part of the planned remedial (SVE) system upgrade. A soil and sediment erosion control and monitoring plan, and a dust and odor control and monitoring plan (N.J.A.C. 7:26E-6.2(a)10) are not applicable to the proposed site efforts presented within this document.

8.0 SITE SPECIFIC HEALTH AND SAFETY PLAN

A Site Specific Health and Safety Plan, as required by N.J.A.C. 7:26E-6.2(a)(11), will be prepared by the selected EEB implementation contractor to address the planned site activities presented within this document.

9.0 REQUIRED PERMITS

The RAWA (GES, 1999) addresses permits regarding implementation of the proposed remedial system upgrade.

As provided in N.J.A.C. 7:14A-7.5 (Authorization of Discharges to Ground Water By Permit-By-Rule), Subsection (b), any person responsible for discharges to ground water listed in 3i through v are deemed to have a permit-by-rule if the discharge occurs when: 1) NJDEP is remediating a contaminated site as defined in N.J.A.C. 7:26C-1.3, pursuant to the rules at N.J.A.C. 7:14B implementing the Underground Storage of Hazardous Substances Act (N.J.S.A 13:1K-6 *et seq*.), or when the owner or operator of a contaminated site is conducting remediation under NJDEP oversight, or the requirements of the Spill Compensation and Control Act (N.J.S.A. 58:10-23.11), or the Procedures for Department Oversight of the Remediation of Contaminated Sites at N.J.A.C. 7:26C; and 2) the person is in receipt of written approval from NJDEP.

The ground water discharges authorized by permit-by-rule under Subsection (b) include: (iv). Discharges to ground water not to exceed 90 calendar days from any other facility or equipment associated with monitoring, engineering, remedial activities, or design studies necessary to evaluate a contaminated site.

By submittal of this SA to the RAW, Fort Monmouth is requesting written approval for Permit-by-Rule for the proposed EEB implementation and discharge to ground water.

10.0 EFFECTIVENESS ANALYSIS AND CERTIFICATION

As stated in the RAWA (GES, 1999), different remedial approaches had been examined and evaluated, and based upon the technical and site-specific criteria presented in the RAWA and the historical data contained therein, a remedial action encompassing a pump and treat/soil vapor extraction/air-sparging system to remediate soil and groundwater at the site was selected. It was stated at that time that the selection and implementation of this remedial action would be effective and protective of the public health, safety, and the environment as outlined in Section 35(g) of P.L. 1993, c.139 (S-1070) of the Industrial Site Recovery Act.

The intention of the planned implementation of EEB encompassed within this SA to the RAW is to attempt to directly impact identified "hot spots" and remediate contaminated low-permeability soils in the upper soil horizon that might not be effectively addressed by the proposed SVE system, thereby supplementing and enhancing the performance of the selected remedial action.

11.0 IMPLEMENTATION SCHEDULE

DPW has awarded a contract to Versar to implement EEB at the Main Post Gas Station as presented within this SA to the RAW. The implementation schedule will be as follows:

- Preparation of required plans (e.g., Site Specific Health and Safety Plan) – 14 days.
- Procurement and delivery to the site of the BioBox and biological enhancement products – 30 days.
- Site mobilization/utility clearances – 3 days.
- Performance of EEB injection program – 19 days.
- Demobilization – 2 days.
- Post-injection soil sampling – 1 week (to be initiated 180 days following completion of the injection program).
- Submittal of Technical Evaluation and Summary Report – following receipt of analytical data from post-injection soil sampling.

12.0 SITE RESTORATION PLAN AND REMEDIAL SYSTEM DISMANTLING PLAN

As stated in the RAWA (GES, 1999), upon receipt of No Further Action declaration from the NJDEP regarding the remediated soils, DPW will contract to dismantle and remove the aboveground portions of the SVE system. The below ground sections of the SVE systems will be sealed and abandoned in-place following generally accepted procedures. Further, once the groundwater quality has attenuated to concentrations below the applicable NJDEP Ground Water Quality Standards (GWQS) and a No Further Action statement is provided by the NJDEP, DPW will implement proper well abandonment procedures as part of the site restoration plan. All monitoring wells and

vacuum monitoring points on-site and off-site will be properly abandoned by a New Jersey-licensed well driller. The wells will be sealed via a tremie pipe with a grout/cement mixture, the concrete flush mount pads will be removed, and the former well locations will be restored to near pre-construction conditions.

The planned EEB implementation addressed within this document will be performed utilizing mobile/trailer mounted equipment and a Geoprobe® to bore directly through the asphalt/ground surfaces. There are no structures or facilities that will require site restoration or dismantling.

13.0 ESTIMATED COSTS

A cost comparison for the proposed remedial system upgrade was previously presented in the RAWA (GES, 1999). As previously discussed, the intention of the planned EEB implementation encompassed within this 2nd Addendum to the RAW is to attempt to directly impact identified "hot spots" and remediate low-permeability, contaminated soils in the upper soil horizon that might not be effectively addressed by the proposed SVE system, thereby supplementing and enhancing the performance of the selected remedial action.

The estimated order of magnitude costs for implementation of the proposed EEB at Building 699 are provided below. The primary assumptions utilized in estimating the order of magnitude costs are as follows:

- Enzyme injection will be performed utilizing a truck mounted Geoprobe®. There are no proposed capital costs associated with the planned remedial action. The treatment system will be dismantled and removed from the site following completion of the injection program.
- All work will be performed under Level D Personnel Safety Protection. No site air monitoring will be performed.
- The injection points will be established on 5-foot centers from each of the seventeen (17) selected boring locations for a total of nine (9) injection points per location or one hundred fifty-three (153) total injections.
- Injection of the biological products will be continuous from ground surface to three to four ft. in depth. A production rate of twenty (20) injection points per day has been assumed. Based on this rate, the 1st stage of biological enhancements will be injected at two (2) boring locations during one day (9 injections per location) followed by the 2nd stage the next day.
- Performance samples will be analyzed in accordance with the NJ Laboratory Certification Program by the Fort Monmouth Environmental Testing Laboratory (NJDEP Certification #13461).

Estimated Order of Magnitude Costs
Proposed Enzyme-Enhanced Bioremediation
Building 699

TASK	ESTIMATED COSTS
1. Plan Preparation	$ 3,900
2. Site Mobilization	$ 2,700
3. Geoprobe® Injection/EEB Treatment	$ 84,600
4. Demobilization	$ 3,700
5. Report Preparation	$ 20,100
TOTAL ESTIMATED COSTS	$115,000

14.0 REFERENCES

DPW, 2000. Fort Monmouth Environmental Testing Laboratory, Analytical Data Reports (Project: 100004), March and April 2000, Volumes 1 - 5.

GES, 1999. Groundwater & Environmental Services, Inc., *Remedial Action Work Plan Addendum, Bldg. 699 Main Post Area, Fort Monmouth, NJ,* June 10, 1999.

Krydon, 1993. The Krydon Group, Inc. *Remedial Action Workplan*, Fort Monmouth Military Installation Service Station, Fort Monmouth, New Jersey. October 1993.

Table 3-1

Main Post Gas Station – Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling – March/April 2000

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5224.02	1	6-12"	3/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5224.03	1	18-24"	3/6/2000	ND	ND	ND	0.66	ND	0.31J	0.66J	ND	ND	0.49	ND	ND	ND
5224.04	1	30-36"	3/6/2000	ND	ND	ND	**9.4**	ND	40	262	ND	ND	120	ND	219.61	ND
5224.05	1	42-48"	3/6/2000	ND	ND	ND	**7.4**	ND	54	360	ND	ND	140	ND	**1130.84**	ND
5224.06	1	54-60"	3/6/2000	ND	ND	ND	**18**	ND	100	**680**	ND	ND	300	ND	ND	ND
5224.07	1	66-72"	3/6/2000	ND	ND	ND	**11**	ND	55	360	ND	ND	170	ND	774.46	ND
5224.08	1	78-84"	3/6/2000	ND	ND	ND	**8.2**	ND	27	222	ND	ND	130	ND	220.4	ND
5224.09	1	90-96"	3/6/2000	ND	ND	ND	**2.2**	ND	9.3	62	ND	ND	43	ND	487.16	26.07
5224.10	1	102-108"	3/6/2000	ND	ND	ND	ND	ND	0.59	3.65	ND	ND	1.9	ND	ND	ND
5224.11	1	114-120"	3/6/2000	ND	ND	ND	ND	ND	ND	0.65J	ND	ND	0.38	ND	ND	ND
5224.12	1	126-132"	3/6/2000	ND	ND	ND	ND	ND	ND	0.56J	ND	ND	ND	ND	ND	ND
5224.13	1	138-144"	3/6/2000	ND	ND	ND	0.38	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.02	2	6-12"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	796.58	ND
5226.03	2	18-24"	3/7/2000	ND	ND	ND	1.1	ND	ND	0.36J	ND	ND	0.57	ND	768.3	ND
5226.04	2	30-36"	3/7/2000	ND	ND	ND	**3.4**	ND	0.32J	1.76	ND	ND	3.7	ND	470.36	ND
5226.05	2	42-48"	3/7/2000	ND	ND	ND	**9.4**	ND	31	198	ND	ND	100	ND	900.61	ND
5226.06	2	54-60"	3/7/2000	ND	ND	ND	**49**	ND	77	**460**	ND	ND	280	ND	201.37	ND
5226.07	2	66-72"	3/7/2000	ND	ND	ND	**54**	ND	58	348	ND	ND	240	ND	442.46	23.67
5226.08	2	78-84"	3/7/2000	ND	ND	ND	**63**	ND	60	360	ND	ND	250	ND	397.58	ND
5226.09	2	90-96"	3/7/2000	ND	ND	ND	**15**	ND	6.8	41	ND	ND	36	ND	958.87	ND
5226.10	2	102-108"	3/7/2000	ND	ND	ND	**46**	ND	52	329	ND	ND	220	ND	406.31	ND
5226.11	2	114-120"	3/7/2000	ND	6.3	ND	**15**	ND	6.8	40	ND	ND	33	ND	377.54	ND
5226.12	2	126-132"	3/7/2000	ND	ND	ND	**4.2**	ND	1.5	8.7	ND	ND	6.3	ND	196.28	ND
5226.13	2	138-144"	3/7/2000	ND	ND	ND	1.1	ND	0.3J	1.47	ND	ND	0.89	ND	ND	ND
5226.14	3	6-12"	3/7/2000	ND	ND	ND	ND	ND	ND	0.35J	ND	ND	ND	ND	338.13	ND
5226.15	3	18-24"	3/7/2000	ND	ND	ND	ND	ND	ND	3.8J	ND	ND	ND	ND	ND	ND
5226.16	3	30-36"	3/7/2000	ND	ND	ND	ND	ND	14	89	ND	ND	25	ND	200.23	ND
5226.17	3	42-48"	3/7/2000	ND	ND	ND	**60**	ND	190	**1610**	ND	ND	690	ND	855.41	ND
5226.18	3	54-60"	3/7/2000	ND	ND	ND	**220**	ND	630	**3890E**	ND	ND	**1900E**	ND	**1015.74**	ND
5226.19	3	66-72"	3/7/2000	ND	ND	ND	**43**	ND	76	**410**	ND	ND	260	ND	**1831.21**	ND
5226.20	3	78-84"	3/7/2000	ND	ND	ND	**25**	ND	57	285	ND	ND	120	ND	368.74	ND
5226.21	3	90-96"	3/7/2000	ND	ND	ND	**3.3**	ND	ND	5.4J	ND	ND	3.9	ND	ND	ND
5226.22	3	102-108"	3/7/2000	ND	ND	ND	**18**	ND	33	184	ND	ND	90	ND	346.18	ND
5226.23	3	114-120"	3/7/2000	ND	ND	ND	**11**	ND	16	76	ND	ND	35	ND	ND	ND
5226.24	3	126-132"	3/7/2000	ND	ND	ND	**6.5**	ND	4.5J	21	ND	ND	9.9	ND	ND	ND
5226.25	3	138-144"	3/7/2000	ND	ND	ND	**3.7**	ND	ND	3.4J	ND	ND	ND	ND	ND	ND
5273.14	4	126-132"	########	ND	ND	ND	0.51	ND	0.71	0.38J	ND	ND	ND	ND	ND	ND
5273.15	4	138-144"	########	ND	ND	ND	0.51	ND	0.70J	0.80J	ND	ND	0.44	ND	ND	ND
5226.26	5	6-12"	3/7/2000	ND	ND	ND	ND	ND	ND	6.2J	ND	ND	ND	ND	352.43	10.84
5226.27	5	18-24"	3/7/2000	ND	ND	ND	ND	ND	32	202	ND	ND	13	ND	247.73	ND

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Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5226.28	5	30-36"	3/7/2000	ND	ND	ND	ND	ND	110	**730**	ND	ND	53	ND	**1365.7**	ND
5226.29	5	42-48"	3/7/2000	ND	ND	ND	ND	ND	190	**1030**	ND	ND	100	ND	**4529.63**	ND
5226.30	5	54-60"	3/7/2000	ND	ND	ND	ND	ND	39	257	ND	ND	22	ND	**1313.65**	5.83
5226.31	5	66-72"	3/7/2000	ND	ND	ND	ND	ND	38	243	ND	ND	23	ND	851.72	ND
5226.32	5	78-84"	3/7/2000	ND	ND	ND	ND	ND	150	**880E**	ND	ND	130	ND	**1198.13**	ND
5226.33	5	90-96"	3/7/2000	ND	ND	ND	ND	ND	15	67	ND	ND	7.2	ND	**1579.41**	45.04
5226.34	5	102-108"	3/7/2000	ND	ND	ND	ND	ND	38	230	ND	ND	30	ND	478.02	ND
5226.35	5	114-120"	3/7/2000	ND	ND	ND	ND	ND	25	150	ND	ND	20	ND	304.58	ND
5226.36	5	126-132"	3/7/2000	ND	ND	ND	ND	ND	16	97	ND	ND	16	ND	998.52	7.74
5226.37	5	138-144"	3/7/2000	ND	ND	ND	ND	ND	0.45J	2.06J	ND	ND	ND	ND	ND	ND
5226.38	6	6-12"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.39	6	18-24"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.40	6	30-36"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.41	6	42-48"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.42	6	54-60"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.43	6	66-72"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	44.17
5226.44	6	78-84"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.45	6	90-96"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.46	6	102-108"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.47	6	114-120"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.48	6	126-132"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.49	6	138-144"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5229.02	7	6-12"	3/8/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5229.03	7	18-24"	3/8/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	186.87	ND
5229.04	7	30-36"	3/8/2000	ND	ND	ND	**39**	ND	170	**850**	ND	ND	350	ND	**1450.01**	ND
5229.05	7	42-48"	3/8/2000	ND	ND	ND	**14**	ND	62	380	ND	ND	180	ND	681.84	ND
5229.06	7	54-60"	3/8/2000	ND	ND	ND	**20**	ND	120	**690**	ND	ND	270	ND	926.66	ND
5229.07	7	66-72"	3/8/2000	ND	ND	ND	**3**	ND	26	155	ND	ND	60	ND	425.04	ND
5229.08	7	78-84"	3/8/2000	ND	ND	ND	**6.5**	ND	76	**460**	ND	ND	170	ND	831.09	ND
5229.09	7	90-96"	3/8/2000	ND	ND	ND	**12**	ND	150	**820**	ND	ND	340	ND	458.12	ND
5229.10	7	102-108"	3/8/2000	ND	ND	ND	ND	ND	24	140	ND	ND	63	ND	681.67	ND
5229.11	7	114-120"	3/8/2000	ND	ND	ND	**11**	ND	140	**700**	ND	ND	260	ND	524	ND
5229.12	7	126-132"	3/8/2000	ND	ND	ND	**23**	ND	190	**1190**	ND	ND	510	ND	**3491.92**	ND
5229.13	7	138-144"	3/8/2000	ND	ND	ND	**15**	ND	39	208	ND	ND	130	ND	231.42	ND
5229.14	8	6-12"	3/8/2000	ND	ND	ND	**5.9**	ND	6.2	323	ND	ND	22	ND	ND	ND
5229.15	8	18-24"	3/8/2000	ND	ND	ND	**14**	ND	23	127	ND	ND	71	ND	211.46	ND
5229.16	8	30-36"	3/8/2000	ND	ND	ND	**35**	ND	63	360	ND	ND	190	ND	811.78	ND
5229.17	8	42-48"	3/8/2000	ND	ND	ND	**34**	ND	76	**450**	ND	ND	240	ND	300.29	ND
5229.18	8	54-60"	3/8/2000	ND	ND	ND	**110**	ND	180	**750**	ND	ND	450	ND	326.53	ND
5229.19	8	66-72"	3/8/2000	ND	ND	ND	**230**	ND	290	**1670**	ND	ND	740	ND	220.54	21.57
5229.20	8	78-84"	3/8/2000	ND	ND	ND	**54**	ND	65	350	ND	ND	250	ND	261.15	ND
5229.21	8	90-96"	3/8/2000	ND	ND	ND	**17**	ND	20	**1100**	ND	ND	69	ND	ND	ND

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(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5229.22	8	102-108"	3/8/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	210.8	ND
5229.23	8	114-120"	3/8/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5229.24	8	126-132"	3/8/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5229.25	8	138-144"	3/8/2000	ND	ND	ND	ND	ND	ND	19J	ND	ND	17	ND	ND	ND
5229.26	9	6-12"	3/8/2000	ND	ND	ND	ND	ND	ND	8.8J	ND	ND	ND	ND	ND	ND
5229.27	9	18-24"	3/8/2000	ND	ND	ND	ND	ND	ND	13J	ND	ND	ND	ND	ND	19.2
5229.28	9	30-36"	3/8/2000	ND	ND	ND	ND	ND	ND	10J	ND	ND	ND	ND	ND	ND
5229.29	9	42-48"	3/8/2000	ND	ND	ND	ND	ND	16	85	ND	ND	23	ND	ND	ND
5229.30	9	54-60"	3/8/2000	ND	ND	ND	**14**	ND	57	302	ND	ND	120	ND	541.33	ND
5229.31	9	66-72"	3/8/2000	ND	ND	ND	**6.1**	ND	13	72	ND	ND	36	ND	ND	ND
5229.32	9	78-84"	3/8/2000	ND	ND	ND	**12**	ND	22	119	ND	ND	72	ND	277.05	ND
5229.33	9	90-96"	3/8/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.9	ND	427.88	ND
5229.34	9	102-108"	3/8/2000	ND	ND	ND	**15**	ND	34	180	ND	ND	97	ND	275.38	ND
5229.35	9	114-120"	3/8/2000	ND	ND	ND	**21**	ND	49	263	ND	ND	140	ND	315.07	ND
5229.36	9	126-132"	3/8/2000	ND	ND	ND	**12**	ND	19	98	ND	ND	58	ND	202.57	ND
5229.37	9	138-144"	3/8/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.16	10	126-132"	########	ND	ND	ND	0.78	ND	0.43J	ND	ND	ND	ND	ND	ND	ND
5273.17	10	138-144"	########	ND	N	ND	**6.9**	ND	28	132	ND	ND	37	ND	ND	ND
5229.38	11	6-12"	3/8/2000	ND	ND	ND	ND	ND	ND	16J	ND	ND	ND	ND	ND	ND
5229.39	11	18-24"	3/8/2000	ND	ND	ND	ND	ND	7.5J	47	ND	ND	ND	ND	172.83	ND
5229.40	11	30-36"	3/8/2000	ND	ND	ND	**7.6**	ND	160	**920**	ND	ND	95	ND	416.92	ND
5229.41	11	42-48"	3/8/2000	ND	ND	ND	**7.8**	ND	140	**810**	ND	ND	110	ND	**5067.13**	ND
5229.42	11	54-60"	3/8/2000	ND	ND	ND	**9.9**	ND	160	**900**	ND	ND	140	ND	**1172.8**	ND
5229.43	11	66-72"	3/8/2000	ND	ND	ND	ND	ND	20	116	ND	ND	17	ND	888.29	ND
5229.44	11	78-84"	3/8/2000	ND	ND	ND	ND	ND	45	267	ND	ND	33	ND	551.99	46.95
5229.45	11	90-96"	3/8/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	273.56	ND
5229.46	11	102-108"	3/8/2000	ND	ND	ND	ND	ND	70	400	ND	ND	46	ND	**2559.03**	ND
5229.47	11	114-120"	3/8/2000	ND	ND	ND	ND	ND	58	330	ND	ND	37	ND	**1582.73**	ND
5229.48	11	126-132"	3/8/2000	ND	ND	ND	ND	ND	6.8J	329	ND	ND	ND	ND	587.82	ND
5229.49	11	138-144"	3/8/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1042.52**	ND
5231.02	12	6-12"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	252.54	40.7
5231.03	12	18-24"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	226.77	ND
5231.04	12	30-36"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	185.58	ND
5231.05	12	42-48"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5231.06	12	54-60"	3/9/2000	ND	ND	ND	ND	ND	0.66	3.7	2.2	ND	2.1	ND	ND	ND
5231.07	12	66-72"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	2.1	ND	ND	ND	ND	ND
5231.08	12	78-84"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	2.1	ND	ND	ND	ND	ND
5231.09	12	90-96"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	2.2	ND	ND	ND	ND	ND
5231.10	12	102-108"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	2	ND	ND	ND	301.05	ND
5231.11	12	114-120"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	2.1	ND	ND	ND	ND	ND
5231.12	12	126-132"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	2.3	ND	ND	ND	ND	29.01
5231.13	12	138-144"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	2.1	ND	ND	ND	ND	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5231.14	13	6-12"	3/9/2000	ND	ND	ND	**5.2**	ND	5.7	24	17	ND	ND	ND	177.25	ND
5231.15	13	18-24"	3/9/2000	ND	ND	ND	**6.5**	ND	6.1J	35	22	ND	15	ND	187.7	ND
5231.16	13	30-36"	3/9/2000	ND	ND	ND	**77**	ND	150	**880**	ND	ND	**1100**	ND	**1665.7**	ND
5231.17	13	42-48"	3/9/2000	ND	ND	ND	**35**	ND	79	**470**	**64**	ND	260	ND	**1071.17**	ND
5231.18	13	54-60"	3/9/2000	ND	ND	ND	**64**	ND	130	**780**	ND	ND	400	ND	212.62	ND
5231.19	13	66-72"	3/9/2000	ND	ND	ND	**44**	ND	92	**540**	ND	ND	310	ND	**1985.29**	ND
5231.20	13	78-84"	3/9/2000	ND	ND	ND	**24**	ND	50	294	**53**	ND	170	ND	534.7	ND
5231.21	13	90-96"	3/9/2000	ND	ND	ND	**11**	ND	17	96	31	ND	66	ND	212.69	ND
5231.22	13	102-108"	3/9/2000	ND	ND	ND	**47**	ND	100	**580**	33	ND	300	ND	**1866.05**	ND
5231.23	13	114-120"	3/9/2000	ND	ND	ND	**54**	ND	130	**750**	36	ND	420	ND	720.01	ND
5231.24	13	126-132"	3/9/2000	ND	ND	ND	**15**	ND	30	167	ND	ND	110	ND	486.18	ND
5231.25	13	138-144"	3/9/2000	ND	ND	ND	**10**	ND	20	114	18	ND	74	ND	275.15	ND
5231.26	14	6-12"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	406.24	ND
5231.27	14	18-24"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5231.28	14	30-36"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	676.44	ND
5231.29	14	42-48"	3/9/2000	ND	ND	ND	**13**	ND	240	**1390**	ND	ND	270	ND	**3490.44**	ND
5231.30	14	54-60"	3/9/2000	ND	ND	ND	ND	ND	140	**860**	ND	ND	140	ND	**1221.51**	51.07
5231.31	14	66-72"	3/9/2000	ND	ND	ND	**7.5**	ND	100	**610**	ND	ND	110	ND	**1049.82**	ND
5231.32	14	78-84"	3/9/2000	ND	ND	ND	**12**	ND	52	289	ND	ND	150	ND	331.42	ND
5231.33	14	90-96"	3/9/2000	ND	ND	ND	**7.6**	ND	7.4J	38	ND	ND	26	ND	208.12	ND
5231.34	14	102-108"	3/9/2000	ND	ND	ND	**11**	ND	200	**1170**	ND	ND	220	ND	**1033.86**	ND
5231.35	14	114-120"	3/9/2000	ND	ND	ND	**9.5**	ND	81	**480**	ND	ND	150	ND	523.68	ND
5231.36	14	126-132"	3/9/2000	ND	ND	ND	**13**	ND	9J	47	ND	ND	19	ND	ND	ND
5231.37	14	138-144"	3/9/2000	ND	ND	ND	**11**	ND	8.4J	40	ND	ND	13	ND	ND	ND
5231.38	15	6-12"	3/9/2000	ND	ND	ND	ND	ND	ND	16J	ND	ND	ND	ND	ND	ND
5231.39	15	18-24"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5231.40	15	30-36"	3/9/2000	ND	ND	ND	**14**	ND	130	**680**	ND	ND	200	ND	521.7	ND
5231.41	15	42-48"	3/9/2000	ND	ND	ND	**17**	ND	160	**840**	ND	ND	280	ND	571.38	ND
5231.42	15	54-60"	3/9/2000	ND	ND	ND	**84**	ND	690	**3590E**	ND	ND	**1300E**	ND	**6957.69**	ND
5231.43	15	66-72"	3/9/2000	ND	ND	ND	ND	ND	ND	16J	ND	ND	12	ND	**2750.01**	ND
5231.44	15	78-84"	3/9/2000	ND	ND	ND	**34**	ND	270	**1390**	ND	ND	560	ND	948.41	ND
5231.45	15	90-96"	3/9/2000	ND	ND	ND	**16**	ND	120	**620**	ND	ND	260	ND	325.81	ND
5231.46	15	102-108"	3/9/2000	ND	ND	ND	**9.5**	ND	70	355	ND	ND	140	ND	920.02	ND
5231.47	15	114-120"	3/9/2000	ND	ND	ND	**14**	ND	110	**550**	ND	ND	230	ND	**1268.96**	ND
5231.48	15	126-132"	3/9/2000	ND	ND	ND	ND	ND	15	72	ND	ND	33	ND	728.83	ND
5231.49	15	138-144"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.7	ND	ND	ND
5242.02	16	6-12"	#######	ND	ND	ND	1.5	ND	0.96	1.5	ND	ND	0.37	ND	ND	35.44
5242.03	16	18-24"	#######	ND	ND	ND	0.35	ND	0.75	0.67J	ND	ND	ND	ND	ND	ND
5242.04	16	30-36"	#######	0.95J	ND	ND	1.1	ND	4.5	8.72	ND	ND	ND	ND	ND	ND
5242.05	16	42-48"	#######	ND	ND	ND	ND	ND	50	210	ND	ND	12	ND	567.23	ND
5242.06	16	54-60"	#######	ND	ND	ND	**9.2**	ND	66	339	ND	ND	98	ND	ND	ND
5242.07	16	66-72"	#######	ND	ND	ND	**51**	ND	440	**2300**	ND	ND	700	ND	**1976.95**	ND
5242.08	16	78-84"	#######	ND	ND	ND	**18**	ND	140	**690**	ND	ND	250	ND	526.44	ND
5242.09	16	90-96"	#######	ND	ND	ND	**61**	ND	200	**1020**	ND	ND	570	ND	260.08	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5242.10	16	102-108"	#######	ND	ND	ND	**43**	ND	160	**840**	ND	ND	440	ND	589.45	ND
5242.11	16	114-120"	#######	ND	ND	ND	**110**	ND	360	**1640**	ND	ND	940	ND	**7072.04**	ND
5242.12	16	126-132"	#######	ND	ND	ND	**8.9**	ND	13	63	**170**	ND	40	ND	ND	23.05
5242.13	16	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	43	ND	ND	ND	ND	ND
5273.18	17	126-132"	#######	ND	ND	ND	ND	ND	0.44J	1.89	ND	ND	0.48	ND	ND	ND
5273.19	17	138-144"	#######	ND	ND	ND	1	ND	0.48J	2.71	ND	ND	0.42	ND	ND	ND
5242.14	18	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	9.7	ND	ND	ND	ND	ND
5242.15	18	18-24"	#######	ND	ND	ND	**4.4**	ND	14	70	ND	ND	40	ND	ND	ND
5242.16	18	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	5.8J	ND	ND	ND	ND	ND
5242.17	18	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5242.18	18	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5242.19	18	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5242.20	18	78-84"	#######	ND	ND	ND	ND	ND	21	6.7J	ND	ND	ND	ND	ND	ND
5242.21	18	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5242.22	18	102-108"	#######	ND	ND	ND	ND	ND	7.4	14	ND	ND	ND	ND	260.48	ND
5242.23	18	114-120"	#######	ND	ND	ND	ND	ND	17	64.8	ND	ND	ND	ND	353.2	ND
5242.24	18	126-132"	#######	ND	ND	ND	ND	ND	ND	6.6J	ND	ND	ND	ND	ND	ND
5242.25	18	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5242.26	19	6-12"	#######	ND	ND	ND	ND	ND	3.2J	5J	ND	ND	ND	ND	409.34	ND
5242.27	19	18-24"	#######	ND	ND	ND	ND	ND	5.9	27.4	ND	ND	9	ND	**1493.74**	ND
5242.28	19	30-36"	#######	ND	ND	ND	**19**	ND	130	**670**	ND	ND	190	ND	**1267.86**	ND
5242.29	19	42-48"	#######	ND	ND	ND	**16**	ND	120	**600**	ND	ND	190	ND	**2888.57**	ND
5242.30	19	54-60"	#######	ND	ND	ND	**30**	ND	170	**850**	ND	ND	310	ND	**3891.82**	ND
5242.31	19	66-72"	#######	ND	ND	ND	**16**	ND	77	400	ND	ND	170	ND	**1406.05**	ND
5242.32	19	78-84"	#######	ND	ND	ND	**38**	ND	140	**730**	ND	ND	330	ND	**1126.25**	ND
5242.33	19	90-96"	#######	ND	ND	ND	ND	ND	16	80	ND	ND	39	ND	286.26	ND
5242.34	19	102-108"	#######	ND	ND	ND	**13**	ND	42	207	ND	ND	100	ND	719.8	ND
5242.35	19	114-120"	#######	ND	ND	ND	**25**	ND	91	**460**	ND	ND	220	ND	375.77	ND
5242.36	19	126-132"	#######	ND	ND	ND	**13**	ND	43	208	ND	ND	100	ND	**1928.76**	ND
5242.37	19	138-144"	#######	ND	ND	ND	ND	ND	6.7J	32.9J	ND	ND	17	ND	194.82	ND
5245.02	20	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	533.26	44.85
5245.03	20	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	454.19	6.07
5245.04	20	30-36"	#######	ND	ND	ND	**26**	ND	98	**490**	ND	ND	180	ND	554.5	ND
5245.05	20	42-48"	#######	ND	ND	ND	**55**	ND	210	**1060**	ND	ND	410	ND	**1072.54**	ND
5245.06	20	54-60"	#######	ND	ND	ND	**41**	ND	160	**800**	ND	ND	320	ND	375.36	ND
5245.07	20	66-72"	#######	ND	ND	ND	**21**	ND	66	340	ND	ND	160	ND	**1108.07**	6.33
5245.08	20	78-84"	#######	ND	ND	ND	**46**	ND	150	**750**	ND	ND	370	ND	246.72	ND
5245.09	20	90-96"	#######	ND	ND	ND	**44**	ND	150	**730**	ND	ND	340	ND	915.19	7.26
5245.10	20	102-108"	#######	ND	ND	ND	**81**	ND	280	**1370**	ND	ND	830	ND	507.13	ND
5245.11	20	114-120"	#######	ND	ND	ND	**58**	ND	200	**960**	ND	ND	460	ND	739.83	ND
5245.12	20	126-132"	#######	ND	ND	ND	**140**	ND	500	**2480**	ND	ND	**1200**	ND	389.79	14.36

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5245.13	20	138-144"	#######	ND	ND	ND	ND	ND	ND	16J	ND	ND	11	ND	318.05	ND
5245.14	21	6-12"	#######	ND	ND	ND	ND	ND	ND	16J	ND	ND	ND	ND	198.63	ND
5245.15	21	18-24"	#######	ND	ND	ND	ND	ND	44	204	ND	ND	34	ND	258.28	ND
5245.16	21	30-36"	#######	ND	ND	ND	**22**	ND	310	**1420**	ND	ND	300	ND	865.28	4.53
5245.17	21	42-48"	#######	ND	ND	ND	**25**	ND	380	**1970**	ND	ND	380	ND	**1535.72**	ND
5245.18	21	54-60"	#######	ND	ND	ND	**25**	ND	430	**1330**	ND	ND	410	ND	**3205.2**	ND
5245.19	21	66-72"	#######	ND	ND	ND	**100**	ND	**1100**	**5200E**	ND	ND	**1400E**	ND	**8739.63**	ND
5245.20	21	78-84"	#######	ND	ND	ND	**15**	ND	180	**880**	ND	ND	270	ND	694.14	ND
5245.21	21	90-96"	#######	ND	ND	ND	**6.3**	ND	75	364	ND	ND	130	ND	772.27	ND
5245.22	21	102-108"	#######	ND	ND	ND	**38**	ND	500	**2410**	ND	ND	760	ND	**1157.87**	ND
5245.23	21	114-120"	#######	ND	ND	ND	ND	ND	25	116	ND	ND	40	ND	517.59	ND
5245.24	21	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5245.25	21	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5245.26	22	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1208.85**	ND
5245.27	22	18-24"	#######	ND	ND	ND	ND	ND	7.7J	36.3	ND	ND	8.8	ND	**1062.68**	ND
5245.28	22	30-36"	#######	ND	ND	ND	**17**	ND	220	**1070**	ND	ND	340	ND	504.67	ND
5245.29	22	42-48"	#######	ND	ND	ND	ND	ND	56	271	ND	ND	71	ND	**1101.25**	ND
5245.30	22	54-60"	#######	ND	ND	ND	2.3J	ND	19	12J	ND	ND	ND	ND	**1865.73**	40.29
5245.31	22	66-72"	#######	ND	ND	ND	ND	ND	15	12J	ND	ND	ND	ND	580.06	ND
5245.32	22	78-84"	#######	ND	ND	ND	ND	ND	40	ND	ND	ND	ND	ND	300.22	ND
5245.33	22	90-96"	#######	ND	ND	ND	ND	ND	27	77	ND	ND	ND	ND	ND	ND
5245.34	22	102-108"	#######	ND	ND	ND	ND	ND	32	96	ND	ND	ND	ND	291.98	ND
5245.35	22	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5245.36	22	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5245.37	22	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.26	23	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.27	23	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	235.85	ND
5247.28	23	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	222.33	ND
5247.29	23	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	161.67	ND
5247.30	23	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	200.75	3.3
5247.31	23	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	187.12	ND
5247.32	23	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.33	23	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.34	23	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.35	23	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.36	23	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.37	23	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.02	24	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	339.68	41.49
5247.03	24	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	210.59	11.78
5247.04	24	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	406.65	ND
5247.05	24	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	231.83	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5247.06	24	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	193.94	ND
5247.07	24	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.08	24	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.09	24	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.10	24	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.11	24	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.12	24	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.13	24	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.14	24D	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1412.42**	60.37
5247.15	24D	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	463.52	ND
5247.16	24D	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	280.57	ND
5247.17	24D	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	214.09	ND
5247.18	24D	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.19	24D	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.20	24D	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.21	24D	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.22	24D	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.23	24D	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.24	24D	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.25	24D	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5254.02	25	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7753.57**	22.01
5254.03	25	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	993.5	65.78
5254.04	25	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	402.32	11.48
5254.05	25	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	493.55	ND
5254.06	25	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	493.45	ND
5254.07	25	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	365.52	ND
5254.08	25	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	259.27	ND
5254.09	25	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	207.83	ND
5254.10	25	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	197.43	ND
5254.11	25	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5254.12	25	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5254.13	25	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	264.75	ND
5254.14	26	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	720.78	6.53
5254.15	26	18-24"	#######	ND	ND	ND	ND	ND	0.37J	0.33J	ND	ND	ND	ND	503.89	ND
5254.16	26	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	319.88	ND
5254.17	26	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	224.72	ND
5254.18	26	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	599.97	ND
5254.19	26	66-72"	#######	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	332.88	ND
5254.20	26	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	239.75	ND
5254.21	26	90-96"	#######	ND	ND	ND	ND	ND	24	69.7	ND	ND	ND	ND	205.27	ND
5254.22	26	102-108"	#######	ND	ND	ND	ND	ND	1.3	3.86	ND	ND	ND	ND	253.99	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5254.23	26	114-120"	#######	ND	ND	ND	ND	ND	6.4	23.2	ND	ND	ND	ND	ND	ND
5254.24	26	126-132"	#######	ND	ND	ND	ND	ND	0.76J	1.8	ND	ND	ND	ND	ND	ND
5254.25	26	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5254.26	27	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	216.57	ND
5254.27	27	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	187.13	ND
5254.28	27	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5254.29	27	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5254.30	27	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	465.37	10.53
5254.31	27	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	236.25	ND
5254.32	27	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	177.04	ND
5254.33	27	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5254.34	27	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	294.68	ND
5254.35	27	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	181.65	ND
5254.36	27	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5254.37	27	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.02	28	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	622.11	302.84
5264.03	28	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	179.48	ND
5264.04	28	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.05	28	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.06	28	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	780.97	ND
5264.07	28	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	247.69	ND
5264.08	28	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	205.97	ND
5264.09	28	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	182.32	ND
5264.10	28	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	346.31	ND
5264.11	28	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	270.26	ND
5264.12	28	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	200.18	ND
5264.13	28	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.14	29	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	173.67	ND
5264.15	29	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.16	29	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.17	29	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.18	29	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	285.93	ND
5264.19	29	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	239.25	ND
5264.20	29	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.21	29	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.22	29	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	263.00	ND
5264.23	29	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	528.19	ND
5264.24	29	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	287.89	ND
5264.25	29	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	228.16	ND

Table 3-1

Main Post Gas Station - Bldg. 699

Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000

(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5264.26	30	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	241.09	ND
5264.27	30	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	188.07	ND
5264.28	30	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.29	30	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.30	30	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	531.98	ND
5264.31	30	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	226.39	ND
5264.32	30	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.33	30	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.34	30	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.35	30	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.36	30	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.37	30	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5270.26	31	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	53	ND	ND	ND	ND
5270.27	31	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	57	ND	ND	ND	ND
5270.28	31	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	66E	ND	ND	ND	ND
5270.29	31	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	68E	ND	ND	ND	ND
5270.30	31	54-60"	#######	1.5	ND	ND	ND	ND	ND	ND	4.4	ND	ND	ND	ND	11.15
5270.31	31	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	1.5	ND	ND	ND	ND	ND
5270.32	31	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND
5270.33	31	90-96"	#######	1.5	ND	ND	ND	ND	ND	ND	0.89	ND	ND	ND	ND	7.58
5270.34	31	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5270.35	31	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5270.36	31	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5270.37	31	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5270.02	32	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5270.03	32	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.06
5270.04	32	30-36"	#######	1.7	ND	ND	ND	ND	ND	ND	2.7	ND	ND	ND	ND	ND
5270.05	32	42-48"	#######	1.7	ND	ND	ND	ND	ND	ND	2.8	ND	ND	ND	ND	ND
5270.06	32	54-60"	#######	1.8	ND	ND	ND	ND	ND	ND	3.4	ND	ND	ND	213.98	ND
5270.07	32	66-72"	#######	1.8	ND	ND	ND	ND	ND	ND	3.7	ND	ND	ND	ND	ND
5270.08	32	78-84"	#######	1.6	ND	ND	ND	ND	ND	ND	4.6	ND	ND	ND	ND	ND
5270.09	32	90-96"	#######	1.4	ND	ND	ND	ND	ND	ND	5.1	ND	ND	ND	ND	ND
5270.10	32	102-108"	#######	1.8	ND	ND	ND	ND	ND	ND	7.3	ND	ND	ND	445.76	ND
5270.11	32	114-120"	#######	1.8	ND	ND	ND	ND	ND	ND	13	ND	ND	ND	271.05	16.32
5270.12	32	126-132"	#######	1.4	ND	ND	ND	ND	ND	ND	23	ND	ND	ND	197.34	ND
5270.13	32	138-144"	#######	1.7	ND	ND	ND	ND	ND	ND	**110E**	ND	ND	ND	ND	ND
5270.14	33	6-12"	#######	1.9	ND	ND	ND	ND	ND	ND	3.4	ND	ND	ND	ND	ND
5270.15	33	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	1.3	ND	ND	ND	208.92	ND
5270.16	33	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND	ND
5270.17	33	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	0.78	ND	ND	ND	197.12	ND
5270.18	33	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	1.4	ND	ND	ND	225.82	6.71
5270.19	33	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	0.88	ND	ND	ND	ND	15.37

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5270.20	33	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	1.9	35	ND	ND	ND	8.67
5270.21	33	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	0.75	36	ND	ND	ND	ND
5270.22	33	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	43	ND	ND	ND	4.95
5270.23	33	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	50	ND	ND	ND	4.97
5270.24	33	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	55	ND	ND	ND	6.7
5270.25	33	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	60	ND	ND	ND	ND
5273.02	34	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.03	34	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.95
5273.04	34	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.05	34	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.06	34	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.07	34	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.08	34	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.09	34	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.10	34	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.11	34	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.12	34	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.63
5273.13	34	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.02	35	6-12"	#######	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.03	35	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.04	35	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.05	35	42-48"	#######	1.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.06	35	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.07	35	66-72"	#######	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.08	35	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.09	35	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.10	35	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	252.4	ND
5279.11	35	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	199.67	ND
5279.12	35	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.13	35	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.14	36	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.15	36	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.16	36	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.17	36	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.18	36	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.19	36	66-72"	#######	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.20	36	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.21	36	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.22	36	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.23	36	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.24	36	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5279.25	36	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.26	37	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.27	37	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.28	37	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.29	37	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.30	37	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.31	37	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.32	37	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.33	37	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.34	37	102-108"	#######	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.35	37	114-120"	#######	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.36	37	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.37	37	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5290.02	38	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	209.79	
5290.03	38	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	251.95	
5290.04	38	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	216.78	
5290.05	38	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	213.69	Pb
5290.06	38	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	208.53	resample
5290.07	38	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	218.53	samples
5290.08	38	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	204.35	disposed
5290.09	38	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	of.
5290.10	38	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.11	38	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	193.08	
5290.12	38	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.13	38	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5393.01	38	6-12"	5/3/2000													ND
5393.02	38	18-24"	5/3/2000													20.1
5393.03	38	30-36"	5/3/2000													ND
5393.04	38	42-48"	5/3/2000													7.12
5393.05	38	54-60"	5/3/2000													ND
5393.06	38	66-72"	5/3/2000						Pb only							ND
5393.07	38	78-84"	5/3/2000													ND
5393.08	38	90-96"	5/3/2000													ND
5393.09	38	102-108"	5/3/2000													ND
5393.10	38	114-120"	5/3/2000													ND
5393.11	38	126-132"	5/3/2000													ND
5393.12	38	138-144"	5/3/2000													ND
5290.14	39	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.15	39	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.16	39	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.17	39	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5290.18	39	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Pb resample samples disposed of.
5290.19	39	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.20	39	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.21	39	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.22	39	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.23	39	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.24	39	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.25	39	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5393.13	39	6-12"	5/3/2000													ND
5393.14	39	18-24"	5/3/2000													ND
5393.15	39	30-36"	5/3/2000													ND
5393.16	39	42-48"	5/3/2000													ND
5393.17	39	54-60"	5/3/2000													ND
5393.18	39	66-72"	5/3/2000						Pb only							ND
5393.19	39	78-84"	5/3/2000													ND
5393.20	39	90-96"	5/3/2000													ND
5393.21	39	102-108"	5/3/2000													ND
5393.22	39	114-120"	5/3/2000													ND
5393.23	39	126-132"	5/3/2000													ND
5393.24	39	138-144"	5/3/2000													ND
5290.26	40	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Pb resample samples disposed of.
5290.27	40	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.28	40	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.29	40	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.30	40	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.31	40	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.32	40	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.33	40	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.34	40	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.35	40	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.36	40	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.37	40	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5393.25	40	6-12"	5/3/2000													ND
5393.26	40	18-24"	5/3/2000													ND
5393.27	40	30-36"	5/3/2000													ND
5393.28	40	42-48"	5/3/2000						Pb only							ND
5393.29	40	54-60"	5/3/2000													ND
5393.30	40	66-72"	5/3/2000													ND
5393.31	40	78-84"	5/3/2000													ND
5393.32	40	90-96"	5/3/2000													ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5393.33	40	102-108"	5/3/2000													ND
5393.34	40	114-120"	5/3/2000													ND
5393.35	40	126-132"	5/3/2000						Pb only							ND
5393.36	40	138-144"	5/3/2000													ND
5298.02	40D	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.03	40D	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.04	40D	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.05	40D	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.06	40D	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.07	40D	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.08	40D	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.09	40D	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.10	40D	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.11	40D	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.12	40D	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.13	40D	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.14	41	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.15	41	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.16	41	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.17	41	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.18	41	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.19	41	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.20	41	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.21	41	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.22	41	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.23	41	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.24	41	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.25	41	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.26	42	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.27	42	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.28	42	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.29	42	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.30	42	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.31	42	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.32	42	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.33	42	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.34	42	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.35	42	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.36	42	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.37	42	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 3-1

Main Post Gas Station - Bldg. 699

Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000

(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5300.02	43	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.03	43	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.04	43	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.05	43	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.06	43	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.07	43	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.08	43	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.09	43	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.10	43	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.11	43	114-120"	#######	ND	ND	ND	ND	ND	0.46J	0.57J	ND	ND	ND	ND	ND	ND
5300.12	43	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.13	43	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.14	44	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.15	44	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.16	44	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.17	44	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.18	44	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.19	44	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.20	44	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.21	44	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.22	44	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.23	44	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.24	44	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.25	44	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.26	45	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.59
5300.27	45	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.28	45	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.29	45	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.30	45	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.31	45	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.32	45	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.33	45	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.34	45	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.35	45	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.22
5300.36	45	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.37	45	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5304.02	46	6-12"	#######	ND	ND	ND	**3.9**	ND	3	17.8	ND	ND	14	ND	ND	ND
5304.03	46	18-24"	#######	ND	ND	ND	**3**	ND	ND	7	ND	ND	8.3	ND	ND	ND
5304.04	46	30-36"	#######	ND	ND	ND	**19**	ND	42	262	ND	ND	160	ND	938.19	ND
5304.05	46	42-48"	#######	ND	ND	ND	**30**	ND	63	400	ND	ND	240	ND	**1784.99**	ND

Table 3-1

Main Post Gas Station - Bldg. 699

Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000

(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5304.06	46	54-60"	#######	ND	N	ND	**49**	ND	120	**510**	ND	ND	340	ND	238.3	ND
5304.07	46	66-72"	#######	ND	ND	ND	**28**	ND	59	360	ND	ND	240	ND	684.08	ND
5304.08	46	78-84"	#######	ND	ND	ND	**48**	ND	100	**640**	ND	ND	440	ND	**1213.19**	ND
5304.09	46	90-96"	#######	ND	ND	ND	**41**	ND	84	**560**	ND	ND	360	ND	**1146.22**	ND
5304.10	46	102-108"	#######	ND	ND	ND	**48**	ND	97	**640**	ND	ND	490	ND	700.47	ND
5304.11	46	114-120"	#######	ND	ND	ND	**31**	ND	50	303	ND	ND	230	ND	584.23	ND
5304.12	46	126-132"	#######	ND	ND	ND	**67**	ND	130	**870**	ND	ND	640	ND	233.01	ND
5304.13	46	138-144"	#######	ND	ND	ND	**18**	ND	32	183	ND	ND	140	ND	237.44	ND
5304.14	47	6-12"	#######	ND	ND	ND	**3.7**	ND	4J	22.1	ND	ND	15	ND	ND	ND
5304.15	47	18-24"	#######	ND	ND	ND	**3.3**	ND	ND	10.8	ND	ND	8.2	ND	ND	ND
5304.16	47	30-36"	#######	ND	ND	ND	ND	ND	ND	4.2J	ND	ND	5.6	ND	ND	ND
5304.17	47	42-48"	#######	ND	ND	ND	**23**	ND	60	400	ND	ND	210	ND	**1088.62**	ND
5304.18	47	54-60"	#######	ND	ND	ND	**30**	ND	86	**590**	ND	ND	290	ND	**1327.62**	ND
5304.19	47	66-72"	#######	ND	ND	ND	**69**	ND	230	**1490**	ND	ND	800	ND	**1759.2**	ND
5304.20	47	78-84"	#######	ND	ND	ND	**13**	ND	35	225	ND	ND	130	ND	861.43	ND
5304.21	47	90-96"	#######	ND	ND	ND	**21**	ND	54	370	ND	ND	200	ND	423.62	ND
5304.22	47	102-108"	#######	ND	ND	ND	**15**	ND	52	358	ND	ND	170	ND	657.42	ND
5304.23	47	114-120"	#######	ND	ND	ND	**36**	ND	89	**550**	ND	ND	340	ND	828.15	ND
5304.24	47	126-132"	#######	ND	ND	ND	**33**	ND	69	**440**	ND	ND	270	ND	485.03	ND
5304.25	47	138-144"	#######	ND	ND	ND	**3.6**	ND	1.1	6.4	ND	ND	4.9	ND	215.06	ND
5304.26	48	6-12"	#######	ND	ND	ND	1.2	ND	2	8.62	ND	ND	1.8	ND	ND	ND
5304.27	48	18-24"	#######	ND	ND	ND	1.1	ND	1.1	4.73	ND	ND	0.9	ND	ND	ND
5304.28	48	30-36"	#######	ND	ND	ND	0.86	ND	0.58J	2.57	ND	ND	0.77	ND	ND	ND
5304.29	48	42-48"	#######	ND	ND	ND	1.5	ND	1.1	5.8	ND	ND	1.9	ND	ND	ND
5304.30	48	54-60"	#######	ND	ND	ND	**5.2**	ND	29	173	ND	ND	56	ND	**10533.83**	ND
5304.31	48	66-72"	#######	ND	ND	ND	**110**	ND	490	**2870**	ND	ND	990	ND	326.19	ND
5304.32	48	78-84"	#######	ND	ND	ND	0.67	ND	5.2	33.1	ND	ND	9.5	ND	**1733.42**	ND
5304.33	48	90-96"	#######	ND	ND	ND	1.5	ND	7.9	50	ND	ND	17	ND	**2091.69**	ND
5304.34	48	102-108"	#######	ND	ND	ND	**150**	ND	420	**1780**	ND	ND	480	ND	201.31	ND
5304.35	48	114-120"	#######	ND	ND	ND	**590**	ND	**1200**	**6900**	ND	ND	**2500**	ND	341.05	ND
5304.36	48	126-132"	#######	ND	ND	ND	**200**	ND	510	**2990**	ND	ND	**1000**	ND	ND	ND
5304.37	48	138-144"	#######	ND	ND	ND	**260**	ND	400	**1340**	ND	ND	650	ND	676.65	ND
5309.02	49	6-12"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.03	49	18-24"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.04	49	30-36"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.05	49	42-48"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.06	49	54-60"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.07	49	66-72"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.08	49	78-84"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.09	49	90-96"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	196.23	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5309.10	49	102-108"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	776.93	ND
5309.11	49	114-120"	4/3/2000	ND	ND	ND	ND	ND	0.67	1.66	ND	ND	ND	ND	964.48	ND
5309.12	49	126-132"	4/3/2000	ND	ND	ND	ND	ND	18	52.7	ND	ND	ND	ND	219.57	ND
5309.13	49	138-144"	4/3/2000	ND	ND	ND	ND	ND	8.3	24.2	ND	ND	ND	ND	197.94	ND
5309.14	50	6-12"	4/3/2000	ND	ND	ND	ND	ND	0.3J	0.6	ND	ND	ND	ND	ND	ND
5309.15	50	18-24"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.16	50	30-36"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.17	50	42-48"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.18	50	54-60"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.19	50	66-72"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.20	50	78-84"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.21	50	90-96"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.22	50	102-108"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.23	50	114-120"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.24	50	126-132"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.25	50	138-144"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.26	51	6-12"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.27	51	18-24"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.28	51	30-36"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.29	51	42-48"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.30	51	54-60"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.31	51	66-72"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.32	51	78-84"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.33	51	90-96"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.34	51	102-108"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.35	51	114-120"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.36	51	126-132"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.37	51	138-144"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.02	52	6-12"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.03	52	18-24"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.04	52	30-36"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.05	52	42-48"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.06	52	54-60"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.07	52	66-72"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.08	52	78-84"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.09	52	90-96"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.10	52	102-108"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.11	52	114-120"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.12	52	126-132"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.13	52	138-144"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5315.14	53	6-12"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.15	53	18-24"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.16	53	30-36"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.17	53	42-48"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.18	53	54-60"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.19	53	66-72"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.20	53	78-84"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.21	53	90-96"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.22	53	102-108"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.23	53	114-120"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.24	53	126-132"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.25	53	138-144"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.26	54	6-12"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.27	54	18-24"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.28	54	30-36"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.29	54	42-48"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.30	54	54-60"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.31	54	66-72"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.32	54	78-84"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.33	54	90-96"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.34	54	102-108"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.35	54	114-120"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.36	54	126-132"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.37	54	138-144"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.02	55	6-12"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.03	55	18-24"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.04	55	30-36"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.05	55	42-48"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.06	55	54-60"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.07	55	66-72"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.08	55	78-84"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.09	55	90-96"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.10	55	102-108"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.11	55	114-120"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.12	55	126-132"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.13	55	138-144"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.14	56	6-12"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.15	56	18-24"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.16	56	30-36"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.17	56	42-48"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.18	56	54-60"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5318.19	56	66-72"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.20	56	78-84"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.21	56	90-96"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.22	56	102-108"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.23	56	114-120"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.24	56	126-132"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.25	56	138-144"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.26	57	6-12"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.27	57	18-24"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.28	57	30-36"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.29	57	42-48"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.30	57	54-60"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.31	57	66-72"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.32	57	78-84"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.33	57	90-96"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.34	57	102-108"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.35	57	114-120"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.36	57	126-132"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.37	57	138-144"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.38	58	6-12"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.39	58	18-24"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13.5
5318.40	58	30-36"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.29
5318.41	58	42-48"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.83
5318.42	58	54-60"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	15.4
5318.43	58	66-72"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.95
5318.44	58	78-84"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.45	58	90-96"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.46	58	102-108"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.41
5318.47	58	114-120"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.48	58	126-132"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.49	58	138-144"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.01	59	6-12"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.02	59	18-24"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.03	59	30-36"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.04	59	42-48"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.05	59	54-60"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.06	59	66-72"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.07	59	78-84"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.08	59	90-96"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.09	59	102-108"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.10	59	114-120"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5320.11	59	126-132"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.12	59	138-144"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.13	60	6-12"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.14	60	18-24"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.15	60	30-36"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.16	60	42-48"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.17	60	54-60"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.18	60	66-72"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.19	60	78-84"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.20	60	90-96"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.21	60	102-108"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.22	60	114-120"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.23	60	126-132"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.24	60	138-144"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.25	60D	6-12"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.26	60D	18-24"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.27	60D	30-36"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.28	60D	42-48"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.29	60D	54-60"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.30	60D	66-72"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.31	60D	78-84"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.32	60D	90-96"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.33	60D	102-108"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.34	60D	114-120"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.35	60D	126-132"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.36	60D	138-144"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.37	61	6-12"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.38	61	18-24"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.39	61	30-36"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.40	61	42-48"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.41	61	54-60"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.42	61	66-72"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.43	61	78-84"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.44	61	90-96"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	49.7
5320.45	61	102-108"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.46	61	114-120"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.47	61	126-132"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.48	61	138-144"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.02	62	6-12"	########	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.03	62	18-24"	########	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.04	62	30-36"	########	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5353.05	62	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.06	62	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.07	62	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.08	62	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	515.84	ND
5353.09	62	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	209.84	ND
5353.10	62	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.11	62	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.12	62	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.13	62	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.14	63	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.15	63	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.16	63	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.17	63	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.18	63	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.19	63	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.20	63	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.21	63	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.22	63	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.23	63	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.24	63	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.25	63	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.26	64	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.27	64	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.28	64	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.29	64	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.30	64	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.31	64	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.32	64	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.33	64	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.34	64	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.35	64	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.36	64	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.37	64	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	65	6-12"	NO SAMPLE TAKEN													
	65	18-24"														
	65	30-36"														
	65	42-48"														
	65	54-60"														
	65	66-72"														
	65	78-84"														

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
	65	90-96"														
	65	102-108"														
	65	114-120"														
	65	126-132"														
	65	138-144"														
	66	6-12"														
	66	18-24"														
	66	30-36"														
	66	42-48"														
	66	54-60"														
	66	66-72"														
	66	78-84"														
	66	90-96"														
	66	102-108"														
	66	114-120"														
	66	126-132"														
	66	138-144"														
5376.02	67	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.03	67	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.04	67	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.05	67	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.06	67	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.07	67	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.08	67	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	566.14	ND
5376.09	67	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	212.32	ND
5376.10	67	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.11	67	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.12	67	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.13	67	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.26	68	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	801.6	ND
5378.27	68	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.28	68	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.29	68	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.30	68	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.31	68	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.32	68	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	206.8	ND
5378.33	68	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.34	68	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.35	68	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.36	68	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NO SAMPLE TAKEN

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5378.37	68	138-144"	#######	2.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.7	ND	ND
5378.74	68D	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.75	68D	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.76	68D	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.77	68D	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.78	68D	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.79	68D	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.80	68D	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.81	68D	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.82	68D	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.83	68D	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.84	68D	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.85	68D	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	69	6-12"	NO SAMPLE TAKEN													
	69	18-24"														
	69	30-36"														
	69	42-48"														
	69	54-60"														
	69	66-72"														
	69	78-84"														
	69	90-96"														
	69	102-108"														
	69	114-120"														
	69	126-132"														
	69	138-144"														
	70	6-12"	NO SAMPLE TAKEN													
	70	18-24"														
	70	30-36"														
	70	42-48"														
	70	54-60"														
	70	66-72"														
	70	78-84"														
	70	90-96"														
	70	102-108"														
	70	114-120"														
	70	126-132"														
	70	138-144"														
	71	6-12"	NO SAMPLE TAKEN													
	71	18-24"														
	71	30-36"														
	71	42-48"														

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
	71	54-60"	NO SAMPLE TAKEN													
	71	66-72"														
	71	78-84"														
	71	90-96"														
	71	102-108"														
	71	114-120"														
	71	126-132"														
	71	138-144"														
5376.14	72	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	543.8	28
5376.15	72	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.16	72	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.17	72	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.18	72	54-60"	#######	ND	ND	ND	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND
5376.19	72	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.20	72	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	219.09	ND
5376.21	72	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.22	72	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.23	72	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.24	72	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.25	72	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.38	73	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.39	73	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.40	73	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.41	73	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.42	73	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.43	73	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.44	73	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.45	73	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.46	73	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.47	73	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.48	73	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.49	73	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	74	6-12"	NO SAMPLE TAKEN													
	74	18-24"														
	74	30-36"														
	74	42-48"														
	74	54-60"														
	74	66-72"														
	74	78-84"														
	74	90-96"														
	74	102-108"														

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
	74	114-120"														
	74	126-132"														
	74	138-144"														
	75	6-12"														
	75	18-24"														
	75	30-36"														
	75	42-48"														
	75	54-60"														
	75	66-72"														
	75	78-84"														
	75	90-96"														
	75	102-108"														
	75	114-120"														
	75	126-132"														
	75	138-144"														
	76	6-12"														
	76	18-24"														
	76	30-36"														
	76	42-48"														
	76	54-60"														
	76	66-72"														
	76	78-84"														
	76	90-96"														
	76	102-108"														
	76	114-120"														
	76	126-132"														
	76	138-144"														
5378.02	77	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.03	77	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.04	77	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.05	77	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.06	77	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.07	77	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.08	77	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**5106.16**	ND
5378.09	77	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	203.53	18.5
5378.10	77	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.11	77	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.12	77	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.13	77	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.50	78	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.51	78	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NO SAMPLE TAKEN

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5378.52	78	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.53	78	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.54	78	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.55	78	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.56	78	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.57	78	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	753.84	ND
5378.58	78	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	286.93	ND
5378.59	78	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.60	78	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.61	78	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	79	6-12"	NO SAMPLE TAKEN													
	79	18-24"														
	79	30-36"														
	79	42-48"														
	79	54-60"														
	79	66-72"														
	79	78-84"														
	79	90-96"														
	79	102-108"														
	79	114-120"														
	79	126-132"														
	79	138-144"														
	80	6-12"	NO SAMPLE TAKEN													
	80	18-24"														
	80	30-36"														
	80	42-48"														
	80	54-60"														
	80	66-72"														
	80	78-84"														
	80	90-96"														
	80	102-108"														
	80	114-120"														
	80	126-132"														
	80	138-144"														
	81	6-12"	NO SAMPLE TAKEN													
	81	18-24"														
	81	30-36"														
	81	42-48"														
	81	54-60"														
	81	66-72"														
	81	78-84"														

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
	81	90-96"	NO SAMPLE TAKEN													
	81	102-108"														
	81	114-120"														
	81	126-132"														
	81	138-144"														
5378.14	82	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	212.78	50
5378.15	82	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.16	82	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.17	82	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.18	82	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.19	82	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.20	82	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.21	82	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.22	82	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.23	82	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.24	82	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	975.14	ND
5378.25	82	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.62	83	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.63	83	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.64	83	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.65	83	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.66	83	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.67	83	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.68	83	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.69	83	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.70	83	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.71	83	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.72	83	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.73	83	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Key

ND - Not Detected

"Bolded" analytical result exceeded the respective NJDEP Residential Direct Contact Soil Cleanup Criteria

Definition of Laboratory Qualifiers

MDL - Method Detection Limit

J - Compound identified below detection limit

B - Compound in both sample and blank

D - Results from dilution of sample

U - Compound searched for but not detected

E - Compound exceeds calibration limit

APPENDIX – A
FORT MONMOUTH
STANDARD OPERATING PROCEDURE

Geoprobe Sampling Methods for the AAFES
Main Post Gas Station, Building 699
SOP No.: SAM-0221, Dated 2-24-2000

STANDARD OPERATING PROCEDURE

SOP No.: SAM-0221
Revision No.: New
Date 2-24-00

CATEGORY: Sample Handling
TITLE: Geoprobe Sampling Methods for the AAFES Main Post Gas Station, Building 699

1 PURPOSE: To document the procedure used to collect samples to delineate the extent of gasoline contamination at the Building 699 site. All samples will be analyzed for TPHC, BTEX and Lead.

2 RESPONSIBILITY: Designated field samplers who have been properly instructed and trained in field sampling protocol and techniques.

3 REFERENCES:

3.1 Field Sampling Procedures Manual, May 1992. New Jersey Department of Environmental Protection.

3.2 Geoprobe Tools and Equipment Catalog 98/99.

4 SUMMARY: This SOP represents all general field sampling requirements as required by the NJDEP. It specifically addresses the proper use of protective equipment, collection of QA/QC samples, field decontamination procedures, proper documentation of all field activities, collection of samples into proper containers with the proper preservation and the techniques for collecting each type of sample.

4.1 As a minimum, all field personnel are required to have work boots (steel toe construction), safety glasses or goggles, hard hat and gloves available for all sampling activities. Standard latex surgical gloves are worn at all times when samples are collected or handled.

4.2 Proper documentation of all site activities is crucial. Documentation is maintained to trace the possession and handling of samples from the time of collection, through analysis and disposal.

Prepared By _____ Date 2-24-00

Approved By _____ Date 2-24-00
QA Manager / Laboratory Director

4.3 Every field sampler (team) is required to maintain a bound field-sampling logbook with permanently numbered pages. All field activities and notes are documented in this book. Notations are made in logbook fashion, noting the time and date of all entries. Information recorded in the logbook includes name and location of site investigation, date and time of arrival and departure, persons contacted, weather conditions, samples taken, method and time of collection and depths if required. Field instrument calibrations are kept in separate books.

4.4 Sample containers are labeled after sample collection. Sample labels include the following: sample number, parameters, preservatives, date and time of sample collection, sampler's initials and site name/location.

4.5 The sample container types utilized during the execution of this project are as follows:
4.5.1 (1) Four ounce clear glass container with Teflon lined lid.
4.5.2 (1) Two ounce clear glass container with septum.
4.5.3 (1) Two ounce clear glass container with Teflon lined lid.

4.6 A chain of custody (COC) form is completed in the field and accompanies each set of samples collected. The COC is a legal record of possession of the samples and of request for analysis. It bears the name of the person assuming responsibility of the sample. A copy of a COC can be found in SAM-0201, Attachment 2 (Sample Receiving, Log-In and Disposal).

4.7 Sample techniques are accomplished as follows:

4.7.1 The Macro Core Sampler ® is utilized in the extraction of the soil samples (Ref.5.1). The soils are placed in the appropriate container, sealed, labeled and placed in a cooler containing ice.

4.8 Samples are properly preserved and the correct size, shape and color containers are to be used. Guidelines for sample containers and preservation can be found in SOP SAM-0200 (Sample Containers, Preservation and Holding Time).

4.9 Equipment List:

4.9.1 Geoprobe Macrocore Sampler® Assembly.

4.10 Decontamination Procedures for Field Sampling Equipment

4.10.1 Items de-contaminated are as follows:
4.10.1.1 Macro Core Sampler® and associated parts.

4.10.2 Non-Aqueous Sampling Decontamination Steps:
4.10.2.1 Detergent plus tap water wash
4.10.2.2 Generous tap water rinse
4.10.2.3 DI water rinse

5 GEOPROBE SAMPLING FOR SOILS:

5.1 Sampling with the Macro Core Sampler: The Macro Core sampler is a steel tube that measures two inches in diameter by forty-eight inches in length. The complete assembly consists of the tube, a cutter shoe, a liner tube, and a drive head that is connected to drill rod and advanced into the soil strata. The liner is manufactured of Polyethylene Tera-Phthalate Glycol (PETG) material as well as other materials. The liner is one point seventy-five inches diameter and forty-six inches long. It can hold up to approximately thirteen hundred milliliters of soil when full recovery is obtained. The sampler is decontaminated (Ref.4.10.2), put together and introduced into the soil from zero grade and driven to the desired depth. The sampler is meant to be used mainly as a open advanced bore-hole system. The sampler is pushed and or percussion hammered into the soil, extracted out of the soil, and opened.

5.2 Sampling Procedures: After the sampler is extracted out of the bore-hole, the liner is removed, cut open and the soil from pre-determined depths are then placed in sample containers. Initial sampling includes the collection of soil samples from the 0-6 inch interval within each bore-hole. Subsequent samples will be taken at alternating 6 inch intervals to a depth of 150 inches. In the event a sample result collected at the 144-150 inch interval exceeds the New Jersey Residential Direct Contact Soil Cleanup Criteria for TPHC, BTEX or Lead, additional samples will be collected within the appropriate bore-hole for the purpose of establishing a complete vertical delineation. Field notes are written as to note soil structures, colors and any other materials. Odors and any other factors regarding the sample are noted as well.

6 QUALITY CONTROL:

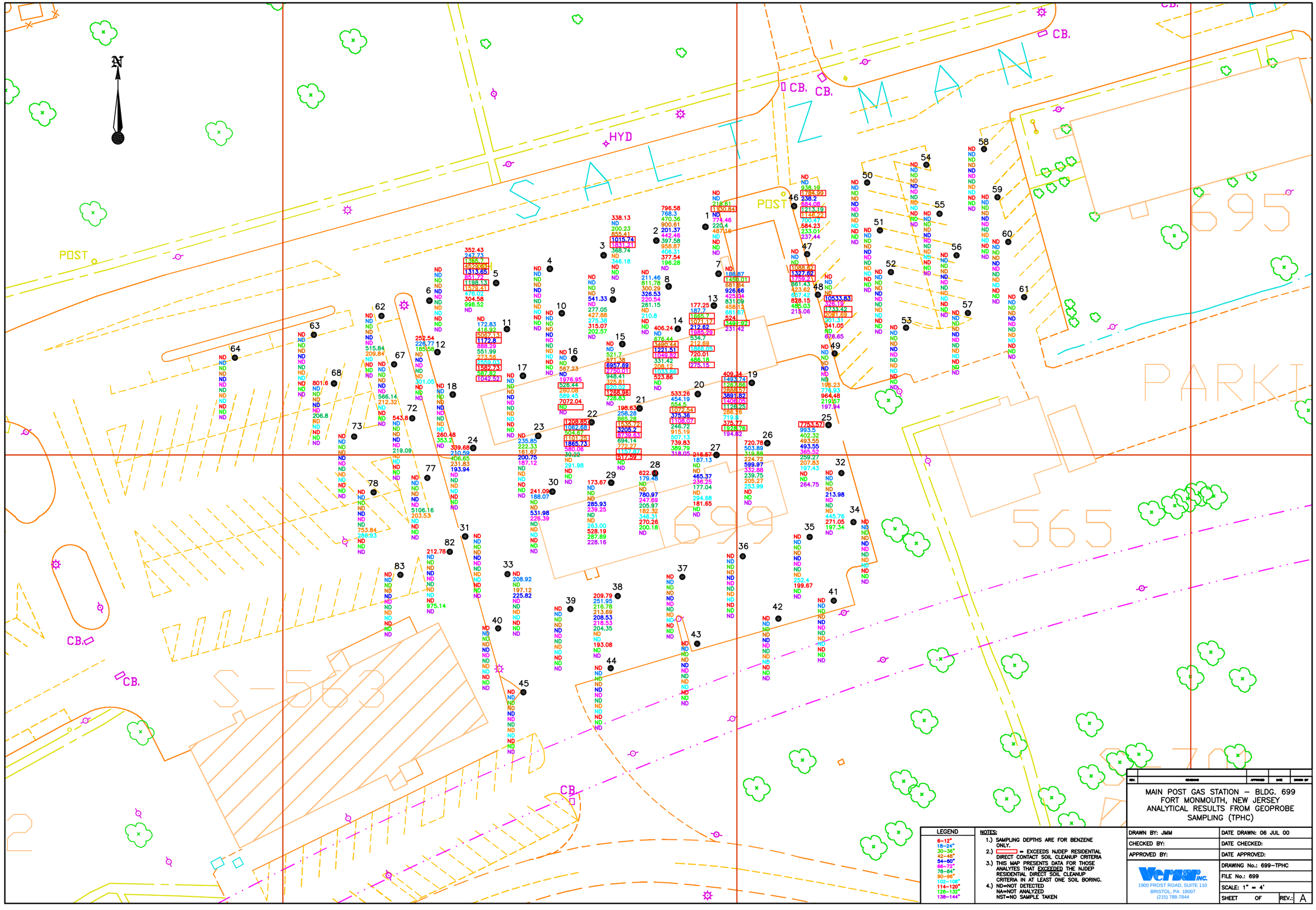
6.1 QA/QC samples are intended to provide control over the collection of environmental measurements and subsequent validation, review and interpretation of generated analytical data.

6.1.1 The trip blanks are exclusively for organic analysis. Its purpose is to measure possible cross-contamination of samples during shipping to and from the site. The trip blank is never opened and travels to the site with the empty samples bottles and back from the site with the collected samples. Contaminated trip blanks may also indicate bottle cleaning of questionable quality. Trip blanks are included at the rate of one per day.

6.1.2 Duplicate samples are required. For non-aqueous matrices, obtaining duplicates requires homogenization of the sample aliquot prior to filling sample containers. Regardless, volatile organic samples must always be taken from discrete locations or intervals without compositing or mixing. Duplicates are taken at the rate of one per twenty.

APPENDIX – B
Drawings

Figure 3 - Analytical Results from Geoprobe Sampling – Total Petroleum Hydrocarbons
Figure 4 - Analytical Results from Geoprobe Sampling – Benzene
Figure 5 - Analytical Results from Geoprobe Sampling – Ethyl-Benzene
Figure 6 - Analytical Results from Geoprobe Sampling – Toluene
Figure 7 - Analytical Results from Geoprobe Sampling – Xylene
Figure 8 - Proposed Areas of Enzyme-Enhanced Bioremediation



LEGEND
6–12"
18–24"
30–36"
42–48"
54–60"
66–72"
78–84"
90–96"
102–108"
114–120"
126–132"
138–144"

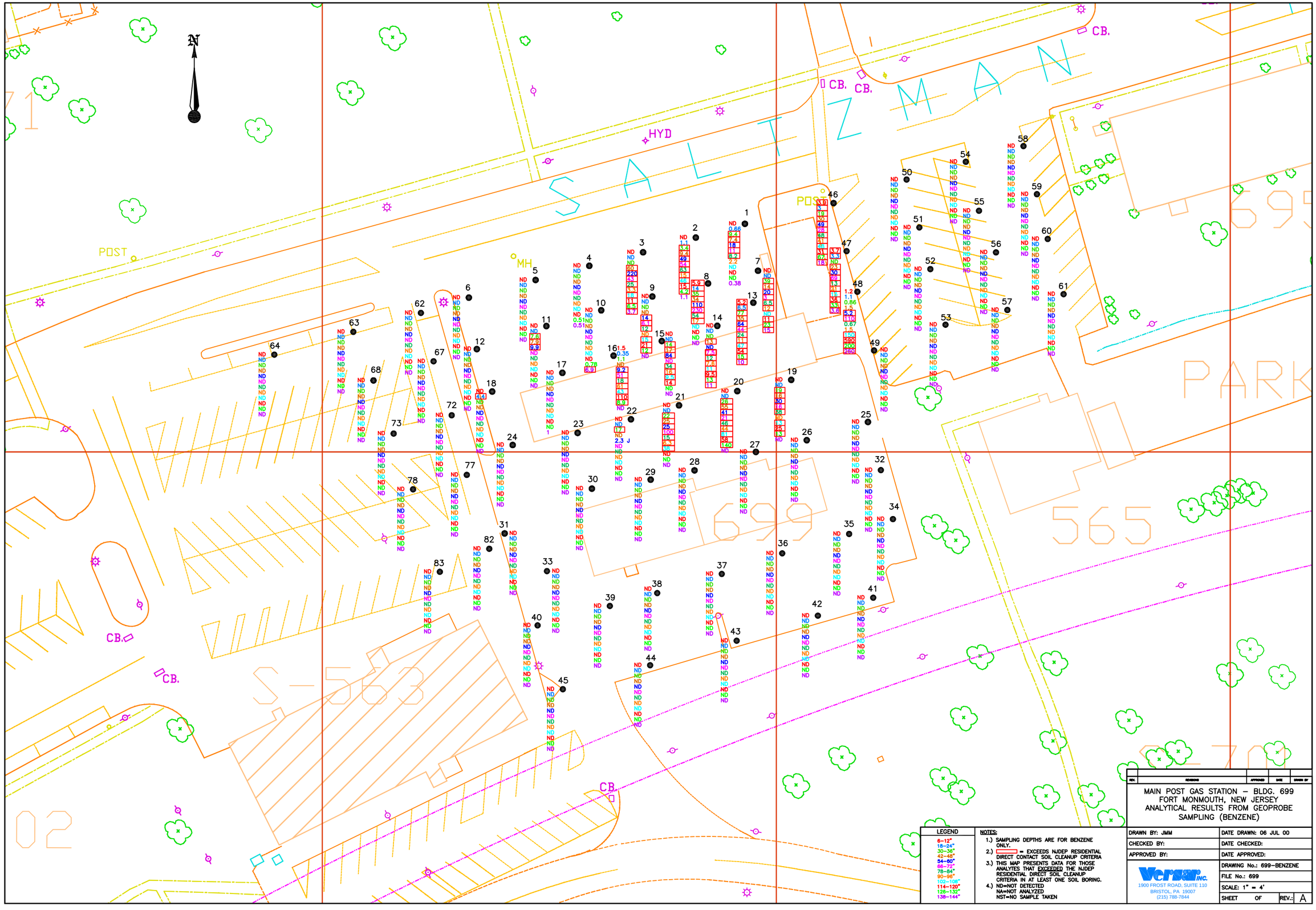
NOTES:
1.) SAMPLING DEPTHS ARE FOR BENZENE ONLY.
2.) = EXCEEDS NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA
3.) THIS MAP PRESENTS DATA FOR THOSE ANALYTES THAT EXCEEDED THE NJDEP RESIDENTIAL DIRECT SOIL CLEANUP CRITERIA IN AT LEAST ONE SOIL BORING.
4.) ND=NOT DETECTED
NA=NOT ANALYZED
NST=NO SAMPLE TAKEN

REV.	REMARKS	APPROVED	DATE	DRAWN BY

MAIN POST GAS STATION – BLDG. 699
FORT MONMOUTH, NEW JERSEY
ANALYTICAL RESULTS FROM GEOPROBE SAMPLING (TPHC)

DRAWN BY: JMM	DATE DRAWN: 06 JUL 00
CHECKED BY:	DATE CHECKED:
APPROVED BY:	DATE APPROVED:
	DRAWING No.: 699–TPHC
	FILE No.: 699
	SCALE: 1" = 4'
	SHEET OF REV.: A

Versar INC.
1900 FROST ROAD, SUITE 110
BRISTOL, PA 19007
(215) 788-7844



LEGEND

- 6–12"
- 18–24"
- 30–36"
- 42–48"
- 54–60"
- 66–72"
- 78–84"
- 90–96"
- 102–108"
- 114–120"
- 126–132"
- 138–144"

NOTES:

1.) SAMPLING DEPTHS ARE FOR BENZENE ONLY.
2.) ▭ = EXCEEDS NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA
3.) THIS MAP PRESENTS DATA FOR THOSE ANALYTES THAT EXCEEDED THE NJDEP RESIDENTIAL DIRECT SOIL CLEANUP CRITERIA IN AT LEAST ONE SOIL BORING.
4.) ND=NOT DETECTED
NA=NOT ANALYZED
NST=NO SAMPLE TAKEN

REV.	REVISIONS	APPROVED	DATE	DRAWN BY

MAIN POST GAS STATION – BLDG. 699
FORT MONMOUTH, NEW JERSEY
ANALYTICAL RESULTS FROM GEOPROBE SAMPLING (BENZENE)

DRAWN BY: JMM	DATE DRAWN: 06 JUL 00
CHECKED BY:	DATE CHECKED:
APPROVED BY:	DATE APPROVED:
	DRAWING No.: 699–BENZENE
	FILE No.: 699
	SCALE: 1" = 4'
	SHEET OF REV.: A

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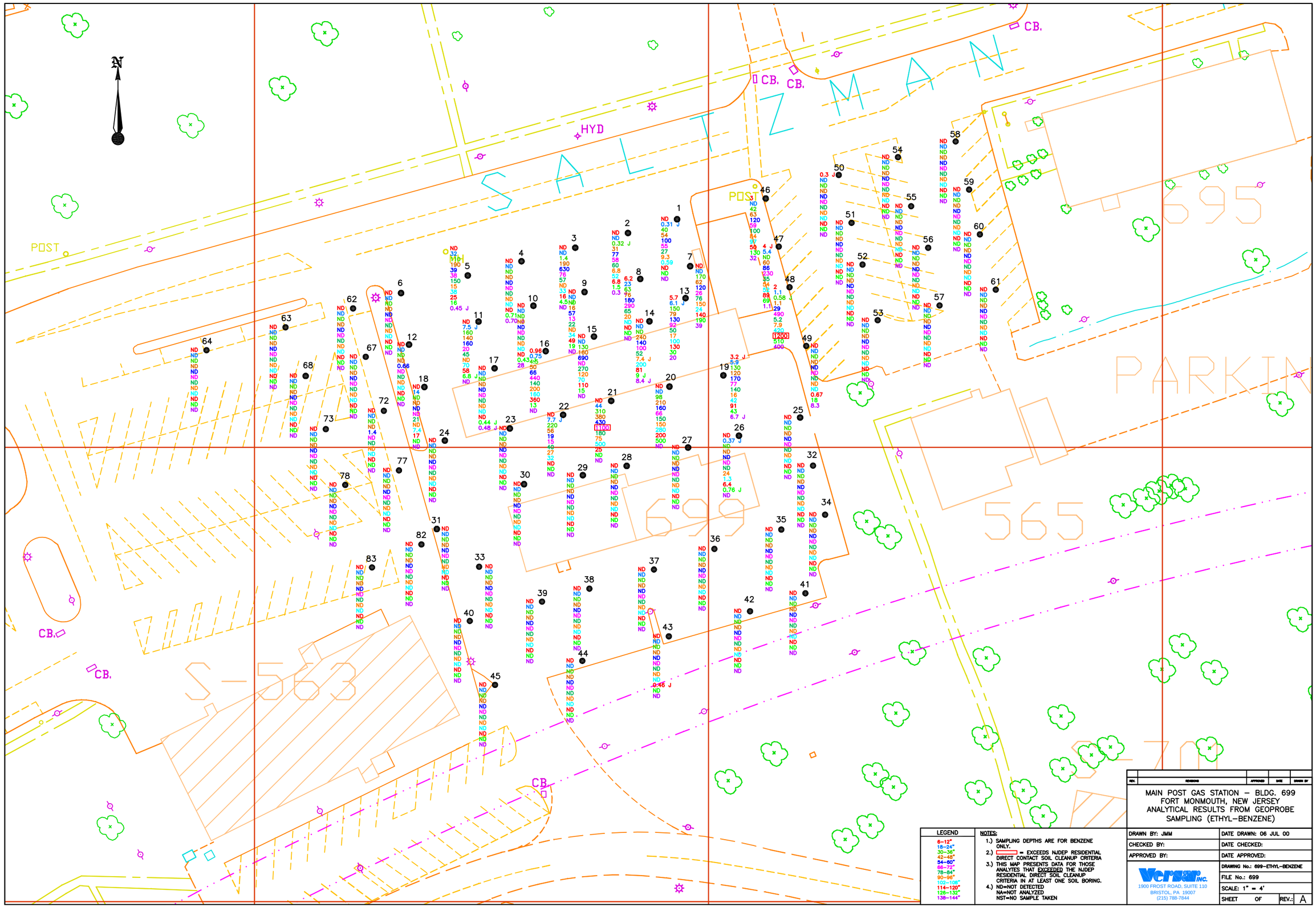
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138–144"
NOTES:
1.) SAMPLING DEPTHS ARE FOR BENZENE ONLY.
2.) = EXCEEDS NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA
3.) THIS MAP PRESENTS DATA FOR THOSE ANALYTES THAT EXCEEDED THE NJDEP RESIDENTIAL DIRECT SOIL CLEANUP CRITERIA IN AT LEAST ONE SOIL BORING.
4.) ND=NOT DETECTED
NA=NOT ANALYZED
NST=NO SAMPLE TAKEN
REV. | REVISIONS | APPROVED | DATE | DRAWN BY
MAIN POST GAS STATION – BLDG. 699
FORT MONMOUTH, NEW JERSEY
ANALYTICAL RESULTS FROM GEOPROBE SAMPLING (ETHYL–BENZENE)
DRAWN BY: JMM
DATE DRAWN: 06 JUL 00
CHECKED BY:
DATE CHECKED:
APPROVED BY:
DATE APPROVED:
DRAWING No.: 699-ETHYL-BENZENE
FILE No.: 699
SCALE: 1" = 4'
SHEET OF
REV.: A
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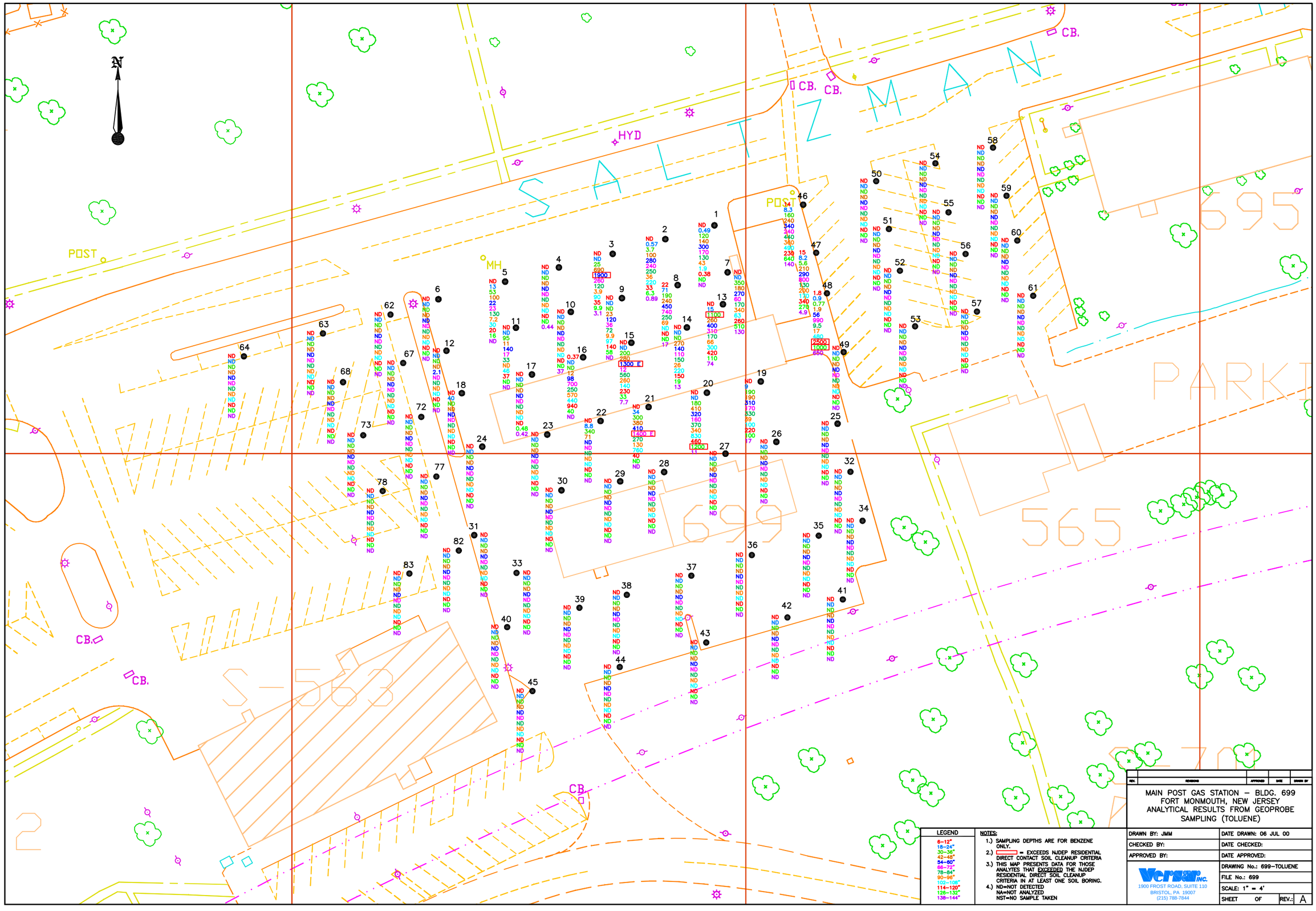
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NOTES:
1.) SAMPLING DEPTHS ARE FOR BENZENE ONLY.
2.) = EXCEEDS NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA
3.) THIS MAP PRESENTS DATA FOR THOSE ANALYTES THAT EXCEEDED THE NJDEP RESIDENTIAL DIRECT SOIL CLEANUP CRITERIA IN AT LEAST ONE SOIL BORING.
4.) ND=NOT DETECTED
NA=NOT ANALYZED
NST=NO SAMPLE TAKEN
REV. REVISIONS APPROVED DATE DRAWN BY
MAIN POST GAS STATION – BLDG. 699
FORT MONMOUTH, NEW JERSEY
ANALYTICAL RESULTS FROM GEOPROBE SAMPLING (TOLUENE)
DRAWN BY: JMM
DATE DRAWN: 06 JUL 00
CHECKED BY:
DATE CHECKED:
APPROVED BY:
DATE APPROVED:
DRAWING No.: 699–TOLUENE
FILE No.: 699
SCALE: 1" = 4'
SHEET OF
REV.: A
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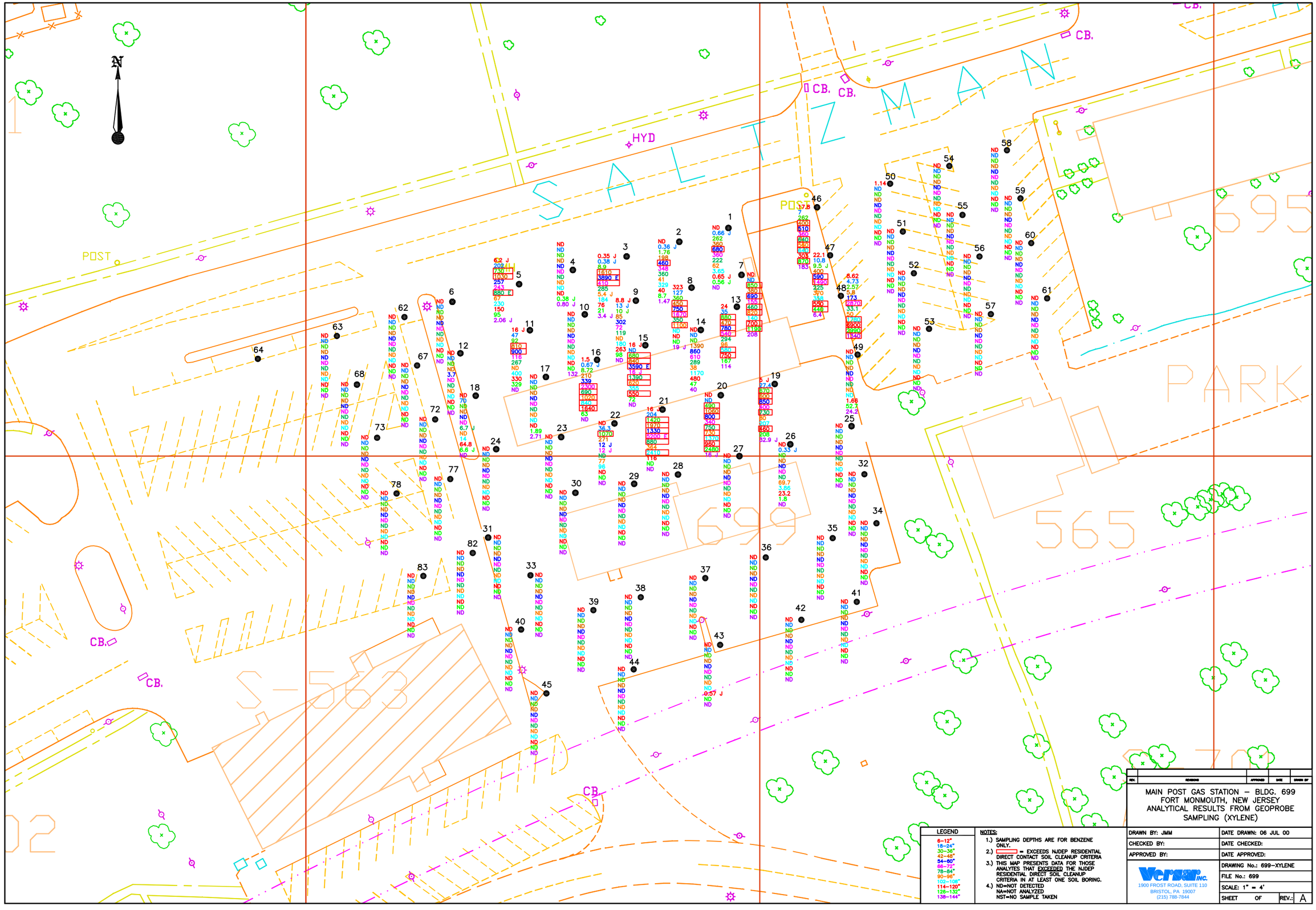

LEGEND
6–12"
18–24"
30–36"
42–48"
54–60"
66–72"
78–84"
90–96"
102–108"
114–120"
126–132"
138–144"

NOTES:

1.) SAMPLING DEPTHS ARE FOR BENZENE ONLY.

2.) [ ] = EXCEEDS NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA

3.) THIS MAP PRESENTS DATA FOR THOSE ANALYTES THAT EXCEEDED THE NJDEP RESIDENTIAL DIRECT SOIL CLEANUP CRITERIA IN AT LEAST ONE SOIL BORING.

4.) ND=NOT DETECTED
NA=NOT ANALYZED
NST=NO SAMPLE TAKEN

REV.	REMARKS	APPROVED	DATE	DRAWN BY

MAIN POST GAS STATION – BLDG. 699
FORT MONMOUTH, NEW JERSEY
ANALYTICAL RESULTS FROM GEOPROBE SAMPLING (XYLENE)

DRAWN BY: JMM	DATE DRAWN: 06 JUL 00
CHECKED BY:	DATE CHECKED:
APPROVED BY:	DATE APPROVED:
	DRAWING No.: 699–XYLENE
	FILE No.: 699
	SCALE: 1" = 4'
	SHEET OF REV.: A

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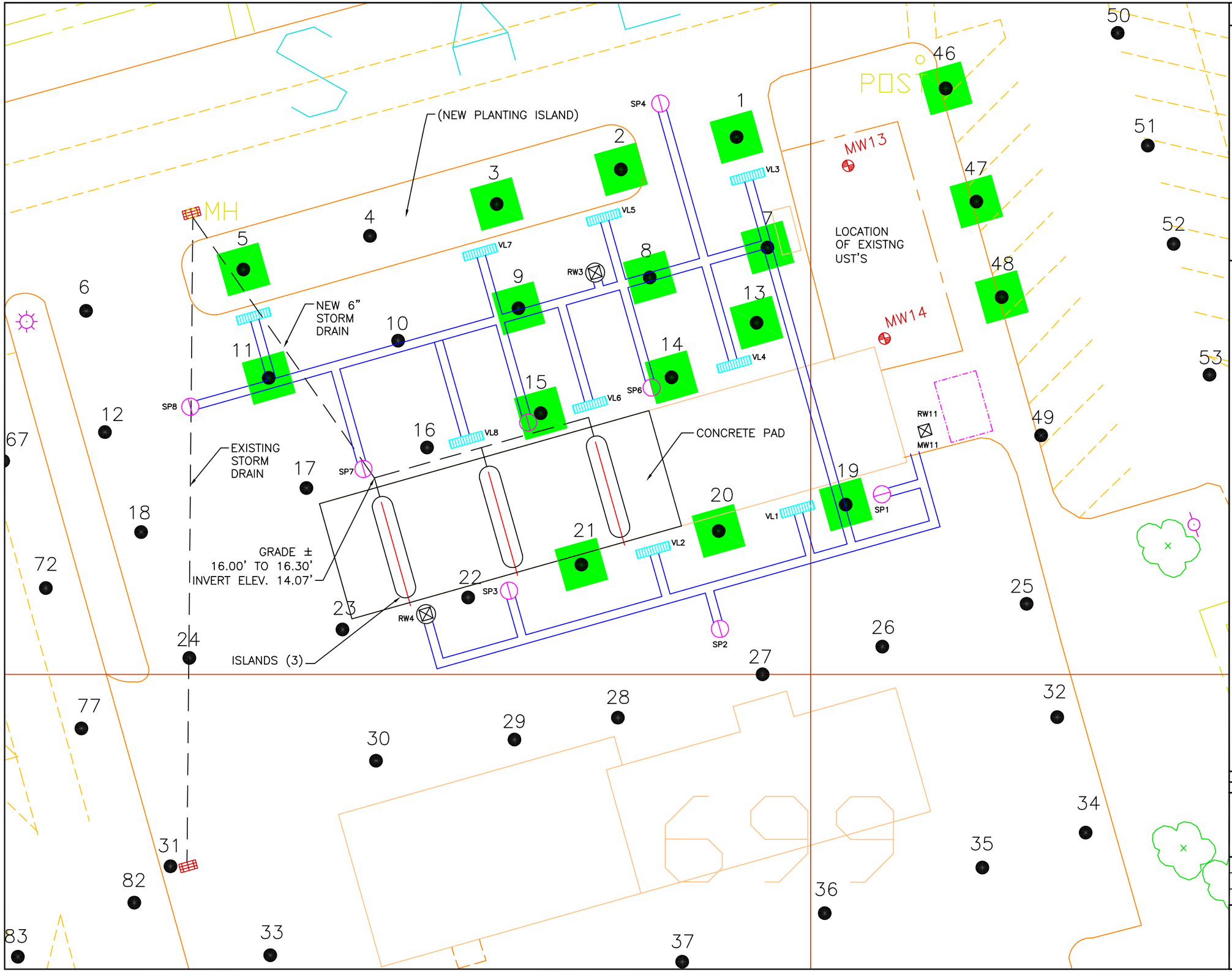

LEGEND

- Proposed Zones of Geoprobe Enzyme Injection
- (1) EXISTING RECOVERY WELL
- (2) NEW RECOVERY WELLS
- (8) SPARGE POINTS
- (9) SUE LATERALS

NOTES:

1.) PRIOR TO BACKFILLING, ALL TRENCHES AND PIPING RUNS ARE TO BE SURVEYED AND LOCATIONS AND ELEVATIONS RECORDED.
2.) SEE FIGURE 15A, FOR SECTIONS

WELLS

MW11 (EXISTING) }
RW13 (NEW) } 20 FT. BGS TO BOTTOM OF SCREEN
RW4 (NEW) }

VAPOR EXTRACTION LATERAL
(NEW) VL 1 THRU VL 9 (3 FT. BGS)

SPARGE POINTS
(NEW) SP1 THRU SP 8 (5 FT. BGS)

REV.	REVISIONS	APPROVED	DATE	DRAWN BY

TITLE: FIGURE 8
PROPOSED AREAS OF ENZYME-ENHANCED BIOREMEDIATION
BUILDING 699
FORT MONMOUTH, NEW JERSEY

DRAWN BY: JMM	DATE DRAWN: 11 JUL 00
CHECKED BY: SJE	DATE CHECKED:
APPROVED BY:	DATE APPROVED:
	DRAWING No.: FIGURE 8
	FILE No.: 699-C
	SCALE: 1" = 10'
	SHEET 1 OF 1 REV.: A

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BRISTOL, PA 19007
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Appendix C
Material Safety Data Sheets

Enzyme Accelerator

EZT-MZC

EZT-A2

MATERIAL SAFETY DATA SHEET

This MSDS complies with OSHA'S Hazard Communication Standard 29 CFR 1910.1200 and OSHA Form 174

IDENTITY AND MANUFACTURER'S INFORMATION

NFPA Rating: Health-1; Flammability-0; Reactivity-0; Special- -		**HMIS Rating:** Health-1; Flammability-0; Reactivity-0; Personal Protection-D
Manufacturer's Name:	Enzyme Technologies, Inc.	**DOT Hazard Classification: None**
Address:	5228 NE 158th Ave Portland, OR 97230	**TRADE NAME: Enzyme Accelerator**
Date Prepared: 3/9/98	**Prepared By: KG**	**MSDS Number:** Revision - 2
Information Calls:	**(503) 254-4331**	NOTICE: JUDGMENT BASED ON INDIRECT TEST DATA

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)	ACS Number	SARA III LIST	OSHA PEL (ppm)	ACGIH TLV (ppm)	Carcinogen Ref. Source **
Proprietary		No	N/E	N/E	N/E

SECTION 2 - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point:	220 F	Specific Gravity (H2O=1):	1.00
Vapor Pressure: PSIG @ 70 F (Aerosols):	N/A	Vapor Pressure (Non-Aerosols)(mm Hg and Temperature):	18 @75^0 F
Vapor Density (Air = 1):	.62	Evaporation Rate (BUAC = 1):	1.20
Solubility in Water:	Complete	Water Reactive:	No
Appearance and Odor:	Tan colored liquid with citrus odor.		

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY as per USA flame projection test (aerosols): N/A	Auto Ignition Temperature: N/E	Flammability Limits in Air by % in Volume:
FLASH POINT AND METHOD USED 115 F (T.C.C.)		% LEL: N/E % UEL: N/E
EXTINGUISHER MEDIA: Non-Combustible	**SPECIAL FIRE FIGHTING PROCEDURES**: None	

Unusual Fire & Explosion Hazards: Provide shielding to protect personnel.

SECTION 4 - REACTIVITY HAZARD DATA

STABILITY: [X] STABLE [ ] UNSTABLE	**HAZARDOUS POLYMERIZATION:** [ ] WILL [X] WILL NOT OCCUR
Incompatibility (Mat. to avoid): None Identified	**Conditions to Avoid:** None Identified

Hazardous Decomposition Products: None

SECTION 5 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: [X] INHALATION [ ] INGESTION [X] SKIN ABSORPTION [X] EYE [ ] NOT HAZARDOUS

ACUTE EFFECTS:	**None**		
Inhalation:	Can cause headache, dizziness**.**		
Eye Contact:	Irritating	**Skin Contact:**	May be an irritant.
Ingestion:	Chemical pneumonitis if aspirated into lungs.		
CHRONIC EFFECTS:	None known.		
Medical Conditions Generally Aggravated by Exposure:	Asthma		

SECTION 6 - EMERGENCY FIRST AID PROCEDURES

Eye Contact: Flush with water for 15 minutes. Get medical attention.

Skin Contact: Wash with soap and water.

Inhalation: Move to fresh air.

Ingestion: **DO NOT INDUCE VOMITING.** Drink large quantity of water. Get immediate medical attention.

SECTION 7 - CONTROL AND PROTECTIVE MEASURES

Respiratory Protection (specify type):.	None normally needed		
Protective Gloves:	Solvent resistant	**Eye Protection:**	Safety glasses.
Ventilation Requirements:	Normal room ventilation.		
Other Protective Clothing & Equipment:	None		
Hygienic Work Practices:	Wash with soap and water after contact.		

SECTION 8 - PRECAUTIONS FOR SAFE HANDLING AND USE

Steps To Be Taken If Material Is Spilled Or Released: Cover with absorbent material and scoop up. Flush area with water.

Waste Disposal Methods: Dispose of in accordance with local, state and federal regulations.

Precautions To Be Taken In Handling & Storage: Keep away from temperatures above 130 F.

Other Precautions &/or Special Hazards: KEEP OUT OF REACH OF CHILDREN.

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind.

**** Chemical Listed as Carcinogen or Potential Carcinogen. [a] NTP [b] IARC Monograph [c] OSHA [d] Not Listed [e] Animal Data Only**

MATERIAL SAFETY DATA SHEET

This MSDS complies with OSHA'S Hazard Communication Standard 29 CFR 1910.1200 and OSHA Form 174

IDENTITY AND MANUFACTURER'S INFORMATION

NFPA Rating: Health-1; Flammability-0; Reactivity-0; Special- -		**HMIS Rating:** Health-1; Flammability-0; Reactivity-0; Personal Protection-D	
Manufacturer's Name:	Enzyme Technologies, Inc.	**DOT Hazard Classification:** None	
Address:	5228 NE 158th Ave. Portland, OR 97230	**TRADE NAME:** **EZT-MZC**	
Date Prepared: 3/9/98	**Prepared By:** KG	**MSDS Number:**	**Revision** - 2
Information Calls:	**(503) 254-4331**	NOTICE: JUDGMENT BASED ON INDIRECT TEST DATA	

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)	ACS Number	SARA III LIST	OSHA PEL (ppm)	ACGIH TLV (ppm)	Carcinogen Ref. Source **
NATURAL ENZYMES	N/A	No	N/E	N/E	N/E
monomethanoxygenase,alcoholdehydrogenase,aldehydehydogenase					

SECTION 2 - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point:	212 F	**Specific Gravity (H2O=1):**	1.00
Vapor Pressure: PSIG @ 70 F (Aerosols):	N/A	**Vapor Pressure (Non-Aerosols)(mm Hg and Temperature):**	18 @75^0 F
Vapor Density (Air = 1):	.62	**Evaporation Rate (BUAC = 1):**	1.00
Solubility in Water:	Complete	**Water Reactive:**	No
Appearance and Odor:	Thin brown/tan liquid with slightly sour odor		

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY as per USA flame projection test (aerosols): N/A	Auto Ignition Temperature: N/A	Flammability Limits in Air by % in Volume:
FLASH POINT AND METHOD USED N/A		% LEL: N/A % UEL: N/A
EXTINGUISHER MEDIA: Non-Combustible	**SPECIAL FIRE FIGHTING PROCEDURES**: None	

Unusual Fire & Explosion Hazards: None

SECTION 4 - REACTIVITY HAZARD DATA

STABILITY: [X] STABLE [ ] UNSTABLE	**HAZARDOUS POLYMERIZATION:** [ ] WILL [X] WILL NOT OCCUR
Incompatibility (Mat. to avoid): None Identified	**Conditions to Avoid:** None Identified

Hazardous Decomposition Products: None

SECTION 5 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: [ ] INHALATION [X] INGESTION [X] SKIN ABSORPTION [X] EYE [ ] NOT HAZARDOUS

ACUTE EFFECTS:	None		
Inhalation:	Can cause headache, dizziness.		
Eye Contact:	May be an irritant	**Skin Contact:**	May be an irritant.
Ingestion:	Gastrointestinal irritant		
CHRONIC EFFECTS:	None known.		

Medical Conditions Generally Aggravated by Exposure: None Identified

SECTION 6 - EMERGENCY FIRST AID PROCEDURES

Eye Contact: Flush with water for 15 minutes. If irritation persists get medical attention.

Skin Contact: Wash with soap and water.

Inhalation: Move to fresh air. No adverse effects noted.

Ingestion: **DO NOT INDUCE VOMITING.** Drink large quantity of water. Get immediate medical attention.

SECTION 7 - CONTROL AND PROTECTIVE MEASURES

Respiratory Protection (specify type):.	None normally needed		
Protective Gloves:	Rubber if desired	**Eye Protection:**	Safety glasses.
Ventilation Requirements:	Normal room ventilation.		
Other Protective Clothing & Equipment:	Apron and boots if desired.		
Hygienic Work Practices:	Wash with soap and water after contact.		

SECTION 8 - PRECAUTIONS FOR SAFE HANDLING AND USE

Steps To Be Taken If Material Is Spilled Or Released: Dike and contain. Collect and re-use.

Waste Disposal Methods: Rinse container with water and dispose of accordingly

Precautions To Be Taken In Handling & Storage: Recommended storage temperature is 50 F. Seal container after use.

Other Precautions &/or Special Hazards: KEEP OUT OF REACH OF CHILDREN.

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind.

**** Chemical Listed as Carcinogen or Potential Carcinogen. [a] NTP [b] IARC Monograph [c] OSHA [d] Not Listed [e] Animal Data Only**

United States Army
Fort Monmouth, New Jersey

Underground Storage Tank Closure and Site Investigation Report

Building 699
Main Post-West Area

NJDEP UST Registration Nos. 81533-235 through 238
DICAR Nos. 89-10-19-1329

May 2001

UNDERGROUND STORAGE TANK
CLOSURE AND SITE INVESTIGATION REPORT

BUILDING 699

MAIN POST-WEST AREA
NJDEP UST REGISTRATION NOS. 81533-235 THROUGH 238

MAY 2001

PREPARED FOR:

UNITED STATES ARMY, FORT MONMOUTH, NEW JERSEY
DIRECTORATE OF PUBLIC WORKS
BUILDING 167
FORT MONMOUTH, NJ 07703

PREPARED BY:

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699.DOC

EXECUTIVE SUMMARY

UST Closure

On September 1, 1999, four steel underground storage tanks (USTs) were closed by removal in accordance with New Jersey Department of Environmental Protection (NJDEP) closure procedures at the Main Post-West Area of the U.S. Army Fort Monmouth, Fort Monmouth, New Jersey. The USTs, NJDEP Registration Nos. 0081533-235 thru 238 (Fort Monmouth ID No. 699), were located northwest of Building 699. These four USTs were each 4,000-gallon tanks that contained gasoline.

Site Assessment-Soil

The site assessment was performed by U.S. Army personnel in accordance with the NJDEP *Technical Requirements for Site Remediation* (N.J.A.C. 7:26E) and the NJDEP *Field Sampling Procedures Manual*. Soils surrounding the tank were screened visually and with air monitoring equipment for evidence of contamination. Following removal, the USTs were inspected for corrosion holes. Numerous holes were noted in the USTs. Soils at the location of the holes were dark in color and appeared to be contaminated. Groundwater was encountered at 10.0 feet below ground surface and sheen was observed on groundwater.

On September 1, 1999, following the removal of the USTs and 60 cubic yards of potentially petroleum contaminated soil, post-excavation soil samples A, B, C, D, E, F, G, H, I, and DUP D were collected from nine (9) locations within the UST excavation area. Sidewall samples A, B, C, D, E, F, G, H, and DUP D were collected at a depth of 8.0 feet bgs. Sample I was collected along the centerline at a depth of 9.5 feet bgs. Between September 29, 1999, and October 4, 1999, nine (9) piping samples were collected along the former piping length of the excavation. These soil samples were designated PS-1 though PS-9. The samples were collected at a depth of 1.5-3.5 feet bgs. Each of the soil samples was analyzed for total solids, lead, and Volatile Organic Compounds (VOCs).

Analytical results of post-excavation soil samples collected between September 1, 1999, and October 4, 1999, indicated concentrations of benzene and xylenes which exceeded the NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC). All other soil samples contained either non-detectable concentrations of contaminants or concentrations of contaminants below the NJDEP RDCSCC.

Site Assessment-Groundwater

In response to the observation of potentially contaminated soil near the shallow water table, one (1) groundwater sample was collected at Building 699 on September 1, 1999. This groundwater sample was analyzed for VOCs calibrated for xylene plus 15 tentatively identified compounds (TICs), methyl tertiary butyl ether (MTBE), tertiary butyl alcohol (TBA), and lead. The following groundwater analytical results for MTBE, benzene, toluene, ethylbenzene, and xylenes were above the New Jersey Ground Water Quality Criteria (GWQC):

- MTBE (GWQC = 70 ug/L) was detected at a concentration of 303.83 ug/L.
- Benzene (GWQC = 1.0 ug/L) was detected at a concentration of 729.61 ug/L.
- Toluene (GWQC = 1,000 ug/L)was detected at a concentration of 3,316.33 ug/L.
- Ethylbenzene (GWQC = 700 ug/L) was detected at a concentration of 886.90 ug/L.
- Xylenes (GWQC = 40 ug/L) were detected at a concentration of 8,068.37 ug/L.

Conclusion and Recommendations

Based on the analytical results of the post-excavation samples collected between September 1, 1999, and October 4, 1999, soil quality at the Building 699 UST closure site exceeds the NJDEP soil cleanup criteria and groundwater quality at the Building 699 UST closure site exceeds the New Jersey GWQC. Should the proposed actions taken from the RAWPSA indicate that the soil quality complies with the NJDEP soil cleanup criteria and the groundwater meets the GWQC, no further action will be proposed in regard to the closure and site assessment of UST Nos. 0081533-235 through 238.

1.0 UNDERGROUND STORAGE TANK DECOMMISSIONING ACTIVITIES

1.1 OVERVIEW

Four underground storage tanks (USTs), New Jersey Department of Environmental Protection (NJDEP) Registration Nos. 81533-235 thru 238, were closed at Building 699 at the Main Post-West area of U.S. Army Fort Monmouth, Fort Monmouth, New Jersey on September 1, 1999. Refer to the Site Location Map, Figure 1. This report presents the results of the Department of Public Works' (DPW) implementation of the UST Decommissioning/Closure Plan approved by the NJDEP. The USTs were each steel 4,000-gallon tanks containing gasoline.

Decommissioning activities for UST Nos. 81533-235 thru 238 complied with all applicable Federal, State, and Local laws and ordinances in effect at the date of decommissioning. These laws included but were not limited to N.J.A.C. 7:14B-1 et seq., N.J.A.C. 5:23-1 et seq., and Occupational Safety and Health Administration (OSHA) 1910.146 and 1910.120. All permits including but not limited to the NJDEP-approved Decommissioning/Closure Plan were posted onsite for inspection. The decommissioning activities were conducted by DPW personnel who are registered and certified by the NJDEP for performing UST closure activities. Closure of UST Nos. 81533-235 thru 238 proceeded under the approval of the NJDEP Bureau of Federal Case Management (NJDEP-BFCM). The Standard Reporting Form and signed Site Assessment Summary form for UST Nos. 81533-235 thru 238 are included in Appendices A and B, respectively.

Versar has prepared this UST Closure and Site Investigation Report to assist the U.S. Army DPW in complying with the NJDEP regulations. The applicable NJDEP regulations at the date of closure were the *Interim Closure Requirements for Underground Storage Tank Systems* (N.J.A.C. 7:14B-1 et seq. October 1990 and revisions dated November 1, 1991).

This report was prepared using information collected at the time of closure. Section 1 of this UST Closure and Site Investigation Report provides a summary of the UST decommissioning activities. Section 2 of this report describes the site investigation activities. Conclusions and recommendations, including the results of the soil sampling and groundwater investigation, are presented in the final section of this report.

1.2 SITE DESCRIPTION AND HISTORY

Building 699 is located in the Main Post-West area of the Fort Monmouth Army Base. UST Nos. 0081533-235 thru 238 were located northwest of Building 699 and appurtenant steel piping ran approximately sixty-four (64) feet northeast from the excavation. A Site Map is provided as Figure 2.

1.2.1 Site History

Provided below is a brief site history and summary of the proposed measures that will be

implemented at the Building 699 area.

On October 19, 1989, the DPW contacted NJDEP to report an apparent release of gasoline from the piping system at the gas station. The loss of product was discovered as a result of an inventory discrepancy found during routine inventory control. Subsequent pressure testing of the gasoline system indicated that the leak was located in the product line between the tanks and pumps. An Incident Number was assigned to the site by the NJDEP (#89-10-19-1329) for the gasoline release. Following the release, the DPW replaced the piping system connecting the USTs and the fuel pumps with equipment that was compliant with NJDEP Bureau of Underground Storage Tanks (BUST) requirements.

A separate-phase product (SPP) recovery pump was then installed in a monitoring well immediately downgradient of the source in an attempt to recover remaining SPP. In response to NJDEP's request, Fort Monmouth submitted a Discharge Investigation and Corrective Action Report (DICAR), dated July 3, 1990. Additionally, in response to the 1989 release, seventeen (17) monitoring wells and three (3) recovery wells were installed at the site. The Krydon Group, Inc. (Krydon) was then contracted to determine the extent of gasoline contamination at the site by means of a soil boring program conducted in July 1993.

Remedial Action Workplan

In a letter dated June 18, 1993, the NJDEP requested submission of a RAW. The U.S. Army submitted the RAW on October 12, 1993 (prepared by Krydon). As specified in the RAW, a groundwater recovery and treatment system was constructed which extracts groundwater from one (1) recovery well (RW-11). TECOM-Vinell Services, Inc. (TVS) personnel currently operate and maintain this currently operational groundwater recovery and treatment system. This treatment system consists of one (1) sediment filter, and three (3) one hundred and eighty (180) pound liquid-phase granular activated carbon (GAC) units installed in series. The GAC units remove VOCs from the extracted groundwater. The treated groundwater is then discharged to the sanitary sewer in accordance with Fort Monmouth's existing Treatment Works Approval (TWA) Permit with the Northeast Monmouth County Regional Sewerage Authority.

Remedial Action Workplan Addendum

In order to improve the remediation program for the site, GES was contracted by DPW (through TVS) to prepare a Remedial Action Workplan Addendum (RAWA) for the site. As part of this effort, GES performed remedial action pilot tests to evaluate potential remedial options. The RAWA (GES, 1999), dated June 10, 1999 was submitted to NJDEP and provided specifications for a proposed remedial system upgrade. As described in the RAWA, the proposed remedial system upgrade utilized soil vapor extraction (SVE) and groundwater pumping to extract soil vapor and groundwater from existing monitoring wells and proposed extraction laterals and wells. Furthermore, it proposed VOC removal from the groundwater using in-situ air stripping (air sparging). The extracted soil vapor and groundwater were to be treated and discharged in accordance with applicable discharge permits. The RAWA also established a proposed Classification Exception Area (CEA)

encompassing the estimated capture zone of the proposed upgraded remedial system.

Remedial Action Workplan Second Addendum

Subsequent to submission of the RAWA, further characterization and evaluation of site conditions identified the potential existence of clays in the upper horizon at the site. These soils would not be effectively addressed by the proposed SVE system, which is typically designed to remediate permeable sandy soils, such as those underlying the upper clay unit at the site. EEB was therefore proposed to attempt to remediate the contaminated soils in the upper soil horizon within an estimated depth of 3-4 feet below ground surface (bgs). EEB involves the process of transforming hazardous constituents to non-hazardous ones in a biological system, and is the result of complex biochemical reactions in which microorganisms (bacteria) convert the hazardous constituents to energy and cell mass. To initiate this process, high levels of target-specific, petroleum-degrading biological enhancements (enzymes, bacteria, nutrients) and oxygen are provided to the targeted contaminated soils.

To further delineate the horizontal and vertical extent of soil contamination at the site and to identify "hot spot" areas that could be addressed by the EEB, as well as to aid in the design of the proposed SVE system, supplemental soil sampling was performed at the site in March and April 2000 by DPW and TVS personnel over a sampling grid encompassing 83 locations. The borings were installed with a Geoprobe®, and soil samples were collected at 6-inch alternating intervals to a depth of 12 feet bgs for a total of 12 samples per boring location. The samples were analyzed for VOCs, total petroleum hydrocarbons (TPHC), lead, and percent (%) solids.

In October 2000, the DPW submitted a Remedial Action Workplan Second Addendum (RAWSA) for the AAFES Main Post Gas Station, Building No. 699 (prepared by Versar).. The RAWSA addresses the planned implementation of enzyme-enhanced bioremediation (EEB) as a supplement to the previously proposed remedial system upgrade for the Main Post Gas Station, Building 699.

1.2.2 Geological/Hydrogeological Setting

The following is a description of the geological/hydrogeological setting of the area surrounding Building 699. Included is a description of the regional geology of the area surrounding Fort Monmouth as well as descriptions of the local geology and hydrogeology of the Main Post area.

Regional Geology

Monmouth County lies within the New Jersey Section of the Atlantic Coastal Plain physiographic province. The Main Post, Charles Wood, and the Evans areas are located in what may be referred to as the Outer Coastal Plain subprovince, or the Outer Lowlands.

In general, New Jersey Coastal Plain formations consist of a seaward-dipping wedge of unconsolidated deposits of clay, silt, and gravel. These formations typically strike

northeast-southwest with a dip ranging from 10 to 60 feet per mile and were deposited on Precambrian and lower Paleozoic rocks (Zapecza, 1989). These sediments, predominantly derived from deltaic, shallow marine, and continental shelf environments, date from Cretaceous through the Quaternary Periods. The mineralogy ranges from quartz to glauconite.

The formations record several major transgressive/regressive cycles and contain units which are generally thicker to the southeast and reflect a deeper water environment. More than 20 regional geologic units are present within the sediments of the Coastal Plain. Regressive, upward coarsening deposits are usually aquifers (e.g., Englishtown and Kirkwood Formations, and the Cohansey Sand) while the transgressive deposits act as confining units (e.g., the Merchantville, Marshalltown, and Navesink Formations). The individual thicknesses for these units vary greatly (i.e., from several feet to several hundred feet). The Coastal Plain deposits thicken to the southeast from the Fall Line to greater than 6,500 feet in Cape May County (Brown and Zapecza, 1990).

Local Geology

Based on the regional geologic map (Jablonski, 1968), the Cretaceous age Red Bank and Tinton Sands outcrop at the Main Post area. The Red Bank sand conformably overlies the Navesink Formation and dips to the southeast at 35 feet per mile. The upper member (Shrewsbury) of the Red Bank sand is a yellowish-gray to reddish brown clayey, medium-to-coarse-grained sand that contains abundant rock fragments, minor mica and glauconite (Jablonski). The lower member (Sandy Hook) is a dark gray to black, medium-to-fine grained sand with abundant clay, mica, and glauconite.

The Tinton sand conformably overlies the Red Bank Sand and ranges from a clayey medium to very coarse-grained feldspathic quartz and glauconite sand to glauconitic coarse sand. The color varies from dark yellowish orange or light brown to moderate brown and from light olive to grayish olive. Glauconite may constitute 60 to 80 percent of the sand fraction in the upper part of the unit (Minard, 1969). The upper part of the Tinton is often highly oxidized and iron oxide encrusted (Minard).

Hydrogeology

The water table aquifer in the Main Post area is identified as part of the "composite 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.

Based on records of wells drilled in the Main Post area, water is typically encountered at depths of 2 to 9 feet below ground surface (bgs). According to Jablonski, wells drilled in the Red Bank and Tinton Sands may produce 2 to 25 gallons per minute (gpm). Some well owners have reported acidic water that requires treatment to remove iron.

Due to the proximity of the Atlantic Ocean to Fort Monmouth, shallow groundwater may be

tidally influenced and may flow toward creeks and brooks as the tide goes out, and away from creeks and brooks as the tide comes in. However, an abundance of clay lenses and sand deposits were noted in borings installed throughout Fort Monmouth. Therefore, the direction of shallow groundwater should be determined on a case-by-case basis.

Shallow groundwater is locally influenced within the Main Post area by the following factors:

- tidal influence (based on proximity to the Atlantic Ocean, rivers, and tributaries)
- topography
- nature of the fill material within the Main Post area
- presence of clay and silt lenses in the natural overburden deposits
- local groundwater recharge areas (i.e., streams, lakes)

Due to the fluvial nature of the overburden deposits (i.e., sand and clay lenses), shallow groundwater flow direction is best determined on a case-by-case basis. This is consistent with lithologies observed in borings installed within the Main Post area, which primarily consisted of fine-to-medium grained sands, with occasional lenses or laminations of gravel silt and/or clay.

Building 699 is located approximately 800 feet north of Husky Brook, the nearest water body. Based on the Main Post topography, the groundwater flow in the area of Building 699 is anticipated to be to the south.

1.3 HEALTH AND SAFETY

Before, during, and after all decommissioning activities, hazards at the work site which may have posed a threat to the Health and Safety of all personnel who were involved with, or were affected by, the decommissioning of the UST system were minimized. All areas which posed or may have been suspected to pose a vapor hazard were monitored by a qualified individual utilizing an organic vapor analyzer (OVA). The individual ascertained if the area was properly vented to render the area safe, as defined by OSHA.

1.4 REMOVAL OF UNDERGROUND STORAGE TANK

1.4.1 General Procedures

- The contractor performing the closure prior to excavation activities identified all underground obstructions (utilities, etc.).

- All activities were carried out with the greatest regard to safety and health and the safeguarding of the environment.

- All excavated soils were visually examined and screened with an Organic Vapor Analyzer (OVA) for evidence of contamination. Potentially contaminated soils were identified and logged during closure activities.

- Surface materials (i.e., asphalt, concrete, etc.) were excavated and

staged separately from all soil and recycled in accordance with all applicable regulations and laws.

- A Subsurface Evaluator from the DPW was present during all site assessment activities.

1.4.2 Underground Storage Tank Excavation and Cleaning

Prior to UST decommissioning activities, surficial soil was removed to expose the UST and associated piping. All free product present in the piping was drained into the UST and the UST was purged to remove vapors prior to cutting and removal of the piping. After removal of the associated piping, a manway was cut in the UST to allow for proper cleaning. The UST was completely emptied of all liquids prior to removal from the ground. Approximately 2,850 gallons of liquid from the UST and its associated piping were transported by Casie Protank to Casie Ecology Oil Salvage, Inc. facility, a NJDEP-approved petroleum recycling and disposal company located in Vineland, New Jersey. Refer to Appendix C for the waste manifest.

The UST was cleaned prior to removal from the excavation in accordance with the NJDEP regulations. After the UST was removed from the excavation, it was staged on polyethylene sheeting and examined for holes. Numerous holes were observed during the inspection by the Subsurface Evaluator. Soils surrounding the UST were screened visually and with an OVA for evidence of contamination. Soils were stained and appeared to be contaminated. Approximately 60 cubic yards of potentially contaminated soils were removed from the excavated area and stored at the Fort Monmouth petroleum contaminated soil staging area. Groundwater was encountered at 10.0 feet below ground surface and sheen was observed on groundwater.

1.5 UNDERGROUND STORAGE TANK TRANSPORTATION AND DISPOSAL

The tank was transported in compliance with all applicable regulations and laws to Metal Recyclers, Inc. Please refer to Appendix D for the UST Disposal Certificate.

The UST was labeled prior to transport with the following information:

- Site of origin
- Contact person
- NJDEP UST Facility ID number
- Former contents
- Destination site
- Date

1.6 MANAGEMENT OF EXCAVATED SOILS

Based on visual observation, approximately 60 cubic yards of potentially contaminated soil were removed from the UST excavation. Potentially contaminated soils were stockpiled separately from other excavated material and were placed on and covered with polyethylene sheets. Potentially contaminated soils were transported to the soil staging

area. Soils that did not exhibit signs of contamination were used as backfill following the removal of the UST.

2.0 SITE INVESTIGATION ACTIVITIES

2.1 OVERVIEW

The Site Investigation was managed and carried out by U.S. Army DPW personnel. All analyses were performed and reported by U.S. Army Fort Monmouth Environmental Laboratory, a NJDEP-certified testing laboratory. All sampling was performed under the direct supervision of a NJDEP Certified Subsurface Evaluator according to the methods described in the NJDEP *Field Sampling Procedures Manual* (1992). Sampling frequency and parameters analyzed complied with the NJDEP document, *Interim Closure Requirements for Underground Storage Tank Systems* (October 1990 and revisions dated November 1, 1991), which was the applicable regulation at the date of the closure. The Fort Monmouth DPW Environmental Office maintains all records of the Site Investigation activities.

The following Parties participated in Closure and Site Investigation Activities:

- Subsurface Evaluator: Frank Accorsi
  Employer: TECOM-Vinell Services
  Phone Number: (732) 532-2207
  NJDEP Certification No.: 0010042

- Analytical Laboratory:U.S. Army Fort Monmouth Environmental laboratory
  Contact Person: Daniel K. Wright
  Phone Number: (908) 532-4359
  NJDEP Company Certification No.: 13461

- Hazardous Waste Hauler: Casie Protank Environmental Services
  Contact Person: David Strang
  Phone Number: (609) 696-4401
  NJDEP Company Certification No.: 16931

2.2 FIELD SCREENING/MONITORING

Field screening was performed by a NJDEP Certified Subsurface Evaluator using an OVA and visual observations to identify potentially contaminated material. Approximately 60 cubic yards of potentially petroleum-contaminated soils were removed from the excavation area and transported to the Fort Monmouth petroleum contaminated soil holding area.

2.3 SOIL SAMPLING

U.S. Army personnel performed the site assessment in accordance with the NJDEP Technical Requirements and the NJDEP Field Sampling Procedures Manual. A summary of sampling activities including parameters analyzed is provided in Table 1. The post-excavation soil samples were collected using NJDEP *Field Sampling Procedures Manual* (1992) standard sampling procedures. Following soil sampling activities, the samples were chilled and delivered to U.S. Army Fort Monmouth Environmental Laboratory located in

Fort Monmouth, New Jersey, for analysis. Each of the samples was analyzed for total solids, lead, and Volatile Organic Compounds (VOCs).

- On September 1, 1999, following the removal of the USTs and 60 cubic yards of potentially petroleum contaminated soil, post-excavation soil samples A, B, C, D, E, F, G, H, I, and DUP D were collected from nine (9) locations within the UST excavation area. Sidewall samples A, B, C, D, E, F, G, H, and DUP D were collected at a depth of 8.0 feet bgs. Sample I was collected along the centerline at a depth of 9.5 feet bgs.

- Between September 29, 1999, and October 4, 1999, nine (9) piping samples were collected along the former piping length of the excavation. These soil samples were designated PS-1 though PS-9.The samples were collected at a depth of 1.5-3.5 feet bgs.

2.4 GROUNDWATER SAMPLING

On September 1, 1999, Building 699 was sampled for VOCs calibrated for xylene plus 15 tentatively identified compounds (TICs), MTBE, TBA, and lead. Sampling and analysis were performed in accordance with the NJDEP *Field Sampling Procedures Manual* and the *Technical Requirements For Site Remediation.* Refer to Appendix F for the field sampling documentation.

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 SOIL SAMPLING RESULTS

To evaluate soil conditions following removal of the UST and associated soils, eighteen (18) post-excavation sample results were compared to NJDEP RDCSCC (N.J.A.C. 7:26D and revisions dated May 12, 1999). Summaries of analytical results for soils are presented in Tables 2 and 3 and the associated soil sampling locations are shown on Figure 3. The analytical data package is provided in Appendix E.

Excavation of potentially contaminated soil from the area surrounding the UST was performed between September 1, 1999, and October 4, 1999. Approximately 60 cubic yards of potentially contaminated soil were removed from the excavated area and stored at the Fort Monmouth petroleum contaminated soil staging area.

Analytical results of post-excavation soil samples collected between September 1, 1999, and October 4, 1999, indicated concentrations of benzene and xylenes which exceeded the NJDEP RDCSCC. All other samples contained either non-detectable concentrations of contaminants or concentrations of contaminants below the NJDEP RDCSCC.

3.2 GROUNDWATER SAMPLING RESULTS

The following groundwater analytical results above the New Jersey Ground Water Quality Criteria (GWQC) for MTBE, benzene, toluene, ethylbenzene, and xylenes:

- MTBE (GWQC = 70 ug/L) was detected at a concentration of 303.83 ug/L.
- Benzene (GWQC = 1.0 ug/L) was detected at a concentration of 729.61 ug/L.
- Toluene (GWQC = 1,000 ug/L)was detected at a concentration of 3,316.33 ug/L.
- Ethylbenzene (GWQC = 700 ug/L) was detected at a concentration of 886.90 ug/L.
- Xylenes (GWQC = 40 ug/L) were detected at a concentration of 8,068.37 ug/L.

A summary of the analytical results and comparison to the NJDEP groundwater cleanup criteria is provided in Table 4 and the groundwater sampling locations are shown on Figure 4. The analytical data package is provided in Appendix F.

3.3 CONCLUSIONS AND RECOMMENDATIONS

Based on the analytical results of the post-excavation soil samples collected between September 1, 1999, and October 4, 1999, soil quality at the Building 699 UST closure site exceeds the NJDEP RDCSCC for benzene and xylenes.

Based on the analytical results of the groundwater sample collected at Building 699 on September 1, 1999, groundwater quality at the Building 699 UST closure site exceeds the New Jersey Groundwater Quality Standard for MTBE, benzene, toluene, ethylbenzene, and xylenes.

Upon completion of the remedial work that was formulated in the RAWPSA, a summary of this work will be submitted in a report to the NJDEP. Should the proposed actions taken

from the RAWPSA indicate that the soil quality complies with the NJDEP soil cleanup criteria and the groundwater meets the GWQC, no further action will be proposed in regard to the closure and site assessment of UST Nos. 0081533-235 thru 238.

TABLES

TABLE 1

SUMMARY OF POST-EXCAVATION SAMPLING ACTIVITIES
BUILDING 699, MAIN POST-WEST AREA
FORT MONMOUTH, NEW JERSEY

Sample ID	Date of Collection	Date Analysis Started	Matrix	Sample Type	Analytical Parameters	Sample Method
699A-North Wall 8.0-8.5' (E)	9/1/99	9/3/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
699B-North Wall 8.0-8.5' (W)	9/1/99	9/3/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
699C-West Wall 8.0-8.5' (N)	9/1/99	9/3/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
699D-West Wall 8.0-8.5' (S)	9/1/99	9/3/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
699E-South Wall 8.0-8.5' (W)	9/1/99	9/3/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
699F-South Wall 8.0-8.5' (E)	9/1/99	9/3/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
699G-East Wall 8.0-8.5' (S)	9/1/99	9/3/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
699H-East Wall 8.0-8.5' (N)	9/1/99	9/3/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
699I-Bottom 9.5-10.0'	9/1/99	9/3/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
699D DUP	9/1/99	9/3/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
699 GW	9/1/99	9/3/99	Aqueous	Post-Excavation	VOA+15,Lead	Scoop

Note:
VOA+15 – Volatile Organic Analysis + Library Search for 15 Tentatively Identified Compounds (TICs)
BGS – Below Ground Surface
DUP – Duplicate

TABLE 1

SUMMARY OF POST-EXCAVATION SAMPLING ACTIVITIES
BUILDING 699, MAIN POST-WEST AREA
FORT MONMOUTH, NEW JERSEY

Sample ID	Date of Collection	Date Analysis Started	Matrix	Sample Type	Analytical Parameters	Sample Method
PS-1 3.5-4.0'	9/29/99	10/4/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
PS-2 3.0-3.5'	9/29/99	10/4/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
PS-3 2.5-3.0'	9/29/99	10/4/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
Duplicate	9/29/99	10/4/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
PS-4 2.5-3.0'	9/29/99	10/4/99	Soil	Post-Excavation	VOA+15,Lead	Scoop

Note:

PS –	Piping Sample
VOA+15 –	Volatile Organic Analysis + Library Search for 15 Tentatively Identified Compounds (TICs)
8.0-8.5' –	Depth of Sample in feet below ground surface (bgs)
Duplicate –	Duplicate of sample PS-3

TABLE 1

SUMMARY OF POST-EXCAVATION SAMPLING ACTIVITIES
BUILDING 699, MAIN POST-WEST AREA
FORT MONMOUTH, NEW JERSEY

Sample ID	Date of Collection	Date Analysis Started	Matrix	Sample Type	Analytical Parameters	Sample Method
PS-5 3.0-3.5'	9/30/99	10/4/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
PS-6 3.0-3.5'	9/30/99	10/4/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
PS-6/Duplicate	9/30/99	10/4/99	Soil	Post-Excavation	VOA+15,Lead	Scoop

Note:

PS –	Piping Sample
VOA+15 –	Volatile Organic Analysis + Library Search for 15 Tentatively Identified Compounds (TICs)
8.0-8.5' –	Depth of Sample in feet below ground surface (bgs)

TABLE 1

SUMMARY OF POST-EXCAVATION SAMPLING ACTIVITIES
BUILDING 699, MAIN POST-WEST AREA
FORT MONMOUTH, NEW JERSEY

Sample ID	Date of Collection	Date Analysis Started	Matrix	Sample Type	Analytical Parameters	Sample Method
PS-7 2.5-3.0'	10/4/99	10/5/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
PS-8 1.5-2.0'	10/4/99	10/5/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
PS-8 Duplicate	10/4/99	10/5/99	Soil	Post-Excavation	VOA+15,Lead	Scoop
PS-9 1.5-2.0'	10/4/99	10/5/99	Soil	Post-Excavation	VOA+15,Lead	Scoop

Note:

PS –	Piping Sample
VOA+15 –	Volatile Organic Analysis + Library Search for 15 Tentatively Identified Compounds (TICs)
8.0-8.5' –	Depth of Sample in feet below ground surface (bgs)

TABLE 2

SUMMARY OF ANALYTICAL RESULTS FOR SOIL
BUILDING NO. 699
FORT MONMOUTH, NEW JERSEY

Sample ID (Abbreviated)	Laboratory I.D.	Sample Date	Benzene	Toluene	Ethylbenzene	Xylenes(Total)
UNITS:			mg/kg	mg/kg	mg/kg	mg/kg
NJDEP RDCSCC			3	1000	1000	410
A	4764.01	09/01/99	**18**	50 D	30	96 D
B	4764.02	09/01/99	**8.2**	89 D	30 D	213
C	4764.03	09/01/99	**6.6**	240 D	83 D	**510 D**
D	4764.04	09/01/99	0.29	22	18	46 D
E	4764.05	09/01/99	U	2.1	1.2	7.6
F	4764.06	09/01/99	U	0.4	.22 J	15.3 J
G	4764.07	09/01/99	**9**	8.7	82 D	237 D
H	4764.08	09/01/99	**24 D**	160 D	74 D	390 D
I	4764.09	09/01/99	0.53	3.3	2.1	9.4
DUP D	4764.09	09/01/99	0.37	21 D	26	167 D

Note:

Gray shading and **bold** indicates exceedance of NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC).

Abbreviations:

mg/kg:	Milligrams per Kilogram.
U:	Compound searched for but not detected.
D:	Result from dilution of sample.
J:	Compound identified below detection limit.
DUP:	Duplicate.

TABLE 2

SUMMARY OF ANALYTICAL RESULTS FOR SOIL
BUILDING NO. 699
FORT MONMOUTH, NEW JERSEY

Sample ID (Abbreviated)	Laboratory I.D.	Sample Date	Benzene	2-Chloroethyl vinyl ether	Toluene	Ethylbenzene	Xylenes(Total)
UNITS:			mg/kg		mg/kg	mg/kg	mg/kg
NJDEP RDCSCC			3	NLE	1000	1000	410
PS-1	4828.01	09/29/99	**36 D**	16	310 D	200 D	**1280 D**
PS-2	4828.02	09/29/99	**35 D**	15	310 D	240 D	**1530 D**
PS-3	4828.03	09/29/99	0.85	U	130	2.5	16.2
DUP PS-3	4828.04	09/29/99	U	U	2.5	2.1	11.7
PS-4	4828.05	09/29/99	**7.1**	3.0	80 D	150 D	**580 D**

Note:
Gray shading and **bold** indicates exceedance of NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC).

Abbreviations:

mg/kg:	Milligrams per Kilogram.
NLE:	No limit established.
U:	Compound searched for but not detected.
D:	Result from dilution of sample.
DUP:	Duplicate.

TABLE 2

SUMMARY OF ANALYTICAL RESULTS FOR SOIL
BUILDING NO. 699
FORT MONMOUTH, NEW JERSEY

Sample ID (Abbreviated)	Laboratory I.D.	Sample Date	Benzene	Toluene	Ethylbenzene	Xylenes(Total)
UNITS:			mg/kg	mg/kg	mg/kg	mg/kg
NJDEP RDCSCC			3	1000	1000	410
PS-5	4834.01	09/30/99	**3**	1.5	97 D	**466 D**
PS-6	4834.02	09/30/99	2.7	1.6	120 D	**532 D**
DUP PS-6	4834.03	09/30/99	2.3	1.8	130 D	**570 D**

Note:

Gray shading and **bold** indicates exceedance of NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC).

Abbreviations:

mg/kg:	Milligrams per Kilogram.
D:	Result from dilution of sample.
DUP:	Duplicate.

TABLE 2

SUMMARY OF ANALYTICAL RESULTS FOR SOIL
BUILDING NO. 699
FORT MONMOUTH, NEW JERSEY

Sample ID (Abbreviated)	Laboratory I.D.	Sample Date	Benzene	Toluene	Ethylbenzene	Xylenes(Total)
UNITS:			mg/kg	mg/kg	mg/kg	mg/kg
NJDEP RDCSCC			3	1000	1000	410
PS-7	4838.01	10/04/99	**7.5**	29	260	**1030 D**
PS-8	4838.02	10/04/99	**3.7**	62	50	354
DUP PS-8	4838.03	10/04/99	**4.3**	63	57	**410**
PS-9	4838.04	10/04/99	U	3.9	32	205

Note:
Gray shading and **bold** indicates exceedance of NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC).

Abbreviations:

mg/kg:	Milligrams per Kilogram.
U:	Compound searched for but not detected.
D:	Result from dilution of sample.
DUP:	Duplicate.

TABLE 3

SUMMARY OF ANALYTICAL RESULTS FOR LEAD
BUILDING 699
FORT MONMOUTH, NEW JERSEY

Site: B699
Lab ID #: 4764.01-.10
Matrix: Soils

Sample Received: 09/01/99
Analysis Start: 09/07/99
Analysis Completed: 09/14/99

LABORATORY I.D. #	SAMPLE LOCATION	RESULT (mg/Kg)	RDCSCC (mg/Kg)
4764.01	699-A	ND	400
4764.02	699-B	ND	400
4764.03	699-C	ND	400
4764.04	699-D	ND	400
4764.05	699-E	ND	400
4764.06	699-F	ND	400
4764.07	699-G	ND	400
4764.08	699-H	ND	400
4764.09	699-I	ND	400
4764.10	699-DUP D	ND	400

Note:
mg/kg: Milligrams per Kilogram.
ND: Not Detected.
RDCSCC refers to the New Jersey Residential Direct Contact Soil Cleanup Criteria

TABLE 3

SUMMARY OF ANALYTICAL RESULTS FOR LEAD
BUILDING 699
FORT MONMOUTH, NEW JERSEY

Site: B699
Lab ID #: 4828.01-.05
Matrix: Soils

Sample Received: 09/29/99
Analysis Start: 10/01/99
Analysis Completed: 10/01/99

LABORATORY I.D. #	SAMPLE LOCATION	RESULT (mg/Kg)	RDCSCC (mg/Kg)
4828.01	699-PS 1	ND	400
4828.02	699-PS 2	ND	400
4828.03	699-PS 3	ND	400
4828.04	699-DUP PS 3	ND	400
4828.05	699-PS 4	ND	400

Note:
mg/kg: Milligrams per Kilogram.
ND: Not Detected.
RDCSCC refers to the New Jersey Residential Direct Contact Soil Cleanup Criteria

TABLE 3

SUMMARY OF ANALYTICAL RESULTS FOR LEAD
BUILDING 699
FORT MONMOUTH, NEW JERSEY

Site: B699
Lab ID #: 4834.01-.03
Matrix: Soils

Sample Received: 10/04/99
Analysis Start: 10/15/99
Analysis Completed: 10/15/99

LABORATORY I.D. #	SAMPLE LOCATION	RESULT (mg/Kg)	RDCSCC (mg/Kg)
4834.01	699-PS 5	ND	400
4834.02	699-PS 6	19.02	400
4834.03	699-DUP PS 6	ND	400

Note:
mg/kg: Milligrams per Kilogram.
ND: Not Detected.
RDCSCC refers to the New Jersey Residential Direct Contact Soil Cleanup Criteria

TABLE 3

SUMMARY OF ANALYTICAL RESULTS FOR LEAD
BUILDING 699
FORT MONMOUTH, NEW JERSEY

Site: B699
Lab ID #: 4838.01-.04
Matrix: Soils

Sample Received: 10/05/99
Analysis Start: 10/15/99
Analysis Completed: 10/15/99

LABORATORY I.D. #	SAMPLE LOCATION	RESULT (mg/Kg)	RDCSCC (mg/Kg)
4838.01	699-PS 7	ND	400
4838.02	699-PS 8	37.17	400
4838.03	699-DUP PS 8	33.43	400
4838.04	699-PS 9	25.98	400

Note:
mg/kg: Milligrams per Kilogram.
ND: Not Detected.
RDCSCC refers to the New Jersey Residential Direct Contact Soil Cleanup Criteria

TABLE 4

SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
BUILDING NO. 699
FORT MONMOUTH, NEW JERSEY

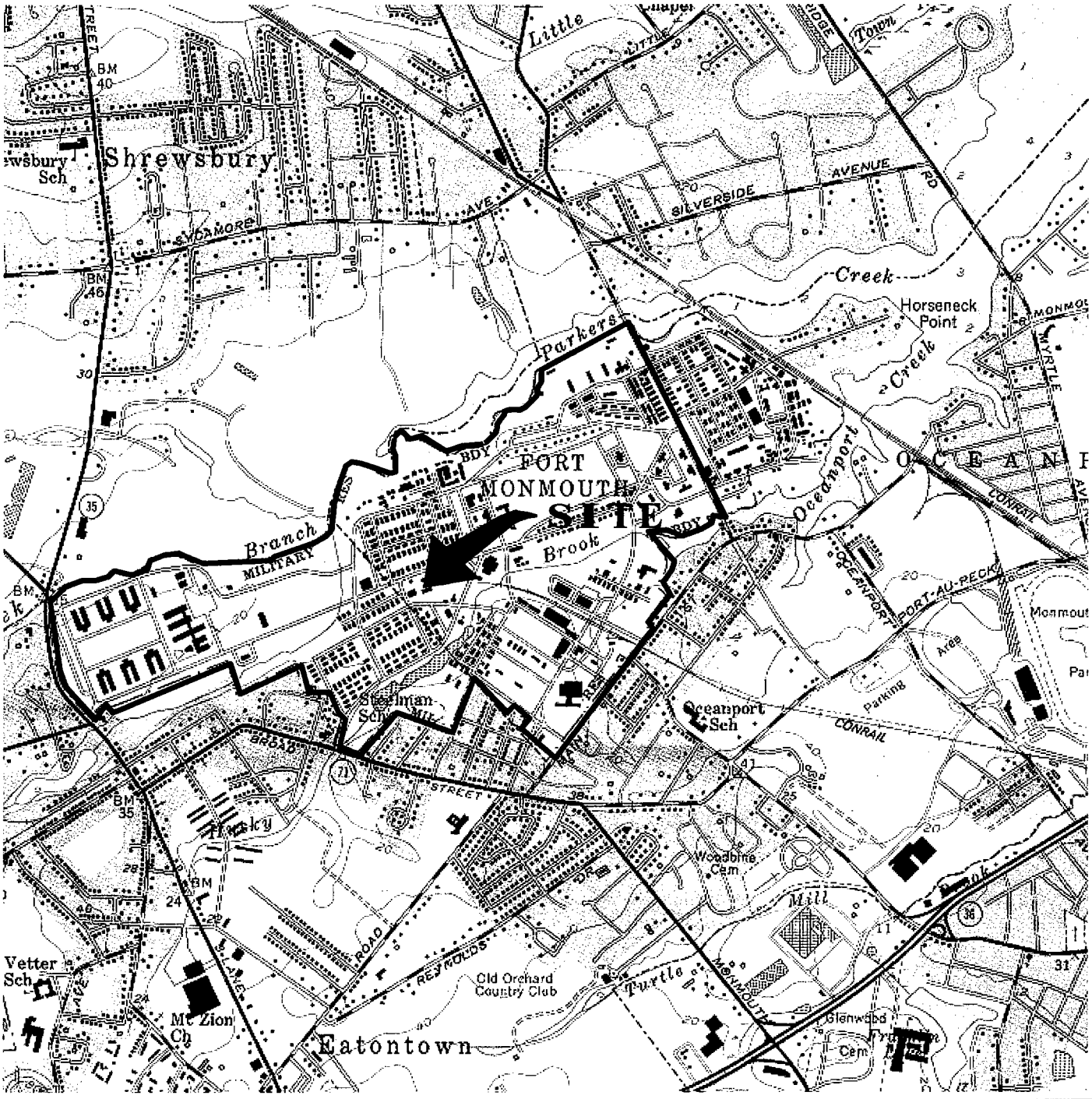
Sample ID	Sample Date	MTBE	Benzene	Toluene	Ethylbenzene	Total Xylenes	Lead
UNITS:		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
NJDEP CRITERIA:		70	1	1000	700	70	10
699 GW	09/01/99	**303.83**	**729.61**	**3316.33**	**886.9**	**8068.37**	**0.035**

Note:
Gray shading and **bold** indicates exceedance of New Jersey Ground Water Quality Criteria (GWQC) defined in NJAC 7:9-6. The criteria of 70 ug/L for total xylenes was established by the NJDEP as an interim groundwater criteria in June 1999.

Abbreviations:

MW:	Monitoring Well.
ND:	Not Detected.
ug/L:	Micrograms per liter.

FIGURES



LONG BRANCH, N. J.

40073-C8-TF-024

1954

PHOTOREVISED 1981

DMA 6164 I SE-SERIES V822

QUADRANGLE LOCATION

Mapped, edited and published by the Geological Survey

FIGURE 1

LOCATION MAP
Building 699
Main-Post West
Fort Monmouth Army Base
Monmouth County, NJ

VERSAR
Engineers, Managers, Scientists, & Planners
Bristol, PA

Scale: 1" = 2000'	Date: Sep. 1995

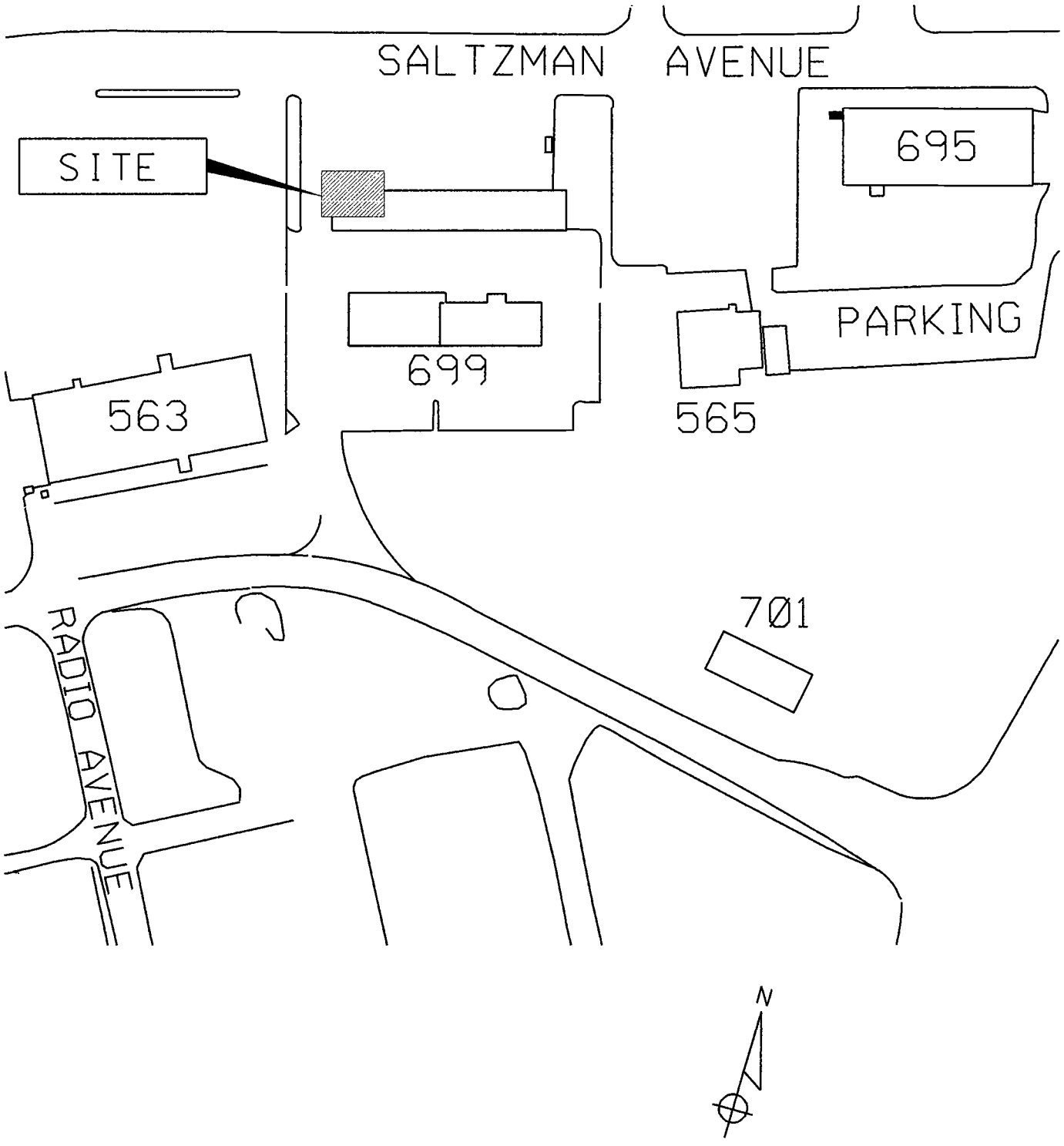
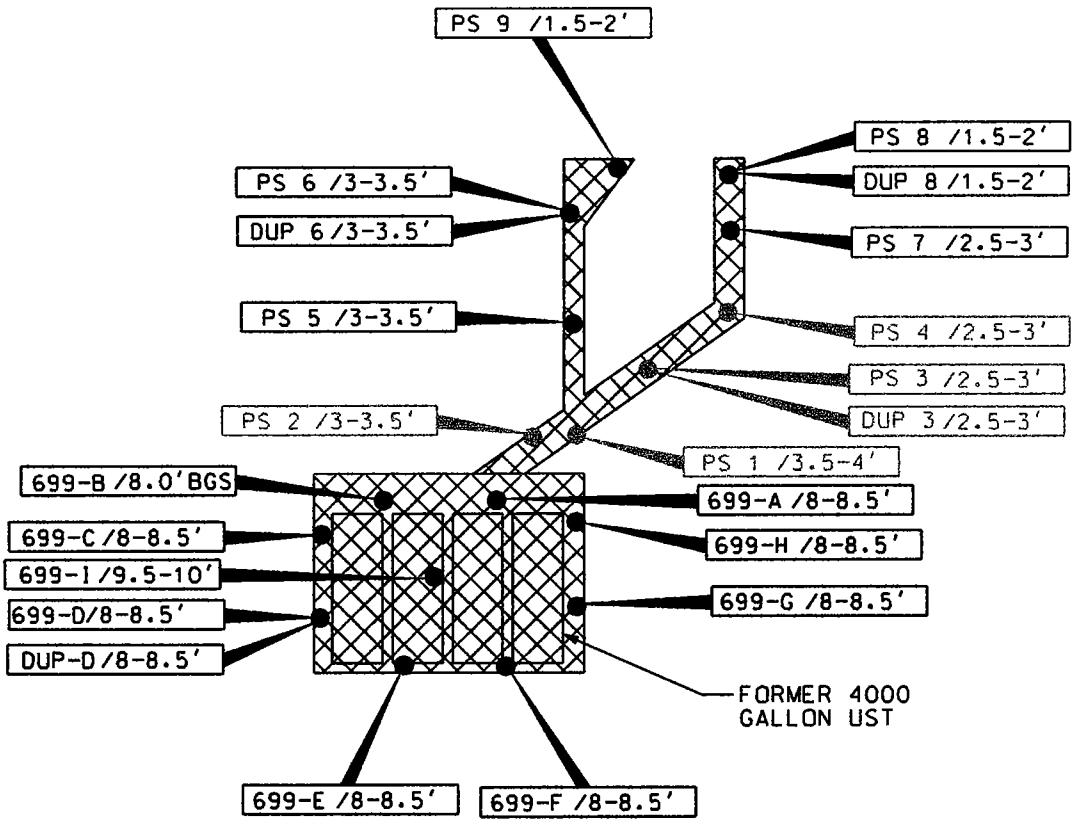


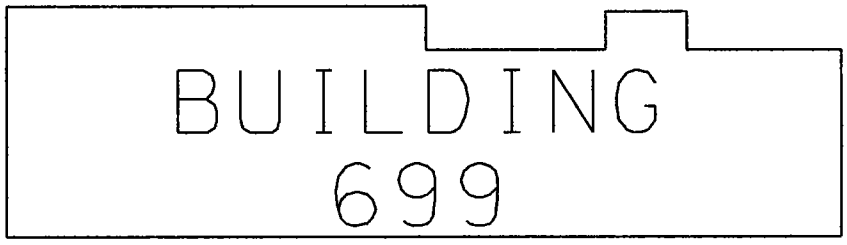
FIGURE 2
SITE MAP
BUILDING 699
FORT MONMOUTH ARMY BASE
MONMOUTH COUNTY, NJ

VERSAR
ENGINEERS, MANAGERS, SCIENTISTS & PLANNERS
BRISTOL, PA.

SCALE: 1"=100' | DATE:SEPTEMBER 1999

699 FIG2





LEGEND

- SOIL SAMPLE LOCATION (SEPTEMBER 1, 1999)
- SOIL SAMPLE LOCATION (SEPTEMBER 29, 1999)
- SOIL SAMPLE LOCATION (SEPTEMBER 30, 1999)
- SOIL SAMPLE LOCATION (OCTOBER 4, 1999)
- LIMIT OF EXCAVATION (OCTOBER 4, 1999)
- 699-E /8-8.5' SAMPLE ID WITH DEPTH (FEET BGS)

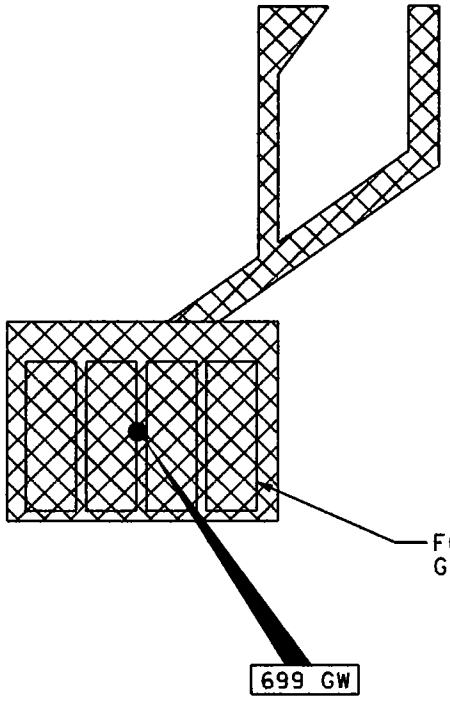
NOTES:
1. SEE TABLE 2 FOR RESULTS FOR VOLATILE ORGANIC COMPOUNDS (VOCs).
2. SEE TABLE 3 FOR RESULTS FOR LEAD
3. BGS = BELOW GROUND SURFACE

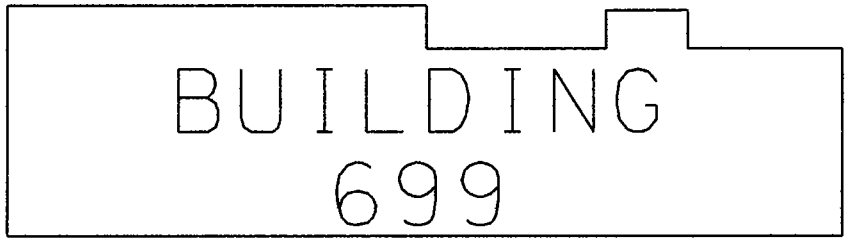
FIGURE 3
SOIL SAMPLING LOCATION MAP
BUILDING 699
FORT MONMOUTH ARMY BASE
MONMOUTH COUNTY, NJ

VERSAR
ENGINEERS, MANAGERS, SCIENTISTS & PLANNERS
BRISTOL, PA.

SCALE: 1"= 30' | DATE: SEPTEMBER 1999

699 FIG3





LEGEND

- GROUNDWATER SAMPLE LOCATION (SEPTEMBER 1, 1999)
- LIMIT OF EXCAVATION (OCTOBER 4, 1999)
- 699 GW SAMPLE ID

NOTES:

1. SEE TABLE 4 FOR GROUNDWATER SAMPLE RESULTS

FIGURE 4
GROUNDWATER SAMPLING MAP
BUILDING 699
FORT MONMOUTH ARMY BASE
MONMOUTH COUNTY, NJ

VERSAR
ENGINEERS, MANAGERS, SCIENTISTS & PLANNERS
BRISTOL, PA.

SCALE: 1"= 30'

DATE:SEPTEMBER 1999

699 FIG4

APPENDIX A

NJDEP-STANDARD REPORTING FORM

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF RESPONSIBLE PARTY SITE REMEDIATION
Underground Storage Tanks
Registration and Billing Unit
PO Box 028, Trenton, N.J. 08625-0028
1-609-633-0719

For State Use Only		
Check in ___Yes ___No		
Status		
Active	Inactive	Comcode
____	_____	_____

UNDERGROUND STORAGE TANK FACILITY CERTIFICATION QUESTIONNAIRE

FACILITY UST # 81533

Completion of this Registration Questionnaire will satisfy the registration requirements of the Underground Storage of Hazardous Substances Act, N.J.S.A. 58: 10A-21, and the Registration and Billing Regulations N.J.A.C. 7: 14B-2.

Check appropriate box

A. ___ This is a registration of a proposed or newly installed underground storage tank. (This form must be filed at least 30 days prior to operation)
B. X This is a registration of an existing underground storage tank not presently registered.
C. X This is a correction or amendment to an existing facility registration.
D. ___ There have been no changes to the facility registration since last submittal. (Go to certification page for signature)

If "C" is checked above, please check the appropriate type of change(s) below

___Facility Name and/or Address Change
___Owner Name and/or Address Change
___Facility Operator and/or Address Change
___Owner Contact Person Change
___Type of Product(s) Stored
___Substantial Modification(s)
___Tank(s) and/or Piping Changes
X Closure (Complete Section B Questions 1,4,5,11,12)
___Financial Responsibility Change
___Sale or Transfer (Complete Section A, Questions 4,5,6 & Section B, 12D)
___Other *(please specify)*

SECTION A - GENERAL FACILITY INFORMATION

1. Facility Name: AAFES MAIN POST GAS STATION
2. Facility Location: BUILDING 699
   NUMBER AND STREET: 699 SALTZMAN AVENUE
   CITY OR MUNICIPALITY: FORT MONMOUTH
   COUNTY: MONMOUTH STATE: NJ ZIP CODE: 07703 BLOCK: LOT:
3. Facility Operator
   PERSON OR TITLE PHONE NUMBER (INCLUDE AREA CODE AND EXT)
   Operator Address (if different than #2)
   NUMBER AND STREET
   CITY OR MUNICIPALITY
4. Tank Owner
5. Tank Owner Address
   NUMBER AND STREET
   CITY OR MUNICIPALITY
   STATE ZIP CODE
6. Contact Person
   (Tank Owner) PHONE NUMBER (INCLUDE AREA CODE AND EXT)
7. EPA ID#
8. Total number of regulated underground storage tanks at facility
   (Complete Section B for each tank)

9. Total Regulated underground storage capacity at facility (gallons) _____

10. Facility Type
A. __State
B. __Commercial/ Industrial
C. __County/Municipal
D. __Federal
E. __Charitable/Public School
F. __Residential
G. __ Other
H. __ Farm (as defined in N.J.S.A. 54:4-23.1 et seq)

Note: The facility site plan must be submitted when registering any underground storage tank pursuant to N.J.A.C. 7:14B 2.2.

Section B - SPECIFIC TANK INFORMATION

ALL underground tanks, including those taken out of operation (UNLESS TANK WAS REMOVED FROM THE GROUND PRIOR TO 9/3/86) must be registered. Report all tank/piping status changes. **DO NOT MARK SHADED AREAS**

1. Tank Identification Number	TANK NO 0235		TANK NO 0236		TANK NO 0237		TANK NO 0238	
2. CAS Number (hazardous substances only)								
3. Date Tanks Installed	Unknown		Unknown		Unknown		Unknown	
4. Tank Size (gallons)	4000		4000		4000		4000	
5. Tank Contents (Mark one "X" for each tank)								
A. Leaded gasoline	X		X		X		X	
B. Unleaded gasoline								
C. Alcohol enriched gasoline								
D. Light Diesel fuel (No. 1-D)								
E. Medium Diesel (No. 2-D)								
F. Waste Oil								
G. Kerosene (No. 1)								
H. Home Heating Oil (No. 2)								
J. Heating Oil (No. 4)								
K. Heavy Heating Oil (No. 6)								
L. Aviation fuel								
M. Motor oil								
N. Lubricating Oil								
P. Other hazardous substances (please specify)								
Q. Hazardous Waste (specify ID number)								
R. Mixtures (please specify)								
S. Emergency Spill tank (specify substance)								
T. Other petroleum products (please specify)								
U. Other (please specify)								
6. Tank and Piping Construction (Mark one for each tank. For piping mark material of construction & Pressurized (F) or Suction (G)	Tank	Piping	Tank	Piping	Tank	Piping	Tank	Piping
A. Bare Steel								
B. Cathodically protected metal								
1. Sacrificial anode								
2. Impressed Current								
C. Fiberglass Coated steel								
D. Fiberglass Reinforced Plastic								
E. Internally Lined (TANK ONLY)		■		■		■		■
F. Pressurized Piping (PIPING ONLY)	■		■		■		■	
G. Suction Piping (PIPING ONLY)								
H. Other (please specify)								
J. Flex Piping (PIPING ONLY)	■		■		■		■	
7. Tank & Piping Structure (Mark one for each tank and piping)								
A. Single Walled								
B. Double Walled								
C. Other (please specify)								
8. Type of Monitoring/Detection (Mark all that apply for tank & piping) A. Statistical inventory reconciliation								
B. Manual tank gauging (TANK ONLY)		■		■		■		■
C. Inventory Control (TANK ONLY)								
D. Interstitial								
E. Tightness test								
F. Ground water observation wells								
G. Vapor observation wells								
H. In tank (auto monitoring gauge) (TANK ONLY)		■		■		■		■
J. "Safe" suction piping (PIPING ONLY) See definition page 4	■		■		■		■	
K. In-line electronic pressure monitor (PIPING ONLY) see definition page 4	■		■		■		■	
L. Automatic Line leak detector (PIPING ONLY)	■		■		■		■	
M. None (TANK & PIPING)								
N. Other (please specify)								

1. Tank Identification Number	TANK NO 0235	TANK NO 0236	TANK NO 0237	TANK NO 0238
9. Overfill protection (tank only) (Mark one X for each tank) A. Yes	Tank	Tank	Tank	Tank
B. No				
10. Spill containment around fill pipe (Mark one X for each tank) A. Yes				
B. No				
11. Tank Status (Mark one X for each tank system) A. In-use				
B. Empty less than 12 mos (complete 12B)				
C. Empty 12 mos or more (complete 12B)				
D. Sump (contains product no more than 48 Hours)				
E. Emergency back-up generator tank				
F. Abandoned in Place (Complete 12A)				
G. Removed (Complete 12C)	X	X	X	X
H. Other (please specify)				
12. Closure Information - Tank ID No.	TANK NO 2356	TANK NO 2366	TANK NO 2376	TANK NO 2386
A. Date abandoned in place				
B. Date taken out of service	1972	1972	1972	1972
C. Date removed	9/1/99	9/1/99	9/1/99	9/1/99
D. Date of sale or transfer				
E. Closure # (if applicable)				
F. ISRA # (if applicable)				
13. Is the tank within wellhead protection area as defined on pg. 4 (Mark one for each tank) A. Yes				
B. No	X	X	X	X

SECTION C - FINANCIAL RESPONSIBILITY

Does this facility have a Financial Responsibility Assurance Mechanism? _____Yes _____No
Please list the appropriate financial information below:

_____ Type

_____ Carrier/Issuing Agency

_____ Effective Date

_____ Expiration Date

_____ Policy Number

$_____ Amount

SECTION D - MONITORING SYSTEMS

Does this facility have a release detection monitoring system which is in compliance with N.J.A.C. 7:14B-6? _____Yes _____No
If "No", please be aware that the facility must meet the appropriate deadline. (See "Dates to Know" on Page 4)

SECTION E - RECORD KEEPING / COMPLIANCE

Please answer all the questions in this section on a facility basis. Any one tank not in compliance requires a "NO" answer for the entire facility.

1. Does this facility have cathodic protection systems for all steel tanks and piping _____Yes _____No
   If "Yes", answer the following
   a. Are the systems tested every three years pursuant to N.J.A.C. 7:14B-5.2(a)? _____Yes _____No
   b. For the sacrificial anode systems, were the systems tested within 180 days after installation? (N.J.A.C. 7:14B-5.2(a)) _____Yes _____No
   c. For Impressed current systems, are the systems operational (turned on and providing continuous protection) pursuant to N.J.A.C. 7:14B-5.2(a)? _____Yes _____No
   d. For Impressed current systems, are the systems tested properly every 60 days? (N.J.A.C. 7:14B-5.2(a)) _____Yes _____No
   a. If internally lined, was the lining inspected within 10 years after installtion & every 5 years thereafter? (N.J.A.C. 7:14B-4.2(b)) _____Yes _____No
2. Are the performance claims and documentation of systems maintained by the owner or operator pursuant to N.J.A.C. 7:14B-6.7 ? _____Yes _____No
3. Are the proper monitoring, testing, sampling, repair and inventory records kept on-site pursuant to N.J.A.C. 7:14B-5 and 6? _____Yes _____No
4. Is the proper Release Response Plan kept on-site pursuant to N.J.A.C. 7:14B-5.5? _____Yes _____No
5. Are the tanks checked monthly for the presence of water pursuant to N.J.A.C. 7:14B-6? _____Yes _____No
6. Have all fill ports been permanently marked per API #1637 pursuant to N.J.A.C. 7:14B-5.8? _____Yes _____No
7. Are the tank systems monitored for releases monthly or on an alternate required frequencey pursuant to N.J.A.C. 7:14B-6? _____Yes _____No
8. Are the release detection monitoring systems operating in accordance with the manufacturers requirements? (N.J.A.C. 7:14B-6) _____Yes _____No

NOTICE: *ALL DEADLINES FOR TANK SYSTEM UPGRADE (CORROSION PROTECTION, SPILL AND OVERFILL PROTECTION) AND LEAK DETECTION HAVE PAST

IMPORTANT INFORMATION

FEE: Please make all checks payable to: "Treasurer, State of New Jersey".
Registration and Billing Schedule can be found in N.J.A.C. 7:14B-3.

PENALTY: Failure by owner or operator of a regulated underground storage tank to comply with any requirements of the State UST Act or regulations may result in the penalties set forth in N.J.S.A. 58:10A-12.

EMERGENCY: If a discharge or spill occurs, the NJDEP Hotline at (609) 292-7172 must be called IMMEDIATELY - 24 hours a day.

EXEMPTION: Residential heating oil underground storage tanks are exempt from all underground storage tank requirements.

CERTIFICATION

Must be signed as follows:

- For a corporation, by a person authorized by resolution of the Board of Directors to sign the document.
- For a partnership or sole proprietorship, by a general partner or the proprietor, respectively.
- For a municipality, State, Federal or other public agency, by either a principal executive officer or ranking elected official.
- For persons other than indicated above, by the person with legal responsibility for the site.

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attached documents and that based on my inquiry of those individuals responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

James OTT
(Typed/Printed Name)

James Ott
(Signature)

Director, Public Works
(Title)

1/16/01
(Date)

DEFINITIONS

Section B8 J. 'Safe' Suction Piping - Suction Piping which has enough slope so that the product in the pipe can drain back into the tank when the suction is released, and which has only one check valve, located directly beneath the pump in the dispensing unit.

Section B8 K. In-Line Electronic Pressure Monitor - (Used with pressurized piping only) A monitor which checks for loss of pressure in piping when no product is dispensed. This method may be used once every 30 days or every time the dispenser turns off.

Section B8 L. Automatic Line Leak Detectors - (Required with pressurized piping - Must be able to detect a 3 gph leak within 1 hour of its occurrence)

1. Flow restrictors and flow shut offs which monitor pressure within piping and when a suspected leak is detected, either restricts the flow of product through the piping well below the 3 gph leak rate it detects, or completely cuts off product flow and shuts down the pump.
2. Continuous alarm systems constantly monitor piping conditions and trigger an audible or visual alarm if a leak is suspected.

Section B 13 Wellhead Protection Area -

1. The area within a 2,000 ft. radius surrounding a public community or public non-community water system well when there is an underground storage tank containing gasoline or non-petroleum hazardous substances located within that area.
2. The area within a 750 ft. radius surrounding a public community or public non-community water system well when there is an underground storage tank containing petroleum products other than gasoline located within that area.

PUBLICATIONS AVAILABLE (on line or call for Copies)

Straight Talk on Tanmks (Release Detection Requirements)
Doing Inventory Control Right
Underground Storage Tank Owner's Self Inspection Checklist
Don't Wait Until 1998 (Upgrade requirements)
Manual Tank Gauging

WEBSITE ADDRESS: WWW.STATE.NJ.US/DEP/SRP/BUST

Telephone Number: (609) 292-8761

UST-021
3/99

APPENDIX B

SITE ASSESSMENT SUMMARY

(12/97) **New Jersey Department of Environmental Protection**

Site Remediation Program

UST Site/Remedial Investigation Report Certification Form

A. Facility Name : U.S. Army Fort Monmouth New Jersey

Facility Street Address : Directorate of Public Works Building 173

Municipality: Oceanport County : Monmouth

Block: Lot(s): Telephone Number : 732-532-6224

B. Owner (RP)'s Name:

Street Address: City :

State: Zip: Telephone Number :

C. (Check as appropriate)

___ Site Investigation Report (SIR) $500 Fee

___ Remedial Investigation Report (RIR) $1000 Fee

_X_ NA – Federal Agreement

D. (Complete all that apply)

- Assigned Case Manager : Ian Curtis, Federal Case Manager
- UST Registration Number : 81533-235 through 238 (7 digits)
- Incident Report Number 89 – 10 – 19 – 1329 (10 or 12 digits)

___–___–___–_____–___

- Tank Closure Number : Federal Case Manager

E. Certification by the Subsurface Evaluator:

The attached report conforms to the specific reporting requirements of N.J.A.C. 7:26E .....Yes No

Name: Frank Accorsi Signature: UST Cert. No.: 10042

Firm: U.S. Army Fort Monmouth Firm's UST Cert. Number: NA-U.S. Army

Firm Address: Directorate of Public Works Building 173 City: Fort Monmouth

State: NJ Zip: 07703 Telephone Number : 732-532-6224

(NOTE: Certification numbers required only if work was conducted on USTs regulated per N.J.S.A. 58:10A-21 et seq.)

F. Certification by the Responsible Party(ies) of the Facility:

The following certification shall be signed [according to the requirements of N.J.A.C. 7:14B-1.7(b)]as follows:

1. For a Corporation by a person authorized by a resolution of the board of directors to sign the document. A copy of the resolution, certified as a true copy by the secretary of the corporation, shall be submitted along with the certification; or
2. For a partnership or sole proprietorship, by a general partner or the proprietor, respectively; or
3. For a municipality, State, federal or other public agency by either a principal executive officer or ranking elected Official.

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attached documents, and that based on my inquiry of those individuals responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate, or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

Name (Print or Type): James Ott Title: Directorate of Public Works

Signature:

Company Name: U.S. Army Fort Monmouth Date:

APPENDIX C

WASTE MANIFEST

FEB. 18. 2000 2:02PM CASIE PROTANK NO. 583 P. 2/2

CASIE / PROTANK
ENVIRONMENTAL SERVICES

Please type or print in block letters. (Form designed for use on elite (12-pitch) typewriter.)

NON-HAZARDOUS MANIFEST

1. Generator's US EPA ID No. E X E M P T - - - - - - Document No. 3 4 7 5 5

2. Page 1 of

3. Generator's Name and Mailing Address: Gas Station, Saltzmar Ave., Fort Monmouth NJ

4. Generator's Phone (732) 542-5997

5. Transporter 1 Company Name: Casie Ecology Oil Salvage, Inc.

6. US EPA ID Number: N J D 0 4 5 9 9 5 6 9 3

7. Transporter 2 Company Name

8. US EPA ID Number

9. Designated Facility Name and Site Address: Casie Ecology Oil Salvage, Inc. T/A / Casie Protank, 3209 N. Mill Rd, Vineland NJ 08360

10. US EPA ID Number: N J D 0 4 5 9 9 5 6 9 3

A. Non-hazardous Manifest Document Number: NHZ020 37630

B. State Generator's ID: SAME

C. State Trans. ID

D. Transporter's Phone (609) 696-4401

E. State Trans. ID

F. Transporter's Phone ( )

G. State Facility's ID: 0814D1BP05

H. Facility's Phone (609) 696-4401

GENERATOR

	11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	L Waste No.
a.	Flammable liquids, n.o.s. (Gasoline) 3, UN1993, III	001	TT	0850	G	IID72
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above: (I,T)

K. Handling Codes for Wastes Listed Above: a. F-Ther-Ent 5012

15. Special Handling Instructions and Additional Information

a. ERG# 128

b. 24 hr emergency response #609-696-4401 K. Ambrosia

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

I hereby certify that the above-named material is not hazardous waste as defined by 40 CFR Part 261, 264 and 279 or any applicable state law.

Printed/Typed Name: FRANK ACCORSI FOR TVS — Signature: Frank Accorsi — Month Day Year: 10 8 2 7 9

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: DAVID STRANG — Signature: David Strang — Month Day Year: 10 8 2 7 9

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name — Signature — Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of non-hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name: D. Macri — Signature: D. Macri — Month Day Year: 10 8 2 7 9

2-TRANSPORTER 1 COPY

SIGNATURE AND INFORMATION *MUST* BE LEGIBLE ON ALL COPIES

APPENDIX D

UST DISPOSAL CERTIFICATE

THIS CHECK IS DELIVERED FOR PAYMENT ON THE FOLLOWING ACCOUNTS.

DATE	AMOUNT
Scrap steel	
TOTAL OF INVOICES	
LESS ___ % DISCOUNT	
LESS FREIGHT	
LESS	
TOTAL DEDUCTIONS	
AMOUNT OF CHECK	

2810

RECYCLING TECHNOLOGIES CENTER INC.
RECYCLING DIVISION
P.O. BOX 246
OAKHURST, NJ 07755

55-7233/2212

DATE 8/30

PAY TO THE ORDER OF Tecom Vinnell $ 55.20

fifty five 20/100 DOLLARS

Sovereign Bank
"Success is confidence. We can help you get there."™

MP

⑈002810⑈ ⑆221272332⑆ 109109986⑈

THIS CHECK IS DELIVERED FOR PAYMENT ON THE FOLLOWING ACCOUNTS.

DATE	AMOUNT
Scrap steel	
TOTAL OF INVOICES	
LESS ___ % DISCOUNT	
LESS FREIGHT	
LESS	
TOTAL DEDUCTIONS	
AMOUNT OF CHECK	

2815

RECYCLING TECHNOLOGIES CENTER INC.
RECYCLING DIVISION
P.O. BOX 246
OAKHURST, NJ 07755

55-7233/2212

DATE 8/31

PAY TO THE ORDER OF Tecom Vinnell $ 267.60

two hundred sixty seven 60/100 DOLLARS

Sovereign Bank
"Success is confidence. We can help you get there."™

MP

⑈002815⑈ ⑆221272332⑆ 109109986⑈

RECYCLING TECHNOLOGY CENTER, INC.

Metal Recyclers
3230 Shafto Rd.
Tinton Falls, NJ
(732) 922-9292

NO. _____

DATE. 30.9.99

Customer's Name Tecom Vanelli

Address _____

	Weight	Price		Weight	Price
Cast Iron			Lt. Copper		
Steel	55 20		Brass		
Lt. Iron			Alum Clean		
Copper #1			Lead		
Copper #2			Stainless		
			Battery		
				55 20	
			TOTAL AMOUNT:		

27400 LB

24640 LB

2760

AUG 30 1999

Weigher _____ Customer _____

RECYCLING TECHNOLOGY CENTER, INC.

Metal Recyclers
3230 Shafto Rd.
Tinton Falls, NJ
(732) 922-9292

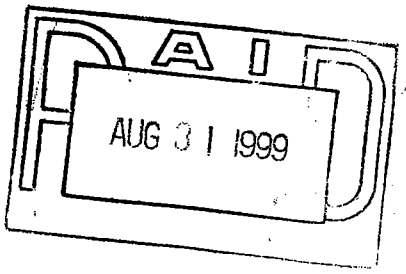
NO. 2614

DATE. 8.31.99

Customer's Name Tecom Vinnell

Address

	Weight	Price		Weight	Price
Cast Iron					
Steel	56.80		22740 LB		
Lt. Iron			19900 LB		
Copper #1			2840		
Copper #2					
				Lt. Copper	
				Brass	
				Alum Clean	
				Lead	
				Stainless	
				Battery	
					56.80
				TOTAL AMOUNT:	



Weigher _____ Customer _____

RECYCLING TECHNOLOGY CENTER, INC.

Metal Recyclers
3230 Shafto Rd.
Tinton Falls, NJ
(732) 922-9292

NO. _____

DATE 31 Aug 99

Customer's Name Tom Winnell

Address _____

	Weight	Price
Cast Iron		
Steel	40.80	
Lt. Iron		
Copper #1		
Copper #2		

21720 LB

19680 LB

2040

PAID
AUG 31 1999

	Weight	Price
Lt. Copper		
Brass		
Alum Clean		
Lead		
Stainless		
Battery		
TOTAL AMOUNT:	40.80	

Weigher _____ Customer _____

T7

RECYCLING TECHNOLOGY CENTER, INC.

Metal Recyclers
3230 Shafto Rd.
Tinton Falls, NJ
(732) 922-9292

NO. 295

DATE. 31 Aug 99

Customer's Name Tecom Dimmick

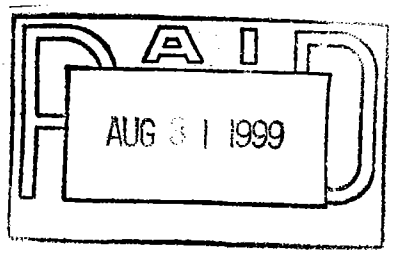
Address _____

	Weight	Price
Cast Iron		
Steel	3160	
Lt. Iron		
Copper #1		
Copper #2		

14220 LB

12640 LB

1,580



	Weight	Price
Lt. Copper		
Brass		
Alum Clean		
Lead		
Stainless		
Battery		
TOTAL AMOUNT:		31.60

Weigher _____ Customer _____

T7

RECYCLING TECHNOLOGY CENTER, INC.

(1)

Metal Recyclers
3230 Shafto Rd.
Tinton Falls, NJ
(732) 922-9292

NO. 295

DATE. 8 31 99

Customer's Name Tecon Vessel

Address _____

	Weight	Price		Weight	Price
Cast Iron			Lt. Copper		
Steel		38.80	Brass		
Lt. Iron			Alum Clean		
Copper #1			Lead		
Copper #2			Stainless		
			Battery		
					$ 38.80
					TOTAL AMOUNT:

14380 LB

12440 LB

1940

RAI
AUG 31 1999

Weigher _____ Customer _____

T10

RECYCLING TECHNOLOGY CENTER, INC.

Metal Recyclers
3230 Shafto Rd.
Tinton Falls, NJ
(732) 922-9292

NO. 295

DATE. 8-31-99

Customer's Name Tecom Vinnell Services

Address _____

	Weight	Price		Weight	Price
Cast Iron			Lt. Copper		
Steel		31.20	Brass		
Lt. Iron			Alum Clean		
Copper #1			Lead		
Copper #2			Stainless		
			Battery		
			TOTAL AMOUNT:		31.20

14000 LB

12440 LB

1560

PAID
AUG 31 1999

Weigher _____ Customer _____

T8

(2)

RECYCLING TECHNOLOGY CENTER, INC.

Metal Recyclers
3230 Shafto Rd.
Tinton Falls, NJ
(732) 922-9292

NO. 024

DATE. 8-31-99

Customer's Name Texas Vinyl

Address _____

	Weight	Price		Weight	Price
Cast Iron			Lt. Copper		
Steel		35.20	Brass		
Lt. Iron			Alum Clean		
Copper #1			Lead		
Copper #2			Stainless		
			Battery		
					$ 35.20
					TOTAL AMOUNT:

21700 LB

19940 LB

1760

RAI
AUG 31 1999

Weigher _____ Customer _____

T8

RECYCLING TECHNOLOGY CENTER, INC.

Metal Recyclers
3230 Shafto Rd.
Tinton Falls, NJ
(732) 922-9292

NO. 2614

DATE. 8-31-99

Customer's Name Tecom Viance

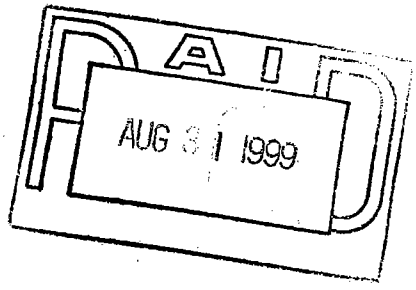
Address [illegible]

	Weight	Price		Weight	Price
Cast Iron			Lt. Copper		
Steel			Brass		
Lt. Iron	33.00		Alum Clean		
Copper #1			Lead		
Copper #2			Stainless		
			Battery		
			TOTAL AMOUNT:		33.00

21400 LB

19740 LB

1660



Weigher _____ Customer _____

T/0

FORT MONMOUTH ENVIRONMENTAL TESTING LABORATORY

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

ANALYTICAL DATA REPORT
Fort Monmouth Environmental Laboratory
ENVIRONMENTAL DIVISION
Fort Monmouth, New Jersey
PROJECT: IJO# 99-0094/UST

Bldg. 699/Saltzman Ave.

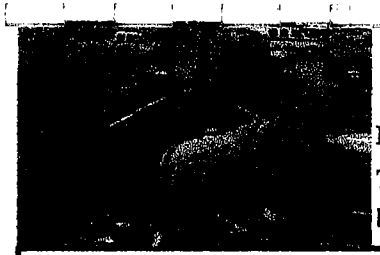
Field Sample Location	Laboratory Sample ID#	Matrix	Date and Time of Collection	Date Received
699A-North Wall 8.0-8.5' (E)	4764.01	Soil	01-Sept-99 09:15	09/01/99
699B-North Wall 8.0-8.5' (W)	4764.02	Soil	01-Sept-99 09:00	09/01/99
699C-West Wall 8.0-8.5' (N)	4764.03	Soil	01-Sept-99 09:35	09/01/99
699D-West Wall 8.0-8.5' (S)	4764.04	Soil	01-Sept-99 09:45	09/01/99
699E-South Wall 8.0-8.5' (W)	4764.05	Soil	01-Sept-99 11:20	09/01/99
699F-South Wall 8.0-8.5' (E)	4764.06	Soil	01-Sept-99 11:40	09/01/99
699G-East Wall 8.0-8.5' (S)	4764.07	Soil	01-Sept-99 12:00	09/01/99
699H-East Wall 8.0-8.5' (N)	4764.08	Soil	01-Sept-99 09:25	09/01/99
699I-Bottom 9.5-10.0'	4764.09	Soil	01-Sept-99 10:00	09/01/99
699D DUP.	4764.10	Soil	01-Sept-99 09:45	09/01/99
699 GW	4764.11	Aqueous	01-Sept-99 12:10	09/01/99
Trip Blank	4764.12	Methanol	01-Sept-99	09/01/99

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

ENCLOSURE:
CHAIN OF CUSTODY
RESULTS

9/16/99
Daniel Wright/Date
Laboratory Director

CHAIN OF CUSTODY



Fort Monmouth Environmental Testing Laboratory

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

Chain of Custody Record

Customer: Charles Appleby
Phone #: X26224
( )DERA (X)OMA UST Assessment

Project No: 99-~~0008~~0094
Location: BLDG. 699 SALTZMAN AVE.
UST#

Samplers Name / Company : Frank Accorsi/TVS

Lab Sample I.D.	Sample Location	Date	Time	Sample Type	# bottles	Analysis Parameters: ~~TPHC~~ Pb	% SOLIDS	VOA+10	VOA ID Number	PID Reading	Comments: * = Samples Kept <4 Celsius / Remarks / Preservation Method
47Ldt. 01	699A- NORTH WALL 8.0-8.5 FT (E)	9-1-99	0915	SOIL	2	X	X	X	736	430	ICE
02	699B- NORTH WALL(W) 8.0-8.5 FT		0900			X	X	X	737	420	
03	699C- WEST WALL(N) 8.0-8.5 FT		0935			X	X	X	738	510	
04	699D- WEST WALL (S) 8.0-8.5 FT		0945			X	X	X	739	450	
05	699E- SOUTH WALL(W) 8.0-8.5 FT		1120			X	X	X	746	36	
06	699F- SOUTH WALL(E) 8.0-8.5 FT		1140			X	X	X	741	20	
07	699G- EAST WALL(S) 8.0-8.5 FT		1200			X	X	X	742	280	
08	699H- EAST WALL(N) 8.0-8.5 FT		0925			X	X	X	743	350	
09	699I- BOTTOM 9.5-10.0 FT		1000 0945 FD			X	X	X	740	20	
10	699D- DUPLICATE		0945			X	X	X	744	430	
11	699-GW		1210	AQ	4	X	X	X	-	-	*
12	TRIP BLANK		-		1			X	745	-	

OVM sn#580U-64455.343 was calibrated with zero air & w/245ppm Isobutylene read 245 ppm. 0900 9-1-99 FA (time/date & initial)

Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):
Frank Accorsi	9-1-99 1306				
Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):

Report Type: ( )Full, ( )Reduced, (X)Standard, ( )Screen / non-certified
Turnaround time: (X)Standard 4 wks, ( )Rush ___ Days, ( )ASAP Verbal ___ Hrs.

Remarks: * HOLD GW ANALYSIS UNTIL APPROVED BY C. APPLEBY
All sample points have been GPS? (X)YES ( )NO ( )NA

Dedicated Sampling Tools Used

print legibly

USTcoc.xls8/18/99

Method Summary

EPA Method 624 – Aqueous
Gas Chromatographic Determination of Volatiles in Water

A 5 ml volume of sample is added to 5 ml aliquot of water. Surrogates and internal standards are added and the sample is placed on a purge and trap concentrator. The sample is purged and desorbed into a GC/MS system. Volatiles are then identified and quantitated.

EPA SW-846 Method 8260
Gas Chromatographic Determination of Volatiles in Soil

A 50ul volume of methanol soil sample is added to 5 ml aliquot of water. Surrogates and internal standards are added and the sample is placed on a purge and trap concentrator. The sample as purged and desorbed into a GC/MS system. Volatiles are identified and quantitated. The final concentration is calculated using soil weight, percent moisture, methanol volume and concentration.

VOLATILES

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

Data File	**VC000746.D**	Sample Name	**Vblk25**
Operator	**Skelton**	Field ID	**Vblk25**
Date Acquired	**3 Sep 1999 11:07 am**	Sample Multiplie	**1**

CAS#	Compound Name	R.T.	Response	Result	Regulatory Level (ug/l)*	MDL	Qualifier
107028	Acrolein			not detected	50	1.85 ug/L	
107131	Acrylonitrile			not detected	50	2.78 ug/L	
75650	tert-Butyl alcohol			not detected	nle	8.52 ug/L	
1634044	Methyl-tert-Butyl ether			not detected	nle	0.16 ug/L	
108203	Di-isopropyl ether			not detected	nle	0.25 ug/L	
	Dichlorodifluoromethane			not detected	nle	1.68 ug/L	
74-87-3	Chloromethane			not detected	30	1.16 ug/L	
75-01-4	Vinyl Chloride			not detected	5	1.06 ug/L	
74-83-9	Bromomethane			not detected	10	1.10 ug/L	
75-00-3	Chloroethane			not detected	nle	1.01 ug/L	
75-69-4	Trichlorofluoromethane			not detected	nle	0.50 ug/L	
75-35-4	1,1-Dichloroethene			not detected	2	0.24 ug/L	
67-64-1	Acetone			not detected	700	1.36 ug/L	
75-15-0	Carbon Disulfide			not detected	nle	0.46 ug/L	
75-09-2	Methylene Chloride			not detected	2	0.24 ug/L	
156-60-5	trans-1,2-Dichloroethene			not detected	100	0.16 ug/L	
75-35-3	1,1-Dichloroethane			not detected	70	0.12 ug/L	
108-05-4	Vinyl Acetate			not detected	nle	0.78 ug/L	
78-93-3	2-Butanone			not detected	300	0.62 ug/L	
	cis-1,2-Dichloroethene			not detected	10	0.17 ug/L	
67-66-3	Chloroform			not detected	6	0.30 ug/L	
75-55-6	1,1,1-Trichloroethane			not detected	30	0.23 ug/L	
56-23-5	Carbon Tetrachloride			not detected	2	0.47 ug/L	
71-43-2	Benzene			not detected	1	0.23 ug/L	
107-06-2	1,2-Dichloroethane			not detected	2	0.18 ug/L	
79-01-6	Trichloroethene			not detected	1	0.23 ug/L	
78-87-5	1,2-Dichloropropane			not detected	1	0.40 ug/L	
75-27-4	Bromodichloromethane			not detected	1	0.55 ug/L	
110-75-8	2-Chloroethyl vinyl ether			not detected	nle	0.65 ug/L	
10061-01-5	cis-1,3-Dichloropropene			not detected	nle	0.69 ug/L	
108-10-1	4-Methyl-2-Pentanone			not detected	400	0.59 ug/L	
108-88-3	Toluene			not detected	1000	0.37 ug/L	
10061-02-6	trans-1,3-Dichloropropene			not detected	nle	0.87 ug/L	
79-00-5	1,1,2-Trichloroethane			not detected	3	0.48 ug/L	
127-18-4	Tetrachloroethene			not detected	1	0.32 ug/L	
591-78-6	2-Hexanone			not detected	nle	0.71 ug/L	
126-48-1	Dibromochloromethane			not detected	10	0.86 ug/L	
108-90-7	Chlorobenzene			not detected	4	0.39 ug/L	
100-41-4	Ethylbenzene			not detected	700	0.65 ug/L	
1330-20-7	m+p-Xylenes			not detected	nle	1.14 ug/L	
1330-20-7	o-Xylene			not detected	nle	0.62 ug/L	
100-42-5	Styrene			not detected	100	0.56 ug/L	
75-25-2	Bromoform			not detected	4	0.70 ug/L	
79-34-5	1,1,2,2-Tetrachloroethane			not detected	2	0.47 ug/L	
541-73-1	1,3-Dichlorobenzene			not detected	600	0.55 ug/L	
106-46-7	1,4-Dichlorobenzene			not detected	75	0.57 ug/L	
95-50-1	1,2-Dichlorobenzene			not detected	600	0.64 ug/L	

*Higher of PQL's and Ground Water Quality Criteria as per N.J.A.C. 7:9-6 2-Sept-9

Qualifiers

B = Compound found in related blank
E = Value above linear range
D = Value from dilution
PQL = Practical Quantitation Limit

MDL = Method Detection Limit
NLE = No Limit Established
R.T. = Retention Time

9/10/99 10:28 AM

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1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

Vblk25

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: Vblk25

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: VC000746.D

Level: (low/med) LOW Date Received: 9/1/99

% Moisture: not dec. Date Analyzed: 9/3/99

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

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

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

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

Data File	**VC000761.D**	Sample Name	**4764.11**
Operator	**Skelton**	Field ID	**699-GW**
Date Acquired	**3 Sep 1999 9:38 pm**	Sample Multiplie	**1**

CAS#	Compound Name	R.T.	Response	Result	Regulatory Level (ug/l)*	MDL	Qualifier
107028	Acrolein			not detected	50	1.85 ug/L	
107131	Acrylonitrile			not detected	50	2.78 ug/L	
75650	tert-Butyl alcohol			not detected	nle	8.52 ug/L	
1634044	Methyl-tert-Butyl ether	11.81	38860025	234.41 ug/L	nle	0.16 ug/L	E
108203	Di-isopropyl ether			not detected	nle	0.25 ug/L	
	Dichlorodifluoromethane			not detected	nle	1.68 ug/L	
74-87-3	Chloromethane			not detected	30	1.16 ug/L	
75-01-4	Vinyl Chloride			not detected	5	1.06 ug/L	
74-83-9	Bromomethane			not detected	10	1.10 ug/L	
75-00-3	Chloroethane			not detected	nle	1.01 ug/L	
75-69-4	Trichlorofluoromethane			not detected	nle	0.50 ug/L	
75-35-4	1,1-Dichloroethene			not detected	2	0.24 ug/L	
67-64-1	Acetone			not detected	700	1.36 ug/L	
75-15-0	Carbon Disulfide			not detected	nle	0.46 ug/L	
75-09-2	Methylene Chloride			not detected	2	0.24 ug/L	
156-60-5	trans-1,2-Dichloroethene			not detected	100	0.16 ug/L	
75-35-3	1,1-Dichloroethane			not detected	70	0.12 ug/L	
108-05-4	Vinyl Acetate			not detected	nle	0.78 ug/L	
78-93-3	2-Butanone			not detected	300	0.62 ug/L	
	cis-1,2-Dichloroethene			not detected	10	0.17 ug/L	
67-66-3	Chloroform			not detected	6	0.30 ug/L	
75-55-6	1,1,1-Trichloroethane			not detected	30	0.23 ug/L	
56-23-5	Carbon Tetrachloride			not detected	2	0.47 ug/L	
71-43-2	Benzene	18.66	58711716	205.21 ug/L	1	0.23 ug/L	E
107-06-2	1,2-Dichloroethane			not detected	2	0.18 ug/L	
79-01-6	Trichloroethene			not detected	1	0.23 ug/L	
78-87-5	1,2-Dichloropropane			not detected	1	0.40 ug/L	
75-27-4	Bromodichloromethane			not detected	1	0.55 ug/L	
110-75-8	2-Chloroethyl vinyl ether			not detected	nle	0.65 ug/L	
10061-01-5	cis-1,3-Dichloropropene			not detected	nle	0.69 ug/L	
108-10-1	4-Methyl-2-Pentanone			not detected	400	0.59 ug/L	
108-88-3	Toluene	23.65	67761507	200.64 ug/L	1000	0.37 ug/L	E
10061-02-6	trans-1,3-Dichloropropene			not detected	nle	0.87 ug/L	
79-00-5	1,1,2-Trichloroethane			not detected	3	0.48 ug/L	
127-18-4	Tetrachloroethene			not detected	1	0.32 ug/L	
591-78-6	2-Hexanone			not detected	nle	0.71 ug/L	
126-48-1	Dibromochloromethane			not detected	10	0.86 ug/L	
108-90-7	Chlorobenzene			not detected	4	0.39 ug/L	
100-41-4	Ethylbenzene	27.48	53941716	144.67 ug/L	700	0.65 ug/L	E
1330-20-7	m+p-Xylenes	27.64	59879447	388.63 ug/L	nle	1.14 ug/L	E
1330-20-7	o-Xylene	28.78	52526900	189.81 ug/L	nle	0.62 ug/L	E
100-42-5	Styrene			not detected	100	0.56 ug/L	
75-25-2	Bromoform			not detected	4	0.70 ug/L	
79-34-5	1,1,2,2-Tetrachloroethane			not detected	2	0.47 ug/L	
541-73-1	1,3-Dichlorobenzene			not detected	600	0.55 ug/L	
106-46-7	1,4-Dichlorobenzene			not detected	75	0.57 ug/L	
95-50-1	1,2-Dichlorobenzene			not detected	600	0.64 ug/L	

*Higher of PQL's and Ground Water Quality Criteria as per N.J.A.C. 7:9-6 2-Sept-9

Qualifiers

B = Compound found in related blank
E = Value above linear range
D = Value from dilution
PQL = Practical Quantitation Limit
MDL = Method Detection Limit
NLE = No Limit Established
R.T. = Retention Time

9/10/99 10:28 AM

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

699-GW

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 4764.11

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: VC000761.D

Level: (low/med) LOW Date Received: 9/1/99

% Moisture: not dec. Date Analyzed: 9/3/99

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

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

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

Number TICs found: 10

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 000100-61-8	Aniline, N-methyl-	27.70	1000	JN
2. 000103-65-1	Benzene, propyl-	30.62	180	JN
3.	unknown	30.86	710	J
4.	unknown	31.94	650	J
5.	unknown	33.04	320	J
6.	unknown	33.56	230	J
7.	unknown	33.78	250	J
8.	unknown	34.27	94	J
9.	unknown	34.45	150	J
10.	unknown	34.95	91	J

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

Data File	**VC000762.D**	Sample Name	**4764.11**
Operator	**Skelton**	Field ID	**699-GW**
Date Acquired	**3 Sep 1999 10:19 pm**	Sample Multiplie	**10**

CAS#	Compound Name	R.T.	Response	Result	Regulatory Level (ug/l)*	MDL	Qualifier
107028	Acrolein			not detected	50	18.50 ug/L	
107131	Acrylonitrile			not detected	50	27.80 ug/L	
75650	tert-Butyl alcohol			not detected	nle	85.20 ug/L	
1634044	Methyl-tert-Butyl ether	11.83	4939746	303.83 ug/L	nle	1.60 ug/L	D
108203	Di-isopropyl ether			not detected	nle	2.50 ug/L	
	Dichlorodifluoromethane			not detected	nle	16.80 ug/L	
74-87-3	Chloromethane			not detected	30	11.60 ug/L	
75-01-4	Vinyl Chloride			not detected	5	10.60 ug/L	
74-83-9	Bromomethane			not detected	10	11.00 ug/L	
75-00-3	Chloroethane			not detected	nle	10.10 ug/L	
75-69-4	Trichlorofluoromethane			not detected	nle	5.00 ug/L	
75-35-4	1,1-Dichloroethene			not detected	2	2.40 ug/L	
67-64-1	Acetone			not detected	700	13.60 ug/L	
75-15-0	Carbon Disulfide			not detected	nle	4.60 ug/L	
75-09-2	Methylene Chloride			not detected	2	2.40 ug/L	
156-60-5	trans-1,2-Dichloroethene			not detected	100	1.60 ug/L	
75-35-3	1,1-Dichloroethane			not detected	70	1.20 ug/L	
108-05-4	Vinyl Acetate			not detected	nle	7.80 ug/L	
78-93-3	2-Butanone			not detected	300	6.20 ug/L	
	cis-1,2-Dichloroethene			not detected	10	1.70 ug/L	
67-66-3	Chloroform			not detected	6	3.00 ug/L	
75-55-6	1,1,1-Trichloroethane			not detected	30	2.30 ug/L	
56-23-5	Carbon Tetrachloride			not detected	2	4.70 ug/L	
71-43-2	Benzene	18.61	20712014	729.61 ug/L	1	2.30 ug/L	D
107-06-2	1,2-Dichloroethane			not detected	2	1.80 ug/L	
79-01-6	Trichloroethene			not detected	1	2.30 ug/L	
78-87-5	1,2-Dichloropropane			not detected	1	4.00 ug/L	
75-27-4	Bromodichloromethane			not detected	1	5.50 ug/L	
110-75-8	2-Chloroethyl vinyl ether			not detected	nle	6.50 ug/L	
10061-01-5	cis-1,3-Dichloropropene			not detected	nle	6.90 ug/L	
108-10-1	4-Methyl-2-Pentanone			not detected	400	5.90 ug/L	
108-88-3	Toluene	23.66	46242230	1380.00 ug/L	1000	3.70 ug/L	E D
10061-02-6	trans-1,3-Dichloropropene			not detected	nle	8.70 ug/L	
79-00-5	1,1,2-Trichloroethane			not detected	3	4.80 ug/L	
127-18-4	Tetrachloroethene			not detected	1	3.20 ug/L	
591-78-6	2-Hexanone			not detected	nle	7.10 ug/L	
126-48-1	Dibromochloromethane			not detected	10	8.60 ug/L	
108-90-7	Chlorobenzene			not detected	4	3.90 ug/L	
100-41-4	Ethylbenzene	27.47	32749913	886.90 ug/L	700	6.50 ug/L	D
1330-20-7	m+p-Xylenes	27.69	40715242	2668.27 ug/L	nle	11.40 ug/L	E D
1330-20-7	o-Xylene	28.76	34196045	1247.74 ug/L	nle	6.20 ug/L	E D
100-42-5	Styrene			not detected	100	5.60 ug/L	
75-25-2	Bromoform			not detected	4	7.00 ug/L	
79-34-5	1,1,2,2-Tetrachloroethane			not detected	2	4.70 ug/L	
541-73-1	1,3-Dichlorobenzene			not detected	600	5.50 ug/L	
106-46-7	1,4-Dichlorobenzene			not detected	75	5.70 ug/L	
95-50-1	1,2-Dichlorobenzene			not detected	600	6.40 ug/L	

*Higher of PQL's and Ground Water Quality Criteria as per N.J.A.C. 7:9-6 2-Sept-9

Qualifiers

B = Compound found in related blank
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D = Value from dilution
PQL = Practical Quantitation Limit

MDL = Method Detection Limit
NLE = No Limit Established
R.T. = Retention Time

9/10/99 10:28 AM

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

Data File	**VC000763.D**	Sample Name	**4764.11**
Operator	**Skelton**	Field ID	**699-GW**
Date Acquired	**3 Sep 1999 11:00 pm**	Sample Multiplie	**50**

CAS#	Compound Name	R.T.	Response	Result	Regulatory Level (ug/l)*	MDL	Qualifier
107028	Acrolein			not detected	50	92.50 ug/L	
107131	Acrylonitrile			not detected	50	139.00 ug/L	
75650	tert-Butyl alcohol			not detected	nle	426.00 ug/L	
1634044	Methyl-tert-Butyl ether	11.83	1055743	326.82 ug/L	nle	8.00 ug/L	D
108203	Di-isopropyl ether			not detected	nle	12.50 ug/L	
	Dichlorodifluoromethane			not detected	nle	84.00 ug/L	
74-87-3	Chloromethane			not detected	30	58.00 ug/L	
75-01-4	Vinyl Chloride			not detected	5	53.00 ug/L	
74-83-9	Bromomethane			not detected	10	55.00 ug/L	
75-00-3	Chloroethane			not detected	nle	50.50 ug/L	
75-69-4	Trichlorofluoromethane			not detected	nle	25.00 ug/L	
75-35-4	1,1-Dichloroethene			not detected	2	12.00 ug/L	
67-64-1	Acetone			not detected	700	68.00 ug/L	
75-15-0	Carbon Disulfide			not detected	nle	23.00 ug/L	
75-09-2	Methylene Chloride			not detected	2	12.00 ug/L	
156-60-5	trans-1,2-Dichloroethene			not detected	100	8.00 ug/L	
75-35-3	1,1-Dichloroethane			not detected	70	6.00 ug/L	
108-05-4	Vinyl Acetate			not detected	nle	39.00 ug/L	
78-93-3	2-Butanone			not detected	300	31.00 ug/L	
	cis-1,2-Dichloroethene			not detected	10	8.50 ug/L	
67-66-3	Chloroform			not detected	6	15.00 ug/L	
75-55-6	1,1,1-Trichloroethane			not detected	30	11.50 ug/L	
56-23-5	Carbon Tetrachloride			not detected	2	23.50 ug/L	
71-43-2	Benzene	18.61	4855433	868.51 ug/L	1	11.50 ug/L	D
107-06-2	1,2-Dichloroethane			not detected	2	9.00 ug/L	
79-01-6	Trichloroethene			not detected	1	11.50 ug/L	
78-87-5	1,2-Dichloropropane			not detected	1	20.00 ug/L	
75-27-4	Bromodichloromethane			not detected	1	27.50 ug/L	
110-75-8	2-Chloroethyl vinyl ether			not detected	nle	32.50 ug/L	
10061-01-5	cis-1,3-Dichloropropene			not detected	nle	34.50 ug/L	
108-10-1	4-Methyl-2-Pentanone			not detected	400	29.50 ug/L	
108-88-3	Toluene	23.63	21884650	3316.33 ug/L	1000	18.50 ug/L	D
10061-02-6	trans-1,3-Dichloropropene			not detected	nle	43.50 ug/L	
79-00-5	1,1,2-Trichloroethane			not detected	3	24.00 ug/L	
127-18-4	Tetrachloroethene			not detected	1	16.00 ug/L	
591-78-6	2-Hexanone			not detected	nle	35.50 ug/L	
126-48-1	Dibromochloromethane			not detected	10	43.00 ug/L	
108-90-7	Chlorobenzene			not detected	4	19.50 ug/L	
100-41-4	Ethylbenzene	27.47	10656721	1453.59 ug/L	700	32.50 ug/L	D
1330-20-7	m+p-Xylenes	27.67	17891343	5905.68 ug/L	nle	57.00 ug/L	D
1330-20-7	o-Xylene	28.76	11767737	2162.69 ug/L	nle	31.00 ug/L	D
100-42-5	Styrene			not detected	100	28.00 ug/L	
75-25-2	Bromoform			not detected	4	35.00 ug/L	
79-34-5	1,1,2,2-Tetrachloroethane			not detected	2	23.50 ug/L	
541-73-1	1,3-Dichlorobenzene			not detected	600	27.50 ug/L	
106-46-7	1,4-Dichlorobenzene			not detected	75	28.50 ug/L	
95-50-1	1,2-Dichlorobenzene			not detected	600	32.00 ug/L	

*Higher of PQL's and Ground Water Quality Criteria as per N.J.A.C. 7:9-6 2-Sept-9

Qualifiers

B = Compound found in related blank
E = Value above linear range
D = Value from dilution
PQL = Practical Quantitation Limit

MDL = Method Detection Limit
NLE = No Limit Established
R.T. = Retention Time

9/10/99 10:28 AM

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1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

Vblk25

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk25

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VC000746.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 0 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1800	U
107131	Acrylonitrile	1800	U
75650	tert-Butyl alcohol	3200	U
1634044	Methyl-tert-Butyl ether	750	U
108203	Di-isopropyl ether	500	U
	Dichlorodifluoromethane	1000	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	750	U
74-83-9	Bromomethane	500	U
75-00-3	Chloroethane	750	U
75-69-4	Trichlorofluoromethane	500	U
75-35-4	1,1-Dichloroethene	250	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-09-2	Methylene Chloride	500	U
156-60-5	trans-1,2-Dichloroethene	500	U
75-35-3	1,1-Dichloroethane	250	U
108-05-4	Vinyl Acetate	750	U
78-93-3	2-Butanone	750	U
	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
75-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	500	U
71-43-2	Benzene	250	U
107-06-2	1,2-Dichloroethane	500	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
110-75-8	2-Chloroethyl vinyl ether	500	U
10061-01-5	cis-1,3-Dichloropropene	250	U
108-10-1	4-Methyl-2-Pentanone	500	U
108-88-3	Toluene	250	U
10061-02-6	trans-1,3-Dichloropropene	500	U
79-00-5	1,1,2-Trichloroethane	500	U
127-18-4	Tetrachloroethene	250	U
591-78-6	2-Hexanone	500	U
126-48-1	Dibromochloromethane	500	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	500	U

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

Vblk25

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk25

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VC000746.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 0 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	750	U
1330-20-7	o-Xylene	500	U
100-42-5	Styrene	500	U
75-25-2	Bromoform	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

Vblk25

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk25

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VC000746.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 0 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

Vblk128

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk128

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004228.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 0 Date Analyzed: 9/7/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1800	U
107131	Acrylonitrile	1800	U
75650	tert-Butyl alcohol	3200	U
1634044	Methyl-tert-Butyl ether	750	U
108203	Di-isopropyl ether	500	U
	Dichlorodifluoromethane	1000	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	750	U
74-83-9	Bromomethane	500	U
75-00-3	Chloroethane	750	U
75-69-4	Trichlorofluoromethane	500	U
75-35-4	1,1-Dichloroethene	250	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-09-2	Methylene Chloride	500	U
156-60-5	trans-1,2-Dichloroethene	500	U
75-35-3	1,1-Dichloroethane	250	U
108-05-4	Vinyl Acetate	750	U
78-93-3	2-Butanone	750	U
	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
75-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	500	U
71-43-2	Benzene	250	U
107-06-2	1,2-Dichloroethane	500	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
110-75-8	2-Chloroethyl vinyl ether	500	U
10061-01-5	cis-1,3-Dichloropropene	250	U
108-10-1	4-Methyl-2-Pentanone	500	U
108-88-3	Toluene	250	U
10061-02-6	trans-1,3-Dichloropropene	500	U
79-00-5	1,1,2-Trichloroethane	500	U
127-18-4	Tetrachloroethene	250	U
591-78-6	2-Hexanone	500	U
126-48-1	Dibromochloromethane	500	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	500	U

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

Vblk128

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk128

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004228.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 0 Date Analyzed: 9/7/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	750	U
1330-20-7	o-Xylene	500	U
100-42-5	Styrene	500	U
75-25-2	Bromoform	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

Vblk128

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk128

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004228.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 0 Date Analyzed: 9/7/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

Trip Blank

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.12

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004237.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 0 Date Analyzed: 9/7/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1800	U
107131	Acrylonitrile	1800	U
75650	tert-Butyl alcohol	3200	U
1634044	Methyl-tert-Butyl ether	750	U
108203	Di-isopropyl ether	500	U
	Dichlorodifluoromethane	1000	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	750	U
74-83-9	Bromomethane	500	U
75-00-3	Chloroethane	750	U
75-69-4	Trichlorofluoromethane	500	U
75-35-4	1,1-Dichloroethene	250	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-09-2	Methylene Chloride	500	U
156-60-5	trans-1,2-Dichloroethene	500	U
75-35-3	1,1-Dichloroethane	250	U
108-05-4	Vinyl Acetate	750	U
78-93-3	2-Butanone	750	U
	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
75-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	500	U
71-43-2	Benzene	250	U
107-06-2	1,2-Dichloroethane	500	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
110-75-8	2-Chloroethyl vinyl ether	500	U
10061-01-5	cis-1,3-Dichloropropene	250	U
108-10-1	4-Methyl-2-Pentanone	500	U
108-88-3	Toluene	250	U
10061-02-6	trans-1,3-Dichloropropene	500	U
79-00-5	1,1,2-Trichloroethane	500	U
127-18-4	Tetrachloroethene	250	U
591-78-6	2-Hexanone	500	U
126-48-1	Dibromochloromethane	500	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	500	U

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

Trip Blank

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.12

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004237.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 0 Date Analyzed: 9/7/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	750	U
1330-20-7	o-Xylene	500	U
100-42-5	Styrene	500	U
75-25-2	Bromoform	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

Trip Blank

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.12

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004237.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 0 Date Analyzed: 9/7/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699A

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.01

Sample wt/vol: 10.2 (g/ml) G Lab File ID: VC000750.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 19 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	2100	U
107131	Acrylonitrile	2100	U
75650	tert-Butyl alcohol	3900	U
1634044	Methyl-tert-Butyl ether	910	U
108203	Di-isopropyl ether	610	U
	Dichlorodifluoromethane	1200	U
74-87-3	Chloromethane	300	U
75-01-4	Vinyl Chloride	910	U
74-83-9	Bromomethane	610	U
75-00-3	Chloroethane	910	U
75-69-4	Trichlorofluoromethane	610	U
75-35-4	1,1-Dichloroethene	300	U
67-64-1	Acetone	610	U
75-15-0	Carbon Disulfide	300	U
75-09-2	Methylene Chloride	610	U
156-60-5	trans-1,2-Dichloroethene	610	U
75-35-3	1,1-Dichloroethane	300	U
108-05-4	Vinyl Acetate	910	U
78-93-3	2-Butanone	910	U
	cis-1,2-Dichloroethene	300	U
67-66-3	Chloroform	300	U
75-55-6	1,1,1-Trichloroethane	300	U
56-23-5	Carbon Tetrachloride	610	U
71-43-2	Benzene	18000	
107-06-2	1,2-Dichloroethane	610	U
79-01-6	Trichloroethene	300	U
78-87-5	1,2-Dichloropropane	300	U
75-27-4	Bromodichloromethane	300	U
110-75-8	2-Chloroethyl vinyl ether	610	U
10061-01-5	cis-1,3-Dichloropropene	300	U
108-10-1	4-Methyl-2-Pentanone	610	U
108-88-3	Toluene	50000	E
10061-02-6	trans-1,3-Dichloropropene	610	U
79-00-5	1,1,2-Trichloroethane	610	U
127-18-4	Tetrachloroethene	300	U
591-78-6	2-Hexanone	610	U
126-48-1	Dibromochloromethane	610	U
108-90-7	Chlorobenzene	300	U
100-41-4	Ethylbenzene	30000	

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699A

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.01

Sample wt/vol: 10.2 (g/ml) G Lab File ID: VC000750.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 19 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	95000	E
1330-20-7	o-Xylene	44000	E
100-42-5	Styrene	610	U
75-25-2	Bromoform	610	U
79-34-5	1,1,2,2-Tetrachloroethane	610	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

699A

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.01

Sample wt/vol: 10.2 (g/ml) G Lab File ID: VC000750.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 19 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 15

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 002216-34-4	Octane, 4-methyl-	25.64	69000	JN
2.	unknown	25.97	50000	J
3. 000111-84-2	Nonane	26.99	33000	JN
4. 000098-82-8	Benzene, (1-methylethyl)-	29.64	30000	JN
5. 000103-65-1	Benzene, propyl-	30.62	45000	JN
6.	unknown	30.85	180000	J
7. 000611-14-3	Benzene, 1-ethyl-2-methyl-	31.00	78000	JN
8. 000526-73-8	Benzene, 1,2,3-trimethyl-	31.61	60000	JN
9.	unknown	31.93	160000	J
10. 000095-63-6	Benzene, 1,2,4-trimethyl-	33.04	56000	JN
11.	unknown	33.38	59000	J
12.	unknown	33.56	85000	J
13. 000496-11-7	Indane	33.77	38000	JN
14. 000933-98-2	Benzene, 1-ethyl-2,3-dimethyl-	34.19	30000	JN
15.	unknown	34.44	46000	J

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699A DL

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.01

Sample wt/vol: 10.2 (g/ml) G Lab File ID: VB004229.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 19 Date Analyzed: 9/7/99

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	21000	U
107131	Acrylonitrile	21000	U
75650	tert-Butyl alcohol	39000	U
1634044	Methyl-tert-Butyl ether	9100	U
108203	Di-isopropyl ether	6100	U
	Dichlorodifluoromethane	12000	U
74-87-3	Chloromethane	3000	U
75-01-4	Vinyl Chloride	9100	U
74-83-9	Bromomethane	6100	U
75-00-3	Chloroethane	9100	U
75-69-4	Trichlorofluoromethane	6100	U
75-35-4	1,1-Dichloroethene	3000	U
67-64-1	Acetone	6100	U
75-15-0	Carbon Disulfide	3000	U
75-09-2	Methylene Chloride	6100	U
156-60-5	trans-1,2-Dichloroethene	6100	U
75-35-3	1,1-Dichloroethane	3000	U
108-05-4	Vinyl Acetate	9100	U
78-93-3	2-Butanone	9100	U
	cis-1,2-Dichloroethene	3000	U
67-66-3	Chloroform	3000	U
75-55-6	1,1,1-Trichloroethane	3000	U
56-23-5	Carbon Tetrachloride	6100	U
71-43-2	Benzene	7300	D
107-06-2	1,2-Dichloroethane	6100	U
79-01-6	Trichloroethene	3000	U
78-87-5	1,2-Dichloropropane	3000	U
75-27-4	Bromodichloromethane	3000	U
110-75-8	2-Chloroethyl vinyl ether	6100	U
10061-01-5	cis-1,3-Dichloropropene	3000	U
108-10-1	4-Methyl-2-Pentanone	6100	U
108-88-3	Toluene	54000	D
10061-02-6	trans-1,3-Dichloropropene	6100	U
79-00-5	1,1,2-Trichloroethane	6100	U
127-18-4	Tetrachloroethene	3000	U
591-78-6	2-Hexanone	6100	U
126-48-1	Dibromochloromethane	6100	U
108-90-7	Chlorobenzene	3000	U
100-41-4	Ethylbenzene	14000	D

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699A DL

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.01

Sample wt/vol: 10.2 (g/ml) G Lab File ID: VB004229.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 19 Date Analyzed: 9/7/99

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	66000	D
1330-20-7	o-Xylene	30000	D
100-42-5	Styrene	6100	U
75-25-2	Bromoform	6100	U
79-34-5	1,1,2,2-Tetrachloroethane	6100	U

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699B

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.02

Sample wt/vol: 10.5 (g/ml) G Lab File ID: VC000751.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 13.13 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1900	U
107131	Acrylonitrile	1900	U
75650	tert-Butyl alcohol	3600	U
1634044	Methyl-tert-Butyl ether	820	U
108203	Di-isopropyl ether	550	U
	Dichlorodifluoromethane	1100	U
74-87-3	Chloromethane	270	U
75-01-4	Vinyl Chloride	820	U
74-83-9	Bromomethane	550	U
75-00-3	Chloroethane	820	U
75-69-4	Trichlorofluoromethane	550	U
75-35-4	1,1-Dichloroethene	270	U
67-64-1	Acetone	550	U
75-15-0	Carbon Disulfide	270	U
75-09-2	Methylene Chloride	550	U
156-60-5	trans-1,2-Dichloroethene	550	U
75-35-3	1,1-Dichloroethane	270	U
108-05-4	Vinyl Acetate	820	U
78-93-3	2-Butanone	820	U
	cis-1,2-Dichloroethene	270	U
67-66-3	Chloroform	270	U
75-55-6	1,1,1-Trichloroethane	270	U
56-23-5	Carbon Tetrachloride	550	U
71-43-2	Benzene	8200	
107-06-2	1,2-Dichloroethane	550	U
79-01-6	Trichloroethene	270	U
78-87-5	1,2-Dichloropropane	270	U
75-27-4	Bromodichloromethane	270	U
110-75-8	2-Chloroethyl vinyl ether	550	U
10061-01-5	cis-1,3-Dichloropropene	270	U
108-10-1	4-Methyl-2-Pentanone	550	U
108-88-3	Toluene	41000	E
10061-02-6	trans-1,3-Dichloropropene	550	U
79-00-5	1,1,2-Trichloroethane	550	U
127-18-4	Tetrachloroethene	270	U
591-78-6	2-Hexanone	550	U
126-48-1	Dibromochloromethane	550	U
108-90-7	Chlorobenzene	270	U
100-41-4	Ethylbenzene	28000	E

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699B

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.02

Sample wt/vol: 10.5 (g/ml) G Lab File ID: VC000751.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 13.13 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	85000	E
1330-20-7	o-Xylene	40000	E
100-42-5	Styrene	550	U
75-25-2	Bromoform	550	U
79-34-5	1,1,2,2-Tetrachloroethane	550	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

699B

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.02

Sample wt/vol: 10.5 (g/ml) G Lab File ID: VC000751.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 13.13 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 10

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 002216-34-4	Octane, 4-methyl-	25.64	70000	JN
2.	unknown	25.97	54000	J
3.	unknown	30.86	190000	J
4. 000526-73-8	Benzene, 1,2,3-trimethyl-	31.00	83000	JN
5. 000098-82-8	Benzene, (1-methylethyl)-	31.61	70000	JN
6.	unknown	31.94	160000	J
7. 000108-67-8	Benzene, 1,3,5-trimethyl-	33.04	62000	JN
8.	unknown	33.38	58000	J
9.	unknown	33.55	84000	J
10.	unknown	34.45	46000	J

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699B DL

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.02

Sample wt/vol: 10.5 (g/ml) G Lab File ID: VB004230.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 13.13 Date Analyzed: 9/7/99

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	19000	U
107131	Acrylonitrile	19000	U
75650	tert-Butyl alcohol	36000	U
1634044	Methyl-tert-Butyl ether	8200	U
108203	Di-isopropyl ether	5500	U
	Dichlorodifluoromethane	11000	U
74-87-3	Chloromethane	2700	U
75-01-4	Vinyl Chloride	8200	U
74-83-9	Bromomethane	5500	U
75-00-3	Chloroethane	8200	U
75-69-4	Trichlorofluoromethane	5500	U
75-35-4	1,1-Dichloroethene	2700	U
67-64-1	Acetone	5500	U
75-15-0	Carbon Disulfide	2700	U
75-09-2	Methylene Chloride	5500	U
156-60-5	trans-1,2-Dichloroethene	5500	U
75-35-3	1,1-Dichloroethane	2700	U
108-05-4	Vinyl Acetate	8200	U
78-93-3	2-Butanone	8200	U
	cis-1,2-Dichloroethene	2700	U
67-66-3	Chloroform	2700	U
75-55-6	1,1,1-Trichloroethane	2700	U
56-23-5	Carbon Tetrachloride	5500	U
71-43-2	Benzene	3700	D
107-06-2	1,2-Dichloroethane	5500	U
79-01-6	Trichloroethene	2700	U
78-87-5	1,2-Dichloropropane	2700	U
75-27-4	Bromodichloromethane	2700	U
110-75-8	2-Chloroethyl vinyl ether	5500	U
10061-01-5	cis-1,3-Dichloropropene	2700	U
108-10-1	4-Methyl-2-Pentanone	5500	U
108-88-3	Toluene	89000	D
10061-02-6	trans-1,3-Dichloropropene	5500	U
79-00-5	1,1,2-Trichloroethane	5500	U
127-18-4	Tetrachloroethene	2700	U
591-78-6	2-Hexanone	5500	U
126-48-1	Dibromochloromethane	5500	U
108-90-7	Chlorobenzene	2700	U
100-41-4	Ethylbenzene	30000	D

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699B DL

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.02

Sample wt/vol: 10.5 (g/ml) G Lab File ID: VB004230.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 13.13 Date Analyzed: 9/7/99

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	150000	D
1330-20-7	o-Xylene	63000	D
100-42-5	Styrene	5500	U
75-25-2	Bromoform	5500	U
79-34-5	1,1,2,2-Tetrachloroethane	5500	U

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699C

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.03

Sample wt/vol: 10.6 (g/ml) G Lab File ID: VC000752.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 21.6 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	2100	U
107131	Acrylonitrile	2100	U
75650	tert-Butyl alcohol	3900	U
1634044	Methyl-tert-Butyl ether	910	U
108203	Di-isopropyl ether	610	U
	Dichlorodifluoromethane	1200	U
74-87-3	Chloromethane	300	U
75-01-4	Vinyl Chloride	910	U
74-83-9	Bromomethane	610	U
75-00-3	Chloroethane	910	U
75-69-4	Trichlorofluoromethane	610	U
75-35-4	1,1-Dichloroethene	300	U
67-64-1	Acetone	610	U
75-15-0	Carbon Disulfide	300	U
75-09-2	Methylene Chloride	610	U
156-60-5	trans-1,2-Dichloroethene	610	U
75-35-3	1,1-Dichloroethane	300	U
108-05-4	Vinyl Acetate	910	U
78-93-3	2-Butanone	910	U
	cis-1,2-Dichloroethene	300	U
67-66-3	Chloroform	300	U
75-55-6	1,1,1-Trichloroethane	300	U
56-23-5	Carbon Tetrachloride	610	U
71-43-2	Benzene	6600	
107-06-2	1,2-Dichloroethane	610	U
79-01-6	Trichloroethene	300	U
78-87-5	1,2-Dichloropropane	300	U
75-27-4	Bromodichloromethane	300	U
110-75-8	2-Chloroethyl vinyl ether	610	U
10061-01-5	cis-1,3-Dichloropropene	300	U
108-10-1	4-Methyl-2-Pentanone	610	U
108-88-3	Toluene	50000	E
10061-02-6	trans-1,3-Dichloropropene	610	U
79-00-5	1,1,2-Trichloroethane	610	U
127-18-4	Tetrachloroethene	300	U
591-78-6	2-Hexanone	610	U
126-48-1	Dibromochloromethane	610	U
108-90-7	Chlorobenzene	300	U
100-41-4	Ethylbenzene	34000	E

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699C

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.03

Sample wt/vol: 10.6 (g/ml) G Lab File ID: VC000752.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 21.6 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	100000	E
1330-20-7	o-Xylene	47000	E
100-42-5	Styrene	610	U
75-25-2	Bromoform	610	U
79-34-5	1,1,2,2-Tetrachloroethane	610	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

699C

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.03

Sample wt/vol: 10.6 (g/ml) G Lab File ID: VC000752.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 21.6 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 10

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 002216-34-4	Octane, 4-methyl-	25.64	83000	JN
2.	unknown	25.97	67000	J
3. 000103-65-1	Benzene, propyl-	30.62	61000	JN
4.	unknown	30.86	250000	J
5.	column bleed	31.00	110000	J
6. 000611-14-3	Benzene, 1-ethyl-2-methyl-	31.61	100000	JN
7.	unknown	31.94	200000	J
8. 000526-73-8	Benzene, 1,2,3-trimethyl-	33.04	89000	JN
9.	unknown	33.38	68000	J
10. 021195-59-5	1,3,8-p-Menthatriene	33.56	100000	JN

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699C DL

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.03

Sample wt/vol: 10.6 (g/ml) G Lab File ID: VB004231.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 21.6 Date Analyzed: 9/7/99

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	21000	U
107131	Acrylonitrile	21000	U
75650	tert-Butyl alcohol	39000	U
1634044	Methyl-tert-Butyl ether	9100	U
108203	Di-isopropyl ether	6100	U
	Dichlorodifluoromethane	12000	U
74-87-3	Chloromethane	3000	U
75-01-4	Vinyl Chloride	9100	U
74-83-9	Bromomethane	6100	U
75-00-3	Chloroethane	9100	U
75-69-4	Trichlorofluoromethane	6100	U
75-35-4	1,1-Dichloroethene	3000	U
67-64-1	Acetone	6100	U
75-15-0	Carbon Disulfide	3000	U
75-09-2	Methylene Chloride	6100	U
156-60-5	trans-1,2-Dichloroethene	6100	U
75-35-3	1,1-Dichloroethane	3000	U
108-05-4	Vinyl Acetate	9100	U
78-93-3	2-Butanone	9100	U
	cis-1,2-Dichloroethene	3000	U
67-66-3	Chloroform	3000	U
75-55-6	1,1,1-Trichloroethane	3000	U
56-23-5	Carbon Tetrachloride	6100	U
71-43-2	Benzene	3500	D
107-06-2	1,2-Dichloroethane	6100	U
79-01-6	Trichloroethene	3000	U
78-87-5	1,2-Dichloropropane	3000	U
75-27-4	Bromodichloromethane	3000	U
110-75-8	2-Chloroethyl vinyl ether	6100	U
10061-01-5	cis-1,3-Dichloropropene	3000	U
108-10-1	4-Methyl-2-Pentanone	6100	U
108-88-3	Toluene	240000	D
10061-02-6	trans-1,3-Dichloropropene	6100	U
79-00-5	1,1,2-Trichloroethane	6100	U
127-18-4	Tetrachloroethene	3000	U
591-78-6	2-Hexanone	6100	U
126-48-1	Dibromochloromethane	6100	U
108-90-7	Chlorobenzene	3000	U
100-41-4	Ethylbenzene	83000	D

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699C DL

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.03

Sample wt/vol: 10.6 (g/ml) G Lab File ID: VB004231.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 21.6 Date Analyzed: 9/7/99

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	360000	D
1330-20-7	o-Xylene	150000	D
100-42-5	Styrene	6100	U
75-25-2	Bromoform	6100	U
79-34-5	1,1,2,2-Tetrachloroethane	6100	U

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699D

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.04

Sample wt/vol: 10.7 (g/ml) G Lab File ID: VC000753.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 20.02 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	2100	U
107131	Acrylonitrile	2100	U
75650	tert-Butyl alcohol	3800	U
1634044	Methyl-tert-Butyl ether	880	U
108203	Di-isopropyl ether	590	U
	Dichlorodifluoromethane	1200	U
74-87-3	Chloromethane	290	U
75-01-4	Vinyl Chloride	880	U
74-83-9	Bromomethane	590	U
75-00-3	Chloroethane	880	U
75-69-4	Trichlorofluoromethane	590	U
75-35-4	1,1-Dichloroethene	290	U
67-64-1	Acetone	590	U
75-15-0	Carbon Disulfide	290	U
75-09-2	Methylene Chloride	590	U
156-60-5	trans-1,2-Dichloroethene	590	U
75-35-3	1,1-Dichloroethane	290	U
108-05-4	Vinyl Acetate	880	U
78-93-3	2-Butanone	880	U
	cis-1,2-Dichloroethene	290	U
67-66-3	Chloroform	290	U
75-55-6	1,1,1-Trichloroethane	290	U
56-23-5	Carbon Tetrachloride	590	U
71-43-2	Benzene	290	
107-06-2	1,2-Dichloroethane	590	U
79-01-6	Trichloroethene	290	U
78-87-5	1,2-Dichloropropane	290	U
75-27-4	Bromodichloromethane	290	U
110-75-8	2-Chloroethyl vinyl ether	590	U
10061-01-5	cis-1,3-Dichloropropene	290	U
108-10-1	4-Methyl-2-Pentanone	590	U
108-88-3	Toluene	22000	
10061-02-6	trans-1,3-Dichloropropene	590	U
79-00-5	1,1,2-Trichloroethane	590	U
127-18-4	Tetrachloroethene	290	U
591-78-6	2-Hexanone	590	U
126-48-1	Dibromochloromethane	590	U
108-90-7	Chlorobenzene	290	U
100-41-4	Ethylbenzene	18000	

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699D

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.04

Sample wt/vol: 10.7 (g/ml) G Lab File ID: VC000753.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 20.02 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	65000	E
1330-20-7	o-Xylene	27000	
100-42-5	Styrene	590	U
75-25-2	Bromoform	590	U
79-34-5	1,1,2,2-Tetrachloroethane	590	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

699D

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.04

Sample wt/vol: 10.7 (g/ml) G Lab File ID: VC000753.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 20.02 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 10

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 000107-83-5	Pentane, 2-methyl-	10.53	17000	JN
2. 000096-14-0	Pentane, 3-methyl-	11.57	15000	JN
3. 000591-76-4	Hexane, 2-methyl-	16.55	20000	JN
4. 000565-59-3	Pentane, 2,3-dimethyl-	16.87	24000	JN
5. 000589-34-4	Hexane, 3-methyl-	17.12	24000	JN
6.	unknown	17.66	62000	J
7.	unknown	21.46	18000	J
8. 000620-14-4	Benzene, 1-ethyl-3-methyl-	30.85	59000	JN
9. 000526-73-8	Benzene, 1,2,3-trimethyl-	30.99	18000	JN
10. 000526-73-8	Benzene, 1,2,3-trimethyl-	31.93	40000	JN

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699D DL

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.04

Sample wt/vol: 10.7 (g/ml) G Lab File ID: VB004235.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 20.02 Date Analyzed: 9/7/99

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 5.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	10000	U
107131	Acrylonitrile	10000	U
75650	tert-Butyl alcohol	19000	U
1634044	Methyl-tert-Butyl ether	4400	U
108203	Di-isopropyl ether	2900	U
	Dichlorodifluoromethane	5900	U
74-87-3	Chloromethane	1500	U
75-01-4	Vinyl Chloride	4400	U
74-83-9	Bromomethane	2900	U
75-00-3	Chloroethane	4400	U
75-69-4	Trichlorofluoromethane	2900	U
75-35-4	1,1-Dichloroethene	1500	U
67-64-1	Acetone	2900	U
75-15-0	Carbon Disulfide	1500	U
75-09-2	Methylene Chloride	2900	U
156-60-5	trans-1,2-Dichloroethene	2900	U
75-35-3	1,1-Dichloroethane	1500	U
108-05-4	Vinyl Acetate	4400	U
78-93-3	2-Butanone	4400	U
	cis-1,2-Dichloroethene	1500	U
67-66-3	Chloroform	1500	U
75-55-6	1,1,1-Trichloroethane	1500	U
56-23-5	Carbon Tetrachloride	2900	U
71-43-2	Benzene	1500	U
107-06-2	1,2-Dichloroethane	2900	U
79-01-6	Trichloroethene	1500	U
78-87-5	1,2-Dichloropropane	1500	U
75-27-4	Bromodichloromethane	1500	U
110-75-8	2-Chloroethyl vinyl ether	2900	U
10061-01-5	cis-1,3-Dichloropropene	1500	U
108-10-1	4-Methyl-2-Pentanone	2900	U
108-88-3	Toluene	10000	D
10061-02-6	trans-1,3-Dichloropropene	2900	U
79-00-5	1,1,2-Trichloroethane	2900	U
127-18-4	Tetrachloroethene	1500	U
591-78-6	2-Hexanone	2900	U
126-48-1	Dibromochloromethane	2900	U
108-90-7	Chlorobenzene	1500	U
100-41-4	Ethylbenzene	7700	D

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699D DL

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.04

Sample wt/vol: 10.7 (g/ml) G Lab File ID: VB004235.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 20.02 Date Analyzed: 9/7/99

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 5.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	33000	D
1330-20-7	o-Xylene	13000	D
100-42-5	Styrene	2900	U
75-25-2	Bromoform	2900	U
79-34-5	1,1,2,2-Tetrachloroethane	2900	U

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699E

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.05

Sample wt/vol: 10.5 (g/ml) G Lab File ID: VC000754.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 21.33 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	2100	U
107131	Acrylonitrile	2100	U
75650	tert-Butyl alcohol	3900	U
1634044	Methyl-tert-Butyl ether	910	U
108203	Di-isopropyl ether	600	U
	Dichlorodifluoromethane	1200	U
74-87-3	Chloromethane	300	U
75-01-4	Vinyl Chloride	910	U
74-83-9	Bromomethane	600	U
75-00-3	Chloroethane	910	U
75-69-4	Trichlorofluoromethane	600	U
75-35-4	1,1-Dichloroethene	300	U
67-64-1	Acetone	600	U
75-15-0	Carbon Disulfide	300	U
75-09-2	Methylene Chloride	600	U
156-60-5	trans-1,2-Dichloroethene	600	U
75-35-3	1,1-Dichloroethane	300	U
108-05-4	Vinyl Acetate	910	U
78-93-3	2-Butanone	910	U
	cis-1,2-Dichloroethene	300	U
67-66-3	Chloroform	300	U
75-55-6	1,1,1-Trichloroethane	300	U
56-23-5	Carbon Tetrachloride	600	U
71-43-2	Benzene	300	U
107-06-2	1,2-Dichloroethane	600	U
79-01-6	Trichloroethene	300	U
78-87-5	1,2-Dichloropropane	300	U
75-27-4	Bromodichloromethane	300	U
110-75-8	2-Chloroethyl vinyl ether	600	U
10061-01-5	cis-1,3-Dichloropropene	300	U
108-10-1	4-Methyl-2-Pentanone	600	U
108-88-3	Toluene	2100	
10061-02-6	trans-1,3-Dichloropropene	600	U
79-00-5	1,1,2-Trichloroethane	600	U
127-18-4	Tetrachloroethene	300	U
591-78-6	2-Hexanone	600	U
126-48-1	Dibromochloromethane	600	U
108-90-7	Chlorobenzene	300	U
100-41-4	Ethylbenzene	1200	

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699E

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.05

Sample wt/vol: 10.5 (g/ml) G Lab File ID: VC000754.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 21.33 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	5800	
1330-20-7	o-Xylene	1800	
100-42-5	Styrene	600	U
75-25-2	Bromoform	600	U
79-34-5	1,1,2,2-Tetrachloroethane	600	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

699E

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.05

Sample wt/vol: 10.5 (g/ml) G Lab File ID: VC000754.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 21.33 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 10

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	17.66	13000	J
2. 000565-75-3	Pentane, 2,3,4-trimethyl-	21.09	3800	JN
3.	unknown	21.46	6000	J
4.	unknown	22.18	1900	J
5.	unknown	29.05	2000	J
6.	unknown	29.42	1300	J
7. 000611-14-3	Benzene, 1-ethyl-2-methyl-	30.85	5400	JN
8. 000108-67-8	Benzene, 1,3,5-trimethyl-	31.93	3000	JN
9.	unknown	32.16	1500	J
10. 000526-73-8	Benzene, 1,2,3-trimethyl-	33.04	1300	JN

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699F

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.06

Sample wt/vol: 11.5 (g/ml) G Lab File ID: VC000755.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 14.62 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1800	U
107131	Acrylonitrile	1800	U
75650	tert-Butyl alcohol	3300	U
1634044	Methyl-tert-Butyl ether	770	U
108203	Di-isopropyl ether	510	U
	Dichlorodifluoromethane	1000	U
74-87-3	Chloromethane	260	U
75-01-4	Vinyl Chloride	770	U
74-83-9	Bromomethane	510	U
75-00-3	Chloroethane	770	U
75-69-4	Trichlorofluoromethane	510	U
75-35-4	1,1-Dichloroethene	260	U
67-64-1	Acetone	510	U
75-15-0	Carbon Disulfide	260	U
75-09-2	Methylene Chloride	510	U
156-60-5	trans-1,2-Dichloroethene	510	U
75-35-3	1,1-Dichloroethane	260	U
108-05-4	Vinyl Acetate	770	U
78-93-3	2-Butanone	770	U
	cis-1,2-Dichloroethene	260	U
67-66-3	Chloroform	260	U
75-55-6	1,1,1-Trichloroethane	260	U
56-23-5	Carbon Tetrachloride	510	U
71-43-2	Benzene	260	U
107-06-2	1,2-Dichloroethane	510	U
79-01-6	Trichloroethene	260	U
78-87-5	1,2-Dichloropropane	260	U
75-27-4	Bromodichloromethane	260	U
110-75-8	2-Chloroethyl vinyl ether	510	U
10061-01-5	cis-1,3-Dichloropropene	260	U
108-10-1	4-Methyl-2-Pentanone	510	U
108-88-3	Toluene	400	
10061-02-6	trans-1,3-Dichloropropene	510	U
79-00-5	1,1,2-Trichloroethane	510	U
127-18-4	Tetrachloroethene	260	U
591-78-6	2-Hexanone	510	U
126-48-1	Dibromochloromethane	510	U
108-90-7	Chlorobenzene	260	U
100-41-4	Ethylbenzene	220	J

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699F

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.06

Sample wt/vol: 11.5 (g/ml) G Lab File ID: VC000755.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 14.62 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	1200	
1330-20-7	o-Xylene	330	J
100-42-5	Styrene	510	U
75-25-2	Bromoform	510	U
79-34-5	1,1,2,2-Tetrachloroethane	510	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

699F

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.06

Sample wt/vol: 11.5 (g/ml) G Lab File ID: VC000755.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 14.62 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699G

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.07

Sample wt/vol: 10.6 (g/ml) G Lab File ID: VC000756.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 13.15 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1900	U
107131	Acrylonitrile	1900	U
75650	tert-Butyl alcohol	3500	U
1634044	Methyl-tert-Butyl ether	810	U
108203	Di-isopropyl ether	540	U
	Dichlorodifluoromethane	1100	U
74-87-3	Chloromethane	270	U
75-01-4	Vinyl Chloride	810	U
74-83-9	Bromomethane	540	U
75-00-3	Chloroethane	810	U
75-69-4	Trichlorofluoromethane	540	U
75-35-4	1,1-Dichloroethene	270	U
67-64-1	Acetone	540	U
75-15-0	Carbon Disulfide	270	U
75-09-2	Methylene Chloride	540	U
156-60-5	trans-1,2-Dichloroethene	540	U
75-35-3	1,1-Dichloroethane	270	U
108-05-4	Vinyl Acetate	810	U
78-93-3	2-Butanone	810	U
	cis-1,2-Dichloroethene	270	U
67-66-3	Chloroform	270	U
75-55-6	1,1,1-Trichloroethane	270	U
56-23-5	Carbon Tetrachloride	540	U
71-43-2	Benzene	9000	
107-06-2	1,2-Dichloroethane	540	U
79-01-6	Trichloroethene	270	U
78-87-5	1,2-Dichloropropane	270	U
75-27-4	Bromodichloromethane	270	U
110-75-8	2-Chloroethyl vinyl ether	540	U
10061-01-5	cis-1,3-Dichloropropene	270	U
108-10-1	4-Methyl-2-Pentanone	540	U
108-88-3	Toluene	8700	
10061-02-6	trans-1,3-Dichloropropene	540	U
79-00-5	1,1,2-Trichloroethane	540	U
127-18-4	Tetrachloroethene	270	U
591-78-6	2-Hexanone	540	U
126-48-1	Dibromochloromethane	540	U
108-90-7	Chlorobenzene	270	U
100-41-4	Ethylbenzene	29000	E

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699G

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.07

Sample wt/vol: 10.6 (g/ml) G Lab File ID: VC000756.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 13.15 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	82000	E
1330-20-7	o-Xylene	21000	
100-42-5	Styrene	540	U
75-25-2	Bromoform	540	U
79-34-5	1,1,2,2-Tetrachloroethane	540	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

699G

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.07

Sample wt/vol: 10.6 (g/ml) G Lab File ID: VC000756.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 13.15 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 11

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 002216-34-4	Octane, 4-methyl-	25.64	72000	JN
2. 000111-84-2	Nonane	26.99	36000	JN
3. 000095-36-3	1,2,4-Trimethylbenzene	29.64	35000	JN
4. 000103-65-1	Benzene, propyl-	30.62	49000	JN
5. 000620-14-4	Benzene, 1-ethyl-3-methyl-	30.89	110000	JN
6.	unknown	31.00	76000	J
7. 000611-14-3	Benzene, 1-ethyl-2-methyl-	31.61	64000	JN
8.	unknown	31.94	150000	J
9. 000108-67-8	Benzene, 1,3,5-trimethyl-	33.04	59000	JN
10.	unknown	33.55	85000	J
11.	unknown	34.45	46000	J

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699G DL

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.07

Sample wt/vol: 10.6 (g/ml) G Lab File ID: VB004232.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 13.15 Date Analyzed: 9/7/99

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	19000	U
107131	Acrylonitrile	19000	U
75650	tert-Butyl alcohol	35000	U
1634044	Methyl-tert-Butyl ether	8100	U
108203	Di-isopropyl ether	5400	U
	Dichlorodifluoromethane	11000	U
74-87-3	Chloromethane	2700	U
75-01-4	Vinyl Chloride	8100	U
74-83-9	Bromomethane	5400	U
75-00-3	Chloroethane	8100	U
75-69-4	Trichlorofluoromethane	5400	U
75-35-4	1,1-Dichloroethene	2700	U
67-64-1	Acetone	5400	U
75-15-0	Carbon Disulfide	2700	U
75-09-2	Methylene Chloride	5400	U
156-60-5	trans-1,2-Dichloroethene	5400	U
75-35-3	1,1-Dichloroethane	2700	U
108-05-4	Vinyl Acetate	8100	U
78-93-3	2-Butanone	8100	U
	cis-1,2-Dichloroethene	2700	U
67-66-3	Chloroform	2700	U
75-55-6	1,1,1-Trichloroethane	2700	U
56-23-5	Carbon Tetrachloride	5400	U
71-43-2	Benzene	6000	D
107-06-2	1,2-Dichloroethane	5400	U
79-01-6	Trichloroethene	2700	U
78-87-5	1,2-Dichloropropane	2700	U
75-27-4	Bromodichloromethane	2700	U
110-75-8	2-Chloroethyl vinyl ether	5400	U
10061-01-5	cis-1,3-Dichloropropene	2700	U
108-10-1	4-Methyl-2-Pentanone	5400	U
108-88-3	Toluene	5400	D
10061-02-6	trans-1,3-Dichloropropene	5400	U
79-00-5	1,1,2-Trichloroethane	5400	U
127-18-4	Tetrachloroethene	2700	U
591-78-6	2-Hexanone	5400	U
126-48-1	Dibromochloromethane	5400	U
108-90-7	Chlorobenzene	2700	U
100-41-4	Ethylbenzene	82000	D

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699G DL

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.07

Sample wt/vol: 10.6 (g/ml) G Lab File ID: VB004232.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 13.15 Date Analyzed: 9/7/99

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	220000	D
1330-20-7	o-Xylene	17000	D
100-42-5	Styrene	5400	U
75-25-2	Bromoform	5400	U
79-34-5	1,1,2,2-Tetrachloroethane	5400	U

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699H

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.08

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VC000757.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 17.91 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	2000	U
107131	Acrylonitrile	2000	U
75650	tert-Butyl alcohol	3700	U
1634044	Methyl-tert-Butyl ether	840	U
108203	Di-isopropyl ether	560	U
	Dichlorodifluoromethane	1100	U
74-87-3	Chloromethane	280	U
75-01-4	Vinyl Chloride	840	U
74-83-9	Bromomethane	560	U
75-00-3	Chloroethane	840	U
75-69-4	Trichlorofluoromethane	560	U
75-35-4	1,1-Dichloroethene	280	U
67-64-1	Acetone	560	U
75-15-0	Carbon Disulfide	280	U
75-09-2	Methylene Chloride	560	U
156-60-5	trans-1,2-Dichloroethene	560	U
75-35-3	1,1-Dichloroethane	280	U
108-05-4	Vinyl Acetate	840	U
78-93-3	2-Butanone	840	U
	cis-1,2-Dichloroethene	280	U
67-66-3	Chloroform	280	U
75-55-6	1,1,1-Trichloroethane	280	U
56-23-5	Carbon Tetrachloride	560	U
71-43-2	Benzene	30000	E
107-06-2	1,2-Dichloroethane	560	U
79-01-6	Trichloroethene	280	U
78-87-5	1,2-Dichloropropane	280	U
75-27-4	Bromodichloromethane	280	U
110-75-8	2-Chloroethyl vinyl ether	560	U
10061-01-5	cis-1,3-Dichloropropene	280	U
108-10-1	4-Methyl-2-Pentanone	560	U
108-88-3	Toluene	46000	E
10061-02-6	trans-1,3-Dichloropropene	560	U
79-00-5	1,1,2-Trichloroethane	560	U
127-18-4	Tetrachloroethene	280	U
591-78-6	2-Hexanone	560	U
126-48-1	Dibromochloromethane	560	U
108-90-7	Chlorobenzene	280	U
100-41-4	Ethylbenzene	32000	E

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699H

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.08

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VC000757.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 17.91 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	93000	E
1330-20-7	o-Xylene	43000	E
100-42-5	Styrene	560	U
75-25-2	Bromoform	560	U
79-34-5	1,1,2,2-Tetrachloroethane	560	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

699H

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.08

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VC000757.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 17.91 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 10

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 000108-88-3	Toluene	23.64	160000	JN
2. 002216-34-4	Octane, 4-methyl-	25.64	92000	JN
3. 000103-65-1	Benzene, propyl-	30.62	66000	JN
4.	unknown	30.86	240000	J
5. 000108-67-8	Benzene, 1,3,5-trimethyl-	31.00	110000	JN
6. 000611-14-3	Benzene, 1-ethyl-2-methyl-	31.61	86000	JN
7.	unknown	31.94	190000	J
8. 000526-73-8	Benzene, 1,2,3-trimethyl-	33.04	90000	JN
9. 021195-59-5	1,3,8-p-Menthatriene	33.56	110000	JN
10.	unknown	34.45	62000	J

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699H DL

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.08

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VB004233.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 17.91 Date Analyzed: 9/7/99

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	20000	U
107131	Acrylonitrile	20000	U
75650	tert-Butyl alcohol	37000	U
1634044	Methyl-tert-Butyl ether	8400	U
108203	Di-isopropyl ether	5600	U
	Dichlorodifluoromethane	11000	U
74-87-3	Chloromethane	2800	U
75-01-4	Vinyl Chloride	8400	U
74-83-9	Bromomethane	5600	U
75-00-3	Chloroethane	8400	U
75-69-4	Trichlorofluoromethane	5600	U
75-35-4	1,1-Dichloroethene	2800	U
67-64-1	Acetone	5600	U
75-15-0	Carbon Disulfide	2800	U
75-09-2	Methylene Chloride	5600	U
156-60-5	trans-1,2-Dichloroethene	5600	U
75-35-3	1,1-Dichloroethane	2800	U
108-05-4	Vinyl Acetate	8400	U
78-93-3	2-Butanone	8400	U
	cis-1,2-Dichloroethene	2800	U
67-66-3	Chloroform	2800	U
75-55-6	1,1,1-Trichloroethane	2800	U
56-23-5	Carbon Tetrachloride	5600	U
71-43-2	Benzene	24000	D
107-06-2	1,2-Dichloroethane	5600	U
79-01-6	Trichloroethene	2800	U
78-87-5	1,2-Dichloropropane	2800	U
75-27-4	Bromodichloromethane	2800	U
110-75-8	2-Chloroethyl vinyl ether	5600	U
10061-01-5	cis-1,3-Dichloropropene	2800	U
108-10-1	4-Methyl-2-Pentanone	5600	U
108-88-3	Toluene	160000	D
10061-02-6	trans-1,3-Dichloropropene	5600	U
79-00-5	1,1,2-Trichloroethane	5600	U
127-18-4	Tetrachloroethene	2800	U
591-78-6	2-Hexanone	5600	U
126-48-1	Dibromochloromethane	5600	U
108-90-7	Chlorobenzene	2800	U
100-41-4	Ethylbenzene	74000	D

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699H DL

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.08

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VB004233.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 17.91 Date Analyzed: 9/7/99

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	280000	D
1330-20-7	o-Xylene	110000	D
100-42-5	Styrene	5600	U
75-25-2	Bromoform	5600	U
79-34-5	1,1,2,2-Tetrachloroethane	5600	U

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

6991

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.09

Sample wt/vol: 11.0 (g/ml) G Lab File ID: VB004236.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 18.65 Date Analyzed: 9/7/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	2000	U
107131	Acrylonitrile	2000	U
75650	tert-Butyl alcohol	3700	U
1634044	Methyl-tert-Butyl ether	840	U
108203	Di-isopropyl ether	560	U
	Dichlorodifluoromethane	1100	U
74-87-3	Chloromethane	280	U
75-01-4	Vinyl Chloride	840	U
74-83-9	Bromomethane	560	U
75-00-3	Chloroethane	840	U
75-69-4	Trichlorofluoromethane	560	U
75-35-4	1,1-Dichloroethene	280	U
67-64-1	Acetone	560	U
75-15-0	Carbon Disulfide	280	U
75-09-2	Methylene Chloride	560	U
156-60-5	trans-1,2-Dichloroethene	560	U
75-35-3	1,1-Dichloroethane	280	U
108-05-4	Vinyl Acetate	840	U
78-93-3	2-Butanone	840	U
	cis-1,2-Dichloroethene	280	U
67-66-3	Chloroform	280	U
75-55-6	1,1,1-Trichloroethane	280	U
56-23-5	Carbon Tetrachloride	560	U
71-43-2	Benzene	530	
107-06-2	1,2-Dichloroethane	560	U
79-01-6	Trichloroethene	280	U
78-87-5	1,2-Dichloropropane	280	U
75-27-4	Bromodichloromethane	280	U
110-75-8	2-Chloroethyl vinyl ether	560	U
10061-01-5	cis-1,3-Dichloropropene	280	U
108-10-1	4-Methyl-2-Pentanone	560	U
108-88-3	Toluene	3300	
10061-02-6	trans-1,3-Dichloropropene	560	U
79-00-5	1,1,2-Trichloroethane	560	U
127-18-4	Tetrachloroethene	280	U
591-78-6	2-Hexanone	560	U
126-48-1	Dibromochloromethane	560	U
108-90-7	Chlorobenzene	280	U
100-41-4	Ethylbenzene	2100	

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699I

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.09

Sample wt/vol: 11.0 (g/ml) G Lab File ID: VB004236.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 18.65 Date Analyzed: 9/7/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	7000	
1330-20-7	o-Xylene	2400	
100-42-5	Styrene	560	U
75-25-2	Bromoform	560	U
79-34-5	1,1,2,2-Tetrachloroethane	560	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

699I

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.09

Sample wt/vol: 11.0 (g/ml) G Lab File ID: VB004236.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 18.65 Date Analyzed: 9/7/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699D-Duplicate

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.10

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VC000759.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 18.67 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	2000	U
107131	Acrylonitrile	2000	U
75650	tert-Butyl alcohol	3700	U
1634044	Methyl-tert-Butyl ether	860	U
108203	Di-isopropyl ether	570	U
	Dichlorodifluoromethane	1100	U
74-87-3	Chloromethane	290	U
75-01-4	Vinyl Chloride	860	U
74-83-9	Bromomethane	570	U
75-00-3	Chloroethane	860	U
75-69-4	Trichlorofluoromethane	570	U
75-35-4	1,1-Dichloroethene	290	U
67-64-1	Acetone	570	U
75-15-0	Carbon Disulfide	290	U
75-09-2	Methylene Chloride	570	U
156-60-5	trans-1,2-Dichloroethene	570	U
75-35-3	1,1-Dichloroethane	290	U
108-05-4	Vinyl Acetate	860	U
78-93-3	2-Butanone	860	U
	cis-1,2-Dichloroethene	290	U
67-66-3	Chloroform	290	U
75-55-6	1,1,1-Trichloroethane	290	U
56-23-5	Carbon Tetrachloride	570	U
71-43-2	Benzene	370	
107-06-2	1,2-Dichloroethane	570	U
79-01-6	Trichloroethene	290	U
78-87-5	1,2-Dichloropropane	290	U
75-27-4	Bromodichloromethane	290	U
110-75-8	2-Chloroethyl vinyl ether	570	U
10061-01-5	cis-1,3-Dichloropropene	290	U
108-10-1	4-Methyl-2-Pentanone	570	U
108-88-3	Toluene	30000	E
10061-02-6	trans-1,3-Dichloropropene	570	U
79-00-5	1,1,2-Trichloroethane	570	U
127-18-4	Tetrachloroethene	290	U
591-78-6	2-Hexanone	570	U
126-48-1	Dibromochloromethane	570	U
108-90-7	Chlorobenzene	290	U
100-41-4	Ethylbenzene	26000	

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699D-Duplicate

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.10

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VC000759.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 18.67 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	85000	E
1330-20-7	o-Xylene	38000	E
100-42-5	Styrene	570	U
75-25-2	Bromoform	570	U
79-34-5	1,1,2,2-Tetrachloroethane	570	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

699D-Duplicate

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.10

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VC000759.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 18.67 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 10

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 000560-21-4	Pentane, 2,3,3-trimethyl-	21.47	35000	JN
2. 000103-65-1	Benzene, propyl-	30.62	23000	JN
3. 000611-14-3	Benzene, 1-ethyl-2-methyl-	30.85	95000	JN
4. 000108-67-8	Benzene, 1,3,5-trimethyl-	31.00	38000	JN
5. 000611-14-3	Benzene, 1-ethyl-2-methyl-	31.61	34000	JN
6.	unknown	31.93	84000	J
7. 000526-73-8	Benzene, 1,2,3-trimethyl-	33.04	28000	JN
8. 001074-43-7	Benzene, 1-methyl-3-propyl-	33.38	23000	JN
9.	unknown	33.55	30000	J
10.	unknown	34.45	17000	J

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699D-Dup DL

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.10

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VB004234.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 18.67 Date Analyzed: 9/7/99

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	20000	U
107131	Acrylonitrile	20000	U
75650	tert-Butyl alcohol	37000	U
1634044	Methyl-tert-Butyl ether	8600	U
108203	Di-isopropyl ether	5700	U
	Dichlorodifluoromethane	11000	U
74-87-3	Chloromethane	2900	U
75-01-4	Vinyl Chloride	8600	U
74-83-9	Bromomethane	5700	U
75-00-3	Chloroethane	8600	U
75-69-4	Trichlorofluoromethane	5700	U
75-35-4	1,1-Dichloroethene	2900	U
67-64-1	Acetone	5700	U
75-15-0	Carbon Disulfide	2900	U
75-09-2	Methylene Chloride	5700	U
156-60-5	trans-1,2-Dichloroethene	5700	U
75-35-3	1,1-Dichloroethane	2900	U
108-05-4	Vinyl Acetate	8600	U
78-93-3	2-Butanone	8600	U
	cis-1,2-Dichloroethene	2900	U
67-66-3	Chloroform	2900	U
75-55-6	1,1,1-Trichloroethane	2900	U
56-23-5	Carbon Tetrachloride	5700	U
71-43-2	Benzene	2900	U
107-06-2	1,2-Dichloroethane	5700	U
79-01-6	Trichloroethene	2900	U
78-87-5	1,2-Dichloropropane	2900	U
75-27-4	Bromodichloromethane	2900	U
110-75-8	2-Chloroethyl vinyl ether	5700	U
10061-01-5	cis-1,3-Dichloropropene	2900	U
108-10-1	4-Methyl-2-Pentanone	5700	U
108-88-3	Toluene	21000	D
10061-02-6	trans-1,3-Dichloropropene	5700	U
79-00-5	1,1,2-Trichloroethane	5700	U
127-18-4	Tetrachloroethene	2900	U
591-78-6	2-Hexanone	5700	U
126-48-1	Dibromochloromethane	5700	U
108-90-7	Chlorobenzene	2900	U
100-41-4	Ethylbenzene	28000	D

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

699D-Dup DL

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.10

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VB004234.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 18.67 Date Analyzed: 9/7/99

GC Column: Rtx502.2 ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	120000	D
1330-20-7	o-Xylene	47000	D
100-42-5	Styrene	5700	U
75-25-2	Bromoform	5700	U
79-34-5	1,1,2,2-Tetrachloroethane	5700	U

METALS

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

Client: U.S. Army
DPW, SELFM-PW-EV
Bldg. 173
Ft. Monmouth, NJ 07703

Lab ID #: 4764.01-.11
Sample Received: 09/01/99
Analysis Start: 09/07/99
Analysis Completed: 09/14/99

Site: Bldg. 699
Saltzman Ave.

Matrix: Soil

Method of Analysis: E.P.A. SW-846, Method 7420, 7421
Method of Digestion: E.P.A. SW-846, Method 3051A

TEST PARAMETER: Lead(ppm)

Laboratory I.D. #	Sample Location	RESULT (mg/Kg)	MDL (mg/Kg)
4764.01	699A-North Wall 8.0-8.5 ft (E)	ND	13.13
4764.02	699B-North Wall 8.0-8.5 ft (W)	ND	12.25
4764.03	699C-West Wall 8.0-8.5 ft (N)	ND	13.86
4764.04	699D-West Wall 8.0-8.5 ft (S)	ND	13.59
4764.05	699E-South Wall 8.0-8.5 ft (W)	ND	13.24
4764.06	699F-South Wall 8.0-8.5 ft (E)	ND	13.31
4764.07	699G-East Wall 8.0-8.5 ft (S)	ND	10.28
4764.08	699H-East Wall 8.0-8.5 ft (N)	ND	13.24
4764.09	699I-Bottom 9.5-10.0 ft	ND	12.05
4764.10	699D-Duplicate	ND	12.55

Laboratory I.D. #	Sample Location	RESULT (mg/L)	MDL (mg/L)
4764.11	699-GW	0.0354	0.0008

ND = Not Detected, MDL = Method Detection Limit, NA = Not Applicable

9/16/99

Daniel K. Wright
Laboratory Director

FORT MONMOUTH ENVIRONMENTAL TESTING LABORATORY

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

ANALYTICAL DATA REPORT
Fort Monmouth Environmental Laboratory
ENVIRONMENTAL DIVISION
Fort Monmouth, New Jersey
PROJECT: IJO# 99-0008

Bldg. 699

Field Sample Location	Laboratory Sample ID#	Matrix	Date and Time of Collection	Date Received
Piping Sample-1 3.5-4.0'	4828.01	Soil	29-Sept-99 10:40	09/29/99
PS-2 3.0-3.5'	4828.02	Soil	29-Sept-99 10:50	09/29/99
PS-3 2.5-3.0'	4828.03	Soil	29-Sept-99 11:25	09/29/99
Duplicate	4828.04	Soil	29-Sept-99 11:25	09/29/99
PS-4 2.5-3.0'	4828.05	Soil	29-Sept-99 14:20	09/29/99
Trip Blank	4828.06	Methanol	29-Sept-99	09/29/99

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

ENCLOSURE:
CHAIN OF CUSTODY
RESULTS

10-14-99
Daniel Wright/Date
Laboratory Director

Fort Monmouth Environmental Testing Laboratory

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

Chain of Custody Record

Customer: Charles Appleby
Phone #: X26224
(X)DERA (●)OMA UST Assessment

Project No: 99-0008
Location: BLDG. 699
UST#

Samplers Name / Company : Frank Accorsi/TVS

Lab Sample I.D.	Sample Location	Date	Time	Sample Type	# bottles	TPH/LEAD	% SOLIDS	VOA+10	VOA ID Number		PID Reading	Remarks / Preservation Method
4828 01	PIPING SAMPLE-1 3.5-4.0FT	9-29-99	1040	SOIL	2	X	X	X	837	11.13	380	ICE
02	PS-2 3.0-3.5 FT		1050		2	X	X	X	838	10.78	420	
03	PS-3 2.5-3.0 FT		1125		2	X	X	X	839	11.23	260	
04	" " DUPLICATE		1125		2	X	X	X	840	10.14	260	
05	PS-4 2.5-3.0 FT		1420		2	X	X	X	836	11.21	410	
06	TRIP BLANK		-		1			X	841	-	-	

Analysis Parameters

Comments:
* = Samples Kept <4 Celsius

OVM sn#580U-64455.343 was calibrated with zero air & w/ 245 ppm Isobutylene read 244 ppm. 1000 9-27-99 FA (time/date & initial)

Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):
Frank Accorsi	9-29-99 1555				
Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):

Report Type: (_)Full, (_)Reduced, (X)Standard, (_)Screen / non-certified
Turnaround time: (_)Standard 4 wks, (_)Rush ___ Days, (_)ASAP Verbal ___ Hrs.

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

print legibly

USTcoc.xls8/18/99

Method Summary

EPA SW-846 Method 8260
Gas Chromatographic Determination of Volatiles in Soil

A 5-gram volume of soil sample is added to a 5-ml aliquot of water. Surrogates and internal standards are added and the sample is placed on a purge and trap concentrator. The sample as purged and desorbed into a GC/MS system. Volatiles are identified and quantitated. The final concentration is calculated using soil weight, percent moisture and concentration.

VOLATILES

US ARMY FT. MONMOUTH ENVIRONMENTAL LABORATORY
NJDEPE # 13461

Definition of Qualifiers

MDL	: Method Detection Limit
J	: Compound identified below detection limit
B	: Compound in both sample and blank
D	: Results from dilution of sample
U	: Compound searched for but not detected
E	: Compound exceeds calibration limit

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

Vblk135

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk135

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004398.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 0 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1800	U
107131	Acrylonitrile	1800	U
75650	tert-Butyl alcohol	3200	U
1634044	Methyl-tert-Butyl ether	750	U
108203	Di-isopropyl ether	500	U
	Dichlorodifluoromethane	1000	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	750	U
74-83-9	Bromomethane	500	U
75-00-3	Chloroethane	750	U
75-69-4	Trichlorofluoromethane	500	U
75-35-4	1,1-Dichloroethene	250	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-09-2	Methylene Chloride	500	U
156-60-5	trans-1,2-Dichloroethene	500	U
75-35-3	1,1-Dichloroethane	250	U
108-05-4	Vinyl Acetate	750	U
78-93-3	2-Butanone	750	U
	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
75-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	500	U
71-43-2	Benzene	250	U
107-06-2	1,2-Dichloroethane	500	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
110-75-8	2-Chloroethyl vinyl ether	500	U
10061-01-5	cis-1,3-Dichloropropene	250	U
108-10-1	4-Methyl-2-Pentanone	500	U
108-88-3	Toluene	250	U
10061-02-6	trans-1,3-Dichloropropene	500	U
79-00-5	1,1,2-Trichloroethane	500	U
127-18-4	Tetrachloroethene	250	U
591-78-6	2-Hexanone	500	U
126-48-1	Dibromochloromethane	500	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	500	U

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

Vblk135

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk135

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004398.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 0 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	750	U
1330-20-7	o-Xylene	500	U
100-42-5	Styrene	500	U
75-25-2	Bromoform	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **Vblk135**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk135

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004398.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 0 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

Vblk136

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk136

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004428.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 0 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1800	U
107131	Acrylonitrile	1800	U
75650	tert-Butyl alcohol	3200	U
1634044	Methyl-tert-Butyl ether	750	U
108203	Di-isopropyl ether	500	U
	Dichlorodifluoromethane	1000	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	750	U
74-83-9	Bromomethane	500	U
75-00-3	Chloroethane	750	U
75-69-4	Trichlorofluoromethane	500	U
75-35-4	1,1-Dichloroethene	250	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-09-2	Methylene Chloride	500	U
156-60-5	trans-1,2-Dichloroethene	500	U
75-35-3	1,1-Dichloroethane	250	U
108-05-4	Vinyl Acetate	750	U
78-93-3	2-Butanone	750	U
	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
75-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	500	U
71-43-2	Benzene	250	U
107-06-2	1,2-Dichloroethane	500	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
110-75-8	2-Chloroethyl vinyl ether	500	U
10061-01-5	cis-1,3-Dichloropropene	250	U
108-10-1	4-Methyl-2-Pentanone	500	U
108-88-3	Toluene	250	U
10061-02-6	trans-1,3-Dichloropropene	500	U
79-00-5	1,1,2-Trichloroethane	500	U
127-18-4	Tetrachloroethene	250	U
591-78-6	2-Hexanone	500	U
126-48-1	Dibromochloromethane	500	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	500	U

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

Vblk136

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk136

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004428.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 0 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	750	U
1330-20-7	o-Xylene	500	U
100-42-5	Styrene	500	U
75-25-2	Bromoform	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **Vblk136**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk136

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004428.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 0 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

Trip Blank

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.06

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004400.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 0 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1800	U
107131	Acrylonitrile	1800	U
75650	tert-Butyl alcohol	3200	U
1634044	Methyl-tert-Butyl ether	750	U
108203	Di-isopropyl ether	500	U
	Dichlorodifluoromethane	1000	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	750	U
74-83-9	Bromomethane	500	U
75-00-3	Chloroethane	750	U
75-69-4	Trichlorofluoromethane	500	U
75-35-4	1,1-Dichloroethene	250	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-09-2	Methylene Chloride	1200	
156-60-5	trans-1,2-Dichloroethene	500	U
75-35-3	1,1-Dichloroethane	250	U
108-05-4	Vinyl Acetate	750	U
78-93-3	2-Butanone	750	U
	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
75-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	500	U
71-43-2	Benzene	250	U
107-06-2	1,2-Dichloroethane	500	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
110-75-8	2-Chloroethyl vinyl ether	500	U
10061-01-5	cis-1,3-Dichloropropene	250	U
108-10-1	4-Methyl-2-Pentanone	500	U
108-88-3	Toluene	250	U
10061-02-6	trans-1,3-Dichloropropene	500	U
79-00-5	1,1,2-Trichloroethane	500	U
127-18-4	Tetrachloroethene	250	U
591-78-6	2-Hexanone	500	U
126-48-1	Dibromochloromethane	500	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	500	U

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

Trip Blank

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.06

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004400.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 0 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	750	U
1330-20-7	o-Xylene	500	U
100-42-5	Styrene	500	U
75-25-2	Bromoform	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **Trip Blank**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.06

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004400.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 0 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-1

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.01

Sample wt/vol: 11.1 (g/ml) G Lab File ID: VB004401.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 3.13 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1600	U
107131	Acrylonitrile	1600	U
75650	tert-Butyl alcohol	3000	U
1634044	Methyl-tert-Butyl ether	690	U
108203	Di-isopropyl ether	460	U
	Dichlorodifluoromethane	930	U
74-87-3	Chloromethane	230	U
75-01-4	Vinyl Chloride	690	U
74-83-9	Bromomethane	460	U
75-00-3	Chloroethane	690	U
75-69-4	Trichlorofluoromethane	460	U
75-35-4	1,1-Dichloroethene	230	U
67-64-1	Acetone	460	U
75-15-0	Carbon Disulfide	230	U
75-09-2	Methylene Chloride	460	U
156-60-5	trans-1,2-Dichloroethene	460	U
75-35-3	1,1-Dichloroethane	230	U
108-05-4	Vinyl Acetate	690	U
78-93-3	2-Butanone	690	U
	cis-1,2-Dichloroethene	230	U
67-66-3	Chloroform	230	U
75-55-6	1,1,1-Trichloroethane	230	U
56-23-5	Carbon Tetrachloride	460	U
71-43-2	Benzene	35000	E
107-06-2	1,2-Dichloroethane	460	U
79-01-6	Trichloroethene	230	U
78-87-5	1,2-Dichloropropane	230	U
75-27-4	Bromodichloromethane	230	U
110-75-8	2-Chloroethyl vinyl ether	16000	
10061-01-5	cis-1,3-Dichloropropene	230	U
108-10-1	4-Methyl-2-Pentanone	460	U
108-88-3	Toluene	99000	E
10061-02-6	trans-1,3-Dichloropropene	460	U
79-00-5	1,1,2-Trichloroethane	460	U
127-18-4	Tetrachloroethene	230	U
591-78-6	2-Hexanone	460	U
126-48-1	Dibromochloromethane	460	U
108-90-7	Chlorobenzene	230	U
100-41-4	Ethylbenzene	84000	E

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-1

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.01

Sample wt/vol: 11.1 (g/ml) G Lab File ID: VB004401.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 3.13 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	270000	E
1330-20-7	o-Xylene	130000	E
100-42-5	Styrene	460	U
75-25-2	Bromoform	460	U
79-34-5	1,1,2,2-Tetrachloroethane	460	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **PS-1**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.01

Sample wt/vol: 11.1 (g/ml) G Lab File ID: VB004401.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 3.13 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 15

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 002216-34-4	Octane, 4-methyl-	25.85	120000	JN
2.	unknown	26.17	87000	J
3.	unknown	27.21	64000	J
4. 005911-04-6	Nonane, 3-methyl-	29.62	41000	JN
5. 000103-65-1	Benzene, propyl-	30.84	62000	JN
6.	unknown	31.09	250000	J
7.	unknown	31.22	110000	J
8. 000620-14-4	Benzene, 1-ethyl-3-methyl-	31.82	80000	JN
9.	unknown	32.16	220000	J
10.	unknown	33.26	86000	J
11. 000135-01-3	Benzene, 1,2-diethyl-	33.59	85000	JN
12. 000099-87-6	Benzene, 1-methyl-4-(1-methylel	33.76	120000	JN
13. 000496-11-7	Indane	33.99	48000	JN
14.	unknown	34.39	44000	J
15.	unknown	34.48	42000	J

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-1 DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.01

Sample wt/vol: 11.1 (g/ml) G Lab File ID: VB004429.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 3.13 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 5 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	16000	U
107131	Acrylonitrile	16000	U
75650	tert-Butyl alcohol	30000	U
1634044	Methyl-tert-Butyl ether	6900	U
108203	Di-isopropyl ether	4600	U
	Dichlorodifluoromethane	9300	U
74-87-3	Chloromethane	2300	U
75-01-4	Vinyl Chloride	6900	U
74-83-9	Bromomethane	4600	U
75-00-3	Chloroethane	6900	U
75-69-4	Trichlorofluoromethane	4600	U
75-35-4	1,1-Dichloroethene	2300	U
67-64-1	Acetone	4600	U
75-15-0	Carbon Disulfide	2300	U
75-09-2	Methylene Chloride	4600	U
156-60-5	trans-1,2-Dichloroethene	4600	U
75-35-3	1,1-Dichloroethane	2300	U
108-05-4	Vinyl Acetate	6900	U
78-93-3	2-Butanone	6900	U
	cis-1,2-Dichloroethene	2300	U
67-66-3	Chloroform	2300	U
75-55-6	1,1,1-Trichloroethane	2300	U
56-23-5	Carbon Tetrachloride	4600	U
71-43-2	Benzene	36000	
107-06-2	1,2-Dichloroethane	4600	U
79-01-6	Trichloroethene	2300	U
78-87-5	1,2-Dichloropropane	2300	U
75-27-4	Bromodichloromethane	2300	U
110-75-8	2-Chloroethyl vinyl ether	4600	U
10061-01-5	cis-1,3-Dichloropropene	2300	U
108-10-1	4-Methyl-2-Pentanone	4600	U
108-88-3	Toluene	420000	E
10061-02-6	trans-1,3-Dichloropropene	4600	U
79-00-5	1,1,2-Trichloroethane	4600	U
127-18-4	Tetrachloroethene	2300	U
591-78-6	2-Hexanone	4600	U
126-48-1	Dibromochloromethane	4600	U
108-90-7	Chlorobenzene	2300	U
100-41-4	Ethylbenzene	280000	E

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-1 DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.01

Sample wt/vol: 11.1 (g/ml) G Lab File ID: VB004429.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 3.13 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 5 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	1200000	E
1330-20-7	o-Xylene	480000	E
100-42-5	Styrene	4600	U
75-25-2	Bromoform	4600	U
79-34-5	1,1,2,2-Tetrachloroethane	4600	U

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-1 DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.01

Sample wt/vol: 11.1 (g/ml) G Lab File ID: VB004435.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 3.13 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 0.5 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	160000	U
107131	Acrylonitrile	160000	U
75650	tert-Butyl alcohol	300000	U
1634044	Methyl-tert-Butyl ether	69000	U
108203	Di-isopropyl ether	46000	U
	Dichlorodifluoromethane	93000	U
74-87-3	Chloromethane	23000	U
75-01-4	Vinyl Chloride	69000	U
74-83-9	Bromomethane	46000	U
75-00-3	Chloroethane	69000	U
75-69-4	Trichlorofluoromethane	46000	U
75-35-4	1,1-Dichloroethene	23000	U
67-64-1	Acetone	46000	U
75-15-0	Carbon Disulfide	23000	U
75-09-2	Methylene Chloride	46000	U
156-60-5	trans-1,2-Dichloroethene	46000	U
75-35-3	1,1-Dichloroethane	23000	U
108-05-4	Vinyl Acetate	69000	U
78-93-3	2-Butanone	69000	U
	cis-1,2-Dichloroethene	23000	U
67-66-3	Chloroform	23000	U
75-55-6	1,1,1-Trichloroethane	23000	U
56-23-5	Carbon Tetrachloride	46000	U
71-43-2	Benzene	23000	
107-06-2	1,2-Dichloroethane	46000	U
79-01-6	Trichloroethene	23000	U
78-87-5	1,2-Dichloropropane	23000	U
75-27-4	Bromodichloromethane	23000	U
110-75-8	2-Chloroethyl vinyl ether	46000	U
10061-01-5	cis-1,3-Dichloropropene	23000	U
108-10-1	4-Methyl-2-Pentanone	46000	U
108-88-3	Toluene	310000	
10061-02-6	trans-1,3-Dichloropropene	46000	U
79-00-5	1,1,2-Trichloroethane	46000	U
127-18-4	Tetrachloroethene	23000	U
591-78-6	2-Hexanone	46000	U
126-48-1	Dibromochloromethane	46000	U
108-90-7	Chlorobenzene	23000	U
100-41-4	Ethylbenzene	200000	

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-1 DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.01

Sample wt/vol: 11.1 (g/ml) G Lab File ID: VB004435.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 3.13 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 0.5 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	920000	
1330-20-7	o-Xylene	360000	
100-42-5	Styrene	46000	U
75-25-2	Bromoform	46000	U
79-34-5	1,1,2,2-Tetrachloroethane	46000	U

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-2

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.02

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VB004402.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 4.17 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND		Q
107028	Acrolein	1700	U
107131	Acrylonitrile	1700	U
75650	tert-Butyl alcohol	3100	U
1634044	Methyl-tert-Butyl ether	720	U
108203	Di-isopropyl ether	480	U
	Dichlorodifluoromethane	970	U
74-87-3	Chloromethane	240	U
75-01-4	Vinyl Chloride	720	U
74-83-9	Bromomethane	480	U
75-00-3	Chloroethane	720	U
75-69-4	Trichlorofluoromethane	480	U
75-35-4	1,1-Dichloroethene	240	U
67-64-1	Acetone	480	U
75-15-0	Carbon Disulfide	240	U
75-09-2	Methylene Chloride	480	U
156-60-5	trans-1,2-Dichloroethene	480	U
75-35-3	1,1-Dichloroethane	240	U
108-05-4	Vinyl Acetate	720	U
78-93-3	2-Butanone	720	U
	cis-1,2-Dichloroethene	240	U
67-66-3	Chloroform	240	U
75-55-6	1,1,1-Trichloroethane	240	U
56-23-5	Carbon Tetrachloride	480	U
71-43-2	Benzene	35000	E
107-06-2	1,2-Dichloroethane	480	U
79-01-6	Trichloroethene	240	U
78-87-5	1,2-Dichloropropane	240	U
75-27-4	Bromodichloromethane	240	U
110-75-8	2-Chloroethyl vinyl ether	15000	
10061-01-5	cis-1,3-Dichloropropene	240	U
108-10-1	4-Methyl-2-Pentanone	480	U
108-88-3	Toluene	110000	E
10061-02-6	trans-1,3-Dichloropropene	480	U
79-00-5	1,1,2-Trichloroethane	480	U
127-18-4	Tetrachloroethene	240	U
591-78-6	2-Hexanone	480	U
126-48-1	Dibromochloromethane	480	U
108-90-7	Chlorobenzene	240	U
100-41-4	Ethylbenzene	60000	E

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-2

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.02

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VB004402.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 4.17 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	190000	E
1330-20-7	o-Xylene	89000	E
100-42-5	Styrene	480	U
75-25-2	Bromoform	480	U
79-34-5	1,1,2,2-Tetrachloroethane	480	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **PS-2**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.02

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VB004402.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 4.17 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 15

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	25.85	150000	J
2.	unknown	26.17	110000	J
3. 000111-84-2	Nonane	27.22	100000	JN
4.	unknown	28.60	54000	J
5. 000103-65-1	Benzene, propyl-	30.84	88000	JN
6.	unknown	31.09	300000	J
7.	unknown	31.23	140000	J
8.	unknown	31.83	100000	J
9.	unknown	32.16	140000	J
10.	unknown	33.26	110000	J
11.	unknown	33.60	110000	J
12.	unknown	33.77	170000	J
13.	unknown	33.99	63000	J
14.	unknown	34.40	64000	J
15.	unknown	34.48	57000	J

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-2 DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.02

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VB004430.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 4.17 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 5 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	17000	U
107131	Acrylonitrile	17000	U
75650	tert-Butyl alcohol	31000	U
1634044	Methyl-tert-Butyl ether	7200	U
108203	Di-isopropyl ether	4800	U
	Dichlorodifluoromethane	9700	U
74-87-3	Chloromethane	2400	U
75-01-4	Vinyl Chloride	7200	U
74-83-9	Bromomethane	4800	U
75-00-3	Chloroethane	7200	U
75-69-4	Trichlorofluoromethane	4800	U
75-35-4	1,1-Dichloroethene	2400	U
67-64-1	Acetone	4800	U
75-15-0	Carbon Disulfide	2400	U
75-09-2	Methylene Chloride	4800	U
156-60-5	trans-1,2-Dichloroethene	4800	U
75-35-3	1,1-Dichloroethane	2400	U
108-05-4	Vinyl Acetate	7200	U
78-93-3	2-Butanone	7200	U
	cis-1,2-Dichloroethene	2400	U
67-66-3	Chloroform	2400	U
75-55-6	1,1,1-Trichloroethane	2400	U
56-23-5	Carbon Tetrachloride	4800	U
71-43-2	Benzene	35000	
107-06-2	1,2-Dichloroethane	4800	U
79-01-6	Trichloroethene	2400	U
78-87-5	1,2-Dichloropropane	2400	U
75-27-4	Bromodichloromethane	2400	U
110-75-8	2-Chloroethyl vinyl ether	4800	U
10061-01-5	cis-1,3-Dichloropropene	2400	U
108-10-1	4-Methyl-2-Pentanone	4800	U
108-88-3	Toluene	460000	E
10061-02-6	trans-1,3-Dichloropropene	4800	U
79-00-5	1,1,2-Trichloroethane	4800	U
127-18-4	Tetrachloroethene	2400	U
591-78-6	2-Hexanone	4800	U
126-48-1	Dibromochloromethane	4800	U
108-90-7	Chlorobenzene	2400	U
100-41-4	Ethylbenzene	310000	E

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-2 DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.02

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VB004430.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 4.17 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 5 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	1200000	E
1330-20-7	o-Xylene	530000	E
100-42-5	Styrene	4800	U
75-25-2	Bromoform	4800	U
79-34-5	1,1,2,2-Tetrachloroethane	4800	U

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-2 DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.02

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VB004436.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 4.17 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 0.5 (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	170000	U
107131	Acrylonitrile	170000	U
75650	tert-Butyl alcohol	310000	U
1634044	Methyl-tert-Butyl ether	72000	U
108203	Di-isopropyl ether	48000	U
	Dichlorodifluoromethane	97000	U
74-87-3	Chloromethane	24000	U
75-01-4	Vinyl Chloride	72000	U
74-83-9	Bromomethane	48000	U
75-00-3	Chloroethane	72000	U
75-69-4	Trichlorofluoromethane	48000	U
75-35-4	1,1-Dichloroethene	24000	U
67-64-1	Acetone	48000	U
75-15-0	Carbon Disulfide	24000	U
75-09-2	Methylene Chloride	48000	U
156-60-5	trans-1,2-Dichloroethene	48000	U
75-35-3	1,1-Dichloroethane	24000	U
108-05-4	Vinyl Acetate	72000	U
78-93-3	2-Butanone	72000	U
	cis-1,2-Dichloroethene	24000	U
67-66-3	Chloroform	24000	U
75-55-6	1,1,1-Trichloroethane	24000	U
56-23-5	Carbon Tetrachloride	48000	U
71-43-2	Benzene	24000	U
107-06-2	1,2-Dichloroethane	48000	U
79-01-6	Trichloroethene	24000	U
78-87-5	1,2-Dichloropropane	24000	U
75-27-4	Bromodichloromethane	24000	U
110-75-8	2-Chloroethyl vinyl ether	48000	U
10061-01-5	cis-1,3-Dichloropropene	24000	U
108-10-1	4-Methyl-2-Pentanone	48000	U
108-88-3	Toluene	310000	
10061-02-6	trans-1,3-Dichloropropene	48000	U
79-00-5	1,1,2-Trichloroethane	48000	U
127-18-4	Tetrachloroethene	24000	U
591-78-6	2-Hexanone	48000	U
126-48-1	Dibromochloromethane	48000	U
108-90-7	Chlorobenzene	24000	U
100-41-4	Ethylbenzene	240000	

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-2 DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.02

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VB004436.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 4.17 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 0.5 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	1100000	
1330-20-7	o-Xylene	430000	
100-42-5	Styrene	48000	U
75-25-2	Bromoform	48000	U
79-34-5	1,1,2,2-Tetrachloroethane	48000	U

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-3

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.03

Sample wt/vol: 11.2 (g/ml) G Lab File ID: VB004403.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 10.22 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1700	U
107131	Acrylonitrile	1700	U
75650	tert-Butyl alcohol	3200	U
1634044	Methyl-tert-Butyl ether	740	U
108203	Di-isopropyl ether	490	U
	Dichlorodifluoromethane	990	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	740	U
74-83-9	Bromomethane	490	U
75-00-3	Chloroethane	740	U
75-69-4	Trichlorofluoromethane	490	U
75-35-4	1,1-Dichloroethene	250	U
67-64-1	Acetone	490	U
75-15-0	Carbon Disulfide	250	U
75-09-2	Methylene Chloride	490	U
156-60-5	trans-1,2-Dichloroethene	490	U
75-35-3	1,1-Dichloroethane	250	U
108-05-4	Vinyl Acetate	740	U
78-93-3	2-Butanone	740	U
	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
75-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	490	U
71-43-2	Benzene	850	
107-06-2	1,2-Dichloroethane	490	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
110-75-8	2-Chloroethyl vinyl ether	490	U
10061-01-5	cis-1,3-Dichloropropene	250	U
108-10-1	4-Methyl-2-Pentanone	490	U
108-88-3	Toluene	13000	
10061-02-6	trans-1,3-Dichloropropene	490	U
79-00-5	1,1,2-Trichloroethane	490	U
127-18-4	Tetrachloroethene	250	U
591-78-6	2-Hexanone	490	U
126-48-1	Dibromochloromethane	490	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	2500	

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-3

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.03

Sample wt/vol: 11.2 (g/ml) G Lab File ID: VB004403.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 10.22 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	12000	
1330-20-7	o-Xylene	4200	
100-42-5	Styrene	490	U
75-25-2	Bromoform	490	U
79-34-5	1,1,2,2-Tetrachloroethane	490	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **PS-3**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.03

Sample wt/vol: 11.2 (g/ml) G Lab File ID: VB004403.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 10.22 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 15

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 000107-83-5	Pentane, 2-methyl-	10.77	18000	JN
2. 000591-76-4	Hexane, 2-methyl-	16.75	17000	JN
3. 000589-34-4	Hexane, 3-methyl-	17.33	21000	JN
4.	unknown	17.86	13000	J
5.	unknown	27.17	85000	J
6.	unknown	28.63	150000	J
7.	unknown	30.23	24000	J
8.	unknown	30.63	15000	J
9. 000611-14-3	Benzene, 1-ethyl-2-methyl-	31.06	25000	JN
10.	unknown	31.56	25000	J
11. 000611-14-3	Benzene, 1-ethyl-2-methyl-	31.81	19000	JN
12. 000526-73-8	Benzene, 1,2,3-trimethyl-	32.14	30000	JN
13. 000091-20-3	Naphthalene	32.70	77000	JN
14.	unknown	33.70	27000	J
15.	unknown	34.42	22000	J

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-3Duplicate

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.04

Sample wt/vol: 10.1 (g/ml) G Lab File ID: VB004404.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 7.82 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1900	U
107131	Acrylonitrile	1900	U
75650	tert-Butyl alcohol	3500	U
1634044	Methyl-tert-Butyl ether	800	U
108203	Di-isopropyl ether	540	U
	Dichlorodifluoromethane	1100	U
74-87-3	Chloromethane	270	U
75-01-4	Vinyl Chloride	800	U
74-83-9	Bromomethane	540	U
75-00-3	Chloroethane	800	U
75-69-4	Trichlorofluoromethane	540	U
75-35-4	1,1-Dichloroethene	270	U
67-64-1	Acetone	540	U
75-15-0	Carbon Disulfide	270	U
75-09-2	Methylene Chloride	540	U
156-60-5	trans-1,2-Dichloroethene	540	U
75-35-3	1,1-Dichloroethane	270	U
108-05-4	Vinyl Acetate	800	U
78-93-3	2-Butanone	800	U
	cis-1,2-Dichloroethene	270	U
67-66-3	Chloroform	270	U
75-55-6	1,1,1-Trichloroethane	270	U
56-23-5	Carbon Tetrachloride	540	U
71-43-2	Benzene	270	U
107-06-2	1,2-Dichloroethane	540	U
79-01-6	Trichloroethene	270	U
78-87-5	1,2-Dichloropropane	270	U
75-27-4	Bromodichloromethane	270	U
110-75-8	2-Chloroethyl vinyl ether	540	U
10061-01-5	cis-1,3-Dichloropropene	270	U
108-10-1	4-Methyl-2-Pentanone	540	U
108-88-3	Toluene	2500	
10061-02-6	trans-1,3-Dichloropropene	540	U
79-00-5	1,1,2-Trichloroethane	540	U
127-18-4	Tetrachloroethene	270	U
591-78-6	2-Hexanone	540	U
126-48-1	Dibromochloromethane	540	U
108-90-7	Chlorobenzene	270	U
100-41-4	Ethylbenzene	2100	

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-3Duplicate

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.04

Sample wt/vol: 10.1 (g/ml) G Lab File ID: VB004404.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 7.82 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	8400	
1330-20-7	o-Xylene	3300	
100-42-5	Styrene	540	U
75-25-2	Bromoform	540	U
79-34-5	1,1,2,2-Tetrachloroethane	540	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **PS-3Duplicate**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.04

Sample wt/vol: 10.1 (g/ml) G Lab File ID: VB004404.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 7.82 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 15

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 000107-83-5	Pentane, 2-methyl-	10.77	3200	JN
2. 000096-14-0	Pentane, 3-methyl-	11.81	1800	JN
3. 000591-76-4	Hexane, 2-methyl-	16.76	3200	JN
4. 000589-34-4	Hexane, 3-methyl-	17.33	3600	JN
5.	unknown	17.85	2500	J
6.	unknown	25.83	2500	J
7. 002216-33-3	Octane, 3-methyl-	26.16	1600	JN
8. 000111-84-2	Nonane	27.17	3000	JN
9.	unknown	28.61	4100	J
10. 000611-14-3	Benzene, 1-ethyl-2-methyl-	31.06	5600	JN
11. 000095-63-6	Benzene, 1,2,4-trimethyl-	31.20	1900	JN
12. 000091-57-6	Naphthalene, 2-methyl-	31.81	26000	JN
13. 000108-67-8	Benzene, 1,3,5-trimethyl-	32.14	6800	JN
14. 000091-20-3	Naphthalene	32.69	2500	JN
15. 000091-57-6	Naphthalene, 2-methyl-	33.72	4100	JN

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-4

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.05

Sample wt/vol: 11.2 (g/ml) G Lab File ID: VB004405.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 8.99 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1700	U
107131	Acrylonitrile	1700	U
75650	tert-Butyl alcohol	3200	U
1634044	Methyl-tert-Butyl ether	740	U
108203	Di-isopropyl ether	490	U
	Dichlorodifluoromethane	980	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	740	U
74-83-9	Bromomethane	490	U
75-00-3	Chloroethane	740	U
75-69-4	Trichlorofluoromethane	490	U
75-35-4	1,1-Dichloroethene	250	U
67-64-1	Acetone	490	U
75-15-0	Carbon Disulfide	250	U
75-09-2	Methylene Chloride	490	U
156-60-5	trans-1,2-Dichloroethene	490	U
75-35-3	1,1-Dichloroethane	250	U
108-05-4	Vinyl Acetate	740	U
78-93-3	2-Butanone	740	U
	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
75-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	490	U
71-43-2	Benzene	7100	
107-06-2	1,2-Dichloroethane	490	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
110-75-8	2-Chloroethyl vinyl ether	3000	
10061-01-5	cis-1,3-Dichloropropene	250	U
108-10-1	4-Methyl-2-Pentanone	490	U
108-88-3	Toluene	59000	E
10061-02-6	trans-1,3-Dichloropropene	490	U
79-00-5	1,1,2-Trichloroethane	490	U
127-18-4	Tetrachloroethene	250	U
591-78-6	2-Hexanone	490	U
126-48-1	Dibromochloromethane	490	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	77000	E

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-4

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.05

Sample wt/vol: 11.2 (g/ml) G Lab File ID: VB004405.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 8.99 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	240000	E
1330-20-7	o-Xylene	100000	E
100-42-5	Styrene	490	U
75-25-2	Bromoform	490	U
79-34-5	1,1,2,2-Tetrachloroethane	490	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **PS-4**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.05

Sample wt/vol: 11.2 (g/ml) G Lab File ID: VB004405.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 8.99 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 15

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 000142-82-5	Heptane	18.62	71000	JN
2.	unknown	21.66	44000	J
3. 000589-81-1	Heptane, 3-methyl-	22.17	63000	JN
4. 000111-65-9	Octane	23.31	54000	JN
5. 002216-34-4	Octane, 4-methyl-	25.84	90000	JN
6.	unknown	26.16	67000	J
7. 000111-84-2	Nonane	27.20	50000	JN
8. 000103-65-1	Benzene, propyl-	30.83	48000	JN
9.	unknown	31.07	200000	J
10.	unknown	31.21	83000	J
11.	unknown	31.82	63000	J
12.	unknown	32.16	190000	J
13. 000526-73-8	Benzene, 1,2,3-trimethyl-	33.25	67000	JN
14.	unknown	33.59	58000	J
15. 021195-59-5	1,3,8-p-Menthatriene	33.76	84000	JN

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-4 DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.05

Sample wt/vol: 11.2 (g/ml) G Lab File ID: VB004431.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 8.99 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 5 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	17000	U
107131	Acrylonitrile	17000	U
75650	tert-Butyl alcohol	32000	U
1634044	Methyl-tert-Butyl ether	7400	U
108203	Di-isopropyl ether	4900	U
	Dichlorodifluoromethane	9800	U
74-87-3	Chloromethane	2500	U
75-01-4	Vinyl Chloride	7400	U
74-83-9	Bromomethane	4900	U
75-00-3	Chloroethane	7400	U
75-69-4	Trichlorofluoromethane	4900	U
75-35-4	1,1-Dichloroethene	2500	U
67-64-1	Acetone	4900	U
75-15-0	Carbon Disulfide	2500	U
75-09-2	Methylene Chloride	4900	U
156-60-5	trans-1,2-Dichloroethene	4900	U
75-35-3	1,1-Dichloroethane	2500	U
108-05-4	Vinyl Acetate	7400	U
78-93-3	2-Butanone	7400	U
	cis-1,2-Dichloroethene	2500	U
67-66-3	Chloroform	2500	U
75-55-6	1,1,1-Trichloroethane	2500	U
56-23-5	Carbon Tetrachloride	4900	U
71-43-2	Benzene	6000	
107-06-2	1,2-Dichloroethane	4900	U
79-01-6	Trichloroethene	2500	U
78-87-5	1,2-Dichloropropane	2500	U
75-27-4	Bromodichloromethane	2500	U
110-75-8	2-Chloroethyl vinyl ether	4900	U
10061-01-5	cis-1,3-Dichloropropene	2500	U
108-10-1	4-Methyl-2-Pentanone	4900	U
108-88-3	Toluene	80000	
10061-02-6	trans-1,3-Dichloropropene	4900	U
79-00-5	1,1,2-Trichloroethane	4900	U
127-18-4	Tetrachloroethene	2500	U
591-78-6	2-Hexanone	4900	U
126-48-1	Dibromochloromethane	4900	U
108-90-7	Chlorobenzene	2500	U
100-41-4	Ethylbenzene	150000	

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-4 DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.05

Sample wt/vol: 11.2 (g/ml) G Lab File ID: VB004431.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 8.99 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 5 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	620000	E
1330-20-7	o-Xylene	180000	
100-42-5	Styrene	4900	U
75-25-2	Bromoform	4900	U
79-34-5	1,1,2,2-Tetrachloroethane	4900	U

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-4 DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.05

Sample wt/vol: 11.2 (g/ml) G Lab File ID: VB004437.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 8.99 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 0.5 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	170000	U
107131	Acrylonitrile	170000	U
75650	tert-Butyl alcohol	320000	U
1634044	Methyl-tert-Butyl ether	74000	U
108203	Di-isopropyl ether	49000	U
	Dichlorodifluoromethane	98000	U
74-87-3	Chloromethane	25000	U
75-01-4	Vinyl Chloride	74000	U
74-83-9	Bromomethane	49000	U
75-00-3	Chloroethane	74000	U
75-69-4	Trichlorofluoromethane	49000	U
75-35-4	1,1-Dichloroethene	25000	U
67-64-1	Acetone	49000	U
75-15-0	Carbon Disulfide	25000	U
75-09-2	Methylene Chloride	49000	U
156-60-5	trans-1,2-Dichloroethene	49000	U
75-35-3	1,1-Dichloroethane	25000	U
108-05-4	Vinyl Acetate	74000	U
78-93-3	2-Butanone	74000	U
	cis-1,2-Dichloroethene	25000	U
67-66-3	Chloroform	25000	U
75-55-6	1,1,1-Trichloroethane	25000	U
56-23-5	Carbon Tetrachloride	49000	U
71-43-2	Benzene	25000	U
107-06-2	1,2-Dichloroethane	49000	U
79-01-6	Trichloroethene	25000	U
78-87-5	1,2-Dichloropropane	25000	U
75-27-4	Bromodichloromethane	25000	U
110-75-8	2-Chloroethyl vinyl ether	49000	U
10061-01-5	cis-1,3-Dichloropropene	25000	U
108-10-1	4-Methyl-2-Pentanone	49000	U
108-88-3	Toluene	47000	
10061-02-6	trans-1,3-Dichloropropene	49000	U
79-00-5	1,1,2-Trichloroethane	49000	U
127-18-4	Tetrachloroethene	25000	U
591-78-6	2-Hexanone	49000	U
126-48-1	Dibromochloromethane	49000	U
108-90-7	Chlorobenzene	25000	U
100-41-4	Ethylbenzene	110000	

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-4 DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4828 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4828.05

Sample wt/vol: 11.2 (g/ml) G Lab File ID: VB004437.D

Level: (low/med) MED Date Received: 9/29/99

% Moisture: not dec. 8.99 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 0.5 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	440000	
1330-20-7	o-Xylene	140000	
100-42-5	Styrene	49000	U
75-25-2	Bromoform	49000	U
79-34-5	1,1,2,2-Tetrachloroethane	49000	U

METALS

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

Client: U.S. Army
DPW, SELFM-PW-EV
Bldg. 173
Ft. Monmouth, NJ 07703

Lab ID #: 4828.01-.05
Sample Received: 09/29/99
Analysis Start: 10/01/99
Analysis Completed: 10/01/99

Site: Bldg. 699

Matrix: Soils

Method of Analysis: E.P.A. SW-846, Method 7420
Method of Digestion: E.P.A. SW-846, Method 3051A

TEST PARAMETER: Lead

Laboratory I.D. #	Sample Location	RESULT (mg/Kg)	MDL (mg/Kg)
4828.01	Piping Sample-1 3.5-4.0ft	ND	11.22
4828.02	PS-2 3.0-3.5ft	ND	11.13
4828.03	PS-3 2.5-3.0ft	ND	12.01
4828.04	PS-3 Duplicate	ND	9.86
4828.05	PS-4 2.5-3.0ft	ND	10.94

ND = Not Detected, MDL = Method Detection Limit, NA = Not Applicable

10.14.99

Daniel K. Wright
Laboratory Director

FORT MONMOUTH ENVIRONMENTAL TESTING LABORATORY

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

ANALYTICAL DATA REPORT
Fort Monmouth Environmental Laboratory
ENVIRONMENTAL DIVISION
Fort Monmouth, New Jersey
PROJECT: IJO# 99-0008

Bldg. 699

Field Sample Location	Laboratory Sample ID#	Matrix	Date and Time of Collection	Date Received
Piping Sample 5/3.0-3.5'	4834.01	Soil	30-Sept-99 14:20	10/04/99
PS-6/3.0-3.5'	4834.02	Soil	30-Sept-99 14:30	10/04/99
PS-6/Duplicate	4834.03	Soil	30-Sept-99 14:30	10/04/99
Trip Blank	4834.04	Methanol	30-Sept-99	10/04/99

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

ENCLOSURE:
CHAIN OF CUSTODY
RESULTS

10/18/99
Daniel Wright/Date
Laboratory Director

Fort Monmouth Environmental Testing Laboratory

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

Chain of Custody Record

Customer: Charles Appleby
Phone #: X26224
(X)DERA ( )OMA UST Assessment

Project No: 99-0008
Location: BLDG. 699
UST#

Samplers Name / Company : Frank Accorsi/TVS

Lab Sample I.D.	Sample Location	Date	Time	Sample Type	# bottles	~~TPH~~LEAD	% SOLIDS	VOA+10	VOA ID Number	PID Reading	Comments: * = Samples Kept <4 Celsius / Remarks / Preservation Method
48341 01	PIPING SAMPLE - 5, 3.0-3.5FT	9-30-99	1420	SOIL	2	X	X	X	844	280	ICE
02	PS-6, 3.0-3.5FT		1430		2	X	X	X	845	260	
03	PS-6 DUPLICATE		1430		2	X	X	X	846	260	
04	TRIP BLANK		—	AQ	1			X	843	—	

OVM sn#580U-64455.343 was calibrated with zero air & w/ 245 ppm Isobutylene read 245 ppm. 1330/9-30-99 FA (time/date & initial)

Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):
Frank Accorsi	10-4-99 0850				
Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):

Report Type: ( )Full, ( )Reduced, (X)Standard, ( )Screen / non-certified
Turnaround time: ( )Standard 7 wks, ( )Rush ___ Days, ( )ASAP Verbal ___ Hrs.

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

print legibly

USTcoc.xls8/18/99

Method Summary

EPA SW-846 Method 8260
Gas Chromatographic Determination of Volatiles in Soil

A 5-gram volume of soil sample is added to a 5-ml aliquot of water. Surrogates and internal standards are added and the sample is placed on a purge and trap concentrator. The sample as purged and desorbed into a GC/MS system. Volatiles are identified and quantitated. The final concentration is calculated using soil weight, percent moisture and concentration.

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

Vblk135

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk135

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004398.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 0 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1800	U
107131	Acrylonitrile	1800	U
75650	tert-Butyl alcohol	3200	U
1634044	Methyl-tert-Butyl ether	750	U
108203	Di-isopropyl ether	500	U
	Dichlorodifluoromethane	1000	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	750	U
74-83-9	Bromomethane	500	U
75-00-3	Chloroethane	750	U
75-69-4	Trichlorofluoromethane	500	U
75-35-4	1,1-Dichloroethene	250	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-09-2	Methylene Chloride	500	U
156-60-5	trans-1,2-Dichloroethene	500	U
75-35-3	1,1-Dichloroethane	250	U
108-05-4	Vinyl Acetate	750	U
78-93-3	2-Butanone	750	U
	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
75-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	500	U
71-43-2	Benzene	250	U
107-06-2	1,2-Dichloroethane	500	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
110-75-8	2-Chloroethyl vinyl ether	500	U
10061-01-5	cis-1,3-Dichloropropene	250	U
108-10-1	4-Methyl-2-Pentanone	500	U
108-88-3	Toluene	250	U
10061-02-6	trans-1,3-Dichloropropene	500	U
79-00-5	1,1,2-Trichloroethane	500	U
127-18-4	Tetrachloroethene	250	U
591-78-6	2-Hexanone	500	U
126-48-1	Dibromochloromethane	500	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	500	U

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

Vblk135

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk135

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004398.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 0 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	750	U
1330-20-7	o-Xylene	500	U
100-42-5	Styrene	500	U
75-25-2	Bromoform	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **Vblk135**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk135

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004398.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 0 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

Vblk136

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk136

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004428.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 0 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1800	U
107131	Acrylonitrile	1800	U
75650	tert-Butyl alcohol	3200	U
1634044	Methyl-tert-Butyl ether	750	U
108203	Di-isopropyl ether	500	U
	Dichlorodifluoromethane	1000	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	750	U
74-83-9	Bromomethane	500	U
75-00-3	Chloroethane	750	U
75-69-4	Trichlorofluoromethane	500	U
75-35-4	1,1-Dichloroethene	250	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-09-2	Methylene Chloride	500	U
156-60-5	trans-1,2-Dichloroethene	500	U
75-35-3	1,1-Dichloroethane	250	U
108-05-4	Vinyl Acetate	750	U
78-93-3	2-Butanone	750	U
	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
75-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	500	U
71-43-2	Benzene	250	U
107-06-2	1,2-Dichloroethane	500	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
110-75-8	2-Chloroethyl vinyl ether	500	U
10061-01-5	cis-1,3-Dichloropropene	250	U
108-10-1	4-Methyl-2-Pentanone	500	U
108-88-3	Toluene	250	U
10061-02-6	trans-1,3-Dichloropropene	500	U
79-00-5	1,1,2-Trichloroethane	500	U
127-18-4	Tetrachloroethene	250	U
591-78-6	2-Hexanone	500	U
126-48-1	Dibromochloromethane	500	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	500	U

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

Vblk136

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk136

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004428.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 0 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	750	U
1330-20-7	o-Xylene	500	U
100-42-5	Styrene	500	U
75-25-2	Bromoform	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **Vblk136**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk136

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004428.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 0 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

Trip Blank

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4834.04

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004399.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 0 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1800	U
107131	Acrylonitrile	1800	U
75650	tert-Butyl alcohol	3200	U
1634044	Methyl-tert-Butyl ether	750	U
108203	Di-isopropyl ether	500	U
	Dichlorodifluoromethane	1000	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	750	U
74-83-9	Bromomethane	500	U
75-00-3	Chloroethane	750	U
75-69-4	Trichlorofluoromethane	500	U
75-35-4	1,1-Dichloroethene	250	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-09-2	Methylene Chloride	2500	
156-60-5	trans-1,2-Dichloroethene	500	U
75-35-3	1,1-Dichloroethane	250	U
108-05-4	Vinyl Acetate	750	U
78-93-3	2-Butanone	750	U
	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
75-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	500	U
71-43-2	Benzene	250	U
107-06-2	1,2-Dichloroethane	500	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
110-75-8	2-Chloroethyl vinyl ether	500	U
10061-01-5	cis-1,3-Dichloropropene	250	U
108-10-1	4-Methyl-2-Pentanone	500	U
108-88-3	Toluene	250	U
10061-02-6	trans-1,3-Dichloropropene	500	U
79-00-5	1,1,2-Trichloroethane	500	U
127-18-4	Tetrachloroethene	250	U
591-78-6	2-Hexanone	500	U
126-48-1	Dibromochloromethane	500	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	500	U

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

Trip Blank

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4834.04

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004399.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 0 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	750	U
1330-20-7	o-Xylene	500	U
100-42-5	Styrene	500	U
75-25-2	Bromoform	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **Trip Blank**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4834.04

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004399.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 0 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-5

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4834.01

Sample wt/vol: 11.0 (g/ml) G Lab File ID: VB004408.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 12.76 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1800	U
107131	Acrylonitrile	1800	U
75650	tert-Butyl alcohol	3400	U
1634044	Methyl-tert-Butyl ether	790	U
108203	Di-isopropyl ether	520	U
	Dichlorodifluoromethane	1000	U
74-87-3	Chloromethane	260	U
75-01-4	Vinyl Chloride	790	U
74-83-9	Bromomethane	520	U
75-00-3	Chloroethane	790	U
75-69-4	Trichlorofluoromethane	520	U
75-35-4	1,1-Dichloroethene	260	U
67-64-1	Acetone	520	U
75-15-0	Carbon Disulfide	260	U
75-09-2	Methylene Chloride	520	U
156-60-5	trans-1,2-Dichloroethene	520	U
75-35-3	1,1-Dichloroethane	260	U
108-05-4	Vinyl Acetate	790	U
78-93-3	2-Butanone	790	U
	cis-1,2-Dichloroethene	260	U
67-66-3	Chloroform	260	U
75-55-6	1,1,1-Trichloroethane	260	U
56-23-5	Carbon Tetrachloride	520	U
71-43-2	Benzene	3000	
107-06-2	1,2-Dichloroethane	520	U
79-01-6	Trichloroethene	260	U
78-87-5	1,2-Dichloropropane	260	U
75-27-4	Bromodichloromethane	260	U
110-75-8	2-Chloroethyl vinyl ether	520	U
10061-01-5	cis-1,3-Dichloropropene	260	U
108-10-1	4-Methyl-2-Pentanone	520	U
108-88-3	Toluene	1500	
10061-02-6	trans-1,3-Dichloropropene	520	U
79-00-5	1,1,2-Trichloroethane	520	U
127-18-4	Tetrachloroethene	260	U
591-78-6	2-Hexanone	520	U
126-48-1	Dibromochloromethane	520	U
108-90-7	Chlorobenzene	260	U
100-41-4	Ethylbenzene	71000	E

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-5

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4834.01

Sample wt/vol: 11.0 (g/ml) G Lab File ID: VB004408.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 12.76 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	230000	E
1330-20-7	o-Xylene	68000	E
100-42-5	Styrene	520	U
75-25-2	Bromoform	520	U
79-34-5	1,1,2,2-Tetrachloroethane	520	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **PS-5**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4834.01

Sample wt/vol: 11.0 (g/ml) G Lab File ID: VB004408.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 12.76 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 15

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	25.84	86000	J
2.	unknown	26.17	61000	J
3. 000111-84-2	Nonane	27.18	63000	JN
4.	unknown	28.60	49000	J
5.	unknown	29.26	34000	J
6. 000098-82-8	Benzene, (1-methylethyl)-	29.85	32000	JN
7. 000103-65-1	Benzene, propyl-	30.83	53000	JN
8. 000620-14-4	Benzene, 1-ethyl-3-methyl-	31.07	200000	JN
9. 000108-67-8	Benzene, 1,3,5-trimethyl-	31.21	80000	JN
10. 000611-14-3	Benzene, 1-ethyl-2-methyl-	31.82	59000	JN
11.	unknown	32.15	210000	J
12. 000091-20-3	Naphthalene	32.70	33000	JN
13. 000095-36-3	1,2,4-Trimethylbenzene	33.25	65000	JN
14. 001074-43-7	Benzene, 1-methyl-3-propyl-	33.59	53000	JN
15.	unknown	33.76	59000	J

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-5 DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4834.01

Sample wt/vol: 11.0 (g/ml) G Lab File ID: VB004432.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 12.76 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	18000	U
107131	Acrylonitrile	18000	U
75650	tert-Butyl alcohol	34000	U
1634044	Methyl-tert-Butyl ether	7900	U
108203	Di-isopropyl ether	5200	U
	Dichlorodifluoromethane	10000	U
74-87-3	Chloromethane	2600	U
75-01-4	Vinyl Chloride	7900	U
74-83-9	Bromomethane	5200	U
75-00-3	Chloroethane	7900	U
75-69-4	Trichlorofluoromethane	5200	U
75-35-4	1,1-Dichloroethene	2600	U
67-64-1	Acetone	5200	U
75-15-0	Carbon Disulfide	2600	U
75-09-2	Methylene Chloride	5200	U
156-60-5	trans-1,2-Dichloroethene	5200	U
75-35-3	1,1-Dichloroethane	2600	U
108-05-4	Vinyl Acetate	7900	U
78-93-3	2-Butanone	7900	U
	cis-1,2-Dichloroethene	2600	U
67-66-3	Chloroform	2600	U
75-55-6	1,1,1-Trichloroethane	2600	U
56-23-5	Carbon Tetrachloride	5200	U
71-43-2	Benzene	2700	D
107-06-2	1,2-Dichloroethane	5200	U
79-01-6	Trichloroethene	2600	U
78-87-5	1,2-Dichloropropane	2600	U
75-27-4	Bromodichloromethane	2600	U
110-75-8	2-Chloroethyl vinyl ether	5200	U
10061-01-5	cis-1,3-Dichloropropene	2600	U
108-10-1	4-Methyl-2-Pentanone	5200	U
108-88-3	Toluene	2600	U
10061-02-6	trans-1,3-Dichloropropene	5200	U
79-00-5	1,1,2-Trichloroethane	5200	U
127-18-4	Tetrachloroethene	2600	U
591-78-6	2-Hexanone	5200	U
126-48-1	Dibromochloromethane	5200	U
108-90-7	Chlorobenzene	2600	U
100-41-4	Ethylbenzene	97000	D

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-5 DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4834.01

Sample wt/vol: 11.0 (g/ml) G Lab File ID: VB004432.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 12.76 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	400000	D
1330-20-7	o-Xylene	66000	D
100-42-5	Styrene	5200	U
75-25-2	Bromoform	5200	U
79-34-5	1,1,2,2-Tetrachloroethane	5200	U

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-6

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4834.02

Sample wt/vol: 10.6 (g/ml) G Lab File ID: VB004409.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 15.9 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	2000	U
107131	Acrylonitrile	2000	U
75650	tert-Butyl alcohol	3700	U
1634044	Methyl-tert-Butyl ether	850	U
108203	Di-isopropyl ether	560	U
	Dichlorodifluoromethane	1100	U
74-87-3	Chloromethane	280	U
75-01-4	Vinyl Chloride	850	U
74-83-9	Bromomethane	560	U
75-00-3	Chloroethane	850	U
75-69-4	Trichlorofluoromethane	560	U
75-35-4	1,1-Dichloroethene	280	U
67-64-1	Acetone	560	U
75-15-0	Carbon Disulfide	280	U
75-09-2	Methylene Chloride	560	U
156-60-5	trans-1,2-Dichloroethene	560	U
75-35-3	1,1-Dichloroethane	280	U
108-05-4	Vinyl Acetate	850	U
78-93-3	2-Butanone	850	U
	cis-1,2-Dichloroethene	280	U
67-66-3	Chloroform	280	U
75-55-6	1,1,1-Trichloroethane	280	U
56-23-5	Carbon Tetrachloride	560	U
71-43-2	Benzene	2700	
107-06-2	1,2-Dichloroethane	560	U
79-01-6	Trichloroethene	280	U
78-87-5	1,2-Dichloropropane	280	U
75-27-4	Bromodichloromethane	280	U
110-75-8	2-Chloroethyl vinyl ether	560	U
10061-01-5	cis-1,3-Dichloropropene	280	U
108-10-1	4-Methyl-2-Pentanone	560	U
108-88-3	Toluene	1600	
10061-02-6	trans-1,3-Dichloropropene	560	U
79-00-5	1,1,2-Trichloroethane	560	U
127-18-4	Tetrachloroethene	280	U
591-78-6	2-Hexanone	560	U
126-48-1	Dibromochloromethane	560	U
108-90-7	Chlorobenzene	280	U
100-41-4	Ethylbenzene	48000	E

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-6

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4834.02

Sample wt/vol: 10.6 (g/ml) G Lab File ID: VB004409.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 15.9 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	160000	E
1330-20-7	o-Xylene	16000	
100-42-5	Styrene	560	U
75-25-2	Bromoform	560	U
79-34-5	1,1,2,2-Tetrachloroethane	560	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **PS-6**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4834.02

Sample wt/vol: 10.6 (g/ml) G Lab File ID: VB004409.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 15.9 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 15

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	18.61	63000	J
2. 000565-75-3	Pentane, 2,3,4-trimethyl-	21.29	59000	JN
3. 000560-21-4	Pentane, 2,3,3-trimethyl-	21.66	79000	JN
4. 000589-81-1	Heptane, 3-methyl-	22.16	73000	JN
5. 000111-65-9	Octane	23.30	58000	JN
6.	unknown	25.84	85000	J
7.	unknown	26.16	68000	J
8. 000111-84-2	Nonane	27.18	53000	JN
9.	unknown	31.07	210000	J
10. 000526-73-8	Benzene, 1,2,3-trimethyl-	31.21	95000	JN
11. 000611-14-3	Benzene, 1-ethyl-2-methyl-	31.82	62000	JN
12.	unknown	32.15	220000	J
13. 000526-73-8	Benzene, 1,2,3-trimethyl-	33.25	76000	JN
14.	unknown	33.59	66000	J
15.	unknown	33.76	97000	J

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-6 DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4834.02

Sample wt/vol: 10.6 (g/ml) G Lab File ID: VB004433.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 15.9 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	20000	U
107131	Acrylonitrile	20000	U
75650	tert-Butyl alcohol	37000	U
1634044	Methyl-tert-Butyl ether	8500	U
108203	Di-isopropyl ether	5600	U
	Dichlorodifluoromethane	11000	U
74-87-3	Chloromethane	2800	U
75-01-4	Vinyl Chloride	8500	U
74-83-9	Bromomethane	5600	U
75-00-3	Chloroethane	8500	U
75-69-4	Trichlorofluoromethane	5600	U
75-35-4	1,1-Dichloroethene	2800	U
67-64-1	Acetone	5600	U
75-15-0	Carbon Disulfide	2800	U
75-09-2	Methylene Chloride	5600	U
156-60-5	trans-1,2-Dichloroethene	5600	U
75-35-3	1,1-Dichloroethane	2800	U
108-05-4	Vinyl Acetate	8500	U
78-93-3	2-Butanone	8500	U
	cis-1,2-Dichloroethene	2800	U
67-66-3	Chloroform	2800	U
75-55-6	1,1,1-Trichloroethane	2800	U
56-23-5	Carbon Tetrachloride	5600	U
71-43-2	Benzene	2800	U
107-06-2	1,2-Dichloroethane	5600	U
79-01-6	Trichloroethene	2800	U
78-87-5	1,2-Dichloropropane	2800	U
75-27-4	Bromodichloromethane	2800	U
110-75-8	2-Chloroethyl vinyl ether	5600	U
10061-01-5	cis-1,3-Dichloropropene	2800	U
108-10-1	4-Methyl-2-Pentanone	5600	U
108-88-3	Toluene	2800	U
10061-02-6	trans-1,3-Dichloropropene	5600	U
79-00-5	1,1,2-Trichloroethane	5600	U
127-18-4	Tetrachloroethene	2800	U
591-78-6	2-Hexanone	5600	U
126-48-1	Dibromochloromethane	5600	U
108-90-7	Chlorobenzene	2800	U
100-41-4	Ethylbenzene	120000	D

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-6 DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4834.02

Sample wt/vol: 10.6 (g/ml) G Lab File ID: VB004433.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 15.9 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	510000	D
1330-20-7	o-Xylene	22000	D
100-42-5	Styrene	5600	U
75-25-2	Bromoform	5600	U
79-34-5	1,1,2,2-Tetrachloroethane	5600	U

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-6 Duplicate

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4834.03

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VB004410.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 12.95 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1900	U
107131	Acrylonitrile	1900	U
75650	tert-Butyl alcohol	3500	U
1634044	Methyl-tert-Butyl ether	800	U
108203	Di-isopropyl ether	530	U
	Dichlorodifluoromethane	1100	U
74-87-3	Chloromethane	270	U
75-01-4	Vinyl Chloride	800	U
74-83-9	Bromomethane	530	U
75-00-3	Chloroethane	800	U
75-69-4	Trichlorofluoromethane	530	U
75-35-4	1,1-Dichloroethene	270	U
67-64-1	Acetone	530	U
75-15-0	Carbon Disulfide	270	U
75-09-2	Methylene Chloride	530	U
156-60-5	trans-1,2-Dichloroethene	530	U
75-35-3	1,1-Dichloroethane	270	U
108-05-4	Vinyl Acetate	800	U
78-93-3	2-Butanone	800	U
	cis-1,2-Dichloroethene	270	U
67-66-3	Chloroform	270	U
75-55-6	1,1,1-Trichloroethane	270	U
56-23-5	Carbon Tetrachloride	530	U
71-43-2	Benzene	2300	
107-06-2	1,2-Dichloroethane	530	U
79-01-6	Trichloroethene	270	U
78-87-5	1,2-Dichloropropane	270	U
75-27-4	Bromodichloromethane	270	U
110-75-8	2-Chloroethyl vinyl ether	530	U
10061-01-5	cis-1,3-Dichloropropene	270	U
108-10-1	4-Methyl-2-Pentanone	530	U
108-88-3	Toluene	1800	
10061-02-6	trans-1,3-Dichloropropene	530	U
79-00-5	1,1,2-Trichloroethane	530	U
127-18-4	Tetrachloroethene	270	U
591-78-6	2-Hexanone	530	U
126-48-1	Dibromochloromethane	530	U
108-90-7	Chlorobenzene	270	U
100-41-4	Ethylbenzene	36000	E

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-6 Duplicate

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4834.03

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VB004410.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 12.95 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	120000	E
1330-20-7	o-Xylene	11000	
100-42-5	Styrene	530	U
75-25-2	Bromoform	530	U
79-34-5	1,1,2,2-Tetrachloroethane	530	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **PS-6 Duplicate**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4834.03

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VB004410.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 12.95 Date Analyzed: 10/4/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 15

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 000142-82-5	Heptane	18.61	57000	JN
2. 000565-75-3	Pentane, 2,3,4-trimethyl-	21.29	57000	JN
3.	unknown	21.66	71000	J
4.	unknown	22.16	66000	J
5. 000111-65-9	Octane	23.30	55000	JN
6. 002216-34-4	Octane, 4-methyl-	25.84	87000	JN
7.	unknown	26.17	69000	J
8. 000111-84-2	Nonane	27.19	65000	JN
9.	unknown	31.07	180000	J
10. 000611-14-3	Benzene, 1-ethyl-2-methyl-	31.21	85000	JN
11. 000095-36-3	1,2,4-Trimethylbenzene	31.82	48000	JN
12.	unknown	32.15	190000	J
13. 000526-73-8	Benzene, 1,2,3-trimethyl-	33.25	67000	JN
14.	unknown	33.59	64000	J
15. 021195-59-5	1,3,8-p-Menthatriene	33.76	95000	JN

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-6 Duplicate DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4834.03

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VB004434.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 12.95 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	19000	U
107131	Acrylonitrile	19000	U
75650	tert-Butyl alcohol	35000	U
1634044	Methyl-tert-Butyl ether	8000	U
108203	Di-isopropyl ether	5300	U
	Dichlorodifluoromethane	11000	U
74-87-3	Chloromethane	2700	U
75-01-4	Vinyl Chloride	8000	U
74-83-9	Bromomethane	5300	U
75-00-3	Chloroethane	8000	U
75-69-4	Trichlorofluoromethane	5300	U
75-35-4	1,1-Dichloroethene	2700	U
67-64-1	Acetone	5300	U
75-15-0	Carbon Disulfide	2700	U
75-09-2	Methylene Chloride	5300	U
156-60-5	trans-1,2-Dichloroethene	5300	U
75-35-3	1,1-Dichloroethane	2700	U
108-05-4	Vinyl Acetate	8000	U
78-93-3	2-Butanone	8000	U
	cis-1,2-Dichloroethene	2700	U
67-66-3	Chloroform	2700	U
75-55-6	1,1,1-Trichloroethane	2700	U
56-23-5	Carbon Tetrachloride	5300	U
71-43-2	Benzene	2700	U
107-06-2	1,2-Dichloroethane	5300	U
79-01-6	Trichloroethene	2700	U
78-87-5	1,2-Dichloropropane	2700	U
75-27-4	Bromodichloromethane	2700	U
110-75-8	2-Chloroethyl vinyl ether	5300	U
10061-01-5	cis-1,3-Dichloropropene	2700	U
108-10-1	4-Methyl-2-Pentanone	5300	U
108-88-3	Toluene	2700	U
10061-02-6	trans-1,3-Dichloropropene	5300	U
79-00-5	1,1,2-Trichloroethane	5300	U
127-18-4	Tetrachloroethene	2700	U
591-78-6	2-Hexanone	5300	U
126-48-1	Dibromochloromethane	5300	U
108-90-7	Chlorobenzene	2700	U
100-41-4	Ethylbenzene	130000	D

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-6 Duplicate DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4834 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4834.03

Sample wt/vol: 10.8 (g/ml) G Lab File ID: VB004434.D

Level: (low/med) MED Date Received: 10/4/99

% Moisture: not dec. 12.95 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 10.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	550000	D
1330-20-7	o-Xylene	20000	D
100-42-5	Styrene	5300	U
75-25-2	Bromoform	5300	U
79-34-5	1,1,2,2-Tetrachloroethane	5300	U

METALS

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

Client: U.S. Army
DPW, SELFM-PW-EV
Bldg. 173
Ft. Monmouth, NJ 07703

Lab ID #: 4834.01-.03
Sample Received: 10/04/99
Analysis Start: 10/15/99
Analysis Completed: 10/15/99

Site: Ft. Monmouth
Bldg. 699

Matrix: Soil

Method of Analysis: Std. Methods 18th, Method 3111B
Method of Digestion: E.P.A. SW-846, Method 3051

TEST PARAMETER: Lead

Laboratory I.D. #	Sample Location	RESULT (mg/Kg)	MDL (mg/Kg)
4834.01	Piping Sample-5, 3.0-3.5ft	ND	12.46
4834.02	PS-6, 3.0-3.5ft	19.02	11.89
4834.03	PS-6, Duplicate	ND	12.49

ND = Not Detected, MDL = Method Detection Limit, NA = Not Applicable

Daniel K. Wright
Laboratory Director

FORT MONMOUTH ENVIRONMENTAL TESTING LABORATORY

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

ANALYTICAL DATA REPORT
Fort Monmouth Environmental Laboratory
ENVIRONMENTAL DIVISION
Fort Monmouth, New Jersey
PROJECT: IJO# 99-0008

Bldg. 699

Field Sample Location	Laboratory Sample ID#	Matrix	Date and Time of Collection	Date Received
Piping Sample 7/2.5-3.0'	4838.01	Soil	04-Oct-99 14:20	10/05/99
PS-8/1.5-2.0'	4838.02	Soil	04-Oct-99 14:30	10/05/99
PS-8/Duplicate	4838.03	Soil	04-Oct-99 14:30	10/05/99
PS-9/1.5-2.0'	4838.04	Soil	05-Oct-99 09:40	10/05/99
Trip Blank	4838.05	Methanol	04-Oct-99	10/05/99

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

ENCLOSURE:
CHAIN OF CUSTODY
RESULTS

10-21-99
Daniel Wright/Date
Laboratory Director

Fort Monmouth Environmental Testing Laboratory

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

Chain of Custody Record

Customer: Charles Appleby
Phone #: X26224
( )DERA (X)OMA UST Assessment

Project No: 99-0008
Location: BL06, 699
UST#

Samplers Name / Company : Frank Accorsi/TVS

Lab Sample I.D.	Sample Location	Date	Time	Sample Type	# bottles	TPHC/LEAD	% SOLIDS	VOA+10	VOA ID Number	PID Reading	Remarks / Preservation Method
4838. 01	PIPING SAMPLE-7, 2.5-3.0FT	10-4-99	1420	SOIL	2	X	X	X	842	380	ICE
02	PS-8, 1.5-2.0FT		1430		2	X	X	X	847	340	
03	PS-8, DUPLICATE		1430		2	X	X	X	848	340	
04	PS-9, 1.5-2.0 FT	10-5-99	0940		2	X	X	X	850	300	
05	TRIP BLANK	10-4-99	—	AQ	1			X	849	—	

Comments:
* = Samples Kept <4 Celsius

Analysis Parameters

OVM sn#580U-64455.343 was calibrated with zero air & w/ 245 ppm Isobutylene read 246 ppm. 1130, 10-4-99 FA (time/date & initial)

Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):
Frank Accorsi	10-5-99 1015				
Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):

Report Type: ( )Full, ( )Reduced, (X)Standard, ( )Screen / non-certified
Turnaround time: ( )Standard (3 wks), ( )Rush ____ Days, ( )ASAP Verbal ____ Hrs.

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

print legibly

USTcoc.xls8/18/99

Method Summary

EPA SW-846 Method 8260
Gas Chromatographic Determination of Volatiles in Soil

A 5-gram volume of soil sample is added to a 5-ml aliquot of water. Surrogates and internal standards are added and the sample is placed on a purge and trap concentrator. The sample as purged and desorbed into a GC/MS system. Volatiles are identified and quantitated. The final concentration is calculated using soil weight, percent moisture and concentration.

US ARMY FT. MONMOUTH ENVIRONMENTAL LABORATORY
NJDEPE # 13461

Definition of Qualifiers

MDL	: Method Detection Limit
J	: Compound identified below detection limit
B	: Compound in both sample and blank
D	: Results from dilution of sample
U	: Compound searched for but not detected
E	: Compound exceeds calibration limit

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

Vblk136

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk136

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004428.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 0 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1800	U
107131	Acrylonitrile	1800	U
75650	tert-Butyl alcohol	3200	U
1634044	Methyl-tert-Butyl ether	750	U
108203	Di-isopropyl ether	500	U
	Dichlorodifluoromethane	1000	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	750	U
74-83-9	Bromomethane	500	U
75-00-3	Chloroethane	750	U
75-69-4	Trichlorofluoromethane	500	U
75-35-4	1,1-Dichloroethene	250	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-09-2	Methylene Chloride	500	U
156-60-5	trans-1,2-Dichloroethene	500	U
75-35-3	1,1-Dichloroethane	250	U
108-05-4	Vinyl Acetate	750	U
78-93-3	2-Butanone	750	U
	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
75-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	500	U
71-43-2	Benzene	250	U
107-06-2	1,2-Dichloroethane	500	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
110-75-8	2-Chloroethyl vinyl ether	500	U
10061-01-5	cis-1,3-Dichloropropene	250	U
108-10-1	4-Methyl-2-Pentanone	500	U
108-88-3	Toluene	250	U
10061-02-6	trans-1,3-Dichloropropene	500	U
79-00-5	1,1,2-Trichloroethane	500	U
127-18-4	Tetrachloroethene	250	U
591-78-6	2-Hexanone	500	U
126-48-1	Dibromochloromethane	500	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	500	U

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

Vblk136

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk136

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004428.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 0 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	750	U
1330-20-7	o-Xylene	500	U
100-42-5	Styrene	500	U
75-25-2	Bromoform	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **Vblk136**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk136

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004428.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 0 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

Trip Blank

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4838.05

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004446.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 0 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1800	U
107131	Acrylonitrile	1800	U
75650	tert-Butyl alcohol	3200	U
1634044	Methyl-tert-Butyl ether	750	U
108203	Di-isopropyl ether	500	U
	Dichlorodifluoromethane	1000	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	750	U
74-83-9	Bromomethane	500	U
75-00-3	Chloroethane	750	U
75-69-4	Trichlorofluoromethane	500	U
75-35-4	1,1-Dichloroethene	250	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-09-2	Methylene Chloride	500	U
156-60-5	trans-1,2-Dichloroethene	500	U
75-35-3	1,1-Dichloroethane	250	U
108-05-4	Vinyl Acetate	750	U
78-93-3	2-Butanone	750	U
	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
75-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	500	U
71-43-2	Benzene	250	U
107-06-2	1,2-Dichloroethane	500	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
110-75-8	2-Chloroethyl vinyl ether	500	U
10061-01-5	cis-1,3-Dichloropropene	250	U
108-10-1	4-Methyl-2-Pentanone	500	U
108-88-3	Toluene	250	U
10061-02-6	trans-1,3-Dichloropropene	500	U
79-00-5	1,1,2-Trichloroethane	500	U
127-18-4	Tetrachloroethene	250	U
591-78-6	2-Hexanone	500	U
126-48-1	Dibromochloromethane	500	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	500	U

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

Trip Blank

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4838.05

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004446.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 0 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	750	U
1330-20-7	o-Xylene	500	U
100-42-5	Styrene	500	U
75-25-2	Bromoform	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **Trip Blank**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4838.05

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004446.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 0 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-7

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4838.01

Sample wt/vol: 11.0 (g/ml) G Lab File ID: VB004438.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 13.06 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 5 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	18000	U
107131	Acrylonitrile	18000	U
75650	tert-Butyl alcohol	34000	U
1634044	Methyl-tert-Butyl ether	7900	U
108203	Di-isopropyl ether	5200	U
	Dichlorodifluoromethane	10000	U
74-87-3	Chloromethane	2600	U
75-01-4	Vinyl Chloride	7900	U
74-83-9	Bromomethane	5200	U
75-00-3	Chloroethane	7900	U
75-69-4	Trichlorofluoromethane	5200	U
75-35-4	1,1-Dichloroethene	2600	U
67-64-1	Acetone	5200	U
75-15-0	Carbon Disulfide	2600	U
75-09-2	Methylene Chloride	5200	U
156-60-5	trans-1,2-Dichloroethene	5200	U
75-35-3	1,1-Dichloroethane	2600	U
108-05-4	Vinyl Acetate	7900	U
78-93-3	2-Butanone	7900	U
	cis-1,2-Dichloroethene	2600	U
67-66-3	Chloroform	2600	U
75-55-6	1,1,1-Trichloroethane	2600	U
56-23-5	Carbon Tetrachloride	5200	U
71-43-2	Benzene	7500	
107-06-2	1,2-Dichloroethane	5200	U
79-01-6	Trichloroethene	2600	U
78-87-5	1,2-Dichloropropane	2600	U
75-27-4	Bromodichloromethane	2600	U
110-75-8	2-Chloroethyl vinyl ether	5200	U
10061-01-5	cis-1,3-Dichloropropene	2600	U
108-10-1	4-Methyl-2-Pentanone	5200	U
108-88-3	Toluene	29000	
10061-02-6	trans-1,3-Dichloropropene	5200	U
79-00-5	1,1,2-Trichloroethane	5200	U
127-18-4	Tetrachloroethene	2600	U
591-78-6	2-Hexanone	5200	U
126-48-1	Dibromochloromethane	5200	U
108-90-7	Chlorobenzene	2600	U
100-41-4	Ethylbenzene	260000	

1A

FIELD ID: **PS-7**

VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4838.01

Sample wt/vol: 11.0 (g/ml) G Lab File ID: VB004438.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 13.06 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 5 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	1000000	E
1330-20-7	o-Xylene	190000	
100-42-5	Styrene	5200	U
75-25-2	Bromoform	5200	U
79-34-5	1,1,2,2-Tetrachloroethane	5200	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **PS-7**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4838.01

Sample wt/vol: 11.0 (g/ml) G Lab File ID: VB004438.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 13.06 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 5 (uL)

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

Number TICs found: 15

	CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1.	000078-78-4	Butane, 2-methyl-	6.48	230000	JN
2.	000107-83-5	Pentane, 2-methyl-	10.76	520000	JN
3.	000096-14-0	Pentane, 3-methyl-	11.80	290000	JN
4.	000110-54-3	Hexane	12.83	290000	JN
5.	000096-37-7	Cyclopentane, methyl-	15.40	290000	JN
6.	000591-76-4	Hexane, 2-methyl-	16.75	410000	JN
7.	000565-59-3	Pentane, 2,3-dimethyl-	17.07	330000	JN
8.	000589-34-4	Hexane, 3-methyl-	17.33	480000	JN
9.		unknown	17.85	430000	J
10.		unknown	25.82	240000	J
11.	000611-14-3	Benzene, 1-ethyl-2-methyl-	31.05	720000	JN
12.	000526-73-8	Benzene, 1,2,3-trimethyl-	31.20	270000	JN
13.	000526-73-8	Benzene, 1,2,3-trimethyl-	32.13	800000	JN
14.	000095-36-3	1,2,4-Trimethylbenzene	33.24	200000	JN
15.		unknown	33.75	210000	J

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-7 DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4838.01

Sample wt/vol: 11.0 (g/ml) G Lab File ID: VB004442.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 13.06 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 100.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	180000	U
107131	Acrylonitrile	180000	U
75650	tert-Butyl alcohol	340000	U
1634044	Methyl-tert-Butyl ether	79000	U
108203	Di-isopropyl ether	52000	U
	Dichlorodifluoromethane	100000	U
74-87-3	Chloromethane	26000	U
75-01-4	Vinyl Chloride	79000	U
74-83-9	Bromomethane	52000	U
75-00-3	Chloroethane	79000	U
75-69-4	Trichlorofluoromethane	52000	U
75-35-4	1,1-Dichloroethene	26000	U
67-64-1	Acetone	52000	U
75-15-0	Carbon Disulfide	26000	U
75-09-2	Methylene Chloride	52000	U
156-60-5	trans-1,2-Dichloroethene	52000	U
75-35-3	1,1-Dichloroethane	26000	U
108-05-4	Vinyl Acetate	79000	U
78-93-3	2-Butanone	79000	U
	cis-1,2-Dichloroethene	26000	U
67-66-3	Chloroform	26000	U
75-55-6	1,1,1-Trichloroethane	26000	U
56-23-5	Carbon Tetrachloride	52000	U
71-43-2	Benzene	26000	U
107-06-2	1,2-Dichloroethane	52000	U
79-01-6	Trichloroethene	26000	U
78-87-5	1,2-Dichloropropane	26000	U
75-27-4	Bromodichloromethane	26000	U
110-75-8	2-Chloroethyl vinyl ether	52000	U
10061-01-5	cis-1,3-Dichloropropene	26000	U
108-10-1	4-Methyl-2-Pentanone	52000	U
108-88-3	Toluene	26000	U
10061-02-6	trans-1,3-Dichloropropene	52000	U
79-00-5	1,1,2-Trichloroethane	52000	U
127-18-4	Tetrachloroethene	26000	U
591-78-6	2-Hexanone	52000	U
126-48-1	Dibromochloromethane	52000	U
108-90-7	Chlorobenzene	26000	U
100-41-4	Ethylbenzene	230000	D

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-7 DL

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4838.01

Sample wt/vol: 11.0 (g/ml) G Lab File ID: VB004442.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 13.06 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 100.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	870000	D
1330-20-7	o-Xylene	160000	D
100-42-5	Styrene	52000	U
75-25-2	Bromoform	52000	U
79-34-5	1,1,2,2-Tetrachloroethane	52000	U

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-8

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4838.02

Sample wt/vol: 10.4 (g/ml) G Lab File ID: VB004439.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 12.27 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 5 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	19000	U
107131	Acrylonitrile	19000	U
75650	tert-Butyl alcohol	35000	U
1634044	Methyl-tert-Butyl ether	8200	U
108203	Di-isopropyl ether	5400	U
	Dichlorodifluoromethane	11000	U
74-87-3	Chloromethane	2700	U
75-01-4	Vinyl Chloride	8200	U
74-83-9	Bromomethane	5400	U
75-00-3	Chloroethane	8200	U
75-69-4	Trichlorofluoromethane	5400	U
75-35-4	1,1-Dichloroethene	2700	U
67-64-1	Acetone	5400	U
75-15-0	Carbon Disulfide	2700	U
75-09-2	Methylene Chloride	5400	U
156-60-5	trans-1,2-Dichloroethene	5400	U
75-35-3	1,1-Dichloroethane	2700	U
108-05-4	Vinyl Acetate	8200	U
78-93-3	2-Butanone	8200	U
	cis-1,2-Dichloroethene	2700	U
67-66-3	Chloroform	2700	U
75-55-6	1,1,1-Trichloroethane	2700	U
56-23-5	Carbon Tetrachloride	5400	U
71-43-2	Benzene	3700	
107-06-2	1,2-Dichloroethane	5400	U
79-01-6	Trichloroethene	2700	U
78-87-5	1,2-Dichloropropane	2700	U
75-27-4	Bromodichloromethane	2700	U
110-75-8	2-Chloroethyl vinyl ether	5400	U
10061-01-5	cis-1,3-Dichloropropene	2700	U
108-10-1	4-Methyl-2-Pentanone	5400	U
108-88-3	Toluene	62000	
10061-02-6	trans-1,3-Dichloropropene	5400	U
79-00-5	1,1,2-Trichloroethane	5400	U
127-18-4	Tetrachloroethene	2700	U
591-78-6	2-Hexanone	5400	U
126-48-1	Dibromochloromethane	5400	U
108-90-7	Chlorobenzene	2700	U
100-41-4	Ethylbenzene	50000	

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-8

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4838.02

Sample wt/vol: 10.4 (g/ml) G Lab File ID: VB004439.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 12.27 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 5 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	260000	
1330-20-7	o-Xylene	94000	
100-42-5	Styrene	5400	U
75-25-2	Bromoform	5400	U
79-34-5	1,1,2,2-Tetrachloroethane	5400	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **PS-8**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4838.02

Sample wt/vol: 10.4 (g/ml) G Lab File ID: VB004439.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 12.27 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 5 (uL)

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

Number TICs found: 15

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 000078-78-4	Butane, 2-methyl-	6.48	57000	JN
2. 000107-83-5	Pentane, 2-methyl-	10.78	100000	JN
3. 000096-14-0	Pentane, 3-methyl-	11.82	59000	JN
4. 000096-37-7	Cyclopentane, methyl-	15.41	58000	JN
5. 000591-76-4	Hexane, 2-methyl-	16.76	68000	JN
6. 000565-59-3	Pentane, 2,3-dimethyl-	17.08	60000	JN
7. 000589-34-4	Hexane, 3-methyl-	17.33	84000	JN
8.	unknown	17.85	86000	J
9. 000111-84-2	Nonane	27.17	70000	JN
10. 000611-14-3	Benzene, 1-ethyl-2-methyl-	31.05	190000	JN
11. 000526-73-8	Benzene, 1,2,3-trimethyl-	31.20	76000	JN
12. 000611-14-3	Benzene, 1-ethyl-2-methyl-	31.81	54000	JN
13. 000526-73-8	Benzene, 1,2,3-trimethyl-	32.13	230000	JN
14. 000611-14-3	Benzene, 1-ethyl-2-methyl-	33.24	58000	JN
15.	unknown	33.75	56000	J

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-8 Duplicate

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4838.03

Sample wt/vol: 10.3 (g/ml) G Lab File ID: VB004440.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 12.01 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 5 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	19000	U
107131	Acrylonitrile	19000	U
75650	tert-Butyl alcohol	36000	U
1634044	Methyl-tert-Butyl ether	8300	U
108203	Di-isopropyl ether	5500	U
	Dichlorodifluoromethane	11000	U
74-87-3	Chloromethane	2800	U
75-01-4	Vinyl Chloride	8300	U
74-83-9	Bromomethane	5500	U
75-00-3	Chloroethane	8300	U
75-69-4	Trichlorofluoromethane	5500	U
75-35-4	1,1-Dichloroethene	2800	U
67-64-1	Acetone	5500	U
75-15-0	Carbon Disulfide	2800	U
75-09-2	Methylene Chloride	5500	U
156-60-5	trans-1,2-Dichloroethene	5500	U
75-35-3	1,1-Dichloroethane	2800	U
108-05-4	Vinyl Acetate	8300	U
78-93-3	2-Butanone	8300	U
	cis-1,2-Dichloroethene	2800	U
67-66-3	Chloroform	2800	U
75-55-6	1,1,1-Trichloroethane	2800	U
56-23-5	Carbon Tetrachloride	5500	U
71-43-2	Benzene	4300	
107-06-2	1,2-Dichloroethane	5500	U
79-01-6	Trichloroethene	2800	U
78-87-5	1,2-Dichloropropane	2800	U
75-27-4	Bromodichloromethane	2800	U
110-75-8	2-Chloroethyl vinyl ether	5500	U
10061-01-5	cis-1,3-Dichloropropene	2800	U
108-10-1	4-Methyl-2-Pentanone	5500	U
108-88-3	Toluene	63000	
10061-02-6	trans-1,3-Dichloropropene	5500	U
79-00-5	1,1,2-Trichloroethane	5500	U
127-18-4	Tetrachloroethene	2800	U
591-78-6	2-Hexanone	5500	U
126-48-1	Dibromochloromethane	5500	U
108-90-7	Chlorobenzene	2800	U
100-41-4	Ethylbenzene	57000	

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-8 Duplicate

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4838.03

Sample wt/vol: 10.3 (g/ml) G Lab File ID: VB004440.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 12.01 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 5 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	310000	
1330-20-7	o-Xylene	100000	
100-42-5	Styrene	5500	U
75-25-2	Bromoform	5500	U
79-34-5	1,1,2,2-Tetrachloroethane	5500	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **PS-8 Duplicate**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4838.03

Sample wt/vol: 10.3 (g/ml) G Lab File ID: VB004440.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 12.01 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 5 (uL)

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

Number TICs found: 15

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 000078-78-4	Butane, 2-methyl-	6.47	68000	JN
2. 000107-83-5	Pentane, 2-methyl-	10.78	120000	JN
3. 000096-14-0	Pentane, 3-methyl-	11.81	72000	JN
4. 000110-54-3	Hexane	12.84	63000	JN
5. 000096-37-7	Cyclopentane, methyl-	15.41	67000	JN
6. 000591-76-4	Hexane, 2-methyl-	16.76	83000	JN
7. 000589-34-4	Hexane, 3-methyl-	17.33	100000	JN
8.	unknown	17.85	54000	J
9. 000611-14-3	Benzene, 1-ethyl-2-methyl-	31.05	220000	JN
10. 000526-73-8	Benzene, 1,2,3-trimethyl-	31.20	98000	JN
11. 000611-14-3	Benzene, 1-ethyl-2-methyl-	31.81	80000	JN
12. 000526-73-8	Benzene, 1,2,3-trimethyl-	32.13	270000	JN
13. 000526-73-8	Benzene, 1,2,3-trimethyl-	33.24	71000	JN
14. 001074-43-7	Benzene, 1-methyl-3-propyl-	33.58	49000	JN
15.	unknown	33.75	76000	J

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-9

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4838.04

Sample wt/vol: 10.6 (g/ml) G Lab File ID: VB004441.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 14.48 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 5 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	19000	U
107131	Acrylonitrile	19000	U
75650	tert-Butyl alcohol	36000	U
1634044	Methyl-tert-Butyl ether	8300	U
108203	Di-isopropyl ether	5500	U
	Dichlorodifluoromethane	11000	U
74-87-3	Chloromethane	2800	U
75-01-4	Vinyl Chloride	8300	U
74-83-9	Bromomethane	5500	U
75-00-3	Chloroethane	8300	U
75-69-4	Trichlorofluoromethane	5500	U
75-35-4	1,1-Dichloroethene	2800	U
67-64-1	Acetone	5500	U
75-15-0	Carbon Disulfide	2800	U
75-09-2	Methylene Chloride	5500	U
156-60-5	trans-1,2-Dichloroethene	5500	U
75-35-3	1,1-Dichloroethane	2800	U
108-05-4	Vinyl Acetate	8300	U
78-93-3	2-Butanone	8300	U
	cis-1,2-Dichloroethene	2800	U
67-66-3	Chloroform	2800	U
75-55-6	1,1,1-Trichloroethane	2800	U
56-23-5	Carbon Tetrachloride	5500	U
71-43-2	Benzene	2800	U
107-06-2	1,2-Dichloroethane	5500	U
79-01-6	Trichloroethene	2800	U
78-87-5	1,2-Dichloropropane	2800	U
75-27-4	Bromodichloromethane	2800	U
110-75-8	2-Chloroethyl vinyl ether	5500	U
10061-01-5	cis-1,3-Dichloropropene	2800	U
108-10-1	4-Methyl-2-Pentanone	5500	U
108-88-3	Toluene	3900	
10061-02-6	trans-1,3-Dichloropropene	5500	U
79-00-5	1,1,2-Trichloroethane	5500	U
127-18-4	Tetrachloroethene	2800	U
591-78-6	2-Hexanone	5500	U
126-48-1	Dibromochloromethane	5500	U
108-90-7	Chlorobenzene	2800	U
100-41-4	Ethylbenzene	32000	

1A

FIELD ID:

VOLATILE ORGANICS ANALYSIS DATA SHEET

PS-9

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4838.04

Sample wt/vol: 10.6 (g/ml) G Lab File ID: VB004441.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 14.48 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 5 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	170000	
1330-20-7	o-Xylene	35000	
100-42-5	Styrene	5500	U
75-25-2	Bromoform	5500	U
79-34-5	1,1,2,2-Tetrachloroethane	5500	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID: **PS-9**

Lab Name: FMETL NJDEP#: 13461

Project: 990008 Case No.: 4838 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4838.04

Sample wt/vol: 10.6 (g/ml) G Lab File ID: VB004441.D

Level: (low/med) MED Date Received: 10/5/99

% Moisture: not dec. 14.48 Date Analyzed: 10/5/99

GC Column: RTX502. ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 5 (uL)

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

Number TICs found: 15

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 000078-78-4	Butane, 2-methyl-	6.48	58000	JN
2. 000107-83-5	Pentane, 2-methyl-	10.80	110000	JN
3. 000096-14-0	Pentane, 3-methyl-	11.82	60000	JN
4. 000110-82-7	Cyclohexane	15.41	59000	JN
5. 000591-76-4	Hexane, 2-methyl-	16.76	67000	JN
6. 000565-59-3	Pentane, 2,3-dimethyl-	17.08	71000	JN
7. 000589-34-4	Hexane, 3-methyl-	17.33	80000	JN
8. 000594-82-1	Butane, 2,2,3,3-tetramethyl-	17.86	89000	JN
9. 000620-14-4	Benzene, 1-ethyl-3-methyl-	31.05	260000	JN
10. 000526-73-8	Benzene, 1,2,3-trimethyl-	31.20	110000	JN
11. 000611-14-3	Benzene, 1-ethyl-2-methyl-	31.81	69000	JN
12. 000526-73-8	Benzene, 1,2,3-trimethyl-	32.13	320000	JN
13. 000526-73-8	Benzene, 1,2,3-trimethyl-	33.24	83000	JN
14. 001074-43-7	Benzene, 1-methyl-3-propyl-	33.58	64000	JN
15.	unknown	33.75	93000	J

METALS

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

Client: U.S. Army
DPW, SELFM-PW-EV
Bldg. 173
Ft. Monmouth, NJ 07703

Lab ID #: 4838.01-.04
Sample Received: 10/05/99
Analysis Start: 10/15/99
Analysis Completed: 10/15/99

Site: Ft. Monmouth
Bldg. 699

Matrix: Soil

Method of Analysis: Std. Methods 18th, Method 3111B
Method of Digestion: E.P.A. SW-846, Method 3051

TEST PARAMETER: Lead

Laboratory I.D. #	Sample Location	RESULT (mg/Kg)	MDL (mg/Kg)
4838.01	Piping Sample-7, 2.5-3.0ft	ND	11.06
4838.02	PS-8, 1.5-2.0ft	37.17	12.39
4838.03	PS-8, Duplicate	33.43	11.14
4838.04	PS-9, 1.5-2.0ft	25.98	10.83

ND = Not Detected, MDL = Method Detection Limit, NA = Not Applicable

Daniel K. Wright
Laboratory Director

APPENDIX F

GROUNDWATER ANALYTICAL DATA PACKAGE

FORT MONMOUTH ENVIRONMENTAL TESTING LABORATORY

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

ANALYTICAL DATA REPORT
Fort Monmouth Environmental Laboratory
ENVIRONMENTAL DIVISION
Fort Monmouth, New Jersey
PROJECT: IJO# 99-0094/UST

Bldg. 699/Saltzman Ave.

Field Sample Location	Laboratory Sample ID#	Matrix	Date and Time of Collection	Date Received
699A-North Wall 8.0-8.5' (E)	4764.01	Soil	01-Sept-99 09:15	09/01/99
699B-North Wall 8.0-8.5' (W)	4764.02	Soil	01-Sept-99 09:00	09/01/99
699C-West Wall 8.0-8.5' (N)	4764.03	Soil	01-Sept-99 09:35	09/01/99
699D-West Wall 8.0-8.5' (S)	4764.04	Soil	01-Sept-99 09:45	09/01/99
699E-South Wall 8.0-8.5' (W)	4764.05	Soil	01-Sept-99 11:20	09/01/99
699F-South Wall 8.0-8.5' (E)	4764.06	Soil	01-Sept-99 11:40	09/01/99
699G-East Wall 8.0-8.5' (S)	4764.07	Soil	01-Sept-99 12:00	09/01/99
699H-East Wall 8.0-8.5' (N)	4764.08	Soil	01-Sept-99 09:25	09/01/99
699I-Bottom 9.5-10.0'	4764.09	Soil	01-Sept-99 10:00	09/01/99
699D DUP.	4764.10	Soil	01-Sept-99 09:45	09/01/99
699 GW	4764.11	Aqueous	01-Sept-99 12:10	09/01/99
Trip Blank	4764.12	Methanol	01-Sept-99	09/01/99

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

ENCLOSURE:
CHAIN OF CUSTODY
RESULTS

9/16/99
Daniel Wright/Date
Laboratory Director

CHAIN OF CUSTODY

Fort Monmouth Environmental Testing Laboratory

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

Chain of Custody Record

Customer: Charles Appleby
Phone #: X26224
( )DERA (X)OMA UST Assessment

Project No: 99-~~0008~~0094
Location: BLDG. 699 SALTZMAN AVE.
UST#

Samplers Name / Company : Frank Accorsi/TVS

Lab Sample I.D.	Sample Location	Date	Time	Sample Type	# bottles	TPHC PB	% SOLIDS	VOA+10	VOA ID Number	PID Reading	Remarks / Preservation Method
47Ldt 01	699A- NORTH WALL 8.0-8.5 FT (E)	9-1-99	0915	SOIL	2	X	X	X	736	430	ICE
02	699B- NORTH WALL(W) 8.0-8.5 FT		0900			X	X	X	737	420	
03	699C- WEST WALL(N) 8.0-8.5 FT		0935			X	X	X	738	510	
04	699D- WEST WALL (S) 8.0-8.5 FT		0945			X	X	X	739	450	
05	699E- SOUTH WALL (W) 8.0-8.5 FT		1120			X	X	X	746	36	
06	699F- SOUTH WALL(E) 8.0-8.5 FT		1140			X	X	X	741	20	
07	699G- EAST WALL(S) 8.0-8.5 FT		1200			X	X	X	742	280	
08	699H- EAST WALL(N) 8.0-8.5 FT		0925			X	X	X	743	350	
09	699I- BOTTOM 9.5-10.0 FT	10000945FD				X	X	X	740	20	
10	699D- DUPLICATE		0945			X	X	X	744	430	
11	699-GW		1210	AQ	4	X	X	X	-	-	*
12	TRIP BLANK		-		1			X	745	-	

Comments: * = Samples Kept <4 Celsius

OVM sn#580U-64455.343 was calibrated with zero air & w/245ppm Isobutylene read 245 ppm. 0900 9-1-99 FA (time/date & initial)

Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):
Frank Accorsi	9-1-99 1306				
Relinquished by (signature):	Date/Time:	Received by (signature):	Relinquished by (signature):	Date/Time:	Received by (signature):

Report Type: ( )Full, ( )Reduced, (X)Standard, ( )Screen / non-certified
Turnaround time: (X)Standard 4 wks, ( )Rush ___ Days, ( )ASAP Verbal ___ Hrs.

Remarks: * HOLD GW ANALYSIS UNTIL APPROVED BY C. APPLEBY
Dedicated Sampling Tools Used
All sample points have been GPS? (X)YES ( )NO ( )NA

print legibly

USTcoc.xls8/18/99

Method Summary

EPA Method 624 – Aqueous
Gas Chromatographic Determination of Volatiles in Water

A 5 ml volume of sample is added to 5 ml aliquot of water. Surrogates and internal standards are added and the sample is placed on a purge and trap concentrator. The sample is purged and desorbed into a GC/MS system. Volatiles are then identified and quantitated.

EPA SW-846 Method 8260
Gas Chromatographic Determination of Volatiles in Soil

A 50ul volume of methanol soil sample is added to 5 ml aliquot of water. Surrogates and internal standards are added and the sample is placed on a purge and trap concentrator. The sample as purged and desorbed into a GC/MS system. Volatiles are identified and quantitated. The final concentration is calculated using soil weight, percent moisture, methanol volume and concentration.

VOLATILES

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

Data File **VC000746.D**
Operator **Skelton**
Date Acquired **3 Sep 1999 11:07 am**

Sample Name **Vblk25**
Field ID **Vblk25**
Sample Multiplie **1**

CAS#	Compound Name	R.T.	Response	Result	Regulatory Level (ug/l)*	MDL	Qualifier
107028	Acrolein			not detected	50	1.85 ug/L	
107131	Acrylonitrile			not detected	50	2.78 ug/L	
75650	tert-Butyl alcohol			not detected	nle	8.52 ug/L	
1634044	Methyl-tert-Butyl ether			not detected	nle	0.16 ug/L	
108203	Di-isopropyl ether			not detected	nle	0.25 ug/L	
	Dichlorodifluoromethane			not detected	nle	1.68 ug/L	
74-87-3	Chloromethane			not detected	30	1.16 ug/L	
75-01-4	Vinyl Chloride			not detected	5	1.06 ug/L	
74-83-9	Bromomethane			not detected	10	1.10 ug/L	
75-00-3	Chloroethane			not detected	nle	1.01 ug/L	
75-69-4	Trichlorofluoromethane			not detected	nle	0.50 ug/L	
75-35-4	1,1-Dichloroethene			not detected	2	0.24 ug/L	
67-64-1	Acetone			not detected	700	1.36 ug/L	
75-15-0	Carbon Disulfide			not detected	nle	0.46 ug/L	
75-09-2	Methylene Chloride			not detected	2	0.24 ug/L	
156-60-5	trans-1,2-Dichloroethene			not detected	100	0.16 ug/L	
75-35-3	1,1-Dichloroethane			not detected	70	0.12 ug/L	
108-05-4	Vinyl Acetate			not detected	nle	0.78 ug/L	
78-93-3	2-Butanone			not detected	300	0.62 ug/L	
	cis-1,2-Dichloroethene			not detected	10	0.17 ug/L	
67-66-3	Chloroform			not detected	6	0.30 ug/L	
75-55-6	1,1,1-Trichloroethane			not detected	30	0.23 ug/L	
56-23-5	Carbon Tetrachloride			not detected	2	0.47 ug/L	
71-43-2	Benzene			not detected	1	0.23 ug/L	
107-06-2	1,2-Dichloroethane			not detected	2	0.18 ug/L	
79-01-6	Trichloroethene			not detected	1	0.23 ug/L	
78-87-5	1,2-Dichloropropane			not detected	1	0.40 ug/L	
75-27-4	Bromodichloromethane			not detected	1	0.55 ug/L	
110-75-8	2-Chloroethyl vinyl ether			not detected	nle	0.65 ug/L	
10061-01-5	cis-1,3-Dichloropropene			not detected	nle	0.69 ug/L	
108-10-1	4-Methyl-2-Pentanone			not detected	400	0.59 ug/L	
108-88-3	Toluene			not detected	1000	0.37 ug/L	
10061-02-6	trans-1,3-Dichloropropene			not detected	nle	0.87 ug/L	
79-00-5	1,1,2-Trichloroethane			not detected	3	0.48 ug/L	
127-18-4	Tetrachloroethene			not detected	1	0.32 ug/L	
591-78-6	2-Hexanone			not detected	nle	0.71 ug/L	
126-48-1	Dibromochloromethane			not detected	10	0.86 ug/L	
108-90-7	Chlorobenzene			not detected	4	0.39 ug/L	
100-41-4	Ethylbenzene			not detected	700	0.65 ug/L	
1330-20-7	m+p-Xylenes			not detected	nle	1.14 ug/L	
1330-20-7	o-Xylene			not detected	nle	0.62 ug/L	
100-42-5	Styrene			not detected	100	0.56 ug/L	
75-25-2	Bromoform			not detected	4	0.70 ug/L	
79-34-5	1,1,2,2-Tetrachloroethane			not detected	2	0.47 ug/L	
541-73-1	1,3-Dichlorobenzene			not detected	600	0.55 ug/L	
106-46-7	1,4-Dichlorobenzene			not detected	75	0.57 ug/L	
95-50-1	1,2-Dichlorobenzene			not detected	600	0.64 ug/L	

*Higher of PQL's and Ground Water Quality Criteria as per N.J.A.C. 7:9-6 2-Sept-9

Qualifiers

B = Compound found in related blank
E = Value above linear range
D = Value from dilution
PQL = Practical Quantitation Limit

MDL = Method Detection Limit
NLE = No Limit Established
R.T. = Retention Time

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID. **Vblk25**

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: Vblk25

Sample wt/vol: 5.0 (g/ml) ML

Lab File ID: VC000746.D

Level: (low/med) LOW

Date Received: 9/1/99

% Moisture: not dec.

Date Analyzed: 9/3/99

GC Column: Rtx502.2 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

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

Data File	**VC000761.D**	Sample Name	**4764.11**
Operator	**Skelton**	Field ID	**699-GW**
Date Acquired	**3 Sep 1999 9:38 pm**	Sample Multiplie	**1**

CAS#	Compound Name	R.T.	Response	Result	Regulatory Level (ug/l)*	MDL	Qualifier
107028	Acrolein			not detected	50	1.85 ug/L	
107131	Acrylonitrile			not detected	50	2.78 ug/L	
75650	tert-Butyl alcohol			not detected	nle	8.52 ug/L	
1634044	Methyl-tert-Butyl ether	11.81	38860025	234.41 ug/L	nle	0.16 ug/L	E
108203	Di-isopropyl ether			not detected	nle	0.25 ug/L	
	Dichlorodifluoromethane			not detected	nle	1.68 ug/L	
74-87-3	Chloromethane			not detected	30	1.16 ug/L	
75-01-4	Vinyl Chloride			not detected	5	1.06 ug/L	
74-83-9	Bromomethane			not detected	10	1.10 ug/L	
75-00-3	Chloroethane			not detected	nle	1.01 ug/L	
75-69-4	Trichlorofluoromethane			not detected	nle	0.50 ug/L	
75-35-4	1,1-Dichloroethene			not detected	2	0.24 ug/L	
67-64-1	Acetone			not detected	700	1.36 ug/L	
75-15-0	Carbon Disulfide			not detected	nle	0.46 ug/L	
75-09-2	Methylene Chloride			not detected	2	0.24 ug/L	
156-60-5	trans-1,2-Dichloroethene			not detected	100	0.16 ug/L	
75-35-3	1,1-Dichloroethane			not detected	70	0.12 ug/L	
108-05-4	Vinyl Acetate			not detected	nle	0.78 ug/L	
78-93-3	2-Butanone			not detected	300	0.62 ug/L	
	cis-1,2-Dichloroethene			not detected	10	0.17 ug/L	
67-66-3	Chloroform			not detected	6	0.30 ug/L	
75-55-6	1,1,1-Trichloroethane			not detected	30	0.23 ug/L	
56-23-5	Carbon Tetrachloride			not detected	2	0.47 ug/L	
71-43-2	Benzene	18.66	58711716	205.21 ug/L	1	0.23 ug/L	E
107-06-2	1,2-Dichloroethane			not detected	2	0.18 ug/L	
79-01-6	Trichloroethene			not detected	1	0.23 ug/L	
78-87-5	1,2-Dichloropropane			not detected	1	0.40 ug/L	
75-27-4	Bromodichloromethane			not detected	1	0.55 ug/L	
110-75-8	2-Chloroethyl vinyl ether			not detected	nle	0.65 ug/L	
10061-01-5	cis-1,3-Dichloropropene			not detected	nle	0.69 ug/L	
108-10-1	4-Methyl-2-Pentanone			not detected	400	0.59 ug/L	
108-88-3	Toluene	23.65	67761507	200.64 ug/L	1000	0.37 ug/L	E
10061-02-6	trans-1,3-Dichloropropene			not detected	nle	0.87 ug/L	
79-00-5	1,1,2-Trichloroethane			not detected	3	0.48 ug/L	
127-18-4	Tetrachloroethene			not detected	1	0.32 ug/L	
591-78-6	2-Hexanone			not detected	nle	0.71 ug/L	
126-48-1	Dibromochloromethane			not detected	10	0.86 ug/L	
108-90-7	Chlorobenzene			not detected	4	0.39 ug/L	
100-41-4	Ethylbenzene	27.48	53941716	144.67 ug/L	700	0.65 ug/L	E
1330-20-7	m+p-Xylenes	27.64	59879447	388.63 ug/L	nle	1.14 ug/L	E
1330-20-7	o-Xylene	28.78	52526900	189.81 ug/L	nle	0.62 ug/L	E
100-42-5	Styrene			not detected	100	0.56 ug/L	
75-25-2	Bromoform			not detected	4	0.70 ug/L	
79-34-5	1,1,2,2-Tetrachloroethane			not detected	2	0.47 ug/L	
541-73-1	1,3-Dichlorobenzene			not detected	600	0.55 ug/L	
106-46-7	1,4-Dichlorobenzene			not detected	75	0.57 ug/L	
95-50-1	1,2-Dichlorobenzene			not detected	600	0.64 ug/L	

*Higher of PQL's and Ground Water Quality Criteria as per N.J.A.C. 7:9-6 2-Sept-9

Qualifiers

B = Compound found in related blank
E = Value above linear range
D = Value from dilution
PQL = Practical Quantitation Limit

MDL = Method Detection Limit
NLE = No Limit Established
R.T. = Retention Time

9/10/99 10:28 AM

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1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

699-GW

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 4764.11

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: VC000761.D

Level: (low/med) LOW Date Received: 9/1/99

% Moisture: not dec. Date Analyzed: 9/3/99

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

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

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

Number TICs found: 10

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1. 000100-61-8	Aniline, N-methyl-	27.70	1000	JN
2. 000103-65-1	Benzene, propyl-	30.62	180	JN
3.	unknown	30.86	710	J
4.	unknown	31.94	650	J
5.	unknown	33.04	320	J
6.	unknown	33.56	230	J
7.	unknown	33.78	250	J
8.	unknown	34.27	94	J
9.	unknown	34.45	150	J
10.	unknown	34.95	91	J

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

Data File **VC000762.D**
Operator **Skelton**
Date Acquired **3 Sep 1999 10:19 pm**

Sample Name **4764.11**
Field ID **699-GW**
Sample Multiplie **10**

CAS#	Compound Name	R.T.	Response	Result	Regulatory Level (ug/l)*	MDL	Qualifier
107028	Acrolein			not detected	50	18.50 ug/L	
107131	Acrylonitrile			not detected	50	27.80 ug/L	
75650	tert-Butyl alcohol			not detected	nle	85.20 ug/L	
1634044	Methyl-tert-Butyl ether	11.83	4939746	303.83 ug/L	nle	1.60 ug/L	D
108203	Di-isopropyl ether			not detected	nle	2.50 ug/L	
	Dichlorodifluoromethane			not detected	nle	16.80 ug/L	
74-87-3	Chloromethane			not detected	30	11.60 ug/L	
75-01-4	Vinyl Chloride			not detected	5	10.60 ug/L	
74-83-9	Bromomethane			not detected	10	11.00 ug/L	
75-00-3	Chloroethane			not detected	nle	10.10 ug/L	
75-69-4	Trichlorofluoromethane			not detected	nle	5.00 ug/L	
75-35-4	1,1-Dichloroethene			not detected	2	2.40 ug/L	
67-64-1	Acetone			not detected	700	13.60 ug/L	
75-15-0	Carbon Disulfide			not detected	nle	4.60 ug/L	
75-09-2	Methylene Chloride			not detected	2	2.40 ug/L	
156-60-5	trans-1,2-Dichloroethene			not detected	100	1.60 ug/L	
75-35-3	1,1-Dichloroethane			not detected	70	1.20 ug/L	
108-05-4	Vinyl Acetate			not detected	nle	7.80 ug/L	
78-93-3	2-Butanone			not detected	300	6.20 ug/L	
	cis-1,2-Dichloroethene			not detected	10	1.70 ug/L	
67-66-3	Chloroform			not detected	6	3.00 ug/L	
75-55-6	1,1,1-Trichloroethane			not detected	30	2.30 ug/L	
56-23-5	Carbon Tetrachloride			not detected	2	4.70 ug/L	
71-43-2	Benzene	18.61	20712014	729.61 ug/L	1	2.30 ug/L	D
107-06-2	1,2-Dichloroethane			not detected	2	1.80 ug/L	
79-01-6	Trichloroethene			not detected	1	2.30 ug/L	
78-87-5	1,2-Dichloropropane			not detected	1	4.00 ug/L	
75-27-4	Bromodichloromethane			not detected	1	5.50 ug/L	
110-75-8	2-Chloroethyl vinyl ether			not detected	nle	6.50 ug/L	
10061-01-5	cis-1,3-Dichloropropene			not detected	nle	6.90 ug/L	
108-10-1	4-Methyl-2-Pentanone			not detected	400	5.90 ug/L	
108-88-3	Toluene	23.66	46242230	1380.00 ug/L	1000	3.70 ug/L	E D
10061-02-6	trans-1,3-Dichloropropene			not detected	nle	8.70 ug/L	
79-00-5	1,1,2-Trichloroethane			not detected	3	4.80 ug/L	
127-18-4	Tetrachloroethene			not detected	1	3.20 ug/L	
591-78-6	2-Hexanone			not detected	nle	7.10 ug/L	
126-48-1	Dibromochloromethane			not detected	10	8.60 ug/L	
108-90-7	Chlorobenzene			not detected	4	3.90 ug/L	
100-41-4	Ethylbenzene	27.47	32749913	886.90 ug/L	700	6.50 ug/L	D
1330-20-7	m+p-Xylenes	27.69	40715242	2668.27 ug/L	nle	11.40 ug/L	E D
1330-20-7	o-Xylene	28.76	34196045	1247.74 ug/L	nle	6.20 ug/L	E D
100-42-5	Styrene			not detected	100	5.60 ug/L	
75-25-2	Bromoform			not detected	4	7.00 ug/L	
79-34-5	1,1,2,2-Tetrachloroethane			not detected	2	4.70 ug/L	
541-73-1	1,3-Dichlorobenzene			not detected	600	5.50 ug/L	
106-46-7	1,4-Dichlorobenzene			not detected	75	5.70 ug/L	
95-50-1	1,2-Dichlorobenzene			not detected	600	6.40 ug/L	

*Higher of PQL's and Ground Water Quality Criteria as per N.J.A.C. 7:9-6 2-Sept-9

Qualifiers

B = Compound found in related blank
E = Value above linear range
D = Value from dilution
PQL = Practical Quantitation Limit

MDL = Method Detection Limit
NLE = No Limit Established
R.T. = Retention Time

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

Data File **VC000763.D**
Operator **Skelton**
Date Acquired **3 Sep 1999 11:00 pm**

Sample Name **4764.11**
Field ID **699-GW**
Sample Multiplie **50**

CAS#	Compound Name	R.T.	Response	Result	Regulatory Level (ug/l)*	MDL	Qualifier
107028	Acrolein			not detected	50	92.50 ug/L	
107131	Acrylonitrile			not detected	50	139.00 ug/L	
75650	tert-Butyl alcohol			not detected	nle	426.00 ug/L	
1634044	Methyl-tert-Butyl ether	11.83	1055743	326.82 ug/L	nle	8.00 ug/L	D
108203	Di-isopropyl ether			not detected	nle	12.50 ug/L	
	Dichlorodifluoromethane			not detected	nle	84.00 ug/L	
74-87-3	Chloromethane			not detected	30	58.00 ug/L	
75-01-4	Vinyl Chloride			not detected	5	53.00 ug/L	
74-83-9	Bromomethane			not detected	10	55.00 ug/L	
75-00-3	Chloroethane			not detected	nle	50.50 ug/L	
75-69-4	Trichlorofluoromethane			not detected	nle	25.00 ug/L	
75-35-4	1,1-Dichloroethene			not detected	2	12.00 ug/L	
67-64-1	Acetone			not detected	700	68.00 ug/L	
75-15-0	Carbon Disulfide			not detected	nle	23.00 ug/L	
75-09-2	Methylene Chloride			not detected	2	12.00 ug/L	
156-60-5	trans-1,2-Dichloroethene			not detected	100	8.00 ug/L	
75-35-3	1,1-Dichloroethane			not detected	70	6.00 ug/L	
108-05-4	Vinyl Acetate			not detected	nle	39.00 ug/L	
78-93-3	2-Butanone			not detected	300	31.00 ug/L	
	cis-1,2-Dichloroethene			not detected	10	8.50 ug/L	
67-66-3	Chloroform			not detected	6	15.00 ug/L	
75-55-6	1,1,1-Trichloroethane			not detected	30	11.50 ug/L	
56-23-5	Carbon Tetrachloride			not detected	2	23.50 ug/L	
71-43-2	Benzene	18.61	4855433	868.51 ug/L	1	11.50 ug/L	D
107-06-2	1,2-Dichloroethane			not detected	2	9.00 ug/L	
79-01-6	Trichloroethene			not detected	1	11.50 ug/L	
78-87-5	1,2-Dichloropropane			not detected	1	20.00 ug/L	
75-27-4	Bromodichloromethane			not detected	1	27.50 ug/L	
110-75-8	2-Chloroethyl vinyl ether			not detected	nle	32.50 ug/L	
10061-01-5	cis-1,3-Dichloropropene			not detected	nle	34.50 ug/L	
108-10-1	4-Methyl-2-Pentanone			not detected	400	29.50 ug/L	
108-88-3	Toluene	23.63	21884650	3316.33 ug/L	1000	18.50 ug/L	D
10061-02-6	trans-1,3-Dichloropropene			not detected	nle	43.50 ug/L	
79-00-5	1,1,2-Trichloroethane			not detected	3	24.00 ug/L	
127-18-4	Tetrachloroethene			not detected	1	16.00 ug/L	
591-78-6	2-Hexanone			not detected	nle	35.50 ug/L	
126-48-1	Dibromochloromethane			not detected	10	43.00 ug/L	
108-90-7	Chlorobenzene			not detected	4	19.50 ug/L	
100-41-4	Ethylbenzene	27.47	10656721	1453.59 ug/L	700	32.50 ug/L	D
1330-20-7	m+p-Xylenes	27.67	17891343	5905.68 ug/L	nle	57.00 ug/L	D
1330-20-7	o-Xylene	28.76	11767737	2162.69 ug/L	nle	31.00 ug/L	D
100-42-5	Styrene			not detected	100	28.00 ug/L	
75-25-2	Bromoform			not detected	4	35.00 ug/L	
79-34-5	1,1,2,2-Tetrachloroethane			not detected	2	23.50 ug/L	
541-73-1	1,3-Dichlorobenzene			not detected	600	27.50 ug/L	
106-46-7	1,4-Dichlorobenzene			not detected	75	28.50 ug/L	
95-50-1	1,2-Dichlorobenzene			not detected	600	32.00 ug/L	

*Higher of PQL's and Ground Water Quality Criteria as per N.J.A.C. 7:9-6 2-Sept-9

Qualifiers

B = Compound found in related blank
E = Value above linear range
D = Value from dilution
PQL = Practical Quantitation Limit

MDL = Method Detection Limit
NLE = No Limit Established
R.T. = Retention Time

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

Vblk25

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk25

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VC000746.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 0 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND		Q
107028	Acrolein	1800	U
107131	Acrylonitrile	1800	U
75650	tert-Butyl alcohol	3200	U
1634044	Methyl-tert-Butyl ether	750	U
108203	Di-isopropyl ether	500	U
	Dichlorodifluoromethane	1000	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	750	U
74-83-9	Bromomethane	500	U
75-00-3	Chloroethane	750	U
75-69-4	Trichlorofluoromethane	500	U
75-35-4	1,1-Dichloroethene	250	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-09-2	Methylene Chloride	500	U
156-60-5	trans-1,2-Dichloroethene	500	U
75-35-3	1,1-Dichloroethane	250	U
108-05-4	Vinyl Acetate	750	U
78-93-3	2-Butanone	750	U
	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
75-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	500	U
71-43-2	Benzene	250	U
107-06-2	1,2-Dichloroethane	500	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
110-75-8	2-Chloroethyl vinyl ether	500	U
10061-01-5	cis-1,3-Dichloropropene	250	U
108-10-1	4-Methyl-2-Pentanone	500	U
108-88-3	Toluene	250	U
10061-02-6	trans-1,3-Dichloropropene	500	U
79-00-5	1,1,2-Trichloroethane	500	U
127-18-4	Tetrachloroethene	250	U
591-78-6	2-Hexanone	500	U
126-48-1	Dibromochloromethane	500	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	500	U

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

Vblk25

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk25

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VC000746.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 0 Date Analyzed: 9/3/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	750	U
1330-20-7	o-Xylene	500	U
100-42-5	Styrene	500	U
75-25-2	Bromoform	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

Vblk25

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL

Lab Sample ID: Vblk25

Sample wt/vol: 10.0 (g/ml) G

Lab File ID: VC000746.D

Level: (low/med) MED

Date Received: 9/1/99

% Moisture: not dec. 0

Date Analyzed: 9/3/99

GC Column: Rtx502.2 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL)

Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

Vblk128

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk128

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004228.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 0 Date Analyzed: 9/7/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
107028	Acrolein	1800	U
107131	Acrylonitrile	1800	U
75650	tert-Butyl alcohol	3200	U
1634044	Methyl-tert-Butyl ether	750	U
108203	Di-isopropyl ether	500	U
	Dichlorodifluoromethane	1000	U
74-87-3	Chloromethane	250	U
75-01-4	Vinyl Chloride	750	U
74-83-9	Bromomethane	500	U
75-00-3	Chloroethane	750	U
75-69-4	Trichlorofluoromethane	500	U
75-35-4	1,1-Dichloroethene	250	U
67-64-1	Acetone	500	U
75-15-0	Carbon Disulfide	250	U
75-09-2	Methylene Chloride	500	U
156-60-5	trans-1,2-Dichloroethene	500	U
75-35-3	1,1-Dichloroethane	250	U
108-05-4	Vinyl Acetate	750	U
78-93-3	2-Butanone	750	U
	cis-1,2-Dichloroethene	250	U
67-66-3	Chloroform	250	U
75-55-6	1,1,1-Trichloroethane	250	U
56-23-5	Carbon Tetrachloride	500	U
71-43-2	Benzene	250	U
107-06-2	1,2-Dichloroethane	500	U
79-01-6	Trichloroethene	250	U
78-87-5	1,2-Dichloropropane	250	U
75-27-4	Bromodichloromethane	250	U
110-75-8	2-Chloroethyl vinyl ether	500	U
10061-01-5	cis-1,3-Dichloropropene	250	U
108-10-1	4-Methyl-2-Pentanone	500	U
108-88-3	Toluene	250	U
10061-02-6	trans-1,3-Dichloropropene	500	U
79-00-5	1,1,2-Trichloroethane	500	U
127-18-4	Tetrachloroethene	250	U
591-78-6	2-Hexanone	500	U
126-48-1	Dibromochloromethane	500	U
108-90-7	Chlorobenzene	250	U
100-41-4	Ethylbenzene	500	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

FIELD ID.

Vblk128

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk128

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004228.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 0 Date Analyzed: 9/7/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND		Q
1330-20-7	m+p-Xylenes	750	U
1330-20-7	o-Xylene	500	U
100-42-5	Styrene	500	U
75-25-2	Bromoform	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID. **Vblk128**

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: Vblk128

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004228.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 0 Date Analyzed: 9/7/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

Trip Blank

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.12

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004237.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 0 Date Analyzed: 9/7/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND		Q
1330-20-7	m+p-Xylenes	750	U
1330-20-7	o-Xylene	500	U
100-42-5	Styrene	500	U
75-25-2	Bromoform	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U

1A

FIELD ID.

VOLATILE ORGANICS ANALYSIS DATA SHEET

Trip Blank

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL Lab Sample ID: 4764.12

Sample wt/vol: 10.0 (g/ml) G Lab File ID: VB004237.D

Level: (low/med) MED Date Received: 9/1/99

% Moisture: not dec. 0 Date Analyzed: 9/7/99

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

Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 50 (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
1330-20-7	m+p-Xylenes	750	U
1330-20-7	o-Xylene	500	U
100-42-5	Styrene	500	U
75-25-2	Bromoform	500	U
79-34-5	1,1,2,2-Tetrachloroethane	500	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

FIELD ID.

Trip Blank

Lab Name: FMETL NJDEP # 13461

Project: 990094 Case No.: 4764 Location: Bldg69 SDG No.:

Matrix: (soil/water) SOIL

Lab Sample ID: 4764.12

Sample wt/vol: 10.0 (g/ml) G

Lab File ID: VB004237.D

Level: (low/med) MED

Date Received: 9/1/99

% Moisture: not dec. 0

Date Analyzed: 9/7/99

GC Column: Rtx502.2 ID: 0.25 (mm)

Dilution Factor: 1.0

Soil Extract Volume: 25000 (uL)

Soil Aliquot Volume: 50 (uL)

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

Number TICs found: 0

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q

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

Client: U.S. Army
DPW, SELFM-PW-EV
Bldg. 173
Ft. Monmouth, NJ 07703

Lab ID #: 4764.01-.11
Sample Received: 09/01/99
Analysis Start: 09/07/99
Analysis Completed: 09/14/99

Site: Bldg. 699
Saltzman Ave.

Matrix: Soil

Method of Analysis: E.P.A. SW-846, Method 7420, 7421
Method of Digestion: E.P.A. SW-846, Method 3051A

TEST PARAMETER: Lead(ppm)

Laboratory I.D. #	Sample Location	RESULT (mg/Kg)	MDL (mg/Kg)
4764.01	699A-North Wall 8.0-8.5 ft (E)	ND	13.13
4764.02	699B-North Wall 8.0-8.5 ft (W)	ND	12.25
4764.03	699C-West Wall 8.0-8.5 ft (N)	ND	13.86
4764.04	699D-West Wall 8.0-8.5 ft (S)	ND	13.59
4764.05	699E-South Wall 8.0-8.5 ft (W)	ND	13.24
4764.06	699F-South Wall 8.0-8.5 ft (E)	ND	13.31
4764.07	699G-East Wall 8.0-8.5 ft (S)	ND	10.28
4764.08	699H-East Wall 8.0-8.5 ft (N)	ND	13.24
4764.09	699I-Bottom 9.5-10.0 ft	ND	12.05
4764.10	699D-Duplicate	ND	12.55

Laboratory I.D. #	Sample Location	RESULT (mg/L)	MDL (mg/L)
4764.11	699-GW	0.0354	0.0008

ND = Not Detected, MDL = Method Detection Limit, NA = Not Applicable

9/16/99

Daniel K. Wright
Laboratory Director

MATERIAL SAFETY DATA SHEET

This MSDS complies with OSHA'S Hazard Communication Standard 29 CFR 1910.1200 and OSHA Form 174

IDENTITY AND MANUFACTURER'S INFORMATION

NFPA Rating: Health-1; Flammability-0; Reactivity-0; Special- -		**HMIS Rating:** Health-1; Flammability-0; Reactivity-0; Personal Protection-D	
Manufacturer's Name:	Enzyme Technologies, Inc.	**DOT Hazard Classification:** None	
Address:	5228 NE 158th Ave Portland, OR 97230	**TRADE NAME:** **EZT-A2**	
Date Prepared: 3/9/98	**Prepared By:** KG	**MSDS Number:**	**Revision** - 2
Information Calls:	**(503) 254-4331**	NOTICE: JUDGMENT BASED ON INDIRECT TEST DATA	

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)	ACS Number	SARA III LIST	OSHA PEL (ppm)	ACGIH TLV (ppm)	Carcinogen Ref. Source **
Bacterial Consortium	N/A	No	N/E	N/E	N/E

SECTION 2 - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point:	212 F	**Specific Gravity (H2O=1):**	1.00
Vapor Pressure: PSIG @ 70 F (Aerosols):	N/A	**Vapor Pressure (Non-Aerosols)(mm Hg and Temperature):**	18 @75^0 F
Vapor Density (Air = 1):	.62	**Evaporation Rate (BUAC = 1):**	1.00
Solubility in Water:	Complete	**Water Reactive:**	No

Appearance and Odor: Thin brown/tan liquid with slightly sour odor

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY as per USA flame projection test (aerosols): N/A	Auto Ignition Temperature: N/A	Flammability Limits in Air by % in Volume:
FLASH POINT AND METHOD USED N/A		% LEL: N/A % UEL: N/A
EXTINGUISHER MEDIA: Non-Combustible	**SPECIAL FIRE FIGHTING PROCEDURES**: None	

Unusual Fire & Explosion Hazards: None

SECTION 4 - REACTIVITY HAZARD DATA

STABILITY: [X] STABLE [ ] UNSTABLE	**HAZARDOUS POLYMERIZATION:** [ ] WILL [X] WILL NOT OCCUR
Incompatibility (Mat. to avoid): None Identified	**Conditions to Avoid:** None Identified

Hazardous Decomposition Products: None

SECTION 5 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: [ ] INHALATION [X] INGESTION [X] SKIN ABSORPTION [X] EYE [ ] NOT HAZARDOUS

ACUTE EFFECTS: None

Inhalation: None

Eye Contact: May be an irritant **Skin Contact:** May be an irritant.

Ingestion: Gastrointestinal irritant

CHRONIC EFFECTS: None known.

Medical Conditions Generally Aggravated by Exposure: None Identified

SECTION 6 - EMERGENCY FIRST AID PROCEDURES

Eye Contact: Flush with water for 15 minutes. If irritation persists get medical attention.

Skin Contact: Wash with soap and water.

Inhalation: Move to fresh air. No adverse effects noted.

Ingestion: **DO NOT INDUCE VOMITING.** Drink large quantity of water. Get immediate medical attention.

SECTION 7 - CONTROL AND PROTECTIVE MEASURES

Respiratory Protection (specify type):. None normally needed

Protective Gloves: Rubber if desired **Eye Protection:** Safety glasses.

Ventilation Requirements: Normal room ventilation.

Other Protective Clothing & Equipment: Apron and boots if desired.

Hygienic Work Practices: Wash with soap and water after contact.

SECTION 8 - PRECAUTIONS FOR SAFE HANDLING AND USE

Steps To Be Taken If Material Is Spilled Or Released: Dike and contain. Collect and re-use.

Waste Disposal Methods: Rinse container with water and dispose of accordingly

Precautions To Be Taken In Handling & Storage: Recommended storage temperature is 60 F. Seal container after use.

Other Precautions &/or Special Hazards: KEEP OUT OF REACH OF CHILDREN.

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind.

**** Chemical Listed as Carcinogen or Potential Carcinogen. [a] NTP [b] IARC Monograph [c] OSHA [d] Not Listed [e] Animal Data Only**

United States Army
Fort Monmouth, New Jersey

Building 699
Remedial Action Progress Report
Enzyme-Enhanced Bioremediation

Fort Monmouth, Main Post
Wall Township, New Jersey

December 23, 2002

DRAFT CA

UNDERGROUND STORAGE TANK CLOSURE AND SITE INVESTIGATION REPORT BUILDING 699 UST REGISTRATION NO. 81533-197

December 23, 1993

W.O. No.: 03886-088-001

Prepared For:

UNITED STATES ARMY, FORT MONMOUTH NEW JERSEY
DIRECTORATE OF PUBLIC WORKS
BUILDING 167
FORT MONMOUTH, NJ 07703

Prepared by:

ROY F. WESTON, INC.
Raritan Plaza I, 4th Floor
Edison, New Jersey 08837

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EXECUTIVE SUMMARY

On 6 January 1992, one underground storage tank (UST) was closed at U.S. Army Fort Monmouth, Fort Monmouth, New Jersey. The UST, New Jersey Department of Environmental Protection and Energy (NJDEPE) Registration No. 81533-197, was located immediately southwest of Building 699 in the Main Post area of Fort Monmouth. UST No. 81533-197 was a single wall steel, 1,000-gallon capacity waste oil tank. The tank closure was performed by Fabiano and Son, Inc. of Long Branch, New Jersey.

Soils surrounding the UST were screened visually and with air monitoring instruments for evidence of contamination. The UST was inspected, following removal, for corrosion holes and indications of historical leakage. No holes were noted and no potentially contaminated soils were identified surrounding the UST.

Following removal of the UST, five (5) post-excavation samples (SP1, SP2, SP3, SP4 and SP5) were collected along the sidewalls and base of the excavation. These samples were analyzed for total petroleum hydrocarbons (TPHC) and priority pollutants plus forty tentatively identified compounds (PP+40). Sample SP2 contained a concentration of total organic compounds exceeding the proposed NJDEPE subsurface cleanup criteria of 10,000 milligrams per kilogram (mg/kg). Sample SP2 also contained an elevated concentration (332.7 mg/kg) of lead, however no subsurface cleanup criterion has been proposed by the NJDEPE for lead. All other contaminants detected in the post-excavation samples were in concentrations below proposed NJDEPE subsurface cleanup criteria.

Based on the elevated concentrations of total organic compounds and lead detected in post-excavation sample SP2, a groundwater monitoring well was installed adjacent to the former location of UST No. 81533-197 on 14 October 1992. The monitoring well, identified as MW-12, was installed to a total depth of 14.73 feet below ground surface (BGS). To further characterize soil conditions in the former location of UST No. 81533-197, three soil boring samples (C92-1009, C92-1010 and C92-1011) were collected during installation of MW-12. The soil boring samples were collected from the following depth intervals: 6.5 feet below ground surface (BGS) to 7.0 feet BGS, 10.5 feet BGS to 11.5 feet BGS and 15 feet BGS to 17 feet BGS. All samples were analyzed for TPHC. Concentrations of TPHC detected in these samples ranged from non-detectable to 22 mg/kg. No subsurface cleanup criterion has been proposed by the NJDEPE for TPHC, however concentrations of TPHC detected in the soil boring samples were below levels of concern.

One groundwater sample was collected from MW-12 on 26 October 1992 and was analyzed for volatile organic compounds plus fifteen tentatively identified compounds (VOC+15) and lead. Lead was detected in this sample at a concentration of 6 micrograms per liter (ug/l), which slightly exceeds the NJDEPE groundwater cleanup standard of 5 ug/l. Methylene chloride, a common laboratory contaminant, was tentatively identified in the sample at a concentration of 4 ug/l, which exceeds the NJDEPE groundwater cleanup standard of 2 ug/l. Methylene chloride

was also detected in the laboratory blank indicating that this compound was a laboratory artifact. No other compounds were detected in this sample at concentration exceeding NJDEPE groundwater cleanup standards.

An additional groundwater sample was collected from MW-12 on 11 May 1993 which provides additional data to groundwater concentrations. This sample was analyzed for VO+15 and lead. Lead was not detected in the sample. Methylene chloride was detected in the sample, however this compound is most likely a laboratory artifact as it was also detected in the laboratory blank.

No further action is proposed relative to the elevated level of total organic compounds detected in post-excavation sample SP2. All other post-excavation samples contained concentrations of total organic compounds below the proposed NJDEPE subsurface cleanup criterion of 10,000 mg/kg. Additionally, groundwater samples collected from MW-12 and analyzed for VO+15 and lead indicate that groundwater has not been impacted by a discharge from UST No. 81533-197.

It is proposed that an additional groundwater sample be collected from MW-12. This sample will be analyzed for base neutral compounds plus 25 tentatively identified compounds (BN+25) to comply with initial groundwater screening parameters specified in the "Technical Requirements for Site Remediation" (NJAC 7: 26E-1 et. seq. June 1993). The sample will also be analyzed for lead to provide additional data relative to lead concentrations in groundwater at this site.

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SECTION 1.0

UNDERGROUND STORAGE TANK DECOMMISSIONING ACTIVITIES

1.1 Overview:

One underground storage tank (UST), New Jersey Department of Environmental Protection and Energy (NJDEPE) Registration No. 81533-197, was closed at Building 699 at U.S. Army Fort Monmouth on 6 January 1992. This Underground Storage Tank Closure and Site Investigation Report was prepared by Roy F. Weston Inc., (WESTON®) to assist the United State Army Directorate of Public Works (DPW) in complying with NJDEPE Bureau of Underground Storage Tanks (NJDEPE-BUST) regulations. The applicable NJDEPE-BUST regulations at the date of closure were the "Interim Closure Requirements for Underground Storage Tank Systems" (NJAC 7:14B-1 et seq. September 1991 and revisions dated November 1991). This report presents the results of the DPW's implementation of the UST Decommissioning/Closure Plan submitted to the NJDEPE on 12 July 1991. UST No. 81533-197 was a single wall steel, 1,000-gallon waste oil tank.

All activities associated with the decommissioning of the UST complied with all applicable Federal, State and Local laws and ordinances in effect at the date of decommissioning. These laws included but were not limited to: NJAC 7:14B-1 et seq., NJAC 5:23-1 et seq., and Occupational Safety and Health Administration (OSHA) 1910.146 &1910.120. All permits including but not limited to the NJDEPE closure approval letter were posted onsite for inspection. Fabiano and Sons Inc., the contractors that conducted the decommissioning activities, are registered and certified by the NJDEPE for performing UST closure activities. Closure of UST No. 81533-197 proceeded under the jurisdiction of the NJDEPE Division of Hazardous Waste Management (NJDEPE-DHWM). The NJDEPE-DHWM conditional closure approval letter and the UST Site Assessment Summary Form for UST No. 81533-197 have been included in Appendices A and B, respectively.

Section 1 of this UST Closure and Site Investigation Report provides a summary of the UST decommissioning activities. Section 2 of this report describes the site investigation activities. Conclusions and recommendations, including the results of the soil and groundwater sampling investigation are presented in the final section of this report.

1.2 Site Description

Building 699 is located within the Main Post area of the U.S. Fort Monmouth. This building is presently utilized as a gasoline service station and convenience store. UST No. 81533-197 was located approximately 10 feet to the southwest of Building 699. A site location map is provided in Figure 1-1.

1.2.1 Geological/Hydrogeological Setting

The following is a description of the geological/hydrogeological setting of the area surrounding Building 699. Included is a description of the regional geology of the area surrounding Fort Monmouth as well as descriptions of the local geology and hydrogeology of the Main Post area.

Regional Geology

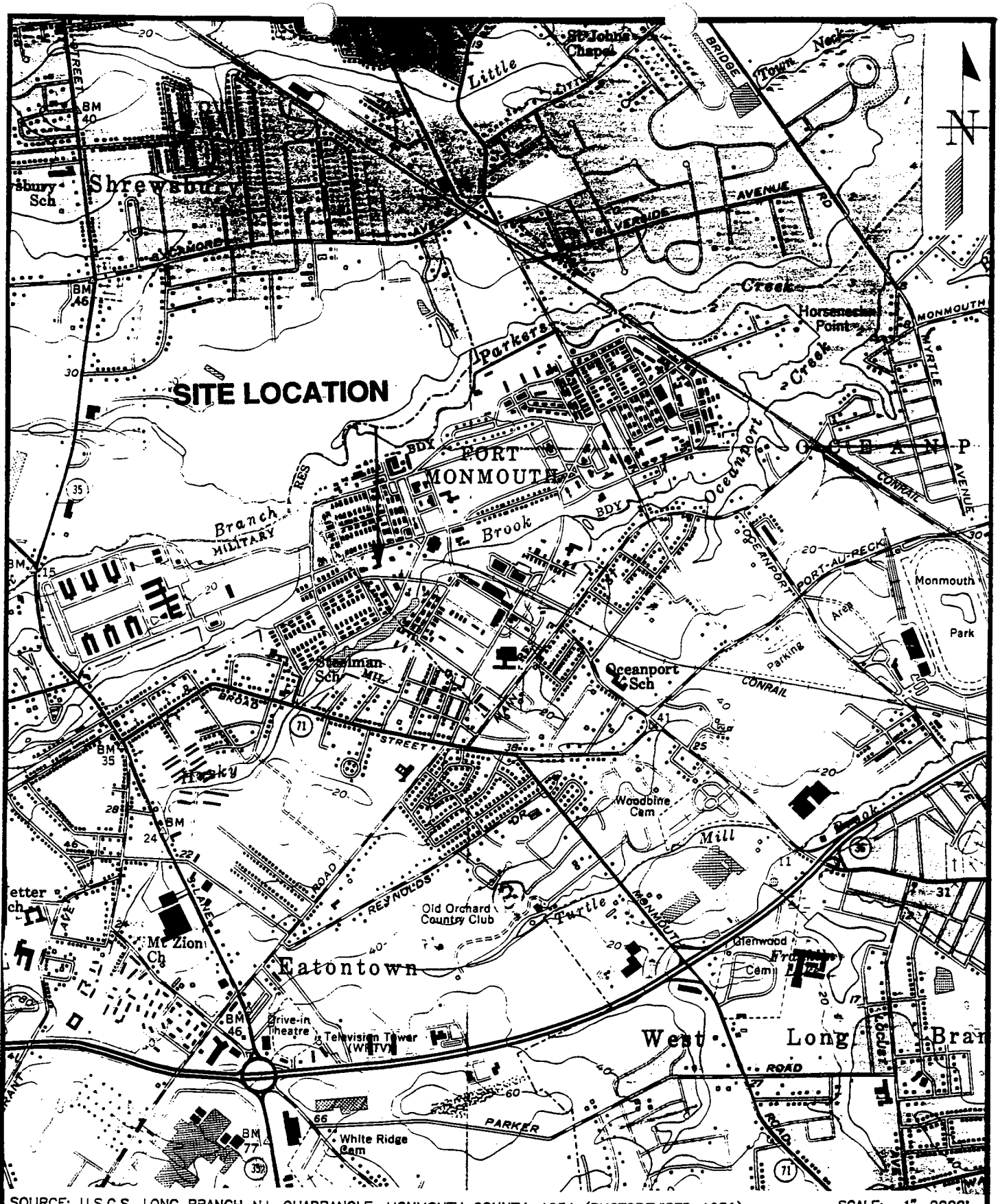
Monmouth County lies within the New Jersey Section of the Atlantic Coastal Plain physiographic province. The Main Post, Charles Wood, and the Evans areas are located in what may be referred to as the Outer Coastal Plain subprovince, or the Outer Lowlands.

In general, New Jersey Coastal Plain formations consist of a seaward-dipping wedge of unconsolidated deposits of clay, silt, sand, and gravel. These formations typically strike northeast-southwest with a dip ranging from 10 to 60 feet per mile and were deposited on Precambrian and lower Paleozoic rocks (Zapecza, 1989). These sediments, predominantly derived from deltaic, shallow marine, and continental shelf environments, date from Cretaceous through the Quaternary Periods. The mineralogy ranges from quartz to glauconite.

The formations record several major transgressive/regressive cycles and contain units which are generally thicker to the southeast and reflect a deeper water environment. Over 20 regional geologic units are present within the sediments of the Coastal Plain. Regressive, upward-coarsening deposits are usually aquifers (e.g., Englishtown and Kirkwood Formations, and the Cohansey Sand) while the transgressive deposits act as confining units (e.g., the Merchantville, Marshalltown, and Navesink Formations). The individual thicknesses for these units vary greatly (i.e., from several feet to several hundred feet). The Coastal Plain deposits thicken to the southeast from the Fall Line to greater than 6,500 feet in Cape May County (Brown and Zapecza, 1990).

Local Geology

Based on the regional geologic map (Jablonski, 1968), the Cretaceous age Red Bank and Tinton Sands outcrop at the Main Post area. The Red Bank sand conformably overlies the Navesink Formation and dips to the southeast at 35 feet per mile. The upper member (Shrewsbury) of the Red Bank sand is a yellowish-gray to reddish brown clayey, medium-to-coarse-grained sand



SOURCE: U.S.G.S. LONG BRANCH NJ, QUADRANGLE, MONMOUTH COUNTY, 1954 (PHOTOREVISED 1981) SCALE: 1"=2000'

REVISION #: 0000 DATE: 10-19-93 PLOT NAME:
FILE NAME: BLDG-699.DWG DRAWN BY: A MAKSUT

WESTON MANAGERS DESIGNERS/CONSULTANTS

PROJECT NAME:
UNDERGROUND STORAGE TANK CLOSURE AND SITE INVESTIGATION REPORT
BUILDING 699 – TANK NO. 197
FORT MONMOUTH, NEW JERSEY

CLIENT NAME: U.S. ARMY–DEH FORT MONMOUTH

SITE LOCATION MAP

DATE: 10–22–93

FIGURE #: 1–1

that contains abundant rock fragments, minor mica and glauconite (Jablonski). The lower member (Sandy Hook) is a dark grey to black, medium-to-fine grained sand with abundant clay,mica, and glauconite.

The Tinton sand conformably overlies the Red Bank Sand and ranges from a clayey, medium-to-very coarse grained feldspathic quartz and glauconite sand to a glauconitic coarse sand. The color varies from dark yellowish orange or light brown to moderate brown and from light olive to grayish olive. Glauconite may constitute 60 to 80 percent of the sand fraction in the upper part of the unit (Minard, 1969). The upper part of the Tinton is often highly oxidized and iron-oxide encrusted (Minard).

Over the last 80 years, the natural topography of Fort Monmouth has been altered by excavation and filling activities by the military. Topographic elevations for the Main Post area range from five feet above mean sea level (MSL) to 31 feet above MSL.

Hydrogeology

The water table aquifer at the Main Post area is identified as part of the "composite 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.

Based on records from wells drilled at the Main Post area, groundwater is typically encountered at depths of two to nine feet below ground surface (BGS). According to Jablonski, wells drilled in the Red Bank and Tinton Sands may produce from 2 to 25 gallons per minute (gpm). Some well owners have reported acidic water that requires treatment to remove iron.

Shallow groundwater is locally influenced within the Main Post area by the following factors:

- tidal influence (based on proximity to the Atlantic Ocean),
- topography,
- nature of the fill material within the Main Post,
- presence of clay and silt lenses in the natural overburden deposits, and
- local groundwater recharge areas (i.e. stream, lakes).

Due to the fluvial nature of the overburden deposits (i.e. sand and clay lenses), shallow groundwater flow direction is best determined on a case-by-case basis. This is consistent with lithologies observed in borings installed within the Main Post area, which primarily consisted of fine-to-medium grained sands, with occasional lenses or laminations of silt and/or clay

1.3 Health and Safety

Hazards at the work site which may have posed a threat to the health and safety of personnel involved with, or affected by, the decommissioning of the UST system were minimized. All areas which posed, or were suspected to pose a vapor hazard were monitored by a qualified individual utilizing approved equipment. The individual ascertained if the area was properly vented to render the area safe, as defined by OSHA.

1.4 Removal of Underground Storage Tanks

1.4.1 General Procedures

- All underground obstructions (utilities,... etc.) were marked out by the contractor performing the closure prior to excavation activities.
- All activities were carried out with the greatest regard to safety and health and the safeguarding of the environment.
- All excavated soils were screened visually and with air monitoring instruments for evidence of contamination. No potentially contaminated soils were identified during closure activities.
- Surface materials (i.e, asphalt, concrete, etc...) were excavated and staged separate from all soils and were recycled in accordance with all applicable laws and regulations.
- A Sub-Surface Evaluator from the DPW and a representative from NJDEPE-DHWM were present during all closure activities.

1.4.2 Underground Storage Tank Excavation

Soil was excavated to expose the UST and associated piping. The piping was not removed/disturbed until all free product was drained into the UST. The UST was rendered vapor free by purging prior to any cutting or access. After the removal of the associated piping, a manway was made in the UST to allow for proper cleaning. The UST was completely emptied of all liquids prior to removal from the ground. Liquids were transported and disposed of by LORCO, Inc. A hazardous waste manifest was completed and can be found in Appendix C. All of the openings in the UST were plugged except for one hole (manway).

After the UST was removed from the excavation, it was staged on polyethylene sheeting and examined for corrosion holes. The presence or absence of corrosion holes was documented by the Sub-Surface Evaluator. No corrosion holes were observed during the inspection of the UST.

Soils surrounding the UST were screened visually and with a Flame Ionization Detector (FID) for evidence of contamination. No evidence of contamination was noted. Prior to disposal, the UST was cleaned in accordance with NJDEPE-BUST regulations.

1.5 Underground Storage Tank Transportation and Disposal:

The UST was transported by Fabiano and Sons to Mazza and Sons Inc., for recycling in compliance with all applicable regulations and laws.

The Subsurface Evaluator labelled each tank prior to transport with the following information:

- site of origin,
- contact person,
- NJDEPE UST Facility ID number,
- name of transporter/contact person, and
- destination site/contact person.

1.6 Management of Excavated Soils:

No potentially contaminated soils were excavated as part of the removal of the UST. All soils were free of evidence of contamination and were backfilled into the excavation following removal of the UST.

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SECTION 2.0

SITE INVESTIGATION ACTIVITIES

2.1 Overview:

The Site Investigation was managed and carried out by U.S ARMY DPW personnel. All analyses were performed and reported by Environmental Profile Laboratories, a NJDEPE-certified testing laboratory. All sampling was performed under the direct supervision of a NJDEPE-certified Sub-Surface Evaluator according to the methods described in the NJDEPE Field Sampling Procedures Manual (May 1988). Soil sampling frequency and parameters analyzed complied with the NJDEPE-BUST document "Interim Closure Requirements for Underground Storage Tank Systems " (September 1990 and revisions dated November 1991) which was the applicable regulation at the time of the closure. Groundwater sampling frequency and parameters analyzed complied with the "Interim Closure Requirements for Underground Storage Tank Systems" with the exception of base neutral compounds plus 25-tentatively identified compounds (BN+25) which were not included in the analysis of groundwater samples. All records of the Site Investigation activities are maintained by Fort Monmouth DPW: Environmental Office.

The following Parties participated in Closure and Site Investigation activities:

- Closure Contractor: FABIANO AND SONS.
  Contact Person: Anthony Fabiano
  Phone Number: (908) 571-1004
  NJDEPE Company Certification No.: PLE01349

- Subsurface Evaluator: Charles Appleby
  Employer: U.S. Army, Fort Monmouth
  Phone Number: (908) 532-1475
  NJDEPE Certification No.: 2056

- Analytical Laboratory: Environmental Profile Laboratories
  Contact Person: Daniel Wright
  Phone Number: (908) 244-6278
  NJDEPE Company Certification No.: 15526

- NJDEPE Representative: DOUG GREENFIELD
  DIVISION OF HAZARDOUS WASTE MANAGEMENT
  Phone Number: (609) 584-4200

2.2 Field Screening/Monitoring

All soils excavated as part of the UST removal were screened for evidence of contamination using a FID. Soils were also visually screened for evidence of contamination (staining, free product, etc..). No evidence of contamination was noted during excavation of soils.

Soils on the sidewalls and base of the excavation were screened with a FID by an individual under the direct supervision of a NJDEPE-certified Sub-Surface Evaluator. No evidence of contamination was noted in soil samples obtained from the sidewalls or base of the excavation.

2.3 Post-Excavation Soil Sampling

Following removal of the UST, five post-excavation soil samples were collected in accordance with NJDEPE procedure. The approved closure plan had originally specified four samples, however at the request of the NJDEPE-DHWM representative the number of samples was increased to five. All post-excavation samples were analyzed for total petroleum hydrocarbons (TPHC) and priority pollutants plus 40 tentatively identified compounds (PP+40), in accordance with NJDEPE requirements at the date of closure. The samples were collected along the base and sidewalls of the excavation using decontaminated stainless steel scoops. Following sampling activities, the soils were chilled and delivered to Environmental Profile laboratories located in Toms River, New Jersey. A summary of post-excavation sampling activities, including parameters analyzed, is provided in Table 2-1. Figure 2-1 depicts the location of the post-excavation samples.

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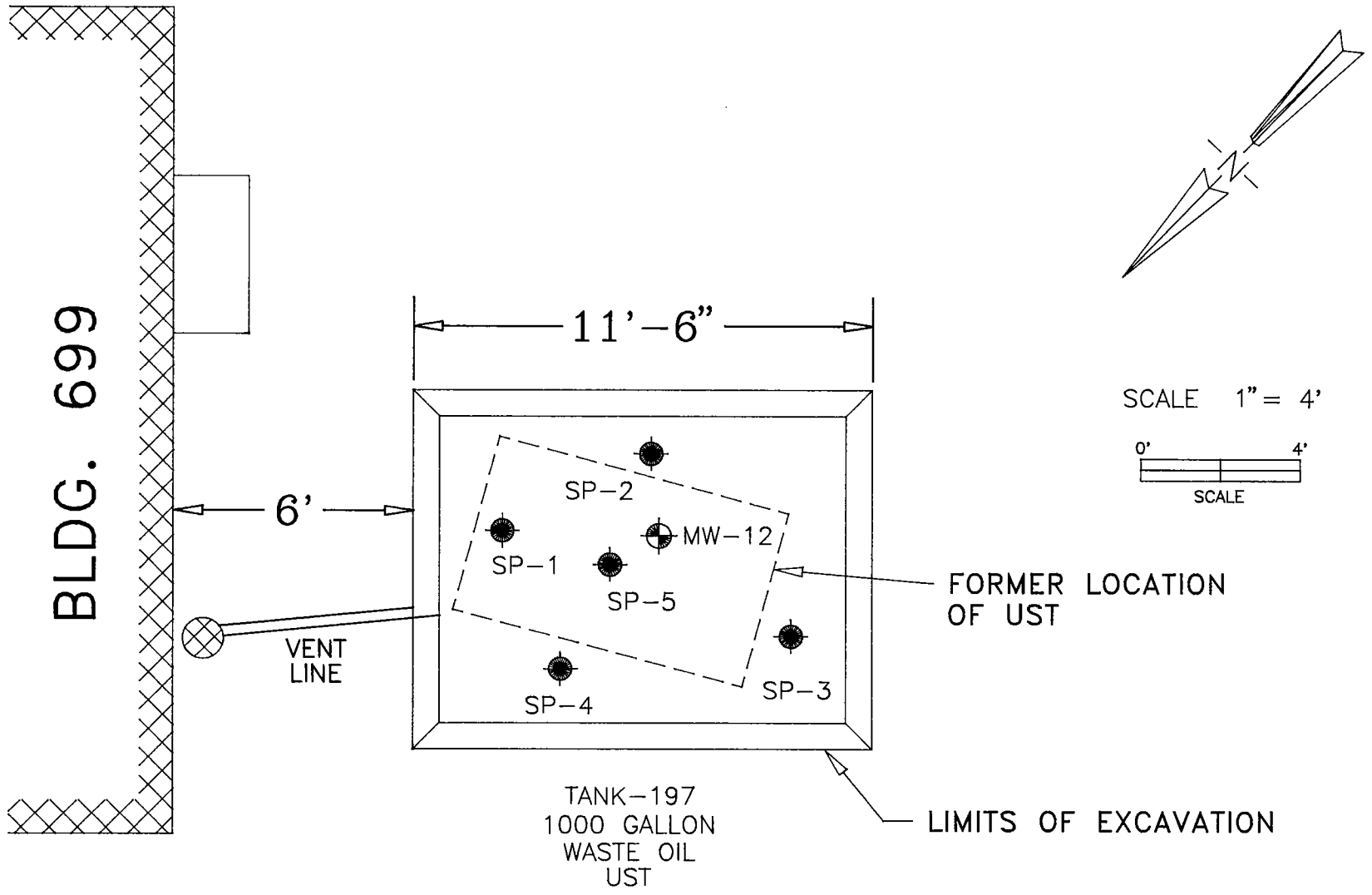
TABLE 2-1

SUMMARY OF POST-EXCAVATION SAMPLING ACTIVITIES
UST REGISTRATION NO. 81533-197
BUILDING NO. 699
FORT MONMOUTH, NEW JERSEY

Sample I.D No.	Matrix	Sample Type	Analytical Parameters	Sampling Method
SP1	Soil	Post-Excavation	TPHC, PP+40	Stainless Steel Scoop
SP2	Soil	Post-Excavation	TPHC, PP+40	Stainless Steel Scoop
SP3	Soil	Post-Excavation	TPHC, PP+40	Stainless Steel Scoop
SP4	Soil	Post-Excavation	TPHC, PP+40	Stainless Steel Scoop
SP5	Soil	Post-Excavation	TPHC, PP+40	Stainless Steel Scoop

TPHC - Total Petroleum Hydrocarbons.

PP+40 - Priority pollutants plus 40 - The priority pollutant list of 126 compounds and elements developed by EPA pursuant to Section 307(a)(1) of the Clean Water Act and 40 non-targeted organic compounds detected by gas chromatography/mass spectroscopy (GC/MS) analysis.



C91-670 – POST-EXCAVATION SAMPLE LOCATION

MW-12 – MONITORING WELL LOCATION

WESTON MANAGERS DESIGNERS/CONSULTANTS

UNDERGROUND STORAGE TANK CLOSURE AND SITE INVESTIGATION REPORT
BUILDING 699 – UST NO. 81533-197
FORT MONMOUTH, NEW JERSEY
U.S. ARMY-DEH
FORT MONMOUTH

POST-EXCAVATION SAMPLE AND MONITORING WELL LOCATIONS

DATE: 10-22-93

FIGURE #: 2-1

FILE NAME: 0000 DEH-699.DWG 10-08-93 A. MAKSUT

2.4 Groundwater Monitoring Well Installation and Sampling

2.4.1 Monitoring Well Installation

On 14 October 1992, a groundwater monitoring well, identified as MW-12 (New Jersey Permit No. 29-28907), was installed in the former location of UST No. 81533. The monitoring well was installed to assess the impacts, to groundwater from elevated TPHC and lead concentrations detected in post-excavation sample SP2. MW-12 is located approximately 20 feet to the southwest of Building 699.

The groundwater monitoring well was constructed in accordance with the requirements specified in the NJDEPE Field Sampling Procedures Manual (May 1992). The well was drilled by using a mobile rig utilizing standard hollow stem auger technology. The driller, Tabasco Drilling Corporation, is a New Jersey licensed drilling company.

All drill cuttings generated during the installation of the monitoring well were handled in accordance with applicable laws and regulations. Evidence of contamination was not observed during monitoring well installations. All cuttings were examined for visual signs of contamination (i.e. staining) and screened with monitoring instruments for evidence of contamination. Cuttings were containerized and transported to the hazardous waste storage area located at U.S. Army Fort Monmouth for later disposal.

The monitoring well was installed with a flush mount security casing at ground level. The top of the four inch PVC casing is at 0.73 feet below ground surface (BGS) and the base is 4.73 feet BGS. The security casing is supported by concrete.

The depth to groundwater noted during installation of MW-12 was approximately 7 feet BGS. The NJDEPE monitoring well permit for MW-12 is presented in Appendix D.

Following installation, the monitoring well was developed with a submersible pump for a minimum of 3-5 times the volume of the standing water in the well or until the water was clear.

2.4.2 Soil Boring Sampling

During installation of MW-12, three soil boring samples were collected from the following depth intervals: 6.5 feet BGS to 7.0 feet BGS; 10.5 feet BGS to 11.5 feet BGS; and 15 feet BGS to 17 feet BGS. All soil boring samples were analyzed for TPHC. Soil boring samples were collected in accordance with guidance specified in the NJDEPE Field Sampling Procedures Manual (May 1992). Soil boring samples were collected in split spoons in the undisturbed soils ahead of the auger.

Soil boring samples were transported to the U.S. Army Fort Monmouth Environmental

Laboratory, a NJDEPE certified testing laboratory.

2.4.3 **Groundwater Sampling**

A groundwater sample was collected from MW-12 on 26 October 1992. The sample was analyzed for volatile organic compounds plus fifteen tentatively identified compounds (VO+15) and lead by Environmental Profile Laboratories. An additional sample was collected from MW-12 on 11 May 1993 and was analyzed for VO+15 and lead by 21st Century Environmental. Both laboratories are certified by the NJDEPE. Recognizing that analysis for VO+15 and lead did not meet the requirements for groundwater sampling specified in N.J.A.C. 7:14B, additional samples will be obtained. The samples will be analyzed for BN+25.

Groundwater sampling procedures compiled with the requirements specified in the NJDEPE Field Sampling Procedures Manual (May 1992). A decontaminated submersible pump was used to purge a minimum of three well volumes of groundwater. During purging, conductivity, temperature and pH were monitored and found to be stable during each volume of groundwater purged. Following purging, a laboratory cleaned teflon bailer was used to collect the water samples. The bailer was lowered slowly until it was approximately opposite the middle of the well screen, and once full it was raised to collect the sample.

SECTION 3.0

CONCLUSIONS AND RECOMMENDATIONS

3.1 Sampling Results

3.1.1 Soil Sampling Results

To evaluate soils conditions following removal of the UST and associated soils, analytical results from soil samples were compared to proposed NJDEPE subsurface cleanup criteria (NJAC 7:26D and revisions dated 8 March 1993).

Post-Excavation Sampling Results

Following removal of UST No. 81533-197, five post-excavation samples (SP1-SP5) were collected from the sidewalls and base of the excavation and were analyzed for TPHC and PP+40.

Sample SP2 contained a concentration of TPHC of 11,600 milligrams per kilogram (mg/kg). No cleanup criterion has been proposed by the NJDEPE for TPHC, however, a subsurface cleanup criterion of 10,000 mg/kg has been proposed for total subsurface organic compounds. The concentration of total organic compounds in sample SP2 exceeds the proposed subsurface cleanup criterion. Sample SP2 also contained an elevated concentration (332.7 mg/kg) of lead, however, no subsurface cleanup criterion has been proposed by the NJDEPE for lead. All other contaminants detected in the samples were in concentrations below proposed NJDEPE subsurface cleanup criteria.

A summary of the analytical results for the post-excavation samples, including applicable subsurface cleanup criteria is provided in Table 3-1. The analytical data package is provided in Appendix E.

Soil Boring Sampling Results

To additionally characterized soil conditions in the former area of UST No. 81533-197, three soil boring samples were collected during installation of MW-12. Soil samples were collected from the following depth intervals: 6.5 feet BGS to 7.0 feet BGS; 10.5 feet BGS to 11.5 feet BGS; and 15 feet BGS to 17 feet BGS and analyzed for TPHC.

Concentrations of TPHC detected in the samples ranged from non-detectable to 22 mg/kg. No cleanup criterion has been proposed for TPHC by NJDEPE, however, the concentrations of TPHC detected in the soil boring samples are below levels of concern. A summary of the analytical results boring samples is provided in Table 3-2. The analytical data package for the soil is provided in Appendix F.

TABLE 3-1

SUMMARY OF ANALYTICAL RESULTS
POST-EXCAVATION SOIL SAMPLES
UST REGISTRATION NO. 81533-197
BUILDING NO. 699
FORT MONMOUTH, NEW JERSEY

SAMPLE ID NO.		SP1	SP2	SP3	SP4	SP5	PROPOSED NJDEPE SUBSURFACE CLEANUP CRITERIA
LABORATORY ID NO.		7030.6	7030.7	7030.8	7030.9	7030.10	
MATRIX		SOIL	SOIL	SOIL	SOIL	SOIL	
SAMPLE TYPE		PE	PE	PE	PE	PE	
SAMPLE COLLECTION DATE		1/6/92	1/6/92	1/6/92	1/6/92	1/6/92	
ANALYTICAL PARAMETER	UNITS						mg/kg
TPHC	mg/kg	6090	11600	2800	ND	15	NC*
BASE NEUTRAL COMPOUNDS	mg/kg						
2-CHLOROPHENOL		0.64J	0.57J	ND	ND	ND	50
4-CHLORO-3-METHYL PHENOL		0.59J	0.84J	ND	ND	ND	100
DI-N-BUTYLPHTHALATE		0.95JB	1.2JB	ND	0.88JB	0.054JB	100
PYRENE		0.62J	0.79J	1.3J	ND	ND	500
BIS(2-ETHYLHEXYL)PHTHALATE		2.6JB	2.3JB	2.9JB	0.24JB	0.23JB	100
2-METHYNAPHTHALENE		ND	0.81J	4.5	ND	ND	NC
ACENAPHTHENE		ND	0.38J	ND	ND	ND	100

TABLE 3-1

SUMMARY OF ANALYTICAL RESULTS (CONTINUED)
POST-EXCAVATION SOIL SAMPLES
UST REGISTRATION NO. 81533-197
BUILDING NO. 699
FORT MONMOUTH, NEW JERSEY

SAMPLE ID NO.		SP1	SP2	SP3	SP4	SP5	PROPOSED NJDEPE SUBSURFACE CLEANUP CRITERIA
LABORATORY ID NO.		7030.6	7030.7	7030.8	7030.9	7030.10	
MATRIX		SOIL	SOIL	SOIL	SOIL	SOIL	
SAMPLE TYPE		PE	PE	PE	PE	PE	
SAMPLE COLLECTION DATE		1/6/92	1/6/92	1/6/92	1/6/92	1/6/92	
ANALYTICAL PARAMETER	UNITS						mg/kg
BASE NEUTRAL COMPOUNDS	mg/kg						
PHENANTHRENE		ND	0.21J	0.84J	ND	ND	NC
NAPHTHALENE		ND	ND	1.7J	ND	ND	100
FLUORENE		ND	ND	0.38J	ND	ND	100
FLUORANTHENE		ND	ND	ND	ND	0.16J	500
VOLATILE ORGANIC COMPOUNDS	mg/kg						
METHYLENE CHLORIDE		0.094	0.068	0.14	0.13	0.13	10
1,1,2-THRICHLOROETHANE		0.13	0.11	0.17	0.12	0.15	50
M & P XYLENES		ND	0.023J	ND	ND	ND	NC
PHENOLS	mg/kg	ND	21.0	ND	ND	ND	NC

TABLE 3-1

SUMMARY OF ANALYTICAL RESULTS (CONTINUED)
POST-EXCAVATION SOIL SAMPLES
UST REGISTRATION NO. 81533-197
BUILDING NO. 699
FORT MONMOUTH, NEW JERSEY

SAMPLE ID NO.		SP1	SP2	SP3	SP4	SP5	PROPOSED NJDEPE SUBSURFACE CLEANUP CRITERIA
LABORATORY ID NO.		7030.6	7030.7	7030.8	7030.9	7030.10	
MATRIX		SOIL	SOIL	SOIL	SOIL	SOIL	
SAMPLE TYPE		PE	PE	PE	PE	PE	
SAMPLE COLLECTION DATE		1/6/92	1/6/92	1/6/92	1/6/92	1/6/92	
ANALYTICAL PARAMETER	UNITS						mg/kg
PRIORITY POLLUTANT METALS	mg/kg						
ANTIMONY		ND	ND	ND	ND	ND	NC
ARSENIC		ND	2.3	ND	ND	ND	NC
BERYLLIUM		0.187	0.423	0.108	0.190	0.310	NC
CADMIUM		0.01	0.02	0.04	0.02	0.04	NC
CHROMIUM		21.7	32.7	NC	16.7	27.4	
COPPER		6.0	8.3	7.6	4.6	7.7	NC
LEAD		12.0	332.7	18.4	4.6	9.5	NC
ZINC		15.1	62.5	18.4	14.4	30.4	NC

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TABLE 3-1

SUMMARY OF ANALYTICAL RESULTS (CONTINUED)
POST-EXCAVATION SOIL SAMPLES
UST REGISTRATION NO. 81533-197
BUILDING NO. 699
FORT MONMOUTH, NEW JERSEY

Notes:

NC*:	-	No cleanup criterion has been proposed for TPHC by NJDEPE; however, the propose NJDEPE subsurface cleanup criterion for total organic compounds is 10,000 mg/kg.
NC:	-	No subsurface cleanup criterion has been proposed for this analyte by NJDEPE.
J:	-	Indicates an estimated value.
ND:	-	Indicates compound not detected.
TPHC:	-	Total Petroleum Hydrocarbons.
PE:	-	Post-Excavation.
B:	-	Indicates also present in blank.
mg/kg:	-	Milligrams per Kilogram.

TABLE 3-2

SUMMARY OF ANALYTICAL RESULTS
FOR SOIL BORING SAMPLES
COLLECTED DURING INSTALLATION OF MW-12
BUILDING NO. 699
FORT MONMOUTH, NEW JERSEY

SAMPLE ID NO.		C92-1009	C92-1010	C92-1011	PROPOSED NJDEPE SUBSURFACE CLEANUP CRITERIA
LAB ID NO.		AA	BB	CC	
MATRIX		Soil	Soil	Soil	
SAMPLE TYPE		Soil Boring	Soil Boring	Soil Boring	
SAMPLE DEPTH (ft)		6.5 - 7.0	10.5-11.5	15.0-17.0	
SAMPLING COLLECTION DATE		10/14/92	10/14/92	10/14/92	
ANALYTICAL PARAMETER	UNITS				mg/kg
TPHC	mg/kg	22.0	3.95	ND	NC*

Notes:
TPHC: - Total Petroleum Hydrocarbons.
ND: - Not detected.
mg/kg: - Milligrams per kilogram.
NC*: - No subsurface cleanup criterion has been proposed by the NJDEPE for TPHC, however, the proposed NJDEPE subsurface cleanup criterion for total organic compounds is 10,000 mg/kg.

3.1.2 Groundwater Sampling Results

One groundwater sample was collected from MW-12 on 26 October 1992 and was analyzed for volatile organic compounds plus fifteen tentatively identified compounds (VOC+15) and lead. Lead was detected in this sample at a concentration of 6 micrograms per liter (ug/l), which slightly exceeds the NJDEPE groundwater cleanup standard of 5 ug/l. Methylene chloride, a common laboratory contaminant, was tentatively identified in the sample at a concentration of 4 ug/l, which exceeds the NJDEPE groundwater cleanup standard of 2 ug/l. Methylene chloride was also detected in the laboratory blank indicating that this compound was a laboratory artifact. No other compounds were detected in this sample at concentration exceeding NJDEPE groundwater cleanup standards.

An additional groundwater sample was collected from MW-12 on 11 May 1993 which provides additional data to groundwater concentrations. This sample was analyzed for VO+15 and lead. Lead was not detected in the sample. Methylene chloride was detected in the sample, however this compound is most likely a laboratory artifact. A summary of the analytical results for groundwater samples collected from MW-12, including comparison to NJDEPE groundwater cleanup standards, is provided in Table 3-3. The analytical data packages for groundwater samples are provided in Appendix G. Table 3-4 presents a summary of the analytical methods and quality assurance information relative to soil and groundwater sampling conducted as part of the closure of UST No. 81533-197.

3.2 Conclusions and Recommendations

No further action is proposed relative to the elevated concentrations of TPHC and lead detected in post-excavation sample SP2. All other post-excavation samples contained non-detectable concentrations of contaminants or concentrations below proposed NJDEPE subsurface cleanup criteria. Additionally, analytical results from groundwater samples collected from MW-12 indicate that groundwater has not been impacted by discharges, if any, from UST No. 81533-197.

It is proposed that an additional sample will be collected from MW-12 and will analyzed for base neutral compounds plus 25 tentatively identified compounds (BN+25). This sample will be collected to satisfy requirements for initial groundwater monitoring specified in the NJDEPE "Technical Requirements for Site Remediation" (NJAC 7: 26 E-1 et.al. June 1993).

TABLE 3-3

SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER SAMPLES FROM MW-12 BUILDING NO. 699 FORT MONMOUTH, NEW JERSEY

SAMPLE ID NO.		MW-12	MW-12	NJDEPE GROUNDWATER CLEANUP STANDARDS FOR CLASS II-A GROUNDWATERS
LAB ID NO.		9173.9	A1859	
MATRIX		Water	Water	
SAMPLE TYPE		Groundwater	Groundwater	
DEPTH OF WELL (ft)		14.73	14.73	ug/L
SAMPLE COLLECTION DATE		10/26/92	5/11/93	
ANALYTICAL PARAMETERS	UNITS			
LEAD	ug/L	6.0	ND	5.0
VOLATILE ORGANIC ANALYSIS	ug/L			
METHYLENE CHLORIDE		4JB	2.90JB	2.0
CARBON DISULFIDE		4J	ND	NJ

Notes:

J: - Indicates detected below method detection limit.
B: - Indicates also present in blank.
NA: - Not analyzed.
ND: - Not detected.
NJ: - No standard has been established for this compound.

TABLE 3-4

ANALYTICAL METHODS/QUALITY ASSURANCE SUMMARY TABLE
UST REGISTRATION NO. 81533-197
BUILDING NO. 699, TANK 197
FORT MONMOUTH, NEW JERSEY

Analytical Parameter	No. of Samples Collected	Matrix	Date Collected	Date Analysis Started	Preservation Method	USEPA SW-486 Analytical Method
TPHC	5	S	01/06/92	01/14/92	Cool to 4°C	418.1
VOC+15	5	S	01/06/92	01/14/92	Cool to 4°C	8240
BNA+15	5	S	01/06/92	01/14/92	Cool to 4°C	8270
PCBs	5	S	01/06/92	01/14/92	Cool to 4°C	608
PP Metals	5	S	01/06/92	01/14/92	Cool to 4°C	6010,7060,7470,7740,841
Lead	2	W	10/26/92, 5/11/93	10/28/92	Cool to 4°C	
VOC+15	1	W	10/26/93	10/28/92	Cool to 4°C	

Notes:

PCBs: - Poly Chlorinated Biphenyls.
PP Metals: - Priority Pollutant Metals.
BNA+25: - Base Neutral Compounds plus 25 tentatively identified compounds.
VOC+15: - Volatile Organic Compounds plus 15 tentatively identified compounds.
TPHC: - Total Petroleum Hydrocarbons.
608: - PCB samples were analyzed using method 608 cited in 40 CFR Part 36.
S: - Soil.
W: - Water.
C: - Celsius.

APPENDIX A

NJDEPE-DHWM CONDITIONAL APPROVAL LETTER

State of New Jersey
Department of Environmental Protection and Energy
Office of Enforcement Policy
CENTRAL BUREAU OF WATER AND HAZARDOUS WASTE ENFORCEMENT
FIELD OPERATIONS

Scott A. Weiner
Commissioner

Edward M. Neafsey
Director

September 20,1991

James Ott, Deputy Director
Directorate of Engineering and Housing
U.S. Army Commmunications-Electronic Command
Building 167 SELHI-FE
Fort Monmouth, NJ 07003

Dear Mr. Ott

The Department of Environmental Protection & Energy has completed its review of your submitted closure plans for six underground waste oil tanks. It has been determined that the plan is acceptable conditioned on the following revision/modifications:

1.In addition to the total petroleum hydrocarbon (TPHC) analysis for each sample taken, the total priority pollutant analysis (PP+40 or TCL) should be utilized for an initial screening. These analyses would be helpful for the remediation of tank number 68 which is known to contain 1000 ppm of hydrogenated chlorides.

2.A detailed description of the steps needed to decontaminate the tanks should be included.

3.An indication of whether the tanks will be disposed off-site as hazardous waste. If not the tanks must be decontaminated and a final rinse water sample and a washwater blank sample must be analyzed for total petroleum hydrocarbons (TPHC) concentration to determine the adequacy of decontamination. The decontamination procedure may have to be repeated to achieve a concentration acceptable to the Department or until the TPHC results of two consecutive samples do not show an appreciable change.

Please Respond To:
CN 407
TRENTON, NJ 08625

Tel. # (609) 584-4200

Please submit these changes in an addendum to your submitted closure plans prior to beginning any closure activities. This writer should be notified 2 weeks in advance of initiation of closure activities.

If you have any questions regarding these requirements, please contact me at (609) 584-4200.

Yours truly,

Douglas Greenfield
Sr. Environmental Engineer
Hazardous Waste Enforcement
CBW&HWEFO

APPENDIX B

NJDEPE UST SITE ASSESSMENT SUMMARY FORM

UST-014
2/91

UST #	
Date Rec'd	
TMS #	
Staff	

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF WATER RESOURCES
BUREAU OF UNDERGROUND STORAGE TANKS
TANK MANAGEMENT SECTION

CN 029, 401 EAST STATE STREET
TRENTON, N.J. 08625-0029

UNDERGROUND STORAGE TANK SITE ASSESSMENT SUMMARY

Under the provisions of the Underground Storage of Hazardous Substances Act in accordance with N.J.A.C. 7:14B

This Summary form shall be used by all owners and operators of Underground Storage Tank Systems (USTS) who have either reported a release and are subject to the site assessment requirements of N.J.A.C. 7:14B-8.2 or who have closed USTS pursuant to N.J.A.C. 7:14B-9.1 et seq. and are subject to the site assessment requirements of N.J.A.C. 7:14B-9.2 and 9.3.

INSTRUCTIONS:

- *Please print legibly or type.*
- *Fill in all applicable blanks. This form will require various attachments in order to complete the Summary. The technical guidance document, Interim Closure Requirements for UST's, explains the regulatory (and technical) requirements for closure and the Scope of Work, Investigation and Corrective Action Requirements for Discharges from Underground Storage Tanks and Piping Systems explains the regulatory (and technical) requirements for corrective action.*
- *Return one original of the form and all required attachments to the above address.*
- *Attach a scaled site diagram of the subject facility which shows the information specified in Item IV B of this form.*
- *Explain any "No" or "N/A" response on a separate sheet.*

Date of Submission 11/10/93

0081533-197
FACILITY REGISTRATION #

I. FACILITY NAME AND ADDRESS

U.S. Army Fort Monmouth
D.E.H. Building 167 Attn: Charles Appleby
Fort Monmouth New Jersey County Monmouth
Telephone No. 908-532-6224

OWNER'S NAME AND ADDRESS, if different from above

Telephone No.

II. DISCHARGE REPORTING REQUIREMENTS

A. Was contamination found? _X_ Yes ___ No If Yes, Case No. 89-10-19-1329
(Note: All discharges must be reported to the Environmental Action Hotline (609) 292-7172)

B. The substance(s) discharged was(were) Waste Oil

C. Have any vapor hazards been mitigated? ___ Yes ___ No _X_ N/A

III. DECOMMISSIONING OF TANK SYSTEMS

Closure Approval No. N/A

The site assessment requirements associated with tank decommissioning are explained in the Technical Guidance Document, **Interim Closure Requirements for UST's**, Section V. A-D. Attach complete documentation of the methods used and the results obtained for each of the steps of tank decommissioning used. Please include a site map which shows the locations of all samples and borings, the location of all tanks and piping runs at the facility at the beginning of the tank closure operation and annotated to differentiate the status of all tanks and piping (e.g., removed, abandoned, temporarily closed, etc.). The same site map can be used to document other parts of the site assessment requirements, if it is properly and legibly annotated.

IV. SITE ASSESSMENT REQUIREMENTS

A. Excavated Soil

Any evidence of contamination in excavated soil will require that the soil be classified as either Hazardous Waste or Non-Hazardous Waste. Please include all required documentation of compliance with the requirements for handling contaminated excavated soil (if any was present) as explained in the technical guidance documents for closure and corrective action. Describe amount of soil removed, its classification, and disposal location.

B. Scaled Site Diagrams

1. Scaled site diagrams must be attached which include the following information:

   a. North arrow and scale
   b. The locations of the ground water monitoring wells
   c. Location and depth of each soil sample and boring
   d. All major surface and sub-surface structures and utilities
   e. Approximate property boundaries
   f. All existing or closed underground storage tank systems, including appurtenant piping
   g. A cross-sectional view indicating depth of tank, stratigraphy and location of water table
   h. Locations of surface water bodies

C. Soil samples and borings (check appropriate answer)

1. Were soil samples taken from the excavation as prescribed? _X_ Yes ___ No ___ N/A

2. Were soil borings taken at the tank system closure site as prescribed? ___ Yes ___ No _X_ N/A

3. Attach the analytical results in tabular form and include the following information about each sample:
   a. Customer sample number (keyed to the site map)
   b. The depth of the soil sample
   c. Soil boring logs
   d. Method detection limit of the method used
   e. QA/QC Information as required

D. Ground Water Monitoring

1. Number of ground water monitoring wells installed 1

2. Attach the analytical results of the ground water samples in tabular form. Include the following information for each sample from each well:

   a. Site diagram number for each well installed
   b. Depth of ground water surface
   c. Depth of screened interval
   d. Method detection limit of the method used
   e. Well logs
   f. Well permit numbers
   g. QA/QC Information as required

V. SOIL CONTAMINATION

A. Was soil contamination found? x Yes ___ No
If "Yes", please answer Question B-E
If "No", please answer Question B

B. The highest soil contamination still remaining in the ground has been determined to be:
1. 23 ppb total BTEX, 278,300 ppb total non-targeted VOC
2. 11620 ppb total B/N, 0 ppb total non-targeted B/N
3. 11600 ppm TPHC
4. 332700 ppb Lead (for non-petroleum substance)

C. Remediation of free product contaminated soils

1. All free product contaminated soil on the property boundaries and above the water table are believed to have been removed from the subsurface ___ Yes x No
2. Free product contaminated soils are suspected to exist below the water table ___ Yes x No
3. Free product contaminated soils are suspected to exist off the property boundaries. ___ Yes x No

D. Was the vertical and horizontal extent of contamination determined? ___ Yes x No ___ N/A

E. Does soil contamination intersect ground water? x Yes ___ No ___ N/A

VI. GROUND WATER CONTAMINATION

A. Was ground water contamination found? ___ Yes x No
If "Yes", please answer Questions B-G.
If "No", please answer only Question B.

B. The highest ground water contamination at any 1 sampling location and at any 1 sampling event to date has been determined to be:

1. 0 ppb total BTEX, 0 ppb total non-targeted VOC
2. N/A ppb total B/N, N/A ppb total non-targeted B/N
3. N/A ppb total MTBE, N/A ppb total TBA
4. 6 ppb Lead (for non-petroleum substance)
5. greatest thickness of separate phase product found N/A
6. separate phase product has been delineated ___ Yes ___ No x N/A

C. Result(s) of well search

1. A well search (including a review of manual well records) indicates that private, municipal or commercial wells do exist within the distances specified in the Scope of Work. ___ Yes ___ No x N/A

2. The number of these wells identified is N/A.

D. Proximity of wells and contaminant plume

1. The shallowest depth of any well noted in the well search which may be in the horizontal or vertical potential path(s) of the contaminant plume(s) is N/A feet below grade (consideration has been given for the effects of pumping, subsurface structures, etc. on the direction(s) of contaminant migration). This well is N/A feet from the source and its screening begins at a depth of N/A feet.

2. The shallowest depth to the top of the well screen for any well in the potential path of the plume(s) (as described in D1 above) is N/A feet below grade. This well is located N/A feet from the source.

3. The closest horizontal distance of a private, commercial or municipal well in the potential path of the plume (as determined in D1) is N/A feet from the source. This well is N/A feet deep and screening begins at a depth of N/A feet.

E. A plan for separate phase product recovery has been included. ___ Yes ___ No X N/A

F. A ground water contour map has been submitted which includes the ground water elevations for each well.
___ Yes ___ No X N/A

G. Delineation of contamination

1. The ground water contaminants have been delineated to MCLs or lower values at the property boundaries. ___ Yes X No

2. The plume is suspected to continue off the property at concentrations greater than MCLs.
___ Yes X No

3. Off property access (circle one): is being sought has been approved has been denied N/A

VII. **SITE ASSESSMENT CERTIFICATION** (preparer of site assessment plan - N.J.A.C. 7:14B-8.3(b) &9.5(a)3)

The person signing this certification as the "Qualified Ground Water Consultant" (as defined in N.J.A.C.7:14B-1.6) responsible for the design and implementation of the site assessment plan as specified in N.J.A.C. 7:14B-8.3(a) & 9.2(b)2, must supply the name of the certifying organization and certification number.

"I certify under penalty of law that the information provided in this document is true, accurate, and complete and was obtained by procedures in compliance with N.J.A.C. 7:14B-8 and 9. I am aware that there are significant penalties for submitting false, inaccurate, or incomplete information, including fines and/or imprisonment."

NAME (Print or Type) Dinkerrai Desai SIGNATURE [signature]

COMPANY NAME U.S. Army Fort Monmouth DATE 10/10/93
(Preparer of Site Assessment Plan)

CERTIFYING ORGANIZATION NJDEPE CERTIFICATION NUMBER 2266

VIII. **TANK DECOMMISSIONING CERTIFICATION** [person performing tank decommissioning portion of closure plan - N.J.A.C. 7:14B-9.5(a)4]

"I certify under penalty of law that tank decommissioning activities were performed in compliance with N.J.A.C. 7:14B-9.2(b)3. I am aware that there are significant penalties for submitting false, inaccurate, or incomplete information, including fines and/or imprisonment."

NAME (Print or Type) Dinkerrai Desai SIGNATURE [signature]

COMPANY NAME U.S. Army Fort Monmouth DATE 11/10/93
(Performer of Tank Decommissioning)

IX. **CERTIFICATIONS BY THE RESPONSIBLE PARTY(IES) OF THE FACILITY**

A. The following certification shall be signed by the highest ranking individual with overall responsibility for that facility [N.J.A.C. 7:14B-2.3(c)1i].

"I certify under penalty of law that the information provided in this document is true, accurate, and complete . I am aware that there are significant penalties for submitting false, inaccurate, or incomplete information, including fines and/or imprisonment."

NAME (Print or Type) James Ott, P.E. SIGNATURE [signature]

COMPANY NAME U.S. Army Fort Monmouth DATE 11/10/93

B. The following certification shall be signed as follows [according to the requirements of N.J.A.C. 7:14B-2.3(C)2i]:

1. For a corporation, by a principal executive officer of at least the level of vice president.
2. For a partnership or sole proprietorship, by a general partner or the proprietor, respectively; or
3. For a municipality, State, Federal or other public agency by either the principal executive officer or ranking elected official.
4. In cases where the highest ranking corporate partnership, governmental officer or official at the facility as required in A above is the same person as the official required to certify in B, only the certification in A need to be made. In all other cases, the certifications of A and B shall be made.

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false, inaccurate, or incomplete information, including fines and/or imprisonment."

NAME (Print or Type) _____ SIGNATURE _____

COMPANY NAME _____ DATE _____

WESTON
MANAGERS DESIGNERS CONSULTANTS

ATTACHMENT I

NO/NA RESPONSE EXPLANATION

SAS QUESTION #	RESPONSE	EXPLANATION
IIC.	N/A	No vapor hazards were identified during closure of the UST.
III.	N/A	Closure of UST No. 0081533-197 was conducted under verbal approval and on-site supervision of the NJDEPE Division of Hazardous Waste Management.
IV.C.2	N/A	No soil borings were proposed in the closure plan.
V.C.1	No	Soils containing concentrations of contaminants exceeding proposed NJDEPE subsurface cleanup criteria have not been remediated from the former location of UST No. 0081533-197.
V.C.2	No	Site observations documented by the subsurface evaluator during closure of the UST system indicate that soils containing concentrations of contaminants exceeding proposed NJDEPE subsurface cleanup criteria are limited to areas above the groundwater table.
V.C.3	No	Site observations by the subsurface evaluator during closure of the UST system indicate that soils containing concentrations of contaminants exceeding proposed NJDEPE subsurface cleanup criteria are limited to the area immediately surrounding the former location of UST No. 0081533-197.
V.D	No	Additional sampling has not been conducted to determine the vertical and horizontal extent of soil contamination.
VI.A	No	The groundwater sample collected on 10/26/92 from the monitoring well (MW-12) installed in the former location of UST No. 0081533-197 contained a concentration of lead of 6 parts per billion (ppb), which slightly exceeds the NJDEPE Class II groundwater cleanup standard of 5 ppb. However, a subsequent sample collected from MW-12 on 5/4/93 contained a non-detectable concentration of lead.

		Methylene chloride, a common laboratory contaminant, was detected in the samples collected from MW-12 at concentrations slightly exceeding the NJDEPE Class II groundwater cleanup standard. However, methylene chloride was also detected in the laboratory blank samples, indicating that this compound is a laboratory artifact. No other contaminants were identified in concentrations exceeding NJDEPE criteria, therefore no additional groundwater sampling is proposed in reference to UST No. 0081533-197.
VI.B.2-3	N/A	Groundwater samples from the monitoring well installed within the former location of UST No. 0081533-197 were analyzed for VO+10 and lead only.
VI.B.5-6	N/A	Separate phase product was not identified in the monitoring well installed in the former location of UST No. 0081533-197.
VI.C.1	N/A	A well search is currently being conducted and will be included in the complete Site Investigation Report for UST No. 0081533-197.
VI.C.2	N/A	Same as above
VI.D.1-3	N/A	Same as above.
VI.E	N/A	Separate phase product was not identified in the monitoring well installed in the former location of UST No. 0081533-197.
VI.F	N/A	This information will be submitted with the complete Site Investigation Report for UST No. 0081533-197.
VI.G.I	No	Same as VI.A.
VI.G.2	No	Same as VI.A.
VI.G.3	N/A	Same as VI.A.

APPENDIX C

HAZARDOUS WASTE MANIFEST

VHW-001 (REV. 9/86)

State of New Jersey
Department of Environmental Protection
Division of Hazardous Waste Management
Manifest Section
CN 028, Trenton, NJ 08625

Please type or print in block letters. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039. Expires 9-30-94

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. NJ2210020597 Manifest Document No. 0012

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
US ARMY FORT MONMOUTH
DIRECTERATE ENGINEERING & HOUSING BLDG 167
FORT MONMOUTH, NJ 07703
3210020597 (HW)

4. Generator's Phone (908) 532-6223

A. State Manifest Document Number **NJA 1308421**

B. State Generator's ID BLDG 594
FT MONMOUTH NJ 07703

5. Transporter 1 Company Name: LIONETTI OIL RECOVERY CO., INC.

6. US EPA ID Number: NJD084044064

C. State Trans. ID NJDEPS 5257

D. Transporter's Phone (908) 721-0900

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Trans. ID

9. Designated Facility Name and Site Address
LIONETTI OIL RECOVERY CO., INC.
RUNYON & CHEESEQUAKE RDS.
OLD BRIDGE, NJ 08857

10. US EPA ID Number: NJD084044064

F. Transporter's Phone ( )

G. State Facility's ID

H. Facility's Phone (908) 721-0900

	11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number) HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.	X PETROLEUM OIL NOS COMBUSTIBLE LIQUID NA 1270 ERG #27 (PETROLEUM OIL)	001	TT	X190	G	X72Z
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a. 1 PETROLEUM OIL 98 %
WATER 2 %
c.
b.
d.

K. Handling Codes for Wastes Listed Above
a. T04 FINGERPRINT
c.
b.
d.

15. Special Handling Instructions and Additional Information
24 HOUR EMERGENCY RESPONSE NO. (908) 721-0900 DIESEL $1000 1/M HAULERS
DECAL# 63125
NOT EPA REGULATED, REGULATED AS HAZARDOUS WASTE IN NEW JERSEY.

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

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR,** if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: George Rochcovsky
Signature: George Rochcovsky
Month Day Year: 10 10 91

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: ARTHUR HULLINGS
Signature: Arthur Hullings
Month Day Year: 10 10 91

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name
Signature
Month Day Year

NJA 1308421

In case of an emergency or spill immediately call the state the emergency occurred in and the N.J. Dept. of Environmental Protection. (609) 292-5560 (Day) (609) 292-7172 (Night)

EPA Form 8700-22 (Rev. 9/88) Previous editions are obsolete.

SIGNATURE AND INFORMATION *MUST* BE LEGIBLE ON ALL COPIES

3 — TSD MAIL TO - GENERATOR

APPENDIX D

NJDEPE MONITORING WELL PERMIT FOR MW-12

DWR-133M (4/90)

Mail to

Water Allocation
CN 029
Trenton, N.J. 08625

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
TRENTON, N.J.

Permit No. 29-

MONITORING WELL PERMIT

VALID ONLY AFTER APPROVAL BY THE D.E.P. COORD #: 29.14.4

Owner U.S. Army Fort Monmouth
Address DPW, ICT DPW Environmental
Fort Monmouth, N.J.

Name of Facility Bldg. # 699
Address

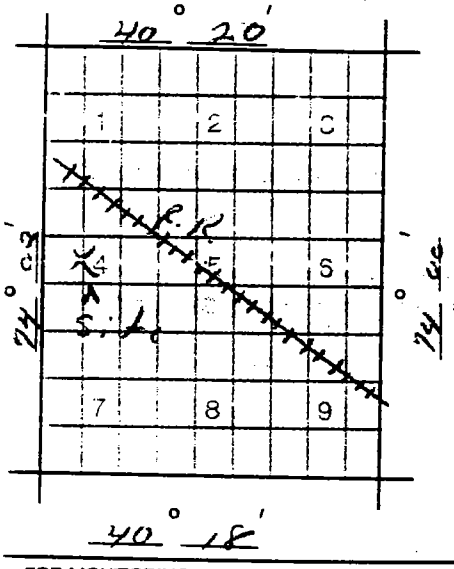
Driller Tobasco Drilling Corp.
Address P.O. Box 747
Hainesport, N.J. 08036

Diameter of Well(s)	4 Inches	Proposed Depth of Well(s)	20 Feet
# of Wells Applied for (max. 10)	1	Will pumping equipment be installed? YES ☐ NO ☒	
Type of Well (see reverse)	Monitor	If Yes, give pump capacity	N/A GPM

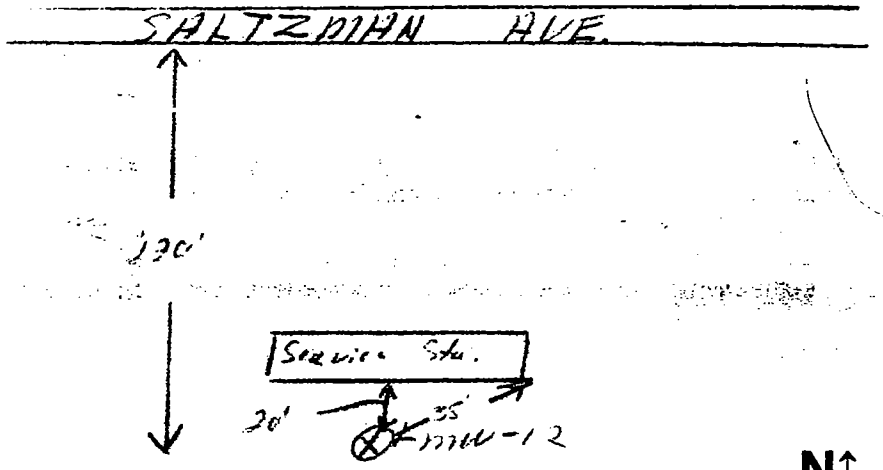
LOCATION OF WELL(S)

Lot #	Block #	Municipality	County
N/A	N/A	Fort Monmouth	Monmouth

State Atlas Map No. 29



Draw sketch of well(s) nearest roads, buildings, etc. with marked distances in feet. Each well MUST be labeled with a name and/or number on the sketch.



FOR MONITORING WELLS, RECOVERY WELLS, OR PIEZOMETERS, THE FOLLOWING MUST BE COMPLETED BY THE APPLICANT. PLEASE INDICATE WHY THE WELLS ARE BEING INSTALLED:

- ☐ Spill Fund Case
- ☐ ECRA Case
- ☐ CERCLA (Superfund) Site
- ☐ RCRA Site
- ☒ Underground Storage Tank
- ☐ NJPDES Municipal Discharge Permit
- ☐ NJPDES Industrial Discharge Permit
- ☐ Div. Hazardous Waste Mgmt. Enforcement Case
- ☐ Div. Water Resources Enforcement Case
- ☐ Water Supply Aquifer Test Observation Well
- ☒ Other (explain) U.S. Army Site Investigation

Case I.D. Number

This Space for Approval Stamp
WELL PERMIT APPROVED
Dept. of Environmental Protection
Water Resources/Water Allocation
OCT 13 1992

FOR D.E.P. USE
☐ Issuance of this permit is subject to the conditions attached. (see next page)
☐ For monitoring purposes only
☐ The well(s) may not be completed with more than 25 feet of total screen or uncased borehole.
☐

SEE REVERSE SIDE FOR IMPORTANT PROVISIONS AND REGULATIONS PERTAINING TO THIS PERMIT.

In compliance with N.J.S.A. 58:4A-14, application is made for a permit to drill a well as described above.

Date 10/12/92

Signature of Driller [signature] License # 4066

Signature of Owner [signature illegible]

COPIES: Water Allocation — White and Pink Health Dept. — Yellow Owner — Blue Driller — White

APPENDIX E

ANALYTICAL DATA PACKAGE FOR POST-EXCAVATION SOIL SAMPLES

ENVIRONMENTAL PROFILE LABORATORIES

ROUTE 37 BUSINESS PARK
SUITE 13
TOMS RIVER, NJ 08755
OFFICE: (908) 244-6278
FAX: (908) 244-6372

REPORT OF ANALYSIS

SERV-AIR
PO BOX 369, BLDG. 490
FT. MONMOUTH, NJ 07703

PO # : R2-0835
SAMPLE ID NO : 7030.1-.4
SAMPLE RCD : 01/10/92
ANALYSIS START : 01/22/92
MATRIX : SOIL

THIS ANALYSES ON SOIL WAS PERFORMED BY GAS CHROMATOGRAPHY (EPA METHOD 608)
THIS SYSTEM IS EQUIPPED WITH AN ELECTRON CAPTURE DETECTOR.
RESULTS AND DETECTION LIMITS ARE EXPRESSED IN ug/Kg (ppb)

EPL ID # :	EXT.	7030.1	7030.2	7030.3	7030.4	
CLIENT ID :	BLANK	B122-SPA	B122-SPB	B122-SPC	B122-SPD	DET.
PARAMETERS:						LIMIT
CHLORDANE	ND	ND	ND	ND	ND	20.0
ALPHA-BHC	ND	ND	ND	ND	ND	3.0
BETA-BHC	ND	ND	ND	ND	ND	3.0
DELTA-BHC	ND	ND	ND	ND	ND	3.0
GAMMA-BHC (LINDANE)	ND	ND	ND	ND	ND	3.0
HEPTACHLOR	ND	ND	ND	ND	ND	3.0
ALDRIN	ND	ND	ND	ND	ND	3.0
HEPTACHLOR EPOXIDE	ND	ND	ND	ND	ND	3.0
ENDOSULFAN I	ND	ND	ND	ND	ND	3.0
DIELDRIN	ND	ND	ND	ND	ND	3.0
4,4-DDE	ND	ND	ND	ND	ND	3.0
ENDRIN	ND	ND	ND	ND	ND	3.0
ENDOSULFAN II	ND	ND	ND	ND	ND	3.0
4,4-DDD	ND	ND	ND	ND	ND	3.0
ENDOSULFAN SULFATE	ND	ND	ND	ND	ND	3.0
4,4-DDT	ND	ND	ND	ND	ND	3.0
METHOXYCHLOR	ND	ND	ND	ND	ND	6.0
ENDRIN ALDEHYDE	ND	ND	ND	ND	ND	3.0
TOXAPHENE	ND	ND	ND	ND	ND	40.0
PCB-1216	ND	ND	ND	ND	ND	40.0
PCB-1221	ND	ND	ND	ND	ND	40.0
PCB-1232	ND	ND	ND	ND	ND	40.0
PCB-1242	ND	ND	ND	ND	ND	40.0
PCB-1248	ND	ND	ND	ND	ND	40.0
PCB-1254	ND	ND	ND	ND	ND	40.0
PCB-1260	ND	ND	ND	ND	ND	40.0

ND= NONE DETECTED

Daniel K. Wright

DANIEL K. WRIGHT
LABORATORY DIRECTOR

ENVIRONMENTAL PROFILE LABORATORIES

ROUTE 37 BUSINESS PARK
SUITE 13
TOMS RIVER, NJ 08755
OFFICE: (908) 244-6278
FAX: (908) 244-6372

REPORT OF ANALYSIS

SERV-AIR
PO BOX 369, BLDG. 450
FT. MONMOUTH, NJ 07703

PO # : R2-0835
SAMPLE ID NO : 7030.5-.9
SAMPLE RCD : 01/10/92
ANALYSIS START : 01/22/92
MATRIX : SOIL

THIS ANALYSES ON SOIL WAS PERFORMED BY GAS CHROMATOGRAPHY (EPA METHOD 608)
THIS SYSTEM IS EQUIPPED WITH AN ELECTRON CAPTURE DETECTOR.
RESULTS AND DETECTION LIMITS ARE EXPRESSED IN ug/Kg (ppb)

EPL ID # :	7030.5	7030.6	7030.7	7030.8	7030.9	
CLIENT ID :	B122-SPE	B699-SP1	B699-SP2	B699-SP3	B699-SP4	DET.
PARAMETERS:						LIMIT
CHLORDANE	ND	ND	ND	ND	ND	20.0
ALPHA-BHC	ND	ND	ND	ND	ND	3.0
BETA-BHC	ND	ND	ND	ND	ND	3.0
DELTA-BHC	ND	ND	ND	ND	ND	3.0
GAMMA-BHC (LINDANE)	ND	ND	ND	ND	ND	3.0
HEPTACHLOR	ND	ND	ND	ND	ND	3.0
ALDRIN	ND	ND	ND	ND	ND	3.0
HEPTACHLOR EPOXIDE	ND	ND	ND	ND	ND	3.0
ENDOSULFAN I	ND	ND	ND	ND	ND	3.0
DIELDRIN	ND	ND	ND	ND	ND	3.0
4,4-DDE	ND	ND	ND	ND	ND	3.0
ENDRIN	ND	ND	ND	ND	ND	3.0
ENDOSULFAN II	ND	ND	ND	ND	ND	3.0
4,4-DDD	ND	ND	ND	ND	ND	3.0
ENDOSULFAN SULFATE	ND	ND	ND	ND	ND	3.0
4,4-DDT	ND	ND	ND	ND	ND	3.0
METHOXYCHLOR	ND	ND	ND	ND	ND	6.0
ENDRIN ALDEHYDE	ND	ND	ND	ND	ND	3.0
TOXAPHENE	ND	ND	ND	ND	ND	40.0
PCB-1216	ND	ND	ND	ND	ND	40.0
PCB-1221	ND	ND	ND	ND	ND	40.0
PCB-1232	ND	ND	ND	ND	ND	40.0
PCB-1242	ND	ND	ND	ND	ND	40.0
PCB-1248	ND	ND	ND	ND	ND	40.0
PCB-1254	ND	ND	ND	ND	ND	40.0
PCB-1260	ND	ND	ND	ND	ND	40.0

ND= NONE DETECTED

Daniel K. Wright

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REPORT OF ANALYSIS

SERV-AIR
PO BOX 369, BLDG. 490
FT. MONMOUTH, NJ 07703

PO # : R2-0835
SAMPLE ID NO : 7030.10
SAMPLE RCD : 01/10/92
ANALYSIS START : 01/22/92
MATRIX : SOIL

THIS ANALYSES ON SOIL WAS PERFORMED BY GAS CHROMATOGRAPHY (EPA METHOD 608)
THIS SYSTEM IS EQUIPPED WITH AN ELECTRON CAPTURE DETECTOR.
RESULTS AND DETECTION LIMITS ARE EXPRESSED IN ug/Kg (ppb)

EPL ID # :	7030.10					
CLIENT ID :	B699-SP5					
PARAMETERS:						DET. LIMIT
CHLORDANE	ND					20.0
ALPHA-BHC	ND					3.0
BETA-BHC	ND					3.0
DELTA-BHC	ND					3.0
GAMMA-BHC (LINDANE)	ND					3.0
HEPTACHLOR	ND					3.0
ALDRIN	ND					3.0
HEPTACHLOR EPOXIDE	ND					3.0
ENDOSULFAN I	ND					3.0
DIELDRIN	ND					3.0
4,4-DDE	ND					3.0
ENDRIN	ND					3.0
ENDOSULFAN II	ND					3.0
4,4-DDD	ND					3.0
ENDOSULFAN SULFATE	ND					3.0
4,4-DDT	ND					3.0
METHOXYCHLOR	ND					6.0
ENDRIN ALDEHYDE	ND					3.0
TOXAPHENE	ND					40.0
PCB-1216	ND					40.0
PCB-1221	ND					40.0
PCB-1232	ND					40.0
PCB-1242	ND					40.0
PCB-1248	ND					40.0
PCB-1254	ND					40.0
PCB-1260	ND					40.0

ND= NONE DETECTED

Daniel K. Wright

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REPORT OF ANALYSIS

SERV-AIR
PO BOX 369 BLDG.490
FT. MONMOUTH, NJ 07703

EPL# : 7030.1-.10
SAMPLE RECEIVED : 01/10/92
ANALYSIS START : 01/14/92
ANALYSIS COMPD. : 01/14/92
CLIENT ID : SEE BELOW
PO # : R2-0835

MATRIX: SOIL

TEST PARAMETERS: PETROLEUM HYDROCARBONS

These samples were anakyzed by Infrared Spectrophotmetry.
Infrared Analyses: EPA METHOD 418.1 Results expressed as ppm. (mg/Kg)

CLIENT ID	EPL#	RESULTS	MS %REC.	MSD %REC.	DET. LIMIT	
EXTRACTION BLANK	NA	ND			10	mg/Kg
B122 SPA E.SIDE	7030.1	1220	87	131	40	"
B122 SPB S.SIDE	7030.2	960			40	"
B122 SPC W.SIDE	7030.3	190			10	"
B122 SPD N.SIDE	7030.4	610			20	"
B122 SPE CENTER	7030.5	445			20	"
B699 SP1 N.SIDE	7030.6	6090			1000	"
B699 SP2 W.SIDE	7030.7	11600			1000	"
B699 SP3 N.SIDE	7030.8	2800			100	"
B699 SP4 W.SIDE	7030.9	ND			10	"
B699 SP5 CENTER	7030.10	15			10	"

ND= NOT DETECTED

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REPORT OF ANALYSIS

SERV-AIR
PO BOX 369 BLDG.490
FT. MONMOUTH, NJ 07703

EPL# : 7030.1-.10
SAMPLE RECEIVED : 01/10/92
ANALYSIS START : 01/10/92
ANALYSIS COMPD. : 01/16/92
CLIENT ID : SEE BELOW
PO # : R2-0835

MATRIX: SOIL

TEST PARAMETERS: PHENOLS

RESULTS AND DETECTION LIMITS ARE EXPRESSED IN mg/Kg

CLIENT ID	EPL#	RESULTS	MS %REC.	MSD %REC.	DET. LIMIT
EXTRACTION BLANK	NA	ND			2.0
B122 SPA E.SIDE	7030.1	4.0			"
B122 SPB S.SIDE	7030.2	87.5			"
B122 SPC W.SIDE	7030.3	ND			"
B122 SPD N.SIDE	7030.4	160.0			"
B122 SPE CENTER	7030.5	24.4			"
B699 SP1 N.SIDE	7030.6	ND			"
B699 SP2 W.SIDE	7030.7	21.0			"
B699 SP3 N.SIDE	7030.8	ND			"
B699 SP4 W.SIDE	7030.9	ND	102	102	"
B699 SP5 CENTER	7030.10	ND			"

ND= NOT DETECTED NA= NOT APPLICABLE

Daniel K. Wright

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DANIEL K. WRIGHT

ENVIRONMENTAL PROFILE LABORATORIES

ROUTE 37 BUSINESS PARK
SUITE 13
TOMS RIVER, NJ 08755
OFFICE: (908) 244-6278
FAX: (908) 244-6372

REPORT OF ANALYSIS

SERV-AIR PO BOX 369 BLDG.490 FT. MONMOUTH, NJ 07703	EPL# : 7030.1-.10 SAMPLE RECEIVED : 01/10/92 ANALYSIS START : 01/20/92 ANALYSIS COMPD. : 01/23/92 CLIENT ID : SEE BELOW PO # : R2-0835

MATRIX: SOIL

TEST PARAMETERS: TOTAL CYANIDE

RESULTS AND DETECTION LIMITS ARE EXPRESSED IN mg/Kg

CLIENT ID	EPL#	RESULTS	DUPLICATE	DET. LIMIT
EXTRACTION BLANK	NA	ND		8.3
B122 SPA E.SIDE	7030.1	ND		"
B122 SPB S.SIDE	7030.2	ND		"
B122 SPC W.SIDE	7030.3	ND		"
B122 SPD N.SIDE	7030.4	ND		"
B122 SPE CENTER	7030.5	ND		"
B699 SP1 N.SIDE	7030.6	ND		"
B699 SP2 W.SIDE	7030.7	ND		"
B699 SP3 N.SIDE	7030.8	ND		"
B699 SP4 W.SIDE	7030.9	ND		"
B699 SP5 CENTER	7030.10	ND	ND	"

ND= NOT DETECTED NA= NOT APPLICABLE

Daniel K. Wright

LABORATORY DIRECTOR
DANIEL K. WRIGHT

ENVIRONMENTAL PROFILE LABORATORIES

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TOMS RIVER, NJ 08755
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REPORT OF ANALYSIS

SERV-AIR
PO BOX 369, BLDG. 490
FT. MONMOUTH, NJ 07703

SAMPLE RECEIVED: 01/10/92
SAMPLE MATRIX: SOIL
EPL SAMPLE ID: 7030.1-10
PO #: R2-0835

QUALITY CONTROL DATA

PRIORITY POLLUTANT METALS

Results expressed in mg/L (ppm)

	MATRIX SPIKE (%REC.)	MATRIX SPIKE DUP (%REC.)	EXTRACTION BLANK	DETECTION LIMIT
Arsenic (As)	88	94	ND	0.012
Antimony (Sb)	104	100	ND	0.01
Beryllium (Be)	100	109	ND	0.0005
Cadmium (Cd)	108	101	ND	0.0002
Chromium (Cr)	102	96	ND	0.25
Copper (Cu)	98	104	ND	0.03
Lead (Pb)	94	92	ND	0.004
Mercury (Hg)	100	108	ND	0.0005
Nickel (Ni)	84	86	ND	0.06
Selenium (Se)	104	100	ND	0.01
Silver (Ag)	108	110	ND	0.03
Zinc (Zn)	104	104	ND	0.03
Thallium (Tl)	106	116	ND	0.003

ND= NOT DETECTED

DANIEL K. WRIGHT
LABORATORY DIRECTOR

ENVIRONMENTAL PROFILE LABORATORIES

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TOMS RIVER, NJ 08755
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REPORT OF ANALYSIS

SERV-AIR
PO BOX 369, BLDG. 490
FT. MONMOUTH, NJ 07703

SAMPLE RECEIVED: 01/10/92
SAMPLE MATRIX: SOIL
EPL SAMPLE ID: 7030.6-.10
PO #: R2-0835

INORGANICS: PRIORITY POLLUTANT METALS

EPL # :		7030.6	7030.7	7030.8	7030.9	7030.10	
CLIENT ID:		B699-SP1	B699-SP2	B699-SP3	B699-SP4	B699-SP5	DETECTION
		RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	LIMITS
Arsenic	(As)	ND	2.3	ND	ND	0.7	0.6
Antimony	(Sb)	ND	ND	ND	ND	ND	0.5
Beryllium	(Be)	0.187	0.423	0.108	0.190	0.310	0.025
Cadmium	(Cd)	0.01	0.02	0.04	0.02	0.04	0.01
Chromium	(Cr)	21.7	32.7	ND	16.7	27.4	12.5
Zinc	(Zn)	15.1	62.5	18.4	14.4	30.4	0.4
Lead	(Pb)	12.0	332.7	18.4	4.6	9.5	0.2
Mercury	(Hg)	ND	ND	ND	ND	ND	0.025
Nickel	(Ni)	ND	ND	ND	ND	ND	3.0
Selenium	(Se)	ND	ND	ND	ND	ND	0.5
Silver	(Ag)	ND	ND	ND	ND	ND	1.5
Copper	(Cu)	6.0	9.3	7.6	4.6	7.7	1.5
Thallium	(Tl)	ND	ND	ND	ND	ND	0.15

DETECTION LIMITS AND RESULTS EXPRESSED IN mg/Kg
ND= NONE DETECTED

LABORATORY DIRECTOR
DANIEL K. WRIGHT

ENVIRONMENTAL PROFILE LABORATORIES

ROUTE 37 BUSINESS PARK
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FAX: (908) 244-6372

REPORT OF ANALYSIS

SERV-AIR
PO BOX 369, BLDG. 490
FT. MONMOUTH, NJ 07703

SAMPLE RECEIVED: 01/10/92
SAMPLE MATRIX: SOIL
EPL SAMPLE ID: 7030.1-.5
PO #: R2-0835

INORGANICS: PRIORITY POLLUTANT METALS

EPL # :		7030.1	7030.2	7030.3	7030.4	7030.5	
CLIENT ID:		B122-SPA	B122-SPB	B122-SPC	B122-SPD	B122-SPE	DETECTION
		RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	LIMITS
Arsenic	(As)	1.8	ND	1.6	1.9	1.6	0.6
Antimony	(Sb)	ND	ND	ND	ND	ND	0.5
Beryllium	(Be)	0.476	0.465	0.513	0.706	0.409	0.025
Cadmium	(Cd)	0.09	0.02	0.05	0.04	0.07	0.01
Chromium	(Cr)	53.6	33.1	50.6	53.5	39.0	12.5
Zinc	(Zn)	40.4	40.1	51.3	60.0	68.3	0.4
Lead	(Pb)	13.3	31.4	15.2	29.4	29.9	0.2
Mercury	(Hg)	ND	ND	ND	0.047	ND	0.025
Nickel	(Ni)	ND	ND	ND	3.5	ND	3.0
Selenium	(Se)	ND	ND	ND	ND	ND	0.5
Silver	(Ag)	ND	ND	ND	ND	ND	1.5
Copper	(Cu)	6.6	9.3	7.6	8.8	9.1	1.5
Thallium	(Tl)	ND	ND	ND	ND	ND	0.15

DETECTION LIMITS AND RESULTS EXPRESSED IN mg/Kg
ND= NONE DETECTED

Daniel K. Wright

LABORATORY DIRECTOR
DANIEL K. WRIGHT

OK.

ENVIRONMENTAL PROFILE LABORATORIES

ROUTE 37 BUSINESS PARK
SUITE 13
TOMS RIVER, NJ 08755
OFFICE: (908) 244-6278
FAX: (908) 244-6372

LABORATORY ANALYSIS REPORT

CLIENT : Serv-Air

PROJECT: FT. Monmouth
VOA+15

Report Number: 7030
Date Received: Jan, 10, 1992
Date Released: Jan, 16, 1992
Data Released By:

Daniel K. Wright
Laboratory Director

TABLE OF CONTENTS

CLIENT: Serv-Air

SAMPLE LOCATION AND IDENTIFICATION

LAB ID NUMBER	SAMPLE IDENTIFICATION	MATRIX
7030.1	BI22 S.P.A E.SIDE	SOIL
7030.2	BI22 S.P.B S.SIDE	SOIL
7030.3	BI22 S.P.C W.SIDE	SOIL
7030.4	BI22 S.P.D.N.SIDE	SOIL
7030.5	BI22 S.P.E CENTER	SOIL
7030.6	B699 S.P.I N.SIDE	SOIL
7030.7	B699 S.P.2 W.SIDE	SOIL
7030.8	B699 S.P.3 N.SIDE	SOIL
7030.9	B699 S.P.4 W.SIDE	SOIL
7030.10	B699 S.P.5 CENTER	SOIL

CHAIN OF CUSTODY RECORD

CLIENT NAME: SERV-AIR INC.
SITE LOCATION: PO BOX 369 BLDG 490
Ft. MONMOUTH NJ 07703 (908)542-4359

SAMPLERS: Rochkovsky

SAMPLE ID.	DATE	TIME	MATRIX	COMP	GRAB	SAMPLE LOCATION	NUMBER OF CONTAINERS	ANALYSES REQUESTED: TPHC	ANALYSES REQUESTED: PP+HD	REMAPKS
C92-678	1/6	1451	Soil		X	B1122 Sample Pt "A" E Side	1	X		
C92-679		1451			X	B1122 S.P. "A" E Side	1		X	TANK PULL.
C92-680		1451			X	B1122 S.P. "B" S Side	1	X		UST # 0081533
C92-681		1451			X	B1122 S.P. "B" S. Side	1		X	
C92-682		1445			X	B1122 S.P. "C" W Side	1	X		
C92-683		1445			X	B1122 S.P. "C" W Side	1		X	
C92-684		1457			X	B1122 S.P. "D" N Side	1	X		
C92-685		1457			X	B1122 S.P. "D" N Side	1		X	
C92-686		1501			X	B1122 S.P. "E" Center	1	X		
C92-687		1501			X	B1122 S.P. "E" Center	1		X	
C92-688		1530			X	B699 S.P. "1" N.Side	1	X		
C92-689		1530			X	B699 S.P. "1" N.Side	1		X	TANK PULL
C92-690		1536			X	B699 S.P. "2" W.Side	1	X		# 0081533-197
C92-691		1536			X	B699 S.P. "2" W.Side	1		X	
TOTALS							14	7	7	

SAMPLE CONTAINERS PREPARED BY: Rochkovsky	RELINQUISHED BY: Rochkovsky	DATE 1/10 TIME 0830	RECEIVED BY: T. Mel
RELINQUISHED BY:	DATE TIME	RECEIVED BY:	RELINQUISHED BY: / DATE TIME / RECEIVED BY:
RELINQUISHED AT LABORATORY BY: T. Mel	DATE 1/10 TIME 9:30	RECEIVED AT LABORATORY BY:	REMARKS

CHAIN OF CUSTODY RECORD

CLIENT NAME: SERV-AIR INC.
SITE LOCATION: PO BOX 369 BLDG 490
Ft. MONMOUTH NJ 07703 (908)542-4359

SAMPLERS: ROCHKOUSKY

R2-0835

ANALYSES REQUESTED

SAMPLE ID.	DATE	TIME	MATRIX	COMP	GRAB	SAMPLE LOCATION	NUMBER OF CONTAINERS	test for TPHC	test PP+4D	REMARKS
C92-692	1/6	1540	Soil			X B699 S.Point "3" N side	1	X		
C92-693	1/6	1540				X B699 S.Point "3" N side	1		X	UST #
C92-694	1/6	1545				X B699 S.Point "4" W side	1	X		0081533-97
C92-695	1/6	1545				X B699 S.Point "4" W side	1		X	
C92-696	1/6	1555				X B699 S.Point "5" Center	1	X		
C92-697	1/6	1555				X B699 S.Point "5" Center	1		X	

TOTALS

SAMPLE CONTAINERS PREPARED BY:

RELINQUISHED BY: Rochkovsky DATE TIME 1/6

RECEIVED BY:

RELINQUISHED BY: Rochkovsky

DATE TIME 1/10 0830

RECEIVED BY:

RELINQUISHED AT LABORATORY BY: T. Mill. DATE TIME 1/10 9:30

RECEIVED AT LABORATORY BY:

REMARKS

LABORATORY CHRONICLE

SAMPLE NUMBER	7030.1	7030.2	7030.3	7030.4	7030.5	7030.6	7030.7
Received & Refrigerated Date	1/10/92	1/10/92	1/10/92	1/10/92	1/10/92	1/10/92	1/10/92
Organics Extraction Date							
BN/ABN	NA	NA	NA	NA	NA	NA	NA
PCB's	NA	NA	NA	NA	NA	NA	NA
Analysis Date							
BN/ABN	NA	NA	NA	NA	NA	NA	NA
PCB's	NA	NA	NA	NA	NA	NA	NA
Volatiles	1/14/92	1/14/92	1/14/92	1/14/92	1/14/92	1/14/92	1/14/92
TPHC's	NA	NA	NA	NA	NA	NA	NA
Metals	NA	NA	NA	NA	NA	NA	NA
Total Solids	NA	NA	NA	NA	NA	NA	NA
Organic Supervisor Review & Approval	Brian K. McKee B.K. McK						01/24/92
Inorganic Supervisor Review & Approval							

LABORATORY CHRONICLE

SAMPLE NUMBER	7030.8	7030.9	7030.10				
Received & Refrigerated Date	1/10/92	1/10/92	1/10/92				
Organics Extraction Date							
BN/ABN	NA	NA	NA	NA	NA	NA	NA
PCB's	NA	NA	NA	NA	NA	NA	NA
Analysis Date							
BN/ABN	NA	NA	NA	NA	NA	NA	NA
PCB's	NA	NA	NA	NA	NA	NA	NA
Volatiles	1/14/92	1/14/92	1/14/92	NA	NA	NA	NA
TPHC's	NA	NA	NA	NA	NA	NA	NA
Metals	NA	NA	NA	NA	NA	NA	NA
Total Solids	NA	NA	NA	NA	NA	NA	NA
Organic Supervisor Review & Approval	Brian K. McKee						01/24/92
Inorganic Supervisor Review & Approval							

METHOD SUMMARY

Volatiles

The volatile samples in this report have been analyzed using the method cited in the USEPA-CLP-IFB version 2/88. The CLP volatile method is based on USEPA Method 624 and SW-846.

The method is based on 5 milliliters of an aqueous, or 5 grams of a non-aqueous sample spiked with a known concentration of surrogate and internal standard. The samples and standards are the purged onto a trap using a Tekmar LSC 2 and desorbed onto a packed glass column installed in a Hewlett Packard 5890 GC coupled via a jet separator a the HP 5970 MSD. The data was then collected and reduced via a HP 1000 RTE data system.

GC/MS

ORGANIC NON-CONFORMANCE SUMMARY

GC/MS TUNE FREQUENCY:- All samples,blanks,standards and matrix spikes were analyzed within the respective 12 hour tune periods.

INITIAL CALIBRATION REQUIREMENTS:
No CCC or SPCC compound was outside of QC limits.

CONTINUING CALIBRATION REQUIREMENTS:
No CCC or SPCC compound was outside of QC limits

DETECTION LIMITS:- Detection limits and search results were modified by dilution or percent solid.*

* All values reported on a DRY WEIGHT basis where applicable

MATRIX SPIKE RECOVERY:- No matrix spike compound was outside QC limits

INTERNAL STANDARD AREA:-

CLIENT ID #	NUMBER OF INTERNAL STANDARD AREA(S)
NONE	0

SURROGATE RECOVERY:-

Client ID #	Surrogates outside QC limits
NONE	0

ANALYSIS TIME:- All samples were extracted and analyzed within the prescribed holding times.

***NOTE: 7008.2 was measured as water cie took 1ml but calculated as soil as per T-VWIX-009 1ml-1oz

DATA REPORTING QUALIFIERS

For reporting results to EPA, the following "results qualifiers" are used:

VALUE - If the result is a value greater than or equal to the detection limit, report the value.

U - Indicates the compound was analyzed for but was not detected. Report the minimum detection limit for the sample with the U, "10U". This is not necessarily the instrument detection limit. The figure represents the minimum detection limit attainable for this particular sample based on any concentration or dilution that may have been required.

J - Indicates an estimated value. This flag is used:

1) When estimating a concentration for tentatively identifid compounds (library search hits) where a 1:1 response is assumed.
2) When the mass spectral data indicated the identification criteria, however, the result was less than the specified detection limit but greater than zero. If the detection limit was 10ug/L and a concentration of 3ug/L was calculated, report as "3J".

B - Indicates the analyte was found in the blank as well as the sample; report as "12B".

E - Indicates the analyte concentration exceeds the calibrated range of the GC/MS instrument for that specific analysis.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

Environmental Profile Laboratories
VOLATILE ORGANIC ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NAME	7030.1 1g	DILUTION FACTOR	5.00
CLIENT ID		QA BATCH	
DATA FILE	>V2403	DATE ANALYZED	01/14/92

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
Chloromethane	ND	60	Trichloroethene	ND	30
Bromomethane	ND	60	Dibromochloromethane	ND	30
Vinyl Chloride	ND	60	1,1,2-Trichloroethane	ND	30
Chloroethane	ND	60	Benzene	ND	30
Methylene Chloride	62	30	trans-1,3-Dichloropropene	ND	30
Acrolein	ND	300	2-Chloroethylvinyl ether	ND	30
Acrylonitrile	ND	300	Bromoform	ND	30
Acetone	ND	30	2-Hexanone	ND	30
Carbon Disulfide	ND	30	4-Methyl-2-Pentanone	38	30
1,1-Dichloroethene	ND	30	Tetrachloroethene	ND	30
1,1-Dichloroethane	ND	30	1,1,2,2-Tetrachloroethane	ND	30
trans-1,2-Dichloroethene	ND	30	Toluene	ND	30
Trichlorofluoromethane	ND	30	Chlorobenzene	ND	30
Chloroform	ND	30	Ethylbenzene	ND	30
1,2-Dichloroethane	ND	30	Styrene	ND	30
2-Butanone	280	30	o-Xylene	ND	30
1,1,1-Trichloroethane	100	30	m + p-Xylenes	ND	30
Carbon Tetrachloride	ND	30	1,3-Dichlorobenzene	ND	30
Bromodichloromethane	ND	30	1,2-Dichlorobenzene	ND	30
Vinyl Acetate	ND	30	1,4-Dichlorobenzene	ND	30
1,2-Dichloropropane	ND	30	tert-Butyl Alcohol	ND	300
cis-1,3-Dichloropropene	ND	30	Methyl tert-Butyl Ether	ND	30

Percent Solid of 83.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

Environmental Profile Laboratories
VOLATILE ORGANIC ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NAME	7030.2 1g	DILUTION FACTOR	5.00
CLIENT ID		QA BATCH	
DATA FILE	>V2404	DATE ANALYZED	01/14/92

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
Chloromethane	ND	58	Trichloroethene	ND	29
Bromomethane	ND	58	Dibromochloromethane	ND	29
Vinyl Chloride	ND	58	1,1,2-Trichloroethane	ND	29
Chloroethane	ND	58	Benzene	ND	29
Methylene Chloride	60	29	trans-1,3-Dichloropropene	ND	29
Acrolein	ND	290	2-Chloroethylvinyl ether	ND	29
Acrylonitrile	ND	290	Bromoform	ND	29
Acetone	ND	29	2-Hexanone	ND	29
Carbon Disulfide	ND	29	4-Methyl-2-Pentanone	ND	29
1,1-Dichloroethene	ND	29	Tetrachloroethene	ND	29
1,1-Dichloroethane	ND	29	1,1,2,2-Tetrachloroethane	ND	29
trans-1,2-Dichloroethene	ND	29	Toluene	ND	29
Trichlorofluoromethane	ND	29	Chlorobenzene	ND	29
Chloroform	ND	29	Ethylbenzene	ND	29
1,2-Dichloroethane	ND	29	Styrene	ND	29
2-Butanone	ND	29	o-Xylene	ND	29
1,1,1-Trichloroethane	100	29	m + p-Xylenes	ND	29
Carbon Tetrachloride	ND	29	1,3-Dichlorobenzene	ND	29
Bromodichloromethane	ND	29	1,2-Dichlorobenzene	ND	29
Vinyl Acetate	ND	29	1,4-Dichlorobenzene	ND	29
1,2-Dichloropropane	ND	29	tert-Butyl Alcohol	ND	290
cis-1,3-Dichloropropene	ND	29	Methyl tert-Butyl Ether	ND	29

Percent Solid of 86.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

Environmental Profile Laboratories
VOLATILE ORGANIC ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NAME	7030.3 1g	DILUTION FACTOR	5.00
CLIENT ID		QA BATCH	
DATA FILE	>V2405	DATE ANALYZED	01/14/92

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
Chloromethane	ND	63	Trichloroethene	ND	32
Bromomethane	ND	63	Dibromochloromethane	ND	32
Vinyl Chloride	ND	63	1,1,2-Trichloroethane	ND	32
Chloroethane	ND	63	Benzene	ND	32
Methylene Chloride	93	32	trans-1,3-Dichloropropene	ND	32
Acrolein	ND	320	2-Chloroethylvinyl ether	ND	32
Acrylonitrile	ND	320	Bromoform	ND	32
Acetone	ND	32	2-Hexanone	ND	32
Carbon Disulfide	ND	32	4-Methyl-2-Pentanone	ND	32
1,1-Dichloroethene	ND	32	Tetrachloroethene	ND	32
1,1-Dichloroethane	ND	32	1,1,2,2-Tetrachloroethane	ND	32
trans-1,2-Dichloroethene	ND	32	Toluene	ND	32
Trichlorofluoromethane	ND	32	Chlorobenzene	ND	32
Chloroform	ND	32	Ethylbenzene	ND	32
1,2-Dichloroethane	ND	32	Styrene	ND	32
2-Butanone	ND	32	o-Xylene	25 J	32
1,1,1-Trichloroethane	160	32	m + p-Xylenes	ND	32
Carbon Tetrachloride	ND	32	1,3-Dichlorobenzene	ND	32
Bromodichloromethane	ND	32	1,2-Dichlorobenzene	ND	32
Vinyl Acetate	ND	32	1,4-Dichlorobenzene	ND	32
1,2-Dichloropropane	ND	32	tert-Butyl Alcohol	ND	320
cis-1,3-Dichloropropene	ND	32	Methyl tert-Butyl Ether	ND	32

Percent Solid of 79.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

Environmental Profile Laboratories
VOLATILE ORGANIC ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NAME	7030.4 1g	DILUTION FACTOR	5.00
CLIENT ID		QA BATCH	
DATA FILE	>U2406	DATE ANALYZED	01/14/92

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
Chloromethane	ND	59	Trichloroethene	ND	29
Bromomethane	ND	59	Dibromochloromethane	ND	29
Vinyl Chloride	ND	59	1,1,2-Trichloroethane	ND	29
Chloroethane	ND	59	Benzene	ND	29
Methylene Chloride	140	29	trans-1,3-Dichloropropene	ND	29
Acrolein	ND	290	2-Chloroethylvinyl ether	ND	29
Acrylonitrile	ND	290	Bromoform	ND	29
Acetone	ND	29	2-Hexanone	ND	29
Carbon Disulfide	ND	29	4-Methyl-2-Pentanone	ND	29
1,1-Dichloroethene	ND	29	Tetrachloroethene	ND	29
1,1-Dichloroethane	ND	29	1,1,2,2-Tetrachloroethane	ND	29
trans-1,2-Dichloroethene	ND	29	Toluene	ND	29
Trichlorofluoromethane	ND	29	Chlorobenzene	ND	29
Chloroform	ND	29	Ethylbenzene	ND	29
1,2-Dichloroethane	ND	29	Styrene	ND	29
2-Butanone	190	29	o-Xylene	48	29
1,1,1-Trichloroethane	250	29	m + p-Xylenes	ND	29
Carbon Tetrachloride	ND	29	1,3-Dichlorobenzene	ND	29
Bromodichloromethane	ND	29	1,2-Dichlorobenzene	ND	29
Vinyl Acetate	ND	29	1,4-Dichlorobenzene	ND	29
1,2-Dichloropropane	ND	29	tert-Butyl Alcohol	ND	290
cis-1,3-Dichloropropene	ND	29	Methyl tert-Butyl Ether	ND	29

Percent Solid of 85.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

Environmental Profile Laboratories
VOLATILE ORGANIC ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NAME	7030.5 1g	DILUTION FACTOR	5.00
CLIENT ID		QA BATCH	
DATA FILE	>V2407	DATE ANALYZED	01/14/92

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
Chloromethane	ND	61	Trichloroethene	ND	30
Bromomethane	ND	61	Dibromochloromethane	ND	30
Vinyl Chloride	ND	61	1,1,2-Trichloroethane	ND	30
Chloroethane	ND	61	Benzene	ND	30
Methylene Chloride	72	30	trans-1,3-Dichloropropene	ND	30
Acrolein	ND	300	2-Chloroethylvinyl ether	ND	30
Acrylonitrile	ND	300	Bromoform	ND	30
Acetone	440	30	2-Hexanone	ND	30
Carbon Disulfide	ND	30	4-Methyl-2-Pentanone	ND	30
1,1-Dichloroethene	ND	30	Tetrachloroethene	ND	30
1,1-Dichloroethane	ND	30	1,1,2,2-Tetrachloroethane	ND	30
trans-1,2-Dichloroethene	ND	30	Toluene	37	30
Trichlorofluoromethane	ND	30	Chlorobenzene	ND	30
Chloroform	ND	30	Ethylbenzene	19 J	30
1,2-Dichloroethane	ND	30	Styrene	ND	30
2-Butanone	ND	30	o-Xylene	48	30
1,1,1-Trichloroethane	130	30	m + p-Xylenes	91	30
Carbon Tetrachloride	ND	30	1,3-Dichlorobenzene	ND	30
Bromodichloromethane	ND	30	1,2-Dichlorobenzene	ND	30
Vinyl Acetate	ND	30	1,4-Dichlorobenzene	ND	30
1,2-Dichloropropane	ND	30	tert-Butyl Alcohol	ND	300
cis-1,3-Dichloropropene	ND	30	Methyl tert-Butyl Ether	ND	30

Percent Solid of 82.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

Environmental Profile Laboratories
VOLATILE ORGANIC ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NAME	7030.6 1g	DILUTION FACTOR	5.00
CLIENT ID		QA BATCH	
DATA FILE	>U2408	DATE ANALYZED	01/14/92

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
Chloromethane	ND	60	Trichloroethene	ND	30
Bromomethane	ND	60	Dibromochloromethane	ND	30
Vinyl Chloride	ND	60	1,1,2-Trichloroethane	ND	30
Chloroethane	ND	60	Benzene	ND	30
Methylene Chloride	94	30	trans-1,3-Dichloropropene	ND	30
Acrolein	ND	300	2-Chloroethylvinyl ether	ND	30
Acrylonitrile	ND	300	Bromoform	ND	30
Acetone	ND	30	2-Hexanone	ND	30
Carbon Disulfide	ND	30	4-Methyl-2-Pentanone	ND	30
1,1-Dichloroethene	ND	30	Tetrachloroethene	ND	30
1,1-Dichloroethane	ND	30	1,1,2,2-Tetrachloroethane	ND	30
trans-1,2-Dichloroethene	ND	30	Toluene	ND	30
Trichlorofluoromethane	ND	30	Chlorobenzene	ND	30
Chloroform	ND	30	Ethylbenzene	ND	30
1,2-Dichloroethane	ND	30	Styrene	ND	30
2-Butanone	ND	30	o-Xylene	ND	30
1,1,1-Trichloroethane	130	30	m + p-Xylenes	ND	30
Carbon Tetrachloride	ND	30	1,3-Dichlorobenzene	ND	30
Bromodichloromethane	ND	30	1,2-Dichlorobenzene	ND	30
Vinyl Acetate	ND	30	1,4-Dichlorobenzene	ND	30
1,2-Dichloropropane	ND	30	tert-Butyl Alcohol	ND	300
cis-1,3-Dichloropropene	ND	30	Methyl tert-Butyl Ether	ND	30

Percent Solid of 83.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

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Environmental Profile Laboratories
VOLATILE ORGANIC ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NAME	7030.7 1g	DILUTION FACTOR	5.00
CLIENT ID		QA BATCH	
DATA FILE	>V2412	DATE ANALYZED	01/14/92

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
Chloromethane	ND	60	Trichloroethene	ND	30
Bromomethane	ND	60	Dibromochloromethane	ND	30
Vinyl Chloride	ND	60	1,1,2-Trichloroethane	ND	30
Chloroethane	ND	60	Benzene	ND	30
Methylene Chloride	68	30	trans-1,3-Dichloropropene	ND	30
Acrolein	ND	300	2-Chloroethylvinyl ether	ND	30
Acrylonitrile	ND	300	Bromoform	ND	30
Acetone	ND	30	2-Hexanone	ND	30
Carbon Disulfide	ND	30	4-Methyl-2-Pentanone	ND	30
1,1-Dichloroethene	ND	30	Tetrachloroethene	ND	30
1,1-Dichloroethane	ND	30	1,1,2,2-Tetrachloroethane	ND	30
trans-1,2-Dichloroethene	ND	30	Toluene	ND	30
Trichlorofluoromethane	ND	30	Chlorobenzene	ND	30
Chloroform	ND	30	Ethylbenzene	ND	30
1,2-Dichloroethane	ND	30	Styrene	ND	30
2-Butanone	ND	30	o-Xylene	ND	30
1,1,1-Trichloroethane	110	30	m + p-Xylenes	23 J	30
Carbon Tetrachloride	ND	30	1,3-Dichlorobenzene	ND	30
Bromodichloromethane	ND	30	1,2-Dichlorobenzene	ND	30
Vinyl Acetate	ND	30	1,4-Dichlorobenzene	ND	30
1,2-Dichloropropane	ND	30	tert-Butyl Alcohol	ND	300
cis-1,3-Dichloropropene	ND	30	Methyl tert-Butyl Ether	ND	30

Percent Solid of 84.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

Environmental Profile Laboratories
VOLATILE ORGANIC ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NAME	7030.8 1g	DILUTION FACTOR	5.00
CLIENT ID		QA BATCH	
DATA FILE	>V2409	DATE ANALYZED	01/14/92

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
Chloromethane	ND	63	Trichloroethene	ND	32
Bromomethane	ND	63	Dibromochloromethane	ND	32
Vinyl Chloride	ND	63	1,1,2-Trichloroethane	ND	32
Chloroethane	ND	63	Benzene	ND	32
Methylene Chloride	140	32	trans-1,3-Dichloropropene	ND	32
Acrolein	ND	320	2-Chloroethylvinyl ether	ND	32
Acrylonitrile	ND	320	Bromoform	ND	32
Acetone	ND	32	2-Hexanone	ND	32
Carbon Disulfide	ND	32	4-Methyl-2-Pentanone	ND	32
1,1-Dichloroethene	ND	32	Tetrachloroethene	ND	32
1,1-Dichloroethane	ND	32	1,1,2,2-Tetrachloroethane	ND	32
trans-1,2-Dichloroethene	ND	32	Toluene	ND	32
Trichlorofluoromethane	ND	32	Chlorobenzene	ND	32
Chloroform	ND	32	Ethylbenzene	ND	32
1,2-Dichloroethane	ND	32	Styrene	ND	32
2-Butanone	ND	32	o-Xylene	ND	32
1,1,1-Trichloroethane	170	32	m + p-Xylenes	ND	32
Carbon Tetrachloride	ND	32	1,3-Dichlorobenzene	ND	32
Bromodichloromethane	ND	32	1,2-Dichlorobenzene	ND	32
Vinyl Acetate	ND	32	1,4-Dichlorobenzene	ND	32
1,2-Dichloropropane	ND	32	tert-Butyl Alcohol	ND	320
cis-1,3-Dichloropropene	ND	32	Methyl tert-Butyl Ether	ND	32

Percent Solid of 79.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

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Environmental Profile Laboratories
VOLATILE ORGANIC ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NAME	7030.9 1g	DILUTION FACTOR	5.00
CLIENT ID		QA BATCH	
DATA FILE	>V2410	DATE ANALYZED	01/14/92

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
Chloromethane	ND	57	Trichloroethene	ND	29
Bromomethane	ND	57	Dibromochloromethane	ND	29
Vinyl Chloride	ND	57	1,1,2-Trichloroethane	ND	29
Chloroethane	ND	57	Benzene	ND	29
Methylene Chloride	130	29	trans-1,3-Dichloropropene	ND	29
Acrolein	ND	290	2-Chloroethylvinyl ether	ND	29
Acrylonitrile	ND	290	Bromoform	ND	29
Acetone	ND	29	2-Hexanone	ND	29
Carbon Disulfide	ND	29	4-Methyl-2-Pentanone	ND	29
1,1-Dichloroethene	ND	29	Tetrachloroethene	ND	29
1,1-Dichloroethane	ND	29	1,1,2,2-Tetrachloroethane	ND	29
trans-1,2-Dichloroethene	ND	29	Toluene	ND	29
Trichlorofluoromethane	ND	29	Chlorobenzene	ND	29
Chloroform	ND	29	Ethylbenzene	ND	29
1,2-Dichloroethane	ND	29	Styrene	ND	29
2-Butanone	ND	29	o-Xylene	ND	29
1,1,1-Trichloroethane	120	29	m + p-Xylenes	ND	29
Carbon Tetrachloride	ND	29	1,3-Dichlorobenzene	ND	29
Bromodichloromethane	ND	29	1,2-Dichlorobenzene	ND	29
Vinyl Acetate	ND	29	1,4-Dichlorobenzene	ND	29
1,2-Dichloropropane	ND	29	tert-Butyl Alcohol	ND	290
cis-1,3-Dichloropropene	ND	29	Methyl tert-Butyl Ether	ND	29

Percent Solid of 87.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

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Environmental Profile Laboratories
VOLATILE ORGANIC ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NAME	7030.10 1g	DILUTION FACTOR	5.00
CLIENT ID		QA BATCH	
DATA FILE	>U2411	DATE ANALYZED	01/14/92

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
Chloromethane	ND	60	Trichloroethene	ND	30
Bromomethane	ND	60	Dibromochloromethane	ND	30
Vinyl Chloride	ND	60	1,1,2-Trichloroethane	ND	30
Chloroethane	ND	60	Benzene	ND	30
Methylene Chloride	130	30	trans-1,3-Dichloropropene	ND	30
Acrolein	ND	300	2-Chloroethylvinyl ether	ND	30
Acrylonitrile	ND	300	Bromoform	ND	30
Acetone	ND	30	2-Hexanone	ND	30
Carbon Disulfide	ND	30	4-Methyl-2-Pentanone	ND	30
1,1-Dichloroethene	ND	30	Tetrachloroethene	ND	30
1,1-Dichloroethane	ND	30	1,1,2,2-Tetrachloroethane	ND	30
trans-1,2-Dichloroethene	ND	30	Toluene	ND	30
Trichlorofluoromethane	ND	30	Chlorobenzene	ND	30
Chloroform	ND	30	Ethylbenzene	ND	30
1,2-Dichloroethane	ND	30	Styrene	ND	30
2-Butanone	ND	30	o-Xylene	ND	30
1,1,1-Trichloroethane	150	30	m + p-Xylenes	ND	30
Carbon Tetrachloride	ND	30	1,3-Dichlorobenzene	ND	30
Bromodichloromethane	ND	30	1,2-Dichlorobenzene	ND	30
Vinyl Acetate	ND	30	1,4-Dichlorobenzene	ND	30
1,2-Dichloropropane	ND	30	tert-Butyl Alcohol	ND	300
cis-1,3-Dichloropropene	ND	30	Methyl tert-Butyl Ether	ND	30

Percent Solid of 84.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LAB SAMPLE N

7030.1 1g

Lab Name: Environmental Profile Lab NJDEP Cert.# 15526

Matrix: Soil

Lab Sample ID: 7030.1 1g

Sample wt/vol: 1.0 (g/mL) g

Lab File ID: >V2403

Level: (Low/med) Low

Date Received: 01-10-92

Date Analyzed: 01/14/92

Column: Capillary

Dilution Factor: 5

Number of TICs found: 0

CONCENTRATION UNITS:
ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

FORM I VOA-TIC 1/87 Rev

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LAB SAMPLE N

7030.2 1g

Lab Name: Environmental Profile Lab NJDEP Cert.# 15526

Matrix: Soil

Sample wt/vol: 1.0 (g/mL) g

Level: (Low/med) Low

Column: Capillary

Lab Sample ID: 7030.2 1g

Lab File ID: >V2404

Date Received: 01-10-92

Date Analyzed: 01/14/92

Dilution Factor: 5

Number of TICs found: 0

CONCENTRATION UNITS:
ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

60

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LAB SAMPLE NO: 7030.3 1g

Lab Name: Environmental Profile Lab NJDEP Cert.# 15526

Matrix: Soil

Lab Sample ID: 7030.3 1g

Sample wt/vol: 1.0 (g/mL) g

Lab File ID: >V2405

Level: (Low/med) Low

Date Received: 01-10-92

Date Analyzed: 01/14/92

Column: Capillary

Dilution Factor: 5

Number of TICs found: 14

CONCENTRATION UNITS: ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1	76131	Freon	8.33	1300	89
2	95476	Benzene, 1,2-dimethyl-	30.47	15	64
3	17302237	Nonane, 4,5-dimethyl-	34.44	45	60
4	620144	Benzene, 1-ethyl-3-methyl-	34.99	45	70
5	108678	Benzene, 1,3,5-trimethyl-	35.15	65	52
6	611143	Benzene, 1-ethyl-2-methyl-	36.01	40	83
7	95636	Benzene, 1,2,4-trimethyl-	36.50	20	52
8		Unknown	37.11	20	
9	622968	Benzene, 1-ethyl-4-methyl-	38.13	50	93
10	1120214	Undecane	38.70	55	59
11	99876	Benzene, 1-methyl-4-(1-methy	39.09	100	79
12		An Aromatic	39.70	15	
13	1758889	Benzene, 2-ethyl-1,4-dimethy	40.05	20	42
14	934805	Benzene, 4-ethyl-1,2-dimethy	40.46	45	84

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LAB SAMPLE NI
7030.4 1g

Lab Name: Environmental Profile Lab NJDEP Cert.# 15526

Matrix: Soil

Lab Sample ID: 7030.4 1g

Sample wt/vol: 1.0 (g/mL) g

Lab File ID: >V2406

Level: (Low/med) Low

Date Received: 01-10-92

Date Analyzed: 01/14/92

Column: Capillary

Dilution Factor: 5

CONCENTRATION UNITS:
ug/Kg

Number of TICs found: 15

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1	76131	Freon	8.33	1850	89
2	5063650	Oxirane, pentyl-	31.37	45	26
3	26730143	Tridecane, 7-methyl-	33.23	45	53
4		Unknown	34.53	55	
5	611143	Benzene, 1-ethyl-2-methyl-	31.04	145	86
6	95636	Benzene, 1,2,4-trimethyl-	35.22	180	93
7	611143	Benzene, 1-ethyl-2-methyl-	36.08	150	94
8	526738	Benzene, 1,2,3-trimethyl-	36.57	70	84
9	934747	Benzene, 1-ethyl-3,5-dimethyl	37.57	45	59
10	526738	Benzene, 1,2,3-trimethyl-	38.20	135	91
11	1074437	Benzene, 1-methyl-3-propyl-	38.87	255	87
12	25155151	Benzene, methyl(1-methylethyl	39.16	285	79
13	1074175	Benzene, 1-methyl-2-propyl-	39.77	40	67
14	141935	Benzene, 1,3-diethyl-	40.12	60	15
15	535773	Benzene, 1-methyl-3-(1-methy	40.53	100	96

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LAB SAMPLE N

7030.5 1g

Lab Name: Environmental Profile Lab NJDEP Cert.# 15526

Matrix: Soil

Lab Sample ID: 7030.5 1g

Sample wt/vol: 1.0 (g/mL) g

Lab File ID: >V2407

Level: (Low/med) Low

Date Received: 01-10-92

Date Analyzed: 01/14/92

Column: Capillary

Dilution Factor: 5

Number of TICs found: 15

CONCENTRATION UNITS:
ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1	33083839	5-Undecanone	23.43	30	35
2		Unknown	34.54	40	
3	103651	Benzene, propyl-	34.68	25	68
4	611143	Benzene, 1-ethyl-2-methyl-	31.05	140	86
5	108678	Benzene, 1,3,5-trimethyl-	35.24	45	88
6	611143	Benzene, 1-ethyl-2-methyl-	36.11	55	95
7	95636	Benzene, 1,2,4-trimethyl-	36.60	220	96
8		Unknown	37.23	25	
9	526738	Benzene, 1,2,3-trimethyl-	38.22	95	96
10	25340174	Benzene, diethyl-	38.89	155	76
11	25155151	Benzene, methyl(1-methylethyl	39.21	195	73
12	135988	Benzene, (1-methylpropyl)-	39.77	30	83
13	527537	Benzene, 1,2,3,5-tetramethyl	40.15	55	25
14	25155151	Benzene, methyl(1-methylethyl	40.25	45	62
15	535773	Benzene, 1-methyl-3-(1-methy	40.56	90	97

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1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LAB SAMPLE N:

7030.6 1g

Lab Name: Environmental Profile Lab NJDEP Cert.# 15526

Matrix: Soil

Lab Sample ID: 7030.6 1g

Sample wt/vol: 1.0 (g/mL) g

Lab File ID: >V2408

Level: (Low/med) Low

Date Received: 01-10-92

Date Analyzed: 01/14/92

Column: Capillary

Dilution Factor: 5

Number of TICs found: 0

CONCENTRATION UNITS:
ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1E

LAB SAMPLE Nt

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

7030.7 1g

Lab Name: Environmental Profile Lab NJDEP Cert.# 15526

Matrix: Soil

Lab Sample ID: 7030.7 1g

Sample wt/vol: 1.0 (g/mL) g

Lab File ID: >V2412

Level: (Low/med) Low

Date Received: 01-10-92

Date Analyzed: 01/14/92

Column: Capillary

Dilution Factor: 5

CONCENTRATION UNITS:
ug/Kg

Number of TICs found: 15

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1	76131	Freon	8.49	500	89
2	1105439	Hexane	12.06	115	36
3		Unknown	32.85	45	
4	5911046	Nonane, 3-methyl-	33.34	55	25
5	124185	Decane	34.61	75	79
6	103651	Benzene, propyl-	34.77	55	60
7	620144	Benzene, 1-ethyl-3-methyl-	35.18	60	67
8	611143	Benzene, 1-ethyl-2-methyl-	36.20	95	95
9	611143	Benzene, 1-ethyl-2-methyl-	36.69	285	93
10	141935	Benzene, 1,3-diethyl-	37.30	55	11
11	622968	Benzene, 1-ethyl-4-methyl-	38.32	75	93
12		Hydrocarbon	38.87	55	
13	135013	Benzene, 1,2-diethyl-	39.00	70	79
14	933982	Benzene, 1-ethyl-2,3-dimethyl	40.24	75	58
15	1758889	Benzene, 2-ethyl-1,4-dimethyl	40.65	120	96

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LAB SAMPLE NO.: 7030.8 1g

Lab Name: Environmental Profile Lab NJDEP Cert.# 15526

Matrix: Soil

Lab Sample ID: 7030.8 1g

Sample wt/vol: 1.0 (g/mL) g

Lab File ID: >V2409

Level: (Low/med) Low

Date Received: 01-10-92

Date Analyzed: 01/14/92

Column: Capillary

Dilution Factor: 5

Number of TICs found: 0

CONCENTRATION UNITS:
ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LAB SAMPLE NO.: 7030.9 1g

Lab Name: Environmental Profile Lab NJDEP Cert.# 15526

Matrix: Soil

Sample wt/vol: 1.0 (g/mL) g

Level: (Low/med) Low

Column: Capillary

Lab Sample ID: 7030.9 1g

Lab File ID: >V2410

Date Received: 01-10-92

Date Analyzed: 01/14/92

Dilution Factor: 5

Number of TICs found: 0

CONCENTRATION UNITS: ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

FORM I VOA-TIC 1/87 Rev

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LAB SAMPLE N

7030.10 1g

Lab Name: Environmental Profile Lab NJDEP Cert.# 15526

Matrix: Soil

Lab Sample ID: 7030.10 1g

Sample wt/vol: 1.0 (g/mL) g

Lab File ID: >V2411

Level: (Low/med) Low

Date Received: 01-10-92

Date Analyzed: 01/14/92

Column: Capillary

Dilution Factor: 5

Number of TICs found: 7

CONCENTRATION UNITS: ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1	76131	Freon	8.47	750	88
2		Benzene, branched	30.64	20	
3	1560958	Tetradecane, 2-methyl-	34.62	25	58
4	625661	Butane, 1,1-dichloro-3-methyl	35.13	20	15
5	526738	Benzene, 1,2,3-trimethyl-	36.66	45	87
6		Unknown	38.83	15	
7	527844	Benzene, 1-methyl-2-(1-methyl	39.26	20	35

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ENVIRONMENTAL PROFILE LABORATORIES
ROUTE 37 BUSINESS PARK
SUITE 13
TOMS RIVER, NJ 08755
OFFICE: (908) 244-6278
FAX: (908) 244-6372

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LABORATORY ANALYSIS REPORT

CLIENT : Serv-Air FT. Monmouth

PROJECT: Serv-Air FT. Monmouth
BNA+25

Report Number: 7030
Date Received: Jan, 10, 1992
Date Released: Jan, 21, 1992
Data Released By:

Daniel K. Wright
Laboratory Director

TABLE OF CONTENTS

CLIENT: Serv-Air FT. Monmouth

SAMPLE LOCATION AND IDENTIFICATION

LAB ID NUMBER	SAMPLE IDENTIFICATION	MATRIX
7030.1	B122 S.P.A. E.SIDE	SOIL
7030.2	B122 S.P.B. S.SIDE	SOIL
7030.3	B122 S.P.C. W.SIDE	SOIL
7030.4	B122 S.P.D. N.SIDE	SOIL
7030.5	B122 S.P.E. CENTER	SOIL
7030.6	B699 S.P.1. N.SIDE	SOIL
7030.7	B699 S.P.2. W.SIDE	SOIL
7030.8	B699 S.P.3. N.SIDE	SOIL
7030.9	B699 S.P.4. W.SIDE	SOIL
7030.10	B699 S.P.5. CENTER	SOIL

Environmental Profile Laboratories

CUSTOMER PURCHASE ORDER NO: R2-0835

CHAIN OF CUSTODY RECORD

PROJECT NO.:

SAMPLER (SIGNATURE):

DATE / TIME

CUSTOMER (NAME/ADDRESS)
Serve-Air
Ft. Monmouth

SITE NAME:

PHONE NO:

FAX NO:

ANALYSIS PARAMETERS

LAB SAMPLE ID NUMBER	DATE/TIME	SAMPLE MATRIX	CUSTOMER SAMPLE LOCATION/ID NUMBER	NUMBER OF CONTAINERS	TPHC + PPHO	624+15 + ABN+25	PEST/PCB + 13 PP Metals	Phenols + Total CN-	PRESERVATION METHOD	REMARKS
7030.1		Soil	B122 SPA E. SIDE	2	X					
.2			B122 SP B S. SIDE	2	X					4°C
.3			B122 SP C W. SIDE	2	X					
.4			B122 SP D N. SIDE	2	X					
.5			B122 SP E Center	2	X					
.6			B699 SP 1 N. Side	2	X					
.7			B699 SP 2 W. Side	2	X					
.8			B699 SP 3 N Side	2	X					
.9			B699 SP 4 W Side	2	X					
.10		↓	B699 SP 5 Center	2	X					
									↓	

Relinquished By (Signature)	DATE / TIME	Received By (Signature)	METHOD OF SHIPPING:
Relinquished By (Signature)	DATE / TIME	Received By (Signature)	SHIPPED BY (Signature):
Relinquished By (Signature)	DATE / TIME	Received for Lab by (Signature):	DATE / TIME 1-10-92 9:30

NOTE: A DRAWING DEPICTING SAMPLE LOCATION SHOULD BE ATTACHED OR DRAWN ON THE REVERSE SIDE OF THIS CHAIN OF CUSTODY.

EPL. FORM 002/CHAIN OF CUSTODY

PAGE _____ OF _____ PAGES

REV. A DATE: 01 AUG 89

CHAIN OF CUSTODY RECORD

CLIENT NAME: SERV-AIR INC.
SITE LOCATION: PO BOX 369 BLDG 490
Ft. MONMOUTH NJ 07703 (908)542-4359

SAMPLERS: Rochkovsky

ANALYSES REQUESTED

SAMPLE ID.	DATE	TIME	MAT RIX	COMP	GRAB	SAMPLE LOCATION	NUMBER OF CONTAINERS	TPHC	PPHO	REMAPKS
92-678	1/6	1451	Soil		X	B1122 Sample Pt "A" E Side	1	X		
92-679		1451			X	B1122 S.P. "A" E Side	1		X	TANK PULL.
92-680		1451			X	B1122 S.P. "B" S Side	1	X		UST # 0081533-197
92-681		1451			X	B1122 S.P. "B" S. Side	1		X	
92-682		1445			X	B1122 S.P. "C" W Side	1	X		
92-683		1445			X	B1122 S.P. "C" W Side	1		X	
92-684		1457			X	B1122 S.P. "D" N Side	1	X		
92-685		1457			X	B1122 S.P. "D" N Side	1		X	
92-686		1501			X	B1122 S.P. "E" Center	1	X		
92-687		1501			X	B1122 S.P. "E" Center	1		X	
92-688		1530			X	B699 S.P. "1" N.Side	1	X		
92-689		1530			X	B699 S.P. "1" N.Side	1		X	TANK PULL
92-690		1536			X	B699 S.P. "2" W.Side	1	X		# 0081533-197
92-691		1536			X	B699 S.P. "2" W.Side	1		X	
TOTALS							14	7	7	

SAMPLE CONTAINERS PREPARED BY: Rochkovsky

RELINQUISHED BY: Rochkovsky — DATE 1/10 TIME 0830 — RECEIVED BY: T. Mele

RELINQUISHED BY: — DATE — TIME — RECEIVED BY: — RELINQUISHED BY: — DATE — TIME — RECEIVED BY:

RELINQUISHED AT LABORATORY BY: W T. Mele — DATE 1/10 TIME 9:30 — RECEIVED AT LABORATORY BY: — REMARKS

CHAIN OF CUSTODY RECORD

CLIENT NAME: SERV-AIR INC.
SITE LOCATION: PO BOX 369 BLDG 490
Ft. MONMOUTH NJ 07703 (908)542-4359

SAMPLERS: ROCHKOUSKY

RZ-0835

ANALYSES REQUESTED

SAMPLE ID.	DATE	TIME	MATRIX	COMP	GRAB	SAMPLE LOCATION	NUMBER OF CONTAINERS	test for TPHC	test for PP+4D	REMARKS
C92-692	1/6	1540	Soil			X B699 S.Point "3" N side	1	X		UST # 0081533-
C92-693	1/6	1540				X B699 S.Point "3" N side	1		X	
C92-694	1/6	1545				X B699 S.Point "4" W side	1	X		
C92-695	1/6	1545				X B699 S.Point "4" W side	1		X	
C92-696	1/6	1555				X B699 S.Point "5" center	1	X		
C92-697	1/6	1555				X B699 S.Point "5" Center	1		X	
TOTALS										

SAMPLE CONTAINERS PREPARED BY:

RELINQUISHED BY: 6 3 3 — DATE TIME — RECEIVED BY:

RELINQUISHED BY: Rochkovsky — DATE TIME — RECEIVED BY:

RELINQUISHED BY: Rochkovsky — DATE TIME 1/10 0830 — RECEIVED BY: T. Miller

RELINQUISHED AT LABORATORY BY: T. Miller — DATE TIME 1/10 4:30 — RECEIVED AT LABORATORY BY:

REMARKS

LABORATORY CHRONICLE

SAMPLE NUMBER	7030.1	7030.2	7030.3	7030.4	7030.5	7030.6	7030.7
Received & Refrigerated Date	1/10/92	1/10/92	1/10/92	1/10/92	1/10/92	1/10/92	1/10/92
Organics Extraction Date							
BN/ABN	1/15/92	1/15/92	1/15/92	1/15/92	1/15/92	1/15/92	1/15/92
PCB's	NA	NA	NA	NA	NA	NA	NA
Analysis Date							
BN/ABN	1/17/92	1/18/92	1/17/92	1/18/92	1/18/92	1/17/92	1/17/92
PCB's	NA	NA	NA	NA	NA	NA	NA
Volatiles	NA	NA	NA	NA	NA	NA	NA
TPHC's	NA	NA	NA	NA	NA	NA	NA
Metals	NA	NA	NA	NA	NA	NA	NA
Total Solids	1/17/92	1/17/92	1/17/92	1/17/92	1/17/92	1/17/92	1/17/92
Organic Supervisor Review & Approval	Brian K. McKee						01/29/92
Inorganic Supervisor Review & Approval							

LABORATORY CHRONICLE

SAMPLE NUMBER	7030.8	7030.9	7030.10				
Received & Refrigerated Date	1/10/92	1/10/92	1/10/92				
Organics Extraction Date							
BN/ABN	1/15/92	1/15/92	1/15/92				
PCB's	NA	NA	NA				
Analysis Date							
BN/ABN	1/18/92	1/17/92	1/17/92				
PCB's	NA	NA	NA				
Volatiles	NA	NA	NA				
TPHC's	NA	NA	NA				
Metals	NA	NA	NA				
Total Solids	1/17/92	1/17/92	1/17/92				
Organic Supervisor Review & Approval	Brian K. McKee B.K. McK						01/29/92
Inorganic Supervisor Review & Approval							

METHOD SUMMARY

Base Neutrals / Acid Extractables

The semivolatile samples in this report have been analyzed using the method cited in the USEPA-CLP-IFB version 2/88. The CLP semivolatile method is based on USEPA Method 625 and SW-846 method 8270.

Three acid and/or three base/neutral surrogates are added to each sample. Aqueous samples are extracted with methylene chloride; soil samples are extracted with a 1 to 1 solution of methylene chloride and acetone. The extracts are then concentrated and the internal standards are added. An Hewlett Packard 5890 GC coupled to the HP 5970 MSD was used for the analysis and data collection.

GC/MS

ORGANIC NON-CONFORMANCE SUMMARY

GC/MS TUNE FREQUENCY:- All samples,blanks,standards and matrix spikes were analyzed within the respective 12 hour tune periods.

INITIAL CALIBRATION REQUIREMENTS:
No CCC or SPCC compound was outside of QC limits.

CONTINUING CALIBRATION REQUIREMENTS:
No CCC or SPCC compound was outside of QC limits

DETECTION LIMITS:- Detection limits and search results were modified by dilution or percent solid.*

* All values reported on a DRY WEIGHT basis where applicable

MATRIX SPIKE RECOVERY:- No matrix spike compound was outside QC limits

INTERNAL STANDARD AREA:-

CLIENT ID #	NUMBER OF INTERNAL STANDARD AREA(S)
7030	10 OUT OF 108 OUTSIDE LIMITS

SURROGATE RECOVERY:-

Client ID #	Surrogates outside QC limits
7030	4 OUT OF 90 OUTSIDE LIMITS

ANALYSIS TIME:- All samples were extracted and analyzed within the prescribed holding times.

***NOTE: 7008.2 was measured as water cie took 1ml but calculated as soil as per T-VWIX-009 1ml-1oz

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DATA REPORTING QUALIFIERS

For reporting results to EPA, the following "results qualifiers" are used:

VALUE - If the result is a value greater than or equal to the detection limit, report the value.

U - Indicates the compound was analyzed for but was not detected. Report the minimum detection limit for the sample with the U, "10U". This is not necessarily the instrument detection limit. The figure represents the minimum detection limit attainable for this particular sample based on any concentration or dilution that may have been required.

J - Indicates an estimated value. This flag is used:

1) When estimating a concentration for tentatively identifid compounds (library search hits) where a 1:1 response is assumed.
2) When the mass spectral data indicated the identification criteria, however, the result was less than the specified detection limit but greater than zero. If the detection limit was 10ug/L and a concentration of 3ug/L was calculated, report as "3J".

B - Indicates the analyte was found in the blank as well as the sample; report as "12B".

E - Indicates the analyte concentration exceeds the calibrated range of the GC/MS instrument for that specific analysis.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

Environmental Profile Laboratories
BASE/NEUTRAL/ACID ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NAME	7030.6 3 g 1-15-92	DILUTION FACTOR	10.00
CLIENT ID		QA BATCH	
DATA FILE	>A2414	DATE ANALYZED	01/17/92

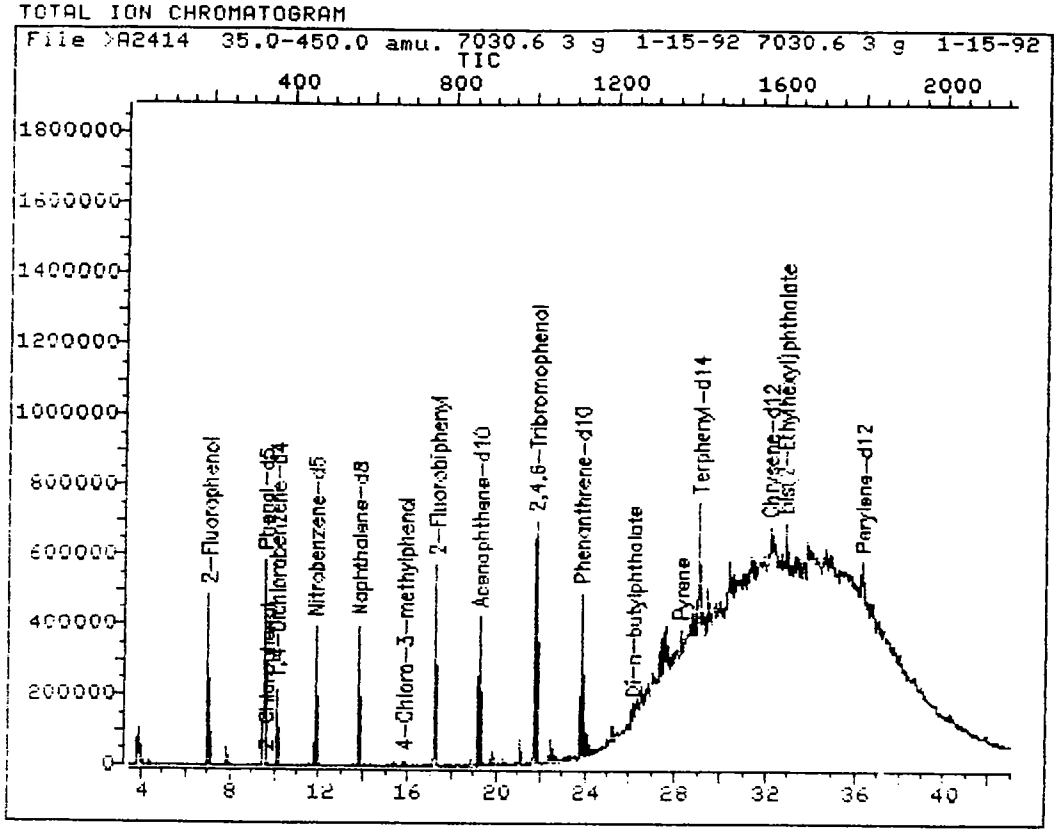
COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
N-nitroso-dimethylamine	ND	4000	Acenaphthene	ND	4000
Phenol	ND	4000	2,4-Dinitrophenol	ND	20000
Aniline	ND	4000	4-Nitrophenol	ND	4000
bis(2-Chloroethyl)Ether	ND	4000	Dibenzofuran	ND	4000
2-Chlorophenol	640 J	4000	2,4-Dinitrotoluene	ND	4000
1,3-Dichlorobenzene	ND	4000	2,6-Dinitrotoluene	ND	4000
1,4-Dichlorobenzene	ND	4000	Diethylphthalate	ND	4000
Benzyl alcohol	ND	4000	4-Chlorophenyl-phenylether	ND	4000
1,2-Dichlorobenzene	ND	4000	Fluorene	ND	4000
2-Methylphenol	ND	4000	4-Nitroaniline	ND	4000
bis(2-chloroisopropyl)ether	ND	4000	4,6-Dinitro-2-methylphenol	ND	4000
4-Methylphenol	ND	4000	N-Nitrosodiphenylamine	ND	4000
N-Nitroso-Di-n-propylamine	ND	4000	1,2-Diphenylhydrazine	ND	4000
Hexachloroethane	ND	4000	4-Bromophenyl-phenylether	ND	4000
Nitrobenzene	ND	4000	Hexachlorobenzene	ND	4000
Isophorone	ND	4000	Pentachlorophenol	ND	4000
2-Nitrophenol	ND	4000	Phenanthrene	ND	4000
2,4-Dimethylphenol	ND	4000	Anthracene	ND	4000
Benzoic Acid	ND	4000	Di-n-butylphthalate	950 JB	4000
bis(2-Chloroethoxy)methane	ND	4000	Fluoranthene	ND	4000
2,4-Dichlorophenol	ND	4000	Benzidine	ND	4000
1,2,4-Trichlorobenzene	ND	4000	Pyrene	620 J	4000
Naphthalene	ND	4000	Butylbenzylphthalate	ND	4000
4-Chloroaniline	ND	4000	3,3`-Dichlorobenzidine	ND	4000
Hexachlorobutadiene	ND	4000	Benzo(a)anthracene	ND	4000
4-Chloro-3-methylphenol	590 J	4000	bis(2-Ethylhexyl)phthalate	2600 JB	4000
2-Methylnaphthalene	ND	4000	Chrysene	ND	4000
Hexachlorocyclopentadiene	ND	4000	Di-n-octylphthalate	ND	4000
2,4,6-Trichlorophenol	ND	4000	Benzo(b)fluoranthene	ND	4000
2,4,5-Trichlorophenol	ND	4000	Benzo(k)fluoranthene	ND	4000
2-Chloronaphthalene	ND	4000	Benzo(a)pyrene	ND	4000
2-Nitroaniline	ND	4000	Indeno(1,2,3-cd)pyrene	ND	4000
Dimethylphthalate	ND	4000	Dibenz(a,h)anthracene	ND	4000
Acenaphthylene	ND	4000	Benzo(g,h,i)perylene	ND	4000
3-Nitroaniline	ND	4000			0

Percent Solid of 83.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

1850 ppb

TOTAL ION CHROMATOGRAM



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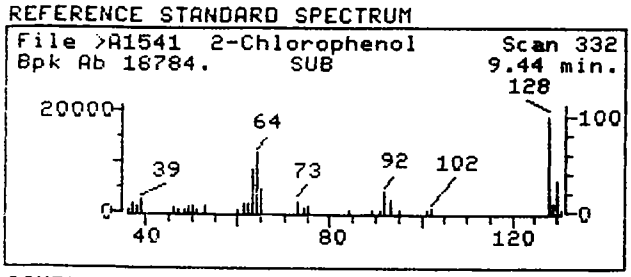
Name: 7030.6 3 g 1-15-92
Misc: 7030.6 3 g 1-15-92 BTL# 9

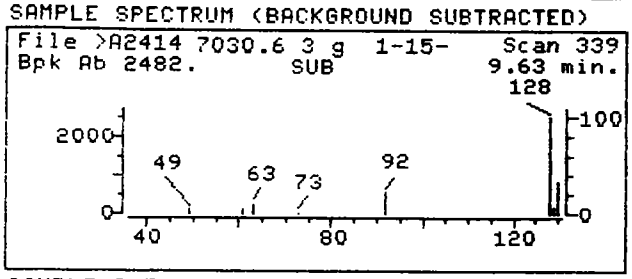
Id File: IDBNA::D4
Title: Semivolatile Organics (EPA Methods 625/8270) by GC/MS
Last Calibration: 920114 16:59

Operator ID: MARK
Quant Time: 920117 20:06
Injected at: 920117 19:22

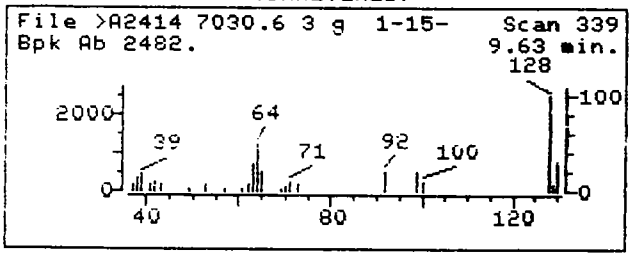
REFERENCE STANDARD SPECTRUM

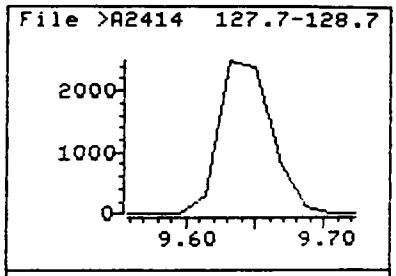


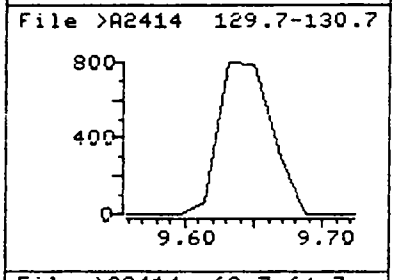
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

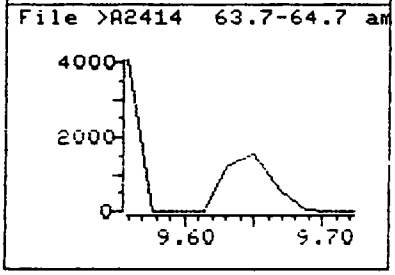


SAMPLE SPECTRUM (UNALTERED)









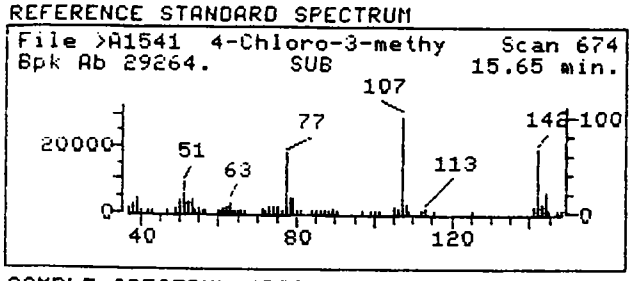
Data File: >A2414::D3
Name: 7030.6 3 g 1-15-92
Misc: 7030.6 3 g 1-15-92
Quant Time: 920117 20:06
Injected at: 920117 19:22

Quant Output File: ^A2414::DB

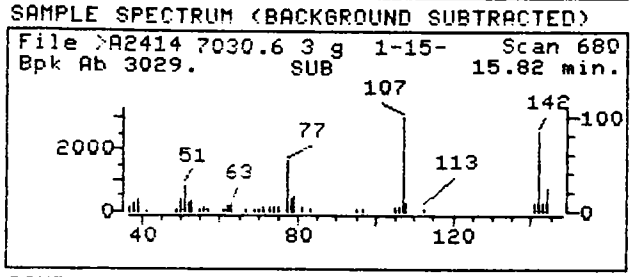
BTL# 9
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:59

Compound No: 9
Compound Name: 2-Chlorophenol
Scan Number: 339
Retention Time: 9.63 min.
Quant Ion: 128.0
Area: 6605
Concentration: 1.59 ng/uL
q-value: 85

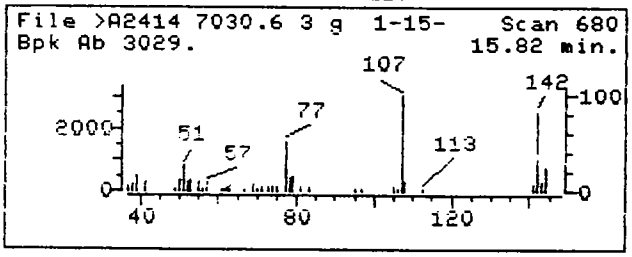
REFERENCE STANDARD SPECTRUM

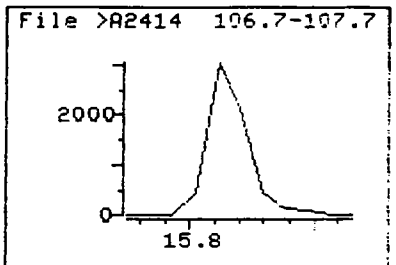


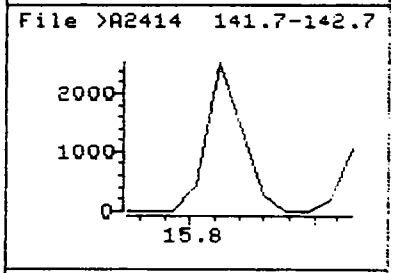
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

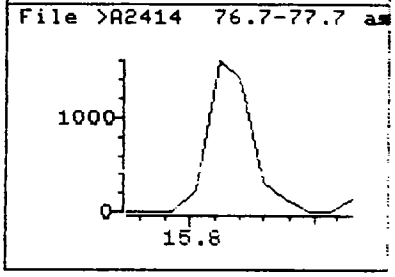


SAMPLE SPECTRUM (UNALTERED)





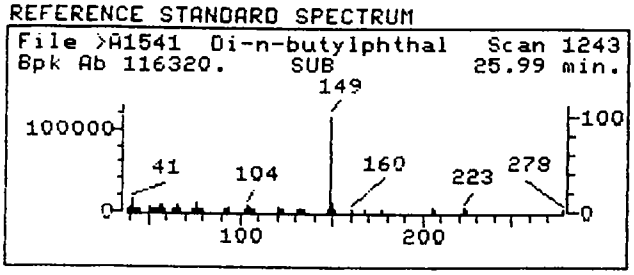


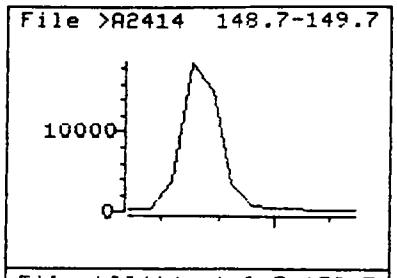


Data File: >A2414::D3 Quant Output File: ^A2414::DB
Name: 7030.6 3 g 1-15-92
Misc: 7030.6 3 g 1-15-92 BTL# 9
Quant Time: 920117 20:06 Quant ID File: IDBNA::D4
Injected at: 920117 19:22 Last Calibration: 920114 16:59

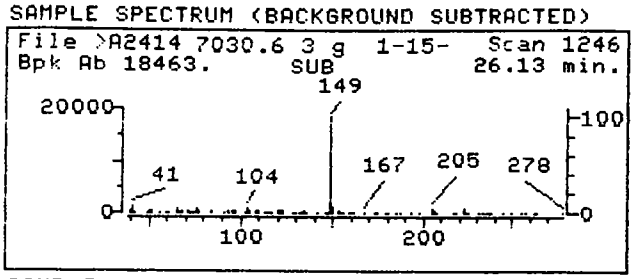
Compound No: 32
Compound Name: 4-Chloro-3-methylphenol
Scan Number: 680
Retention Time: 15.82 min.
Quant Ion: 107.0
Area: 6753
Concentration: 1.48 ng/uL
q-value: 89

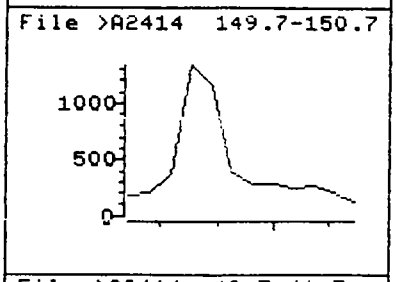
REFERENCE STANDARD SPECTRUM



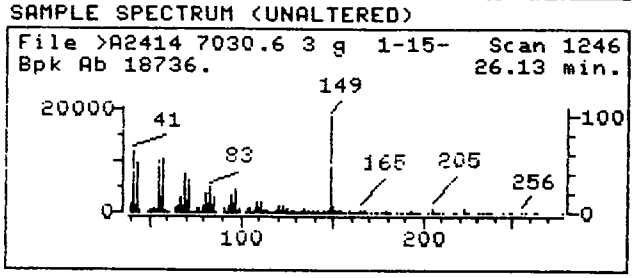


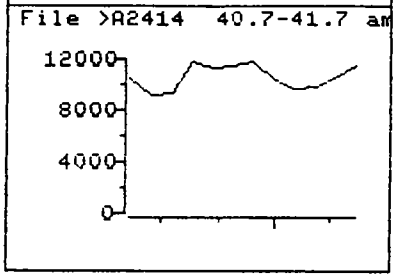
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)





SAMPLE SPECTRUM (UNALTERED)





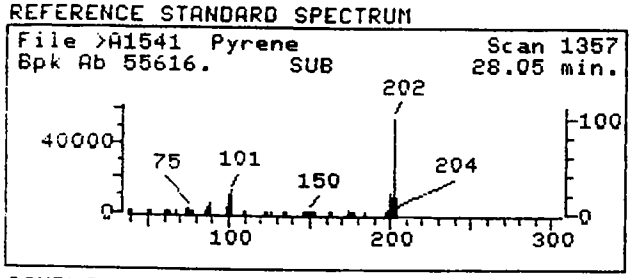
Data File: >A2414::D3
Name: 7030.6 3 g 1-15-92
Misc: 7030.6 3 g 1-15-92
Quant Time: 920117 20:06
Injected at: 920117 19:22

Quant Output File: ^A2414::DB

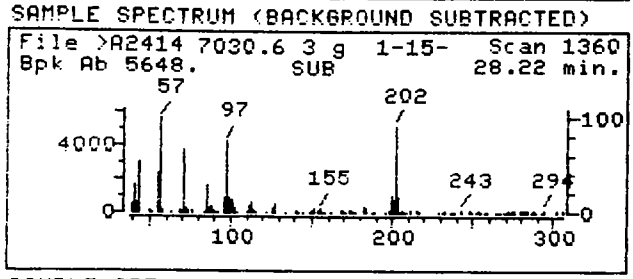
BTL# 9
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:59

Compound No: 64
Compound Name: Di-n-butylphthalate
Scan Number: 1246
Retention Time: 26.13 min.
Quant Ion: 149.0
Area: 45951
Concentration: 2.37 ng/uL
q-value: 91

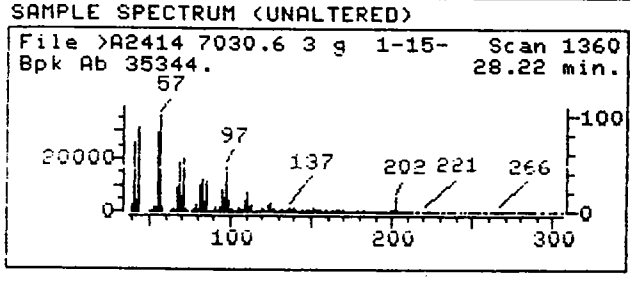
REFERENCE STANDARD SPECTRUM

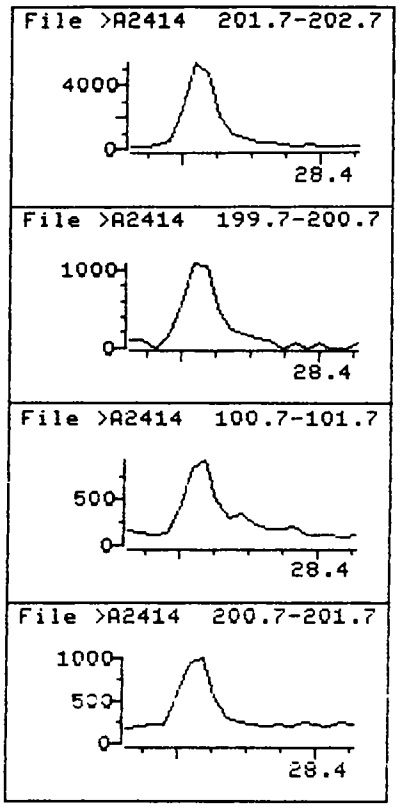


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)





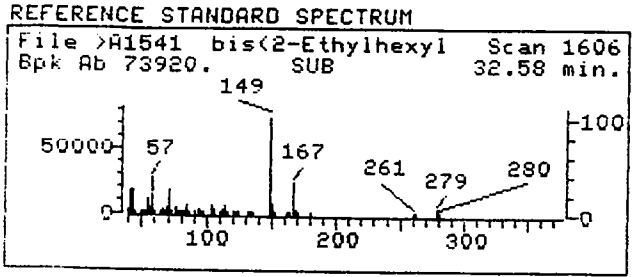
Data File: >A2414::D3
Name: 7030.6 3 g 1-15-92
Misc: 7030.6 3 g 1-15-92
Quant Time: 920117 20:06
Injected at: 920117 19:22

Quant Output File: ^A2414::DB

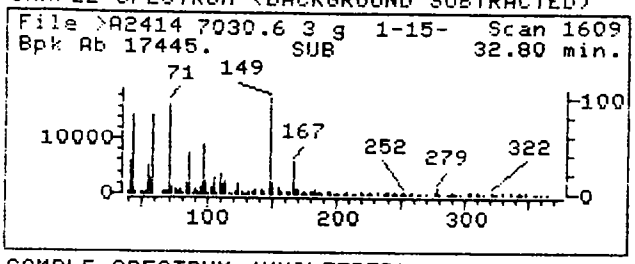
BTL# 9
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:59

Compound No: 68
Compound Name: Pyrene
Scan Number: 1360
Retention Time: 28.22 min.
Quant Ion: 202.0
Area: 18289
Concentration: 1.54 ng/uL
q-value: 97

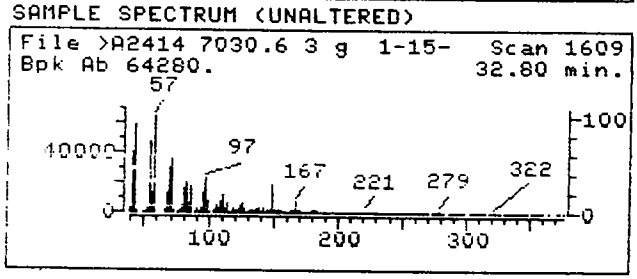
REFERENCE STANDARD SPECTRUM

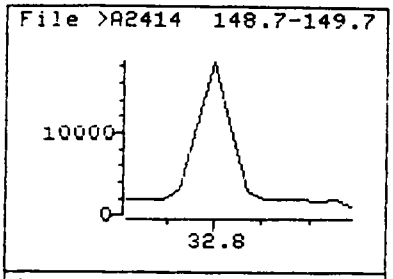


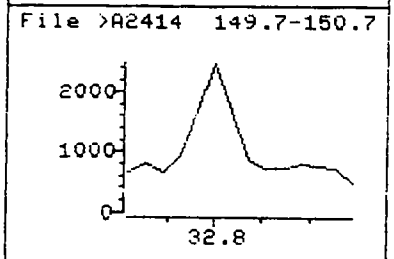
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

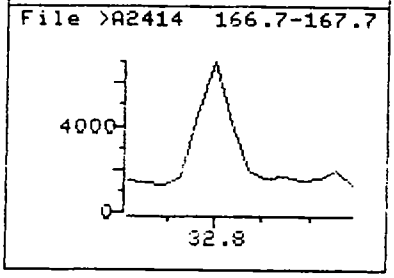


SAMPLE SPECTRUM (UNALTERED)









Data File: >A2414::D3
Name: 7030.6 3 g 1-15-92
Misc: 7030.6 3 g 1-15-92
Quant Time: 920117 20:06
Injected at: 920117 19:22

Quant Output File: ^A2414::DB

BTL# 9
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:59

Compound No: 73
Compound Name: bis(2-Ethylhexyl)phthalate
Scan Number: 1609
Retention Time: 32.80 min.
Quant Ion: 149.0
Area: 51305
Concentration: 6.42 ng/uL
q-value: 91

Environmental Profile Laboratories
BASE/NEUTRAL/ACID ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NAME	7030.7 3 g 1-15-92	DILUTION FACTOR	10.00
CLIENT ID		QA BATCH	
DATA FILE	>A2416	DATE ANALYZED	01/17/92

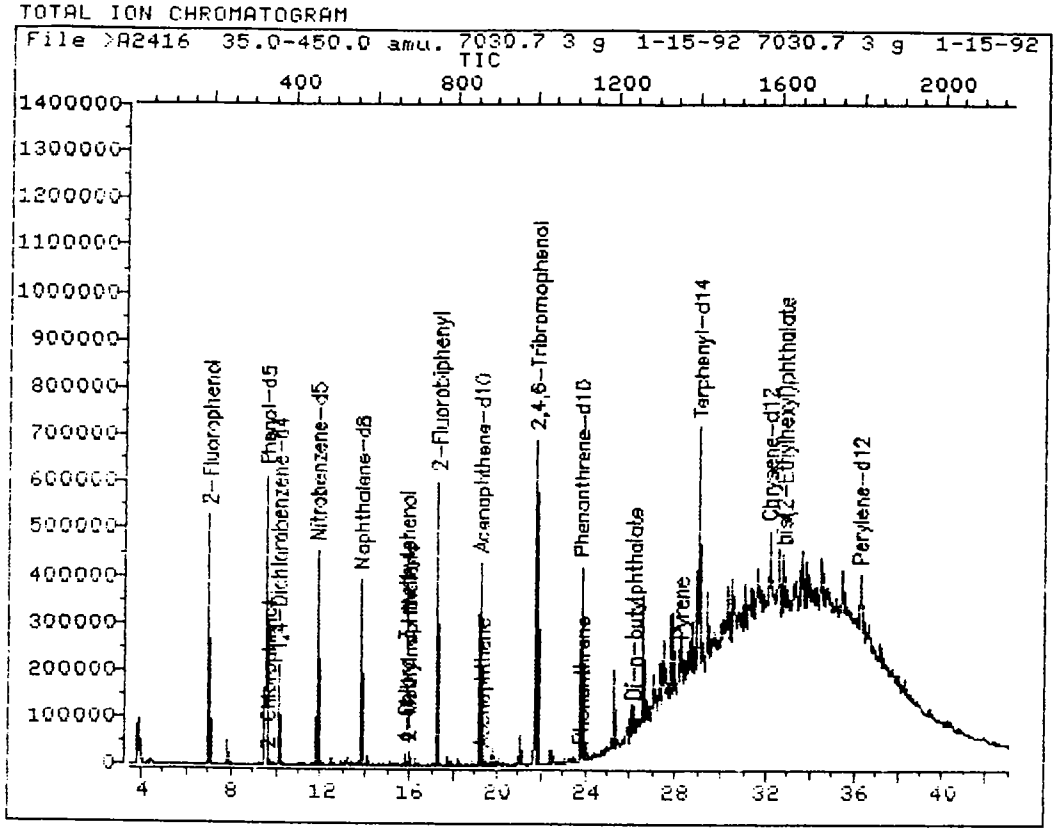
COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
N-nitroso-dimethylamine	ND	3900	Acenaphthene	380 J	3900
Phenol	ND	3900	2,4-Dinitrophenol	ND	20000
Aniline	ND	3900	4-Nitrophenol	ND	3900
bis(2-Chloroethyl)Ether	ND	3900	Dibenzofuran	ND	3900
2-Chlorophenol	570 J	3900	2,4-Dinitrotoluene	ND	3900
1,3-Dichlorobenzene	ND	3900	2,6-Dinitrotoluene	ND	3900
1,4-Dichlorobenzene	ND	3900	Diethylphthalate	ND	3900
Benzyl alcohol	ND	3900	4-Chlorophenyl-phenylether	ND	3900
1,2-Dichlorobenzene	ND	3900	Fluorene	ND	3900
2-Methylphenol	ND	3900	4-Nitroaniline	ND	3900
bis(2-chloroisopropyl)ether	ND	3900	4,6-Dinitro-2-methylphenol	ND	3900
4-Methylphenol	ND	3900	N-Nitrosodiphenylamine	ND	3900
N-Nitroso-Di-n-propylamine	ND	3900	1,2-Diphenylhydrazine	ND	3900
Hexachloroethane	ND	3900	4-Bromophenyl-phenylether	ND	3900
Nitrobenzene	ND	3900	Hexachlorobenzene	ND	3900
Isophorone	ND	3900	Pentachlorophenol	ND	3900
2-Nitrophenol	ND	3900	Phenanthrene	210 J	3900
2,4-Dimethylphenol	ND	3900	Anthracene	ND	3900
Benzoic Acid	ND	3900	Di-n-butylphthalate	1200 JB	3900
bis(2-Chloroethoxy)methane	ND	3900	Fluoranthene	ND	3900
2,4-Dichlorophenol	ND	3900	Benzidine	ND	3900
1,2,4-Trichlorobenzene	ND	3900	Pyrene	790 J	3900
Naphthalene	ND	3900	Butylbenzylphthalate	ND	3900
4-Chloroaniline	ND	3900	3,3`-Dichlorobenzidine	ND	3900
Hexachlorobutadiene	ND	3900	Benzo(a)anthracene	ND	3900
4-Chloro-3-methylphenol	840 J	3900	bis(2-Ethylhexyl)phthalate	2300 JB	3900
2-Methylnaphthalene	810 J	3900	Chrysene	ND	3900
Hexachlorocyclopentadiene	ND	3900	Di-n-octylphthalate	ND	3900
2,4,6-Trichlorophenol	ND	3900	Benzo(b)fluoranthene	ND	3900
2,4,5-Trichlorophenol	ND	3900	Benzo(k)fluoranthene	ND	3900
2-Chloronaphthalene	ND	3900	Benzo(a)pyrene	ND	3900
2-Nitroaniline	ND	3900	Indeno(1,2,3-cd)pyrene	ND	3900
Dimethylphthalate	ND	3900	Dibenz(a,h)anthracene	ND	3900
Acenaphthylene	ND	3900	Benzo(g,h,i)perylene	ND	3900
3-Nitroaniline	ND	3900			0

Percent Solid of 84.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

3600 ppb

TOTAL ION CHROMATOGRAM

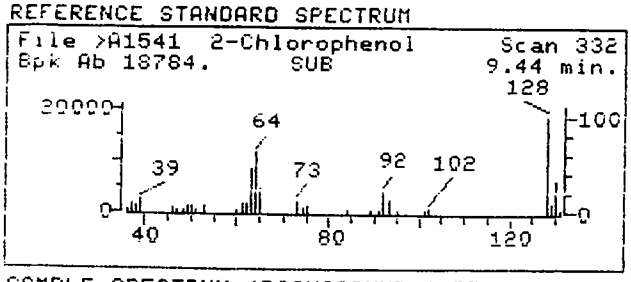


Data File: >A2416::D3 Quant Output File: ^A2416::DB
Name: 7030.7 3 g 1-15-92
Misc: 7030.7 3 g 1-15-92 BTL#11

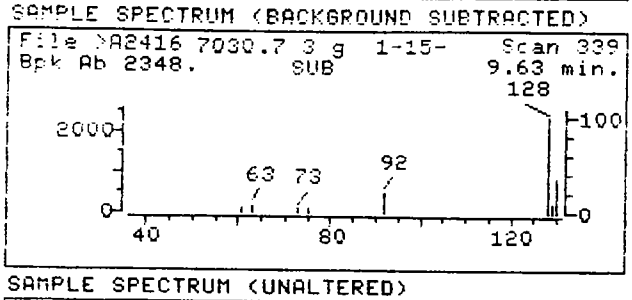
Id File: IDBNA::D4
Title: Semivolatile Organics (EPA Methods 625/8270) by GC/MS
Last Calibration: 920114 16:59

Operator ID: MARK
Quant Time: 920117 21:51
Injected at: 920117 21:07

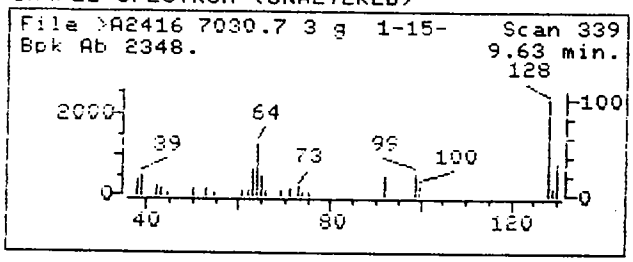
REFERENCE STANDARD SPECTRUM

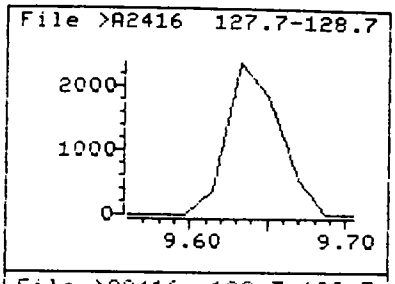


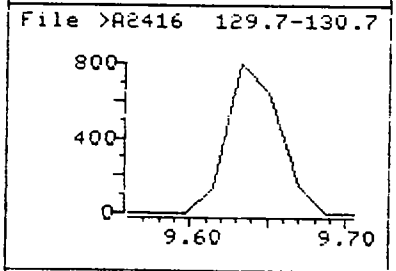
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

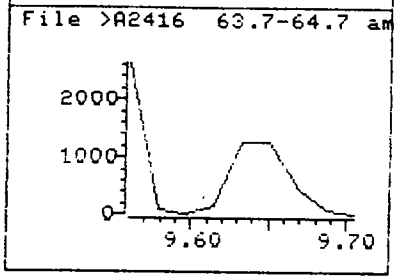


SAMPLE SPECTRUM (UNALTERED)









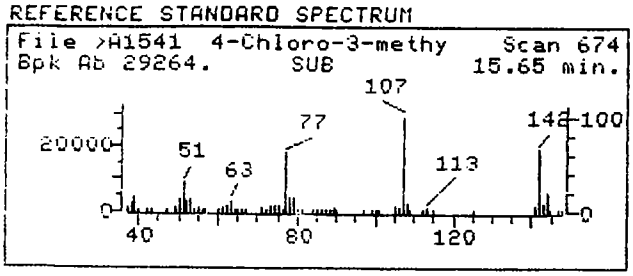
Data File: >A2416::D3
Name: 7030.7 3 g 1-15-92
Misc: 7030.7 3 g 1-15-92
Quant Time: 920117 21:51
Injected at: 920117 21:07

Quant Output File: ^A2416 :DB

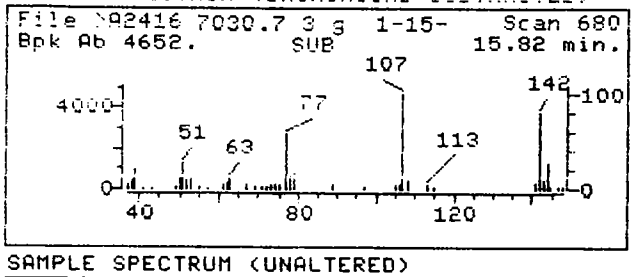
BTL#11
Quant ID File: IDBNA: D4
Last Calibration: 920114 16:59

Compound No: 9
Compound Name: 2-Chlorophenol
Scan Number: 339
Retention Time: 9.63 min.
Quant Ion: 128.0
Area: 5532
Concentration: 1.44 ng/uL
q-value: 88

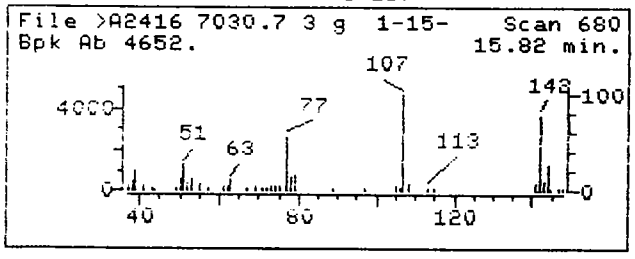
REFERENCE STANDARD SPECTRUM

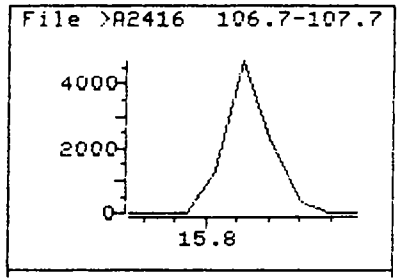


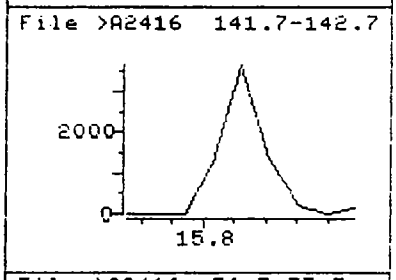
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

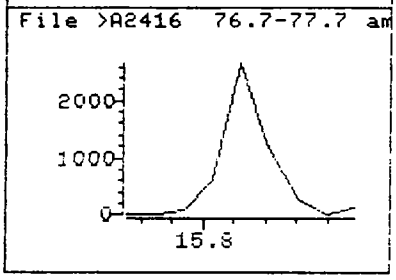


SAMPLE SPECTRUM (UNALTERED)









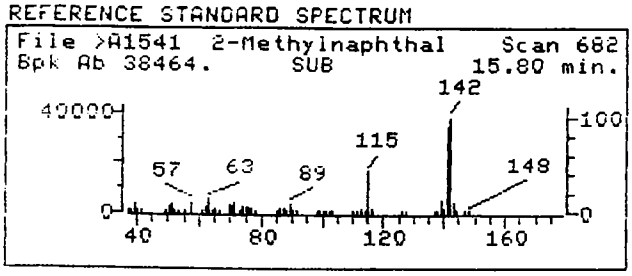
Data File: >A2416::D3
Name: 7030.7 3 g 1-15-92
Misc: 7030.7 3 g 1-15-92
Quant Time: 920117 21:51
Injected at: 920117 21:07

Quant Output File: ^A2416::DB

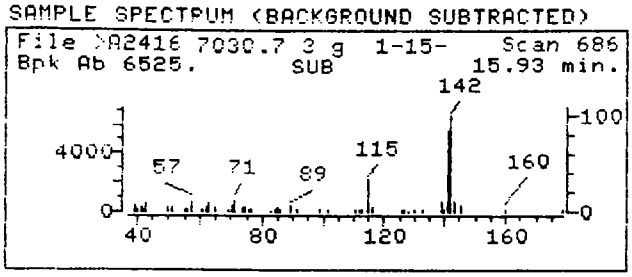
BTL#11
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:59

Compound No: 32
Compound Name: 4-Chloro-3-methylphenol
Scan Number: 680
Retention Time: 15.82 min.
Quant Ion: 107.0
Area: 9128
Concentration: 2.11 ng/uL
q-value: 95

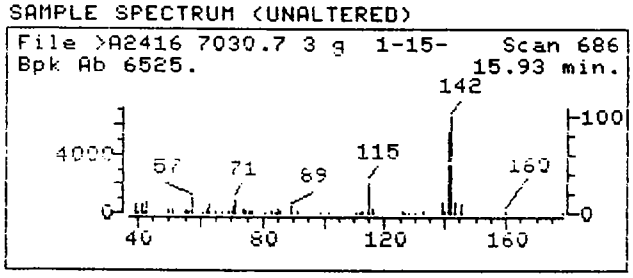
REFERENCE STANDARD SPECTRUM

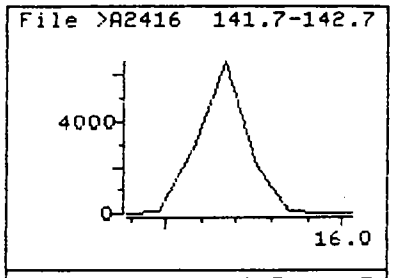


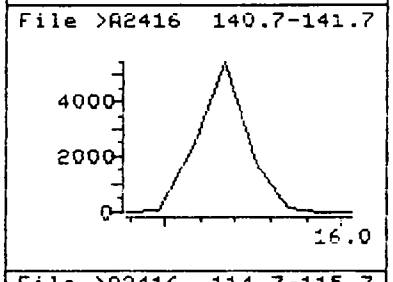
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

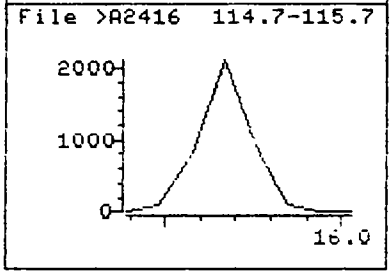


SAMPLE SPECTRUM (UNALTERED)









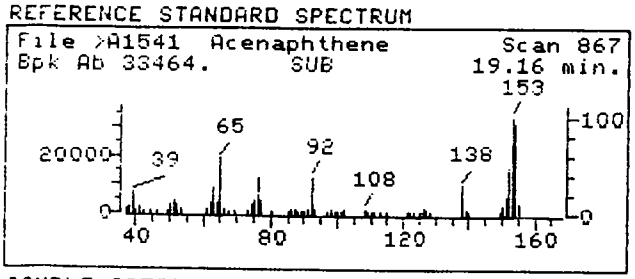
Data File: >A2416::D3
Name: 7030.7 3 g 1-15-92
Misc: 7030.7 3 g 1-15-92
Quant Time: 920117 21:51
Injected at: 920117 21:07

Quant Output File: ^A2416::DB

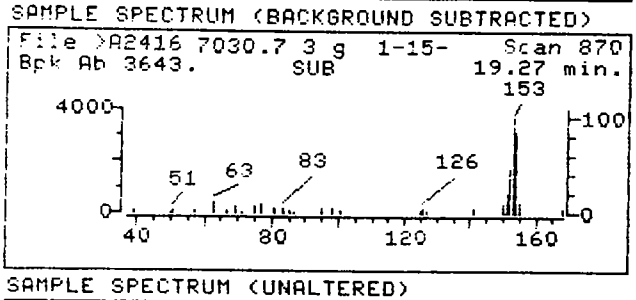
BTL#11
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:55

Compound No: 33
Compound Name: 2-Methylnaphthalene
Scan Number: 686
Retention Time: 15.93 min.
Quant Ion: 142.0
Area: 12646
Concentration: 2.04 ng/uL
q-value: 87

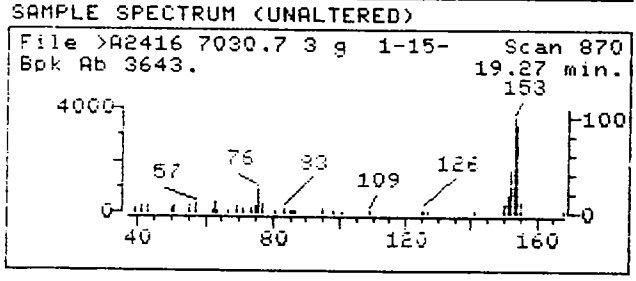
REFERENCE STANDARD SPECTRUM

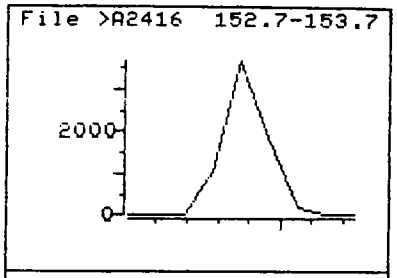


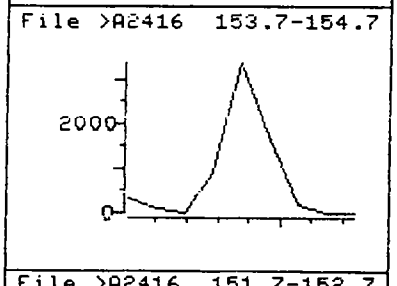
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

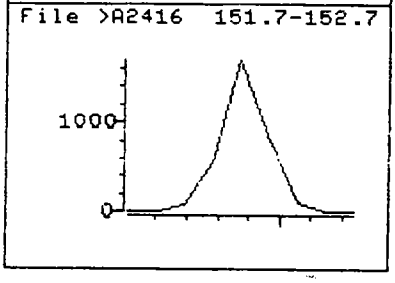


SAMPLE SPECTRUM (UNALTERED)









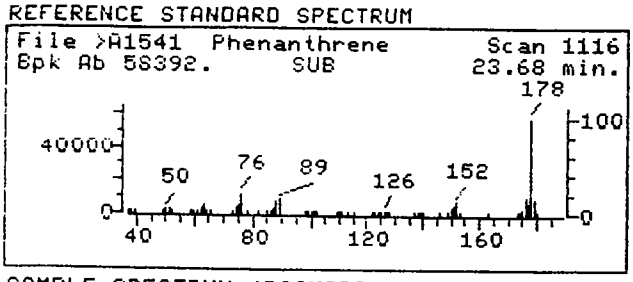
Data File: >A2416::D3
Name: 7030.7 3 g 1-15-92
Misc: 7030.7 3 g 1-15-92
Quant Time: 920117 21:51
Injected at: 920117 21:07

Quant Output File: ^A2416::DB

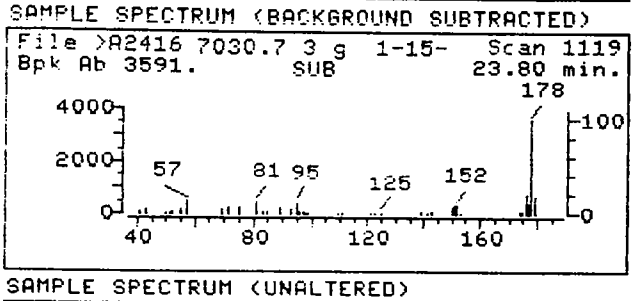
BTL#11
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:59

Compound No: 44
Compound Name: Acenaphthene
Scan Number: 870
Retention Time: 19.27 min.
Quant Ion: 153.0
Area: 7339
Concentration: .96 ng/uL
q-value: 94

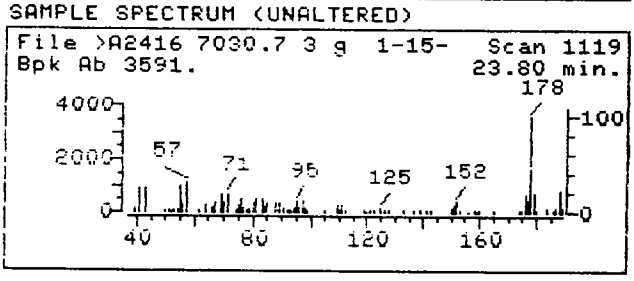
REFERENCE STANDARD SPECTRUM

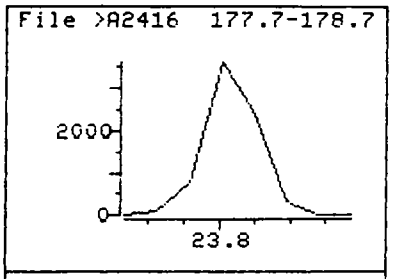


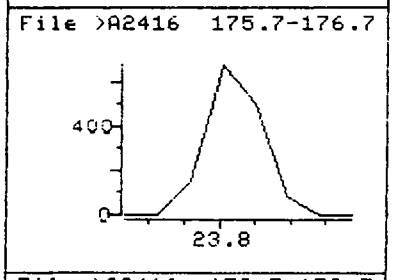
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

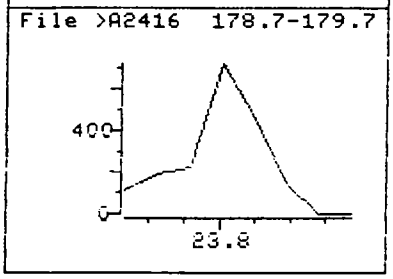


SAMPLE SPECTRUM (UNALTERED)









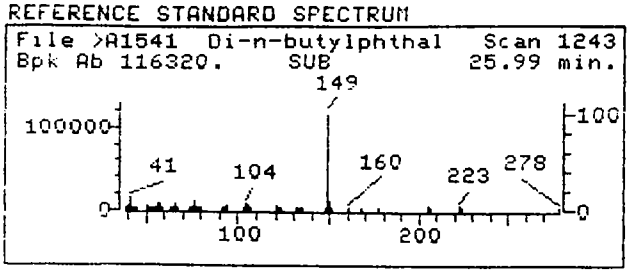
Data File: >A2416::D3
Name: 7030.7 3 g 1-15-92
Misc: 7030.7 3 g 1-15-92
Quant Time: 920117 21:51
Injected at: 920117 21:07

Quant Output File: ^A2416::DB

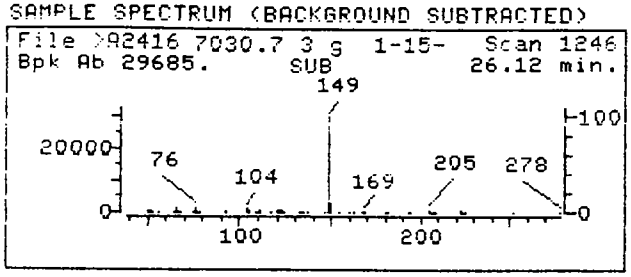
BTL#11
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:59

Compound No: 62
Compound Name: Phenanthrene
Scan Number: 1119
Retention Time: 23.80 min.
Quant Ion: 178.0
Area: 7809
Concentration: .53 ng/uL
q-value: 96

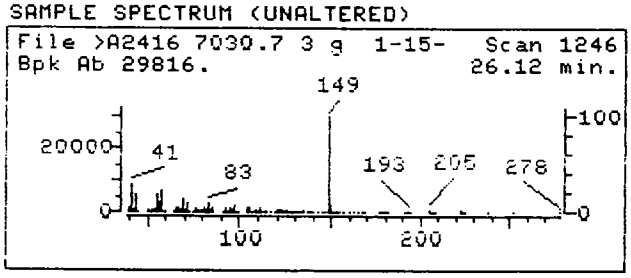
REFERENCE STANDARD SPECTRUM

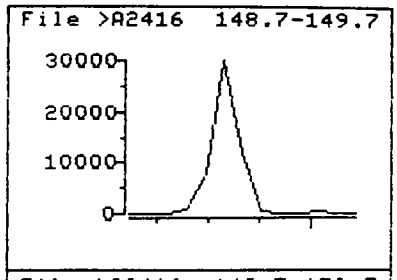


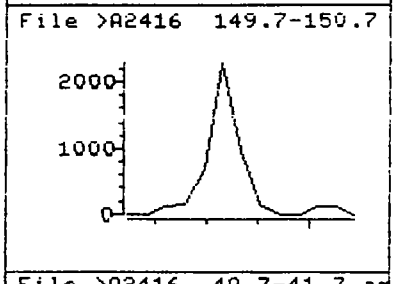
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

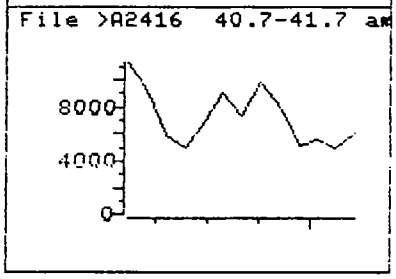


SAMPLE SPECTRUM (UNALTERED)









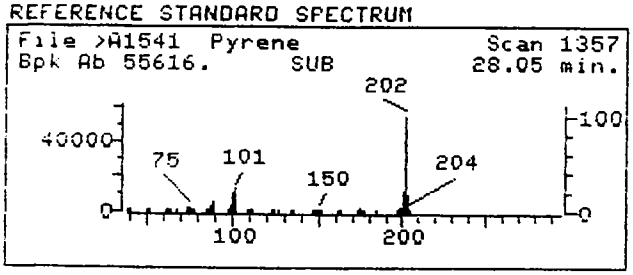
Data File: >A2416::D3
Name: 7030.7 3 g 1-15-92
Misc: 7030.7 3 g 1-15-92
Quant Time: 920117 21:51
Injected at: 920117 21:07

Quant Output File: ^A2416::DB

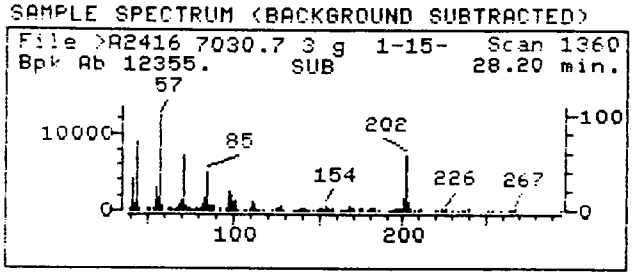
BTL#11
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:59

Compound No: 64
Compound Name: Di-n-butylphthalate
Scan Number: 1246
Retention Time: 26.12 min.
Quant Ion: 149.0
Area: 55823
Concentration: 3.04 ng/uL
q-value: 96

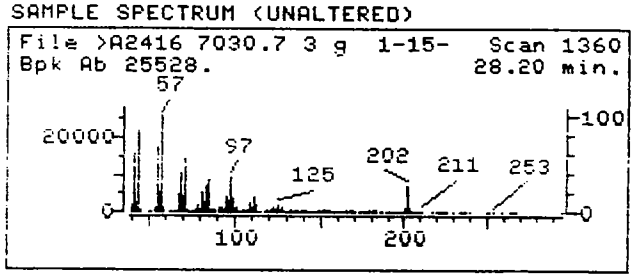
REFERENCE STANDARD SPECTRUM

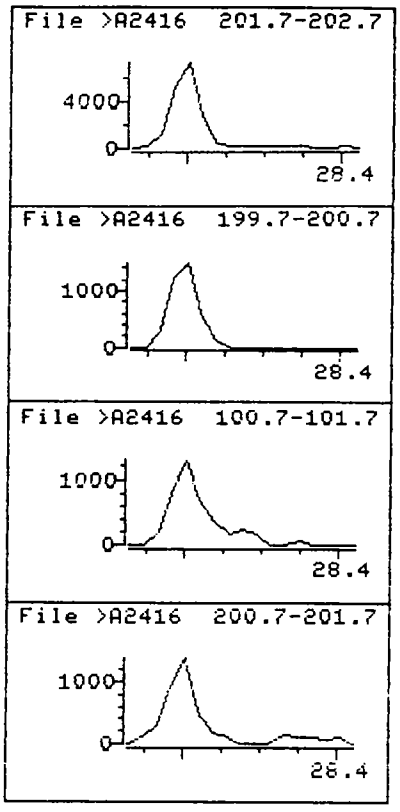


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)





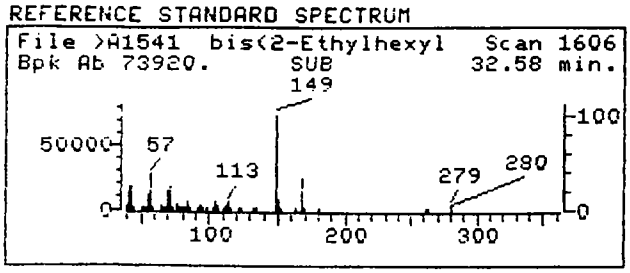
Data File: >A2416::D3
Name: 7030.7 3 g 1-15-92
Misc: 7030.7 3 g 1-15-92
Quant Time: 920117 21:51
Injected at: 920117 21:07

Quant Output File: ^A2416::DB

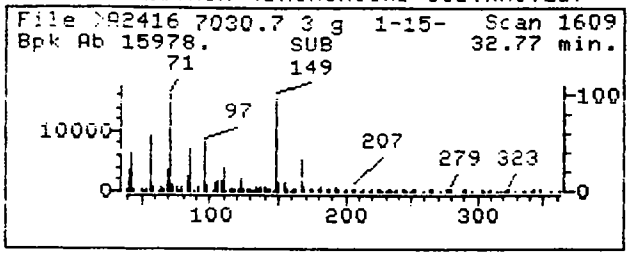
BTL#11
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:59

Compound No: 68
Compound Name: Pyrene
Scan Number: 1360
Retention Time: 28.20 min.
Quant Ion: 202.0
Area: 20682
Concentration: 2.00 ng/uL
q-value: 94

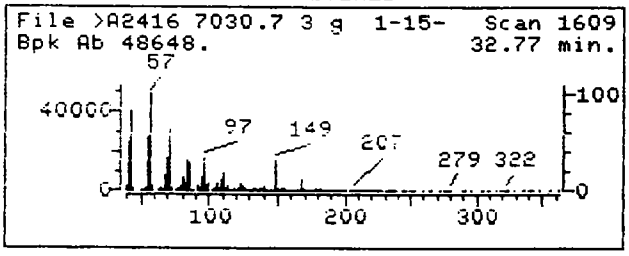
REFERENCE STANDARD SPECTRUM

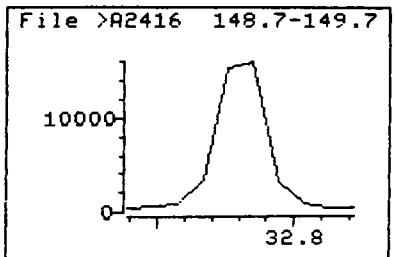


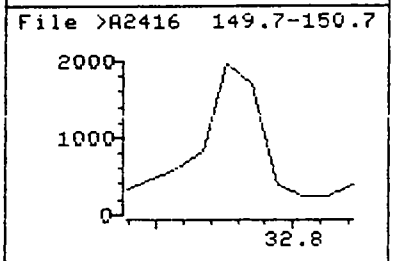
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

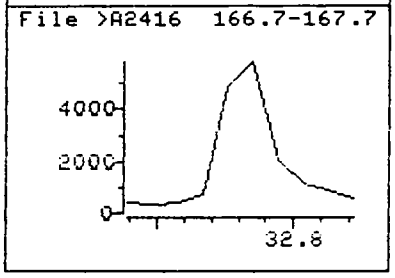


SAMPLE SPECTRUM (UNALTERED)









Data File: >A2416::D3 Quant Output File: ^A2416::DB
Name: 7030.7 3 g 1-15-92
Misc: 7030.7 3 g 1-15-92 BTL#11
Quant Time: 920117 21:51 Quant ID File: IDBNA::D4
Injected at: 920117 21:07 Last Calibration: 920114 16:59

Compound No: 73
Compound Name: bis(2-Ethylhexyl)phthalate
Scan Number: 1609
Retention Time: 32.77 min.
Quant Ion: 149.0
Area: 40487
Concentration: 5.84 ng/uL
q-value: 88

Environmental Profile Laboratories
BASE/NEUTRAL/ACID ANALYSIS DATA

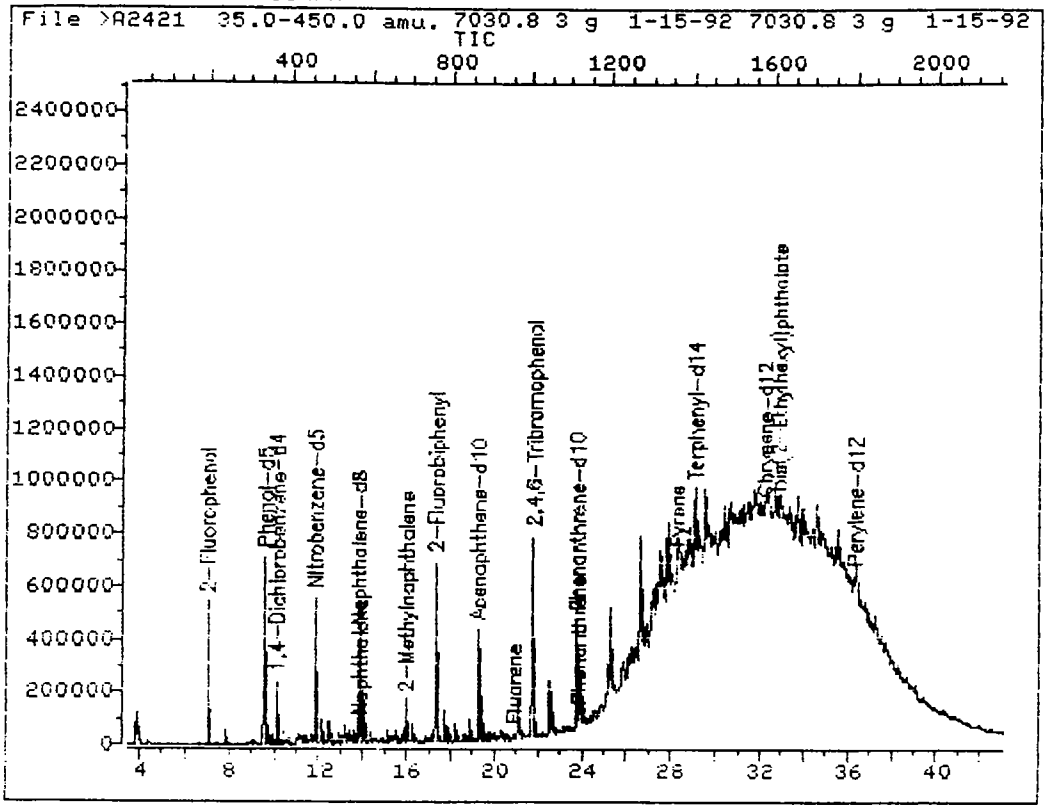
JOB NUMBER		MATRIX	Soil
SAMPLE NAME	7030.8 3 g 1-15-92	DILUTION FACTOR	10.00
CLIENT ID		QA BATCH	
DATA FILE	>A2421	DATE ANALYZED	01/18/92

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
N-nitroso-dimethylamine	ND	4200	Acenaphthene	ND	4200
Phenol	ND	4200	2,4-Dinitrophenol	ND	21000
Aniline	ND	4200	4-Nitrophenol	ND	4200
bis(2-Chloroethyl)Ether	ND	4200	Dibenzofuran	ND	4200
2-Chlorophenol	ND	4200	2,4-Dinitrotoluene	ND	4200
1,3-Dichlorobenzene	ND	4200	2,6-Dinitrotoluene	ND	4200
1,4-Dichlorobenzene	ND	4200	Diethylphthalate	ND	4200
Benzyl alcohol	ND	4200	4-Chlorophenyl-phenylether	ND	4200
1,2-Dichlorobenzene	ND	4200	Fluorene	380 J	4200
2-Methylphenol	ND	4200	4-Nitroaniline	ND	4200
bis(2-chloroisopropyl)ether	ND	4200	4,6-Dinitro-2-methylphenol	ND	4200
4-Methylphenol	ND	4200	N-Nitrosodiphenylamine	ND	4200
N-Nitroso-Di-n-propylamine	ND	4200	1,2-Diphenylhydrazine	ND	4200
Hexachloroethane	ND	4200	4-Bromophenyl-phenylether	ND	4200
Nitrobenzene	ND	4200	Hexachlorobenzene	ND	4200
Isophorone	ND	4200	Pentachlorophenol	ND	4200
2-Nitrophenol	ND	4200	Phenanthrene	840 J	4200
2,4-Dimethylphenol	ND	4200	Anthracene	ND	4200
Benzoic Acid	ND	4200	Di-n-butylphthalate	ND	4200
bis(2-Chloroethoxy)methane	ND	4200	Fluoranthene	ND	4200
2,4-Dichlorophenol	ND	4200	Benzidine	ND	4200
1,2,4-Trichlorobenzene	ND	4200	Pyrene	1300 J	4200
Naphthalene	1700 J	4200	Butylbenzylphthalate	ND	4200
4-Chloroaniline	ND	4200	3,3`-Dichlorobenzidine	ND	4200
Hexachlorobutadiene	ND	4200	Benzo(a)anthracene	ND	4200
4-Chloro-3-methylphenol	ND	4200	bis(2-Ethylhexyl)phthalate	2900 JB	4200
2-Methylnaphthalene	4500	4200	Chrysene	ND	4200
Hexachlorocyclopentadiene	ND	4200	Di-n-octylphthalate	ND	4200
2,4,6-Trichlorophenol	ND	4200	Benzo(b)fluoranthene	ND	4200
2,4,5-Trichlorophenol	ND	4200	Benzo(k)fluoranthene	ND	4200
2-Chloronaphthalene	ND	4200	Benzo(a)pyrene	ND	4200
2-Nitroaniline	ND	4200	Indeno(1,2,3-cd)pyrene	ND	4200
Dimethylphthalate	ND	4200	Dibenz(a,h)anthracene	ND	4200
Acenaphthylene	ND	4200	Benzo(g,h,i)perylene	ND	4200
3-Nitroaniline	ND	4200			0

Percent Solid of 79.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

TOTAL ION CHROMATOGRAM

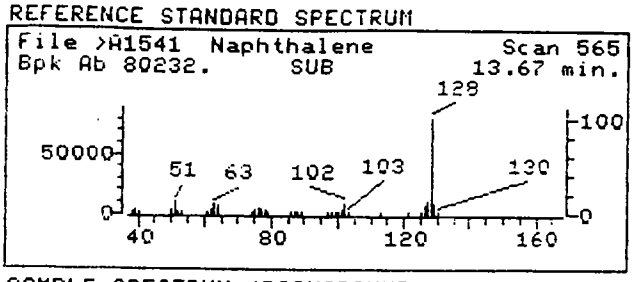


Data File: >A2421::D3 Quant Output File: ^A2421::DB
Name: 7030.8 3 g 1-15-92
Misc: 7030.8 3 g 1-15-92 BTL#16

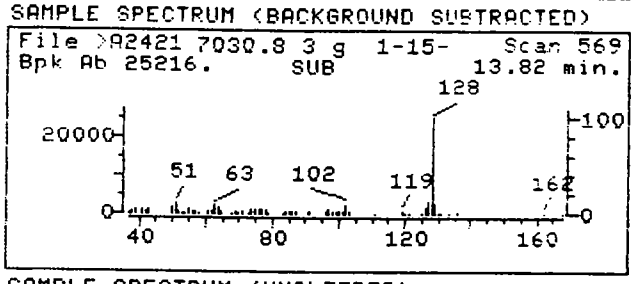
Id File: IDBNA::D4
Title: Semivolatile Organics (EPA Methods 625/8270) by GC/MS
Last Calibration: 920114 16:59

Operator ID: MARK
Quant Time: 920118 01:39
Injected at: 920118 00:55

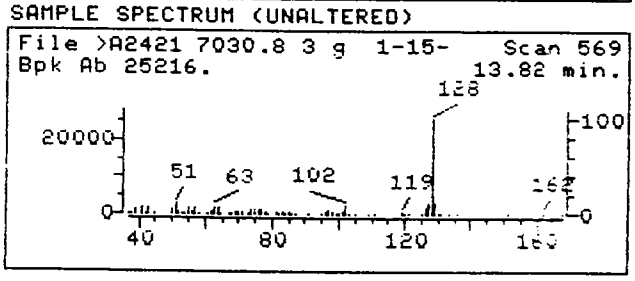
REFERENCE STANDARD SPECTRUM

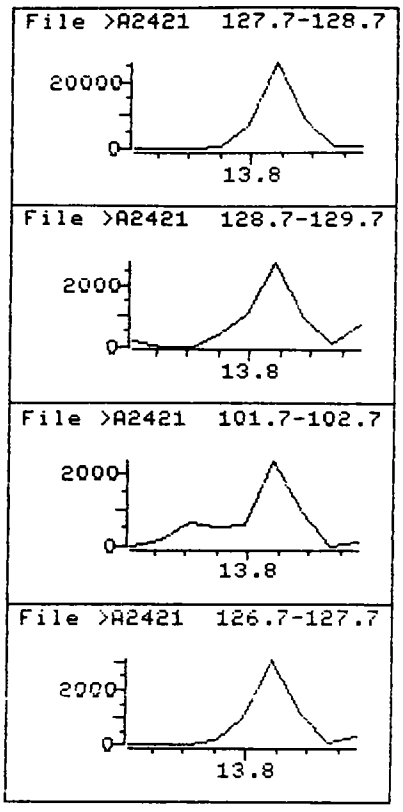


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)





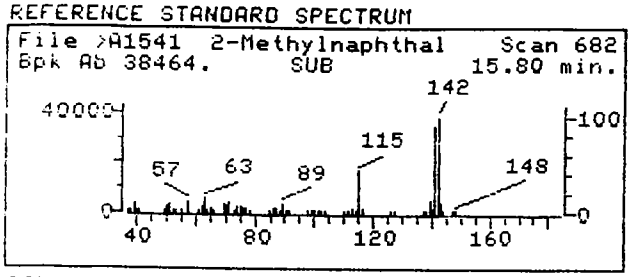
Data File: >A2421::D3
Name: 7030.8 3 g 1-15-92
Misc: 7030.8 3 g 1-15-92
Quant Time: 920118 01:39
Injected at: 920118 00:55

Quant Output File: ^A2421::DB

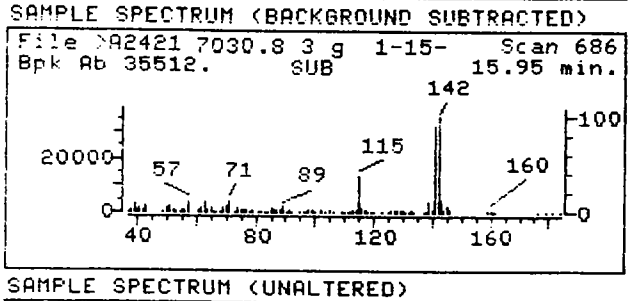
BTL#16
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:59

Compound No: 29
Compound Name: Naphthalene
Scan Number: 569
Retention Time: 13.82 min.
Quant Ion: 128.0
Area: 46466
Concentration: 4.02 ng/uL
q-value: 99

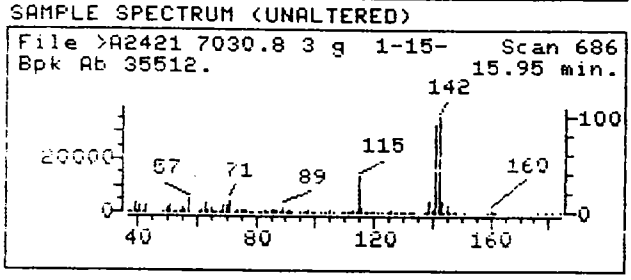
REFERENCE STANDARD SPECTRUM

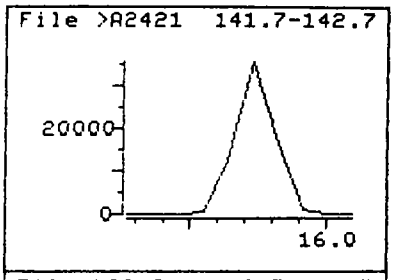


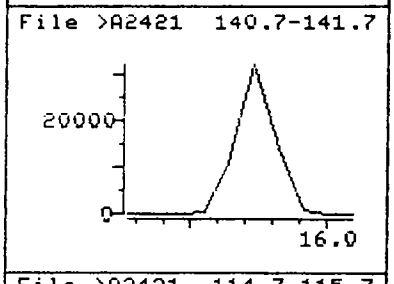
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

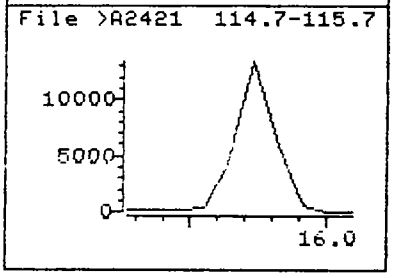


SAMPLE SPECTRUM (UNALTERED)









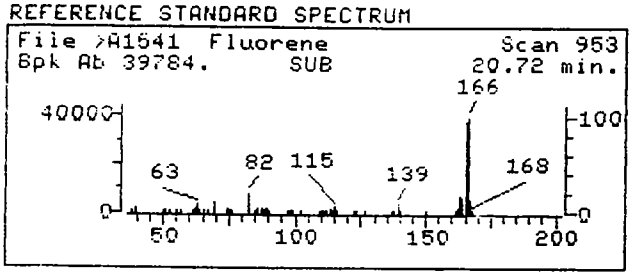
Data File: >A2421::D3
Name: 7030.8 3 g 1-15-92
Misc: 7030.8 3 g 1-15-92
Quant Time: 920118 01:39
Injected at: 920118 00:55

Quant Output File: ^A2421::DB

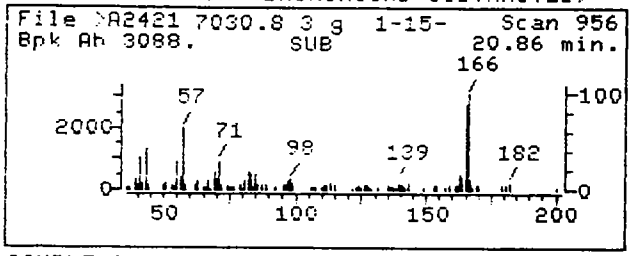
BTL#16
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:59

Compound No: 33
Compound Name: 2-Methylnaphthalene
Scan Number: 686
Retention Time: 15.95 min.
Quant Ion: 142.0
Area: 72185
Concentration: 10.64 ng/uL
q-value: 94

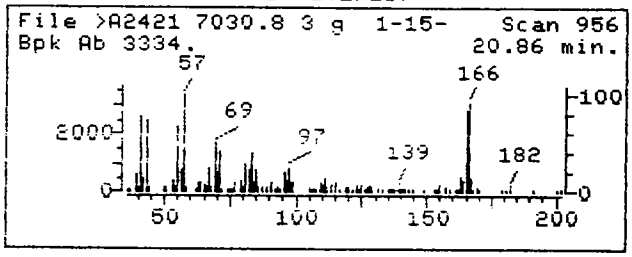
REFERENCE STANDARD SPECTRUM

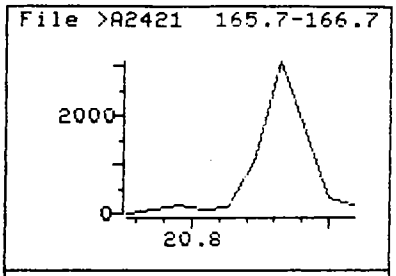


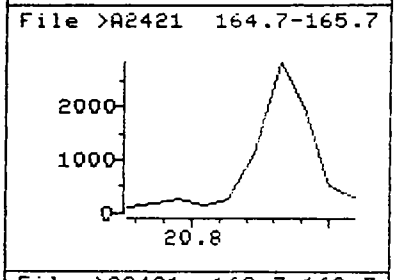
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

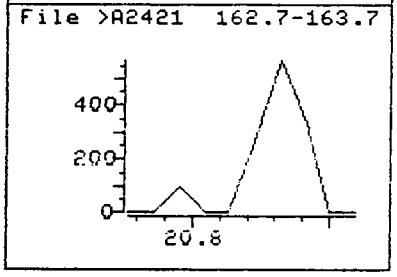


SAMPLE SPECTRUM (UNALTERED)









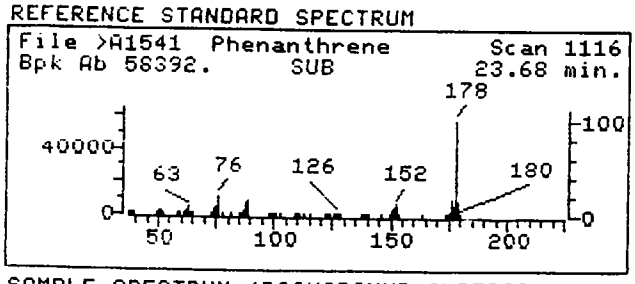
Data File: >A2421::D3
Name: 7030.8 3 g 1-15-92
Misc: 7030.8 3 g 1-15-92
Quant Time: 920118 01:39
Injected at: 920118 00:55

Quant Output File: ^A2421::DB

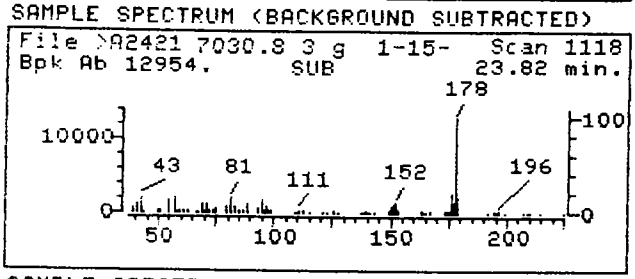
BTL#16
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:59

Compound No: 52
Compound Name: Fluorene
Scan Number: 956
Retention Time: 20.86 min.
Quant Ion: 166.0
Area: 7501
Concentration: .89 ng/uL
q-value: 92

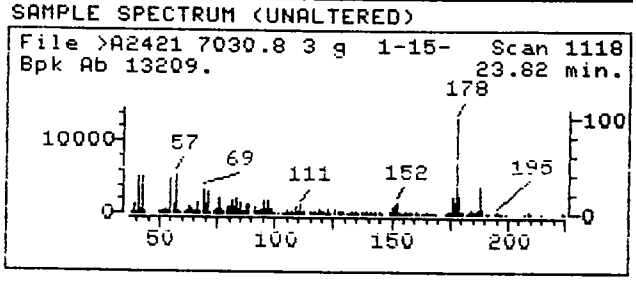
REFERENCE STANDARD SPECTRUM

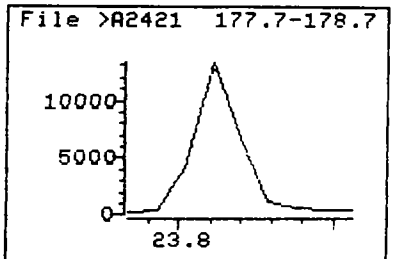


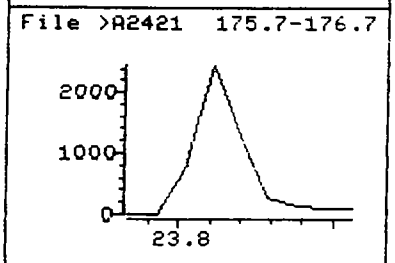
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

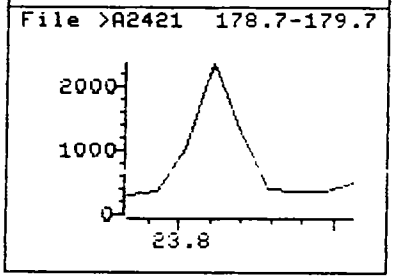


SAMPLE SPECTRUM (UNALTERED)









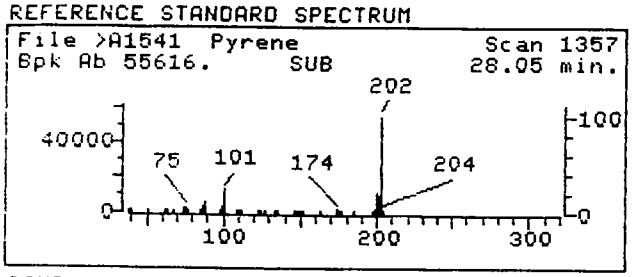
Data File: >A2421::D3
Name: 7030.8 3 g 1-15-92
Misc: 7030.8 3 g 1-15-92
Quant Time: 920118 01:39
Injected at: 920118 00:55

Quant Output File: ^A2421::DB

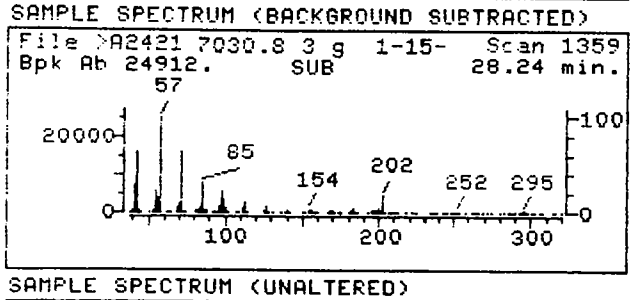
BTL#16
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:59

Compound No: 62
Compound Name: Phenanthrene
Scan Number: 1118
Retention Time: 23.82 min.
Quant Ion: 178.0
Area: 27516
Concentration: 2.00 ng/uL
q-value: 96

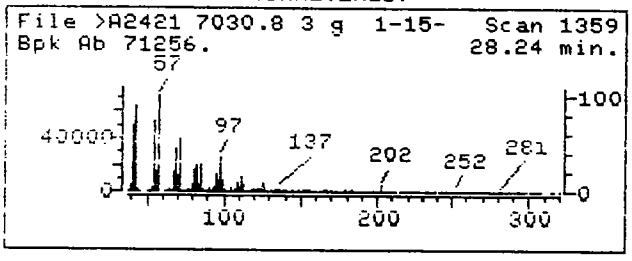
REFERENCE STANDARD SPECTRUM

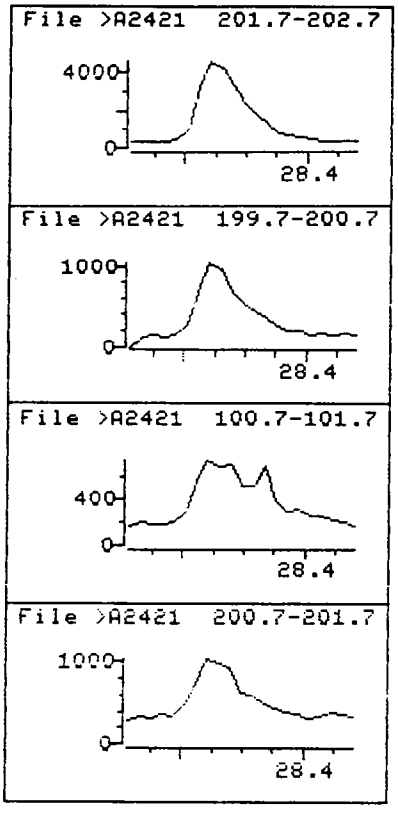


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)





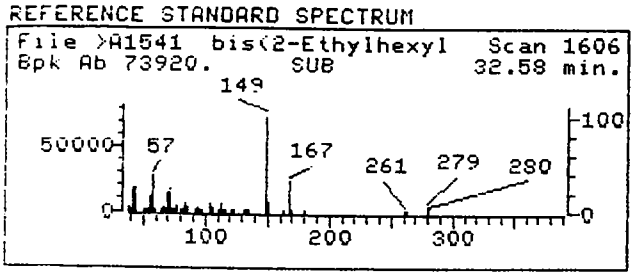
Data File: >A2421::D3
Name: 7030.8 3 g 1-15-92
Misc: 7030.8 3 g 1-15-92
Quant Time: 920118 01:39
Injected at: 920118 00:55

Quant Output File: ^A2421::DB

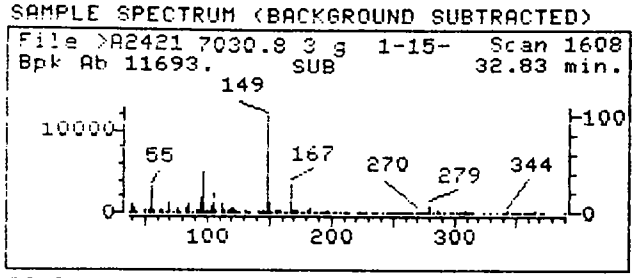
BTL#16
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:59

Compound No: 68
Compound Name: Pyrene
Scan Number: 1359
Retention Time: 28.24 min.
Quant Ion: 202.0
Area: 23434
Concentration: 3.07 ng/uL
q-value: 91

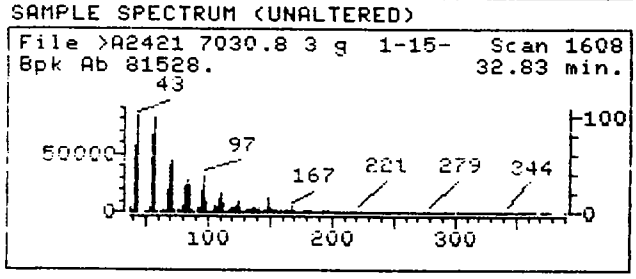
REFERENCE STANDARD SPECTRUM

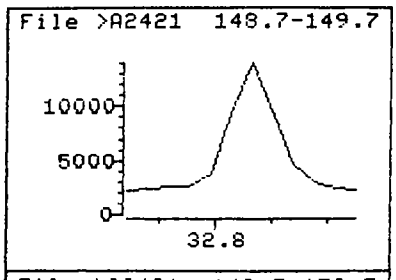


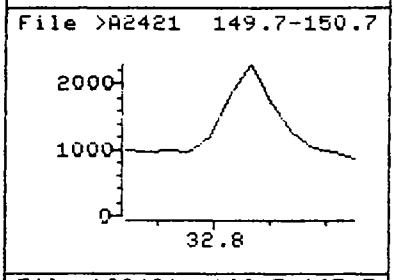
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

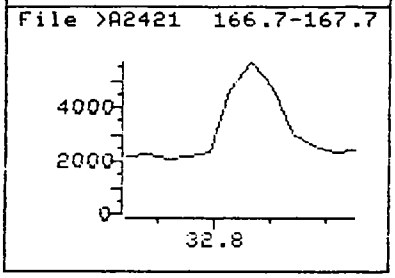


SAMPLE SPECTRUM (UNALTERED)









Data File: >A2421::D3 Quant Output File: ^A2421::DB
Name: 7030.8 3 g 1-15-92
Misc: 7030.8 3 g 1-15-92 BTL#16
Quant Time: 920118 01:39 Quant ID File: IDBNA::D4
Injected at: 920118 00:55 Last Calibration: 920114 16:59

Compound No: 73
Compound Name: bis(2-Ethylhexyl)phthalate
Scan Number: 1608
Retention Time: 32.83 min.
Quant Ion: 149.0
Area: 35069
Concentration: 6.86 ng/uL
q-value: 94

Environmental Profile Laboratories
BASE/NEUTRAL/ACID ANALYSIS DATA

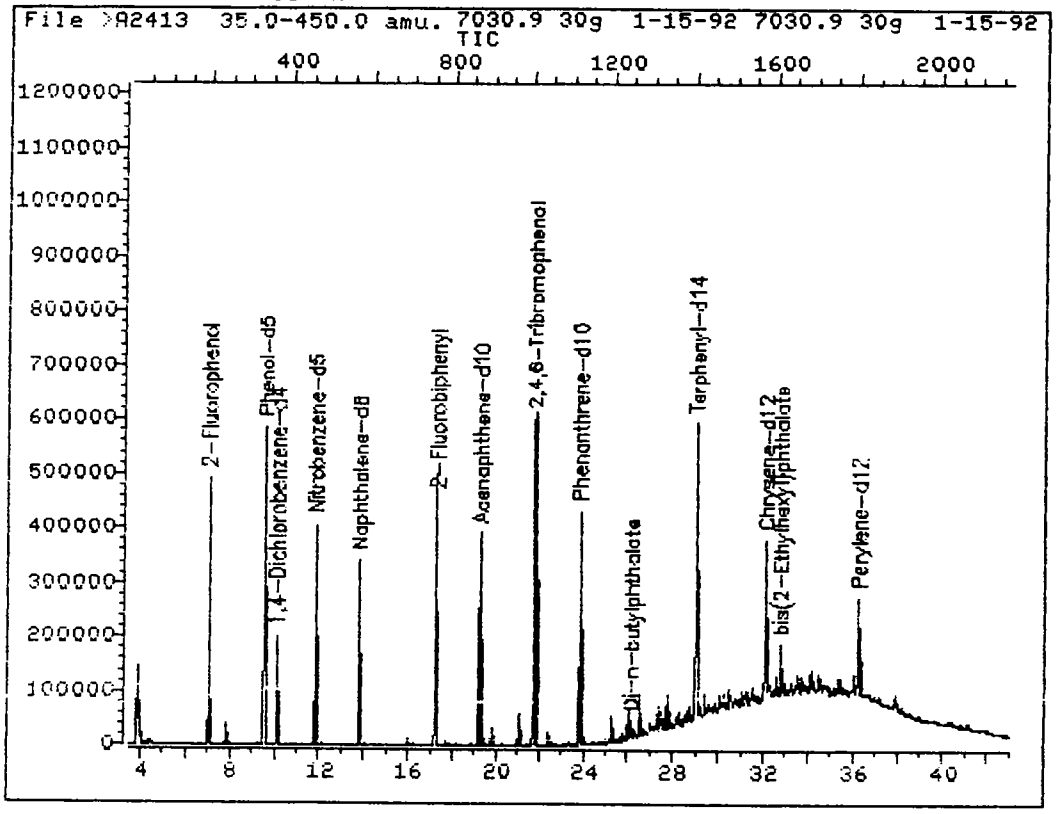
JOB NUMBER		MATRIX	Soil
SAMPLE NAME	7030.9 30g 1-15-92	DILUTION FACTOR	1.00
CLIENT ID		QA BATCH	
DATA FILE	>A2413	DATE ANALYZED	01/17/92

COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
N-nitroso-dimethylamine	ND	380	Acenaphthene	ND	380
Phenol	ND	380	2,4-Dinitrophenol	ND	1900
Aniline	ND	380	4-Nitrophenol	ND	380
bis(2-Chloroethyl)Ether	ND	380	Dibenzofuran	ND	380
2-Chlorophenol	ND	380	2,4-Dinitrotoluene	ND	380
1,3-Dichlorobenzene	ND	380	2,6-Dinitrotoluene	ND	380
1,4-Dichlorobenzene	ND	380	Diethylphthalate	ND	380
Benzyl alcohol	ND	380	4-Chlorophenyl-phenylether	ND	380
1,2-Dichlorobenzene	ND	380	Fluorene	ND	380
2-Methylphenol	ND	380	4-Nitroaniline	ND	380
bis(2-chloroisopropyl)ether	ND	380	4,6-Dinitro-2-methylphenol	ND	380
4-Methylphenol	ND	380	N-Nitrosodiphenylamine	ND	380
N-Nitroso-Di-n-propylamine	ND	380	1,2-Diphenylhydrazine	ND	380
Hexachloroethane	ND	380	4-Bromophenyl-phenylether	ND	380
Nitrobenzene	ND	380	Hexachlorobenzene	ND	380
Isophorone	ND	380	Pentachlorophenol	ND	380
2-Nitrophenol	ND	380	Phenanthrene	ND	380
2,4-Dimethylphenol	ND	380	Anthracene	ND	380
Benzoic Acid	ND	380	Di-n-butylphthalate	88 JB	380
bis(2-Chloroethoxy)methane	ND	380	Fluoranthene	ND	380
2,4-Dichlorophenol	ND	380	Benzidine	ND	380
1,2,4-Trichlorobenzene	ND	380	Pyrene	ND	380
Naphthalene	ND	380	Butylbenzylphthalate	ND	380
4-Chloroaniline	ND	380	3,3`-Dichlorobenzidine	ND	380
Hexachlorobutadiene	ND	380	Benzo(a)anthracene	ND	380
4-Chloro-3-methylphenol	ND	380	bis(2-Ethylhexyl)phthalate	240 JB	380
2-Methylnaphthalene	ND	380	Chrysene	ND	380
Hexachlorocyclopentadiene	ND	380	Di-n-octylphthalate	ND	380
2,4,6-Trichlorophenol	ND	380	Benzo(b)fluoranthene	ND	380
2,4,5-Trichlorophenol	ND	380	Benzo(k)fluoranthene	ND	380
2-Chloronaphthalene	ND	380	Benzo(a)pyrene	ND	380
2-Nitroaniline	ND	380	Indeno(1,2,3-cd)pyrene	ND	380
Dimethylphthalate	ND	380	Dibenz(a,h)anthracene	ND	380
Acenaphthylene	ND	380	Benzo(g,h,i)perylene	ND	380
3-Nitroaniline	ND	380			0

Percent Solid of 87.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

TOTAL ION CHROMATOGRAM

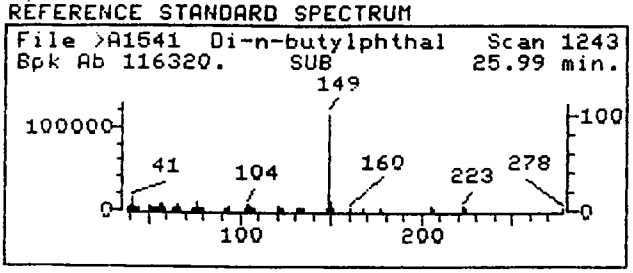


Data File: >A2413::D3 Quant Output File: ^A2413::DB
Name: 7030.9 30g 1-15-92
Misc: 7030.9 30g 1-15-92 BTL# 8

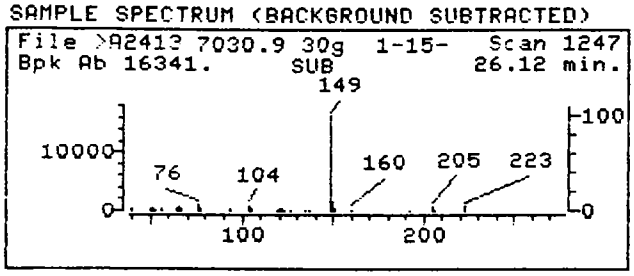
Id File: IDBNA::D4
Title: Semivolatile Organics (EPA Methods 625/8270) by GC/MS
Last Calibration: 920114 16:59

Operator ID: MARK
Quant Time: 920117 19:13
Injected at: 920117 18:29

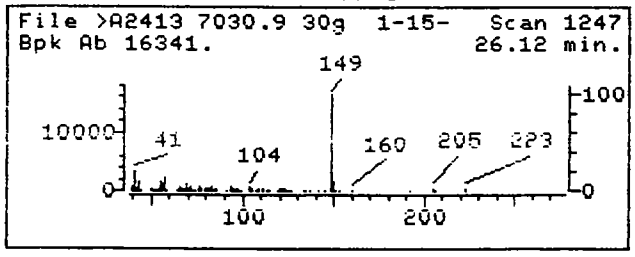
REFERENCE STANDARD SPECTRUM

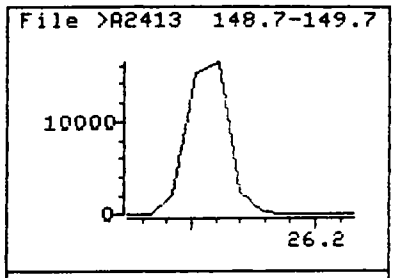


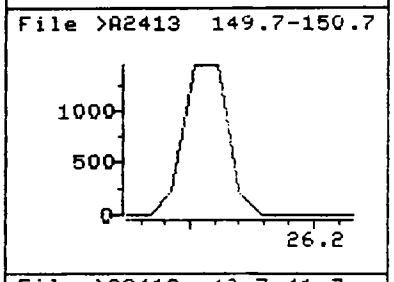
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

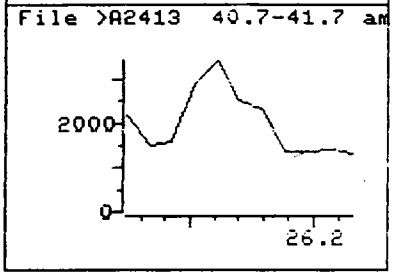


SAMPLE SPECTRUM (UNALTERED)









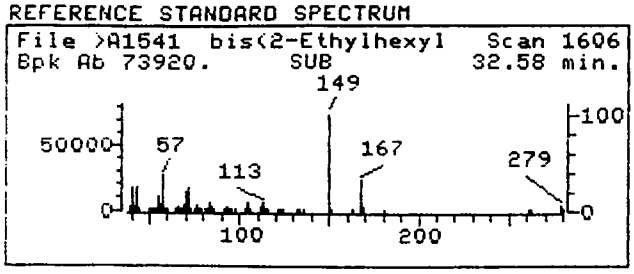
Data File: >A2413::D3
Name: 7030.9 30g 1-15-92
Misc: 7030.9 30g 1-15-92
Quant Time: 920117 19:13
Injected at: 920117 18:29

Quant Output File: ^A2413::DB

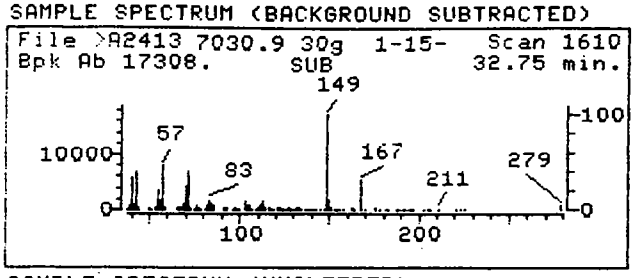
BTL# 8
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:59

Compound No: 64
Compound Name: Di-n-butylphthalate
Scan Number: 1247
Retention Time: 26.12 min.
Quant Ion: 149.0
Area: 40208
Concentration: 2.30 ng/uL
q-value: 94

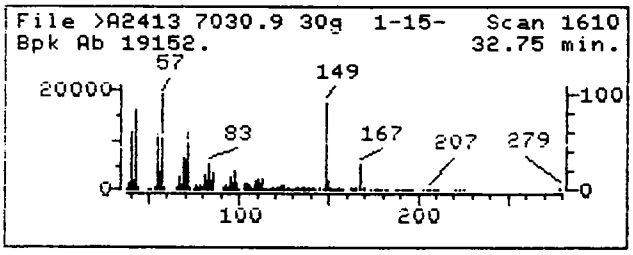
REFERENCE STANDARD SPECTRUM

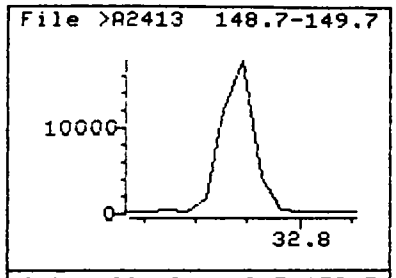


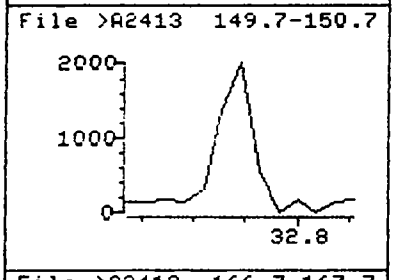
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

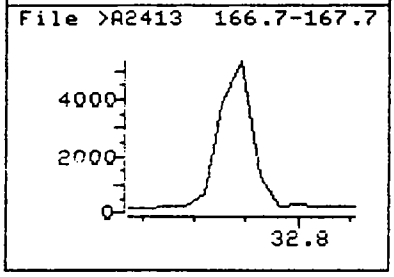


SAMPLE SPECTRUM (UNALTERED)









Data File: >A2413::D3 Quant Output File: ^A2413::DB
Name: 7030.9 30g 1-15-92
Misc: 7030.9 30g 1-15-92 BTL# 8
Quant Time: 920117 19:13 Quant ID File: IDBNA::D4
Injected at: 920117 18:29 Last Calibration: 920114 16:59

Compound No: 73
Compound Name: bis(2-Ethylhexyl)phthalate
Scan Number: 1610
Retention Time: 32.75 min.
Quant Ion: 149.0
Area: 38819
Concentration: 6.14 ng/uL
q-value: 95

Environmental Profile Laboratories
BASE/NEUTRAL/ACID ANALYSIS DATA

JOB NUMBER		MATRIX	Soil
SAMPLE NAME	7030.10 30g 1-15-92	DILUTION FACTOR	1.00
CLIENT ID		QA BATCH	
DATA FILE	>A2417	DATE ANALYZED	01/17/92

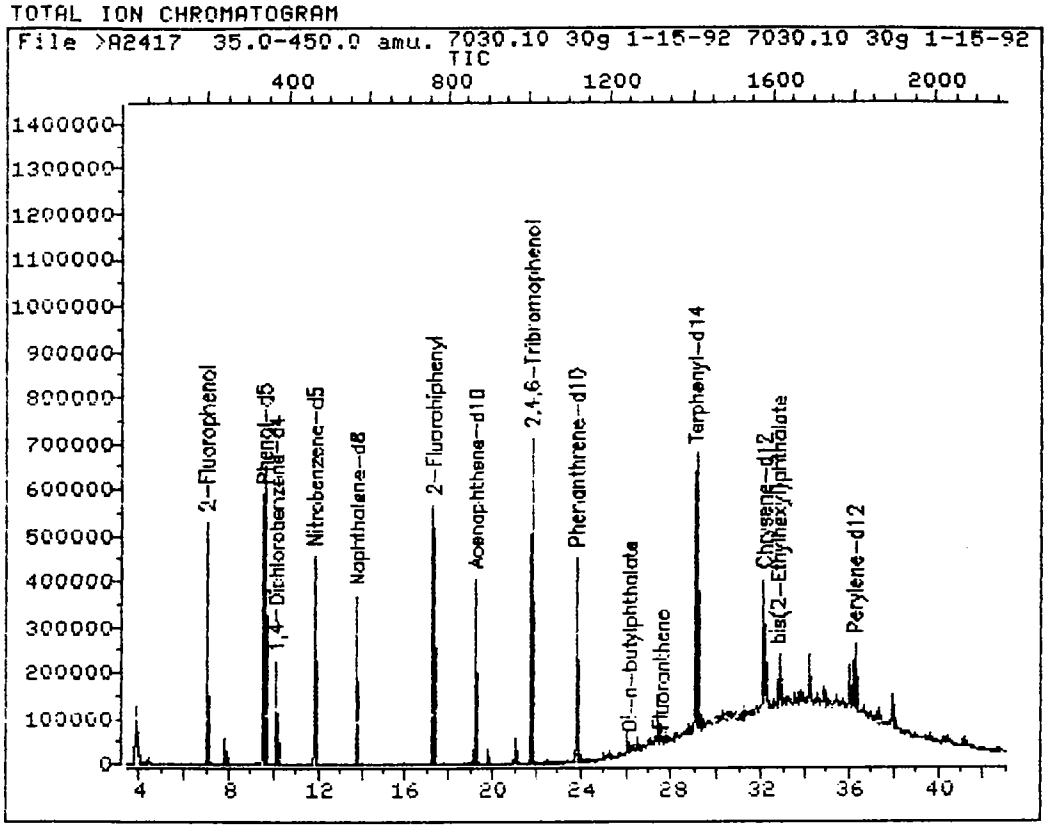
COMPOUND	UG/KG	MDL	COMPOUND	UG/KG	MDL
N-nitroso-dimethylamine	ND	390	Acenaphthene	ND	390
Phenol	ND	390	2,4-Dinitrophenol	ND	2000
Aniline	ND	390	4-Nitrophenol	ND	390
bis(2-Chloroethyl)Ether	ND	390	Dibenzofuran	ND	390
2-Chlorophenol	ND	390	2,4-Dinitrotoluene	ND	390
1,3-Dichlorobenzene	ND	390	2,6-Dinitrotoluene	ND	390
1,4-Dichlorobenzene	ND	390	Diethylphthalate	ND	390
Benzyl alcohol	ND	390	4-Chlorophenyl-phenylether	ND	390
1,2-Dichlorobenzene	ND	390	Fluorene	ND	390
2-Methylphenol	ND	390	4-Nitroaniline	ND	390
bis(2-chloroisopropyl)ether	ND	390	4,6-Dinitro-2-methylphenol	ND	390
4-Methylphenol	ND	390	N-Nitrosodiphenylamine	ND	390
N-Nitroso-Di-n-propylamine	ND	390	1,2-Diphenylhydrazine	ND	390
Hexachloroethane	ND	390	4-Bromophenyl-phenylether	ND	390
Nitrobenzene	ND	390	Hexachlorobenzene	ND	390
Isophorone	ND	390	Pentachlorophenol	ND	390
2-Nitrophenol	ND	390	Phenanthrene	ND	390
2,4-Dimethylphenol	ND	390	Anthracene	ND	390
Benzoic Acid	ND	390	Di-n-butylphthalate	54 JB	390
bis(2-Chloroethoxy)methane	ND	390	Fluoranthene	16 J	390
2,4-Dichlorophenol	ND	390	Benzidine	ND	390
1,2,4-Trichlorobenzene	ND	390	Pyrene	ND	390
Naphthalene	ND	390	Butylbenzylphthalate	ND	390
4-Chloroaniline	ND	390	3,3`-Dichlorobenzidine	ND	390
Hexachlorobutadiene	ND	390	Benzo(a)anthracene	ND	390
4-Chloro-3-methylphenol	ND	390	bis(2-Ethylhexyl)phthalate	230 JB	390
2-Methylnaphthalene	ND	390	Chrysene	ND	390
Hexachlorocyclopentadiene	ND	390	Di-n-octylphthalate	ND	390
2,4,6-Trichlorophenol	ND	390	Benzo(b)fluoranthene	ND	390
2,4,5-Trichlorophenol	ND	390	Benzo(k)fluoranthene	ND	390
2-Chloronaphthalene	ND	390	Benzo(a)pyrene	ND	390
2-Nitroaniline	ND	390	Indeno(1,2,3-cd)pyrene	ND	390
Dimethylphthalate	ND	390	Dibenz(a,h)anthracene	ND	390
Acenaphthylene	ND	390	Benzo(g,h,i)perylene	ND	390
3-Nitroaniline	ND	390			0

Percent Solid of 84.0 is used for all Target compounds.

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

16 ppb

TOTAL ION CHROMATOGRAM

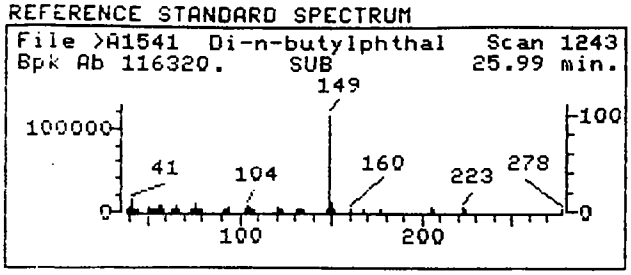


Data File: >A2417::D3 Quant Output File: ^A2417::DB
Name: 7030.10 30g 1-15-92
Misc: 7030.10 30g 1-15-92 BTL#12

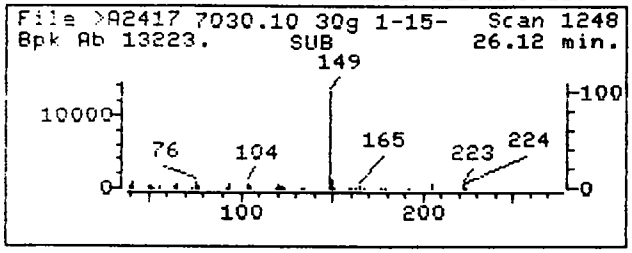
Id File: IDBNA::D4
Title: Semivolatile Organics (EPA Methods 625/8270) by GC/MS
Last Calibration: 920114 16:59

Operator ID: MARK
Quant Time: 920117 22:44
Injected at: 920117 22:00

REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



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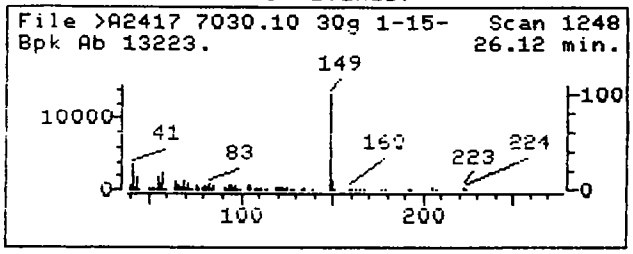
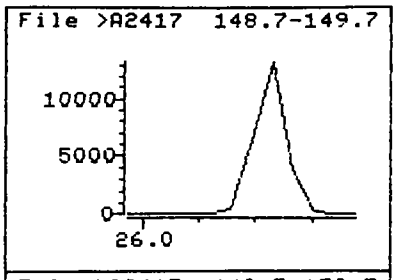
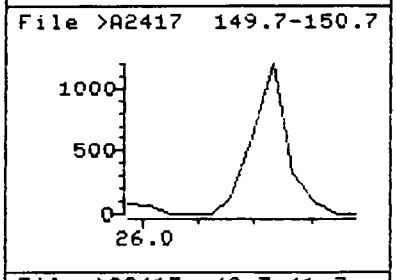
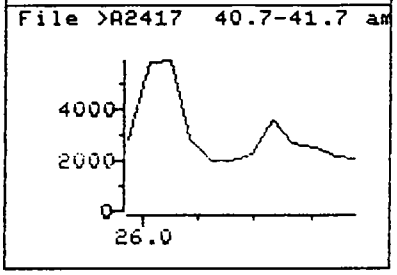








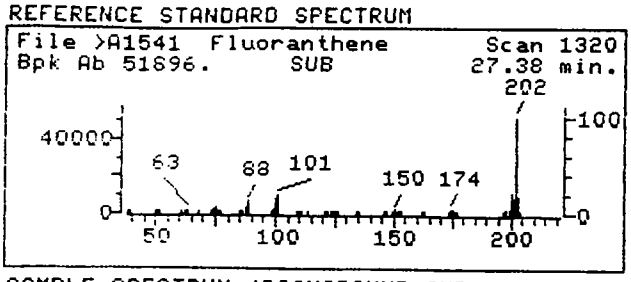
Data File: >A2417::D3
Name: 7030.10 30g 1-15-92
Misc: 7030.10 30g 1-15-92
Quant Time: 920117 22:44
Injected at: 920117 22:00

Quant Output File: ^A2417::DB

BTL#12
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:59

Compound No: 64
Compound Name: Di-n-butylphthalate
Scan Number: 1248
Retention Time: 26.12 min.
Quant Ion: 149.0
Area: 26867
Concentration: 1.36 ng/uL
q-value: 96

REFERENCE STANDARD SPECTRUM



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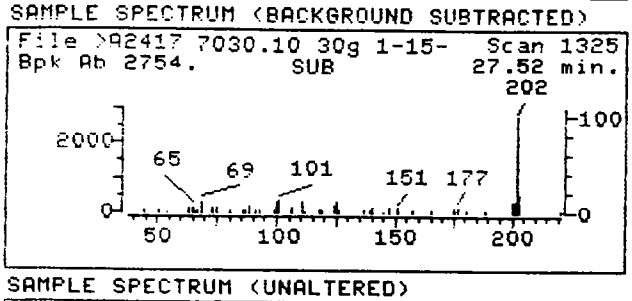

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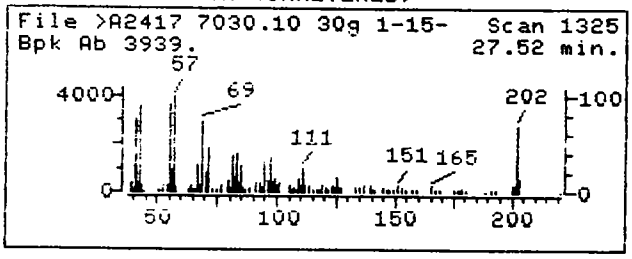
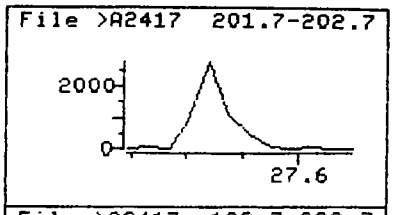
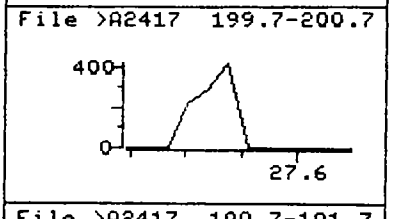
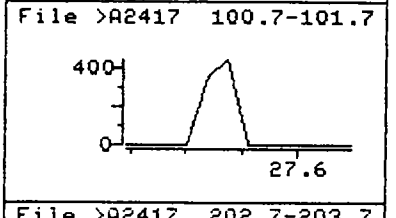
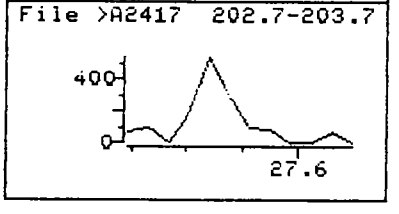










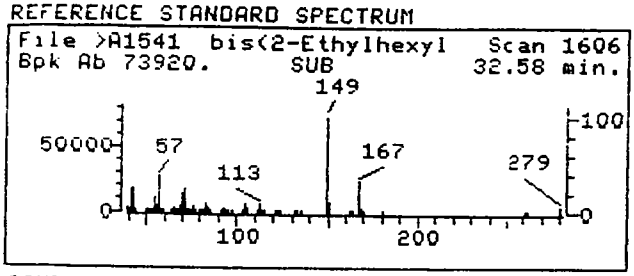
Data File: >A2417::D3
Name: 7030.10 30g 1-15-92
Misc: 7030.10 30g 1-15-92
Quant Time: 920117 22:44
Injected at: 920117 22:00

Quant Output File: ^A2417::DB

BTL#12
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:59

Compound No: 65
Compound Name: Fluoranthene
Scan Number: 1325
Retention Time: 27.52 min.
Quant Ion: 202.0
Area: 6051
Concentration: .39 ng/uL
q-value: 85

REFERENCE STANDARD SPECTRUM



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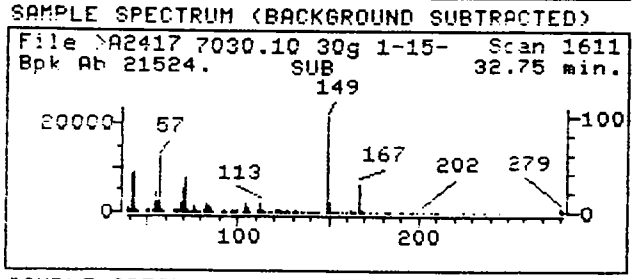

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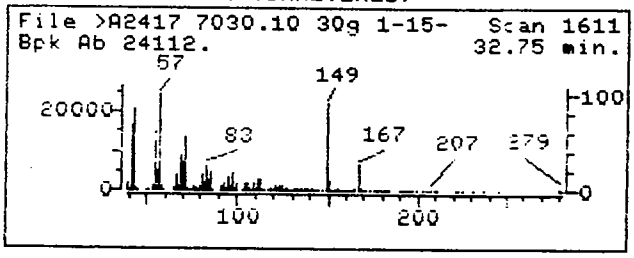
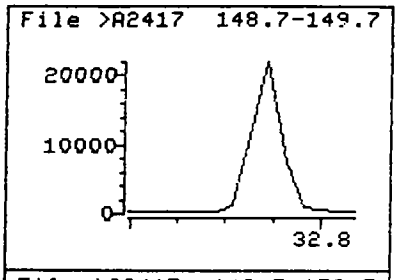
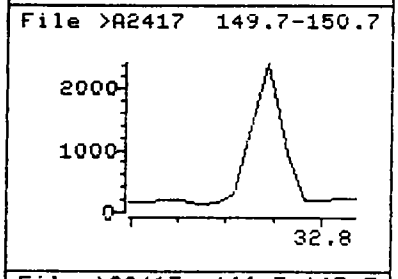
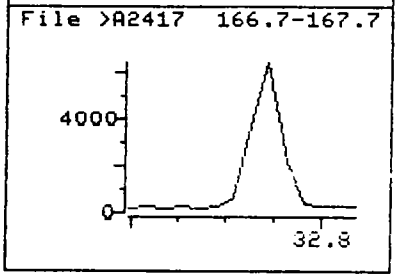








Data File: >A2417::D3
Name: 7030.10 30g 1-15-92
Misc: 7030.10 30g 1-15-92
Quant Time: 920117 22:44
Injected at: 920117 22:00

Quant Output File: ^A2417::DB

BTL#12
Quant ID File: IDBNA::D4
Last Calibration: 920114 16:59

Compound No: 73
Compound Name: bis(2-Ethylhexyl)phthalate
Scan Number: 1611
Retention Time: 32.75 min.
Quant Ion: 149.0
Area: 45910
Concentration: 5.72 ng/uL
q-value: 97

APPENDIX F

ANALYTICAL DATA PACKAGE FOR SOIL BORING SAMPLES

Serv-Air, Inc.
A Subsidiary of E-Systems, Inc.
Environmental and Energy Laboratory
P.O. Box 369
Fort Monmouth, NJ 07703
908-532-6147

NJDEPE Certified Laboratory # 13461

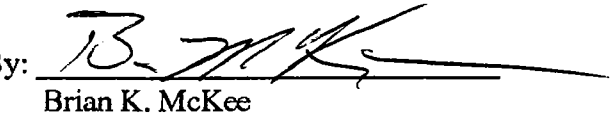
Report of Analysis

Analysis by: Sarah J. Hubbard

Project: Mw # 12 Installation Bldg. 699 TPHC

Date Started: 10-14-92
Date Complete: 11-02-92

Reviewed: 11-02-92
Revised: 11-03-92
Released: 11-03-92

By: 

Brian K. McKee
Environmental and Energy Chief

Serv-Air, Inc.

A Subsidiary of E-Systems, Inc.
Environmental and Energy Laboratory
P.O. Box 369
Fort Monmouth, NJ 07703
908-532-6147

NJDEPE Certified Laboratory # 13461

Project: MW #12 Installation Bldg. 699 Date: 10-14-92
Sample Matrix: Soil
Parameter: Total Petroleum Hydrocarbon
Method: 418.1

Sample ID	Rec'd	Extract	Anaylsis	Results (mg/Kg)	Detection Limit (mg/Kg)
C92-1009	10/14	10/26	10/26	22.0	3.3
C92-1010	10/14	10/26	10/26	3.95	3.3
C92-1011	10/14	10/26	10/26	nd	3.3
Blank	0/00	10/26	10/26	nd	3.3

Notes:
Sample holding times exceeded.
C92-1009 = mw12-ss-6.5'-6.57', 89% Solid
C92-1010 = mw12-ss-10.5'-11.5', 81% Solid
C92-1011 =mw12-ss-15.0'-17.0', 79% Solid

All Samples reported on a dry weight basis

ND = none detected

Brian K. McKee
Laboratory Director

SERV-AIR, INC.
An E-SYSTEMS Company

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
	Bldg. 698 - MW #12 Installation

SAMPLERS: C. Appleby

SAMPLE	DATE	TIME	SOIL	AQ.	SAMPLE LOCATION	NO. OF CONTAINERS	CONTAINER TYPE	REMARKS
C92-1009	10/14/92	10:55	X		MW 12 - SS - 6.5'-6.75			TPHC Analysis - ~~N/A~~ ND
C92-1010	↓	11:05	X		MW 12 - SS - 10.5-11.5			ND
C92-1011	↓	11:20	X		MW 12 - SS - 15.0-17.0			ND

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	10/14/92				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	
		Sarah J. Hubbard	10/14/92 1:00		

FT. MONMOUTH OFFICE
E-SYSTEMS, INC. • P. O. BOX 369, BUILDING 1209 • FT. MONMOUTH, NEW JERSEY 07703-5000 • (201) 544-0995

APPENDIX G

ANALYTICAL DATA PACKAGE FOR GROUNDWATER SAMPLES

Bldg. 611 – Waste oil / Site Assess.

ENVIRONMENTAL PROFILE LABORATORIES

ROUTE 37 BUSINESS PARK
SUITE 13
TOMS RIVER, NJ 08755
OFFICE: (908) 244-6278
FAX: (908) 244-6372

REPORT OF ANALYSIS

SERV-AIR FT.MONMOUTH
PO BOX 369 BLDG.#490
FORT MONMOUTH, NJ 07703-5000

EPL# : 9173.1-10,24
SAMPLE RCD : 10/26/92
ANALYSIS START : 10/28/92
ANALYSIS COMP : 10/28/92
PO# : R2-2672

TEST PARAMETER: LEAD (Pb)

RESULTS AND DETECTION LIMITS ARE EXPRESSED IN mg/L. (ppm)

EPL#	BLDG. #	MW#	DICAR#	RESULTS	DETECTION LIMIT
9173.1	699	1-2923677-1	NJPDES-NJ0079863	0.007	0.004 mg/L
9173.2	699	2-2923678-9	"	0.024	"
9173.3	699	5-2923808-1	"	ND	"
9173.4	699	6-2923809-9	"	0.004	"
9173.5	699	8-2923811-1	"	ND	"
9173.6	699	9-2924639	"	0.004	"
9173.7	699	11-2928031EFF	"	ND	"
9173.8	699	11-2928031EFF DUP	"	ND	"
9173.9	699	12	"	0.006	"
9173.10	699	13	"	0.068	"
9173.24	699	14	"	0.007	"

ND = NONE DETECTED

DANIEL K. WRIGHT
LABORATORY DIRECTOR

5/14/93

CERTIFICATE OF ANALYSIS

LEAD

U.S. ARMY-FORT MONMOUTH, NJ BLDG 699

ANALYSIS NO:	CLIENT ID:	MDL (mg/L)	RESULT (mg/L)
A 1856	MW-2 2-2923678-1	0.05	N.D.
A 1857	MW-1 1-2923677-1	0.05	0.08
A 1858	MW-8 8-2923811-1	0.05	0.06
A 1859	MW-12 12-2924640	0.05	N.D.
A 1860	MW-9 9-2924639	0.05	N.D.
A 1861	MW-4 4-2923680	0.05	N.D.
A 1862	MW-3 3-2923679-1	0.05	0.08
A 1863	MW-6 6-29238009-9	0.05	0.05
A 1864	RW-4 11-2928031-Eff	0.05	0.06
A 1865	MW-5 5-2923808-1	0.05	0.08
A 1867	Field Blank	0.05	N.D.
A 1868	MW-1D 1-2923677-1-Dup	0.05	N.D.

00006

Environmental Profile Laboratories
VOLATILE ORGANIC ANALYSIS DATA

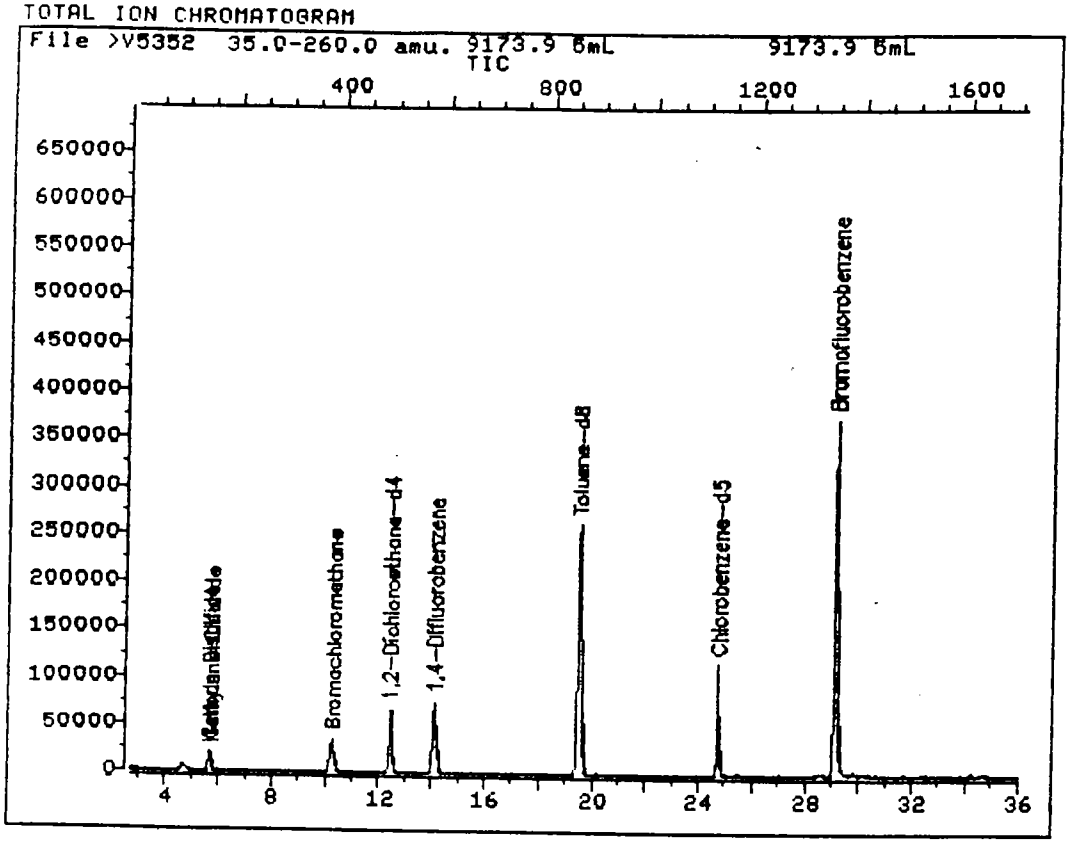
PROJECT	9173	MATRIX	Water
SAMPLE ID	9173.9 5mL	DILUTION FACTOR	1.00
CLIENT NAME	Serv-Air	DATE RECEIVED	10-26-92
DATA FILE	>U5352	DATE ANALYZED	10/27/92

Compound	ug/L	MDL
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl Chloride	ND	10
Chloroethane	ND	10
Methylene Chloride	4 JB	5
Acrolein	ND	50
Acrylonitrile	ND	50
Acetone	ND	5
Carbon Disulfide	4 J	5
1,1-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
trans-1,2-Dichloroethene	ND	5
Trichlorofluoromethane	ND	5
Chloroform	ND	5
1,2-Dichloroethane	ND	5
2-Butanone	ND	5
1,1,1-Trichloroethane	ND	5
Carbon Tetrachloride	ND	5
Bromodichloromethane	ND	5
Vinyl Acetate	ND	5
1,2-Dichloropropane	ND	5
cis-1,3-Dichloropropene	ND	5
Trichloroethene	ND	5

Compound	ug/L	MDL
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5
trans-1,3-Dichloropropene	ND	5
2-Chloroethylvinyl ether	ND	5
Bromoform	ND	5
2-Hexanone	ND	5
4-Methyl-2-Pentanone	ND	5
Tetrachloroethene	ND	5
1,1,2,2-Tetrachloroethane	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethylbenzene	ND	5
Styrene	ND	5
o-Xylene	ND	5
m + p-Xylenes	ND	5
1,3-Dichlorobenzene	ND	5
1,2-Dichlorobenzene	ND	5
1,4-Dichlorobenzene	ND	5
tert-Butyl Alcohol	ND	50
Methyl tert-Butyl Ether	ND	5
Diethyl ether	ND	50
		0

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates Compound not detected

TOTAL ION CHROMATOGRAM



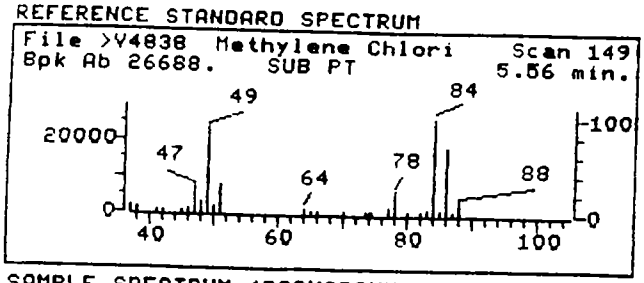
Data File: >V5352::D1
Name: 9173.9 5mL
Misc: 9173.9 5mL

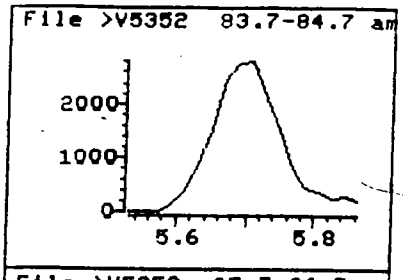
Quant Output File: ^V5352::DB

Id File: IDVOA::D2
Title: HSL VOLATILE ORGANICS
Last Calibration: 921020 16:10

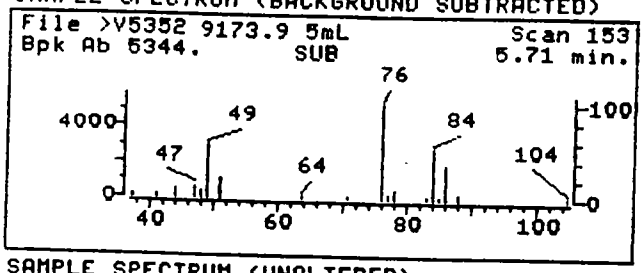
Operator ID: MARK
Quant Time: 921027 16:15
Injected at: 921027 15:38

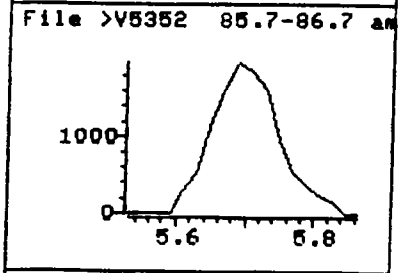
REFERENCE STANDARD SPECTRUM



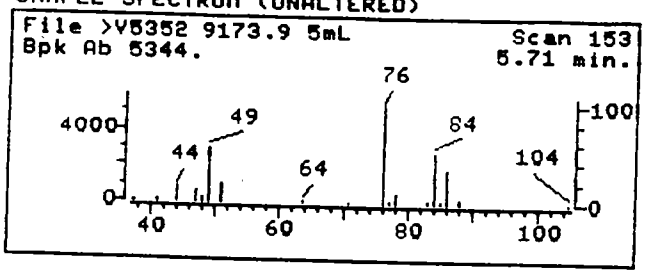


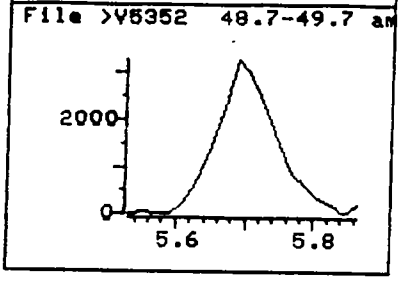
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)





SAMPLE SPECTRUM (UNALTERED)





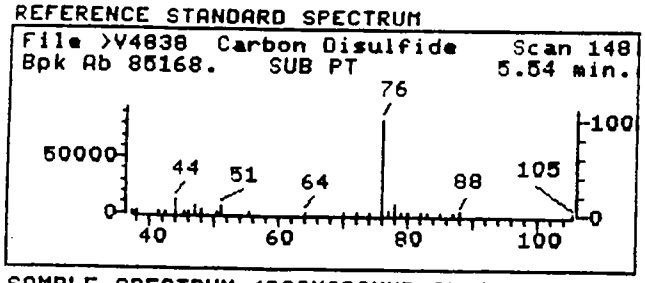
Data File: >V5352::D1
Name: 9173.9 5mL
Misc: 9173.9 5mL
Quant Time: 921027 16:15
Injected at: 921027 15:38

Quant Output File: ^V5352::DB

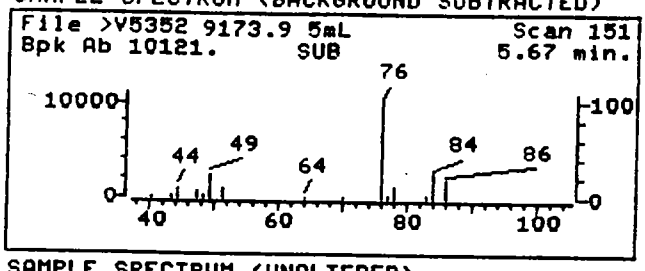
Quant ID File: IDVOA::D2
Last Calibration: 921020 16:10

Compound No: 7
Compound Name: Methylene Chloride
Scan Number: 153
Retention Time: 5.71 min.
Quant Ion: 84.0
Area: 19633
Concentration: 4.37 ppb
q-value: 88

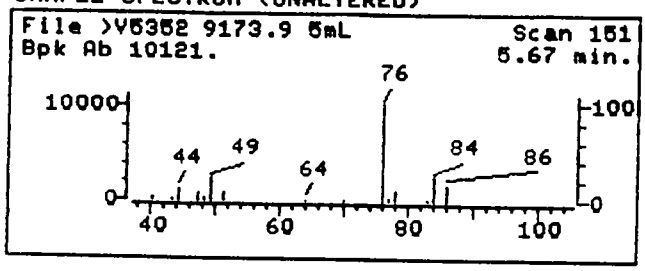
REFERENCE STANDARD SPECTRUM

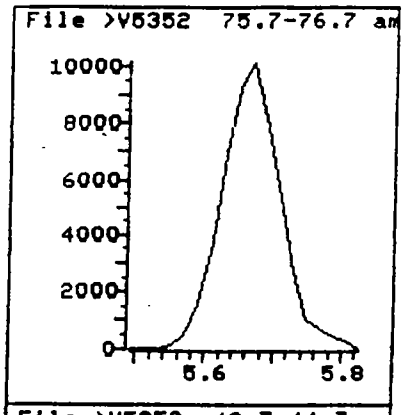


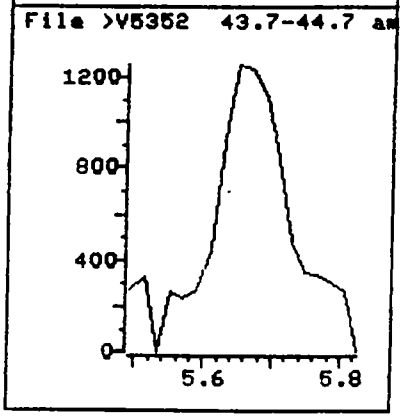
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)







Data File: >V5352::D1
Name: 9173.9 5mL
Misc: 9173.9 5mL
Quant Time: 921027 16:15
Injected at: 921027 15:38

Quant Output File: ^V5352::DB

Quant ID File: IDVOA::D2
Last Calibration: 921020 16:10

Compound No: 11
Compound Name: Carbon Disulfide
Scan Number: 151
Retention Time: 5.67 min.
Quant Ion: 76.0
Area: 59313
Concentration: 4.09 ppb
q-value: 98

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LAB SAMPLE NO.

9173.9 5mL

Lab Name: Environmental Profile Lab NJDEP Cert.# 15526

Matrix: Water

Lab Sample ID: 9173.9 5mL

Sample wt/vol: 5.0 (g/mL) mL

Lab File ID: >V5352

Level: (low/med) LOW

Date Received: 10-26-92

Date Analyzed: 10/27/92

Column: Capillary

Dilution Factor: 1

Number of TICs found: 0

CONCENTRATION UNITS:
ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

FORM I VOA-TIC

1/87 Rev

Environmental Profile Laboratories
VOLATILE ORGANIC ANALYSIS DATA

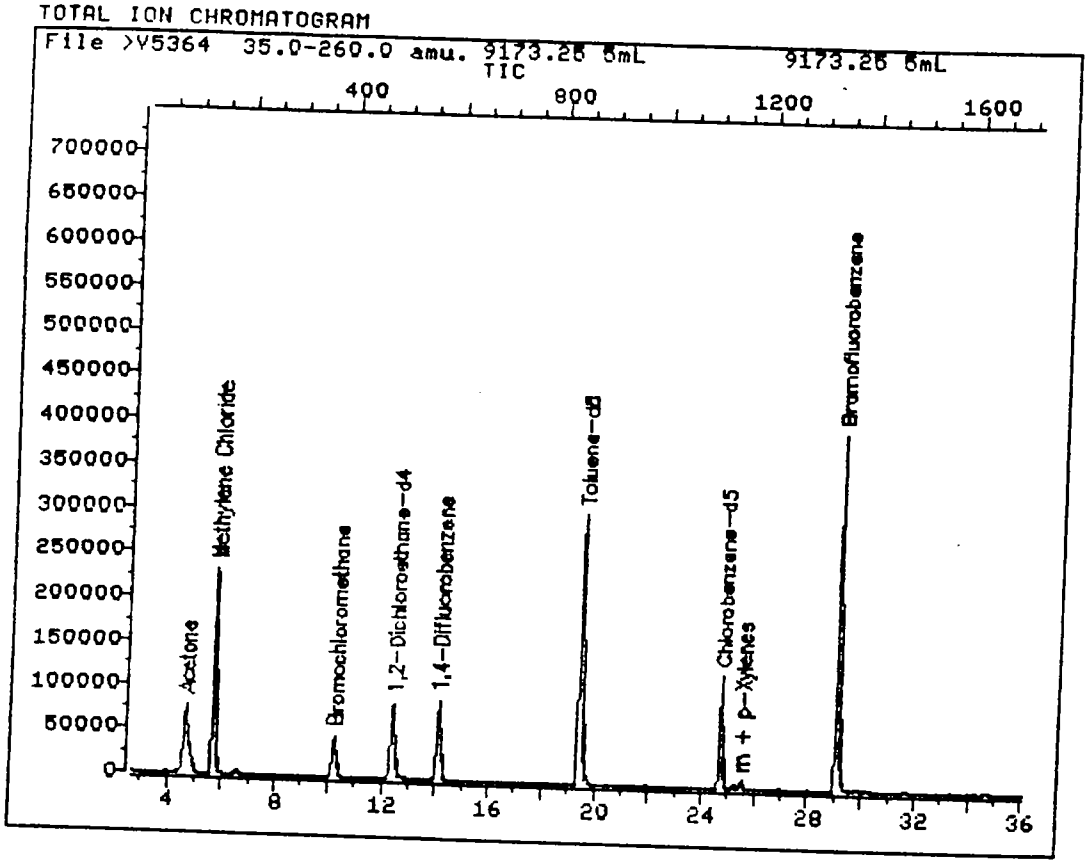
PROJECT	9173	MATRIX	Water
SAMPLE ID	9173.25 5mL	DILUTION FACTOR	1.00
CLIENT NAME	Serv-Air	DATE RECEIVED	10-26-92
DATA FILE	>U5364	DATE ANALYZED	10/28/92

Compound	ug/L	MDL
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl Chloride	ND	10
Chloroethane	ND	10
Methylene Chloride	66 B	5
Acrolein	ND	50
Acrylonitrile	ND	50
Acetone	84	5
Carbon Disulfide	ND	5
1,1-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
trans-1,2-Dichloroethene	ND	5
Trichlorofluoromethane	ND	5
Chloroform	ND	5
1,2-Dichloroethane	ND	5
2-Butanone	ND	5
1,1,1-Trichloroethane	ND	5
Carbon Tetrachloride	ND	5
Bromodichloromethane	ND	5
Vinyl Acetate	ND	5
1,2-Dichloropropane	ND	5
cis-1,3-Dichloropropene	ND	5
Trichloroethene	ND	5

Compound	ug/L	MDL
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5
trans-1,3-Dichloropropene	ND	5
2-Chloroethylvinyl ether	ND	5
Bromoform	ND	5
2-Hexanone	ND	5
4-Methyl-2-Pentanone	ND	5
Tetrachloroethene	ND	5
1,1,2,2-Tetrachloroethane	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethylbenzene	ND	5
Styrene	ND	5
o-Xylene	ND	5
m + p-Xylenes	1 J	5
1,3-Dichlorobenzene	ND	5
1,2-Dichlorobenzene	ND	5
1,4-Dichlorobenzene	ND	5
tert-Butyl Alcohol	ND	50
Methyl tert-Butyl Ether	ND	5
Diethyl ether	ND	50
		0

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates Compound not detected

TOTAL ION CHROMATOGRAM



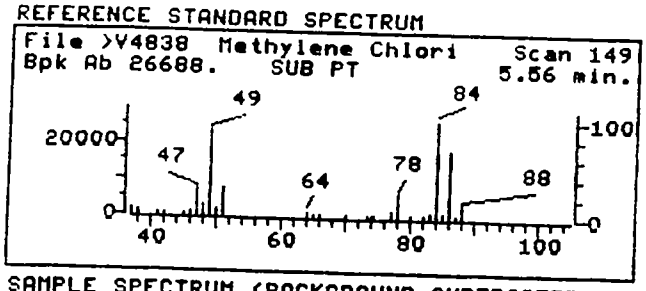
Data File: >V5364::D1
Name: 9173.25 5mL
Misc: 9173.25 5mL

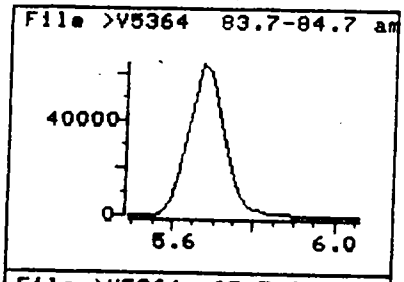
Quant Output File: ^V5364::DB

Id File: IDVOA::D2
Title: HSL VOLATILE ORGANICS
Last Calibration: 921027 22:05

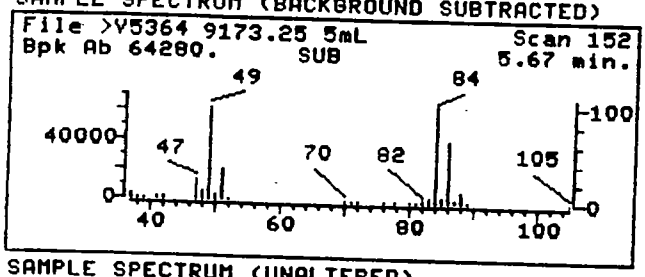
Operator ID: MARK
Quant Time: 921028 00:55
Injected at: 921028 00:19

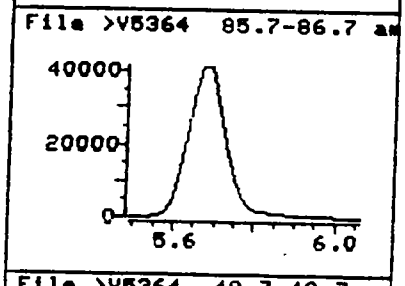
REFERENCE STANDARD SPECTRUM



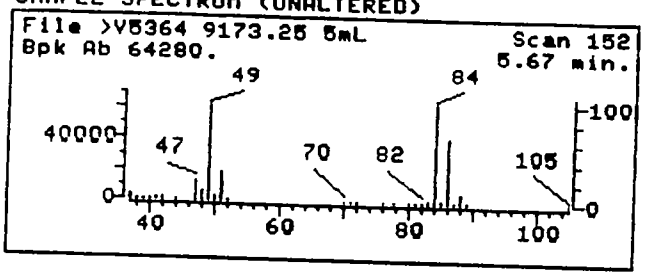


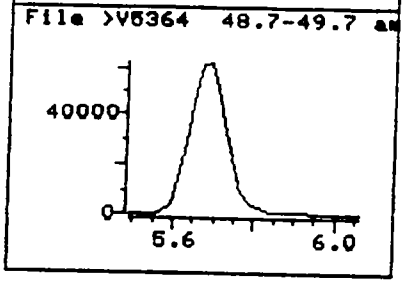
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)





SAMPLE SPECTRUM (UNALTERED)





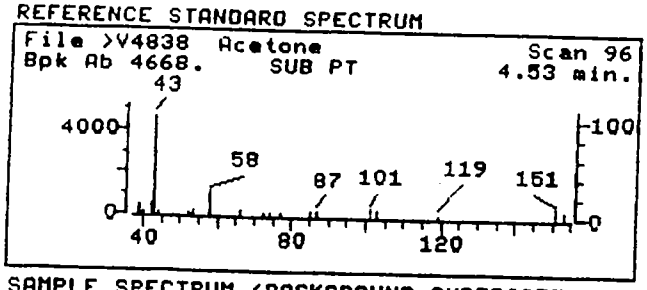
Data File: >V5364::D1
Name: 9173.25 5mL
Misc: 9173.25 5mL
Quant Time: 921028 00:55
Injected at: 921028 00:19

Quant Output File: ^V5364::DB

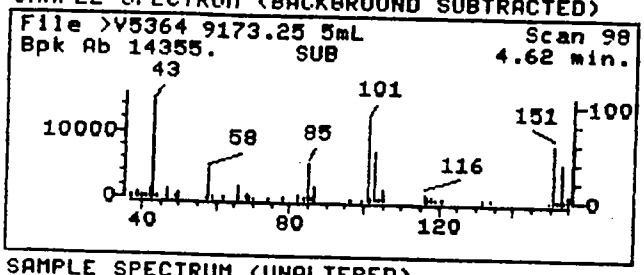
Quant ID File: IDV0A::D2
Last Calibration: 921027 22:05

Compound No: 7
Compound Name: Methylene Chloride
Scan Number: 152
Retention Time: 5.67 min.
Quant Ion: 84.0
Area: 412043
Concentration: 66.23 ppb
q-value: 93

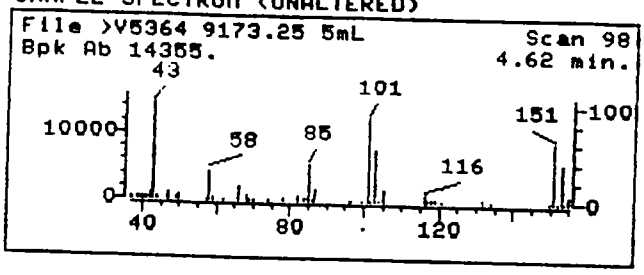
REFERENCE STANDARD SPECTRUM

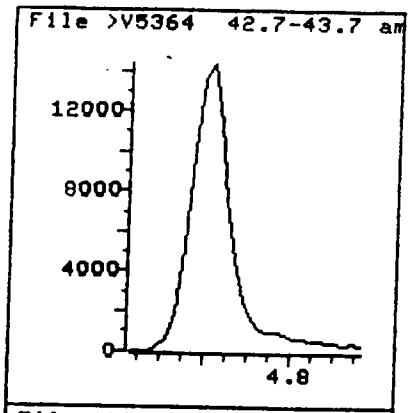


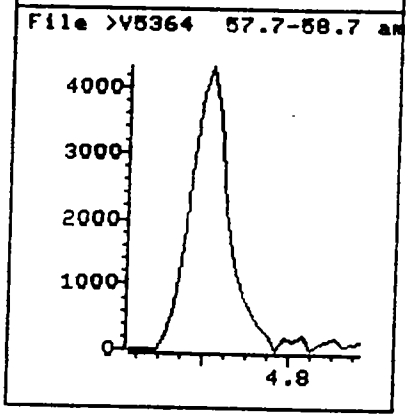
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)







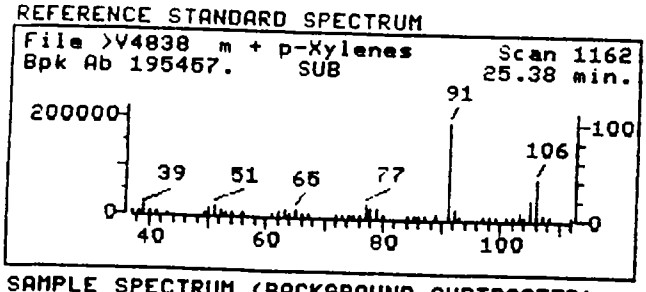
Data File: >V5364::D1
Name: 9173.25 5mL
Misc: 9173.25 5mL
Quant Time: 921028 00:55
Injected at: 921028 00:19

Quant Output File: ^V5364::DB

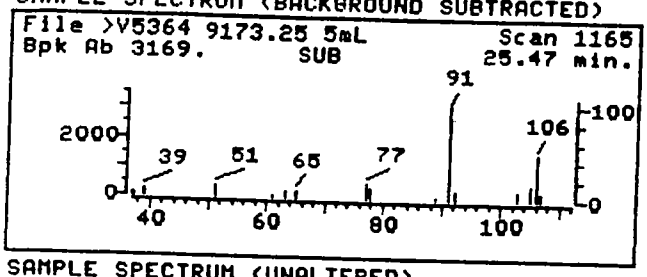
Quant ID File: IDV0A::D2
Last Calibration: 921027 22:05

Compound No: 10
Compound Name: Acetone
Scan Number: 98
Retention Time: 4.62 min.
Quant Ion: 43.0
Area: 94984
Concentration: 83.95 ppb
q-value: 96

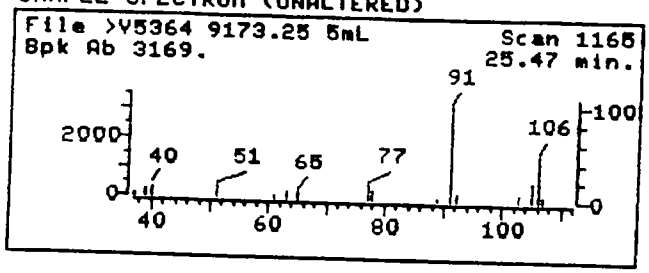
REFERENCE STANDARD SPECTRUM

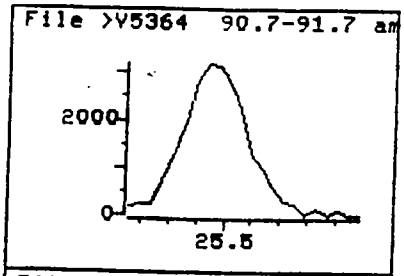


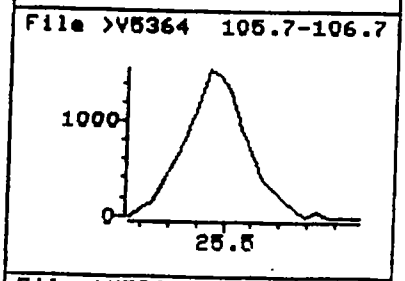
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

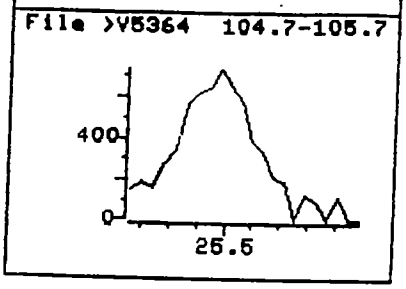


SAMPLE SPECTRUM (UNALTERED)









Data File: >V5364::D1
Name: 9173.25 5mL
Misc: 9173.25 5mL
Quant Time: 921028 00:55
Injected at: 921028 00:19

Quant Output File: ^V5364::DB

Quant ID File: IDV0A::D2
Last Calibration: 921027 22:05

Compound No: 44
Compound Name: m + p-Xylenes
Scan Number: 1165
Retention Time: 25.47 min.
Quant Ion: 91.0
Area: 26208
Concentration: 1.45 ppb
q-value: 95

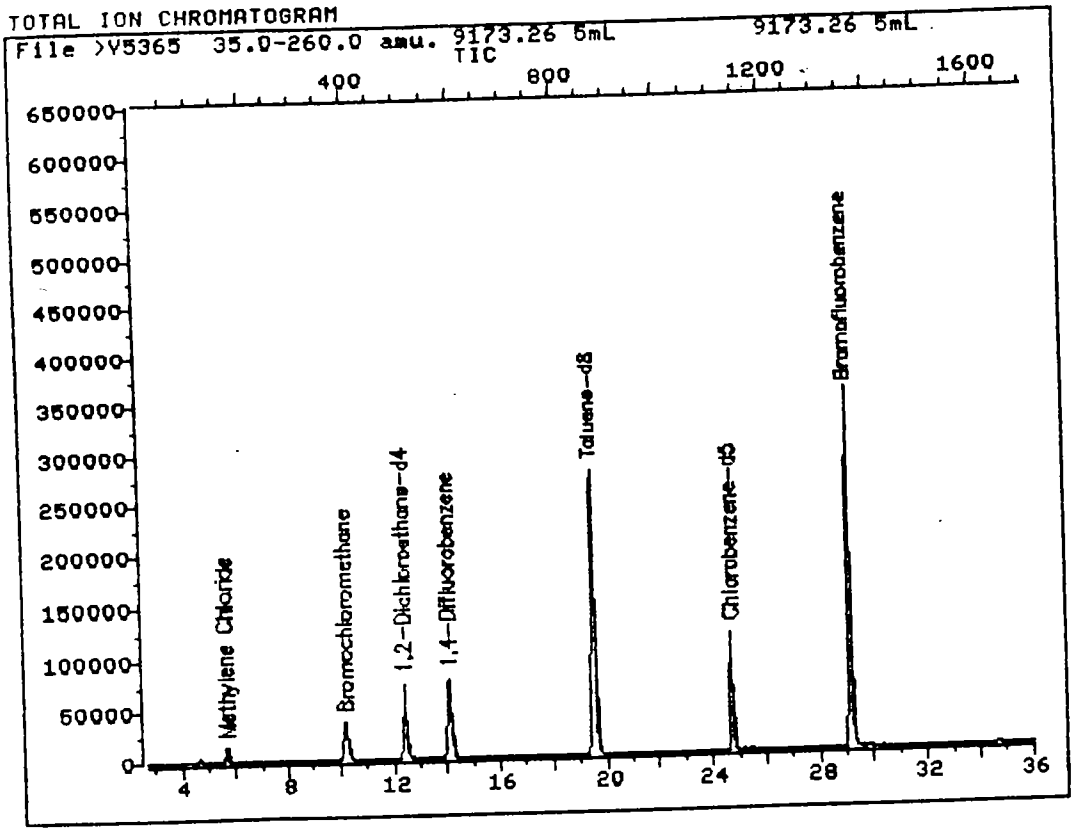
Environmental Profile Laboratories
VOLATILE ORGANIC ANALYSIS DATA

PROJECT	9173	MATRIX	Water
SAMPLE ID	9173.26 5mL	DILUTION FACTOR	1.00
CLIENT NAME	Serv-Air	DATE RECEIVED	10-26-92
DATA FILE	>V5365	DATE ANALYZED	10/28/92

Compound	ug/L	MDL
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl Chloride	ND	10
Chloroethane	ND	10
Methylene Chloride	5 JB	5
Acrolein	ND	50
Acrylonitrile	ND	50
Acetone	ND	5
Carbon Disulfide	ND	5
1,1-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
trans-1,2-Dichloroethene	ND	5
Trichlorofluoromethane	ND	5
Chloroform	ND	5
1,2-Dichloroethane	ND	5
2-Butanone	ND	5
1,1,1-Trichloroethane	ND	5
Carbon Tetrachloride	ND	5
Bromodichloromethane	ND	5
Vinyl Acetate	ND	5
1,2-Dichloropropane	ND	5
cis-1,3-Dichloropropene	ND	5
Trichloroethene	ND	5

Compound	ug/L	MDL
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5
trans-1,3-Dichloropropene	ND	5
2-Chloroethylvinyl ether	ND	5
Bromoform	ND	5
2-Hexanone	ND	5
4-Methyl-2-Pentanone	ND	5
Tetrachloroethene	ND	5
1,1,2,2-Tetrachloroethane	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethylbenzene	ND	5
Styrene	ND	5
o-Xylene	ND	5
m + p-Xylenes	ND	5
1,3-Dichlorobenzene	ND	5
1,2-Dichlorobenzene	ND	5
1,4-Dichlorobenzene	ND	5
tert-Butyl Alcohol	ND	50
Methyl tert-Butyl Ether	ND	5
Diethyl ether	ND	50
		0

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates Compound not detected



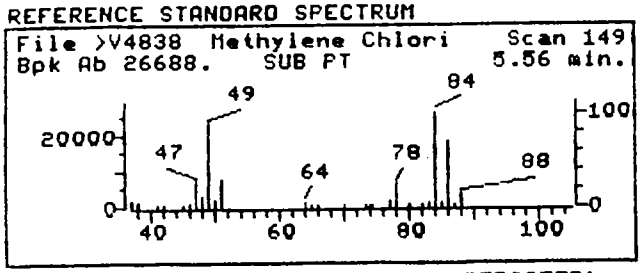
Data File: >V5365::D1
Name: 9173.26 5mL
Misc: 9173.26 5mL

Quant Output File: ^V5365::DB

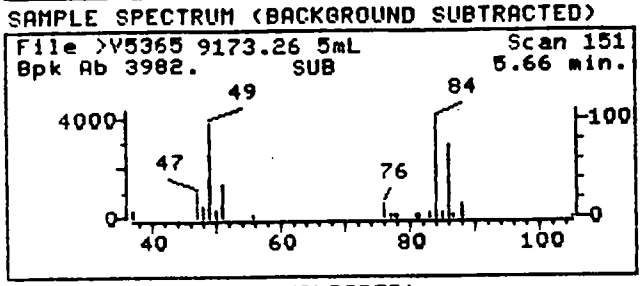
Id File: IDV0A::D2
Title: HSL VOLATILE ORGANICS
Last Calibration: 921027 22:05

Operator ID: MARK
Quant Time: 921028 01:38
Injected at: 921028 01:01

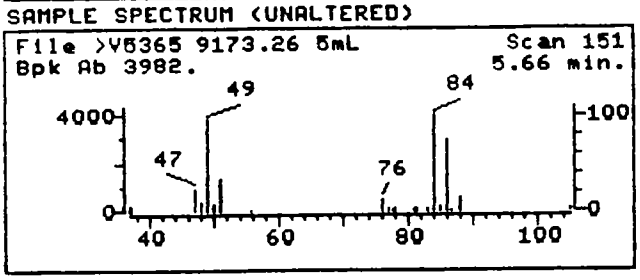
REFERENCE STANDARD SPECTRUM

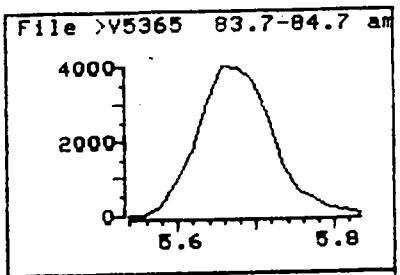


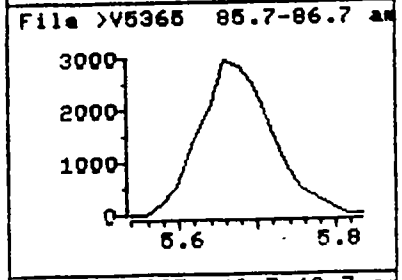
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

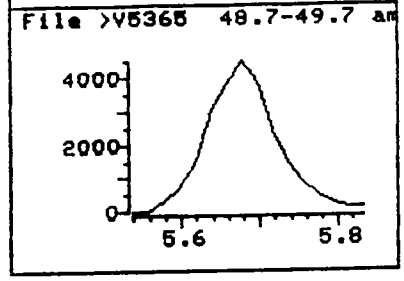


SAMPLE SPECTRUM (UNALTERED)









Data File: >V5365::D1
Name: 9173.26 5mL
Misc: 9173.26 5mL
Quant Time: 921028 01:38
Injected at: 921028 01:01

Quant Output File: ^V5365::DB

Quant ID File: IDVOA::D2
Last Calibration: 921027 22:05

Compound No: 7
Compound Name: Methylene Chloride
Scan Number: 151
Retention Time: 5.66 min.
Quant Ion: 84.0
Area: 26436
Concentration: 4.90 ppb
q-value: 90

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LAB SAMPLE N(

9173.25 5ml

Lab Name: Environmental Profile Lab   NJDEP Cert.# 15526

Matrix: Water

Lab Sample ID: 9173.25 5mL

Sample wt/vol: 5.0 (g/mL) mL

Lab File ID: >V5364

Level: (low/med) LOW

Date Received: 10-26-92

Date Analyzed: 10/28/92

Column: Capillary

Dilution Factor: 1

Number of TICs found: 0

CONCENTRATION UNITS:
ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LAB SAMPLE NO.
9173.26 5mL.

Lab Name: Environmental Profile Lab NJDEP Cert.# 15526

Matrix: Water

Lab Sample ID: 9173.26 5mL

Sample wt/vol: 5.0 (g/mL) mL

Lab File ID: >V5365

Level: (low/med) LOW

Date Received: 10-26-92

Date Analyzed: 10/28/92

Column: Capillary

Dilution Factor: 1

Number of TICs found: 0

CONCENTRATION UNITS:
ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: Environmental Profile Lab Contract: Serv-Air

Lab Code: 15526

Lab File ID: >V5345 BFB Injection Date: 10/27/92

Instrument ID: GC/MSD 5970 #1 BFB Injection Time: 9:54

Matrix: Water Column: Capillary

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	15.9
75	30.0 - 60.0% of mass 95	48.4
95	Base peak, 100% relative abundance	100.
96	5.0 - 9.0% of mass 95	6.5
173	Less than 2.0% of mass 174	0.0(0.0)1
174	Greater than 50.0% of mass 95	76.3
175	5.0 - 9.0% of mass 174	5.5(7.2)1
176	Greater than 95.0%, but less than 101.0% of mass 174	73.7(96.6)1
177	5.0 - 9.0% of mass 176	4.7(6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CCC/SPCC	CCC/SPCC	>V5346	10/27/92	10:27
02	VOA BLANK	VOA BLANK	>V5347	10/27/92	11:36
03	9173.9 5mL	9173.9 5mL	>V5352	10/27/92	15:38
04	9173.2 5mL	9173.2 5mL	>V5353	10/27/92	16:20
05	9173.3 5mL	9173.3 5mL	>V5356	10/27/92	18:26
06	9173.5 5mL	9173.5 5mL	>V5358	10/27/92	19:50
07	9173.6 5mL	9173.6 5mL	>V5359	10/27/92	20:33
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: Environmental Profile Lab Contract: Serv-Air

Lab Code: 15526

Lab File ID: >V5361 BFB Injection Date: 10/27/92

Instrument ID: GC/MSD 5970 #1 BFB Injection Time: 21:53

Matrix: Water Column: Capillary

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	16.5
75	30.0 - 60.0% of mass 95	49.5
95	Base peak, 100% relative abundance	100.
96	5.0 - 9.0% of mass 95	6.3
173	Less than 2.0% of mass 174	0.0(0.0)1
174	Greater than 50.0% of mass 95	65.3
175	5.0 - 9.0% of mass 174	5.0(7.6)1
176	Greater than 95.0%, but less than 101.0% of mass 174	63.9(97.9)1
177	5.0 - 9.0% of mass 176	4.1(6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CCC/SPCC	CCC/SPCCC	>V5362	10/27/92	22:24
02	VOA Blank	VOA Blank	>V5363	10/27/92	23:37
03	9173.25 5m	9173.25 5m	>V5364	10/28/92	0:19
04	9173.26 5m	9173.26 5m	>V5365	10/28/92	1:01
05	9173.14 5m	9173.14 5m	>V5366	10/28/92	1:43
06	9173.13 5m	9173.13 5m	>V5367	10/28/92	2:26
07	9173.23.5m	9173.23 5m	>V5368	10/28/92	3:08
08	9173.12 5m	9173.12 5m	>V5369	10/28/92	3:50
09	9173.21-5m	9173.21 5m	>V5370	10/28/92	4:33
10	9173.19-5m	9173.19 5m	>V5371	10/28/92	5:15
11	9173.11-5m	9173.11 5m	>V5372	10/28/92	5:58
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: Environmental Profile Lab Contract: Serv-Air

Lab Code: 15526

Lab File ID: >V5411 BFB Injection Date: 10/30/92

Instrument ID: GC/MSD 5970 #1 BFB Injection Time: 10:16

Matrix: Water Column: Capillary

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	17.4
75	30.0 - 60.0% of mass 95	48.0
95	Base peak, 100% relative abundance	100.
96	5.0 - 9.0% of mass 95	6.5
173	Less than 2.0% of mass 174	0.0(0.0)1
174	Greater than 50.0% of mass 95	70.7
175	5.0 - 9.0% of mass 174	5.2(7.4)1
176	Greater than 95.0%, but less than 101.0% of mass 174	68.6(97.0)1
177	5.0 - 9.0% of mass 176	4.5(6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CCC/SPCC	CCC/SPCC	>V5412	10/30/92	10:38
02	VOA BLANK	VOA BLANK	>V5413	10/30/92	11:42
03	9173.1 5uL	9173.1 5uL	>V5415	10/30/92	13:26
04	9173.8 50u	9173.8 50u	>V5418	10/30/92	15:31
05	9173.10 50	9173.10 50	>V5419	10/30/92	16:12
06	9173.15 .5	9173.15 .5	>V5421	10/30/92	17:37
07	9173.16 .5	9173.16 .5	>V5422	10/30/92	18:19
08	9173.24 .5	9173.24 .5	>V5423	10/30/92	19:01
09	9173.17 5m	9173.17 5m	>V5424	10/30/92	19:43
10	9173.22 5m	9173.22 5m	>V5426	10/30/92	21:07
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: Environmental Profile Lab Contract: Serv-Air

Lab Code: 15526

Lab File ID: >V5427 BFB Injection Date: 10/31/92

Instrument ID: GC/MSD 5970 #1 BFB Injection Time: 13:44

Matrix: Water Column: Capillary

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	16.5
75	30.0 - 60.0% of mass 95	48.9
95	Base peak, 100% relative abundance	100.
96	5.0 - 9.0% of mass 95	6.2
173	Less than 2.0% of mass 174	0.0(0.0)1
174	Greater than 50.0% of mass 95	71.3
175	5.0 - 9.0% of mass 174	5.5(7.7)1
176	Greater than 95.0%, but less than 101.0% of mass 174	70.1(98.3)1
177	5.0 - 9.0% of mass 176	4.7(6.7)2

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CCC/SPCC	CCC/SPCC	>V5428	10/31/92	14:11
02	VOA Blank	VOA Blank	>V5429	10/31/92	15:10
03	9173.22 MS	9173.22 MS	>V5430	10/31/92	15:53
04	9173.22 MS	9173.22 MS	>V5431	10/31/92	16:36
05	9173.7 50u	9173.7 50u	>V5432	10/31/92	17:18
06	9173.4 .5m	9173.4 .5m	>V5433	10/31/92	18:01
07	9173.20 5m	9173.20 5m	>V5434	10/31/92	18:42
08	9173.18 5m	9173.18 5m	>V5436	10/31/92	20:07
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

Continuing Calibration Check
HSL Compounds

Case No:

Calibration Date: 10/27/92

Contractor: E.P.L.

Time: 10:27

Contract No: NJDEPE ID# 15526

Laboratory ID: >U5346

Instrument ID: GC/MSD #1

Initial Calibration Date: 10/20/92

Minimum $\overline{RF}$ for SPCC is .30

Maximum % Diff for CCC is 25%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC	
Chloromethane	1.28136	1.10969	13.40		**	
Bromomethane	3.56350	4.34436	21.91			
Vinyl Chloride	1.97246	1.84004	6.71	*		
Chloroethane	1.85262	1.95151	5.34			
Methyl tert-Butyl Ether	4.64109	4.28257	7.72			
Methylene Chloride	4.28970	4.07719	4.95			
Acrolein	.16356	.15680	4.13			(Conc=500.00)
Acrylonitrile	.25730	.25179	2.14			(Conc=500.00)
Acetone	.78012	.70591	9.51			
Carbon Disulfide	13.8242	12.5381	9.30			
1,1-Dichloroethene	3.15223	3.19648	1.40	*		
1,1-Dichloroethane	6.23895	6.12772	1.78		**	
tert-Butyl Alcohol	.08598	.07902	8.09			(Conc=500.00)
trans-1,2-Dichloroethene	5.26164	4.84898	7.84			
Trichlorofluoromethane	7.49104	7.69633	2.74			
Chloroform	8.86038	9.30035	4.97	*		
1,2-Dichloroethane-d4	2.29358	2.19975	4.09			(Conc=100.00)
1,2-Dichloroethane	4.12337	3.83860	6.91			
2-Butanone	.09677	.08491	12.26			
1,1,1-Trichloroethane	1.36023	1.48732	9.34			
Carbon Tetrachloride	1.18650	1.40226	18.18			
Bromodichloromethane	1.29358	1.38989	7.45			
Vinyl Acetate	.58768	.53142	9.57			
1,2-Dichloropropane	.60165	.61519	2.25	*		
cis-1,3-Dichloropropene	1.50097	1.52344	1.50			
Trichloroethene	.83241	.94431	13.44			
Dibromochloromethane	.95834	1.13720	18.66			
1,1,2-Trichloroethane	.44874	.49892	11.18			
Benzene	1.62988	1.64407	.87			
trans-1,3-Dichloropropene	.27115	.27867	2.77			
2-Chloroethylvinyl ether	.18189	.15307	15.84			
Bromoform	.55286	.62873	13.72		**	

RF - Response Factor from daily standard file at 50.00 ppb

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Continu. Calibration Check
HSL Compounds

Case No:

Calibration Date: 10/27/92

Contractor: E.P.L.

Time: 10:27

Contract No: NJDEPE ID# 15526

Laboratory ID: >V5346

Instrument ID: GC/MSD #1

Initial Calibration Date: 10/20/92

Minimum $\overline{RF}$ for SPCC is .30

Maximum % Diff for CCC is 25%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC	
4-Methyl-2-Pentanone	.43455	.31830	26.75			
2-Hexanone	.17597	.12124	31.10			
Tetrachloroethene	1.07022	1.15747	8.15			
1,1,2,2-Tetrachloroethane	.70932	.66273	6.57		**	
Toluene	2.66135	2.48907	6.47	*		
Chlorobenzene	1.82137	1.89128	3.84		**	
Ethylbenzene	3.30060	3.23850	1.88	*		
Styrene	2.20138	2.08635	5.23			
m + p-Xylenes	2.78650	2.85973	2.63			(Conc=100.00)
o-Xylene	3.11671	2.95494	5.19			
1,3-Dichlorobenzene	1.83717	1.88150	2.41			
1,4-Dichlorobenzene	1.61421	1.66581	3.20			
1,2-Dichlorobenzene	1.42741	1.49493	4.73			
Toluene-d8	1.69988	1.49723	11.92			(Conc=180.00)
Bromofluorobenzene	1.04741	1.07886	3.00			(Conc=100.00)
Diethyl ether	.22600	.24279	7.43			(Conc=500.00)

RF - Response Factor from daily standard file at 50.00 ppb

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HSL Compounds

Case No:

Calibration Date: 10/27/92

Contractor: E.P.L.

Time: 22:24

Contract No: NJDEPE ID# 15526

Laboratory ID: >U5362

Instrument ID: GC/MSD #1

Initial Calibration Date: 10/20/92

Minimum $\overline{RF}$ for SPCC is .30

Maximum % Diff for CCC is 25%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC	
Chloromethane	1.28136	1.00891	21.26		**	
Bromomethane	3.56350	3.79699	6.55			
Vinyl Chloride	1.97246	1.75265	11.14	*		
Chloroethane	1.85262	1.70283	8.09			
Methyl tert-Butyl Ether	4.64109	4.35179	6.23			
Methylene Chloride	4.28970	4.24373	1.07			
Acrolein	.16356	.15834	3.19			(Conc=500.00)
Acrylonitrile	.25730	.25680	.19			(Conc=500.00)
Acetone	.78012	.78218	.26			
Carbon Disulfide	13.8242	10.5646	23.58			
1,1-Dichloroethene	3.15223	2.75138	12.72	*		
1,1-Dichloroethane	6.23895	5.33563	14.48		**	
tert-Butyl Alcohol	.08598	.08212	4.49			(Conc=500.00)
trans-1,2-Dichloroethene	5.26164	4.21587	19.88			
Trichlorofluoromethane	7.49104	6.60187	11.87			
Chloroform	8.86038	8.06368	8.99	*		
1,2-Dichloroethane-d4	2.29358	2.15653	5.98			(Conc=100.00)
1,2-Dichloroethane	4.12337	3.58684	13.01			
2-Butanone	.09677	.09095	6.02			
1,1,1-Trichloroethane	1.36023	1.24949	8.14			
Carbon Tetrachloride	1.18650	1.13685	4.18			
Bromodichloromethane	1.29358	1.25370	3.08			
Vinyl Acetate	.58768	.51357	12.61			
1,2-Dichloropropane	.60165	.55803	7.25	*		
cis-1,3-Dichloropropene	1.50097	1.43608	4.32			
Trichloroethene	.83241	.82498	.89			
Dibromochloromethane	.95834	1.02949	7.43			
1,1,2-Trichloroethane	.44874	.47960	6.88			
Benzene	1.62988	1.42725	12.43			
trans-1,3-Dichloropropene	.27115	.26154	3.54			
2-Chloroethylvinyl ether	.18189	.17662	2.90			
Bromoform	.55286	.57041	3.17		**	

RF - Response Factor from daily standard file at 50.00 ppb

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HSL Compounds

Case No:

Calibration Date: 10/27/92

Contractor: E.P.L.

Time: 22:24

Contract No: NJDEPE ID# 15526

Laboratory ID: >V5362

Instrument ID: GC/MSD #1

Initial Calibration Date: 10/20/92

Minimum $\overline{RF}$ for SPCC is .30

Maximum % Diff for CCC is 25%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC	
4-Methyl-2-Pentanone	.43455	.39889	8.21			
2-Hexanone	.17597	.15736	10.57			
Tetrachloroethene	1.07022	1.08033	.94			
1,1,2,2-Tetrachloroethane	.70932	.69714	1.72		**	
Toluene	2.66135	2.47343	7.06	*		
Chlorobenzene	1.82137	1.84446	1.27		**	
Ethylbenzene	3.30060	3.11994	5.47	*		
Styrene	2.20138	2.07044	5.95			
m + p-Xylenes	2.78650	2.84431	2.07			(Conc=100.00)
o-Xylene	3.11671	2.90506	6.79			
1,3-Dichlorobenzene	1.83717	1.78947	2.60			
1,4-Dichlorobenzene	1.61421	1.57625	2.35			
1,2-Dichlorobenzene	1.42741	1.41788	.67			
Toluene-d8	1.69988	1.66654	1.96			(Conc=100.00)
Bromofluorobenzene	1.04741	1.00885	3.68			(Conc=100.00)
Diethyl ether	.22600	.25915	14.67			(Conc=500.00)

RF - Response Factor from daily standard file at 50.00 ppb

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

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Continuin)libration Check
HSL Compounds

Case No:

Calibration Date: 10/30/92

Contractor: E.P.L.

Time: 10:38

Contract No: NJDEPE ID# 15526

Laboratory ID: >V5412

Instrument ID: GC/MSD #1

Initial Calibration Date: 10/20/92

Minimum $\overline{RF}$ for SPCC is .30

Maximum % Diff for CCC is 25%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC	
Chloromethane	1.28136	1.42497	11.21		**	
Bromomethane	3.56350	5.25171	47.38			
Vinyl Chloride	1.97246	2.24517	13.83	*		
Chloroethane	1.85262	2.62542	41.71			
Methyl tert-Butyl Ether	4.64109	4.65209	.24			
Methylene Chloride	4.28970	4.64636	8.31			
Acrolein	.16356	.18016	10.15			(Conc=500.00)
Acrylonitrile	.25730	.28763	11.79			(Conc=500.00)
Acetone	.78012	.67769	13.13			
Carbon Disulfide	13.8242	13.7629	.44			
1,1-Dichloroethene	3.15223	3.11384	1.22	*		
1,1-Dichloroethane	6.23895	5.69765	8.68		**	
tert-Butyl Alcohol	.08598	.07386	14.10			(Conc=500.00)
trans-1,2-Dichloroethene	5.26164	4.95498	5.83			
Trichlorofluoromethane	7.49104	6.92690	7.53			
Chloroform	8.86038	7.97901	9.95	*		
1,2-Dichloroethane-d4	2.29358	1.93489	15.64			(Conc=100.00)
1,2-Dichloroethane	4.12337	3.33024	19.24			
2-Butanone	.09677	.09101	5.95			
1,1,1-Trichloroethane	1.36023	1.59743	17.44			
Carbon Tetrachloride	1.18650	1.44374	21.68			
Bromodichloromethane	1.29358	1.35297	4.59			
Vinyl Acetate	.58768	.54273	7.65			
1,2-Dichloropropane	.60165	.61272	1.84	*		
cis-1,3-Dichloropropene	1.50097	1.35777	9.54			
Trichloroethene	.83241	.90926	9.23			
Dibromochloromethane	.95834	.87002	9.22			
1,1,2-Trichloroethane	.44874	.38603	13.97			
Benzene	1.62988	1.74667	7.17			
trans-1,3-Dichloropropene	.27115	.19636	27.58			
2-Chloroethylvinyl ether	.18189	.12213	32.86			
Bromoform	.55286	.50254	9.10		**	

RF - Response Factor from daily standard file at 50.00 ppb

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HSL Compounds

Case No:

Calibration Date: 10/30/92

Contractor: E.P.L.

Time: 10:38

Contract No: NJDEPE ID# 15526

Laboratory ID: >V5412

Instrument ID: GC/MSD #1

Initial Calibration Date: 10/20/92

Minimum $\overline{RF}$ for SPCC is .30

Maximum % Diff for CCC is 25%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC	
4-Methyl-2-Pentanone	.43455	.45656	5.06			
2-Hexanone	.17597	.12670	28.00			
Tetrachloroethene	1.07022	1.29156	20.68			
1,1,2,2-Tetrachloroethane	.70932	.88704	25.05		**	
Toluene	2.66135	3.01024	13.11	*		
Chlorobenzene	1.82137	1.90927	4.83		**	
Ethylbenzene	3.30060	3.44915	4.50	*		
Styrene	2.20138	2.10412	4.42			
m + p-Xylenes	2.78650	3.14011	12.69			(Conc=100.00)
o-Xylene	3.11671	3.72390	19.48			
1,3-Dichlorobenzene	1.83717	2.18733	19.06			
1,4-Dichlorobenzene	1.61421	1.98239	22.81			
1,2-Dichlorobenzene	1.42741	1.95327	36.84			
Toluene-d8	1.69988	1.90992	12.36			(Conc=100.00)
Bromofluorobenzene	1.04741	.96961	7.43			(Conc=100.00)
Diethyl ether	.22600	.36374	60.95			(Conc=500.00)

RF - Response Factor from daily standard file at 50.00 ppb

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Continuing Calibration Check
HC Compounds

Case No:

Calibration Date: 10/31/92

Contractor: E.P.L.

Time: 14:11

Contract No: NJDEPE ID# 15526

Laboratory ID: >V5428

Instrument ID: GC/MSD #1

Initial Calibration Date: 10/20/92

Minimum $\overline{RF}$ for SPCC is .30

Maximum % Diff for CCC is 25%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC	
Chloromethane	1.28136	.94388	26.34		**	
Bromomethane	3.56350	3.48553	2.19			
Vinyl Chloride	1.97246	1.49094	24.41	*		
Chloroethane	1.85262	1.67619	9.52			
Methyl tert-Butyl Ether	4.64109	3.69393	20.41			
Methylene Chloride	4.28970	3.34148	22.10			
Acrolein	.16356	.14666	10.34			(Conc=500.00)
Acrylonitrile	.25730	.24070	6.45			(Conc=500.00)
Acetone	.78012	.66595	14.63			
Carbon Disulfide	13.8242	9.38635	32.10			
1,1-Dichloroethene	3.15223	2.42613	23.03	*		
1,1-Dichloroethane	6.23895	4.71782	24.38		**	
tert-Butyl Alcohol	.08598	.07476	13.05			(Conc=500.00)
trans-1,2-Dichloroethene	5.26164	3.90874	25.71			
Trichlorofluoromethane	7.49104	5.78736	22.74			
Chloroform	8.86038	7.20816	18.65	*		
1,2-Dichloroethane-d4	2.29358	2.13399	6.96			(Conc=100.00)
1,2-Dichloroethane	4.12337	3.39589	17.64			
2-Butanone	.09677	.09011	6.88			
1,1,1-Trichloroethane	1.36023	1.21163	10.92			
Carbon Tetrachloride	1.18650	1.11049	6.41			
Bromodichloromethane	1.29358	1.24061	4.09			
Vinyl Acetate	.58768	.49255	16.19			
1,2-Dichloropropane	.60165	.53234	11.52	*		
cis-1,3-Dichloropropene	1.50097	1.38885	7.47			
Trichloroethene	.83241	.78313	5.92			
Dibromochloromethane	.95834	.99353	3.67			
1,1,2-Trichloroethane	.44874	.44642	.52			
Benzene	1.62988	1.39653	14.32			
trans-1,3-Dichloropropene	.27115	.25874	4.57			
2-Chloroethylvinyl ether	.18189	.15617	14.14			
Bromoform	.55286	.61280	10.84		**	

RF - Response Factor from daily standard file at 50.00 ppb

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

335

Continuing Calibration Check
Compounds

Case No:

Calibration Date: 10/31/92

Contractor: E.P.L.

Time: 14:11

Contract No: NJDEPE ID# 15526

Laboratory ID: >V5428

Instrument ID: GC/MSD #1

Initial Calibration Date: 10/20/92

Minimum $\overline{RF}$ for SPCC is .30

Maximum % Diff for CCC is 25%

Compound	$\overline{RF}$	RF	%Diff	CCC	SPCC	
4-Methyl-2-Pentanone	.43455	.40304	7.25			
2-Hexanone	.17597	.16314	7.29			
Tetrachloroethene	1.07022	1.06550	.44			
1,1,2,2-Tetrachloroethane	.70932	.74675	5.28		**	
Toluene	2.66135	2.46072	7.54	*		
Chlorobenzene	1.82137	1.72300	5.40		**	
Ethylbenzene	3.30060	3.13570	5.00	*		
Styrene	2.20138	1.96840	10.58			
m + p-Xylenes	2.78650	2.71732	2.48			(Conc=100.00)
o-Xylene	3.11671	2.76517	11.28			
1,3-Dichlorobenzene	1.83717	1.79836	2.11			
1,4-Dichlorobenzene	1.61421	1.54930	4.02			
1,2-Dichlorobenzene	1.42741	1.45842	2.17			
Toluene-d8	1.69988	1.67960	1.19			(Conc=100.00)
Bromofluorobenzene	1.04741	1.03599	1.09			(Conc=100.00)
Diethyl ether	.22600	.24008	6.23			(Conc=500.00)

RF - Response Factor from daily standard file at 50.00 ppb

$\overline{RF}$ - Average Response Factor from Initial Calibration Form VI

%Diff - % Difference from original average or curve

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Cal[illegible]tion Data
HSL Compounds

Case No:

Instrument ID: GC/MSD #1

Contractor: E.P.L.

Calibration Date: 10/20/92

Contract No: NJDEPE ID# 15526

Minimum $\overline{RF}$ for SPCC is .30 Maximum % RSD for CCC is 30%

Laboratory ID: >V5268 >V5267 >V5269 >V5270 >V5271

Compound	RF 20.00	RF 50.00	RF 100.00	RF 150.00	RF 200.00	$\overline{RRT}$	$\overline{RF}$	% RSD	CCC	SPCC	
Chloromethane	1.50294	1.49992	1.23329	1.26730	.90332	.287	1.28136	19.207		**	
Bromomethane	2.99361	3.06827	4.19806	4.11264	3.44492	.347	3.56350	15.926			
Vinyl Chloride	2.37503	2.39296	1.75423	1.91730	1.42279	.296	1.97246	21.082	*		
Chloroethane	2.06558	1.67363	1.97650	1.95322	1.59418	.350	1.85262	11.116			
Methyl tert-Butyl Ether	5.23012	4.46234	4.55414	4.35144	4.60740	.590	4.64109	7.398			
Methylene Chloride	6.52683	4.31940	3.68406	3.67415	3.24404	.555	4.28970	30.495			
Acrolein	.19388	.14394	.15627	.15387	.16984	.440	.16356	11.804			(Conc=200.0,500.0,1000.
Acrylonitrile	.31782	.22703	.23784	.23622	.26759	.579	.25730	14.422			(Conc=200.0,500.0,1000.
Acetone	1.08049	.64897	.68880	.66465	.81769	.450	.78012	23.154			
Carbon Disulfide	14.2782	15.1274	14.0606	13.8156	11.8392	.552	13.8242	8.786			
1,1-Dichloroethene	3.32574	3.32445	3.21478	3.19919	2.69700	.471	3.15223	8.289	*		
1,1-Dichloroethane	6.41226	6.33833	6.46757	6.29424	5.68233	.716	6.23895	5.101		**	
tert-Butyl Alcohol	.12654	.06211	.06182	.08538	.09405	.486	.08598	31.121			(Conc=200.0,500.0,1000.0
trans-1,2-Dichloroethene	5.48229	5.34734	5.44542	5.29069	4.74247	.615	5.26164	5.703			
Trichlorofluoromethane	7.68374	8.19352	7.77534	7.41394	6.38869	.383	7.49104	9.036			
Chloroform	8.97644	9.21552	9.13957	8.79679	8.17359	.947	8.86038	4.699	*		
1,2-Dichloroethane-d4	2.27053	2.26971	2.33545	2.26930	2.32291	1.207	2.29358	1.430			(Conc=100.0,100.0,100.0,
1,2-Dichloroethane	4.26473	4.15584	4.22888	3.94809	4.01933	1.241	4.12337	3.292			
2-Butanone	.14133	.08539	.08184	.08521	.09008	.616	.09677	25.920			
1,1,1-Trichloroethane	1.42998	1.40101	1.37080	1.32401	1.27538	.800	1.36023	4.525			
Carbon Tetrachloride	1.20523	1.22422	1.20203	1.16924	1.13177	.863	1.18650	3.070			
Bromodichloromethane	1.31961	1.31057	1.31020	1.21944	1.30806	1.173	1.29358	3.222			
Vinyl Acetate	.64791	.54036	.56471	.55417	.63126	.531	.58768	8.256			
1,2-Dichloropropane	.61714	.60474	.60838	.57505	.60292	1.118	.60165	2.633	*		
cis-1,3-Dichloropropene	1.52169	1.49737	1.53565	1.40337	1.54677	1.323	1.50097	3.837			
Trichloroethene	.85254	.85548	.84841	.80629	.79933	1.070	.83241	3.273			
Dibromochloromethane	.98735	.94819	.97105	.88207	1.00302	1.597	.95834	4.927			
1,1,2-Trichloroethane	.48914	.43663	.44227	.40730	.46835	1.485	.44874	6.979			
Benzene	1.70335	1.66594	1.63209	1.60501	1.54302	.908	1.62988	3.740			
trans-1,3-Dichloropropene	.27867	.25889	.27571	.25326	.28920	1.454	.27115	5.449			

RF - Response Factor (Subscript is amount in ppb)

$\overline{RRT}$ - Average Relative Retention Time (RT Std/RT Istd)

$\overline{RF}$ - Average Response Factor

%RSD - Percent Relative Standard Deviation

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

Initial Calibration Data
HSL Compounds

Case No:

Instrument ID: GC/MSD #1

Contractor: E.P.L.

Calibration Date: 10/20/92

Contract No: NJDEPE ID# 15526

Minimum $\overline{RF}$ for SPCC is .30 Maximum % RSD for CCC is 30%

Laboratory ID:	>V5268	>V5267	>V5269	>V5270	>V5271						
Compound	RF 20.00	RF 50.00	RF 100.00	RF 150.00	RF 200.00	$\overline{RRT}$	$\overline{RF}$	% RSD	CCC	SPCC	
2-Chloroethylvinyl ether	.19725	.16887	.18343	.15994	.19995	1.279	.18189	9.586			
Bromoform	.62420	.51703	.53621	.50415	.58272	1.976	.55286	9.005		**	
4-Methyl-2-Pentanone	.50746	.39358	.41056	.37438	.48678	.736	.43455	13.575			
2-Hexanone	.22675	.15072	.15799	.14286	.20151	.864	.17597	20.662			
Tetrachloroethene	1.07964	1.12434	1.08302	1.05412	1.00996	.890	1.07022	3.929			
1,1,2,2-Tetrachloroethane	.85100	.63396	.66487	.65771	.73904	1.169	.70932	12.466		**	
Toluene	2.71636	2.73374	2.68535	2.59823	2.57307	.800	2.66135	2.698	*		
Chlorobenzene	1.84549	1.80756	1.87468	1.80640	1.77272	1.005	1.82137	2.162		**	
Ethylbenzene	3.34626	3.34865	3.38158	3.27018	3.15631	1.019	3.30060	2.739	*		
Styrene	2.26810	2.19597	2.24196	2.18267	2.11820	1.096	2.20138	2.629			
m + p-Xylenes	3.13549	3.08067	2.53435	2.81919	2.36279	1.031	2.78650	12.070			(Conc=40.0,100.0,200.0,3
o-Xylene	3.20746	3.15608	3.18110	3.08625	2.95265	1.090	3.11671	3.279			
1,3-Dichlorobenzene	1.92379	1.87945	1.77328	1.85845	1.75086	1.330	1.83717	3.970			
1,4-Dichlorobenzene	1.73771	1.63695	1.54290	1.61479	1.53872	1.346	1.61421	5.047			
1,2-Dichlorobenzene	1.55009	1.48125	1.31546	1.44555	1.34469	1.395	1.42741	6.797			
Toluene-d8	1.67182	1.68428	1.71921	1.70405	1.72006	.789	1.69988	1.258			(Conc=100.0,100.0,100.0,1
Bromofluorobenzene	1.00324	.99381	1.06747	1.15179	1.02073	1.176	1.04741	6.193			(Conc=100.0,100.0,100.0,1
Diethyl ether	.25659	.22226	.21098	.21817	.22199	.178	.22600	7.830			(Conc=200.0,500.0,1000.0,

RF - Response Factor (Subscript is amount in ppb)

$\overline{RRT}$ - Average Relative Retention Time (RT Std/RT Istd)

$\overline{RF}$ - Average Response Factor

%RSD - Percent Relative Standard Deviation

CCC - Calibration Check Compounds (*) SPCC - System Performance Check Compounds (**)

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Environmental Profile Labs

Lab Code: 15526

Matrix Spike - EPL Sample No.: 9148.2 5mL

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	#	QC LIMITS REC.
1,1-Dichloroethene	100.00	0.00	74.20	74		61-145
Trichloroethene	100.00	0.00	113.00	113		71-120
Benzene	100.00	0.00	103.00	103		76-127
Toluene	100.00	0.00	95.50	95		76-125
Chlorobenzene	100.00	0.00	109.00	109		75-130

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	#	% RPD	#	QC LIMITS RPD	REC.
1,1-Dichloroethene	100.00	78.80	78		5		14	61-145
Trichloroethene	100.00	113.00	113		0		14	71-120
Benzene	100.00	104.00	103		0		11	76-127
Toluene	100.00	94.00	93		2		13	76-125
Chlorobenzene	100.00	112.00	112		2		13	75-130

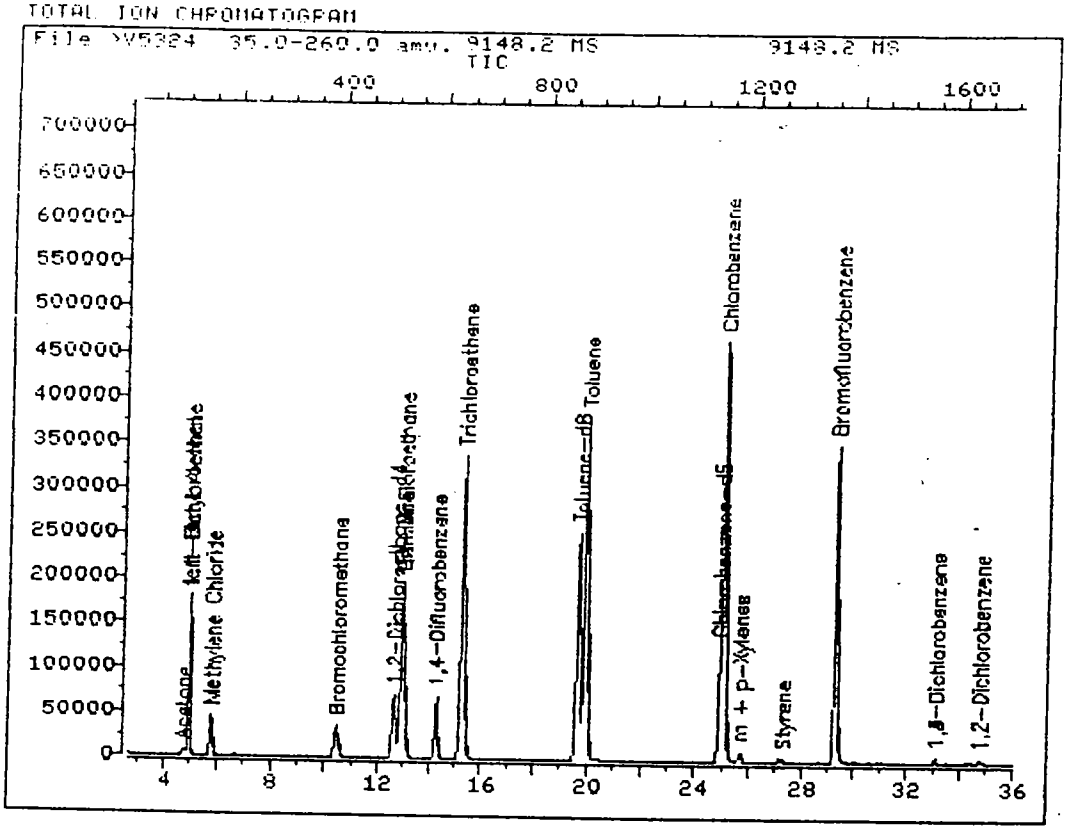
Column to be used to flag recovery and RPD values with an asterisk

* Values outside of qc limits

RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

COMMENTS: _____

TOTAL ION CHROMATOGRAM



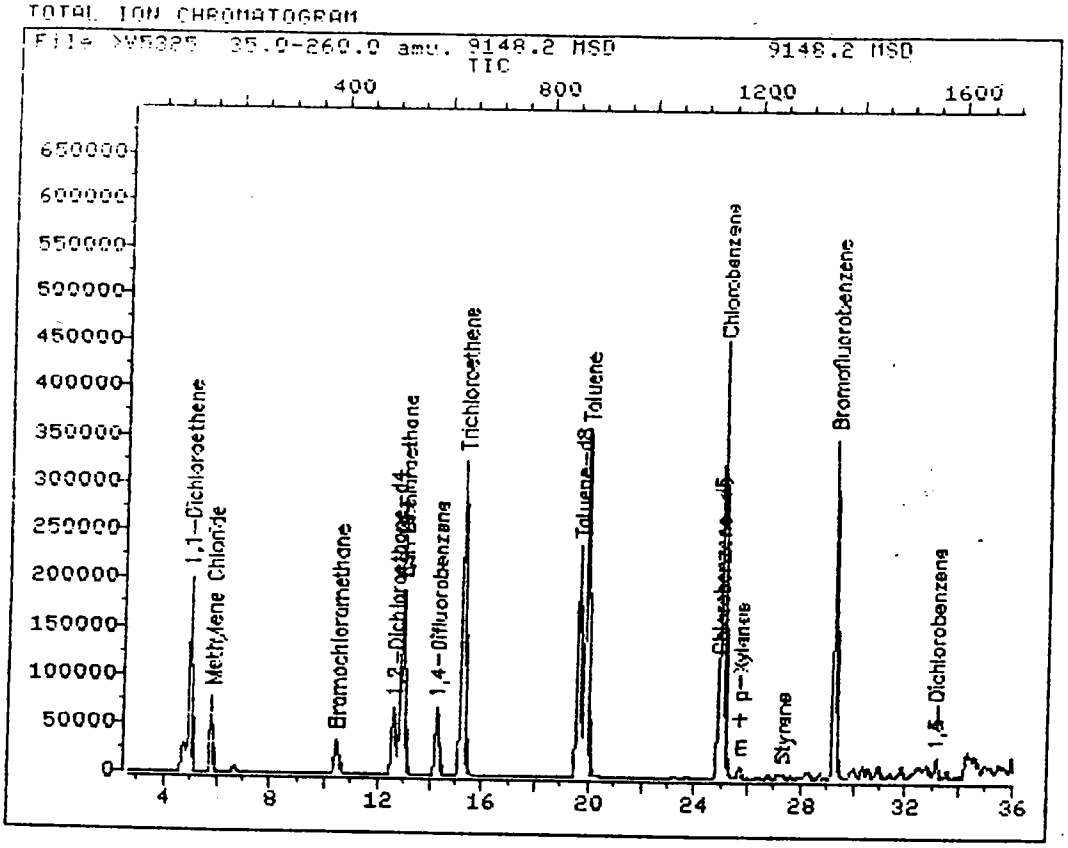
Data File: >V5324::D1
Name: 9148.2 MS
Misc: 9148.2 MS

Quant Output File: ^V5324::DB

Id File: IDVOA::D2
Title: HSL VOLATILE ORGANICS
Last Calibration: 921020 16:10

Operator ID: MARK
Quant Time: 921023 20:21
Injected at: 921023 19:44

TOTAL ION CHROMATOGRAM



Data File: >V5325::D1
Name: 9148.2 MSD
Misc: 9148.2 MSD

Quant Output File: ^V5325::DB

Id File: IDVOA::D2
Title: HSL VOLATILE ORGANICS
Last Calibration: 921020 16:10

Operator ID: MARK
Quant Time: 921023 21:03
Injected at: 921023 20:26

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Environmental Profile Labs Contract: CVI

Lab Code: 15526

Matrix Spike - EPL Sample No.: 9173.22 5m

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	#	QC LIMITS REC.
1,1-Dichloroethene	100.00	0.00	77.40	77		61-145
Trichloroethene	100.00	0.00	103.00	103		71-120
Benzene	100.00	2.83	90.60	87		76-127
Toluene	100.00	0.00	89.30	89		76-125
Chlorobenzene	100.00	0.00	102.00	102		75-130

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	#	% RPD	#	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	100.00	86.00	85		9		14	61-145
Trichloroethene	100.00	118.00	117		12		14	71-120
Benzene	100.00	105.00	101		14	*	11	76-127
Toluene	100.00	102.00	101		12		13	76-125
Chlorobenzene	100.00	118.00	117		13		13	75-130

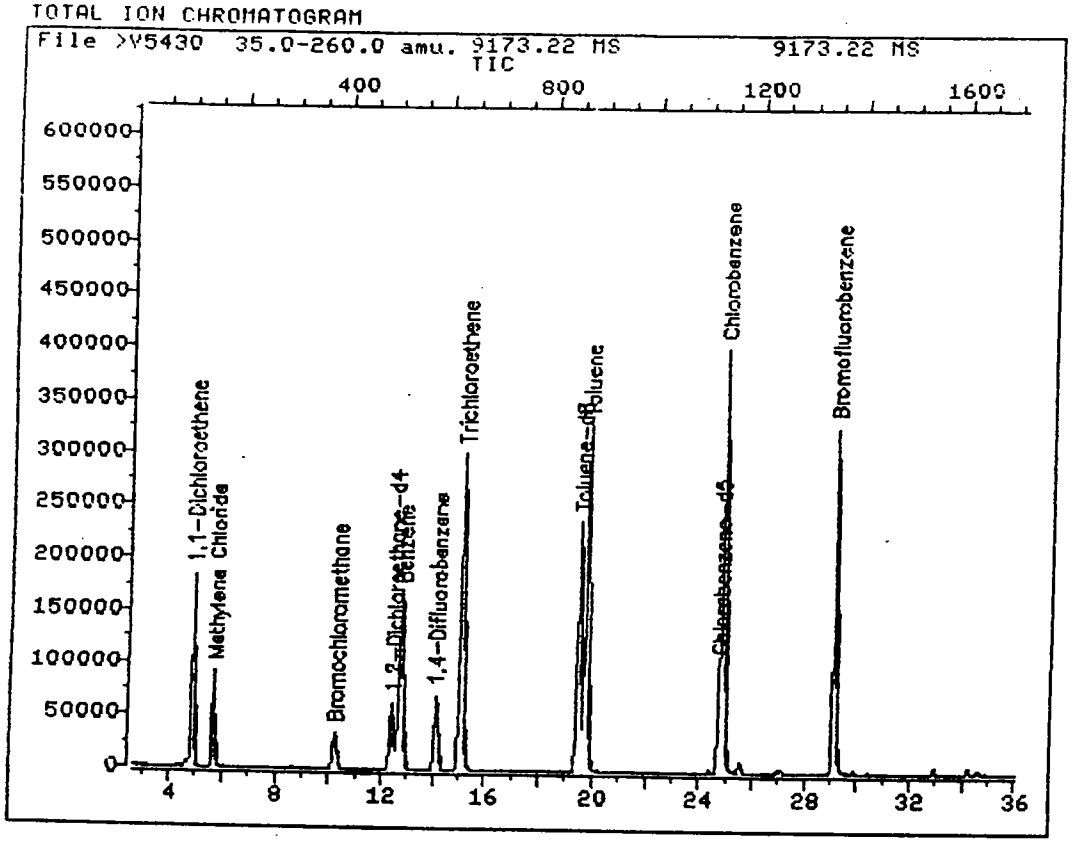
Column to be used to flag recovery and RPD values with an asterisk

* Values outside of qc limits

RPD: 1 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

COMMENTS: _____

TOTAL ION CHROMATOGRAM

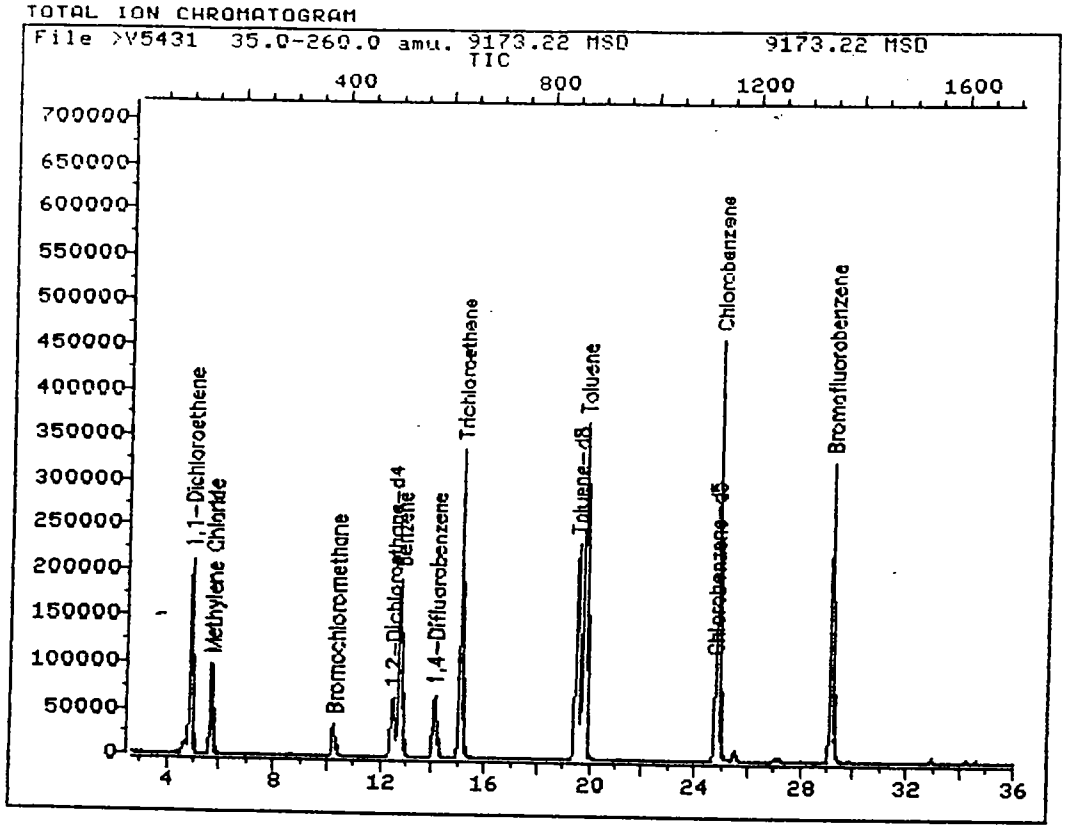


Data File: >V5430::D1 **Quant Output File: ^V5430::DB**
Name: 9173.22 MS
Misc: 9173.22 MS

Id File: IDVOA::D2
Title: HSL VOLATILE ORGANICS
Last Calibration: 921031 15:57

Operator ID: MARK
Quant Time: 921031 16:30
Injected at: 921031 15:53

TOTAL ION CHROMATOGRAM



Data File: >V5431::D1 Quant Output File: ^V5431::DB
Name: 9173.22 MSD
Misc: 9173.22 MSD

Id File: IDVOA::D2
Title: HSL VOLATILE ORGANICS
Last Calibration: 921031 15:57

Operator ID: MARK
Quant Time: 921031 17:13
Injected at: 921031 16:36

4A

VOLATILE METHOD BLANK SUMMARY

Lab Name: Environmental Profile Lab Contract: Serv-Air

Lab Code: 15526

Lab File ID: >V5347 Lab Sample ID: VOA BLANK

Date Analyzed: 10/27/92 Time Analyzed: 11:36

Matrix: Water

Instrument ID: GC/MSD 5970 #1

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	CCC/SPCC	CCC/SPCC	>V5346	10:27
02	9173.9 5mL	9173.9 5mL	>V5352	15:38
03	9173.2 5mL	9173.2 5mL	>V5353	16:20
04	9173.3 5mL	9173.3 5mL	>V5356	18:26
05	9173.5 5mL	9173.5 5mL	>V5358	19:50
06	9173.6 5mL	9173.6 5mL	>V5359	20:33
07				
08				
09				
10				
11				
12				
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14				
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25				
26				
27				
28				
29				
30				

COMMENTS: _____

4A

VOLATILE METHOD BLANK SUMMARY

Lab Name: Environmental Profile Lab Contract: Serv-Air

Lab Code: 15526

Lab File ID: >V5363 Lab Sample ID: VOA Blank

Date Analyzed: 10/27/92 Time Analyzed: 23:37

Matrix: Water

Instrument ID: GC/MSD 5970 #1

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	CCC/SPCC	CCC/SPCCC	>V5362	22:24
02	9173.25 5m	9173.25 5m	>V5364	0:19
03	9173.26 5m	9173.26 5m	>V5365	1:01
04	9173.14 5m	9173.14 5m	>V5366	1:43
05	9173.13 5m	9173.13 5m	>V5367	2:26
06	9173.23 5m	9173.23 5m	>V5368	3:08
07	9173.12 5m	9173.12 5m	>V5369	3:50
08	9173.21 5m	9173.21 5m	>V5370	4:33
09	9173.19 5m	9173.19 5m	>V5371	5:15
10	9173.11 5m	9173.11 5m	>V5372	5:58
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
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COMMENTS: _____

4A

VOLATILE METHOD BLANK SUMMARY

Lab Name: Environmental Profile Lab Contract: Serv-Air

Lab Code: 15526

Lab File ID: >V5413 Lab Sample ID: VOA BLANK

Date Analyzed: 10/30/92 Time Analyzed: 11:42

Matrix: Water

Instrument ID: GC/MSD 5970 #1

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	CCC/SPCC	CCC/SPCC	>V5412	10:38
02	9173.1 5uL	9173.1 5uL	>V5415	13:26
03	9173.8 50u	9173.8 50u	>V5418	15:31
04	9173.10 50	9173.10 50	>V5419	16:12
05	9173.15 .5	9173.15 .5	>V5421	17:37
06	9173.16 .5	9173.16 .5	>V5422	18:19
07	9173.24 .5	9173.24 .5	>V5423	19:01
08	9173.17 5m	9173.17 5m	>V5424	19:43
09	9173.22 5m	9173.22 5m	>V5426	21:07
10				
11				
12				
13				
14				
15				
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COMMENTS: _____

4A

VOLATILE METHOD BLANK SUMMARY

Lab Name: Environmental Profile Lab Contract: Serv-Air

Lab Code: 15526

Lab File ID: >V5429 Lab Sample ID: VOA Blank

Date Analyzed: 10/31/92 Time Analyzed: 15:10

Matrix: Water

Instrument ID: GC/MSD 5970 #1

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	CCC/SPCC	CCC/SPCC	>V5428	14:11
02	9173.22 MS	9173.22 MS	>V5430	15:53
03	9173.22 MS	9173.22 MS	>V5431	16:36
04	9173.7 50u	9173.7 50u	>V5432	17:18
05	9173.4 .5m	9173.4 .5m	>V5433	18:01
06	9173.20 5m	9173.20 5m	>V5434	18:42
07	9173.18 5m	9173.18 5m	>V5436	20:07
08				
09				
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11				
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29				
30				

COMMENTS: _____

Environmental Profile Laboratories
VOLATILE ORGANIC ANALYSIS DATA

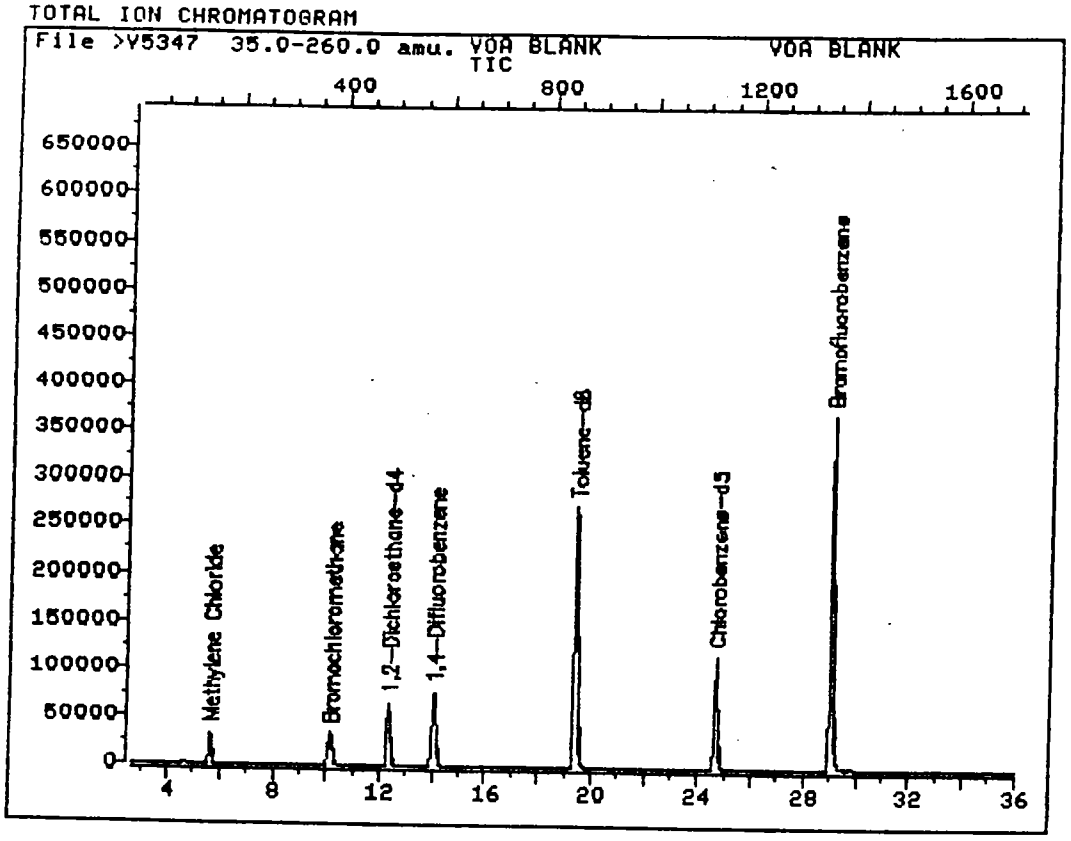
JOB NUMBER		MATRIX	Water
SAMPLE NAME	VOA BLANK	DILUTION FACTOR	1.00
CLIENT ID		QA BATCH	
DATA FILE	>V5347	DATE ANALYZED	10/27/92

COMPOUND	UG/L		MDL
Chloromethane	ND		10
Bromomethane	ND		10
Vinyl Chloride	ND		10
Chloroethane	ND		10
Methylene Chloride	12	B	5
Acrolein	ND		50
Acrylonitrile	ND		50
Acetone	ND		5
Carbon Disulfide	ND		5
1,1-Dichloroethene	ND		5
1,1-Dichloroethane	ND		5
trans-1,2-Dichloroethene	ND		5
Trichlorofluoromethane	ND		5
Chloroform	ND		5
1,2-Dichloroethane	ND		5
2-Butanone	ND		5
1,1,1-Trichloroethane	ND		5
Carbon Tetrachloride	ND		5
Bromodichloromethane	ND		5
Vinyl Acetate	ND		5
1,2-Dichloropropane	ND		5
cis-1,3-Dichloropropene	ND		5
Trichloroethene	ND		5

COMPOUND	UG/L	MDL
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5
trans-1,3-Dichloropropene	ND	5
2-Chloroethylvinyl ether	ND	5
Bromoform	ND	5
2-Hexanone	ND	5
4-Methyl-2-Pentanone	ND	5
Tetrachloroethene	ND	5
1,1,2,2-Tetrachloroethane	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethylbenzene	ND	5
Styrene	ND	5
o-Xylene	ND	5
m + p-Xylenes	ND	5
1,3-Dichlorobenzene	ND	5
1,2-Dichlorobenzene	ND	5
1,4-Dichlorobenzene	ND	5
tert-Butyl Alcohol	ND	50
Methyl tert-Butyl Ether	ND	5
Diethyl ether	ND	50
		0

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

TOTAL ION CHROMATOGRAM



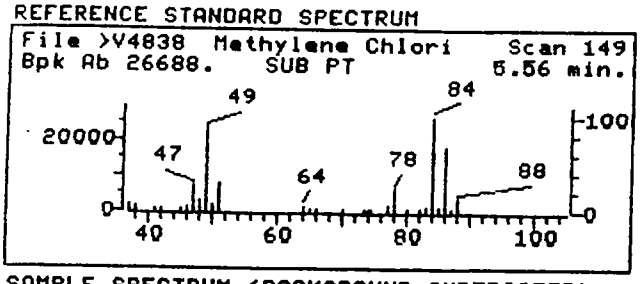
Data File: >V5347::D1
Name: VOA BLANK
Misc: VOA BLANK

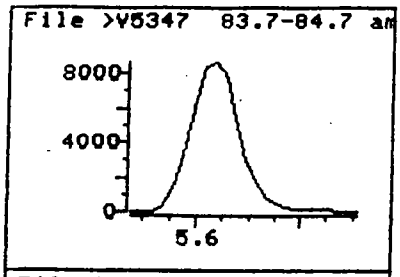
Quant Output File: ^V5347::DB

Id File: IDVOA::D2
Title: HSL VOLATILE ORGANICS
Last Calibration: 921020 16:10

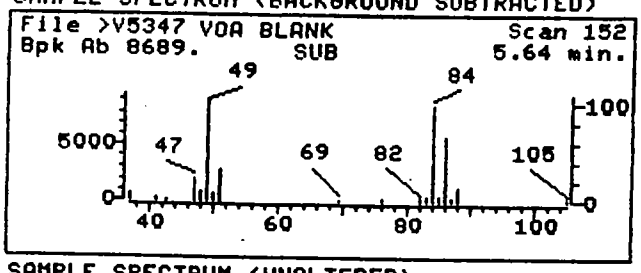
Operator ID: MARK
Quant Time: 921027 12:13
Injected at: 921027 11:36

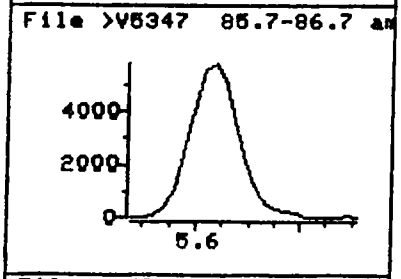
REFERENCE STANDARD SPECTRUM



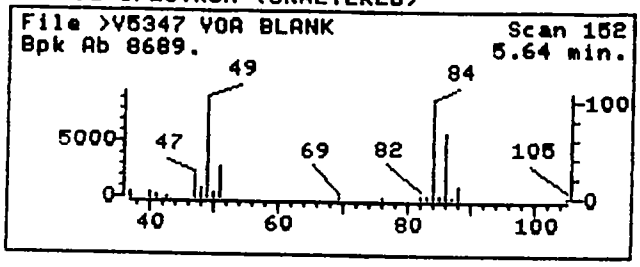


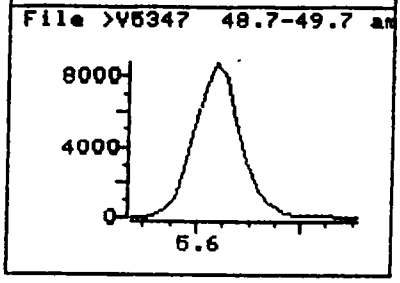
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)





SAMPLE SPECTRUM (UNALTERED)





Data File: >V5347::D1
Name: VOA BLANK
Misc: VOA BLANK
Quant Time: 921027 12:13
Injected at: 921027 11:36

Quant Output File: ^V5347::DB

Quant ID File: IDVOA::D2
Last Calibration: 921020 16:10

Compound No: 7
Compound Name: Methylene Chloride
Scan Number: 152
Retention Time: 5.64 min.
Quant Ion: 84.0
Area: 56606
Concentration: 11.84 ppb
q-value: 90

Environmental Profile Laboratories
VOLATILE ORGANIC ANALYSIS DATA

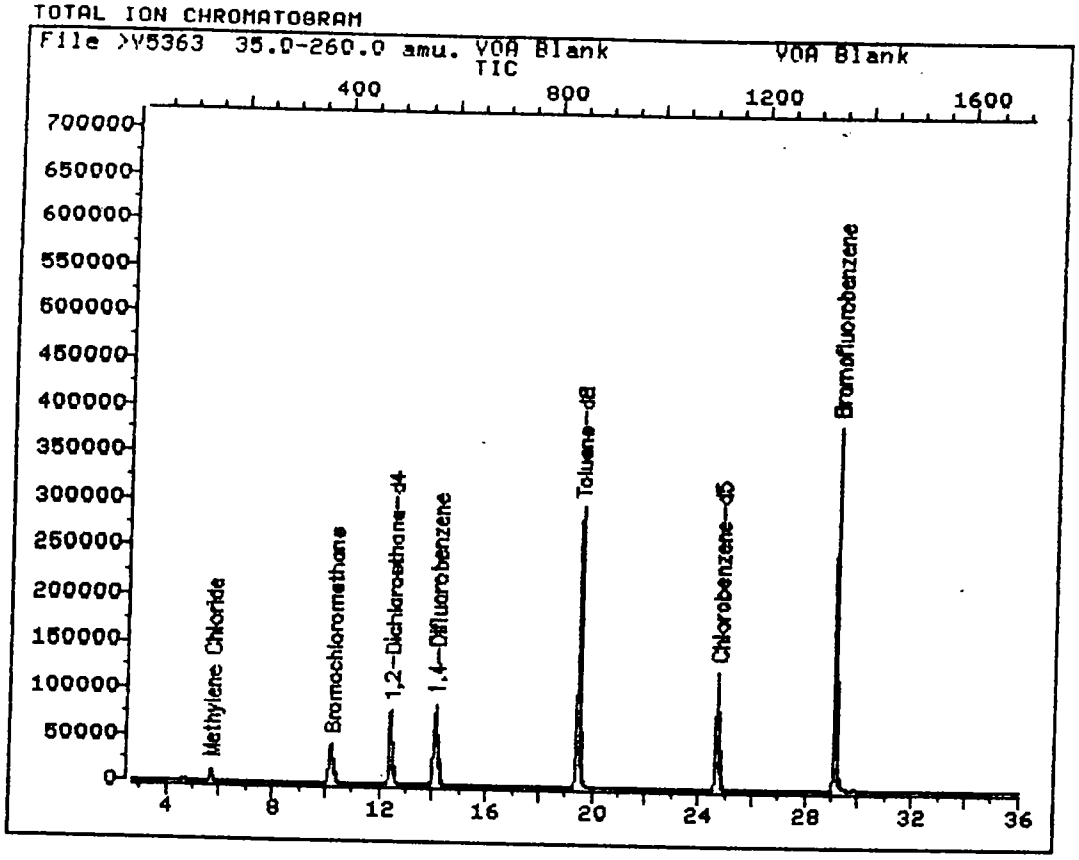
JOB NUMBER		MATRIX	Water
SAMPLE NAME	VOA Blank	DILUTION FACTOR	1.00
CLIENT ID		QA BATCH	
DATA FILE	>V5363	DATE ANALYZED	10/27/92

COMPOUND	UG/L	MDL
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl Chloride	ND	10
Chloroethane	ND	10
Methylene Chloride	4 JB	5
Acrolein	ND	50
Acrylonitrile	ND	50
Acetone	ND	5
Carbon Disulfide	ND	5
1,1-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
trans-1,2-Dichloroethene	ND	5
Trichlorofluoromethane	ND	5
Chloroform	ND	5
1,2-Dichloroethane	ND	5
2-Butanone	ND	5
1,1,1-Trichloroethane	ND	5
Carbon Tetrachloride	ND	5
Bromodichloromethane	ND	5
Vinyl Acetate	ND	5
1,2-Dichloropropane	ND	5
cis-1,3-Dichloropropene	ND	5
Trichloroethene	ND	5

COMPOUND	UG/L	MDL
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5
trans-1,3-Dichloropropene	ND	5
2-Chloroethylvinyl ether	ND	5
Bromoform	ND	5
2-Hexanone	ND	5
4-Methyl-2-Pentanone	ND	5
Tetrachloroethene	ND	5
1,1,2,2-Tetrachloroethane	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethylbenzene	ND	5
Styrene	ND	5
o-Xylene	ND	5
m + p-Xylenes	ND	5
1,3-Dichlorobenzene	ND	5
1,2-Dichlorobenzene	ND	5
1,4-Dichlorobenzene	ND	5
tert-Butyl Alcohol	ND	50
Methyl tert-Butyl Ether	ND	5
Diethyl ether	ND	50
		0

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

TOTAL ION CHROMATOGRAM



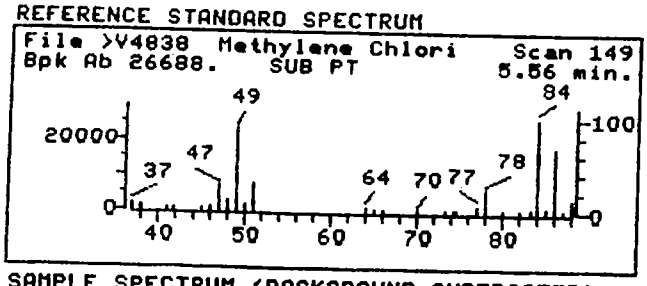
Data File: >V5363::D1
Name: VOA Blank
Misc: VOA Blank

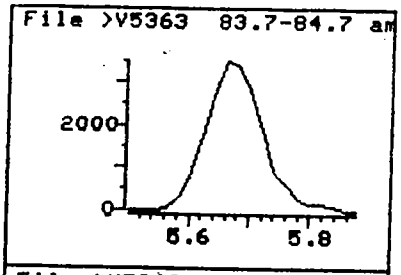
Quant Output File: ^V5363::DB

Id File: IDVOA::D2
Title: HSL VOLATILE ORGANICS
Last Calibration: 921027 22:05

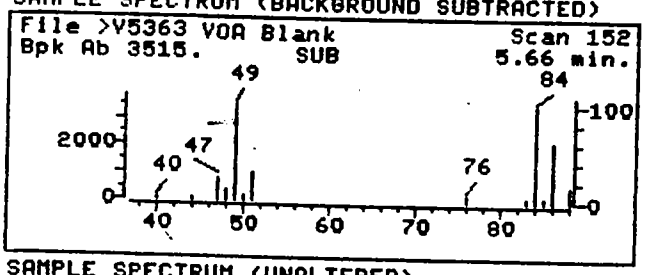
Operator ID: MARK
Quant Time: 921028 00:14
Injected at: 921027 23:37

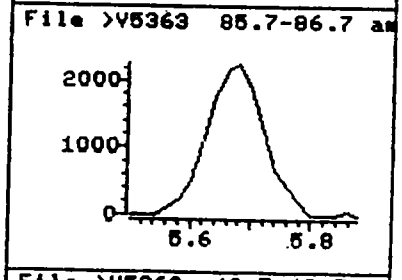
REFERENCE STANDARD SPECTRUM



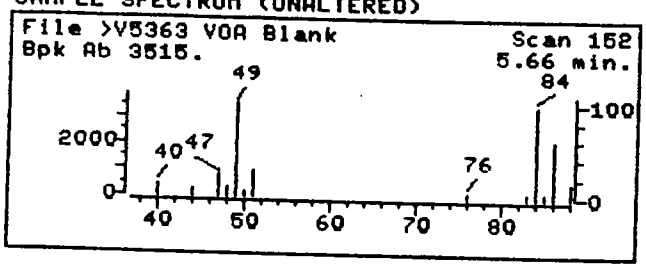


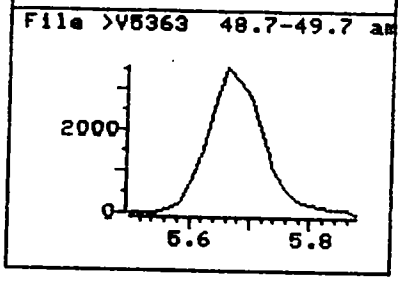
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)





SAMPLE SPECTRUM (UNALTERED)





Data File: >V5363::D1
Name: VOA Blank
Misc: VOA Blank
Quant Time: 921028 00:14
Injected at: 921027 23:37

Quant Output File: ^V5363::DB

Quant ID File: IDVOA::D2
Last Calibration: 921027 22:05

Compound No: 7
Compound Name: Methylene Chloride
Scan Number: 152
Retention Time: 5.66 min.
Quant Ion: 84.0
Area: 22779
Concentration: 3.84 ppb
q-value: 88

Environmental Profile Laboratories
VOLATILE ORGANIC ANALYSIS DATA

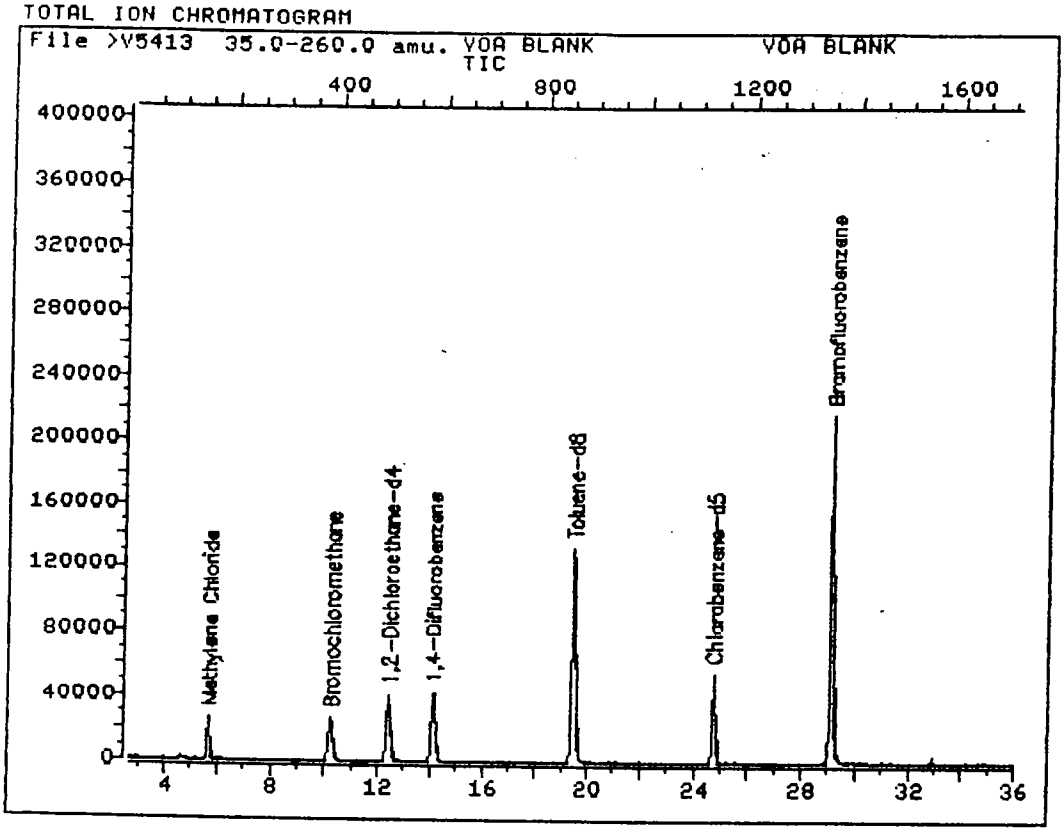
JOB NUMBER		MATRIX	Water
SAMPLE NAME	VOA BLANK	DILUTION FACTOR	1.00
CLIENT ID		QA BATCH	
DATA FILE	>V5413	DATE ANALYZED	10/30/92

COMPOUND	UG/L		MDL
Chloromethane	ND		10
Bromomethane	ND		10
Vinyl Chloride	ND		10
Chloroethane	ND		10
Methylene Chloride	13	B	5
Acrolein	ND		50
Acrylonitrile	ND		50
Acetone	ND		5
Carbon Disulfide	ND		5
1,1-Dichloroethene	ND		5
1,1-Dichloroethane	ND		5
trans-1,2-Dichloroethene	ND		5
Trichlorofluoromethane	ND		5
Chloroform	ND		5
1,2-Dichloroethane	ND		5
2-Butanone	ND		5
1,1,1-Trichloroethane	ND		5
Carbon Tetrachloride	ND		5
Bromodichloromethane	ND		5
Vinyl Acetate	ND		5
1,2-Dichloropropane	ND		5
cis-1,3-Dichloropropene	ND		5
Trichloroethene	ND		5

COMPOUND	UG/L	MDL
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5
trans-1,3-Dichloropropene	ND	5
2-Chloroethylvinyl ether	ND	5
Bromoform	ND	5
2-Hexanone	ND	5
4-Methyl-2-Pentanone	ND	5
Tetrachloroethene	ND	5
1,1,2,2-Tetrachloroethane	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethylbenzene	ND	5
Styrene	ND	5
o-Xylene	ND	5
m + p-Xylenes	ND	5
1,3-Dichlorobenzene	ND	5
1,2-Dichlorobenzene	ND	5
1,4-Dichlorobenzene	ND	5
tert-Butyl Alcohol	ND	50
Methyl tert-Butyl Ether	ND	5
Diethyl ether	ND	50
		0

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

TOTAL ION CHROMATOGRAM



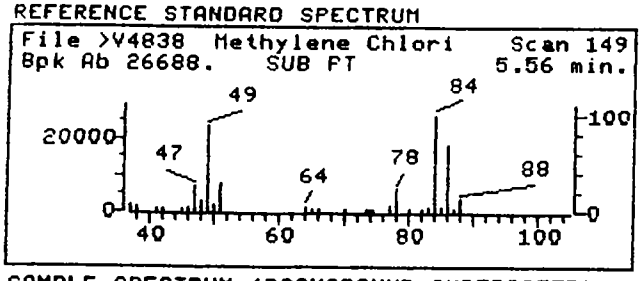
Data File: >V5413::D1
Name: VOA BLANK
Misc: VOA BLANK

Quant Output File: ^V5413::DB

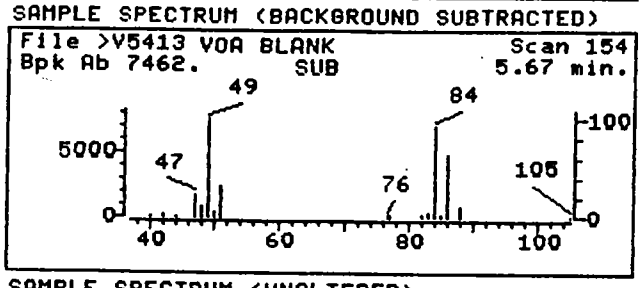
Id File: IDVOA::D2
Title: HSL VOLATILE ORGANICS
Last Calibration: 921027 22:05

Operator ID: MARK
Quant Time: 921030 12:19
Injected at: 921030 11:42

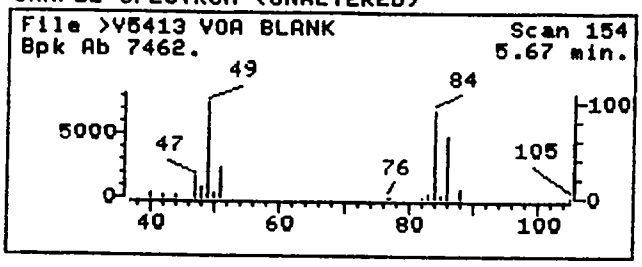
REFERENCE STANDARD SPECTRUM

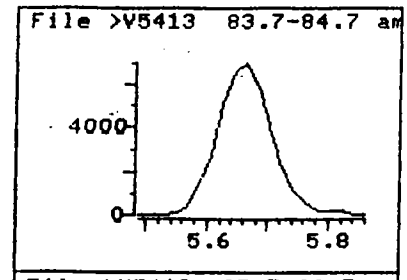


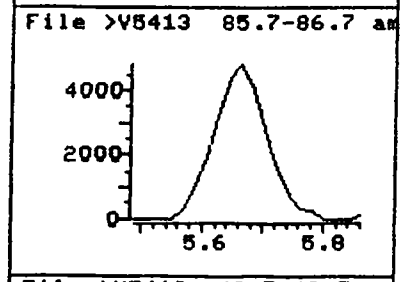
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

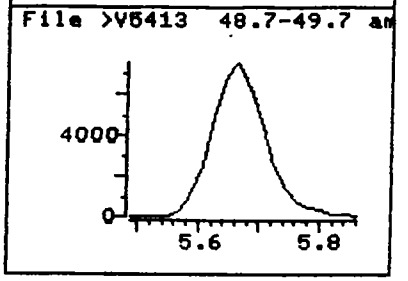


SAMPLE SPECTRUM (UNALTERED)









Data File: >V5413::D1
Name: VOA BLANK
Misc: VOA BLANK
Quant Time: 921030 12:19
Injected at: 921030 11:42

Quant Output File: ^V5413::DB

Quant ID File: IDVOA::D2
Last Calibration: 921027 22:05

Compound No: 7
Compound Name: Methylene Chloride
Scan Number: 154
Retention Time: 5.67 min.
Quant Ion: 84.0
Area: 44004
Concentration: 12.63 ppb
q-value: 85

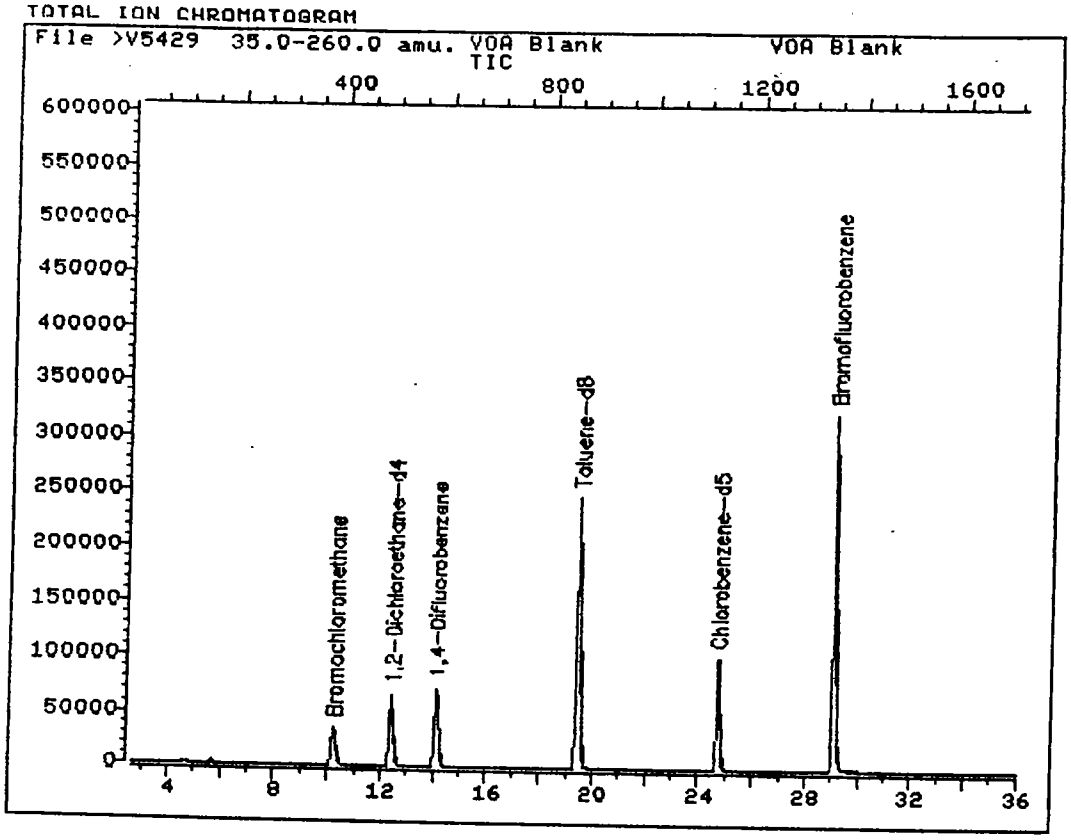
Environmental Profile Laboratories
VOLATILE ORGANIC ANALYSIS DATA

JOB NUMBER		MATRIX	Water
SAMPLE NAME	VOA Blank	DILUTION FACTOR	1.00
CLIENT ID		QA BATCH	
DATA FILE	>V5429	DATE ANALYZED	10/31/92

COMPOUND	UG/L	MDL	COMPOUND	UG/L	MDL
Chloromethane	ND	10	Dibromochloromethane	ND	5
Bromomethane	ND	10	1,1,2-Trichloroethane	ND	5
Vinyl Chloride	ND	10	Benzene	ND	5
Chloroethane	ND	10	trans-1,3-Dichloropropene	ND	5
Methylene Chloride	ND	5	2-Chloroethylvinyl ether	ND	5
Acrolein	ND	50	Bromoform	ND	5
Acrylonitrile	ND	50	2-Hexanone	ND	5
Acetone	ND	5	4-Methyl-2-Pentanone	ND	5
Carbon Disulfide	ND	5	Tetrachloroethene	ND	5
1,1-Dichloroethene	ND	5	1,1,2,2-Tetrachloroethane	ND	5
1,1-Dichloroethane	ND	5	Toluene	ND	5
trans-1,2-Dichloroethene	ND	5	Chlorobenzene	ND	5
Trichlorofluoromethane	ND	5	Ethylbenzene	ND	5
Chloroform	ND	5	Styrene	ND	5
1,2-Dichloroethane	ND	5	o-Xylene	ND	5
2-Butanone	ND	5	m + p-Xylenes	ND	5
1,1,1-Trichloroethane	ND	5	1,3-Dichlorobenzene	ND	5
Carbon Tetrachloride	ND	5	1,2-Dichlorobenzene	ND	5
Bromodichloromethane	ND	5	1,4-Dichlorobenzene	ND	5
Vinyl Acetate	ND	5	tert-Butyl Alcohol	ND	50
1,2-Dichloropropane	ND	5	Methyl tert-Butyl Ether	ND	5
cis-1,3-Dichloropropene	ND	5	Diethyl ether	ND	50
Trichloroethene	ND	5			0

(J) Indicates detected below MDL
(B) Indicates also present in blank
(ND) Indicates compound not detected

TOTAL ION CHROMATOGRAM



Data File: >V5429::D1
Name: VOA Blank
Misc: VOA Blank

Quant Output File: ^V5429::DB

Id File: IDVOA::D2
Title: HSL VOLATILE ORGANICS
Last Calibration: 921030 12:33

Operator ID: MARK
Quant Time: 921031 15:47
Injected at: 921031 15:10

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LAB SAMPLE NO

VOA BLANK

Lab Name: Environmental Profile Lab . NJDEP Cert.# 15526

Matrix: Water

Sample wt/vol: 5.0 (g/mL) mL

Column: Capillary

Lab Sample ID: VOA BLANK

Lab File ID: >V5347

Date Analyzed: 10/27/92

Dilution Factor: 1

Number of TICs found: 0

CONCENTRATION UNITS:
ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

FORM I VOA-TIC 1/87 Rev

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LAB SAMPLE NO

VOA Blank

Lab Name: Environmental Profile Lab   NJDEP Cert.# 15526

Matrix: Water

Lab Sample ID: VOA Blank

Sample wt/vol: 5.0 (g/mL) mL

Lab File ID: >V5363

Date Analyzed: 10/27/92

Column: Capillary

Dilution Factor: 1

Number of TICs found: 0

CONCENTRATION UNITS:
ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LAB SAMPLE NO.

VOA BLANK

Lab Name: Environmental Profile Lab NJDEP Cert.# 15526

Matrix: Water

Lab Sample ID: VOA BLANK

Sample wt/vol: 5.0 (g/mL) mL

Lab File ID: >V5413

Date Analyzed: 10/30/92

Column: Capillary

Dilution Factor: 1

Number of TICs found: 0

CONCENTRATION UNITS:
ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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362

LAB SAMPLE NO.

VOA Blank

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Environmental Profile Lab NJDEP Cert.# 15526

Matrix: Water

Sample wt/vol: 5.0 (g/mL) mL

Column: Capillary

Lab Sample ID: VOA Blank

Lab File ID: >V5429

Date Analyzed: 10/31/92

Dilution Factor: 1

Number of TICs found: 0

CONCENTRATION UNITS:
ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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2A

WATER VOLATILE SURROGATE RECOVERY

Lab Name: Environmental Profile Lab Contract: Serv-Air

Lab Code: 15526

	EPA SAMPLE NO.	S1 (TOL)#	S2 (BFB)#	S3 (DCE)#	OTHER	TOT OUT
01	CCC/SPCC	88	103	96		0
02	VOA BLANK	94	94	101		0
03	9173.9 5mL	96	97	105		0
04	9173.2 5mL	93	96	103		0
05	9173.3 5mL	90	98	108		0
06	9173.5 5mL	93	97	102		0
07	9173.6 5mL	94	95	102		0
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	QC LIMITS
S1 (TOL) = Toluene-d8	(76-125)
S2 (BFB) = Bromofluorobenzene	(76-125)
S3 (DCE) = 1,2-Dichloroethane-d4	(76-125)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

2A

WATER VOLATILE SURROGATE RECOVERY

Lab Name: Environmental Profile Lab Contract: Serv-Air

Lab Code: 15526

	EPA SAMPLE NO.	S1 (TOL)#	S2 (BFB)#	S3 (DCE)#	OTHER	TOT OUT
01	CCC/SPCC	98	96	94		0
02	VOA Blank	98	95	96		0
03	9173.25 5m	99	95	98		0
04	9173.26 5m	99	92	99		0
05	9173.14 5m	97	95	98		0
06	9173.13 5m	101	94	99		0
07	9173.23 5m	96	94	102		0
08	9173.12 5m	99	97	98		0
09	9173.21 5m	98	93	103		0
10	9173.19 5m	96	96	103		0
11	9173.11 5m	101	93	103		0
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	QC LIMITS
S1 (TOL) = Toluene-d8	(76-125)
S2 (BFB) = Bromofluorobenzene	(76-125)
S3 (DCE) = 1,2-Dichloroethane-d4	(76-125)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

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2A

WATER VOLATILE SURROGATE RECOVERY

Lab Name: Environmental Profile Lab Contract: Serv-Air

Lab Code: 15526

	EPA SAMPLE NO.	S1 (TOL)#	S2 (BFB)#	S3 (DCE)#	OTHER	TOT OUT
01	CCC/SPCC	112	93	84		0
02	VOA BLANK	100	117	83		0
03	9173.1 5uL	101	93	100		0
04	9173.8 50u	101	93	99		0
05	9173.10 50	98	92	97		0
06	9173.15 .5	97	96	98		0
07	9173.16 .5	99	95	103		0
08	9173.24 .5	97	97	105		0
09	9173.17 5m	100	93	100		0
10	9173.22 5m	99	92	103		0
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	QC LIMITS
S1 (TOL) = Toluene-d8	(76-125)
S2 (BFB) = Bromofluorobenzene	(76-125)
S3 (DCE) = 1,2-Dichloroethane-d4	(76-125)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

366

FORM II VOA-1

1/87 Rev.

2A

WATER VOLATILE SURROGATE RECOVERY

Lab Name: Environmental Profile Lab Contract: Serv-Air

Lab Code: 15526

	EPA SAMPLE NO.	S1 (TOL)#	S2 (BFB)#	S3 (DCE)#	OTHER	TOT OUT
01	CCC/SPCC	99	99	93		0
02	VOA Blank	99	93	96		0
03	9173.22 MS	98	95	99		0
04	9173.22 MS	96	95	97		0
05	9173.7 50u	97	95	94		0
06	9173.4 .5m	97	92	102		0
07	9173.20 5m	96	98	101		0
08	9173.18 5m	91	97	101		0
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	QC LIMITS
S1 (TOL) = Toluene-d8	(76-125)
S2 (BFB) = Bromofluorobenzene	(76-125)
S3 (DCE) = 1,2-Dichloroethane-d4	(76-125)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

8A

VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Environmental Profile Lab Contract: Serv-Air

Lab Code: 15526

Lab File ID (Standard): >V5346 Date Analyzed: 10/27/92

Instrument ID: GC/MSD 5970 #1 Time Analyzed: 10:27

Matrix: Water Column: Capillary

	IS1(BCM) AREA	#	RT	IS2(DFB) AREA	#	RT	IS3(CBZ) AREA	#	RT
12 HOUR STD	60835.		10.14	360489.		13.97	332581.		24.65
UPPER LIMIT	121670.			720978.			665162.		
LOWER LIMIT	30418.			180244.			166290.		
EPA SAMPLE NO.									
01 VOA BLANK	55744.		10.15	358504.		14.02	304794.		24.67
02 9173.9 5mL	52411.		10.24	331354.		14.09	290799.		24.72
03 9173.2 5mL	49460.		10.22	305897.		14.06	281602.		24.73
04 9173.3 5mL	52227.		10.25	299326.		14.08	278122.		24.71
05 9173.5 5mL	55898.		10.25	308076.		14.08	272346.		24.72
06 9173.6 5mL	59783.		10.25	335710.		14.08	300453.		24.71
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IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

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8A

VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Environmental Profile Lab Contract: Serv-Air

Lab Code: 15526

Lab File ID (Standard): >V5362 Date Analyzed: 10/27/92

Instrument ID: GC/MSD 5970 #1 Time Analyzed: 22:24

Matrix: Water Column: Capillary

	IS1(BCM) AREA #	RT	IS2(DFB) AREA #	RT	IS3(CBZ) AREA #	RT
12 HOUR STD	60490.	10.22	361830.	14.06	306493.	24.71
UPPER LIMIT	120980.		723660.		612986.	
LOWER LIMIT	30245.		180915.		153247.	
EPA SAMPLE NO.						
01 VOA Blank	69178.	10.21	396368.	14.06	319166.	24.71
02 9173.25 5m	72516.	10.22	398017.	14.08	324081.	24.71
03 9173.26 5m	62939.	10.21	350228.	14.06	296205.	24.71
04 9173.14 5m	70442.	10.22	376073.	14.05	319381.	24.70
05 9173.13 5m	68426.	10.24	362464.	14.07	294665.	24.70
06 9173.23 5m	66281.	10.21	355875.	14.04	311506.	24.71
07 9173.12 5m	64934.	10.23	328325.	14.06	273672.	24.71
08 9173.21 5m	62593.	10.22	334076.	14.05	291079.	24.72
09 9173.19 5m	62023.	10.22	325900.	14.07	280903.	24.70
10 9173.11 5m	66389.	10.24	355432.	14.07	288161.	24.70
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IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

369

8A

VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Environmental Profile Lab Contract: Serv-Air

Lab Code: 15526

Lab File ID (Standard): >V5412 Date Analyzed: 10/30/92

Instrument ID: GC/MSD 5970 #1 Time Analyzed: 10:38

Matrix: Water Column: Capillary

	IS1(BCM) AREA #	RT	IS2(DFB) AREA #	RT	IS3(CBZ) AREA #	RT
12 HOUR STD	44650.	10.19	228874.	14.06	159025.	24.73
UPPER LIMIT	89300.		457748.		318050.	
LOWER LIMIT	22325.		114437.		79513.	
EPA SAMPLE NO.						
01 VOA BLANK	40625.	10.22	189887.	14.07	139015.	24.73
02 9173.1 5uL	50369.	10.28	291166.	14.09	240904.	24.74
03 9173.8 50u	50705.	10.30	270452.	14.11	219647.	24.76
04 9173.10 50	49769.	10.27	274961.	14.10	234733.	24.75
05 9173.15 .5	55387.	10.25	270531.	14.09	235486.	24.74
06 9173.16 .5	43537.	10.25	236958.	14.10	196077.	24.74
07 9173.24 .5	45462.	10.23	241628.	14.10	200442.	24.74
08 9173.17 5m	51271.	10.24	258374.	14.09	213999.	24.72
09 9173.22 5m	50884.	10.24	264926.	14.07	216604.	24.72
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IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

8A

VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: Environmental Profile Lab Contract: Serv-Air

Lab Code: 15526

Lab File ID (Standard): >V5428 Date Analyzed: 10/31/92

Instrument ID: GC/MSD 5970 #1 Time Analyzed: 14:11

Matrix: Water Column: Capillary

	IS1(BCM) AREA #	RT	IS2(DFB) AREA #	RT	IS3(CBZ) AREA #	RT
12 HOUR STD	58522.	10.18	344471.	14.03	279811.	24.71
UPPER LIMIT	117044.		688942.		559622.	
LOWER LIMIT	29261.		172235.		139905.	
EPA SAMPLE NO.						
01 VOA Blank	57744.	10.23	328188.	14.08	263560.	24.71
02 9173.22 MS	54202.	10.23	306564.	14.08	260880.	24.71
03 9173.22 MS	55367.	10.25	299591.	14.08	258664.	24.72
04 9173.7 50u	62364.	10.26	316891.	14.09	265035.	24.72
05 9173.4 .5m	54046.	10.24	294194.	14.08	249348.	24.73
06 9173.20 5m	56592.	10.22	297390.	14.07	255176.	24.71
07 9173.18 5m	46021.	10.22	215967.	14.05	197363.	24.72
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22						

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

PREPARED BY:

201 Gibraltar Road, Suite 100
Horsham, Pennsylvania 19044

December 23, 2002

VERSAR PROJECT NO. 4936-122

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TABLES

APPENDICES

EXECUTIVE SUMMARY

Enzyme-enhanced bioremediation (EEB) was implemented to remediate volatile organic compounds (VOCs) in the shallow subsurface soils beneath the Main Post Gas Station, Building 699, Main Post, Fort Monmouth, New Jersey. The application of biological enhancements was conducted according to the Second Addendum to the Remedial Action Work Plan (RAWP) for the AAFES Main Post Gas Station, Building No. 699, prepared by Versar, Inc., dated October 2000. This Remedial Action Progress Report (RAPR) documents soil quality conditions before and after the application of biological enhancements, summarizes the field activities, and evaluates the EEB program undertaken in November 2000.

During the initial soil sampling (as reported in the Second Addendum to the RAWP) clay layers were observed to be present in the shallow subsurface beneath the Building 699 site within 3 to 4 feet below ground surface (bgs). These soils would not be effectively treated by the proposed soil vapor extraction (SVE) system which is typically designed to remediate permeable sandy soils. EEB was therefore proposed to facilitate biodegradation of contaminated soils in the upper soil horizon. The EEB injection was performed at seventeen (17) selected borings using a Geoprobe® rig. Permeation of the EEB into the soil was achieved at each of these borings.

Following the EEB injection and a six month treatment period, post-injection soil sampling was performed to evaluate the EEB application effectiveness. An evaluation of the soil sample results indicate that overall concentrations of the primary contaminants of concern (COCs) (benzene, toluene, ethylbenzene, and xylenes) and total petroleum hydrocarbons (TPHC), have reduced from the initial soil sampling throughout the injection zone. Additional reductions in the concentrations of COCs at the Building 699 site will likely be achieved through operation of the groundwater pump and treat/air sparging/SVE system and through natural biodegradation, therefore, additional EEB treatment is not warranted at this time. No further action regarding EEB application at this site is recommended.

1.0 INTRODUCTION

Versar, Inc. (Versar) has been contracted by the United States (U.S.) Army Fort Monmouth (Fort Monmouth), Directorate of Public Works (DPW), Fort Monmouth, New Jersey to prepare a Remedial Action Progress Report (RAPR) to the Remedial Action Workplan (RAWP), 2nd Addendum, for the AAFES Main Post Gas Station, Building No. 699, located in the Main Post area of Fort Monmouth (Figure 1-1). This RAPR has been prepared in partial fulfillment of Contract No. DACA 51-00-D-004, Delivery Order No. 22 (Versar Project 4936-122) for submittal to the New Jersey Department of Environmental Protection (NJDEP) for review and approval.

1.1 Objectives

The objective of this RAPR is to report on the effectiveness of enzyme-enhanced bioremediation (EEB) in reducing the concentration of volatile organic compounds (VOCs) in the shallow subsurface soils beneath the Main Post Gas Station, Building 699 (Building 699). EEB was proposed as a supplement to a previously planned remedial system upgrade encompassing soil vapor extraction (SVE), groundwater pump and treat, and in-situ air stripping (air sparging).

The EEB treatment design encompassed the injection of biological enhancements into the shallow subsurface soil at identified “hot spot” areas to accelerate remediation of “petroleum” contaminants within the top 3 to 4 feet below ground surface (bgs). The contaminants of concern (COCs) include benzene, ethylbenzene, toluene, and total xylenes (BTEX), as well as total petroleum hydrocarbons (TPHC).

The activities addressed in this RAPR include:

- Describing the EEB injection activities performed at the site;
- Presenting and summarizing the results of post-injection soil sampling performed following the application of EEB, and
- Evaluating the effectiveness of the EEB application by comparing the results of post-injection soil sampling event performed in May 2001 to the initial soil sampling event performed from March to May 2000.

The presentation of the data, results, and analysis will allow for a decision to be made as to whether the EEB implementation enhanced the progress of remedial action at Building 699.

1.2 Report Organization

The information presented in the Second Addendum to the RAWP (Versar, 2000) was used as the basis for this remedial action program. Section 2 provides background information about the Building 699 site. Section 3 describes and summarizes the remedial activities (EEB injections) conducted and Section 4 presents the chemical

results of the post-injection soil sampling. Section 5 discusses the impact of the EEB on the progress of remedial action at Building 699 and Section 6 presents recommendations.

2.0 SITE BACKGROUND AND ENVIRONMENTAL SETTING

2.1 Site Description

The Building 699 site is located on Saltzman Avenue, a thoroughfare through Fort Monmouth (Figure 2-1). The site is approximately one acre in size and serves as the only on-base Main Post gasoline dispensing facility, for non-military vehicles. The site consists of a service station building (Building 699) and active pump islands under canopy. The service station has six (6) 10,000-gallon, fiberglass underground storage tanks (USTs) that store various grades of gasoline products. Building 699 was historically utilized as an automotive service garage. There are four bays located at the eastern side of the building, where limited auto servicing is still performed. The site is approximately ninety percent covered by impervious surface including pavement, concrete islands, and the service station. Large paved parking areas exist to the east and west of the site. A large grassy area is found to the north across Saltzman Avenue. Building 699 is located approximately 750 feet northwest of Husky Brook, which empties into Oceanport Creek. The previous groundwater treatment system was located within an enclosure area on the eastern side of the site. The upgraded treatment system is also enclosed and occupies a larger space in approximately the same location. Topography at the site is relatively flat, sloping gradually to the southeast.

2.2 Remedial System Background

Site characterization and remedial activities have been ongoing at Building 699 since 1989 with the reported apparent release of gasoline from the piping system at the service station. As specified in the RAWP, prepared by The Krydon Group, Inc., dated October 1993, the initial remedial system consisted of groundwater recovery and treatment system. This system extracted groundwater from one (1) recovery well (RW-11) and consisted of one (1) sediment filter, and three (3) one hundred and eighty (180) pound liquid-phase granular activated carbon (GAC) units installed in series. The GAC units provided the necessary treatment for the removal of VOCs from the extracted groundwater. The treated groundwater was then discharged to the sanitary sewer in accordance with Fort Monmouth's existing Treatment Works Approval (TWA) Permit with the Northeast Monmouth County Regional Sewerage Authority.

In 1999, the DPW proposed remedial system upgrades in an Addendum to the RAWP (GES, 1999) which encompassed SVE and continued groundwater pumping to extract soil vapor and groundwater from existing monitoring wells and proposed extraction laterals and wells. Furthermore, VOC removal from groundwater was proposed using in-situ air stripping (air sparging). The extracted soil vapor and groundwater were to be treated and discharged in accordance with Fort Monmouth's discharge permits. The Addendum also established a proposed Classification Exception Area (CEA) encompassing the estimated capture zone of the proposed upgraded remedial system.

Supplemental soil sampling was performed at the site between March 6, 2000 and May 3, 2000 by the DPW's base operations contractor, TECOM-Vinnell Sevices, Inc. (TVS), to

further delineate the horizontal and vertical extent of soil contamination, as well as to support design of the SVE system (Appendix A). TVS collected soil samples using a Geoprobe® on a sampling grid established across the site at 30-foot intervals, totaling 83 potential sampling locations. The soil sample results from these 83 borings indicated that benzene, toluene, ethylbenzene, and total xylene concentrations ranged to a maximum of 590 milligrams per kilogram (mg/kg), 2500 mg/kg, 1200 mg/kg, and 6900 mg/kg, respectively. This sampling also identified the existence of clays in subsurface soil at the site within an estimated depth of 3 to 4 feet bgs.

Since clayey soils would not be effectively treated by the proposed SVE system which is typically designed to remediate permeable sandy soils, EEB was proposed to attempt to remediate the contaminated soils in the upper soil horizon. This EEB program was specified in the Second Addendum to the RAWP prepared by Versar and submitted in October 2000.

Handex, Inc. (Handex) under contract to Fort Monmouth mobilized to the site in the late fall of 2000 to implement the remedial system upgrades specified in the Addendum to the RAWP. Excavation and construction of the SVE extraction laterals and air sparging wells was being performed during performance of the EEB Program. The SVE system became operational in the fall of 2001.

3.0 SITE ACTIVITIES

This section describes the EEB injection activities performed at the Building 699 site and the performance of post-injection soil sampling following a 6-month treatment period.

3.1 Enzyme-Enhanced Bioremediation Injection Activities

As presented in the Second Addendum to the RAWP (Versar, 2000), the analytical results from the supplemental soil sampling conducted in March through May 2000 and specifically, detections of benzene and xylene in the shallow subsurface (e.g., 0-3 feet bgs), were used to delineate "hot spot" areas that could be addressed by EEB. Based on the supplemental sampling, seventeen (17) areas were identified for the EEB implementation. This consisted of thirteen (13) boring locations (Nos. 1, 2, 5, 7, 8, 11, 13, 15, 19, 20, 21, 46, and 47) which were identified with benzene or xylene detections above the respective NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC) within the shallow subsurface. Boring Nos. 3, 9, and 14 were included due to their proximity to the thirteen (13) boring locations discussed above and because of soils identified from these borings, just below 3 feet bgs, which exceeded the respective RDCSCC. Boring No. 48 was also included to evaluate the effectiveness of the EEB application on BTEX concentrations detected in the lower subsurface.

Versar conducted premobilization activities on November 6, 2000, including utility mark-out and coordination with the Handex Site Manager. Enzyme Technologies, Inc. (ETEC), Portland, Oregon provided a mobile "BioBox" (Model 10-M) and the proprietary biological enhancements to implement the EEB Program. The BioBox served as the mixing chamber for the biological enhancements and incorporated a unique oxygen mixing process to achieve dissolved oxygen concentrations in the water of 40 parts per million (ppm) or greater, achieving full solubility of the oxygen in the water. The biological enhancements consisted of four different products:

- Enzyme Accelerator (EA) acted as a pre-treatment agent for enzyme and bacterial applications. EA is a liquid biosurfactant that increases the surface area for enzymes and bacteria, thereby increasing the cleanup rate.
- Multi-Enzyme Complexes (MZC) is a concentrated liquid extract of mono- and dehydroxygenase compounds that are responsible for over 90% of the bioremediation process.
- TPH Bacterial Consortium (A2) is a liquid multi-strain bacterial consortium specifically designed to degrade long-chain petroleum hydrocarbons.
- Custom Blend Nutrients (CBN) is a dry mixture of proprietary nitrogen, phosphorus and potassium compounds with micronutrients.

Versar personnel prepared the mixtures of biological enhancements, which were injected into the designated boring locations using a Geoprobe® rig operated by Terraprobe of Jamison, Pennsylvania. The Geoprobe® was outfitted for injection in order to install an array of temporary injection points. As described in the Second Addendum to the RAWP (Versar, 2000), the EEB injection points were placed on 5-foot centers from each of the

seventeen (17) selected boring locations for a total of nine (9) injection points per location or one hundred fifty-three (153) total injections. GPS data was used to identify the initial boring locations from the supplemental soil sampling event performed from March to May, 2000. The EEB implementation was performed during the excavation and construction of the SVE extraction laterals and wells. Permeation of the EEB into the soil was achieved at each of the seventeen (17) selected borings.

The injection grid was adjusted, as required, from the GPS reproduced Geoprobe sampling locations to avoid backfilled areas resulting from the installation of the SVE system. This required the injection grid at five (5) borings locations (7, 8, 13, 14, and 15) to be repositioned. The repositioned injection grid was shifted 5 to 8 feet (depending on site conditions) from the initial boring location toward areas of observed contamination. The locations of these repositioned injection locations are shown as dashed circles in Figures 5-1 through 5-5.

Injection of the biological enhancements was conducted from ground surface to 3 to 4 feet bgs. The Geoprobe® injection point was pushed to 3 to 4 feet bgs and the injections started. The injection point was then slowly withdrawn while still injecting and the borehole was monitored to ensure that biological enhancements did not overflow onto the surface.

The biological enhancements were injected in two stages from November 7, 2001 and continuing through November 22, 2001. A representative of ETEC was onsite from 7 to 9 November to support system startup of the injection program and monitor the initial injection performance. Stage 1 enhancements were used to "pretreat" and saturate the shallow soils in order to maximize diffusion of the bacteria and provide available nutrients upon injection of the Stage 2 mixture.Stage 2 enhancements inoculated the shallow subsurface soils to begin the contaminant digestion process.

During Stage 1, biological enhancements were mixed in the Biobox and injected into the ground in accordance with the Manufacturer's instructions. The injection program consisted of 1,559.25 gallons of biological enhacements were injected at the Building 699 site. Four batches of the first stage of enzyme injection were implemented. The batches of biological enhancement consisted of the following:

- Two hundred-sixty (260) gallons of water.
- One hundred (100) pounds (lbs.) of nutrient (CBN).
- Ten (10) gallons of enzyme accelerator (EA).
- Five (5) gallons of enzyme (MZC).
- Two and a half (2.5) gallons of bacteria (A2).

During the EEB injection process, batches of ingredients were mixed and then injected into the boreholes. After a batch was injected into the ground, successive batches had identical ratios of ingredients for the duration of each stage. Appendix B provides a summary of the injection volumes at each boring. The Stage 1 Geoprobe® installation, an

"injection stinger" was placed in the borehole to keep the hole open until the 2nd injection stage. The injections were performed over a 2-day treatment period.

During Stage 2, approximately 1,182 gallons were injected at the site. Three batches of the second stage of the enzyme injection were implemented. The batch mixing process was identical to Stage 1 process described above. The batches of biological enhancements consisted of the following:

- Two hundred-sixty (260) gallons of water.
- One (100) hundred lbs. of nutrient (CBN).
- Ten (10) gallons of bacteria (A2).

3.2 Post-Injection Soil Sampling

The post-injection soil sampling was performed by TVS following a treatment period of 180 days after completion of the injection program. The post-injection soil sampling was completed to a depth of 6 feet bgs to evaluate not only the shallow subsurface soils (3 to 4 feet bgs), but also the deeper soils. Between May 21 and May 25, 2001, post-injection soil sampling was completed at the seventeen (17) boring locations (Boring Nos. 1, 2, 3, 5, 7, 8, 9, 11, 13, 14, 15, 19, 20, 21, 46, 47, and 48). The injection locations were surveyed using GPS, thus allowing the post-injection sampling to be conducted at the same approximate locations. The soil samples were collected at alternating 6-inch intervals (6 to12 inches bgs, 18 to 24 inches bgs, 30 to 36 inches bgs, 42 to 48 inches bgs, 54 to 60 inches bgs, and 66 to 72 inches bgs). A total of 108 soil samples were collected from the six (6) depth intervals at the seventeen (17) boring locations, including six (6) duplicate samples collected at Boring No. 15 (labeled "F.D."). The samples were collected using standard Fort Monmouth DPW Geoprobe® sampling procedures in accordance with the NJDEP Field Sampling Procedures Manual (NJDEP, May 1992) and analyzed for VOCs plus fifteen tentatively identified compounds (TICs), and TPHC. In addition, four (4) trip blanks (TB) were analyzed for VOCs plus fifteen TICs. Following the collection of soil samples during May 2001, soil cuttings from the borings were placed back in the boreholes.

Copies of the chain-of-custody forms for the laboratory analyses and laboratory data sheets are presented in Appendix C. A summary of the soil sample laboratory IDs, boring IDs, and depths is provided in Table 3-1. The results of these analyses are discussed in Section 4.0.

4.0 POST-INJECTION SAMPLING ANALYTICAL RESULTS

According to laboratory results, six (6) VOCs (2- butanone, benzene, ethylbenzene, total xylenes, methylene chloride, and toluene) were detected in soil samples collected during the May 2001 soil sampling event. Of the six (6) VOCs detected, three (3) VOCs (benzene, toluene, and total xylenes) were detected at concentrations exceeding the RDCSCC, as follows:

- Benzene was detected in fifteen (15) of the seventeen (17) boring locations at concentrations exceeding the RDCSCC of 3 mg/kg. A maximum concentration of 100 mg/kg was detected in Boring No.13 at a depth of 54 to 60 inches bgs.
- Toluene was detected in one (1) boring location at a concentration greater than the RDCSCC of 1,000 mg/kg. A concentration of 1,100 mg/kg was detected in the field duplicate sample collected from Boring No. 15 at a depth of 66 to 72 inches bgs.
- Total xylenes were detected in eleven (11) boring locations at concentrations exceeding the RDCSCC of 410 mg/kg. A maximum concentration of 1,970 mg/kg was detected in Boring No. 15 at a depth of 66 to 72 inches bgs. The field duplicate for this sample had a total xylene concentration of 2,780 mg/kg.

The other COCs addressed by the EEB program, ethylbenzene and TPHC, were detected at concentrations below the RDCSCC, as follows:

- Ethylbenzene was detected at each of the 17 the boring locations below the RDCSCC of 1,000 mg/kg. A maximum concentration of 400 mg/kg was detected in Boring No. 15 at a depth of 66 to 72 inches bgs.
- TPHC were detected at each of the 17 the boring locations below the regulatory criteria for total organic contaminants of 10,000 mg/kg. A maximum concentration of 5,612.80 mg/kg was detected in Boring No. 47 at a depth of 42 to 48 inches bgs.

The quality control/quality assurance (QA/QC) sampling had the following results (Table 4-1):

- Of the six (6) duplicate samples (F.D. on Tables 3-1 and 4-1) collected from Boring No. 15, three (3) VOCs (benzene, total xylenes, and toluene) were detected at concentrations exceeding the respective RDCSCC. The concentrations of the duplicate samples are relatively close (within industry standards) to the concentrations in the samples identified in the laboratory reports as Boring No. 15.
- There were a total of three (3) VOCs (methylene chloride, 2-butanone, and toluene) detected in the Trip Blanks at concentrations below the RDCSCC. Methylene chloride and 2-butanone are common laboratory contaminants. The detection of toluene in one of the trip blanks may be indicative of minor cross-contamination.

Table 4-1 presents a summary of the laboratory analytical results in mg/kg for the May 2001 post-injection soil sampling. Table 4-1 also lists the RDCSCC in mg/kg for each of the detected analytes.. Each sample that exceeded the respective RDCSCC has been shown in bold print and the table cell has been shaded.

5.0 REMEDIAL ACTION PROGRESS

Versar evaluated the soil analytical results of the seventeen (17) boring locations sampled before and after the EEB Program to determine whether the EEB application enhanced the progress of remedial action in the shallow subsurface soils at Building 699.

While there was a significant reduction in COC concentrations, some increased concentrations in soil samples were also observed. Overall, exceedances of the COCs decreased from the initial soil sampling throughout the assessed vadose zone (i.e., 0 to 6 feet bgs). Following EEB injection, the total number of exceedences of the respective RDCSCC for BTEX decreased from 62 to 45, 1 to 0, 4 to 0, and 39 to 24, respectively. There were no exceedances of the RDCSCC detected during the May 2001 sampling for three (3) of the COCs, ethylbenzene, toluene, and TPHC. In addition, several VOCs, acetone, 2-chloroethyl vinyl ether, tetrachloroethene (PCE), and trichloroethene (TCE), which were detected in soil samples collected at the Building 699 site in 2000, were not detected during the May 2001 soil sampling. Concentrations of benzene and total xylenes (Figures 5-1, and 5-4, respectively) in excess of the RDCSCC remain in the targeted areas, although the concentrations of benzene and total xylenes have decreased in many locations.

As previously discussed, the COCs identified at the Building 699 site are BTEX and TPHC. The concentrations of the COCs in soil samples collected before and after the EEB (2000 and 2001, respectively) are shown in Table 5-1 and in Figures 5-1 through 5-5. The total number of soil samples in which concentrations exceed the respective RDCSCC in both the 2000 and 2001 sampling events is shown at the bottom of Table 5-1. During the 6-month treatment period (November 2000 to May 2001), prior to the post-injection sampling event, the Building 699 site had been disturbed/excavated to support construction/ installation of the SVE and air sparging system. Approximately 200 tons of soil was removed as part of the remediation system upgrade. The SVE system was started in September 2001, approximately four months after to the post-injection soil sampling event was performed. Construction activities have likely impacted the original site conditions both prior to and following the EEB application in November 2000. In addition, five (5) boring locations (7, 8, 13, 14, and 15) were repositioned to avoid backfilled areas resulting from installation of the SVE system. This repositioning resulted in the post-injection sampling being performed at a different location that the pre-injection sampling, possibly causing a misrepresentation of the effectiveness of the EEB program at these locations.

6.0 RECOMMENDATIONS

The objective of the EEB program was to directly impact identified "hot spot" areas of concern and remediate contaminated shallow subsurface soils (0 to 4 feet bgs) that might not be effectively addressed by the SVE system. During performance of the EEB Program, permeation of the injected EEB was achieved at each of the seventeen (17) boring locations. Concentrations of COCs exceeding the RDCSCC decreased significantly throughout the application area during the six-month treatment period. Additional reductions in the concentrations of COCs at the Building 699 site will likely be achieved through operation of the groundwater pump and treat/air sparging/SVE system and through natural biodegradation, therefore, additional EEB treatment is not warranted at this time. No further action regarding EEB application at this site is recommended. .

7.0 REFERENCES

1. DPW, 2001. Fort Monmouth Environmental Testing Laboratory, Analytical Data Reports (Project: 100004), May and June 2001.

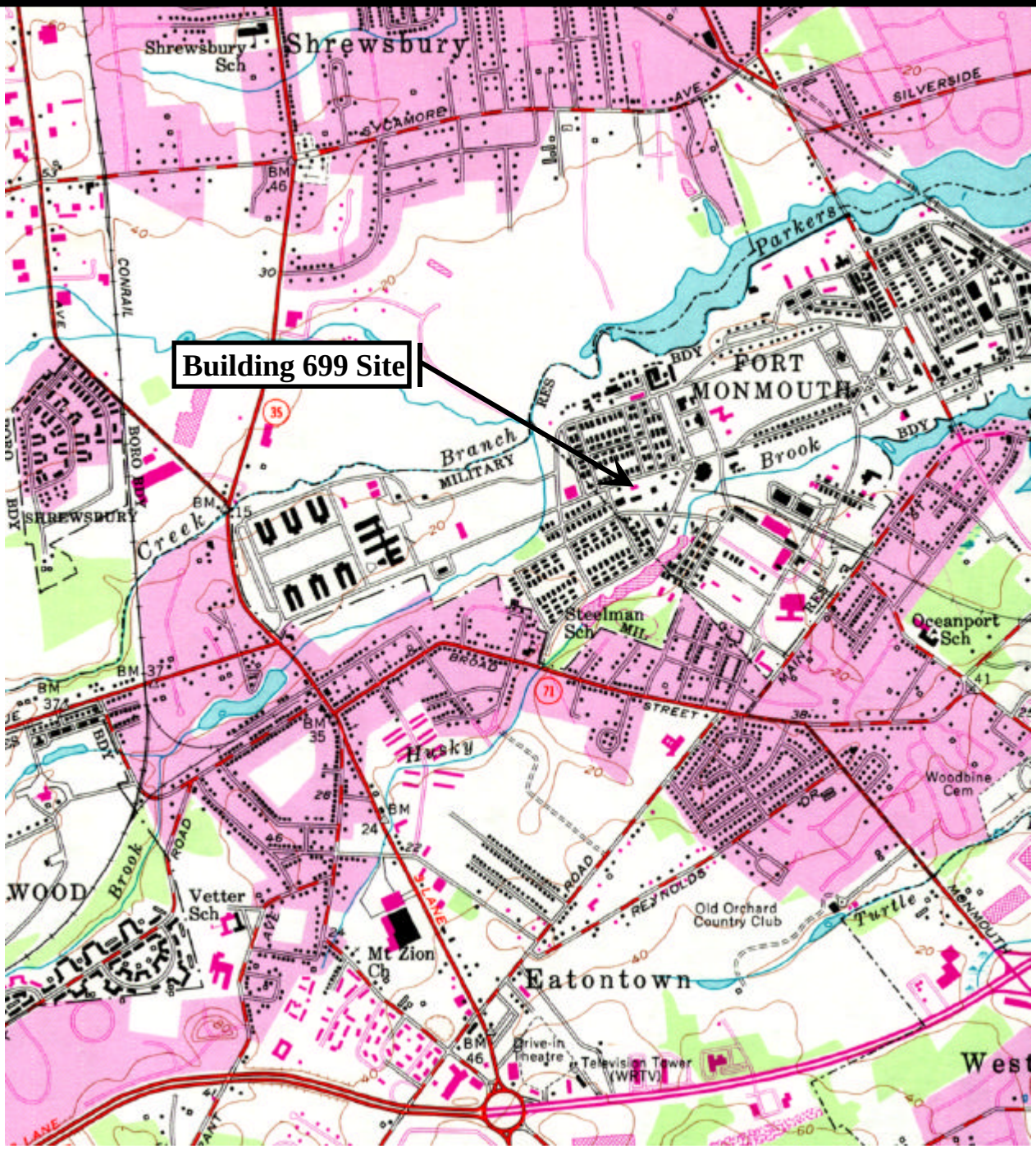
2. GES, 1999. Groundwater & Environmental Services, Inc., *Remedial Action Work Plan Addendum, Bldg. 699 Main Post Area, Fort Monmouth, NJ,* June 10, 1999.

3. Krydon, 1993. The Krydon Group, Inc. *Remedial Action Work Plan*, Fort Monmouth Military Installation Service Station, Fort Monmouth, New Jersey, October 1993.

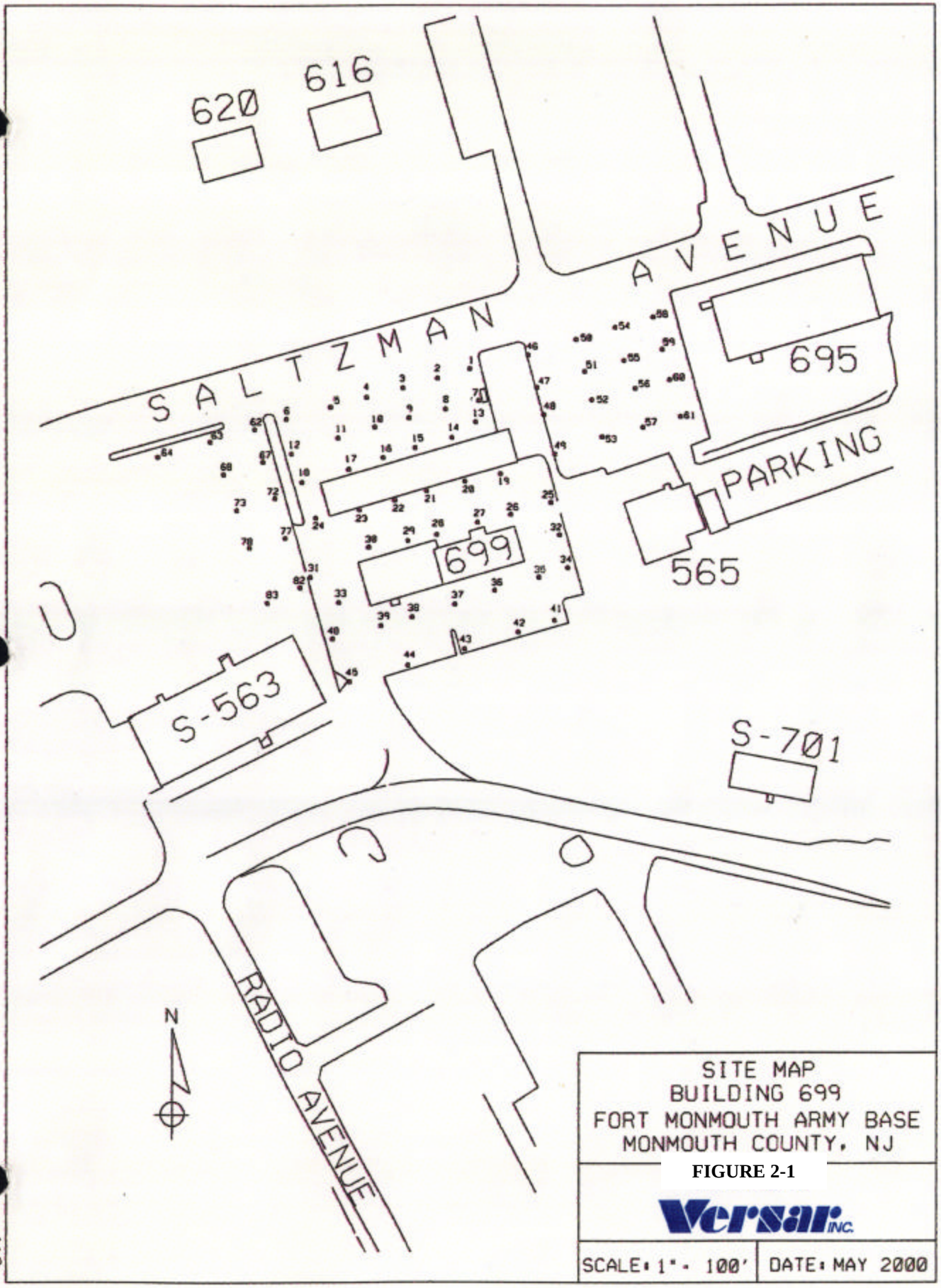
4. NJDEP, May 1992. Field Sampling Procedures Manual.

5. Versar, 2000. Versar, Inc. *Remedial Action Work Plan, 2nd Addendum, Enzyme-Enhanced Bioremediation at the AAFES Main Post Gas Station, Building 699, Fort Monmouth, New Jersey*, October 9, 2000.

FIGURES



Building 699 Site **Fort Monmouth, New Jersey**	**FIGURE 1-1**
	Site Location Map
U.S.G.S Topographic Map Long Branch, NJ Quadrangle 7.5-Minute Series	Versar INC.



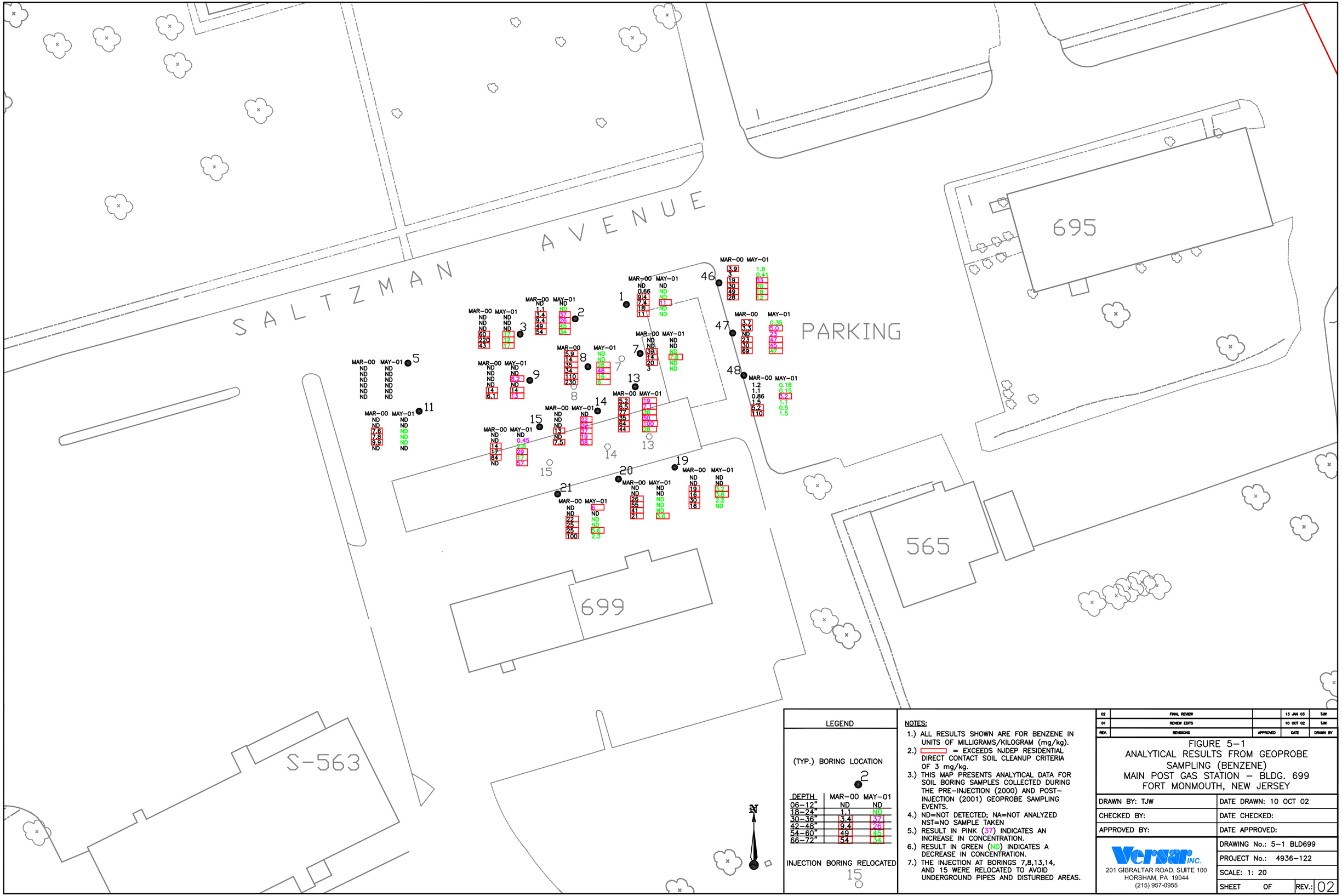
SITE MAP
BUILDING 699
FORT MONMOUTH ARMY BASE
MONMOUTH COUNTY, NJ

FIGURE 2-1

Versar INC.

SCALE: 1" = 100' | DATE: MAY 2000

699



LEGEND

(TYP.) BORING LOCATION 2

DEPTH	MAR-00	MAY-01
06-12"	ND	ND
18-24"	1.1	ND
30-36"	3.4	37
42-48"	9.4	28
54-60"	49	45
66-72"	54	34

INJECTION BORING RELOCATED 15

NOTES:

1.) ALL RESULTS SHOWN ARE FOR BENZENE IN UNITS OF MILLIGRAMS/KILOGRAM (mg/kg).
2.) [ ] = EXCEEDS NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA OF 3 mg/kg.
3.) THIS MAP PRESENTS ANALYTICAL DATA FOR SOIL BORING SAMPLES COLLECTED DURING THE PRE-INJECTION (2000) AND POST-INJECTION (2001) GEOPROBE SAMPLING EVENTS.
4.) ND=NOT DETECTED; NA=NOT ANALYZED NST=NO SAMPLE TAKEN
5.) RESULT IN PINK (37) INDICATES AN INCREASE IN CONCENTRATION.
6.) RESULT IN GREEN (ND) INDICATES A DECREASE IN CONCENTRATION.
7.) THE INJECTION AT BORINGS 7,8,13,14, AND 15 WERE RELOCATED TO AVOID UNDERGROUND PIPES AND DISTURBED AREAS.

REV.	REVISIONS	APPROVED	DATE	DRAWN BY
02	FINAL REVIEW		13 JAN 03	TJW
01	REVIEW EDITS		10 OCT 02	TJW

FIGURE 5-1
ANALYTICAL RESULTS FROM GEOPROBE SAMPLING (BENZENE)
MAIN POST GAS STATION - BLDG. 699
FORT MONMOUTH, NEW JERSEY

DRAWN BY: TJW	DATE DRAWN: 10 OCT 02
CHECKED BY:	DATE CHECKED:
APPROVED BY:	DATE APPROVED:
	DRAWING No.: 5-1 BLD699
	PROJECT No.: 4936-122
	SCALE: 1: 20
	SHEET OF REV.: 02

Versar INC.
201 GIBRALTAR ROAD, SUITE 100
HORSHAM, PA 19044
(215) 957-0955

LEGEND

(TYP.) BORING LOCATION

2

DEPTH	MAR-00	MAY-01
06-12"	ND	ND
18-24"	1.1	ND
30-36"	3.4	76
42-48"	9.4	28
54-60"	49	58
66-72"	54	47

INJECTION BORING RELOCATED

15

NOTES:

1.) ALL RESULTS SHOWN ARE FOR ETHYLBENZENE IN UNITS OF MILLIGRAMS/KILOGRAM (mg/kg).
2.) [ ] = EXCEEDS NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA OF 1,000 mg/kg.
3.) THIS MAP PRESENTS ANALYTICAL DATA FOR SOIL BORING SAMPLES COLLECTED DURING THE PRE-INJECTION (2000) AND POST-INJECTION (2001) GEOPROBE SAMPLING EVENTS
4.) ND=NOT DETECTED; NA=NOT ANALYZED NST=NO SAMPLE TAKEN
5.) RESULT IN PINK (76) INDICATES AN INCREASE IN CONCENTRATION.
6.) RESULT IN GREEN (28) INDICATES A DECREASE IN CONCENTRATION.
7.) THE INJECTION AT BORINGS 7,8,13,14, AND 15 WERE RELOCATED TO AVOID UNDERGROUND PIPES AND DISTURBED AREAS.

REV.	REVISIONS	APPROVED	DATE	DRAWN BY
02	FINAL REVIEW		13 JAN 03	TJW
01	REVIEW EDITS		10 OCT 02	TJW

FIGURE 5-2
ANALYTICAL RESULTS FROM GEOPROBE SAMPLING (ETHYLBENZENE)
MAIN POST GAS STATION - BLDG. 699
FORT MONMOUTH, NEW JERSEY

DRAWN BY: TJW	DATE DRAWN: 10 OCT 02
CHECKED BY:	DATE CHECKED:
APPROVED BY:	DATE APPROVED:
	DRAWING No.: BLD699
	PROJECT No.: 4936-122
	SCALE: 1: 20
	SHEET OF REV.: 02

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LEGEND

(TYP.) BORING LOCATION 2

DEPTH	MAR-00	MAY-01
06-12"	ND	ND
18-24"	0.57	7.3
30-36"	3.7	300
42-48"	100	140
54-60"	280	260
66-72"	240	210

INJECTION BORING RELOCATED 15

NOTES:

1.) ALL RESULTS SHOWN ARE FOR TOLUENE IN UNITS OF MILLIGRAMS/KILOGRAM (mg/kg).
2.) [ ] = EXCEEDS NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA OF 1,000 mg/kg.
3.) THIS MAP PRESENTS ANALYTICAL DATA FOR SOIL BORING SAMPLES COLLECTED DURING THE PRE-INJECTION (2000) AND POST-INJECTION (2001) GEOPROBE SAMPLING EVENTS
4.) ND=NOT DETECTED; NA=NOT ANALYZED NST=NO SAMPLE TAKEN
5.) RESULT IN PINK (7.3) INDICATES AN INCREASE IN CONCENTRATION.
6.) RESULT IN GREEN (260) INDICATES A DECREASE IN CONCENTRATION.
7.) THE INJECTION AT BORINGS 7,8,13,14, AND 15 WERE RELOCATED TO AVOID UNDERGROUND PIPES AND DISTURBED AREAS.

REV.	REVISIONS	APPROVED	DATE	DRAWN BY
02	FINAL REVIEW		13 JAN 03	TJW
01	REVIEW EDITS		10 OCT 02	TJW

FIGURE 5-3
ANALYTICAL RESULTS FROM GEOPROBE SAMPLING (TOLUENE)
MAIN POST GAS STATION - BLDG. 699
FORT MONMOUTH, NEW JERSEY

DRAWN BY: TJW	DATE DRAWN: 10 OCT 02
CHECKED BY:	DATE CHECKED:
APPROVED BY:	DATE APPROVED:
	DRAWING No.: BLD699
	PROJECT No.: 4936-122
	SCALE: 1: 20
	SHEET OF REV.: 02

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SALTZMAN AVENUE

PARKING

695

565

699

S-563

1
MAR-00 MAY-01
ND ND
0.86 ND
262 91
360 610
680 224
360 108

2
MAR-00 MAY-01
ND ND
0.36 ND
1.76 480
198 170
460 360
348 280

3
MAR-00 MAY-01
0.35 ND
3.8 ND
89 ND
1610 400
3890 322
410 279

5
MAR-00 MAY-01
6.2 ND
202 ND
730 ND
1030 800
257 610
243 820

7
MAR-00 MAY-01
ND ND
ND ND
850 ND
380 800
690 390
155 410

8
MAR-00 MAY-01
323 29.9
127 ND
360 290
450 630
750 179
1670 10

9
MAR-00 MAY-01
8.8 19
13 37.7
10 397
85 176
302 318
72 169

11
MAR-00 MAY-01
16 550
47 460
920 312
810 389
900 45U
116 343

13
MAR-00 MAY-01
24 74
35 40.7
880 450
470 690
750 1180
540 540

14
MAR-00 MAY-01
ND 106
ND 540
ND 1100
1390 1110
880 374
610 870

15
MAR-00 MAY-01
16 ND
ND 7
680 74
840 1180
3590 690
16J 1970

19
MAR-00 MAY-01
5 4.7
27.4 73
670 101
600 106
850 53
400 ND

20
MAR-00 MAY-01
ND 4.4
ND ND
490 2.8
1060 2.6
800 342
340 158

21
MAR-00 MAY-01
16 27
204 125
1420 174
1970 200
1330 321
5200 136

46
MAR-00 MAY-01
17.8 30.7
7 1.42
262 420
400 255
510 240
360 196

47
MAR-00 MAY-01
22.1 0.44
10.8 31.8
4.2 340
490 570
590 500
1490 480

48
MAR-00 MAY-01
8.62 2.7
4.73 1.34
2.57 370
5.8 294
123 9.4
2870 25.4

N

LEGEND

(TYP.) BORING LOCATION 2

DEPTH	MAR-00	MAY-01
06-12"	ND	ND
18-24"	0.36J	ND
30-36"	1.76	480
42-48"	198	170
54-60"	460	360
66-72"	348	280

INJECTION BORING RELOCATED 15

NOTES:

1.) ALL RESULTS SHOWN ARE FOR TOTAL XYLENES IN UNITS OF MILLIGRAMS/KILOGRAM (mg/kg).
2.) [ ] = EXCEEDS NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA OF 410 mg/kg.
3.) THIS MAP PRESENTS ANALYTICAL DATA FOR SOIL BORING SAMPLES COLLECTED DURING THE PRE-INJECTION (2000) AND POST-INJECTION (2001) GEOPROBE SAMPLING EVENTS
4.) ND=NOT DETECTED; NA=NOT ANALYZED NST=NO SAMPLE TAKEN
5.) RESULT IN PINK (480) INDICATES AN INCREASE IN CONCENTRATION.
6.) RESULT IN GREEN (ND) INDICATES A DECREASE IN CONCENTRATION.
7.) THE INJECTION AT BORINGS 7,8,13,14, AND 15 WERE RELOCATED TO AVOID UNDERGROUND PIPES AND DISTURBED AREAS.

REV.	REVISIONS	APPROVED	DATE	DRAWN BY
02	FINAL REVIEW		13 JAN 03	TJW
01	REVIEW EDITS		10 OCT 02	TJW

FIGURE 5-4
ANALYTICAL RESULTS FROM GEOPROBE SAMPLING (TOTAL XYLENES)
MAIN POST GAS STATION - BLDG. 699
FORT MONMOUTH, NEW JERSEY

DRAWN BY: TJW	DATE DRAWN: 10 OCT 02
CHECKED BY:	DATE CHECKED:
APPROVED BY:	DATE APPROVED:

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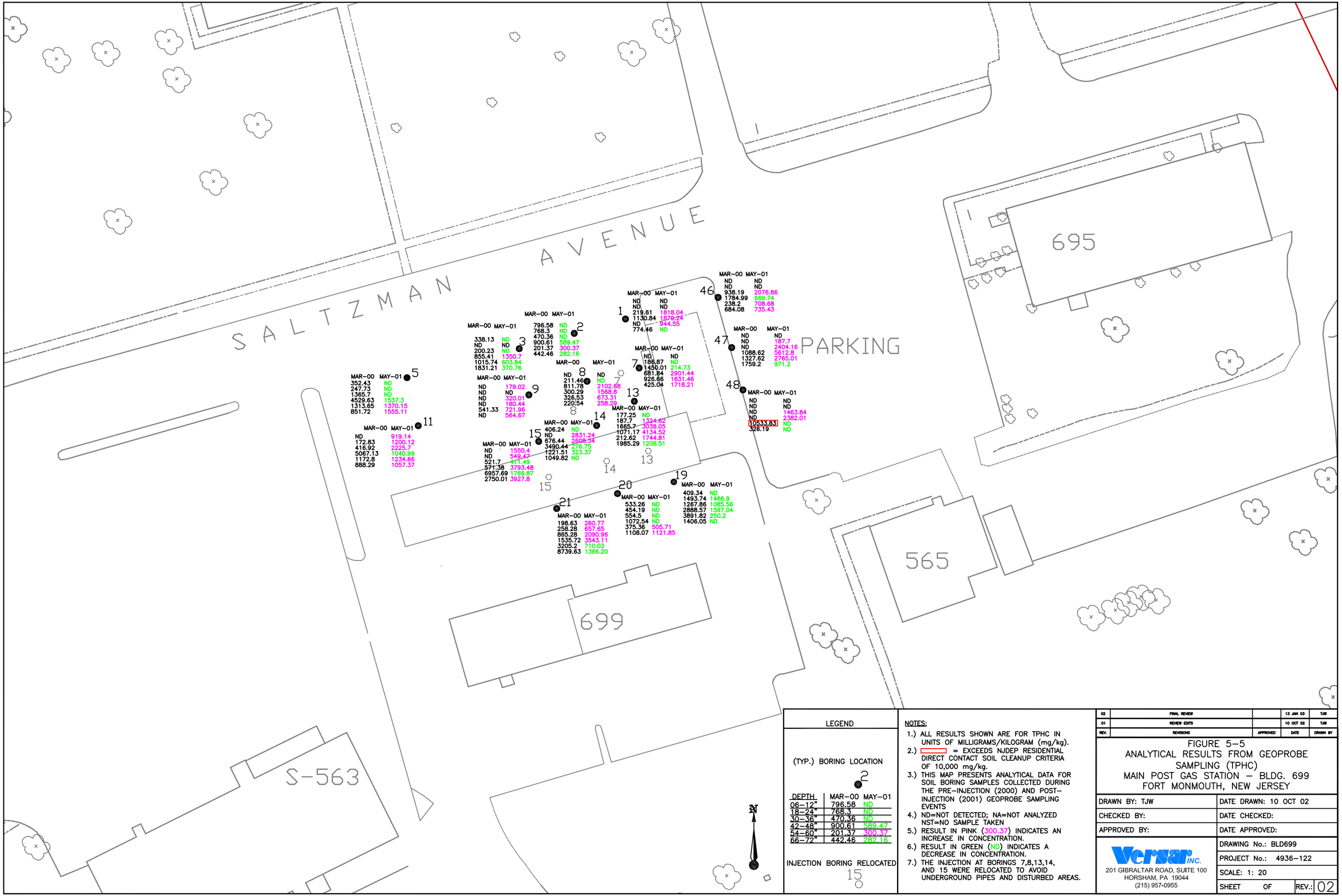
HORSHAM, PA 19044
(215) 957-0955

DRAWING No.:	BLD699
PROJECT No.:	4936-122
SCALE:	1: 20
SHEET OF	REV.: 02



LEGEND

(TYP.) BORING LOCATION

2

DEPTH	MAR-00	MAY-01
06-12"	796.58	ND
18-24"	768.3	ND
30-36"	470.36	ND
42-48"	900.61	589.47
54-60"	201.37	300.37
66-72"	442.46	282.16

INJECTION BORING RELOCATED

15

NOTES:

1.) ALL RESULTS SHOWN ARE FOR TPHC IN UNITS OF MILLIGRAMS/KILOGRAM (mg/kg).
2.) [ ] = EXCEEDS NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA OF 10,000 mg/kg.
3.) THIS MAP PRESENTS ANALYTICAL DATA FOR SOIL BORING SAMPLES COLLECTED DURING THE PRE-INJECTION (2000) AND POST-INJECTION (2001) GEOPROBE SAMPLING EVENTS
4.) ND=NOT DETECTED; NA=NOT ANALYZED NST=NO SAMPLE TAKEN
5.) RESULT IN PINK (300.37) INDICATES AN INCREASE IN CONCENTRATION.
6.) RESULT IN GREEN (ND) INDICATES A DECREASE IN CONCENTRATION.
7.) THE INJECTION AT BORINGS 7,8,13,14, AND 15 WERE RELOCATED TO AVOID UNDERGROUND PIPES AND DISTURBED AREAS.

REV.	REVISIONS	APPROVED	DATE	DRAWN BY
02	FINAL REVIEW		13 JAN 03	TJW
01	REVIEW EDITS		10 OCT 02	TJW

FIGURE 5-5
ANALYTICAL RESULTS FROM GEOPROBE SAMPLING (TPHC)
MAIN POST GAS STATION - BLDG. 699
FORT MONMOUTH, NEW JERSEY

DRAWN BY: TJW	DATE DRAWN: 10 OCT 02
CHECKED BY:	DATE CHECKED:
APPROVED BY:	DATE APPROVED:
	DRAWING No.: BLD699
	PROJECT No.: 4936-122
	SCALE: 1: 20
	SHEET OF REV.: 02

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TABLES

Table 3-1
Soil Sample Collection Summary – May 2001
Main Post Gas Station – Bldg. 699
Fort Monmouth, New Jersey

Lab ID	Boring	Depth	Date Collected	Date Analysis Started	Matrix	Analytical Parameters	Analytical Methods
16136.01	TB	NA	5/21/01	5/22/01	Methanol	VOCs+15	EPA Method 8260
16136.02	48	6-12"	5/21/01	5/22/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16136.03	48	18-24"	5/21/01	5/22/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16136.04	48	30-36"	5/21/01	5/22/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16136.05	48	42-48"	5/21/01	5/22/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16136.06	48	54-60"	5/21/01	5/22/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16136.07	48	66-72"	5/21/01	5/22/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16136.08	47	6-12"	5/21/01	5/22/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16136.09	47	18-24"	5/21/01	5/22/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16136.10	47	30-36"	5/21/01	5/22/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16136.11	47	42-48"	5/21/01	5/22/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16136.12	47	54-60"	5/21/01	5/22/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16136.13	47	66-72"	5/21/01	5/22/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16136.14	46	6-12"	5/21/01	5/24/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16136.15	46	18-24"	5/21/01	5/24/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16136.16	46	30-36"	5/21/01	5/23/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16136.17	46	42-48"	5/21/01	5/23/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16136.18	46	54-60"	5/21/01	5/23/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16136.19	46	66-72"	5/21/01	5/23/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.01	TB	NA	5/23/01	5/31/01	Methanol	VOCs+15	EPA Method 8260
16139.02	5	6-12"	5/23/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.03	5	18-24"	5/23/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.04	5	30-36"	5/23/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.05	5	42-48"	5/23/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.06	5	54-60"	5/23/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.07	5	66-72"	5/23/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.08	11	6-12"	5/23/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.09	11	18-24"	5/23/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.10	11	30-36"	5/23/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.11	11	42-48"	5/23/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.12	11	54-60"	5/23/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM

TB: Trip Blank; NA: Not applicable;.
VOCs+15: Volatile Organic Compounds plus 15 tentatively identified compounds (TICs).
TPHC: Total Petroleum Hydrocarbons.
F.D.: Field Duplicate of Boring 15.
Date Analysis Started: Date of VOCs analysis.

Table 3-1
Soil Sample Collection Summary – May 2001
Main Post Gas Station – Bldg. 699
Fort Monmouth, New Jersey

Lab ID	Boring	Depth	Date Collected	Date Analysis Started	Matrix	Analytical Parameters	Analytical Methods
16139.13	11	66-72"	5/23/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.14	3	6-12"	5/23/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.15	3	18-24"	5/23/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.16	3	30-36"	5/23/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.17	3	42-48"	5/23/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.18	3	54-60"	5/23/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.19	3	66-72"	5/23/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.20	9	6-12"	5/23/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.21	9	18-24"	5/23/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.22	9	30-36"	5/23/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.23	9	42-48"	5/23/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.24	9	54-60"	5/23/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.25	9	66-72"	5/23/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.26	2	6-12"	5/23/01	6/2/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.27	2	18-24"	5/23/01	6/2/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.28	2	30-36"	5/23/01	6/2/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.29	2	42-48"	5/23/01	6/2/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.30	2	54-60"	5/23/01	6/2/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.31	2	66-72"	5/23/01	6/2/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.32	8	6-12"	5/23/01	6/2/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.33	8	18-24"	5/23/01	6/2/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.34	8	30-36"	5/23/01	6/2/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.35	8	42-48"	5/23/01	6/2/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.36	8	54-60"	5/23/01	6/2/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16139.37	8	66-72"	5/23/01	6/2/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.01	TB	NA	5/24/01	5/29/01	Methanol	VOCs+15	EPA Method 8260
16144.02	15	6-12"	5/24/01	5/29/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.03	15	18-24"	5/24/01	5/29/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.04	15	30-36"	5/24/01	5/29/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.05	15	42-48"	5/24/01	5/30/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.06	15	54-60"	5/24/01	5/30/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM

TB: Trip Blank; NA: Not applicable;.
VOCs+15: Volatile Organic Compounds plus 15 tentatively identified compounds (TICs).
TPHC: Total Petroleum Hydrocarbons.
F.D.: Field Duplicate of Boring 15.
Date Analysis Started: Date of VOCs analysis.

Table 3-1
Soil Sample Collection Summary – May 2001
Main Post Gas Station – Bldg. 699
Fort Monmouth, New Jersey

Lab ID	Boring	Depth	Date Collected	Date Analysis Started	Matrix	Analytical Parameters	Analytical Methods
16144.07	15	66-72"	5/24/01	5/30/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.08	14	6-12"	5/24/01	5/30/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.09	14	18-24"	5/24/01	5/30/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.10	14	30-36"	5/24/01	5/30/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.11	14	42-48"	5/24/01	5/30/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.12	14	54-60"	5/24/01	5/30/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.13	14	66-72"	5/24/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.14	1	6-12"	5/24/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.15	1	18-24"	5/24/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.16	1	30-36"	5/24/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.17	1	42-48"	5/24/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.18	1	54-60"	5/24/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.19	1	66-72"	5/24/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.20	7	6-12"	5/24/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.21	7	18-24"	5/24/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.22	7	30-36"	5/24/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.23	7	42-48"	5/24/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.24	7	54-60"	5/24/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.25	7	66-72"	5/24/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.26	13	6-12"	5/24/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.27	13	18-24"	5/24/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.28	13	30-36"	5/24/01	5/31/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.29	13	42-48"	5/24/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.30	13	54-60"	5/24/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.31	13	66-72"	5/24/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.32	F. D.	6-12"	5/24/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.33	F. D.	18-24"	5/24/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.34	F. D.	30-36"	5/24/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.35	F. D.	42-48"	5/24/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.36	F. D.	54-60"	5/24/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16144.37	F. D.	66-72"	5/24/01	6/1/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM

TB: Trip Blank; NA: Not applicable;.
VOCs+15: Volatile Organic Compounds plus 15 tentatively identified compounds (TICs).
TPHC: Total Petroleum Hydrocarbons.
F.D.: Field Duplicate of Boring 15.
Date Analysis Started: Date of VOCs analysis.

Table 3-1
Soil Sample Collection Summary – May 2001
Main Post Gas Station – Bldg. 699
Fort Monmouth, New Jersey

Lab ID	Boring	Depth	Date Collected	Date Analysis Started	Matrix	Analytical Parameters	Analytical Methods
16148.01	TB	NA	5/25/01	6/3/01	Methanol	VOCs+15	EPA Method 8260
16148.02	21	6-12"	5/25/01	6/3/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16148.03	21	18-24"	5/25/01	6/3/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16148.04	21	30-36"	5/25/01	6/3/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16148.05	21	42-48"	5/25/01	6/3/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16148.06	21	54-60"	5/25/01	6/3/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16148.07	21	66-72"	5/25/01	6/3/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16148.08	20	6-12"	5/25/01	6/3/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16148.09	20	18-24"	5/25/01	6/3/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16148.10	20	30-36"	5/25/01	6/3/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16148.11	20	42-48"	5/25/01	6/3/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16148.12	20	54-60"	5/25/01	6/3/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16148.13	20	66-72"	5/25/01	6/3/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16148.14	19	6-12"	5/25/01	6/3/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16148.15	19	18-24"	5/25/01	6/3/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16148.16	19	30-36"	5/25/01	6/3/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16148.17	19	42-48"	5/25/01	6/3/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16148.18	19	54-60"	5/25/01	6/3/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM
16148.19	19	66-72"	5/25/01	6/3/01	Soil	VOCs+15; TPHC	EPA Method 8260; NJDEP Method OQA-QAM

TB: Trip Blank; NA: Not applicable;.
VOCs+15: Volatile Organic Compounds plus 15 tentatively identified compounds (TICs).
TPHC: Total Petroleum Hydrocarbons.
F.D.: Field Duplicate of Boring 15.
Date Analysis Started: Date of VOCs analysis.

Table 4-1
Soil Analytical Results – May 2001
Main Post Gas Station – Bldg. 699
Fort Monmouth, New Jersey

(mg/kg)

Lab ID	Boring	Depth	Date Collected	2-Butanone	Benzene	Ethyl-benzene	Total Xylenes	Methylene Chloride	Toluene	TPHC
Residental Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				**1000**	**3**	**1000**	**410**	**49**	**1000**	**10,000**
16136.02	48	6-12"	5/21/01	13	0.18	0.7	2.7	2	1.1	U
16136.03	48	18-24"	5/21/01	11	0.15	0.27	1.34	1.8	0.32	U
16136.04	48	30-36"	5/21/01	U	**3.2**	74	370	U	67	1463.84
16136.05	48	42-48"	5/21/01	U	1.1	54	294	1.6	56	2382.01
16136.06	48	54-60"	5/21/01	9.3	0.5	2.1	9.4	1.6	4.4	U
16136.07	48	66-72"	5/21/01	9.7	1.5	4.8	25.4	1.7	8.7	U
16136.08	47	6-12"	5/21/01	8.7	0.35	U	0.44	2.4	0.37	U
16136.09	47	18-24"	5/21/01	11	**5**	5.6	31.8	1.9	29	187.70
16136.10	47	30-36"	5/21/01	U	**23**	61	340	U	150	2404.16
16136.11	47	42-48"	5/21/01	U	**47**	120	**570**	U	220	5612.80
16136.12	47	54-60"	5/21/01	U	**45**	99	**500**	U	210	2765.01
16136.13	47	66-72"	5/21/01	U	**47**	97	**480**	U	200	971.20
16136.14	46	6-12"	5/21/01	U	1.8	5.1	30.7	U	14	U
16136.15	46	18-24"	5/21/01	U	0.41	0.23	1.42	U	1.5	U
16136.16	46	30-36"	5/21/01	U	**33**	91	**420**	U	250	2076.86
16136.17	46	42-48"	5/21/01	U	**20**	40	255	U	140	669.74
16136.18	46	54-60"	5/21/01	U	**18**	37	240	U	140	708.68
16136.19	46	66-72"	5/21/01	U	**12**	31	196	U	120	735.43
16139.02	5	6-12"	5/23/01	U	U	U	U	U	U	U
16139.03	5	18-24"	5/23/01	U	U	U	U	U	U	U
16139.04	5	30-36"	5/23/01	U	U	U	U	U	U	U
16139.05	5	42-48"	5/23/01	U	U	100	**800**	U	24	1537.30
16139.06	5	54-60"	5/23/01	U	U	80	**610**	U	29	1370.15
16139.07	5	66-72"	5/23/01	U	U	100	**620**	U	61	1555.11
16139.08	11	6-12"	5/23/01	U	U	31	**550**	U	48	919.14
16139.09	11	18-24"	5/23/01	U	U	48	**460**	U	50	1200.12
16139.10	11	30-36"	5/23/01	U	U	50	312	U	54	2225.70
16139.11	11	42-48"	5/23/01	U	U	68	389	U	67	1040.99
16139.12	11	54-60"	5/23/01	U	U	8.1	45	U	9.7	1234.66
16139.13	11	66-72"	5/23/01	U	U	59	343	U	77	1057.37
16139.14	3	6-12"	5/23/01	U	U	U	U	U	U	U
16139.15	3	18-24"	5/23/01	U	U	U	U	U	U	U
16139.16	3	30-36"	5/23/01	U	U	U	U	U	U	U
16139.17	3	42-48"	5/23/01	U	**17**	74	400	U	170	1350.70
16139.18	3	54-60"	5/23/01	U	**12**	57	322	U	130	603.84
16139.19	3	66-72"	5/23/01	U	**17**	51	279	U	110	370.76
16139.20	9	6-12"	5/23/01	U	U	6	19	U	U	179.02
16139.21	9	18-24"	5/23/01	U	U	7.3	37.7	U	8.9	U
16139.22	9	30-36"	5/23/01	U	**8.2**	78	397	U	95	320.01
16139.23	9	42-48"	5/23/01	U	U	33	176	U	50	180.44
16139.24	9	54-60"	5/23/01	U	**14**	60	318	U	130	721.96
16139.25	9	66-72"	5/23/01	U	**13**	32	169	U	96	564.67
16139.26	2	6-12"	5/23/01	U	U	U	U	U	U	U
16139.27	2	18-24"	5/23/01	U	U	U	U	U	7.3	U
16139.28	2	30-36"	5/23/01	U	**37**	76	**480**	U	300	U
16139.29	2	42-48"	5/23/01	U	**26**	28	170	U	140	589.47
16139.30	2	54-60"	5/23/01	U	**45**	58	360	U	260	300.37
16139.31	2	66-72"	5/23/01	U	**34**	47	280	U	210	282.16
16139.32	8	6-12"	5/23/01	U	U	U	29.9	U	18	U
16139.33	8	18-24"	5/23/01	U	U	U	U	U	U	U

F.D.: Field Duplicate of boring 15.

Exceeds Residential Direct Contact Soil Cleanup Criteria

TPHC: Total Petroleum Hydrocarbons.

U: Not detected.

Table 4-1
Soil Analytical Results – May 2001
Main Post Gas Station – Bldg. 699
Fort Monmouth, New Jersey

(mg/kg)

Lab ID	Boring	Depth	Date Collected	2-Butanone	Benzene	Ethyl-benzene	Total Xylenes	Methylene Chloride	Toluene	TPHC
Residental Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				**1000**	**3**	**1000**	**410**	**49**	**1000**	**10,000**
16139.34	8	30-36"	5/23/01	U	**26**	51	290	U	170	2102.68
16139.35	8	42-48"	5/23/01	U	**48**	110	**630**	U	360	1568.80
16139.36	8	54-60"	5/23/01	U	**16**	31	179	U	120	673.31
16139.37	8	66-72"	5/23/01	U	**6**	U	10	U	14	258.29
16144.02	15	6-12"	5/24/01	320	U	U	U	29	U	1550.40
16144.03	15	18-24"	5/24/01	U	0.45	1.2	7	U	0.92	549.47
16144.04	15	30-36"	5/24/01	U	2.8	13	74	U	21	411.49
16144.05	15	42-48"	5/24/01	U	**29**	230	**1180**	U	420	3793.48
16144.06	15	54-60"	5/24/01	U	**17**	140	**690**	U	270	1769.87
16144.07	15	66-72"	5/24/01	U	**57**	400	**1970**	U	750	3927.80
16144.08	14	6-12"	5/24/01	U	U	21	106	U	46	U
16144.09	14	18-24"	5/24/01	U	**22**	150	**840**	U	340	2831.24
16144.10	14	30-36"	5/24/01	U	**29**	210	**1100**	U	480	2608.34
16144.11	14	42-48"	5/24/01	U	**37**	210	**1110**	U	520	276.75
16144.12	14	54-60"	5/24/01	U	**19**	61	324	U	190	323.37
16144.13	14	66-72"	5/24/01	U	**38**	130	**670**	U	340	U
16144.14	1	6-12"	5/24/01	U	U	U	16	U	11	U
16144.15	1	18-24"	5/24/01	U	U	U	U	U	U	U
16144.16	1	30-36"	5/24/01	U	U	15	91	U	37	1818.04
16144.17	1	42-48"	5/24/01	U	**11**	99	**610**	U	200	1879.24
16144.18	1	54-60"	5/24/01	U	U	35	224	U	80	944.55
16144.19	1	66-72"	5/24/01	U	U	18	108	U	41	U
16144.20	7	6-12"	5/24/01	U	U	U	U	U	U	U
16144.21	7	18-24"	5/24/01	U	U	U	U	U	U	U
16144.22	7	30-36"	5/24/01	U	U	U	U	U	U	214.73
16144.23	7	42-48"	5/24/01	U	**7.8**	130	**800**	U	200	2901.44
16144.24	7	54-60"	5/24/01	U	U	65	390	U	87	1631.46
16144.25	7	66-72"	5/24/01	U	U	71	410	U	100	1718.21
16144.26	13	6-12"	5/24/01	U	**19**	16	74	U	8.3	U
16144.27	13	18-24"	5/24/01	U	**7.1**	7.3	40.7	U	17	1324.62
16144.28	13	30-36"	5/24/01	U	**36**	74	**450**	U	240	3038.05
16144.29	13	42-48"	5/24/01	U	**50**	110	**690**	U	370	4134.52
16144.30	13	54-60"	5/24/01	U	**100**	260	**1560**	U	850	1744.81
16144.31	13	66-72"	5/24/01	U	**28**	85	**540**	U	260	1208.51
16144.32	F. D.	6-12"	5/24/01	U	U	U	U	U	U	1805.68
16144.33	F. D.	18-24"	5/24/01	U	U	U	U	U	U	508.86
16144.34	F. D.	30-36"	5/24/01	U	U	8.4	56	U	16	323.19
16144.35	F. D.	42-48"	5/24/01	U	**25**	230	**1160**	U	380	2601.22
16144.36	F. D.	54-60"	5/24/01	U	**18**	160	**810**	U	310	2553.80
16144.37	F. D.	66-72"	5/24/01	U	**69**	540	**2780**	U	**1100**	3134.08
16148.02	21	6-12"	5/25/01	4.4	**6**	9.9	27	9.2	U	260.77
16148.03	21	18-24"	5/25/01	6.4	U	28	125	9	24	657.65
16148.04	21	30-36"	5/25/01	4.9	U	38	174	8.5	34	2090.96
16148.05	21	42-48"	5/25/01	7.7	U	43	200	9.3	39	3543.11
16148.06	21	54-60"	5/25/01	U	**5.6**	71	321	11	85	710.03
16148.07	21	66-72"	5/25/01	7.6	2.3	30	136	10	38	1366.20
16148.08	20	6-12"	5/25/01	U	U	U	4.4	9.7	U	U
16148.09	20	18-24"	5/25/01	U	U	U	U	9.5	U	U
16148.10	20	30-36"	5/25/01	U	U	U	2.8	9.3	U	U
16148.11	20	42-48"	5/25/01	5	U	U	2.6	14	U	U
16148.12	20	54-60"	5/25/01	U	U	7.1	342	9.7	10	505.71

F.D.: Field Duplicate of boring 15.

Exceeds Residential Direct Contact Soil Cleanup Criteria

TPHC: Total Petroleum Hydrocarbons.

U: Not detected.

Table 4-1
Soil Analytical Results – May 2001
Main Post Gas Station – Bldg. 699
Fort Monmouth, New Jersey

(mg/kg)

Lab ID	Boring	Depth	Date Collected	2-Butanone	Benzene	Ethyl-benzene	Total Xylenes	Methylene Chloride	Toluene	TPHC
Residental Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				**1000**	**3**	**1000**	**410**	**49**	**1000**	**10,000**
16148.13	20	66-72"	5/25/01	7	**3.6**	35	158	10	45	1121.85
16148.14	19	6-12"	5/25/01	U	U	3.8	4.7	U	4.7	U
16148.15	19	18-24"	5/25/01	U	U	14	73	U	19	1466.90
16148.16	19	30-36"	5/25/01	U	**3.2**	20	101	U	31	1085.56
16148.17	19	42-48"	5/25/01	U	**3.8**	21	106	U	38	1597.04
16148.18	19	54-60"	5/25/01	U	2.2	10	53	U	22	250.20
16148.19	19	66-72"	5/25/01	U	U	U	U	U	2.5	U
16136.01	TB	NA	5/21/01	9.8	U	U	U	1.7	0.34	NA
16139.01	TB	NA	5/23/01	U	U	U	U	U	U	NA
16144.01	TB	NA	5/24/01	U	U	U	U	U	U	NA
16148.01	TB	NA	5/25/01	5.2	U	U	U	U	U	NA

Note: TB = Trip Blank, NA = Not Applicable.

F.D.: Field Duplicate of boring 15.
Exceeds Residential Direct Contact Soil Cleanup Criteria
TPHC: Total Petroleum Hydrocarbons.
U: Not detected.

Table 5-1
Soil Analytical Results Comparisons by Boring
Main Post Gas Station - Building 699
Fort Monmouth, New Jersey

Boring	Depth	Benzene		Ethylbenzene		Toluene		Total Xylenes		TPHC	
RDCSCC		3		1000		1000		410		10,000	
Date		2000	2001	2000	2001	2000	2001	2000	2001	2000	2001
1	6-12"	U	U	U	U	U	11	U	16	U	U
1	18-24"	0.66	U	0.31	U	0.49	U	0.66	U	U	U
1	30-36"	**9.4**	U	40	15	120	37	262	91	219.61	1818.04
1	42-48"	**7.4**	11	54	99	140	200	360	610	1130.84	1879.24
1	54-60"	**18**	U	100	35	300	80	**680**	224	U	944.55
1	66-72"	**11**	U	55	18	170	41	360	108	774.46	U
2	6-12"	U	U	U	U	U	U	U	U	796.58	U
2	18-24"	1.1	U	U	U	0.57	7.3	0.36	U	768.3	U
2	30-36"	**3.4**	37	0.32	76	3.7	300	1.76	480	470.36	U
2	42-48"	**9.4**	26	31	28	100	140	198	170	900.61	589.47
2	54-60"	**49**	45	77	58	280	260	**460**	360	201.37	300.37
2	66-72"	**54**	34	58	47	240	210	348	280	442.46	282.16
3	6-12"	U	U	U	U	U	U	0.35	U	338.13	U
3	18-24"	U	U	U	U	U	U	3.8	U	U	U
3	30-36"	U	U	14	U	25	U	89	U	200.23	U
3	42-48"	**60**	17	190	74	690	170	**1610**	400	855.41	1350.70
3	54-60"	**220**	12	630	57	**1900**	130	**3890**	322	1015.74	603.84
3	66-72"	**43**	17	76	51	260	110	410	279	1831.21	370.76
5	6-12"	U	U	U	U	U	U	6.2	U	352.43	U
5	18-24"	U	U	32	U	13	U	202	U	247.73	U
5	30-36"	U	U	110	U	53	U	**730**	U	1365.7	U
5	42-48"	U	U	190	100	100	24	**1030**	800	4529.63	1537.30
5	54-60"	U	U	39	80	22	29	257	610	1313.65	1370.15
5	66-72"	U	U	38	100	23	61	243	620	851.72	1555.11
7*	6-12"	U	U	U	U	U	U	U	U	U	U
7*	18-24"	U	U	U	U	U	U	U	U	186.87	U
7*	30-36"	**39**	U	170	U	350	U	**850**	U	1450.01	214.73
7*	42-48"	**14**	7.8	62	130	180	200	380	800	681.84	2901.44
7*	54-60"	**20**	U	120	65	270	87	**690**	390	926.66	1631.46
7*	66-72"	3	U	26	71	60	100	155	410	425.04	1718.21
8*	6-12"	**5.9**	U	6.2	U	22	18	323	29.9	U	U
8*	18-24"	**14**	U	23	U	71	U	127	U	211.46	U
8*	30-36"	**35**	26	63	51	190	170	360	290	811.78	2102.68
8*	42-48"	**34**	48	76	110	240	360	**450**	630	300.29	1568.80
8*	54-60"	**110**	16	180	31	450	120	**750**	179	326.53	673.31
8*	66-72"	**230**	6	290	U	740	14	**1670**	10	220.54	258.29
9	6-12"	U	U	U	6	U	U	8.8	19	U	179.02
9	18-24"	U	U	U	7.3	U	8.9	13	37.7	U	U
9	30-36"	U	8.2	U	78	U	95	10	397	U	320.01
9	42-48"	U	U	16	33	23	50	85	176	U	180.44
9	54-60"	**14**	**14**	57	60	120	130	302	318	541.33	721.96
9	66-72"	**6.1**	13	13	32	36	96	72	169	U	564.67
11	6-12"	U	U	U	31	U	48	16	550	U	919.14
11	18-24"	U	U	7.5	48	U	50	47	460	172.83	1200.12
11	30-36"	**7.6**	U	160	50	95	54	**920**	312	416.92	2225.70
11	42-48"	**7.8**	U	140	68	110	67	**810**	389	5067.13	1040.99
11	54-60"	**9.9**	U	160	8.1	140	9.7	**900**	45	1172.8	1234.66
11	66-72"	U	U	20	59	17	77	116	343	888.29	1057.37
13*	6-12"	**5.2**	19	5.7	16	U	8.3	24	74	177.25	U
13*	18-24"	**6.5**	7.1	6.1	7.3	15	17	35	40.7	187.7	1324.62
13*	30-36"	**77**	36	150	74	**1100**	240	**880**	450	1665.7	3038.05
13*	42-48"	**35**	50	79	110	260	370	**470**	690	1071.17	4134.52
13*	54-60"	**64**	100	130	260	400	850	**780**	1560	212.62	1744.81
13*	66-72"	**44**	28	92	85	310	260	**540**	**540**	1985.29	1208.51

Table 5-1
Soil Analytical Results Comparisons by Boring
Main Post Gas Station - Building 699
Fort Monmouth, New Jersey

Boring	Depth	Benzene		Ethylbenzene		Toluene		Total Xylenes		TPHC	
RDCSCC		3		1000		1000		410		10,000	
Date		2000	2001	2000	2001	2000	2001	2000	2001	2000	2001
14*	6-12"	U	U	U	21	U	46	U	106	406.24	U
14*	18-24"	U	22	U	150	U	340	U	840	U	2831.24
14*	30-36"	U	29	U	210	U	480	U	1100	676.44	2608.34
14*	42-48"	13	37	240	210	270	520	1390	1110	3490.44	276.75
14*	54-60"	U	19	140	61	140	190	860	324	1221.51	323.37
14*	66-72"	7.5	38	100	130	110	340	610	670	1049.82	U
15*	6-12"	U	U	U	U	U	U	16	U	U	1550.40
15*	18-24"	U	0.45	U	1.2	U	0.92	U	7	U	549.47
15*	30-36"	14	2.8	130	13	200	21	680	74	521.7	411.49
15*	42-48"	17	29	160	230	280	420	840	1180	571.38	3793.48
15*	54-60"	84	17	690	140	1300	270	3590	690	6957.69	1769.87
15*	66-72"	U	57	U	400	12	750	16	1979	2750.01	3927.80
19	6-12"	U	U	3.2	3.8	U	4.7	5	4.7	409.34	U
19	18-24"	U	U	5.9	14	9	19	27.4	73	1493.74	1466.90
19	30-36"	19	3.2	130	20	190	31	670	101	1267.86	1085.56
19	42-48"	16	3.8	120	21	190	38	600	106	2888.57	1597.04
19	54-60"	30	2.2	170	10	310	22	850	53	3891.82	250.20
19	66-72"	16	U	77	U	170	2.5	400	U	1406.05	U
20	6-12"	U	U	U	U	U	U	U	4.4	533.26	U
20	18-24"	U	U	U	U	U	U	U	U	454.19	U
20	30-36"	26	U	98	U	180	U	490	2.8	554.5	U
20	42-48"	55	U	210	U	410	U	1060	2.6	1072.54	U
20	54-60"	41	U	160	7.1	320	10	800	342	375.36	505.71
20	66-72"	21	3.6	66	35	160	45	340	158	1108.07	1121.85
21	6-12"	U	6	U	9.9	U	U	16	27	198.63	260.77
21	18-24"	U	U	44	28	34	24	204	125	258.28	657.65
21	30-36"	22	U	310	38	300	34	1420	174	865.28	2090.96
21	42-48"	25	U	380	43	380	39	1970	200	1535.72	3543.11
21	54-60"	25	5.6	430	71	410	85	1330	321	3205.2	710.03
21	66-72"	100	2.3	1100	30	1400	38	5200	136	8739.63	1366.20
46	6-12"	3.9	1.8	3	5.1	14	14	17.8	30.7	U	U
46	18-24"	3	0.41	U	0.23	8.3	1.5	7	1.42	U	U
46	30-36"	19	33	42	91	160	250	262	420	938.19	2076.86
46	42-48"	30	20	63	40	240	140	400	255	1784.99	669.74
46	54-60"	49	18	120	37	340	140	510	240	238.3	708.68
46	66-72"	28	12	59	31	240	120	360	196	684.08	735.43
47	6-12"	3.7	0.35	4	U	15	0.37	22.1	0.44	U	U
47	18-24"	3.3	5	U	5.6	8.2	29	10.8	31.8	U	187.70
47	30-36"	U	23	U	61	5.6	150	4.2	340	U	2404.16
47	42-48"	23	47	60	120	210	220	400	570	1088.62	5612.80
47	54-60"	30	45	86	99	290	210	590	500	1327.62	2765.01
47	66-72"	69	47	230	97	800	200	1490	480	1759.2	971.20
48	6-12"	1.2	0.18	2	0.7	1.8	1.1	8.62	2.7	U	U
48	18-24"	1.1	0.15	1.1	0.27	0.9	0.32	4.73	1.34	U	U
48	30-36"	0.86	3.2	0.58	74	0.77	67	2.57	370	U	1463.84
48	42-48"	1.5	1.1	1.1	54	1.9	56	5.8	294	U	2382.01
48	54-60"	5.2	0.5	29	2.1	56	4.4	173	9.4	10533.83	U
48	66-72"	110	1.5	490	4.8	990	8.7	2870	25.4	326.19	U
Total Number* of Exceedances of RDCSCC:		Benzene		Ethylbenzene		Toluene		Total Xylenes		TPHC	
		60	45	1	0	4	0	38	24	1	0

Notes

*Borings 7, 8, 13, 14, and 15 were repositioned between 2000 and 2001.
U: Not detected.
Bold and shaded: exceeds RDCSCC.
Decrease in concentration between 2000 and 2001 analytical result.
Increase in concentration between 2000 and 2001 analytical result.

Appendix A

Versar, Inc., October 2000. Remedial Action Work Plan Second Addendum, Enzyme Enhanced Bioremediation at the AAFES Main Post Gas Station, Building 699, Fort Monmouth, New Jersey.

FINAL

REMEDIAL ACTION WORKPLAN, 2nd ADDENDUM

Enzyme-Enhanced Bioremediation At the AAFES Main Post Gas Station, Building 699 Fort Monmouth, New Jersey

U.S. Army Garrison
Fort Monmouth, New Jersey

Directorate of Public Works

October 2000

1900 Frost Road, Suite 110
Bristol, Pennsylvania 19007

Contract No. DACA51-00-D-0004
Delivery Order No. 0002

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LIST OF ACRONYMS AND ABBREVIATIONS

AMC	U.S. Army Material Command
A2	TPH Bacterial Consortium
BTEX	Benzene, Toluene, Ethylbenzene, and Xylene
BUST	Bureau of Underground Storage Tanks
CADD	Computer Aided Drafting and Design
CBN	Custom Blend Nutrients
CEA	Classification Exception Area
CECOM	U.S. Army Communications and Electronics Command
COC	Constituent of Concern
COR	Contracting Officer's Representative
CY	cubic yard
DICAR	Discharge Investigation and Corrective Action Report
DPW	Directorate of Public Works
EA	Enzyme Accelerator
EEB	Enhanced-Enzyme Bioremediation
ETEC	Enzyme Technologies, Inc.
HASP	Health and Safety Plan
GAC	Granular Activated Carbon
GES	Groundwater & Environmental Systems, Inc.
GPS	Global Positioning System
GWQS	Ground Water Quality Standards
MSDS	Material Safety Data Sheet
MDL	Method Detection Limit
mg/Kg	milligram per Kilogram
MZC	Multi-Enzyme Complexes
NJDEP	New Jersey Department of Environmental Protection
ppm	Part per million
PID	Photoionization Detector
QAPP	Quality Assurance Project Plan
RAW	Remedial Action Workplan
RAWA	Remedial Action Workplan Addendum
RDCSCC	(NJDEP) Residential Direct Contact Soil Cleanup Criteria
RW	Recovery Well
SA	Second Addendum
SOW	Statement of Work
SPP	Separate-phase Product
SVE	Soil Vapor Extraction
TES	Technical Evaluation and Summary
TPHC	Total Petroleum Hydrocarbons

LIST OF ACRONYMS AND ABBREVIATIONS
(continued)

TVS	TECOM-Vinell Services, Inc.
TWA	Treatment Works Approval
UST	Underground Storage Tank
US	United States
VOC	Volatile Organic Compound
WP	Workplan

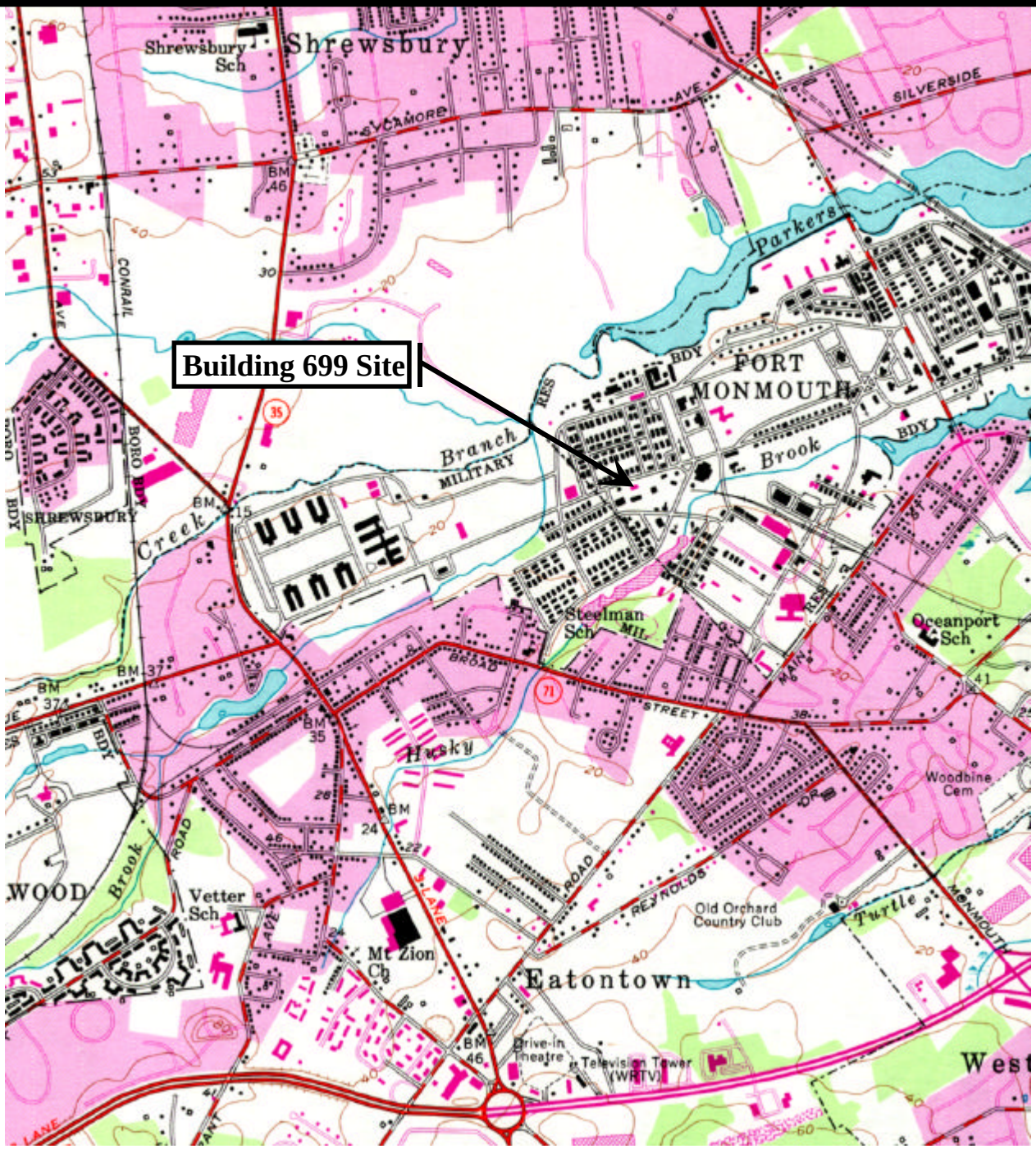
1.0 INTRODUCTION

Versar, Inc. (Versar) has been contracted by the United States (U.S.) Army Fort Monmouth (Fort Monmouth), Directorate of Public Works (DPW), Fort Monmouth, New Jersey to prepare a second addendum (SA) to the Remedial Action Workplan (RAW) for the AAFES Main Post Gas Station, Building No. 699 located in the Main Post area of Fort Monmouth. This SA addresses the planned implementation of enzyme-enhanced bioremediation (EEB) as a supplement to the previously proposed remedial system upgrade for the Main Post Gas Station, Building 699. The proposed system upgrade was presented in the Remedial Action Workplan Addendum (RAWA), dated 10 June 1999 and prepared by Groundwater & Environmental Systems, Inc. (GES). This SA has been prepared in partial fulfillment of Contract No. DACA 51-00-D-004, Delivery Order No. 0002 for submittal to the New Jersey Department of Environmental Protection (NJDEP) for review and approval.

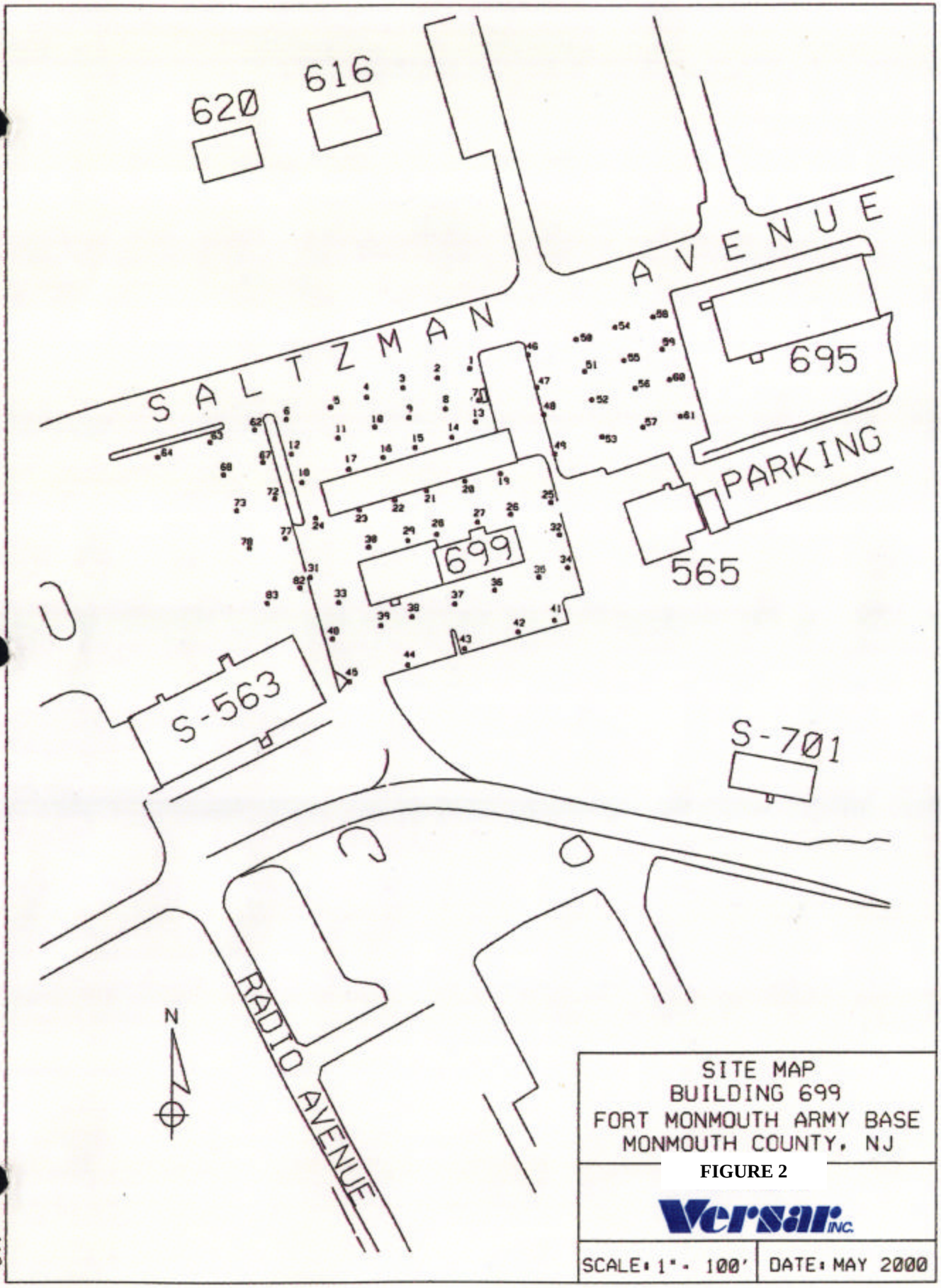
1.1 Background

Fort Monmouth is located in the central-eastern portion of New Jersey in Monmouth County, approximately 45 miles south of New York City and 70 miles northeast of Philadelphia. In addition to the Main Post, the installation includes two subposts, the Charles Wood Area and the Evans Area. The Main Post (Figure 1) encompasses approximately 630 acres and is generally bounded by State Highway 35, Parkers Creek, Lafetra Brook, the New Jersey Transit Railroad, and a residential area to the south. The post was established during WW I, in 1918, as an Army Signal Corps training center. The Main Post currently provides supporting administrative, training, and housing functions, as well as many of the community facilities for Fort Monmouth. The primary mission of Fort Monmouth is to provide command, administrative, and logistical support for Headquarters, U.S. Army Communications and Electronics Command (CECOM). CECOM is a major subordinate command of the U.S. Army Material Command (AMC) and is the host tenant at Fort Monmouth. The Main Post Gas Station – Building 699 ("the site") is approximately one acre in size and serves as the only on-base Main Post location for non-military vehicles to obtain fuel. Figure 2 shows the layout of the site.

On October 19, 1989, the DPW contacted NJDEP to report an apparent release of gasoline from the piping system at the gas station. The loss of product was discovered as a result of an inventory discrepancy found during routine inventory control. Subsequent pressure testing of the gasoline system indicated that the leak was located in the product line between the tanks and pumps. An Incident Number was assigned to the site by the NJDEP (#89-10-19-1329) for the gasoline release. Following the release, the DPW replaced the piping system connecting the USTs and the fuel pumps with equipment that was compliant with NJDEP Bureau of Underground Storage Tanks (BUST) requirements.



Building 699 Site **Fort Monmouth, New Jersey**	**FIGURE 1**
	Site Location Map
U.S.G.S Topographic Map Long Branch, NJ Quadrangle 7.5-Minute Series	Versar INC.



SITE MAP
BUILDING 699
FORT MONMOUTH ARMY BASE
MONMOUTH COUNTY, NJ

FIGURE 2

Versar INC.

SCALE: 1" = 100' | DATE: MAY 2000

A separate-phase product (SPP) recovery pump was then installed in a monitoring well immediately downgradient of the source in an attempt to recover remaining SPP. In response to NJDEP's request, Fort Monmouth submitted a Discharge Investigation and Corrective Action Report (DICAR), dated 3 July 1990.

The Krydon Group, Inc. (Krydon) was contracted to determine the extent of gasoline contamination at the site by means of a soil boring program conducted in July 1993. Additionally, in response to the 1989 release, seventeen (17) monitoring wells and three (3) recovery wells were installed at the site. Further, in a letter dated June 18, 1993, the NJDEP requested submission of a RAW, which was submitted by the U.S. Army on October 12, 1993 (Krydon, 1993).

The existing groundwater recovery and treatment system extracts groundwater from one (1) recovery well (RW-11). TECOM-Vinell Services, Inc. (TVS) personnel currently operate and maintain the existing groundwater recovery and treatment system. The current treatment system consists of one (1) sediment filter, and three (3) one hundred and eighty (180) pound liquid-phase granular activated carbon (GAC) units installed in series. The GAC units provide the necessary treatment for the removal of volatile organic compounds (VOCs) from the extracted groundwater. The treated groundwater is then discharged to the sanitary sewer in accordance with Fort Monmouth's existing Treatment Works Approval (TWA) Permit with the Northeast Monmouth County Regional Sewerage Authority.

GES was contracted by DPW (through TVS) to prepare a Remedial Action Workplan Addendum (RAWA) for the site. As part of this effort, GES performed remedial action pilot tests to evaluate potential remedial options. The RAWA (GES, 1999), dated 10 June 1999 was submitted to NJDEP and provided a brief history of the site and area of concern, a performance summary of the current groundwater remedial system, a summary of groundwater monitoring and sampling data, and the design and specifications of a proposed remedial system upgrade. As described in the RAWA, the proposed remedial system upgrade utilized soil vapor extraction (SVE) and groundwater pumping to extract soil vapor and groundwater from existing monitoring wells and proposed extraction laterals and wells. Furthermore, it proposed VOC removal from the groundwater using in-situ air stripping (air sparging). The extracted soil vapor and groundwater were to be treated and discharged in accordance with applicable discharge permits. The RAWA also established a proposed Classification Exception Area (CEA) encompassing the estimated capture zone of the proposed upgraded remedial system.

Subsequent to submission of the RAWA, further characterization and evaluation of site conditions identified the potential existence of clays in the upper horizon at the site. It was presumed that these soils would not be effectively addressed by the proposed SVE system, which is typically designed to remediate permeable sandy soils, such as those underlying the upper clay unit at the site. EEB was therefore proposed to attempt to remediate the contaminated soils in the upper soil horizon within an estimated depth of 3-

4 feet (ft.). EEB involves the process of transforming hazardous constituents to non-hazardous ones in a biological system, and is the result of complex biochemical reactions in which microorganisms (bacteria) convert the hazardous constituents to energy and cell mass. To initiate this process, high levels of target-specific, petroleum-degrading biological enhancements (enzymes, bacteria, nutrients) and oxygen need to be provided to the targeted contaminated soils.

To further delineate the horizontal and vertical extent of soil contamination at the site and to identify "hot spot" areas that could be addressed by the EEB, as well as to support design of the proposed SVE system, supplemental soil sampling was performed at the site in March and April 2000 by DPW and TVS personnel over a sampling grid encompassing eighty-three (83) locations. The borings were installed with a Geoprobe®, and soil samples were collected at 6-inch alternating intervals to a depth of twelve (12) ft. for a total of twelve (12) samples per location. The samples were analyzed for VOCs, total petroleum hydrocarbons (TPHC), lead, and percent (%) solids.

1.2 Objective

The objective of this SA to the RAW is to summarize the additional characterization performed at the site, and present a supplemental site remediation (EEB) for the impacted clay-rich soils beneath the Main Post Gas Station. The purpose of the planned supplemental activities is to inject biological enhancements into the shallow subsurface soils at identified "hot spot" areas to accelerate remediation of "petroleum" contaminants that might not be effectively addressed by the proposed SVE and air sparging system, thereby improving overall remedial performance at the site.

The activities addressed in this SA to the RAW include:

- Presenting and summarizing the results of the additional soil sampling performed in March/April 2000 to identify "hot spot" areas and determine the areal extent of low-permeable soils;
- Planning the application of EEB to "hot spot" areas using a Geoprobe® delivery system;
- Providing procedures for applying the biological enhancements;
- Conducting post-injection soil sampling to evaluate effectiveness of the supplemental site remediation activities; and
- Preparing a Technical Evaluation and Summary Report to document findings.

Construction of the proposed remedial system upgrade, including the SVE system extraction laterals and extraction and sparge wells, will be completed prior to implementing the EEB application. These activities will involve the excavation and removal of subsurface soils some of which may be within the delineated "hot spot"

locations. The EEB application will then be directed toward contaminated shallow subsurface soils within the remaining “hot spot” locations.

2.0 SITE SETTING

2.1 Site Description

As reported in the RAWA, the site is located on Saltzman Avenue, a thoroughfare through Fort Monmouth. The site is approximately one acre in size and serves as the only on-base Main Post location for non-military vehicles to obtain fuel. The site consists of a service station building (Bldg. 699) and two active pump islands under canopy. The station has six 10,000-gallon, fiberglass USTs that store various grades of gasoline products. Building 699 was historically utilized as an automotive service garage, and there are four bays located at the eastern side of the building. However, limited auto servicing is still performed. The site is approximately ninety percent covered by impervious surfaces including pavement, concrete islands, and the service station. Large paved parking areas exist to the east and west of the site. A large grassy area is found to the north across Saltzman Avenue. Building 699 is located approximately 750 ft. northwest of Husky Brook, which empties into Oceanport Creek. Topography at the site is relatively flat, sloping gradually to the southeast.

The current groundwater treatment system is located within an enclosure area on the concrete island that borders the eastern side of the site. As previously discussed, restoration/reconfiguration of the site is planned for implementation. Existing facilities will be demolished, and new refueling facilities and an overhead canopy will be constructed. The proposed remedial system upgrade will be located in a separate fenced enclosure, adjacent to the current treatment system enclosure.

2.2 Regional Geology

As reported in the RAWA (GES, 1999), Monmouth County lies within the New Jersey Section of the Atlantic Coastal Plain Physiographic province. The site is located in what may be referred to as the Outer Coastal Plain subprovince, or the Outer Lowlands. In general, New Jersey Coastal Plain formations consist of a seaward-dipping wedge of unconsolidated deposits of clay, silt, and gravel. The mineralogy ranges from quartz to glauconite. The New Jersey Coastal Plain formations record several major transgressive/regressive cycles and contain units, which are generally thicker to the southeast and reflect a deeper water environment. Over twenty (20) regional geologic units are present within the sediments of the Coastal Plain. Regressive, upward coarsening deposits are usually aquifers (e.g., Englishtown and Kirkwood Formations, and the Cohansey Sand), while the transgressive deposits act as confining units (e.g., the Merchantville, Marshaltown, and Navensink Formations). The individual thickness for these units varies greatly (i.e., from several ft. to several hundred ft.). The lithologies observed in borings installed within the Main Post area have reportedly consisted of fine-to-medium grained sands, with occasional lenses or lamentations of gravel silt and/or clay.

Based on past drilling, the depth to bedrock is greater than twenty (20) ft. A generalized stratigraphic sequence at the site (progressing upward) includes a lower (Sandy Hook) and upper (Shrewsbury) member of the Red Bank sand. The lower member is a dark gray to black, medium-to-fine grained sand with abundant clay, mica, and glauconite. The upper is a yellowish-gray to reddish brown clayey, medium-to-coarse grained sand that contains abundant rock fragments, minor mica, and glauconite.

2.3 Hydrogeology

Groundwater has been encountered at depths of between two (2) and fourteen (14) ft. across the site. During soil sampling at the site, unsaturated soils were reportedly encountered up to twelve (12) ft. below ground surface (bgs). Seasonal water table fluctuations are expected to be limited to two (2) to three (3) ft. Fluctuations may also be locally influenced by tidal influence (based on proximity to the Atlantic Ocean, rivers, tributaries), the nature of fill material, presence of clay and silt lenses in the overburden, and local recharge areas (streams and lakes). The interbedded sequences of sand and clay transmit water under both confined and unconfined conditions. The intermittent clay strata serve as semi-confining beds, where present. Based on GES groundwater elevation data from July 1998 to February 1999, the predominant groundwater flow direction is northeast to east.

3.0 SITE CHARACTERIZATION

3.1 Previous Soil Sampling Summary

In 1993, samples were collected to further define the extent of gasoline contamination on the east side of the site. A total of twenty-seven (27) soil samples were collected at 5.5 ft. below grade (the soil-groundwater interface). Based on the soil analytical data, total benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations ranged from 125 to 2170 milligrams per Kilogram (mg/Kg), and total VOCs ranged from 307 to 2877 mg/Kg (GES, 1999). However, the extent of contamination was not completely defined. In September 1999, four USTs were discovered below the pump island area on the west side of the site. The USTs and associated contaminated soil were removed, and soil sampling was conducted by DPW and TVS. The data indicated that total BTEX concentrations in the soils beneath the USTs ranged from 2 to 1487 mg/Kg, and total VOCs ranged from 26 to 1728 mg/Kg (DPW, 1999).

3.2 March/April 2000 Geoprobe Sampling

As previously discussed, supplemental soil sampling was performed at the site in March and April 2000 by DPW and TVS personnel to further delineate the horizontal and vertical extent of soil contamination, and to identify "hot spot" areas that could be addressed by EEB, as well as to support design of the proposed SVE system. TVS collected soil samples using a Geoprobe® on a sampling grid established across the site at 30-foot intervals, totaling 83 potential sampling locations. Figure 2 shows the sampling grid for the Geoprobe® soil sampling. Soil samples were collected at alternating 6-inch intervals from ground surface to a depth of 12 ft. at each location for a total of 12 samples per boring. Each boring location was then surveyed using a Global Positioning System (GPS). The collected samples were analyzed at the Fort Monmouth Environmental Testing Laboratory (DPW, 2000) for VOCs (EPA SW-846 Method 8260), Total Petroleum Hydrocarbons (TPHC) (NJDEP Method OQA-QAM-025, 10/97), lead (EPA SW-846 Method 3051A/ Method 3111B FLAA PB), and percent solids. Appendix A provides a copy of Fort Monmouth Standard Operating Procedure (SOP) No. SAM-0221 entitled: Geoprobe Sampling Methods for the AAFES Main Post Gas Station, Building 600, dated 24 February 2000. SAM-0221 documents the procedure used to collect samples to delineate the extent of gasoline contamination at Building 699.

Table 3-1 (following page 19) presents a summary of the analytical results in mg/Kg for the March/April 2000 soil Geoprobe® sampling. The analytes listed include: TPHC, lead (Pb) and the VOCs detected above the respective analytical method detection limits (MDLs) (2-Butanone, 2-Chloroethyl vinyl ether, trichloroethylene (TCE) benzene, perchloroethylene (PCE), ethyl-benzene, xylene, methylene chloride, acetone, toluene, and chloroform). Table 3-1 also lists the NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC) in mg/Kg for each of the listed constituents of concern (COCs).

(Note: The Method Detection Limit or MDL for each analyte is either at or below the respective RDCSCC.) Each sample that exceeded the respective RDCSCC has been shown in bold print and the table cell has been shaded (e.g., **9.4**). If there was no detection for any COC at a sampling interval, the interval has not been listed in Table 3-1 for the respective boring location. As can be seen in Table 3-1, COCs were detected in fifty-three (53) of the eighty-three (83) boring locations. There were no detections for analyzed constituents at nineteen (19) boring locations: Nos. 37, 39, 40 and 40D (duplicate sample), 41, 42, 44, 51, 52, 53, 54, 55, 56, 57, 59, 60 and 60D (duplicate sample), 63, 64, 73, and 83. At eleven (11) boring locations: Nos. 65, 66, 69, 70, 71, 74, 75, 76, 79, 80, and 81, no samples were collected. In evaluation of the preliminary field investigation efforts, these borings were determined to be out of the area of concern and no samples were taken.

As can be expected in characterizing a site following a release of gasoline, the detected COCs at a majority of the borings were TPHC and BTEX. TPHC was detected at forty-one (41) boring locations with nineteen (19) locations containing detections above the RDCSCC of 1000 mg/Kg. The detections ranged to a maximum of 8,739.63 mg/Kg at Boring No. 21. Benzene was detected at twenty-two (22) boring locations with twenty (20) locations containing detections above the RDCSCC of 3 mg/Kg. The detections ranged to a maximum of 590 mg/Kg at Boring No. 48. Toluene was detected at twenty-four (24) boring locations with six (6) locations containing detections above the RDCSCC of 1000 mg/Kg. The detections ranged to a maximum of 2500 mg/Kg at Boring No. 48. Ethyl-benzene was detected at twenty-eight (28) boring locations with two (2) locations containing detections above the RDCSCC of 1000 mg/Kg. The detections ranged to a maximum of 1200 mg/Kg at Boring No. 48. Xylene was detected at twenty-seven (27) boring locations with eighteen (18) locations containing detections above the RDCSCC of 410 mg/Kg. The detections ranged to a maximum of 6900 mg/Kg at Boring No. 48. Except for four (4) detections at Boring Nos. 13, 16, and 32 that were above the RDCSCC for Methylene Chloride of 49 mg/Kg, there were no detections of the remaining VOCs/SVOCs (2-Butanone, 2-Chloroethyl vinyl ether, TCE, PCE, Acetone, and Chloroform) above the respective RDCSCCs. Methylene Chloride was detected in one (1) of the Laboratory Method Blanks and is generally a laboratory contaminant. Lead was detected in twenty-nine (29) borings, but none of the detections exceeded the RDCSCC of 400 mg/Kg.

Figures 3, 4, 5, 6, and 7 (provided in Appendix B) provide a graphical representation of the analytical results for TPHC, benzene, toluene, ethyl-benzene, and xylene, respectively for each boring location by sampling interval. At sampling intervals where the detection exceeded the RDCSCC, the detection has been "boxed" or outlined in "red". Not detected (ND) has been listed for results observed below the MDL for the respective analyte. As can be seen from Figures 3 through 7, the majority of the detections that exceed the respective RDCSCCs are located in an area encompassing approximately 22,000 square feet to the north of the existing fuel islands and bordered (to the north) by Saltzman Avenue.

For the purposes of this effort, detections of benzene and xylene in the shallow subsurface (e.g., 0 – 3 ft.) will be used to delineate "hot spot" areas to focus the EEB application. Table 3-2 presents a summary of results for benzene and xylene at the twenty (21) borings with detections (for both benzene and xylene) above the RDCSCC. As can be seen in Table 3-2, there are thirteen (13) boring locations (Nos. 1, 2, 5, 7, 8, 11, 13, 15, 19, 20, 21, 46, and 47) with benzene or xylene detections above the RDCSCC within the shallow subsurface (0 – 3 ft. bgs). In addition, Boring Nos. 3, 9, and 14 are in close proximity to the initially identified boring locations and contain detections above the RDCSCC just below the 3 ft. depth. Further, Boring No. 48 contained the maximum detections for benzene, toluene, ethyl-benzene, and xylene from the March/April 2000 soil sampling and while the detections were at depths greater than the established target depth of 3 ft., has been included to evaluate the effectiveness of the EEB application in the deeper zones. These seventeen (17) total boring locations will be the focus of the EEB implementation.

A secondary objective of the supplemental soil sampling performed in March and April 2000 was to attempt to confirm the existence of clays or a confining clay layer in the upper horizon at the site. It was presumed that these soils would not be effectively addressed by the proposed SVE system, which is typically designed to remediate permeable sandy soils, such as those found beneath the clays at the site. Review of the boring logs generated during the Geoprobe® sampling conducted in March and April 2000 showed a number of observed locations with silty clay conditions. These clays ranged primarily from 0.5 ft. to 10 ft. in depth, often occurring as clay lenses, confirming the feasibility of implementing EEB as a supplement to the previously proposed remedial system upgrade.

Table 3-2

Main Post Gas Station - Bldg. 699

Summary of Soil Analytical Results for Benzene and Xylene at Borings with Detections Above NJDEP Soil Cleanup Criteria

(mg/Kg)

BENZENE																					
Boring No.	1	2	3	5	7	8	9	10	11	13	14	15	16	18	19	20	21	22	46	47	48
Depth																					
6-12"	ND	ND	ND		ND	**5.9**	ND	ND	ND	**5.2**	ND	ND	1.5	ND	ND	ND	ND	ND	**3.9**	**3.7**	1.2
18-24"	0.66	1.1	ND		ND	**14**	ND	ND	ND	**6.5**	ND	ND	0.35	**4.4**	ND	ND	ND	ND	**3**	**3.3**	1.1
30-36"	**9.4**	**3.4**	ND		**39**	**35**	ND	ND	**7.6**	**77**	ND	**14**	1.1	ND	**19**	**26**	**22**	**17**	**19**	ND	0.86
42-48"	**7.4**	**9.4**	**60**		**14**	**34**	ND	ND	**7.8**	**35**	**13**	**17**	ND	ND	**16**	**55**	**25**	ND	**30**	**23**	1.5
54-60"	**18**	**49**	**220**		**20**	**110**	**14**	ND	**9.9**	**64**	ND	**84**	**9.2**	ND	**30**	**41**	**25**	2.3J	**49**	**30**	**5.2**
66-72"	**11**	**54**	**43**		**3**	**230**	**6.1**	ND	ND	**44**	**7.5**	ND	**51**	ND	**16**	**21**	**100**	ND	**28**	**69**	**110**
78-84"	**8.2**	**63**	**25**		**6.5**	**54**	**12**	ND	ND	**24**	**12**	**34**	**18**	ND	**38**	**46**	**15**	ND	**48**	**13**	0.67
90-96"	**2.2**	**15**	**3.3**		**12**	**17**	ND	ND	ND	**11**	**7.6**	**16**	**61**	ND	ND	**44**	**6.3**	ND	**41**	**21**	1.5
102-108"	ND	**46**	**18**		ND	ND	**15**	ND	ND	**47**	**11**	**9.5**	**43**	ND	**13**	**81**	**38**	ND	**48**	**15**	**150**
114-120"	ND	**15**	**11**		ND	ND	**21**	ND	ND	**54**	**9.5**	**14**	**110**	ND	**25**	**58**	ND	ND	**31**	**36**	**590**
126-132"	ND	**4.2**	**6.5**		ND	ND	**12**	0.78	ND	**15**	**13**	ND	**8.9**	ND	**13**	**140**	ND	ND	**67**	**33**	**200**
138-144"	0.38	1.1	**3.7**		ND	ND	ND	**6.9**	ND	**10**	**11**	ND	ND	ND	ND	ND	ND	ND	**18**	**3.6**	**260**
	Residential Direct Contact Soil Cleanup Criteria for Benzene = 3 mg/Kg																				
XYLENE																					
Boring No.	1	2	3	5	7	8	9	10	11	13	14	15	16	18	19	20	21	22	46	47	48
Depth																					
6-12"	ND	ND	0.35J	6.2J	ND	323			16J	24	ND	16J	1.5		5J	ND	16J	ND	17.8	22.1	8.62
18-24"	0.66J	0.36J	0.38J	202	ND	127			47	35	ND	ND	0.67J		27.4	ND	204	36.3	7	10.8	4.73
30-36"	262	1.76	8.9	**730**	**850**	360			**920**	**880**	ND	**680**	8.72		**670**	**490**	**1420**	**1070**	262	9.5J	2.57
42-48"	360	198	**1610**	**1030**	380	**450**			**810**	**470**	**1390**	**840**	210		**600**	**1060**	**1970**	271	400	400	5.8
54-60"	**680**	**460**	**3890E**	257	**690**	**750**			**900**	**780**	**860**	**3590E**	339		**850**	**800**	**1330**	12J	**510**	**590**	173
66-72"	360	348	**410**	243	155	**1670**			116	**540**	**610**	16J	**2300**		400	340	**5200E**	12J	360	**1490**	**2870**
78-84"	222	360	285	**880E**	**460**	350			267	294	289	**1390**	**690**		**730**	**750**	**880**	ND	**640**	225	33.1
90-96"	62	41	5.4J	67	**820**	**1100**			ND	96	38	**620**	**1020**		80	**730**	364	77	**560**	370	50
102-108"	3.65	329	184	230	140	ND			400	**580**	**1170**	355	**840**		207	**1370**	**2410**	96	**640**	358	**1780**
114-120"	0.65J	40	76	150	**700**	ND			330	**750**	**480**	**550**	**1640**		**460**	**960**	116	ND	303	**550**	**6900**
126-132"	0.56J	8.7	21	95	**1190**	ND			329	167	47	72	63		208	**2480**	ND	ND	**870**	**440**	**2990**
138-144"	ND	1.47	3.4J	2.06J	208	19J			ND	114	40	ND	ND		32.9J	16J	ND	ND	183	6.4	**1340**
	Residential Direct Contact Soil Cleanup Criteria for Xylene = 410 mg/Kg																				
KEY:	- Detection above the respective Residential Direct Contact Soil Cleanup Criteria																				
	- Target depth for EEB application																				
	- Selected boring locations for EEB application																				

4.0 ENZYME-ENHANCED BIOREMEDIATION

4.1 Overview of Proposed EEB Implementation

Fort Monmouth proposes to implement EEB to remediate the impacted clay-rich soils in the shallow subsurface beneath Main Post Gas Station and supplement the previously proposed remedial system upgrade. Enzyme Technologies, Inc. (ETEC), Portland, Oregon will support the project. Background information from their Web Site (www.enzymetech.com) has been summarized below to provide an overview of the proposed EEB implementation.

The key to any bioremediation process is the control of specific microorganisms under specific environmental conditions to achieve specific chemical transformations. Bioremediation requires this control be performed in complex hydrogeological settings to transform often complex mixtures of compounds to carbon dioxide and water in a process call "mineralization". The process of transforming a hazardous chemical to a non-hazardous compound in a biological system is a result of complex biochemical reaction in which microorganisms (bacteria) convert the hazardous compound to energy and cell mass. Bioremediation processes are catalyzed chemical reactions in which the microorganism provides the catalyst (enzyme) to transform a specific compound (contaminant) in an oxygen-reduction (redox) reaction. Enzyme production and the subsequent reaction will not occur unless suitable environmental conditions are carefully maintained. The primary components required to sustain a bioremediation process are: a bacteria species capable of producing "target-specific enzymes" to degrade the contaminant, an energy source (contaminant), and an electron acceptor for the redox reaction. Components of secondary importance are: nutrients, moisture, pH, and temperature. The absence or the imbalance of these components may limit the biological process and result in a lack of contaminant transformation. ETEC has developed proprietary methods to enhance the bioremediation process.

Oxygenation is extremely important in the performance of an in-situ bioremediation process, often controlling both the overall rate of contaminant degradation as well as the cleanup levels attainable. Maximizing the available oxygen is critical in order to maximize the degradation rates achievable using the proposed biological enhancement products. There are two common methods for oxygenation of groundwater: 1) air injection, and 2) oxygen (or oxygen-augmented air) injection. With both of these methods, the air or oxygen is forced below the surface into the groundwater to subsequently migrate upward, creating an oxygenated volume of water surrounding the injection location. With air injection, the dissolved oxygen saturation point is approximately 8 to 12 ppm, depending on elevation and temperature. With pure oxygen injection, the dissolved oxygen can typically be increased to 15 to 20 ppm. ETEC manufactures and will provide a BioBox for use at the site that incorporates a unique oxygen mixing process to achieve dissolved oxygen concentrations in the water of 40 ppm or greater, achieving full solubility of the oxygen into the water.

Table 4-1

Procedures for preparing, mixing, and delivering the biological enhancement products

The biological enhancement products will be prepared prior to injection into the soils as follows:

1. Prepare BioBox
   a. Obtain 30 Amp, 110 Volt generator.
   b. Connect mobile BioBox to vehicle.
   c. Connect generator and check operating status of BioBox.

2. Determine injection volumes
   a. Fill BioBox tank (included on trailer) with water.
   b. Read flowmeter totalizer.
   c. Inject water into a geoprobe hole using injection assembly until water flows out of hole or is no longer being accepted.
   d. Read flowmeter totalizer.
   e. Subtract reading in step (d) from reading in step (b): this is the total expected injection volume per well. If the hole continues to take water, a field determination needs to be made regarding injection volume per hole (recommend 20 to 50 gallons, or as much as possible).
   f. Determine the total injection volume required for the entire site by multiplying the volume from (2)(e) by the planned number of geoprobe holes.
   g. If the total estimated volume from 2(f) exceeds the BioBox tank volume, calculate the number of tanks required for the entire project site by dividing the total volume by the useable tank volume (approximately 300 gallons).

3. Prepare for inoculation with Enzyme Accelerator (EA) and Multi-Enzyme Complexes (MZC)
   a. Fill the BioBox tank with water.
   b. Turn on the BioBox and circulate water in the tank with oxygenation system ON.
   c. Circulate water for 10 minutes or until oxygen reaches a minimum of 35 parts per million (ppm).
   d. Add EA and MZC to the tank in relative percentages (FOR EXAMPLE: if the total expected injection volume is 3,000 gallons and the tank volume is 300 gallons, this means that there will be 10 tanks of water injected into the site; therefore, $1/10^{th}$ of the total volume of EA and MZC should be used per batch). The total volume of EA and MZC will be approximately 50 and 25 gallons, respectively.

4. Inoculate the site with EA and MZC
   a. Inject the volume of water determined in step (6)(e) into each hole; monitor the injection volume by using the flowmeter on the BioBox

b. Repeat steps (3) and (4) until entire site is inoculated. ALL EA and MZC should be used after completion of these tasks.

5. Prepare for inoculation with Custom Blend Nutrients (CBN) and TPH Bacterial Consortium (A2)
    a. Fill the BioBox tank with water.
    b. Turn on the BioBox and circulate the water in the tank with the oxygenation system ON.
    c. Circulate the water for 10 minutes or until oxygen reaches a minimum of 35 ppm.
    d. Add CBN to the tank in relative percentages as described in step (3)(d). The total volume of CBN and A2 will be approximately 1,000 lbs. and 50 gallons, respectively.
        i. CBN is a dry product and should be apportioned according to weight.
        ii. Use caution when adding to tank to avoid splashing.
        iii. Add CBN to water ONLY, do NOT add water to CBN.
        iv. NOTE: If the formation will only take a small volume of water per injection point, all of the biological products may be injected, but the nutrient volume may need to be reduced.
    e. Add A2 to the tank in relative percentage as described in step (3)(d). The total volume of A2 will be approximately 50 gallons.

6. Inoculate the site with CBN and A2
    a. Inject the estimated volume of water into each hole; monitor the injection volume using the flowmeter on BioBox.
    b. Repeat steps (5) and (6) until the entire site is inoculated. ALL CBN and A2 should be used after completion of these tasks.

The proposed biological enhancements consist of four different products: Enzyme Accelerator (EA), Multi-Enzyme Complexes (MZC), TPH Bacterial Consortium (A2), and Custom Blend Nutrients (CBN). A description of each of the proposed enhancements is provided below:

- EA acts as a pre-treatment agent for enzyme and bacterial applications. EA is a liquid biosurfactant that increases the surface area for enzymes and bacteria, thereby increasing the cleanup rate.
- MZC is a concentrated liquid extract of mono- and dehydroxygenase compounds that are responsible for over 90% of the bioremediation process.
- A2 is a liquid multi-strain bacterial consortium specifically designed to degrade long-chain petroleum hydrocarbons.
- CBN is dry mixture of proprietary nitrogen, phosphorus and potassium compounds with micronutrients.

Material Safety Data Sheets (MSDS) for EA, MZC, and A2 are provided in Appendix C. Water will be oxygenated using an oxygen generator located inside the BioBox and utilized as a transport agent for the biological enhancements.

4.2 EEB Implementation Approach

The application of biological enhancements will be accomplished by using one Geoprobe® rig to install an array of temporary injection points for introduction of the biological enhancements. Injection of the biological products will be continuous from ground surface to three to four ft. in depth. The injection points will be established on 5-foot centers from each of the seventeen (17) selected boring locations for a total of nine (9) injection points per location or one hundred fifty-three (153) total injections. The EEB implementation will be performed following excavation and construction of the planned SVE extraction laterals and wells. Injection points will not be located in backfilled SVE trench areas, or in clean fill areas associated with former USTs. If required, the planned injection pattern will be adjusted away from these areas.

The biological enhancements will be injected in two stages. During stage one, the EA and MZC will be mixed in the Biobox and injected into the ground. During stage two, the CBN and A2 will be mixed in the Biobox and then injected into the same locations. During the initial Geoprobe® installation, a PVC “injection stinger” will be placed in the borehole to keep the hole open until the 2nd injection stage. A production rate of twenty (20) injection points per day has been estimated with penetration depths of 3-4 ft. per borehole. Based on this rate, the 1st stage of biological enhancements will be injected at two (2) boring locations during one day (9 injections per location) followed by the 2nd

stage the next day. This will minimize the treatment area requiring restricted access until the injection process is complete.

Injection of the biological products will be accomplished using a mobile BioBox (Model 10-M). The biological enhancements and BioBox will be supplied by ETEC. Water and electricity for the EEB implementation will be provided by DPW. Assuming an injection volume of ten (10) gallons per well and a total of one hundred and fifty-three (153) injection points, 1,530 total gallons of biological enhancements will be required or five (5) tank volumes (@300 gallons per tank) for each stage. Assuming a product mixture of 5 gallons of EA and 2.5 gallons of MZC per tank for stage 1 and 5 gallons of A2 and 100 pounds of CBN per tank for stage 2, a total of 25 gallons of EA, 12.5 gallons of MZC, 25 gallons of A2, and 500 pounds of CBN will be required.

The injection procedure will be conducted as follows:

- Based on the established grid system from the March/April 2000 soil sampling and the selected boring locations, the planned injection points will be marked on the ground/pavement.
- Required contacts for utility clearances will be made and performed. This information will be confirmed in the daily site logs.
- The Geoprobe® rig will be positioned at the proposed injection location and a concrete core will be used to clear the ground surface/asphalt for the Geoprobe®. The Geoprobe® will then be advanced to the selected application depth.
- Once the probe is inserted to the desired depth and the injection stinger is installed, the BioBox injection hose will be connected to the Geoprobe® assembly using an adapted union.
- Procedures for preparing, mixing, and delivering the biological enhancement products are provided in Table 4-1. Note: Use of high pressure (>40 psi) pumps will ruin the biological products; therefore, the biological enhancement products will be injected using ONLY the pump on the BioBox unit.
- After both stages of enhancement injection have occurred, each Geoprobe® borehole will be abandoned by filling with sand.

During performance of the injection program, an observation of increasing injection pressures and decreasing flow rates should indicate an impermeable boundary. Should this situation be observed, a decision will be made regarding relocation of the proposed injection point.

4.3 Post-Injection Soil Sampling

The objective of post-injection soil sampling is to attempt to determine the extent of biodegradation of contaminants within the treatment zone. Based on NJDEP Technical Requirements for Site Remediation, for in-situ remediation of soils, the minimum post-

remediation sampling frequency is one sample per 900 square foot. Additionally, in accordance with the Technical Requirements, the sample locations are to be biased towards areas that previously exhibited highest contamination.

Post-injection soil sampling will be performed directly adjacent to the seventeen (17) boring locations established as the proposed zones of Geoprobe® enzyme injection (Boring Nos. 1, 2, 3, 5, 7, 8, 9, 11, 13, 14, 15, 19, 20, 21, 46, 47, and 48). The initial boring locations were surveyed using GPS; this should allow the post-injection sampling to be performed directly adjacent to the initial sampling locations. The post-injection soil sampling will be performed 180-days following the completion of the injection program. The soil samples will be collected at alternating 6-inch intervals from ground surface to a depth of 6 ft. at each location for a total of six (6) samples per boring (i.e., 6-12 inches, 18-24 inches, 30-36 inches, 42-48 inches, 54-60 inches, and 66-72 inches). The post injection soil sampling has been proposed to a depth of six (6) ft. to evaluate the direct impact of EEB on the shallow subsurface soils (the primary focus of this effort). The samples will be collected using standard Fort Monmouth DPW Geoprobe® sampling procedures and analyzed for VOCs + 10, TPHC, and percent solids.

4.4 Technical Evaluation and Summary Report

A Technical Evaluation and Summary (TES) Report will be prepared following performance of the post-injection soil sampling and receipt of analytical data. The TES Report will include the analytical data collected prior to the implementation of the EEB program at the site. This data delineates the vertical and horizontal extent of soil contamination. The results of the confirmation sampling will then be presented, and comparisons will be established regarding estimated contaminant reductions.

5.0 PROJECT ORGANIZATION

The Contracting Officer's Representative (COR) for this project is Mr. Kevin Dooney, Chief, Engineering Plans & Services Div., DPW, Fort Monmouth, NJ. The DPW Environmental Coordinator is Mr. Joseph Fallon, CHMM, Fort Monmouth, NJ.

6.0 QUALITY ASSURANCE PROJECT PLAN

Field sampling activities will be conducted in accordance with the NJDEP Field Sampling Manual. All analyses will be conducted in accordance with the NJ Laboratory Certification Program by the Fort Monmouth Environmental Testing Laboratory (NJDEP Certification #13461). A separate Quality Assurance Project Plan will not be submitted for the planned EEB implementation.

7.0 SOIL AND SEDIMENT EROSION

As described within this document, the application of biological enhancements will be accomplished using a Geoprobe® following initial installation of the planned SVE system extraction laterals and extraction and sparge wells. Required soil and sediment erosion control and dust and odor control measures will be implemented as part of the planned remedial (SVE) system upgrade. A soil and sediment erosion control and monitoring plan, and a dust and odor control and monitoring plan (N.J.A.C. 7:26E-6.2(a)10) are not applicable to the proposed site efforts presented within this document.

8.0 SITE SPECIFIC HEALTH AND SAFETY PLAN

A Site Specific Health and Safety Plan, as required by N.J.A.C. 7:26E-6.2(a)(11), will be prepared by the selected EEB implementation contractor to address the planned site activities presented within this document.

9.0 REQUIRED PERMITS

The RAWA (GES, 1999) addresses permits regarding implementation of the proposed remedial system upgrade.

As provided in N.J.A.C. 7:14A-7.5 (Authorization of Discharges to Ground Water By Permit-By-Rule), Subsection (b), any person responsible for discharges to ground water listed in 3i through v are deemed to have a permit-by-rule if the discharge occurs when: 1) NJDEP is remediating a contaminated site as defined in N.J.A.C. 7:26C-1.3, pursuant to the rules at N.J.A.C. 7:14B implementing the Underground Storage of Hazardous Substances Act (N.J.S.A 13:1K-6 *et seq*.), or when the owner or operator of a contaminated site is conducting remediation under NJDEP oversight, or the requirements of the Spill Compensation and Control Act (N.J.S.A. 58:10-23.11), or the Procedures for Department Oversight of the Remediation of Contaminated Sites at N.J.A.C. 7:26C; and 2) the person is in receipt of written approval from NJDEP.

The ground water discharges authorized by permit-by-rule under Subsection (b) include: (iv). Discharges to ground water not to exceed 90 calendar days from any other facility or equipment associated with monitoring, engineering, remedial activities, or design studies necessary to evaluate a contaminated site.

By submittal of this SA to the RAW, Fort Monmouth is requesting written approval for Permit-by-Rule for the proposed EEB implementation and discharge to ground water.

10.0 EFFECTIVENESS ANALYSIS AND CERTIFICATION

As stated in the RAWA (GES, 1999), different remedial approaches had been examined and evaluated, and based upon the technical and site-specific criteria presented in the RAWA and the historical data contained therein, a remedial action encompassing a pump and treat/soil vapor extraction/air-sparging system to remediate soil and groundwater at the site was selected. It was stated at that time that the selection and implementation of this remedial action would be effective and protective of the public health, safety, and the environment as outlined in Section 35(g) of P.L. 1993, c.139 (S-1070) of the Industrial Site Recovery Act.

The intention of the planned implementation of EEB encompassed within this SA to the RAW is to attempt to directly impact identified "hot spots" and remediate contaminated low-permeability soils in the upper soil horizon that might not be effectively addressed by the proposed SVE system, thereby supplementing and enhancing the performance of the selected remedial action.

11.0 IMPLEMENTATION SCHEDULE

DPW has awarded a contract to Versar to implement EEB at the Main Post Gas Station as presented within this SA to the RAW. The implementation schedule will be as follows:

- Preparation of required plans (e.g., Site Specific Health and Safety Plan) – 14 days.
- Procurement and delivery to the site of the BioBox and biological enhancement products – 30 days.
- Site mobilization/utility clearances – 3 days.
- Performance of EEB injection program – 19 days.
- Demobilization – 2 days.
- Post-injection soil sampling – 1 week (to be initiated 180 days following completion of the injection program).
- Submittal of Technical Evaluation and Summary Report – following receipt of analytical data from post-injection soil sampling.

12.0 SITE RESTORATION PLAN AND REMEDIAL SYSTEM DISMANTLING PLAN

As stated in the RAWA (GES, 1999), upon receipt of No Further Action declaration from the NJDEP regarding the remediated soils, DPW will contract to dismantle and remove the aboveground portions of the SVE system. The below ground sections of the SVE systems will be sealed and abandoned in-place following generally accepted procedures. Further, once the groundwater quality has attenuated to concentrations below the applicable NJDEP Ground Water Quality Standards (GWQS) and a No Further Action statement is provided by the NJDEP, DPW will implement proper well abandonment procedures as part of the site restoration plan. All monitoring wells and

vacuum monitoring points on-site and off-site will be properly abandoned by a New Jersey-licensed well driller. The wells will be sealed via a tremie pipe with a grout/cement mixture, the concrete flush mount pads will be removed, and the former well locations will be restored to near pre-construction conditions.

The planned EEB implementation addressed within this document will be performed utilizing mobile/trailer mounted equipment and a Geoprobe® to bore directly through the asphalt/ground surfaces. There are no structures or facilities that will require site restoration or dismantling.

13.0 ESTIMATED COSTS

A cost comparison for the proposed remedial system upgrade was previously presented in the RAWA (GES, 1999). As previously discussed, the intention of the planned EEB implementation encompassed within this 2nd Addendum to the RAW is to attempt to directly impact identified "hot spots" and remediate low-permeability, contaminated soils in the upper soil horizon that might not be effectively addressed by the proposed SVE system, thereby supplementing and enhancing the performance of the selected remedial action.

The estimated order of magnitude costs for implementation of the proposed EEB at Building 699 are provided below. The primary assumptions utilized in estimating the order of magnitude costs are as follows:

- Enzyme injection will be performed utilizing a truck mounted Geoprobe®. There are no proposed capital costs associated with the planned remedial action. The treatment system will be dismantled and removed from the site following completion of the injection program.
- All work will be performed under Level D Personnel Safety Protection. No site air monitoring will be performed.
- The injection points will be established on 5-foot centers from each of the seventeen (17) selected boring locations for a total of nine (9) injection points per location or one hundred fifty-three (153) total injections.
- Injection of the biological products will be continuous from ground surface to three to four ft. in depth. A production rate of twenty (20) injection points per day has been assumed. Based on this rate, the 1st stage of biological enhancements will be injected at two (2) boring locations during one day (9 injections per location) followed by the 2nd stage the next day.
- Performance samples will be analyzed in accordance with the NJ Laboratory Certification Program by the Fort Monmouth Environmental Testing Laboratory (NJDEP Certification #13461).

Estimated Order of Magnitude Costs
Proposed Enzyme-Enhanced Bioremediation
Building 699

TASK	ESTIMATED COSTS
1. Plan Preparation	$ 3,900
2. Site Mobilization	$ 2,700
3. Geoprobe® Injection/EEB Treatment	$ 84,600
4. Demobilization	$ 3,700
5. Report Preparation	$ 20,100
TOTAL ESTIMATED COSTS	$115,000

14.0 REFERENCES

DPW, 2000. Fort Monmouth Environmental Testing Laboratory, Analytical Data Reports (Project: 100004), March and April 2000, Volumes 1 - 5.

GES, 1999. Groundwater & Environmental Services, Inc., *Remedial Action Work Plan Addendum, Bldg. 699 Main Post Area, Fort Monmouth, NJ,* June 10, 1999.

Krydon, 1993. The Krydon Group, Inc. *Remedial Action Workplan*, Fort Monmouth Military Installation Service Station, Fort Monmouth, New Jersey. October 1993.

Table 3-1

Main Post Gas Station – Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling – March/April 2000

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5224.02	1	6-12"	3/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5224.03	1	18-24"	3/6/2000	ND	ND	ND	0.66	ND	0.31J	0.66J	ND	ND	0.49	ND	ND	ND
5224.04	1	30-36"	3/6/2000	ND	ND	ND	**9.4**	ND	40	262	ND	ND	120	ND	219.61	ND
5224.05	1	42-48"	3/6/2000	ND	ND	ND	**7.4**	ND	54	360	ND	ND	140	ND	**1130.84**	ND
5224.06	1	54-60"	3/6/2000	ND	ND	ND	**18**	ND	100	**680**	ND	ND	300	ND	ND	ND
5224.07	1	66-72"	3/6/2000	ND	ND	ND	**11**	ND	55	360	ND	ND	170	ND	774.46	ND
5224.08	1	78-84"	3/6/2000	ND	ND	ND	**8.2**	ND	27	222	ND	ND	130	ND	220.4	ND
5224.09	1	90-96"	3/6/2000	ND	ND	ND	**2.2**	ND	9.3	62	ND	ND	43	ND	487.16	26.07
5224.10	1	102-108"	3/6/2000	ND	ND	ND	ND	ND	0.59	3.65	ND	ND	1.9	ND	ND	ND
5224.11	1	114-120"	3/6/2000	ND	ND	ND	ND	ND	ND	0.65J	ND	ND	0.38	ND	ND	ND
5224.12	1	126-132"	3/6/2000	ND	ND	ND	ND	ND	ND	0.56J	ND	ND	ND	ND	ND	ND
5224.13	1	138-144"	3/6/2000	ND	ND	ND	0.38	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.02	2	6-12"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	796.58	ND
5226.03	2	18-24"	3/7/2000	ND	ND	ND	1.1	ND	ND	0.36J	ND	ND	0.57	ND	768.3	ND
5226.04	2	30-36"	3/7/2000	ND	ND	ND	**3.4**	ND	0.32J	1.76	ND	ND	3.7	ND	470.36	ND
5226.05	2	42-48"	3/7/2000	ND	ND	ND	**9.4**	ND	31	198	ND	ND	100	ND	900.61	ND
5226.06	2	54-60"	3/7/2000	ND	ND	ND	**49**	ND	77	**460**	ND	ND	280	ND	201.37	ND
5226.07	2	66-72"	3/7/2000	ND	ND	ND	**54**	ND	58	348	ND	ND	240	ND	442.46	23.67
5226.08	2	78-84"	3/7/2000	ND	ND	ND	**63**	ND	60	360	ND	ND	250	ND	397.58	ND
5226.09	2	90-96"	3/7/2000	ND	ND	ND	**15**	ND	6.8	41	ND	ND	36	ND	958.87	ND
5226.10	2	102-108"	3/7/2000	ND	ND	ND	**46**	ND	52	329	ND	ND	220	ND	406.31	ND
5226.11	2	114-120"	3/7/2000	ND	6.3	ND	**15**	ND	6.8	40	ND	ND	33	ND	377.54	ND
5226.12	2	126-132"	3/7/2000	ND	ND	ND	**4.2**	ND	1.5	8.7	ND	ND	6.3	ND	196.28	ND
5226.13	2	138-144"	3/7/2000	ND	ND	ND	1.1	ND	0.3J	1.47	ND	ND	0.89	ND	ND	ND
5226.14	3	6-12"	3/7/2000	ND	ND	ND	ND	ND	ND	0.35J	ND	ND	ND	ND	338.13	ND
5226.15	3	18-24"	3/7/2000	ND	ND	ND	ND	ND	ND	3.8J	ND	ND	ND	ND	ND	ND
5226.16	3	30-36"	3/7/2000	ND	ND	ND	ND	ND	14	89	ND	ND	25	ND	200.23	ND
5226.17	3	42-48"	3/7/2000	ND	ND	ND	**60**	ND	190	**1610**	ND	ND	690	ND	855.41	ND
5226.18	3	54-60"	3/7/2000	ND	ND	ND	**220**	ND	630	**3890E**	ND	ND	**1900E**	ND	**1015.74**	ND
5226.19	3	66-72"	3/7/2000	ND	ND	ND	**43**	ND	76	**410**	ND	ND	260	ND	**1831.21**	ND
5226.20	3	78-84"	3/7/2000	ND	ND	ND	**25**	ND	57	285	ND	ND	120	ND	368.74	ND
5226.21	3	90-96"	3/7/2000	ND	ND	ND	**3.3**	ND	ND	5.4J	ND	ND	3.9	ND	ND	ND
5226.22	3	102-108"	3/7/2000	ND	ND	ND	**18**	ND	33	184	ND	ND	90	ND	346.18	ND
5226.23	3	114-120"	3/7/2000	ND	ND	ND	**11**	ND	16	76	ND	ND	35	ND	ND	ND
5226.24	3	126-132"	3/7/2000	ND	ND	ND	**6.5**	ND	4.5J	21	ND	ND	9.9	ND	ND	ND
5226.25	3	138-144"	3/7/2000	ND	ND	ND	**3.7**	ND	ND	3.4J	ND	ND	ND	ND	ND	ND
5273.14	4	126-132"	########	ND	ND	ND	0.51	ND	0.71	0.38J	ND	ND	ND	ND	ND	ND
5273.15	4	138-144"	########	ND	ND	ND	0.51	ND	0.70J	0.80J	ND	ND	0.44	ND	ND	ND
5226.26	5	6-12"	3/7/2000	ND	ND	ND	ND	ND	ND	6.2J	ND	ND	ND	ND	352.43	10.84
5226.27	5	18-24"	3/7/2000	ND	ND	ND	ND	ND	32	202	ND	ND	13	ND	247.73	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5226.28	5	30-36"	3/7/2000	ND	ND	ND	ND	ND	110	**730**	ND	ND	53	ND	**1365.7**	ND
5226.29	5	42-48"	3/7/2000	ND	ND	ND	ND	ND	190	**1030**	ND	ND	100	ND	**4529.63**	ND
5226.30	5	54-60"	3/7/2000	ND	ND	ND	ND	ND	39	257	ND	ND	22	ND	**1313.65**	5.83
5226.31	5	66-72"	3/7/2000	ND	ND	ND	ND	ND	38	243	ND	ND	23	ND	851.72	ND
5226.32	5	78-84"	3/7/2000	ND	ND	ND	ND	ND	150	**880E**	ND	ND	130	ND	**1198.13**	ND
5226.33	5	90-96"	3/7/2000	ND	ND	ND	ND	ND	15	67	ND	ND	7.2	ND	**1579.41**	45.04
5226.34	5	102-108"	3/7/2000	ND	ND	ND	ND	ND	38	230	ND	ND	30	ND	478.02	ND
5226.35	5	114-120"	3/7/2000	ND	ND	ND	ND	ND	25	150	ND	ND	20	ND	304.58	ND
5226.36	5	126-132"	3/7/2000	ND	ND	ND	ND	ND	16	97	ND	ND	16	ND	998.52	7.74
5226.37	5	138-144"	3/7/2000	ND	ND	ND	ND	ND	0.45J	2.06J	ND	ND	ND	ND	ND	ND
5226.38	6	6-12"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.39	6	18-24"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.40	6	30-36"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.41	6	42-48"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.42	6	54-60"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.43	6	66-72"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	44.17
5226.44	6	78-84"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.45	6	90-96"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.46	6	102-108"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.47	6	114-120"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.48	6	126-132"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5226.49	6	138-144"	3/7/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5229.02	7	6-12"	3/8/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5229.03	7	18-24"	3/8/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	186.87	ND
5229.04	7	30-36"	3/8/2000	ND	ND	ND	**39**	ND	170	**850**	ND	ND	350	ND	**1450.01**	ND
5229.05	7	42-48"	3/8/2000	ND	ND	ND	**14**	ND	62	380	ND	ND	180	ND	681.84	ND
5229.06	7	54-60"	3/8/2000	ND	ND	ND	**20**	ND	120	**690**	ND	ND	270	ND	926.66	ND
5229.07	7	66-72"	3/8/2000	ND	ND	ND	**3**	ND	26	155	ND	ND	60	ND	425.04	ND
5229.08	7	78-84"	3/8/2000	ND	ND	ND	**6.5**	ND	76	**460**	ND	ND	170	ND	831.09	ND
5229.09	7	90-96"	3/8/2000	ND	ND	ND	**12**	ND	150	**820**	ND	ND	340	ND	458.12	ND
5229.10	7	102-108"	3/8/2000	ND	ND	ND	ND	ND	24	140	ND	ND	63	ND	681.67	ND
5229.11	7	114-120"	3/8/2000	ND	ND	ND	**11**	ND	140	**700**	ND	ND	260	ND	524	ND
5229.12	7	126-132"	3/8/2000	ND	ND	ND	**23**	ND	190	**1190**	ND	ND	510	ND	**3491.92**	ND
5229.13	7	138-144"	3/8/2000	ND	ND	ND	**15**	ND	39	208	ND	ND	130	ND	231.42	ND
5229.14	8	6-12"	3/8/2000	ND	ND	ND	**5.9**	ND	6.2	323	ND	ND	22	ND	ND	ND
5229.15	8	18-24"	3/8/2000	ND	ND	ND	**14**	ND	23	127	ND	ND	71	ND	211.46	ND
5229.16	8	30-36"	3/8/2000	ND	ND	ND	**35**	ND	63	360	ND	ND	190	ND	811.78	ND
5229.17	8	42-48"	3/8/2000	ND	ND	ND	**34**	ND	76	**450**	ND	ND	240	ND	300.29	ND
5229.18	8	54-60"	3/8/2000	ND	ND	ND	**110**	ND	180	**750**	ND	ND	450	ND	326.53	ND
5229.19	8	66-72"	3/8/2000	ND	ND	ND	**230**	ND	290	**1670**	ND	ND	740	ND	220.54	21.57
5229.20	8	78-84"	3/8/2000	ND	ND	ND	**54**	ND	65	350	ND	ND	250	ND	261.15	ND
5229.21	8	90-96"	3/8/2000	ND	ND	ND	**17**	ND	20	**1100**	ND	ND	69	ND	ND	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5229.22	8	102-108"	3/8/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	210.8	ND
5229.23	8	114-120"	3/8/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5229.24	8	126-132"	3/8/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5229.25	8	138-144"	3/8/2000	ND	ND	ND	ND	ND	ND	19J	ND	ND	17	ND	ND	ND
5229.26	9	6-12"	3/8/2000	ND	ND	ND	ND	ND	ND	8.8J	ND	ND	ND	ND	ND	ND
5229.27	9	18-24"	3/8/2000	ND	ND	ND	ND	ND	ND	13J	ND	ND	ND	ND	ND	19.2
5229.28	9	30-36"	3/8/2000	ND	ND	ND	ND	ND	ND	10J	ND	ND	ND	ND	ND	ND
5229.29	9	42-48"	3/8/2000	ND	ND	ND	ND	ND	16	85	ND	ND	23	ND	ND	ND
5229.30	9	54-60"	3/8/2000	ND	ND	ND	**14**	ND	57	302	ND	ND	120	ND	541.33	ND
5229.31	9	66-72"	3/8/2000	ND	ND	ND	**6.1**	ND	13	72	ND	ND	36	ND	ND	ND
5229.32	9	78-84"	3/8/2000	ND	ND	ND	**12**	ND	22	119	ND	ND	72	ND	277.05	ND
5229.33	9	90-96"	3/8/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.9	ND	427.88	ND
5229.34	9	102-108"	3/8/2000	ND	ND	ND	**15**	ND	34	180	ND	ND	97	ND	275.38	ND
5229.35	9	114-120"	3/8/2000	ND	ND	ND	**21**	ND	49	263	ND	ND	140	ND	315.07	ND
5229.36	9	126-132"	3/8/2000	ND	ND	ND	**12**	ND	19	98	ND	ND	58	ND	202.57	ND
5229.37	9	138-144"	3/8/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.16	10	126-132"	########	ND	ND	ND	0.78	ND	0.43J	ND	ND	ND	ND	ND	ND	ND
5273.17	10	138-144"	########	ND	N	ND	**6.9**	ND	28	132	ND	ND	37	ND	ND	ND
5229.38	11	6-12"	3/8/2000	ND	ND	ND	ND	ND	ND	16J	ND	ND	ND	ND	ND	ND
5229.39	11	18-24"	3/8/2000	ND	ND	ND	ND	ND	7.5J	47	ND	ND	ND	ND	172.83	ND
5229.40	11	30-36"	3/8/2000	ND	ND	ND	**7.6**	ND	160	**920**	ND	ND	95	ND	416.92	ND
5229.41	11	42-48"	3/8/2000	ND	ND	ND	**7.8**	ND	140	**810**	ND	ND	110	ND	**5067.13**	ND
5229.42	11	54-60"	3/8/2000	ND	ND	ND	**9.9**	ND	160	**900**	ND	ND	140	ND	**1172.8**	ND
5229.43	11	66-72"	3/8/2000	ND	ND	ND	ND	ND	20	116	ND	ND	17	ND	888.29	ND
5229.44	11	78-84"	3/8/2000	ND	ND	ND	ND	ND	45	267	ND	ND	33	ND	551.99	46.95
5229.45	11	90-96"	3/8/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	273.56	ND
5229.46	11	102-108"	3/8/2000	ND	ND	ND	ND	ND	70	400	ND	ND	46	ND	**2559.03**	ND
5229.47	11	114-120"	3/8/2000	ND	ND	ND	ND	ND	58	330	ND	ND	37	ND	**1582.73**	ND
5229.48	11	126-132"	3/8/2000	ND	ND	ND	ND	ND	6.8J	329	ND	ND	ND	ND	587.82	ND
5229.49	11	138-144"	3/8/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1042.52**	ND
5231.02	12	6-12"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	252.54	40.7
5231.03	12	18-24"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	226.77	ND
5231.04	12	30-36"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	185.58	ND
5231.05	12	42-48"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5231.06	12	54-60"	3/9/2000	ND	ND	ND	ND	ND	0.66	3.7	2.2	ND	2.1	ND	ND	ND
5231.07	12	66-72"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	2.1	ND	ND	ND	ND	ND
5231.08	12	78-84"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	2.1	ND	ND	ND	ND	ND
5231.09	12	90-96"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	2.2	ND	ND	ND	ND	ND
5231.10	12	102-108"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	2	ND	ND	ND	301.05	ND
5231.11	12	114-120"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	2.1	ND	ND	ND	ND	ND
5231.12	12	126-132"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	2.3	ND	ND	ND	ND	29.01
5231.13	12	138-144"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	2.1	ND	ND	ND	ND	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5231.14	13	6-12"	3/9/2000	ND	ND	ND	**5.2**	ND	5.7	24	17	ND	ND	ND	177.25	ND
5231.15	13	18-24"	3/9/2000	ND	ND	ND	**6.5**	ND	6.1J	35	22	ND	15	ND	187.7	ND
5231.16	13	30-36"	3/9/2000	ND	ND	ND	**77**	ND	150	**880**	ND	ND	**1100**	ND	**1665.7**	ND
5231.17	13	42-48"	3/9/2000	ND	ND	ND	**35**	ND	79	**470**	**64**	ND	260	ND	**1071.17**	ND
5231.18	13	54-60"	3/9/2000	ND	ND	ND	**64**	ND	130	**780**	ND	ND	400	ND	212.62	ND
5231.19	13	66-72"	3/9/2000	ND	ND	ND	**44**	ND	92	**540**	ND	ND	310	ND	**1985.29**	ND
5231.20	13	78-84"	3/9/2000	ND	ND	ND	**24**	ND	50	294	**53**	ND	170	ND	534.7	ND
5231.21	13	90-96"	3/9/2000	ND	ND	ND	**11**	ND	17	96	31	ND	66	ND	212.69	ND
5231.22	13	102-108"	3/9/2000	ND	ND	ND	**47**	ND	100	**580**	33	ND	300	ND	**1866.05**	ND
5231.23	13	114-120"	3/9/2000	ND	ND	ND	**54**	ND	130	**750**	36	ND	420	ND	720.01	ND
5231.24	13	126-132"	3/9/2000	ND	ND	ND	**15**	ND	30	167	ND	ND	110	ND	486.18	ND
5231.25	13	138-144"	3/9/2000	ND	ND	ND	**10**	ND	20	114	18	ND	74	ND	275.15	ND
5231.26	14	6-12"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	406.24	ND
5231.27	14	18-24"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5231.28	14	30-36"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	676.44	ND
5231.29	14	42-48"	3/9/2000	ND	ND	ND	**13**	ND	240	**1390**	ND	ND	270	ND	**3490.44**	ND
5231.30	14	54-60"	3/9/2000	ND	ND	ND	ND	ND	140	**860**	ND	ND	140	ND	**1221.51**	51.07
5231.31	14	66-72"	3/9/2000	ND	ND	ND	**7.5**	ND	100	**610**	ND	ND	110	ND	**1049.82**	ND
5231.32	14	78-84"	3/9/2000	ND	ND	ND	**12**	ND	52	289	ND	ND	150	ND	331.42	ND
5231.33	14	90-96"	3/9/2000	ND	ND	ND	**7.6**	ND	7.4J	38	ND	ND	26	ND	208.12	ND
5231.34	14	102-108"	3/9/2000	ND	ND	ND	**11**	ND	200	**1170**	ND	ND	220	ND	**1033.86**	ND
5231.35	14	114-120"	3/9/2000	ND	ND	ND	**9.5**	ND	81	**480**	ND	ND	150	ND	523.68	ND
5231.36	14	126-132"	3/9/2000	ND	ND	ND	**13**	ND	9J	47	ND	ND	19	ND	ND	ND
5231.37	14	138-144"	3/9/2000	ND	ND	ND	**11**	ND	8.4J	40	ND	ND	13	ND	ND	ND
5231.38	15	6-12"	3/9/2000	ND	ND	ND	ND	ND	ND	16J	ND	ND	ND	ND	ND	ND
5231.39	15	18-24"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5231.40	15	30-36"	3/9/2000	ND	ND	ND	**14**	ND	130	**680**	ND	ND	200	ND	521.7	ND
5231.41	15	42-48"	3/9/2000	ND	ND	ND	**17**	ND	160	**840**	ND	ND	280	ND	571.38	ND
5231.42	15	54-60"	3/9/2000	ND	ND	ND	**84**	ND	690	**3590E**	ND	ND	**1300E**	ND	**6957.69**	ND
5231.43	15	66-72"	3/9/2000	ND	ND	ND	ND	ND	ND	16J	ND	ND	12	ND	**2750.01**	ND
5231.44	15	78-84"	3/9/2000	ND	ND	ND	**34**	ND	270	**1390**	ND	ND	560	ND	948.41	ND
5231.45	15	90-96"	3/9/2000	ND	ND	ND	**16**	ND	120	**620**	ND	ND	260	ND	325.81	ND
5231.46	15	102-108"	3/9/2000	ND	ND	ND	**9.5**	ND	70	355	ND	ND	140	ND	920.02	ND
5231.47	15	114-120"	3/9/2000	ND	ND	ND	**14**	ND	110	**550**	ND	ND	230	ND	**1268.96**	ND
5231.48	15	126-132"	3/9/2000	ND	ND	ND	ND	ND	15	72	ND	ND	33	ND	728.83	ND
5231.49	15	138-144"	3/9/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.7	ND	ND	ND
5242.02	16	6-12"	#######	ND	ND	ND	1.5	ND	0.96	1.5	ND	ND	0.37	ND	ND	35.44
5242.03	16	18-24"	#######	ND	ND	ND	0.35	ND	0.75	0.67J	ND	ND	ND	ND	ND	ND
5242.04	16	30-36"	#######	0.95J	ND	ND	1.1	ND	4.5	8.72	ND	ND	ND	ND	ND	ND
5242.05	16	42-48"	#######	ND	ND	ND	ND	ND	50	210	ND	ND	12	ND	567.23	ND
5242.06	16	54-60"	#######	ND	ND	ND	**9.2**	ND	66	339	ND	ND	98	ND	ND	ND
5242.07	16	66-72"	#######	ND	ND	ND	**51**	ND	440	**2300**	ND	ND	700	ND	**1976.95**	ND
5242.08	16	78-84"	#######	ND	ND	ND	**18**	ND	140	**690**	ND	ND	250	ND	526.44	ND
5242.09	16	90-96"	#######	ND	ND	ND	**61**	ND	200	**1020**	ND	ND	570	ND	260.08	ND

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Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5242.10	16	102-108"	#######	ND	ND	ND	**43**	ND	160	**840**	ND	ND	440	ND	589.45	ND
5242.11	16	114-120"	#######	ND	ND	ND	**110**	ND	360	**1640**	ND	ND	940	ND	**7072.04**	ND
5242.12	16	126-132"	#######	ND	ND	ND	**8.9**	ND	13	63	**170**	ND	40	ND	ND	23.05
5242.13	16	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	43	ND	ND	ND	ND	ND
5273.18	17	126-132"	#######	ND	ND	ND	ND	ND	0.44J	1.89	ND	ND	0.48	ND	ND	ND
5273.19	17	138-144"	#######	ND	ND	ND	1	ND	0.48J	2.71	ND	ND	0.42	ND	ND	ND
5242.14	18	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	9.7	ND	ND	ND	ND	ND
5242.15	18	18-24"	#######	ND	ND	ND	**4.4**	ND	14	70	ND	ND	40	ND	ND	ND
5242.16	18	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	5.8J	ND	ND	ND	ND	ND
5242.17	18	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5242.18	18	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5242.19	18	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5242.20	18	78-84"	#######	ND	ND	ND	ND	ND	21	6.7J	ND	ND	ND	ND	ND	ND
5242.21	18	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5242.22	18	102-108"	#######	ND	ND	ND	ND	ND	7.4	14	ND	ND	ND	ND	260.48	ND
5242.23	18	114-120"	#######	ND	ND	ND	ND	ND	17	64.8	ND	ND	ND	ND	353.2	ND
5242.24	18	126-132"	#######	ND	ND	ND	ND	ND	ND	6.6J	ND	ND	ND	ND	ND	ND
5242.25	18	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5242.26	19	6-12"	#######	ND	ND	ND	ND	ND	3.2J	5J	ND	ND	ND	ND	409.34	ND
5242.27	19	18-24"	#######	ND	ND	ND	ND	ND	5.9	27.4	ND	ND	9	ND	**1493.74**	ND
5242.28	19	30-36"	#######	ND	ND	ND	**19**	ND	130	**670**	ND	ND	190	ND	**1267.86**	ND
5242.29	19	42-48"	#######	ND	ND	ND	**16**	ND	120	**600**	ND	ND	190	ND	**2888.57**	ND
5242.30	19	54-60"	#######	ND	ND	ND	**30**	ND	170	**850**	ND	ND	310	ND	**3891.82**	ND
5242.31	19	66-72"	#######	ND	ND	ND	**16**	ND	77	400	ND	ND	170	ND	**1406.05**	ND
5242.32	19	78-84"	#######	ND	ND	ND	**38**	ND	140	**730**	ND	ND	330	ND	**1126.25**	ND
5242.33	19	90-96"	#######	ND	ND	ND	ND	ND	16	80	ND	ND	39	ND	286.26	ND
5242.34	19	102-108"	#######	ND	ND	ND	**13**	ND	42	207	ND	ND	100	ND	719.8	ND
5242.35	19	114-120"	#######	ND	ND	ND	**25**	ND	91	**460**	ND	ND	220	ND	375.77	ND
5242.36	19	126-132"	#######	ND	ND	ND	**13**	ND	43	208	ND	ND	100	ND	**1928.76**	ND
5242.37	19	138-144"	#######	ND	ND	ND	ND	ND	6.7J	32.9J	ND	ND	17	ND	194.82	ND
5245.02	20	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	533.26	44.85
5245.03	20	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	454.19	6.07
5245.04	20	30-36"	#######	ND	ND	ND	**26**	ND	98	**490**	ND	ND	180	ND	554.5	ND
5245.05	20	42-48"	#######	ND	ND	ND	**55**	ND	210	**1060**	ND	ND	410	ND	**1072.54**	ND
5245.06	20	54-60"	#######	ND	ND	ND	**41**	ND	160	**800**	ND	ND	320	ND	375.36	ND
5245.07	20	66-72"	#######	ND	ND	ND	**21**	ND	66	340	ND	ND	160	ND	**1108.07**	6.33
5245.08	20	78-84"	#######	ND	ND	ND	**46**	ND	150	**750**	ND	ND	370	ND	246.72	ND
5245.09	20	90-96"	#######	ND	ND	ND	**44**	ND	150	**730**	ND	ND	340	ND	915.19	7.26
5245.10	20	102-108"	#######	ND	ND	ND	**81**	ND	280	**1370**	ND	ND	830	ND	507.13	ND
5245.11	20	114-120"	#######	ND	ND	ND	**58**	ND	200	**960**	ND	ND	460	ND	739.83	ND
5245.12	20	126-132"	#######	ND	ND	ND	**140**	ND	500	**2480**	ND	ND	**1200**	ND	389.79	14.36

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5245.13	20	138-144"	#######	ND	ND	ND	ND	ND	ND	16J	ND	ND	11	ND	318.05	ND
5245.14	21	6-12"	#######	ND	ND	ND	ND	ND	ND	16J	ND	ND	ND	ND	198.63	ND
5245.15	21	18-24"	#######	ND	ND	ND	ND	ND	44	204	ND	ND	34	ND	258.28	ND
5245.16	21	30-36"	#######	ND	ND	ND	**22**	ND	310	**1420**	ND	ND	300	ND	865.28	4.53
5245.17	21	42-48"	#######	ND	ND	ND	**25**	ND	380	**1970**	ND	ND	380	ND	**1535.72**	ND
5245.18	21	54-60"	#######	ND	ND	ND	**25**	ND	430	**1330**	ND	ND	410	ND	**3205.2**	ND
5245.19	21	66-72"	#######	ND	ND	ND	**100**	ND	**1100**	**5200E**	ND	ND	**1400E**	ND	**8739.63**	ND
5245.20	21	78-84"	#######	ND	ND	ND	**15**	ND	180	**880**	ND	ND	270	ND	694.14	ND
5245.21	21	90-96"	#######	ND	ND	ND	**6.3**	ND	75	364	ND	ND	130	ND	772.27	ND
5245.22	21	102-108"	#######	ND	ND	ND	**38**	ND	500	**2410**	ND	ND	760	ND	**1157.87**	ND
5245.23	21	114-120"	#######	ND	ND	ND	ND	ND	25	116	ND	ND	40	ND	517.59	ND
5245.24	21	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5245.25	21	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5245.26	22	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1208.85**	ND
5245.27	22	18-24"	#######	ND	ND	ND	ND	ND	7.7J	36.3	ND	ND	8.8	ND	**1062.68**	ND
5245.28	22	30-36"	#######	ND	ND	ND	**17**	ND	220	**1070**	ND	ND	340	ND	504.67	ND
5245.29	22	42-48"	#######	ND	ND	ND	ND	ND	56	271	ND	ND	71	ND	**1101.25**	ND
5245.30	22	54-60"	#######	ND	ND	ND	2.3J	ND	19	12J	ND	ND	ND	ND	**1865.73**	40.29
5245.31	22	66-72"	#######	ND	ND	ND	ND	ND	15	12J	ND	ND	ND	ND	580.06	ND
5245.32	22	78-84"	#######	ND	ND	ND	ND	ND	40	ND	ND	ND	ND	ND	300.22	ND
5245.33	22	90-96"	#######	ND	ND	ND	ND	ND	27	77	ND	ND	ND	ND	ND	ND
5245.34	22	102-108"	#######	ND	ND	ND	ND	ND	32	96	ND	ND	ND	ND	291.98	ND
5245.35	22	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5245.36	22	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5245.37	22	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.26	23	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.27	23	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	235.85	ND
5247.28	23	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	222.33	ND
5247.29	23	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	161.67	ND
5247.30	23	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	200.75	3.3
5247.31	23	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	187.12	ND
5247.32	23	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.33	23	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.34	23	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.35	23	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.36	23	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.37	23	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.02	24	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	339.68	41.49
5247.03	24	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	210.59	11.78
5247.04	24	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	406.65	ND
5247.05	24	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	231.83	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5247.06	24	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	193.94	ND
5247.07	24	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.08	24	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.09	24	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.10	24	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.11	24	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.12	24	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.13	24	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.14	24D	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1412.42**	60.37
5247.15	24D	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	463.52	ND
5247.16	24D	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	280.57	ND
5247.17	24D	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	214.09	ND
5247.18	24D	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.19	24D	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.20	24D	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.21	24D	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.22	24D	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.23	24D	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.24	24D	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5247.25	24D	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5254.02	25	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7753.57**	22.01
5254.03	25	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	993.5	65.78
5254.04	25	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	402.32	11.48
5254.05	25	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	493.55	ND
5254.06	25	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	493.45	ND
5254.07	25	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	365.52	ND
5254.08	25	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	259.27	ND
5254.09	25	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	207.83	ND
5254.10	25	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	197.43	ND
5254.11	25	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5254.12	25	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5254.13	25	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	264.75	ND
5254.14	26	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	720.78	6.53
5254.15	26	18-24"	#######	ND	ND	ND	ND	ND	0.37J	0.33J	ND	ND	ND	ND	503.89	ND
5254.16	26	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	319.88	ND
5254.17	26	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	224.72	ND
5254.18	26	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	599.97	ND
5254.19	26	66-72"	#######	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	332.88	ND
5254.20	26	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	239.75	ND
5254.21	26	90-96"	#######	ND	ND	ND	ND	ND	24	69.7	ND	ND	ND	ND	205.27	ND
5254.22	26	102-108"	#######	ND	ND	ND	ND	ND	1.3	3.86	ND	ND	ND	ND	253.99	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5254.23	26	114-120"	#######	ND	ND	ND	ND	ND	6.4	23.2	ND	ND	ND	ND	ND	ND
5254.24	26	126-132"	#######	ND	ND	ND	ND	ND	0.76J	1.8	ND	ND	ND	ND	ND	ND
5254.25	26	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5254.26	27	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	216.57	ND
5254.27	27	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	187.13	ND
5254.28	27	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5254.29	27	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5254.30	27	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	465.37	10.53
5254.31	27	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	236.25	ND
5254.32	27	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	177.04	ND
5254.33	27	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5254.34	27	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	294.68	ND
5254.35	27	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	181.65	ND
5254.36	27	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5254.37	27	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.02	28	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	622.11	302.84
5264.03	28	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	179.48	ND
5264.04	28	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.05	28	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.06	28	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	780.97	ND
5264.07	28	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	247.69	ND
5264.08	28	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	205.97	ND
5264.09	28	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	182.32	ND
5264.10	28	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	346.31	ND
5264.11	28	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	270.26	ND
5264.12	28	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	200.18	ND
5264.13	28	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.14	29	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	173.67	ND
5264.15	29	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.16	29	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.17	29	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.18	29	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	285.93	ND
5264.19	29	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	239.25	ND
5264.20	29	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.21	29	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.22	29	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	263.00	ND
5264.23	29	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	528.19	ND
5264.24	29	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	287.89	ND
5264.25	29	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	228.16	ND

Table 3-1

Main Post Gas Station - Bldg. 699

Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000

(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5264.26	30	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	241.09	ND
5264.27	30	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	188.07	ND
5264.28	30	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.29	30	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.30	30	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	531.98	ND
5264.31	30	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	226.39	ND
5264.32	30	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.33	30	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.34	30	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.35	30	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.36	30	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5264.37	30	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5270.26	31	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	53	ND	ND	ND	ND
5270.27	31	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	57	ND	ND	ND	ND
5270.28	31	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	66E	ND	ND	ND	ND
5270.29	31	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	68E	ND	ND	ND	ND
5270.30	31	54-60"	#######	1.5	ND	ND	ND	ND	ND	ND	4.4	ND	ND	ND	ND	11.15
5270.31	31	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	1.5	ND	ND	ND	ND	ND
5270.32	31	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND
5270.33	31	90-96"	#######	1.5	ND	ND	ND	ND	ND	ND	0.89	ND	ND	ND	ND	7.58
5270.34	31	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5270.35	31	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5270.36	31	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5270.37	31	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5270.02	32	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5270.03	32	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.06
5270.04	32	30-36"	#######	1.7	ND	ND	ND	ND	ND	ND	2.7	ND	ND	ND	ND	ND
5270.05	32	42-48"	#######	1.7	ND	ND	ND	ND	ND	ND	2.8	ND	ND	ND	ND	ND
5270.06	32	54-60"	#######	1.8	ND	ND	ND	ND	ND	ND	3.4	ND	ND	ND	213.98	ND
5270.07	32	66-72"	#######	1.8	ND	ND	ND	ND	ND	ND	3.7	ND	ND	ND	ND	ND
5270.08	32	78-84"	#######	1.6	ND	ND	ND	ND	ND	ND	4.6	ND	ND	ND	ND	ND
5270.09	32	90-96"	#######	1.4	ND	ND	ND	ND	ND	ND	5.1	ND	ND	ND	ND	ND
5270.10	32	102-108"	#######	1.8	ND	ND	ND	ND	ND	ND	7.3	ND	ND	ND	445.76	ND
5270.11	32	114-120"	#######	1.8	ND	ND	ND	ND	ND	ND	13	ND	ND	ND	271.05	16.32
5270.12	32	126-132"	#######	1.4	ND	ND	ND	ND	ND	ND	23	ND	ND	ND	197.34	ND
5270.13	32	138-144"	#######	1.7	ND	ND	ND	ND	ND	ND	**110E**	ND	ND	ND	ND	ND
5270.14	33	6-12"	#######	1.9	ND	ND	ND	ND	ND	ND	3.4	ND	ND	ND	ND	ND
5270.15	33	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	1.3	ND	ND	ND	208.92	ND
5270.16	33	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND	ND
5270.17	33	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	0.78	ND	ND	ND	197.12	ND
5270.18	33	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	1.4	ND	ND	ND	225.82	6.71
5270.19	33	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	0.88	ND	ND	ND	ND	15.37

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5270.20	33	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	1.9	35	ND	ND	ND	8.67
5270.21	33	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	0.75	36	ND	ND	ND	ND
5270.22	33	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	43	ND	ND	ND	4.95
5270.23	33	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	50	ND	ND	ND	4.97
5270.24	33	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	55	ND	ND	ND	6.7
5270.25	33	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	60	ND	ND	ND	ND
5273.02	34	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.03	34	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.95
5273.04	34	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.05	34	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.06	34	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.07	34	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.08	34	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.09	34	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.10	34	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.11	34	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5273.12	34	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.63
5273.13	34	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.02	35	6-12"	#######	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.03	35	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.04	35	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.05	35	42-48"	#######	1.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.06	35	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.07	35	66-72"	#######	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.08	35	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.09	35	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.10	35	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	252.4	ND
5279.11	35	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	199.67	ND
5279.12	35	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.13	35	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.14	36	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.15	36	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.16	36	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.17	36	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.18	36	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.19	36	66-72"	#######	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.20	36	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.21	36	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.22	36	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.23	36	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.24	36	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5279.25	36	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.26	37	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.27	37	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.28	37	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.29	37	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.30	37	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.31	37	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.32	37	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.33	37	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.34	37	102-108"	#######	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.35	37	114-120"	#######	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.36	37	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5279.37	37	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5290.02	38	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	209.79	
5290.03	38	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	251.95	
5290.04	38	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	216.78	
5290.05	38	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	213.69	Pb
5290.06	38	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	208.53	resample
5290.07	38	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	218.53	samples
5290.08	38	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	204.35	disposed
5290.09	38	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	of.
5290.10	38	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.11	38	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	193.08	
5290.12	38	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.13	38	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5393.01	38	6-12"	5/3/2000													ND
5393.02	38	18-24"	5/3/2000													20.1
5393.03	38	30-36"	5/3/2000													ND
5393.04	38	42-48"	5/3/2000													7.12
5393.05	38	54-60"	5/3/2000													ND
5393.06	38	66-72"	5/3/2000						Pb only							ND
5393.07	38	78-84"	5/3/2000													ND
5393.08	38	90-96"	5/3/2000													ND
5393.09	38	102-108"	5/3/2000													ND
5393.10	38	114-120"	5/3/2000													ND
5393.11	38	126-132"	5/3/2000													ND
5393.12	38	138-144"	5/3/2000													ND
5290.14	39	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.15	39	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.16	39	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.17	39	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5290.18	39	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Pb resample samples disposed of.
5290.19	39	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.20	39	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.21	39	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.22	39	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.23	39	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.24	39	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.25	39	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5393.13	39	6-12"	5/3/2000													ND
5393.14	39	18-24"	5/3/2000													ND
5393.15	39	30-36"	5/3/2000													ND
5393.16	39	42-48"	5/3/2000													ND
5393.17	39	54-60"	5/3/2000													ND
5393.18	39	66-72"	5/3/2000						Pb only							ND
5393.19	39	78-84"	5/3/2000													ND
5393.20	39	90-96"	5/3/2000													ND
5393.21	39	102-108"	5/3/2000													ND
5393.22	39	114-120"	5/3/2000													ND
5393.23	39	126-132"	5/3/2000													ND
5393.24	39	138-144"	5/3/2000													ND
5290.26	40	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Pb resample samples disposed of.
5290.27	40	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.28	40	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.29	40	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.30	40	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.31	40	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.32	40	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.33	40	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.34	40	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.35	40	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.36	40	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5290.37	40	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
5393.25	40	6-12"	5/3/2000													ND
5393.26	40	18-24"	5/3/2000													ND
5393.27	40	30-36"	5/3/2000													ND
5393.28	40	42-48"	5/3/2000						Pb only							ND
5393.29	40	54-60"	5/3/2000													ND
5393.30	40	66-72"	5/3/2000													ND
5393.31	40	78-84"	5/3/2000													ND
5393.32	40	90-96"	5/3/2000													ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5393.33	40	102-108"	5/3/2000													ND
5393.34	40	114-120"	5/3/2000													ND
5393.35	40	126-132"	5/3/2000						Pb only							ND
5393.36	40	138-144"	5/3/2000													ND
5298.02	40D	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.03	40D	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.04	40D	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.05	40D	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.06	40D	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.07	40D	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.08	40D	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.09	40D	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.10	40D	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.11	40D	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.12	40D	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.13	40D	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.14	41	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.15	41	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.16	41	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.17	41	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.18	41	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.19	41	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.20	41	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.21	41	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.22	41	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.23	41	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.24	41	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.25	41	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.26	42	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.27	42	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.28	42	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.29	42	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.30	42	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.31	42	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.32	42	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.33	42	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.34	42	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.35	42	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.36	42	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5298.37	42	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 3-1

Main Post Gas Station - Bldg. 699

Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000

(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5300.02	43	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.03	43	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.04	43	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.05	43	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.06	43	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.07	43	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.08	43	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.09	43	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.10	43	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.11	43	114-120"	#######	ND	ND	ND	ND	ND	0.46J	0.57J	ND	ND	ND	ND	ND	ND
5300.12	43	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.13	43	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.14	44	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.15	44	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.16	44	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.17	44	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.18	44	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.19	44	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.20	44	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.21	44	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.22	44	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.23	44	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.24	44	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.25	44	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.26	45	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.59
5300.27	45	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.28	45	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.29	45	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.30	45	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.31	45	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.32	45	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.33	45	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.34	45	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.35	45	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.22
5300.36	45	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5300.37	45	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5304.02	46	6-12"	#######	ND	ND	ND	**3.9**	ND	3	17.8	ND	ND	14	ND	ND	ND
5304.03	46	18-24"	#######	ND	ND	ND	**3**	ND	ND	7	ND	ND	8.3	ND	ND	ND
5304.04	46	30-36"	#######	ND	ND	ND	**19**	ND	42	262	ND	ND	160	ND	938.19	ND
5304.05	46	42-48"	#######	ND	ND	ND	**30**	ND	63	400	ND	ND	240	ND	**1784.99**	ND

Table 3-1

Main Post Gas Station - Bldg. 699

Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000

(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5304.06	46	54-60"	#######	ND	N	ND	**49**	ND	120	**510**	ND	ND	340	ND	238.3	ND
5304.07	46	66-72"	#######	ND	ND	ND	**28**	ND	59	360	ND	ND	240	ND	684.08	ND
5304.08	46	78-84"	#######	ND	ND	ND	**48**	ND	100	**640**	ND	ND	440	ND	**1213.19**	ND
5304.09	46	90-96"	#######	ND	ND	ND	**41**	ND	84	**560**	ND	ND	360	ND	**1146.22**	ND
5304.10	46	102-108"	#######	ND	ND	ND	**48**	ND	97	**640**	ND	ND	490	ND	700.47	ND
5304.11	46	114-120"	#######	ND	ND	ND	**31**	ND	50	303	ND	ND	230	ND	584.23	ND
5304.12	46	126-132"	#######	ND	ND	ND	**67**	ND	130	**870**	ND	ND	640	ND	233.01	ND
5304.13	46	138-144"	#######	ND	ND	ND	**18**	ND	32	183	ND	ND	140	ND	237.44	ND
5304.14	47	6-12"	#######	ND	ND	ND	**3.7**	ND	4J	22.1	ND	ND	15	ND	ND	ND
5304.15	47	18-24"	#######	ND	ND	ND	**3.3**	ND	ND	10.8	ND	ND	8.2	ND	ND	ND
5304.16	47	30-36"	#######	ND	ND	ND	ND	ND	ND	4.2J	ND	ND	5.6	ND	ND	ND
5304.17	47	42-48"	#######	ND	ND	ND	**23**	ND	60	400	ND	ND	210	ND	**1088.62**	ND
5304.18	47	54-60"	#######	ND	ND	ND	**30**	ND	86	**590**	ND	ND	290	ND	**1327.62**	ND
5304.19	47	66-72"	#######	ND	ND	ND	**69**	ND	230	**1490**	ND	ND	800	ND	**1759.2**	ND
5304.20	47	78-84"	#######	ND	ND	ND	**13**	ND	35	225	ND	ND	130	ND	861.43	ND
5304.21	47	90-96"	#######	ND	ND	ND	**21**	ND	54	370	ND	ND	200	ND	423.62	ND
5304.22	47	102-108"	#######	ND	ND	ND	**15**	ND	52	358	ND	ND	170	ND	657.42	ND
5304.23	47	114-120"	#######	ND	ND	ND	**36**	ND	89	**550**	ND	ND	340	ND	828.15	ND
5304.24	47	126-132"	#######	ND	ND	ND	**33**	ND	69	**440**	ND	ND	270	ND	485.03	ND
5304.25	47	138-144"	#######	ND	ND	ND	**3.6**	ND	1.1	6.4	ND	ND	4.9	ND	215.06	ND
5304.26	48	6-12"	#######	ND	ND	ND	1.2	ND	2	8.62	ND	ND	1.8	ND	ND	ND
5304.27	48	18-24"	#######	ND	ND	ND	1.1	ND	1.1	4.73	ND	ND	0.9	ND	ND	ND
5304.28	48	30-36"	#######	ND	ND	ND	0.86	ND	0.58J	2.57	ND	ND	0.77	ND	ND	ND
5304.29	48	42-48"	#######	ND	ND	ND	1.5	ND	1.1	5.8	ND	ND	1.9	ND	ND	ND
5304.30	48	54-60"	#######	ND	ND	ND	**5.2**	ND	29	173	ND	ND	56	ND	**10533.83**	ND
5304.31	48	66-72"	#######	ND	ND	ND	**110**	ND	490	**2870**	ND	ND	990	ND	326.19	ND
5304.32	48	78-84"	#######	ND	ND	ND	0.67	ND	5.2	33.1	ND	ND	9.5	ND	**1733.42**	ND
5304.33	48	90-96"	#######	ND	ND	ND	1.5	ND	7.9	50	ND	ND	17	ND	**2091.69**	ND
5304.34	48	102-108"	#######	ND	ND	ND	**150**	ND	420	**1780**	ND	ND	480	ND	201.31	ND
5304.35	48	114-120"	#######	ND	ND	ND	**590**	ND	**1200**	**6900**	ND	ND	**2500**	ND	341.05	ND
5304.36	48	126-132"	#######	ND	ND	ND	**200**	ND	510	**2990**	ND	ND	**1000**	ND	ND	ND
5304.37	48	138-144"	#######	ND	ND	ND	**260**	ND	400	**1340**	ND	ND	650	ND	676.65	ND
5309.02	49	6-12"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.03	49	18-24"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.04	49	30-36"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.05	49	42-48"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.06	49	54-60"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.07	49	66-72"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.08	49	78-84"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.09	49	90-96"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	196.23	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5309.10	49	102-108"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	776.93	ND
5309.11	49	114-120"	4/3/2000	ND	ND	ND	ND	ND	0.67	1.66	ND	ND	ND	ND	964.48	ND
5309.12	49	126-132"	4/3/2000	ND	ND	ND	ND	ND	18	52.7	ND	ND	ND	ND	219.57	ND
5309.13	49	138-144"	4/3/2000	ND	ND	ND	ND	ND	8.3	24.2	ND	ND	ND	ND	197.94	ND
5309.14	50	6-12"	4/3/2000	ND	ND	ND	ND	ND	0.3J	0.6	ND	ND	ND	ND	ND	ND
5309.15	50	18-24"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.16	50	30-36"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.17	50	42-48"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.18	50	54-60"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.19	50	66-72"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.20	50	78-84"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.21	50	90-96"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.22	50	102-108"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.23	50	114-120"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.24	50	126-132"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.25	50	138-144"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.26	51	6-12"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.27	51	18-24"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.28	51	30-36"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.29	51	42-48"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.30	51	54-60"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.31	51	66-72"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.32	51	78-84"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.33	51	90-96"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.34	51	102-108"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.35	51	114-120"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.36	51	126-132"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5309.37	51	138-144"	4/3/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.02	52	6-12"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.03	52	18-24"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.04	52	30-36"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.05	52	42-48"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.06	52	54-60"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.07	52	66-72"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.08	52	78-84"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.09	52	90-96"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.10	52	102-108"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.11	52	114-120"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.12	52	126-132"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.13	52	138-144"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5315.14	53	6-12"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.15	53	18-24"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.16	53	30-36"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.17	53	42-48"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.18	53	54-60"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.19	53	66-72"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.20	53	78-84"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.21	53	90-96"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.22	53	102-108"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.23	53	114-120"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.24	53	126-132"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.25	53	138-144"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.26	54	6-12"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.27	54	18-24"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.28	54	30-36"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.29	54	42-48"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.30	54	54-60"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.31	54	66-72"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.32	54	78-84"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.33	54	90-96"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.34	54	102-108"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.35	54	114-120"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.36	54	126-132"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5315.37	54	138-144"	4/4/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.02	55	6-12"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.03	55	18-24"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.04	55	30-36"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.05	55	42-48"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.06	55	54-60"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.07	55	66-72"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.08	55	78-84"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.09	55	90-96"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.10	55	102-108"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.11	55	114-120"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.12	55	126-132"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.13	55	138-144"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.14	56	6-12"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.15	56	18-24"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.16	56	30-36"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.17	56	42-48"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.18	56	54-60"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5318.19	56	66-72"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.20	56	78-84"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.21	56	90-96"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.22	56	102-108"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.23	56	114-120"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.24	56	126-132"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.25	56	138-144"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.26	57	6-12"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.27	57	18-24"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.28	57	30-36"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.29	57	42-48"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.30	57	54-60"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.31	57	66-72"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.32	57	78-84"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.33	57	90-96"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.34	57	102-108"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.35	57	114-120"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.36	57	126-132"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.37	57	138-144"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.38	58	6-12"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.39	58	18-24"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13.5
5318.40	58	30-36"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.29
5318.41	58	42-48"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.83
5318.42	58	54-60"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	15.4
5318.43	58	66-72"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.95
5318.44	58	78-84"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.45	58	90-96"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.46	58	102-108"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.41
5318.47	58	114-120"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.48	58	126-132"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5318.49	58	138-144"	4/5/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.01	59	6-12"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.02	59	18-24"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.03	59	30-36"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.04	59	42-48"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.05	59	54-60"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.06	59	66-72"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.07	59	78-84"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.08	59	90-96"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.09	59	102-108"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.10	59	114-120"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5320.11	59	126-132"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.12	59	138-144"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.13	60	6-12"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.14	60	18-24"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.15	60	30-36"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.16	60	42-48"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.17	60	54-60"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.18	60	66-72"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.19	60	78-84"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.20	60	90-96"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.21	60	102-108"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.22	60	114-120"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.23	60	126-132"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.24	60	138-144"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.25	60D	6-12"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.26	60D	18-24"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.27	60D	30-36"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.28	60D	42-48"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.29	60D	54-60"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.30	60D	66-72"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.31	60D	78-84"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.32	60D	90-96"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.33	60D	102-108"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.34	60D	114-120"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.35	60D	126-132"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.36	60D	138-144"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.37	61	6-12"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.38	61	18-24"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.39	61	30-36"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.40	61	42-48"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.41	61	54-60"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.42	61	66-72"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.43	61	78-84"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.44	61	90-96"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	49.7
5320.45	61	102-108"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.46	61	114-120"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.47	61	126-132"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5320.48	61	138-144"	4/6/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.02	62	6-12"	########	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.03	62	18-24"	########	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.04	62	30-36"	########	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5353.05	62	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.06	62	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.07	62	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.08	62	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	515.84	ND
5353.09	62	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	209.84	ND
5353.10	62	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.11	62	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.12	62	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.13	62	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.14	63	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.15	63	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.16	63	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.17	63	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.18	63	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.19	63	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.20	63	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.21	63	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.22	63	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.23	63	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.24	63	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.25	63	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.26	64	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.27	64	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.28	64	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.29	64	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.30	64	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.31	64	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.32	64	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.33	64	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.34	64	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.35	64	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.36	64	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5353.37	64	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	65	6-12"	NO SAMPLE TAKEN													
	65	18-24"														
	65	30-36"														
	65	42-48"														
	65	54-60"														
	65	66-72"														
	65	78-84"														

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
	65	90-96"														
	65	102-108"														
	65	114-120"														
	65	126-132"														
	65	138-144"														
	66	6-12"														
	66	18-24"														
	66	30-36"														
	66	42-48"														
	66	54-60"														
	66	66-72"														
	66	78-84"														
	66	90-96"														
	66	102-108"														
	66	114-120"														
	66	126-132"														
	66	138-144"														
5376.02	67	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.03	67	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.04	67	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.05	67	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.06	67	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.07	67	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.08	67	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	566.14	ND
5376.09	67	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	212.32	ND
5376.10	67	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.11	67	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.12	67	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.13	67	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.26	68	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	801.6	ND
5378.27	68	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.28	68	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.29	68	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.30	68	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.31	68	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.32	68	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	206.8	ND
5378.33	68	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.34	68	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.35	68	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.36	68	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NO SAMPLE TAKEN

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5378.37	68	138-144"	#######	2.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.7	ND	ND
5378.74	68D	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.75	68D	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.76	68D	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.77	68D	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.78	68D	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.79	68D	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.80	68D	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.81	68D	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.82	68D	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.83	68D	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.84	68D	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.85	68D	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	69	6-12"	NO SAMPLE TAKEN													
	69	18-24"														
	69	30-36"														
	69	42-48"														
	69	54-60"														
	69	66-72"														
	69	78-84"														
	69	90-96"														
	69	102-108"														
	69	114-120"														
	69	126-132"														
	69	138-144"														
	70	6-12"	NO SAMPLE TAKEN													
	70	18-24"														
	70	30-36"														
	70	42-48"														
	70	54-60"														
	70	66-72"														
	70	78-84"														
	70	90-96"														
	70	102-108"														
	70	114-120"														
	70	126-132"														
	70	138-144"														
	71	6-12"	NO SAMPLE TAKEN													
	71	18-24"														
	71	30-36"														
	71	42-48"														

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup Criteria (mg/Kg) NJAC 7:26D				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
	71	54-60"	NO SAMPLE TAKEN													
	71	66-72"														
	71	78-84"														
	71	90-96"														
	71	102-108"														
	71	114-120"														
	71	126-132"														
	71	138-144"														
5376.14	72	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	543.8	28
5376.15	72	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.16	72	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.17	72	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.18	72	54-60"	#######	ND	ND	ND	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND
5376.19	72	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.20	72	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	219.09	ND
5376.21	72	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.22	72	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.23	72	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.24	72	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5376.25	72	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.38	73	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.39	73	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.40	73	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.41	73	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.42	73	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.43	73	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.44	73	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.45	73	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.46	73	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.47	73	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.48	73	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.49	73	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	74	6-12"	NO SAMPLE TAKEN													
	74	18-24"														
	74	30-36"														
	74	42-48"														
	74	54-60"														
	74	66-72"														
	74	78-84"														
	74	90-96"														
	74	102-108"														

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
	74	114-120"														
	74	126-132"														
	74	138-144"														
	75	6-12"														
	75	18-24"														
	75	30-36"														
	75	42-48"														
	75	54-60"														
	75	66-72"														
	75	78-84"														
	75	90-96"														
	75	102-108"														
	75	114-120"														
	75	126-132"														
	75	138-144"														
	76	6-12"														
	76	18-24"														
	76	30-36"														
	76	42-48"														
	76	54-60"														
	76	66-72"														
	76	78-84"														
	76	90-96"														
	76	102-108"														
	76	114-120"														
	76	126-132"														
	76	138-144"														
5378.02	77	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.03	77	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.04	77	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.05	77	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.06	77	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.07	77	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.08	77	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**5106.16**	ND
5378.09	77	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	203.53	18.5
5378.10	77	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.11	77	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.12	77	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.13	77	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.50	78	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.51	78	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NO SAMPLE TAKEN

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
5378.52	78	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.53	78	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.54	78	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.55	78	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.56	78	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.57	78	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	753.84	ND
5378.58	78	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	286.93	ND
5378.59	78	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.60	78	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.61	78	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	79	6-12"	NO SAMPLE TAKEN													
	79	18-24"														
	79	30-36"														
	79	42-48"														
	79	54-60"														
	79	66-72"														
	79	78-84"														
	79	90-96"														
	79	102-108"														
	79	114-120"														
	79	126-132"														
	79	138-144"														
	80	6-12"	NO SAMPLE TAKEN													
	80	18-24"														
	80	30-36"														
	80	42-48"														
	80	54-60"														
	80	66-72"														
	80	78-84"														
	80	90-96"														
	80	102-108"														
	80	114-120"														
	80	126-132"														
	80	138-144"														
	81	6-12"	NO SAMPLE TAKEN													
	81	18-24"														
	81	30-36"														
	81	42-48"														
	81	54-60"														
	81	66-72"														
	81	78-84"														

Table 3-1
Main Post Gas Station - Bldg. 699
Summary of Analytical Results from Geoprobe Soil Sampling - March/April 2000
(mg/Kg)

Lab ID	Boring	Depth	Date	2-Butanone	2-Chloroethyl vinyl ether	TCE	Benzene	PCE	Ethyl-benzene	Xylene	MeCl	Acetone	Toluene	Chloro-form	TPHC	Pb
Residential Direct Contact Soil Cleanup				1000	NLE	23	3	4	1000	410	49	1000	1000	19	1000	400
	81	90-96"	NO SAMPLE TAKEN													
	81	102-108"														
	81	114-120"														
	81	126-132"														
	81	138-144"														
5378.14	82	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	212.78	50
5378.15	82	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.16	82	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.17	82	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.18	82	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.19	82	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.20	82	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.21	82	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.22	82	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.23	82	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.24	82	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	975.14	ND
5378.25	82	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.62	83	6-12"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.63	83	18-24"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.64	83	30-36"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.65	83	42-48"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.66	83	54-60"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.67	83	66-72"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.68	83	78-84"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.69	83	90-96"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.70	83	102-108"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.71	83	114-120"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.72	83	126-132"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5378.73	83	138-144"	#######	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Key

ND - Not Detected

"Bolded" analytical result exceeded the respective NJDEP Residential Direct Contact Soil Cleanup Criteria

Definition of Laboratory Qualifiers

MDL - Method Detection Limit

J - Compound identified below detection limit

B - Compound in both sample and blank

D - Results from dilution of sample

U - Compound searched for but not detected

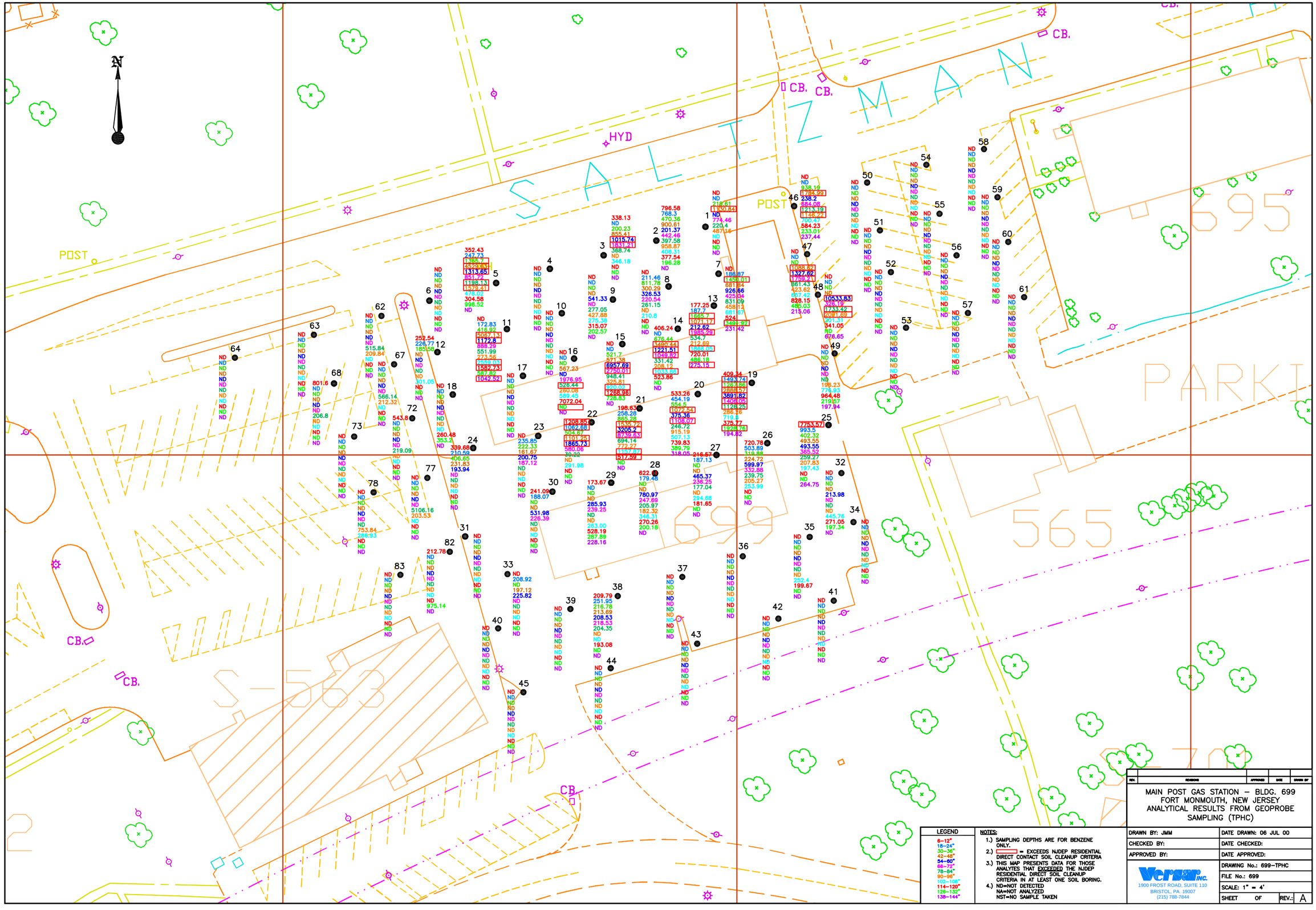
E - Compound exceeds calibration limit

APPENDIX – A
FORT MONMOUTH
STANDARD OPERATING PROCEDURE

Geoprobe Sampling Methods for the AAFES
Main Post Gas Station, Building 699
SOP No.: SAM-0221, Dated 2-24-2000

APPENDIX – B
Drawings

Figure 3 - Analytical Results from Geoprobe Sampling – Total Petroleum Hydrocarbons
Figure 4 - Analytical Results from Geoprobe Sampling – Benzene
Figure 5 - Analytical Results from Geoprobe Sampling – Ethyl-Benzene
Figure 6 - Analytical Results from Geoprobe Sampling – Toluene
Figure 7 - Analytical Results from Geoprobe Sampling – Xylene
Figure 8 - Proposed Areas of Enzyme-Enhanced Bioremediation



LEGEND

6–12"
18–24"
30–36"
42–48"
54–60"
66–72"
78–84"
90–96"
102–108"
114–120"
126–132"
138–144"

NOTES:

1.) SAMPLING DEPTHS ARE FOR BENZENE ONLY.

2.) = EXCEEDS NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA

3.) THIS MAP PRESENTS DATA FOR THOSE ANALYTES THAT EXCEEDED THE NJDEP RESIDENTIAL DIRECT SOIL CLEANUP CRITERIA IN AT LEAST ONE SOIL BORING.

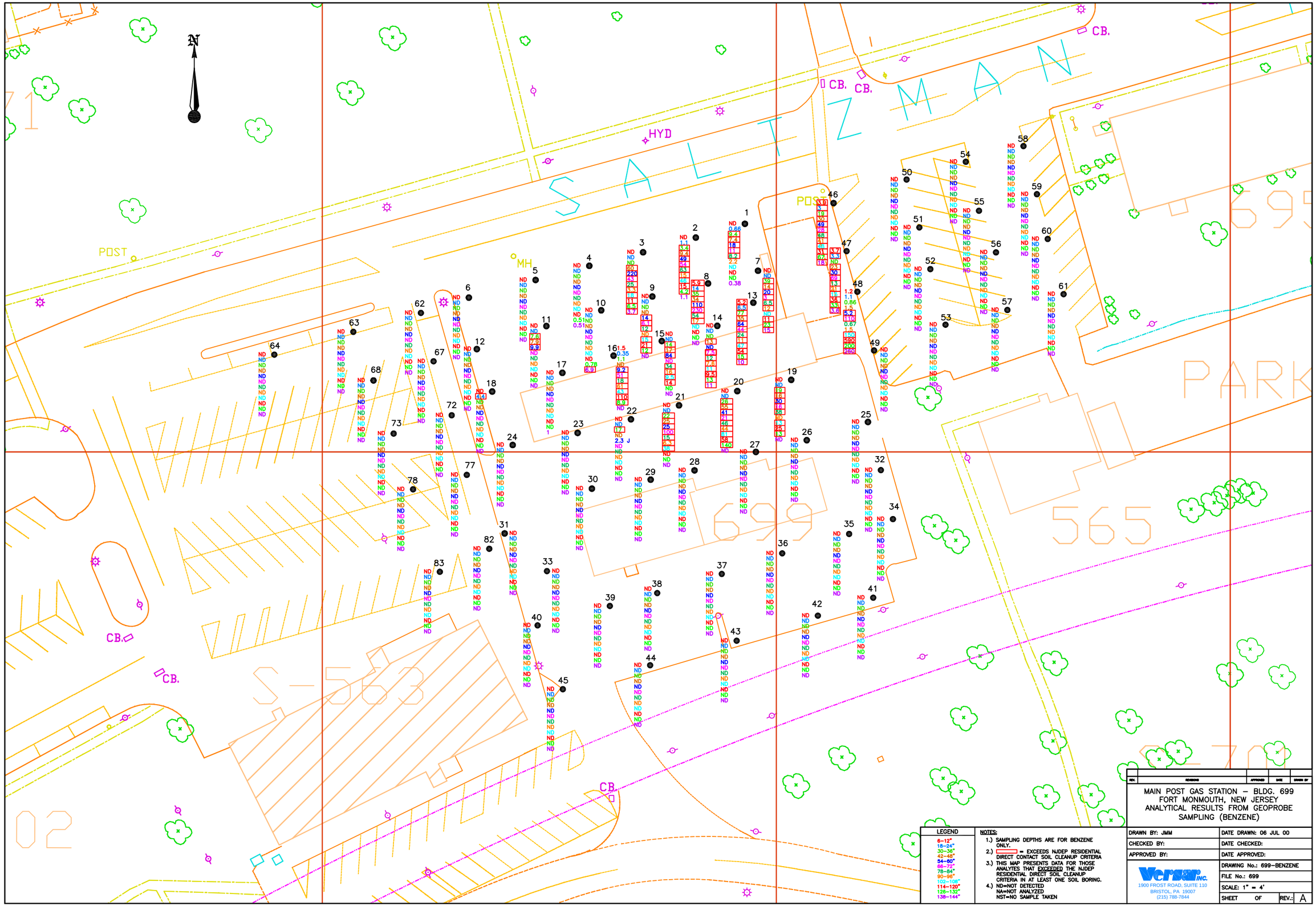
4.) ND=NOT DETECTED
NA=NOT ANALYZED
NST=NO SAMPLE TAKEN

REV.	REMARKS	APPROVED	DATE	DRAWN BY

MAIN POST GAS STATION – BLDG. 699
FORT MONMOUTH, NEW JERSEY
ANALYTICAL RESULTS FROM GEOPROBE SAMPLING (TPHC)

DRAWN BY: JMM	DATE DRAWN: 06 JUL 00
CHECKED BY:	DATE CHECKED:
APPROVED BY:	DATE APPROVED:
	DRAWING No.: 699–TPHC
	FILE No.: 699
	SCALE: 1" = 4'
	SHEET OF REV.: A

Versar INC.
1900 FROST ROAD, SUITE 110
BRISTOL, PA 19007
(215) 788-7844



LEGEND

- 6–12"
- 18–24"
- 30–36"
- 42–48"
- 54–60"
- 66–72"
- 78–84"
- 90–96"
- 102–108"
- 114–120"
- 126–132"
- 138–144"

NOTES:

1.) SAMPLING DEPTHS ARE FOR BENZENE ONLY.
2.) ▭ = EXCEEDS NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA
3.) THIS MAP PRESENTS DATA FOR THOSE ANALYTES THAT EXCEEDED THE NJDEP RESIDENTIAL DIRECT SOIL CLEANUP CRITERIA IN AT LEAST ONE SOIL BORING.
4.) ND=NOT DETECTED
NA=NOT ANALYZED
NST=NO SAMPLE TAKEN

REV.	REVISIONS	APPROVED	DATE	DRAWN BY

MAIN POST GAS STATION – BLDG. 699
FORT MONMOUTH, NEW JERSEY
ANALYTICAL RESULTS FROM GEOPROBE SAMPLING (BENZENE)

DRAWN BY: JMM	DATE DRAWN: 06 JUL 00
CHECKED BY:	DATE CHECKED:
APPROVED BY:	DATE APPROVED:
	DRAWING No.: 699–BENZENE
	FILE No.: 699
	SCALE: 1" = 4'
	SHEET OF REV.: A

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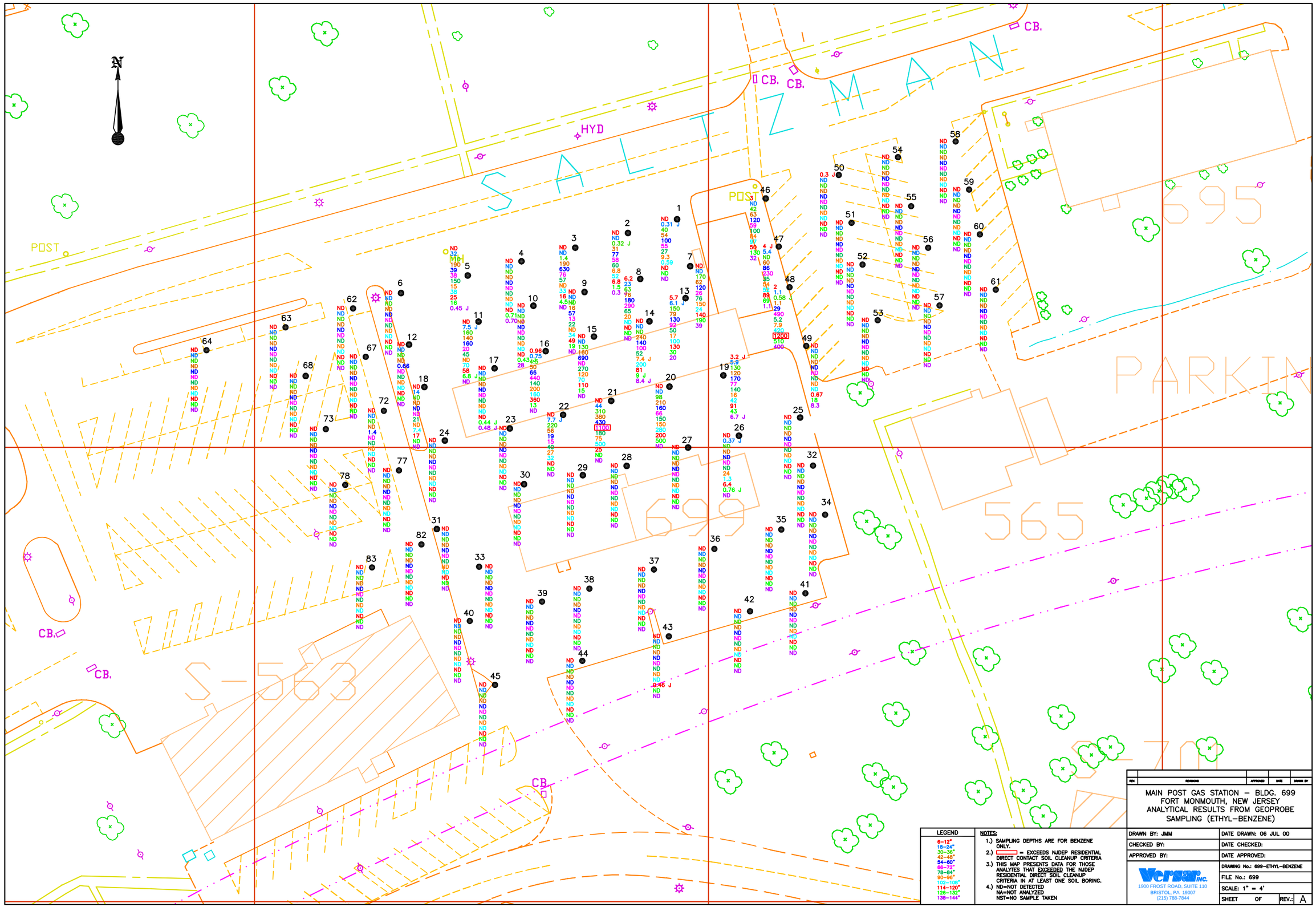
BRISTOL, PA 19007
(215) 788-7844


N
SALTZMAN
HYD
POST
CB.
CB.
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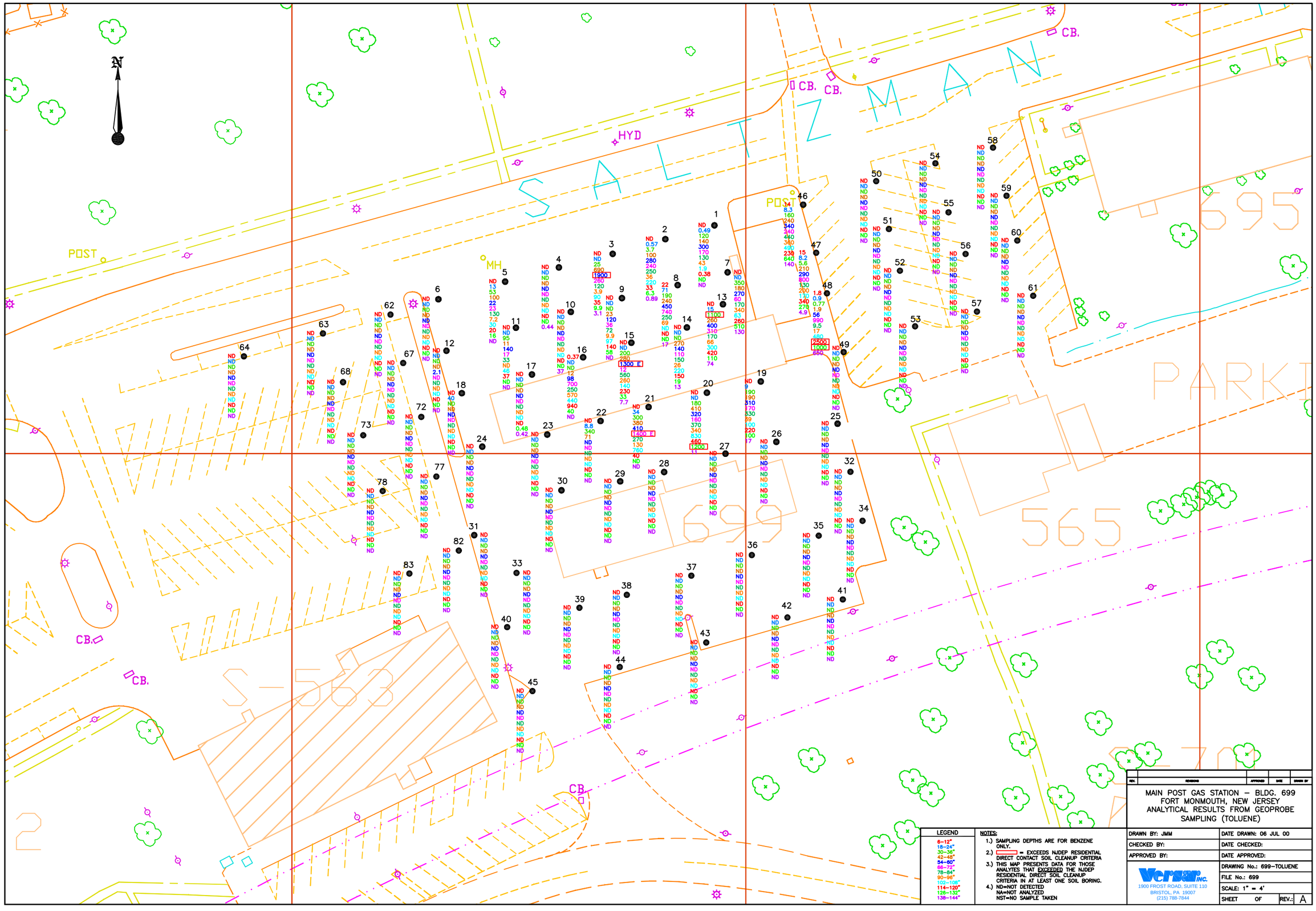
CB.
CB.
CB.
699
695
565
563
PARKIN
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 67 68 72 73 77 78 82 83
LEGEND
6–12"
18–24"
30–36"
42–48"
54–60"
66–72"
78–84"
90–96"
102–108"
114–120"
126–132"
138–144"
NOTES:
1.) SAMPLING DEPTHS ARE FOR BENZENE ONLY.
2.) = EXCEEDS NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA
3.) THIS MAP PRESENTS DATA FOR THOSE ANALYTES THAT EXCEEDED THE NJDEP RESIDENTIAL DIRECT SOIL CLEANUP CRITERIA IN AT LEAST ONE SOIL BORING.
4.) ND=NOT DETECTED
NA=NOT ANALYZED
NST=NO SAMPLE TAKEN
REV. | REVISIONS | APPROVED | DATE | DRAWN BY
MAIN POST GAS STATION – BLDG. 699
FORT MONMOUTH, NEW JERSEY
ANALYTICAL RESULTS FROM GEOPROBE SAMPLING (ETHYL–BENZENE)
DRAWN BY: JMM
DATE DRAWN: 06 JUL 00
CHECKED BY:
DATE CHECKED:
APPROVED BY:
DATE APPROVED:
DRAWING No.: 699-ETHYL-BENZENE
FILE No.: 699
SCALE: 1" = 4'
SHEET OF
REV.: A
Versar INC.
1900 FROST ROAD, SUITE 110
BRISTOL, PA 19007
(215) 788-7844


N
SALTZMAN
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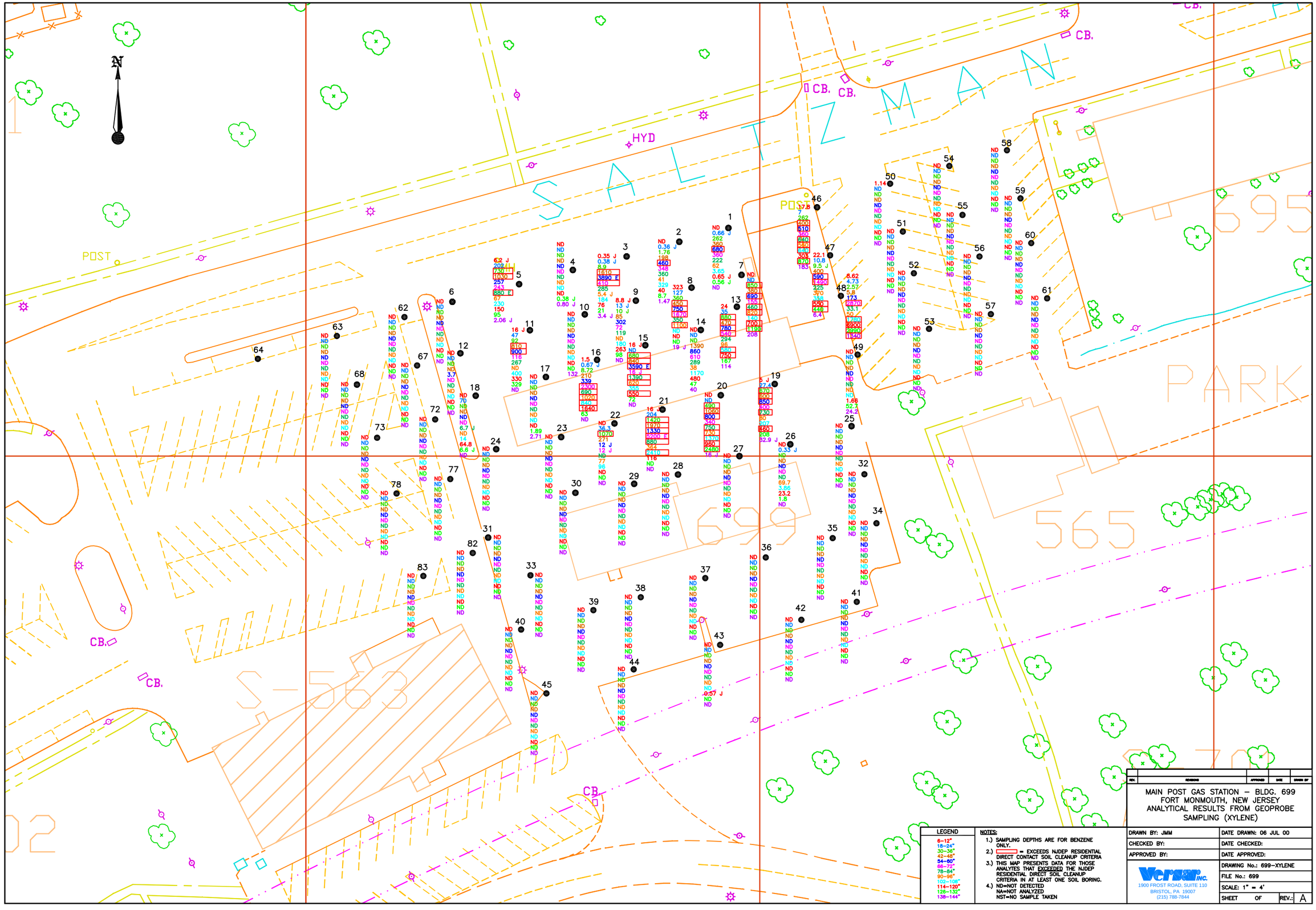
LEGEND
6–12"
18–24"
30–36"
42–48"
54–60"
66–72"
78–84"
90–96"
102–108"
114–120"
126–132"
138–144"
NOTES:
1.) SAMPLING DEPTHS ARE FOR BENZENE ONLY.
2.) = EXCEEDS NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA
3.) THIS MAP PRESENTS DATA FOR THOSE ANALYTES THAT EXCEEDED THE NJDEP RESIDENTIAL DIRECT SOIL CLEANUP CRITERIA IN AT LEAST ONE SOIL BORING.
4.) ND=NOT DETECTED
NA=NOT ANALYZED
NST=NO SAMPLE TAKEN
REV. REVISIONS APPROVED DATE DRAWN BY
MAIN POST GAS STATION – BLDG. 699
FORT MONMOUTH, NEW JERSEY
ANALYTICAL RESULTS FROM GEOPROBE SAMPLING (TOLUENE)
DRAWN BY: JMM
DATE DRAWN: 06 JUL 00
CHECKED BY:
DATE CHECKED:
APPROVED BY:
DATE APPROVED:
DRAWING No.: 699–TOLUENE
FILE No.: 699
SCALE: 1" = 4'
SHEET OF
REV.: A
Versar INC.
1900 FROST ROAD, SUITE 110
BRISTOL, PA. 19007
(215) 788-7844



LEGEND
6–12"
18–24"
30–36"
42–48"
54–60"
66–72"
78–84"
90–96"
102–108"
114–120"
126–132"
138–144"

NOTES:

1.) SAMPLING DEPTHS ARE FOR BENZENE ONLY.

2.) [ ] = EXCEEDS NJDEP RESIDENTIAL DIRECT CONTACT SOIL CLEANUP CRITERIA

3.) THIS MAP PRESENTS DATA FOR THOSE ANALYTES THAT EXCEEDED THE NJDEP RESIDENTIAL DIRECT SOIL CLEANUP CRITERIA IN AT LEAST ONE SOIL BORING.

4.) ND=NOT DETECTED
NA=NOT ANALYZED
NST=NO SAMPLE TAKEN

REV.	REMARKS	APPROVED	DATE	DRAWN BY

MAIN POST GAS STATION – BLDG. 699
FORT MONMOUTH, NEW JERSEY
ANALYTICAL RESULTS FROM GEOPROBE SAMPLING (XYLENE)

DRAWN BY: JMM	DATE DRAWN: 06 JUL 00
CHECKED BY:	DATE CHECKED:
APPROVED BY:	DATE APPROVED:
	DRAWING No.: 699–XYLENE
	FILE No.: 699
	SCALE: 1" = 4'
	SHEET OF REV.: A

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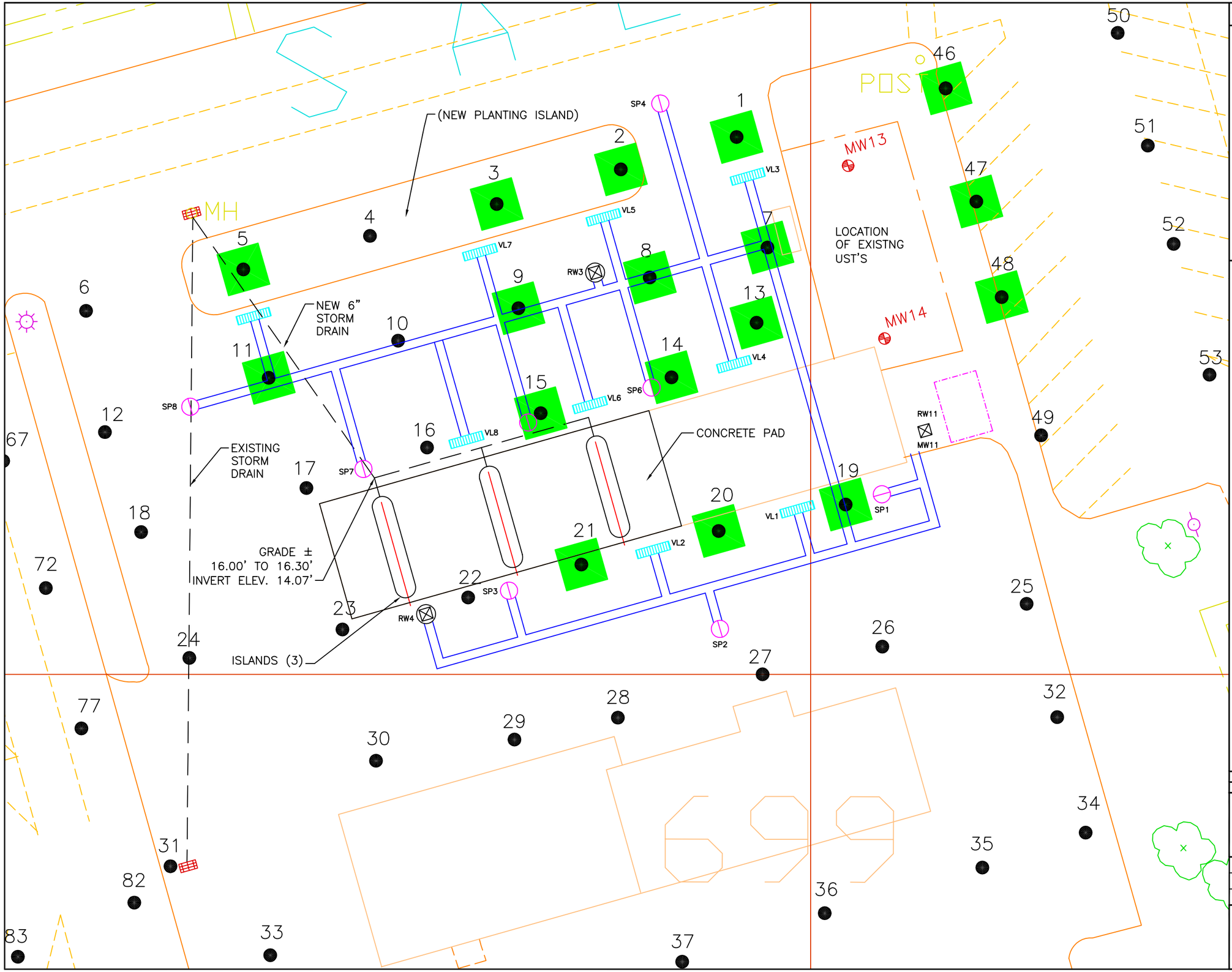
BRISTOL, PA. 19007
(215) 788-7844



LEGEND

- Proposed Zones of Geoprobe Enzyme Injection
- (1) EXISTING RECOVERY WELL
- (2) NEW RECOVERY WELLS
- (8) SPARGE POINTS
- (9) SUE LATERALS

NOTES:

1.) PRIOR TO BACKFILLING, ALL TRENCHES AND PIPING RUNS ARE TO BE SURVEYED AND LOCATIONS AND ELEVATIONS RECORDED.
2.) SEE FIGURE 15A, FOR SECTIONS

WELLS

MW11 (EXISTING) }
RW13 (NEW) } 20 FT. BGS TO BOTTOM OF SCREEN
RW4 (NEW) }

VAPOR EXTRACTION LATERAL
(NEW) VL 1 THRU VL 9 (3 FT. BGS)

SPARGE POINTS
(NEW) SP1 THRU SP 8 (5 FT. BGS)

REV.	REVISIONS	APPROVED	DATE	DRAWN BY

TITLE: FIGURE 8
PROPOSED AREAS OF ENZYME-ENHANCED BIOREMEDIATION
BUILDING 699
FORT MONMOUTH, NEW JERSEY

DRAWN BY: JMM	DATE DRAWN: 11 JUL 00
CHECKED BY: SJE	DATE CHECKED:
APPROVED BY:	DATE APPROVED:
	DRAWING No.: FIGURE 8
	FILE No.: 699-C
	SCALE: 1" = 10'
	SHEET 1 OF 1 REV.: A

Versar INC.
1900 FROST ROAD, SUITE 110
BRISTOL, PA 19007
(215) 788-7844

Appendix C
Material Safety Data Sheets

Enzyme Accelerator

EZT-MZC

EZT-A2

MATERIAL SAFETY DATA SHEET

This MSDS complies with OSHA'S Hazard Communication Standard 29 CFR 1910.1200 and OSHA Form 174

IDENTITY AND MANUFACTURER'S INFORMATION

NFPA Rating: Health-1; Flammability-0; Reactivity-0; Special- -		**HMIS Rating:** Health-1; Flammability-0; Reactivity-0; Personal Protection-D
Manufacturer's Name:	Enzyme Technologies, Inc.	**DOT Hazard Classification: None**
Address:	5228 NE 158th Ave Portland, OR 97230	**TRADE NAME: Enzyme Accelerator**
Date Prepared: 3/9/98	**Prepared By: KG**	**MSDS Number:** Revision - 2
Information Calls:	**(503) 254-4331**	NOTICE: JUDGMENT BASED ON INDIRECT TEST DATA

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)	ACS Number	SARA III LIST	OSHA PEL (ppm)	ACGIH TLV (ppm)	Carcinogen Ref. Source **
Proprietary		No	N/E	N/E	N/E

SECTION 2 - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point:	220 F	Specific Gravity (H2O=1):	1.00
Vapor Pressure: PSIG @ 70 F (Aerosols):	N/A	Vapor Pressure (Non-Aerosols)(mm Hg and Temperature):	18 @75^0 F
Vapor Density (Air = 1):	.62	Evaporation Rate (BUAC = 1):	1.20
Solubility in Water:	Complete	Water Reactive:	No
Appearance and Odor:	Tan colored liquid with citrus odor.		

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY as per USA flame projection test (aerosols): N/A	Auto Ignition Temperature: N/E	Flammability Limits in Air by % in Volume:
FLASH POINT AND METHOD USED 115 F (T.C.C.)		% LEL: N/E % UEL: N/E
EXTINGUISHER MEDIA: Non-Combustible	**SPECIAL FIRE FIGHTING PROCEDURES**: None	

Unusual Fire & Explosion Hazards: Provide shielding to protect personnel.

SECTION 4 - REACTIVITY HAZARD DATA

STABILITY: [X] STABLE [ ] UNSTABLE	**HAZARDOUS POLYMERIZATION:** [ ] WILL [X] WILL NOT OCCUR
Incompatibility (Mat. to avoid): None Identified	**Conditions to Avoid:** None Identified

Hazardous Decomposition Products: None

SECTION 5 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: [X] INHALATION [ ] INGESTION [X] SKIN ABSORPTION [X] EYE [ ] NOT HAZARDOUS

ACUTE EFFECTS:	**None**		
Inhalation:	Can cause headache, dizziness**.**		
Eye Contact:	Irritating	**Skin Contact:**	May be an irritant.
Ingestion:	Chemical pneumonitis if aspirated into lungs.		
CHRONIC EFFECTS:	None known.		
Medical Conditions Generally Aggravated by Exposure:	Asthma		

SECTION 6 - EMERGENCY FIRST AID PROCEDURES

Eye Contact: Flush with water for 15 minutes. Get medical attention.

Skin Contact: Wash with soap and water.

Inhalation: Move to fresh air.

Ingestion: **DO NOT INDUCE VOMITING.** Drink large quantity of water. Get immediate medical attention.

SECTION 7 - CONTROL AND PROTECTIVE MEASURES

Respiratory Protection (specify type):.	None normally needed		
Protective Gloves:	Solvent resistant	**Eye Protection:**	Safety glasses.
Ventilation Requirements:	Normal room ventilation.		
Other Protective Clothing & Equipment:	None		
Hygienic Work Practices:	Wash with soap and water after contact.		

SECTION 8 - PRECAUTIONS FOR SAFE HANDLING AND USE

Steps To Be Taken If Material Is Spilled Or Released: Cover with absorbent material and scoop up. Flush area with water.

Waste Disposal Methods: Dispose of in accordance with local, state and federal regulations.

Precautions To Be Taken In Handling & Storage: Keep away from temperatures above 130 F.

Other Precautions &/or Special Hazards: KEEP OUT OF REACH OF CHILDREN.

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind.

**** Chemical Listed as Carcinogen or Potential Carcinogen. [a] NTP [b] IARC Monograph [c] OSHA [d] Not Listed [e] Animal Data Only**

MATERIAL SAFETY DATA SHEET

This MSDS complies with OSHA'S Hazard Communication Standard 29 CFR 1910.1200 and OSHA Form 174

IDENTITY AND MANUFACTURER'S INFORMATION

NFPA Rating: Health-1; Flammability-0; Reactivity-0; Special- -		**HMIS Rating:** Health-1; Flammability-0; Reactivity-0; Personal Protection-D	
Manufacturer's Name:	Enzyme Technologies, Inc.	**DOT Hazard Classification:** None	
Address:	5228 NE 158th Ave. Portland, OR 97230	**TRADE NAME:** **EZT-MZC**	
Date Prepared: 3/9/98	**Prepared By:** KG	**MSDS Number:**	**Revision** - 2
Information Calls:	**(503) 254-4331**	NOTICE: JUDGMENT BASED ON INDIRECT TEST DATA	

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)	ACS Number	SARA III LIST	OSHA PEL (ppm)	ACGIH TLV (ppm)	Carcinogen Ref. Source **
NATURAL ENZYMES	N/A	No	N/E	N/E	N/E
monomethanoxygenase,alcoholdehydrogenase,aldehydehydogenase					

SECTION 2 - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point:	212 F	**Specific Gravity (H2O=1):**	1.00
Vapor Pressure: PSIG @ 70 F (Aerosols):	N/A	**Vapor Pressure (Non-Aerosols)(mm Hg and Temperature):**	18 @75^0 F
Vapor Density (Air = 1):	.62	**Evaporation Rate (BUAC = 1):**	1.00
Solubility in Water:	Complete	**Water Reactive:**	No
Appearance and Odor:	Thin brown/tan liquid with slightly sour odor		

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY as per USA flame projection test (aerosols): N/A	Auto Ignition Temperature: N/A	Flammability Limits in Air by % in Volume:
FLASH POINT AND METHOD USED N/A		% LEL: N/A % UEL: N/A
EXTINGUISHER MEDIA: Non-Combustible	**SPECIAL FIRE FIGHTING PROCEDURES**: None	

Unusual Fire & Explosion Hazards: None

SECTION 4 - REACTIVITY HAZARD DATA

STABILITY: [X] STABLE [ ] UNSTABLE	**HAZARDOUS POLYMERIZATION:** [ ] WILL [X] WILL NOT OCCUR
Incompatibility (Mat. to avoid): None Identified	**Conditions to Avoid:** None Identified

Hazardous Decomposition Products: None

SECTION 5 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: [ ] INHALATION [X] INGESTION [X] SKIN ABSORPTION [X] EYE [ ] NOT HAZARDOUS

ACUTE EFFECTS:	None		
Inhalation:	Can cause headache, dizziness.		
Eye Contact:	May be an irritant	**Skin Contact:**	May be an irritant.
Ingestion:	Gastrointestinal irritant		
CHRONIC EFFECTS:	None known.		

Medical Conditions Generally Aggravated by Exposure: None Identified

SECTION 6 - EMERGENCY FIRST AID PROCEDURES

Eye Contact: Flush with water for 15 minutes. If irritation persists get medical attention.

Skin Contact: Wash with soap and water.

Inhalation: Move to fresh air. No adverse effects noted.

Ingestion: **DO NOT INDUCE VOMITING.** Drink large quantity of water. Get immediate medical attention.

SECTION 7 - CONTROL AND PROTECTIVE MEASURES

Respiratory Protection (specify type):.	None normally needed		
Protective Gloves:	Rubber if desired	**Eye Protection:**	Safety glasses.
Ventilation Requirements:	Normal room ventilation.		
Other Protective Clothing & Equipment:	Apron and boots if desired.		
Hygienic Work Practices:	Wash with soap and water after contact.		

SECTION 8 - PRECAUTIONS FOR SAFE HANDLING AND USE

Steps To Be Taken If Material Is Spilled Or Released: Dike and contain. Collect and re-use.

Waste Disposal Methods: Rinse container with water and dispose of accordingly

Precautions To Be Taken In Handling & Storage: Recommended storage temperature is 50 F. Seal container after use.

Other Precautions &/or Special Hazards: KEEP OUT OF REACH OF CHILDREN.

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind.

**** Chemical Listed as Carcinogen or Potential Carcinogen. [a] NTP [b] IARC Monograph [c] OSHA [d] Not Listed [e] Animal Data Only**

MATERIAL SAFETY DATA SHEET

This MSDS complies with OSHA'S Hazard Communication Standard 29 CFR 1910.1200 and OSHA Form 174

IDENTITY AND MANUFACTURER'S INFORMATION

NFPA Rating: Health-1; Flammability-0; Reactivity-0; Special- -		**HMIS Rating:** Health-1; Flammability-0; Reactivity-0; Personal Protection-D	
Manufacturer's Name:	Enzyme Technologies, Inc.	**DOT Hazard Classification:** None	
Address:	5228 NE 158th Ave Portland, OR 97230	**TRADE NAME:** **EZT-A2**	
Date Prepared: 3/9/98	**Prepared By:** KG	**MSDS Number:**	**Revision** - 2
Information Calls:	**(503) 254-4331**	NOTICE: JUDGMENT BASED ON INDIRECT TEST DATA	

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS-CHEMICAL NAMES AND COMMON NAMES (Hazardous Components 1% or greater; Carcinogens 0.1% or greater)	ACS Number	SARA III LIST	OSHA PEL (ppm)	ACGIH TLV (ppm)	Carcinogen Ref. Source **
Bacterial Consortium	N/A	No	N/E	N/E	N/E

SECTION 2 - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point:	212 F	**Specific Gravity (H2O=1):**	1.00
Vapor Pressure: PSIG @ 70 F (Aerosols):	N/A	**Vapor Pressure (Non-Aerosols)(mm Hg and Temperature):**	18 @75^0 F
Vapor Density (Air = 1):	.62	**Evaporation Rate (BUAC = 1):**	1.00
Solubility in Water:	Complete	**Water Reactive:**	No

Appearance and Odor: Thin brown/tan liquid with slightly sour odor

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY as per USA flame projection test (aerosols): N/A	Auto Ignition Temperature: N/A	Flammability Limits in Air by % in Volume:
FLASH POINT AND METHOD USED N/A		% LEL: N/A % UEL: N/A
EXTINGUISHER MEDIA: Non-Combustible	**SPECIAL FIRE FIGHTING PROCEDURES**: None	

Unusual Fire & Explosion Hazards: None

SECTION 4 - REACTIVITY HAZARD DATA

STABILITY: [X] STABLE [ ] UNSTABLE	**HAZARDOUS POLYMERIZATION:** [ ] WILL [X] WILL NOT OCCUR
Incompatibility (Mat. to avoid): None Identified	**Conditions to Avoid:** None Identified

Hazardous Decomposition Products: None

SECTION 5 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENTRY: [ ] INHALATION [X] INGESTION [X] SKIN ABSORPTION [X] EYE [ ] NOT HAZARDOUS

ACUTE EFFECTS: None

Inhalation: None

Eye Contact: May be an irritant **Skin Contact:** May be an irritant.

Ingestion: Gastrointestinal irritant

CHRONIC EFFECTS: None known.

Medical Conditions Generally Aggravated by Exposure: None Identified

SECTION 6 - EMERGENCY FIRST AID PROCEDURES

Eye Contact: Flush with water for 15 minutes. If irritation persists get medical attention.

Skin Contact: Wash with soap and water.

Inhalation: Move to fresh air. No adverse effects noted.

Ingestion: **DO NOT INDUCE VOMITING.** Drink large quantity of water. Get immediate medical attention.

SECTION 7 - CONTROL AND PROTECTIVE MEASURES

Respiratory Protection (specify type):. None normally needed

Protective Gloves: Rubber if desired **Eye Protection:** Safety glasses.

Ventilation Requirements: Normal room ventilation.

Other Protective Clothing & Equipment: Apron and boots if desired.

Hygienic Work Practices: Wash with soap and water after contact.

SECTION 8 - PRECAUTIONS FOR SAFE HANDLING AND USE

Steps To Be Taken If Material Is Spilled Or Released: Dike and contain. Collect and re-use.

Waste Disposal Methods: Rinse container with water and dispose of accordingly

Precautions To Be Taken In Handling & Storage: Recommended storage temperature is 60 F. Seal container after use.

Other Precautions &/or Special Hazards: KEEP OUT OF REACH OF CHILDREN.

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind.

**** Chemical Listed as Carcinogen or Potential Carcinogen. [a] NTP [b] IARC Monograph [c] OSHA [d] Not Listed [e] Animal Data Only**

Appendix B

Summary of EEB Injection Volumes

APPENDIX B
SUMMARY OF ENZYME-ENHANCED BIOREMEDIATION (EEB) INJECTION VOLUMES
MAIN POST GAS STATION, BUILDING 699, FORT MONMOUTH, NEW JERSEY

Boring #1		**Boring #2**		**Boring #3**	
First Stage	106 gallons	First Stage	150.75 gallons	First Stage	96.75 gallons
Per injection (avg.)	11.78 gallons	Per injection (avg.)	16.75 gallons	Per injection (avg.)	10.75 gallons
Completed	11/7/00	Completed	11/8/00	Completed	11/7/00
Second Stage	92.5 gallons	Second Stage	58 gallons	Second Stage	96 gallons
Per Injection (avg.)	10.28 gallons	Per Injection (avg.)	6.44 gallons	Per Injection (avg.)	10.67 gallons
Completed	11/9/00	Completed	11/9/00	Completed	11/9/00
Boring #5		**Boring #7**		**Boring #8**	
First Stage	93 gallons	First Stage	86.25 gallons	First Stage	70 gallons
Per injection (avg.)	10.33 gallons	Per injection (avg.)	9.58 gallons	Per injection (avg.)	7.78 gallons
Completed	11/8/00	Completed	11/13/00	Completed	11/10/00
Second Stage	-	Second Stage	67.5 gallons	Second Stage	65.9 gallons
Per Injection (avg.)	-	Per Injection (avg.)	7.5 gallons	Per Injection (avg.)	7.32 gallons
Completed	11/9/00	Completed	11/13/00	Completed	11/13/00
Boring #9		**Boring #11**		**Boring #13**	
First Stage	68 gallons	First Stage	150 gallons	First Stage	89.5 gallons
Per injection (avg.)	7.56 gallons	Per injection (avg.)	16.67 gallons	Per injection (avg.)	9.94 gallons
Completed	11/8/00	Completed	11/10/00	Completed	11/15/00
Second Stage	-	Second Stage	93.5 gallons	Second Stage	84 gallons
Per Injection (avg.)	-	Per Injection (avg.)	10.38 gallons	Per Injection (avg.)	9.33 gallons
Completed	11/9/00	Completed	11/13/00	Completed	11/13/00
Boring #14		**Boring #15**		**Boring #19**	
First Stage	86 gallons	First Stage	83.5 gallons	First Stage	85.5 gallons
Per injection (avg.)	9.56 gallons	Per injection (avg.)	9.28 gallons	Per injection (avg.)	9.5 gallons
Completed =	11/15/00	Completed	11/14/00	Completed	11/14/00
Second Stage	38 gallons	Second Stage	91 gallons	Second Stage	82 gallons
Per Injection (avg.)	4.22 gallons	Per Injection (avg.)	10.11 gallons	Per Injection (avg.)	9.11 gallons
Completed	11/16/00	Completed	11/16/00	Completed	11/15/00

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APPENDIX B

SUMMARY OF ENZYME-ENHANCED BIOREMEDIATION (EEB) INJECTION VOLUMES
MAIN POST GAS STATION, BUILDING 699, FORT MONMOUTH, NEW JERSEY

Boring #20		**Boring #21**		**Boring #46**	
First Stage	81.5 gallons	First Stage	79 gallons	First Stage	77 gallons
Per injection (avg.)	9.05 gallons	Per injection (avg.)	8.78 gallons	Per injection (avg.)	8.56 gallons
Completed	11/14/00	Completed	11/14/00	Completed	11/17/00
Second Stage	90 gallons	Second Stage	85.3 gallons	Second Stage	76 gallons
Per Injection (avg.)	9 gallons	Per Injection (avg.)	9.47 gallons	Per Injection (avg.)	8.44 gallons
Completed	11/15/00	Completed	11/16/00	Completed	11/21/00
Boring #47		**Boring #48**			
First Stage	70 gallons	First Stage	86.5 gallons		
Per injection (avg.)	7.78 gallons	Per injection (avg.)	9.61gallons		
Completed	11/17/00	Completed	11/17/00		
Second Stage	80 gallons	Second Stage	82 gallons		
Per Injection (avg.)	8.89 gallons	Per Injection (avg.)	9 gallons		
Completed	11/21/00	Completed	11/21/00		

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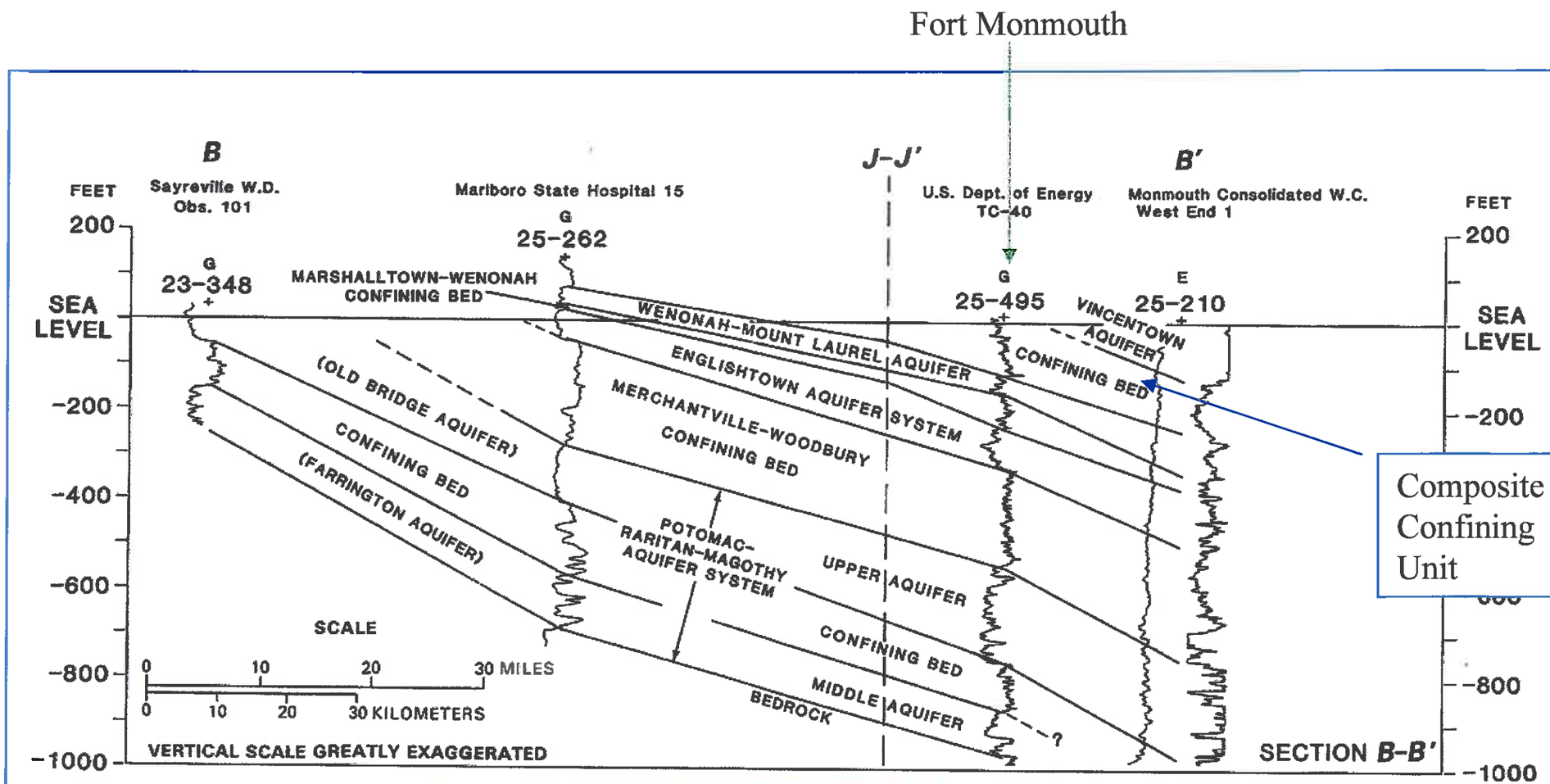
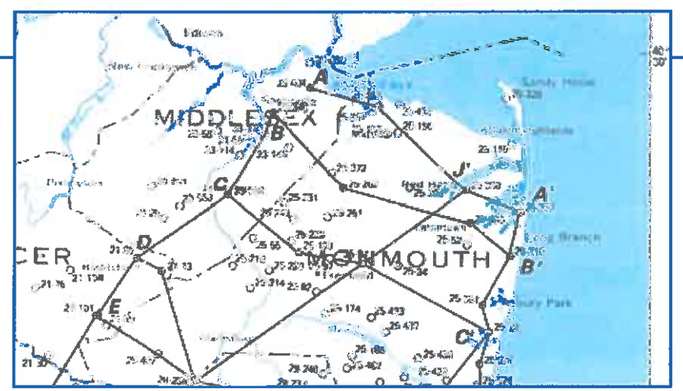
Appendix C

Soil Analytical Data Package





Source: Zapecza, O. 1989. *Hydrogeologic Framework of the New Jersey Coastal Plain.* USGS Professional Paper 1404-B. U.S. Government Printing Office, Washington, DC.

FIGURE 6-1

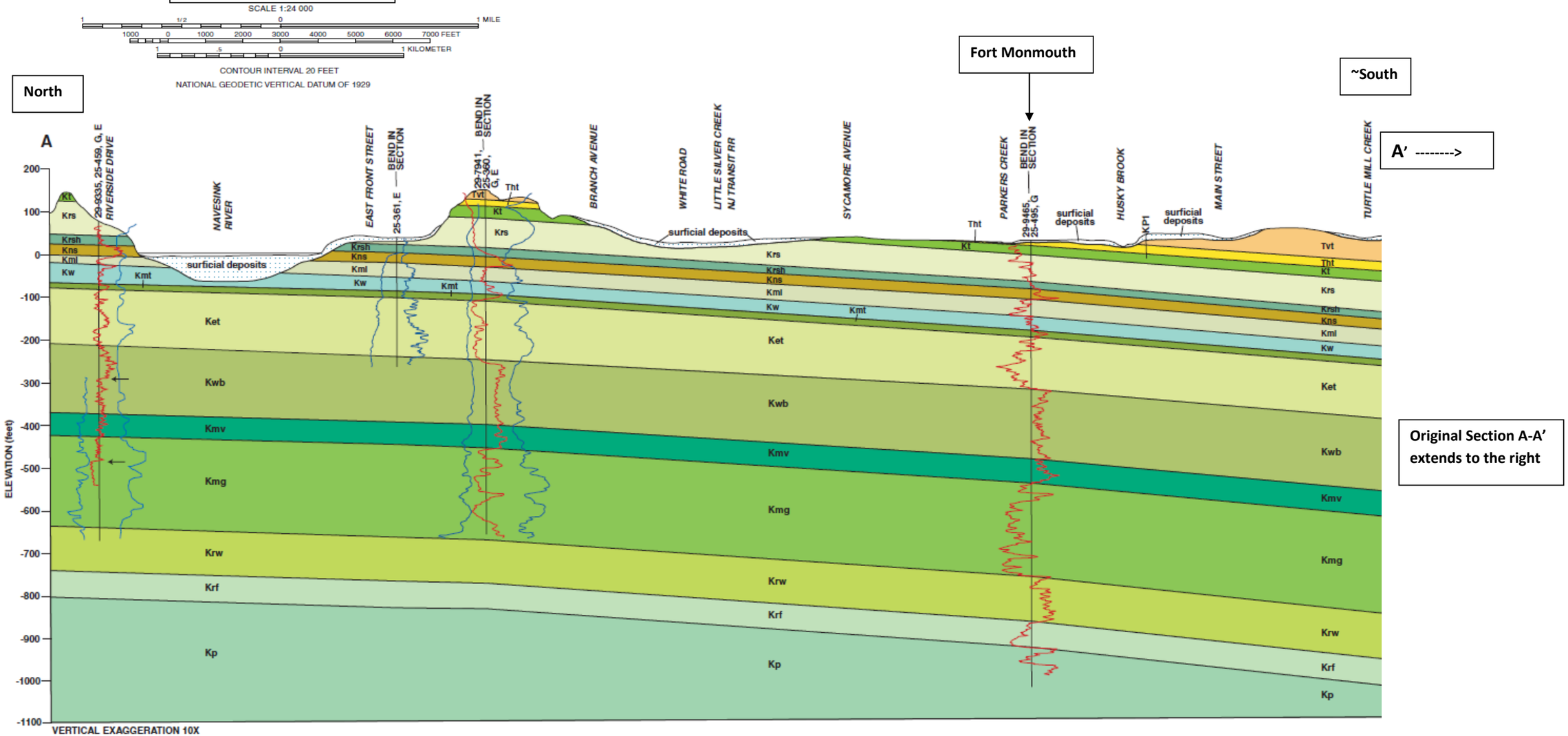
Regional Geologic Cross-Section
Site 1122 – Main Post
Fort Monmouth, New Jersey

Versar INC.
2558 Pearl Buck Road, Suite 1
Bristol, PA 19007
(215) 788-7844

BEDROCK GEOLOGY OF THE LONG BRANCH QUADRANGLE MONMOUTH COUNTY, NEW JERSEY

by
Scott D. Stanford and Peter J. Sugarman
2010

Excerpt of Cross-Section A-A'



Original Section A-A' extends to the right

Description of Geologic Units Shown on Cross-Section A-A'

Tvt VINCENTOWN FORMATION—Glauconitic (5-20%) silty medium-to-coarse quartz sand, some fine-to-medium sand, some very coarse sand to very fine pebbles; yellow, reddish-yellow, olive-yellow, olive-brown; unstratified to weakly horizontally stratified. Coarse sands are locally iron-cemented into beds and masses as much as 10 feet thick. Lowermost 10-20 feet of the formation is silty fine-to-medium sand, with more glauconite than upsection. Total thickness of formation is 180 feet. Late Paleocene in age, based on foraminifera (Olsson and Wise, 1987; Miller and others, 2006) and calcareous nannofossils (Sugarman and others, 1991). Unconformably overlies the Hornerstown Formation.

Tht HORNERSTOWN FORMATION—Glauconite (>50%) clay and silty clay; olive, dark green, black where unweathered, olive-brown with brown to reddish-brown mottles where weathered; unstratified. Glauconite occurs primarily in soft grains of fine-to-medium sand size. Thickness is 25 to 30 feet. Early Paleocene in age, based on foraminifera (Olsson and others, 1997; Landman and others, 2004; Miller and others, 2006) and calcareous nannofossils (Sugarman and others, 1991; Miller and others, 2006). Unconformably overlies the Tinton Formation.

Kt TINTON FORMATION—Glauconitic (5-30%) silty medium-to-coarse and fine-to-medium quartz sand; reddish-brown, reddish-yellow, yellowish-brown where weathered, grayish-brown, brown, olive-brown where unweathered; unstratified to weakly horizontally stratified. Commonly iron-cemented into beds and masses as much as 15 feet thick. Uppermost 4-6 feet, just below contact with Hornerstown Formation, is a brown to olive-gray glauconitic clayey-silty fine sand to fine-sandy silt-clay ("New Egypt Formation" of Landman and others, 2004). Total thickness of Tinton is 30 to 40 feet. Late Cretaceous (late Maestrichtian) in age based on foraminifera, nannofossils, and ammonites (Landman and others, 2004) and strontium-isotope ratios (Sugarman and others, 1995). Overlies the Shrewsbury Member of the Red Bank Formation. Contact with Shrewsbury is not exposed in the Long Branch quadrangle. It is gradational over several feet in the Sandy Hook quadrangle, north of the Long Branch quadrangle (Minard, 1969), but may be unconformable in the Marlboro quadrangle, west of the Long Branch quadrangle (Sugarman and Owens, 1996).

Krs RED BANK FORMATION, SHREWSBURY MEMBER—Fine-to-medium quartz sand, minor medium-to-coarse sand, slightly silty, glauconitic (<5%), and micaceous; reddish-yellow, yellow where weathered, light gray and gray where unweathered; unstratified to weakly horizontally bedded; locally iron-cemented. As much as 100 feet thick. Late Cretaceous (late Maestrichtian) in age based on fossils in the underlying Sandy Hook Member; the Shrewsbury Member is unfossiliferous. Grades downward within 2-3 feet to the Red Bank Formation, Sandy Hook Member. On geophysical well logs, transition to Sandy Hook Member is marked by increased gamma-ray intensity and decreased resistance.

Krsh RED BANK FORMATION, SANDY HOOK MEMBER—Fine-sandy clayey silt, micaceous, slightly glauconitic (<5%); brown to yellowish-brown where weathered, dark gray, olive-gray where unweathered; unstratified. Calcareous brachiopod, pelecypod, and gastropod fossils are common. As much as 20 feet thick. Late Cretaceous (late Maestrichtian) in age based on calcareous nannofossils (Sugarman and Owens, 1996), foraminifera (Olsson, 1964; Olsson and Wise, 1987; Owens and others, 1977), and strontium-isotope ratios (Sugarman and others, 1995). Grades downward within 2-3 feet into the Navesink Formation. On geophysical well logs, transition to Navesink is marked by increased gamma-ray intensity and slightly decreased resistance.

Kns NAVESINK FORMATION—Glauconitic (20-50%) clayey-silty fine-to-medium quartz sand to fine-sandy clayey silt; dark gray, gray, grayish-brown, olive-gray where unweathered, brown to yellowish-brown where weathered; unstratified. Glauconite occurs chiefly in soft grains of fine-to-medium sand size. Calcareous brachiopod, pelecypod, and gastropod fossils are common. Late Cretaceous (late Maestrichtian) in age based on calcareous nannofossils and foraminifera (Olsson, 1964; Miller and others, 2006), macrofossils (Sohl, 1977), and strontium-isotope ratios (Sugarman and others, 1995). Unconformably overlies the Mount Laurel Formation. Contact with Mount Laurel is commonly marked by a sharp peak in gamma-ray intensity on geophysical well logs, with reduced intensity in the Mount Laurel.

Description of Geologic Units Shown on Cross-Section A-A' (cont.)

Kml MOUNT LAUREL FORMATION—Glauconitic (3-15%) fine-to-medium quartz sand, minor medium-to-coarse sand, with thin interbeds of clay and silt; yellowish-brown where weathered, olive-gray to olive-brown where unweathered. Sand is unstratified to horizontally bedded to cross-bedded. As much as 50 feet thick in the southern part of the quadrangle; thins to 20 feet to the north. In subsurface only, covered by surficial deposits in the Navesink River estuary and by overlying Coastal Plain formations elsewhere. Late Cretaceous (late Campanian) in age, based on calcareous nannofossils and strontium-isotope ratios (Sugarman and others, 1991; Miller and others, 2006). Grades downward into the Wenonah Formation. On geophysical well logs, transition to Wenonah is generally marked by slightly decreased resistance and increased gamma-ray intensity.

Kw WENONAH FORMATION—Silty fine-to-very-fine quartz sand to fine-sandy clayey silt, micaceous, slightly glauconitic (<5%); yellow, very pale brown where weathered, gray to pale-olive where unweathered; unstratified. As much as 40 feet thick. In subsurface only, covered by surficial deposits in the Navesink River estuary and by overlying Coastal Plain formations elsewhere. Late Cretaceous (late Campanian) in age based on pollen (Wolfe, 1976) and ammonites (Kennedy and Cobban, 1994). Grades downward into the Marshalltown Formation. On geophysical well logs, transition to Marshalltown is marked by increased gamma-ray intensity.

Kmt MARSHALLTOWN FORMATION—Glauconitic (20-50%), slightly micaceous, silty-clayey fine-to-medium quartz sand, to fine-sandy clayey silt; olive-gray to olive-brown; unstratified. Thickness is 15 to 20 feet. In subsurface only. Late Cretaceous (middle Campanian) in age based on calcareous nannofossils, foraminifera, mollusks, and strontium-isotope ratios (Sugarman and others, 1995). Unconformably overlies the Englishtown Formation. On geophysical well logs, contact with Englishtown is marked by decreased gamma-ray intensity and slightly increased resistance.

Ket ENGLISHTOWN FORMATION—Fine-to-medium quartz sand, minor medium-to-coarse sand, with thin interbeds of clay and silt; micaceous and lignitic, with a trace (<1%) of glauconite; white and light gray where weathered, dark gray where unweathered. Sand is unstratified to horizontally bedded to cross-bedded. In subsurface only. As much as 140 feet thick in the eastern part of the quadrangle, thins to 110 feet thick in the west. In the Asbury Park quadrangle to the south of the Long Branch quadrangle, and farther southwest in northern Ocean County, the Englishtown is divided into an upper and lower member based on the presence of a clay-silt facies in the middle of the formation that is distinctive on gamma-ray logs (Nichols, 1977; Sugarman and Owens, 1994; Miller and others, 2006). This facies is not well marked on gamma-ray logs in the Long Branch quadrangle (wells 29-9335, 29-7941, 29-9465, 29-6173, 29-23948, and 29-48307) and so the members are not mapped here. Late Cretaceous (middle to late Campanian) in age, based on pollen (Wolfe, 1976), ostracodes (Gohn, 1992), calcareous nannofossils, and strontium-isotope ratios (Miller and others, 2006). Grades downward into the Woodbury Formation. On geophysical well logs, transition to Woodbury is marked by increased gamma-ray intensity and decreased resistance.

Kwb WOODBURY FORMATION—Clay, silty clay, with minor thin beds of very fine quartz sand, slightly micaceous and lignitic; dark gray and black where unweathered, yellowish-brown to brown where weathered; unstratified. In subsurface only. As much as 240 feet thick in the eastern part of the quadrangle, thins to 160 feet thick in the central and western parts of the quadrangle. Late Cretaceous (early to middle Campanian) based on pollen (Wolfe, 1976), ostracodes (Gohn, 1992), and calcareous nannofossils (Miller and others, 2006). Grades downward into the Merchantville Formation. On geophysical well logs, transition to the Merchantville is marked by slightly increased gamma-ray intensity.

Description of Geologic Units Shown on Cross-Section A-A' (cont.)

Kmv MERCHANTVILLE FORMATION—Glauconitic (20-50%) clayey silt to sandy clayey silt, slightly micaceous; olive, dark gray, black where unweathered, olive-brown to yellowish-brown where weathered; unstratified. Thickness is 40 to 60 feet. In subsurface only. Late Cretaceous (early Campanian to Santonian) in age based on ammonites (Owens and others, 1977) and calcareous nannofossils (Miller and others, 2006). The Cheesequake Formation, a glauconitic clayey silt underlying the Merchantville, is mapped in outcrop in northern Monmouth and eastern Middlesex counties (Sugarman and Owens, 1996; Sugarman and others, 2005; Stanford and Sugarman, 2008) and in the subsurface both west and south of the Long Branch quadrangle (Sugarman and Owens, 1994, 1996). Because it is lithically similar to the Merchantville and cannot be easily distinguished from it on geophysical logs, it is not mapped separately here. If present, it is included here within the Merchantville, or uppermost Magothy Formation.

Kmg MAGOTHY FORMATION—Fine-to-medium quartz sand, some very-fine-to-fine sand and minor medium-to-coarse sand, micaceous, lignitic, and pyrite-bearing in places, with thin interbeds of silt and clay; white to yellow where weathered, light gray to gray where unweathered. Sand is cross-bedded to laminated. As much as 220 feet thick. In subsurface only. Late Cretaceous (Turonian-Santonian) in age, based on pollen (Christopher, 1979, 1982; Miller and others, 2006). Unconformably overlies the Raritan Formation, Woodbridge Clay member. On geophysical well logs, contact with the Woodbridge is marked by increased gamma-ray intensity.

In its outcrop area in eastern Middlesex County the Magothy is divided into 5 members. From bottom to top they include: South Amboy Fire Clay, Old Bridge Sand, Amboy Stoneware Clay, Morgan beds, and Cliffwood beds (Sugarman and others, 2005). The Old Bridge is a thick sand, the other members are interbedded clay-silt and fine sand. These members may extend downdip in the subsurface (Miller and others, 2006). Geophysical well logs in the Long Branch quadrangle (wells 29-21612, 29-23948, 29-21510, 29-9335, 29-7941, 29-9465, and 29-6173) show generally higher gamma-ray intensity and lower resistivity in the uppermost 50 feet of the formation, and again in the lowermost 30-40 feet, than in the middle 100-120 feet. The upper fine-grained beds may correspond to the Amboy Stoneware Clay and Morgan and Cliffwood beds, and the lower fine-grained beds may correspond to the South Amboy Fire Clay. The middle sand may correspond to the Old Bridge Sand.

Krw RARITAN FORMATION, WOODBRIDGE CLAY MEMBER—Clay and silt, micaceous, lignitic, and pyrite-bearing; gray and black where unweathered, white to brown where weathered; with minor thin interbeds and laminas of white, yellow, and light gray very-fine-to-fine quartz sand. As much as 110 feet thick. In subsurface only, penetrated by wells 29-9465 and 29-1921. The driller's log for well 29-2366 in Eatontown reports "weathered bedrock", with no further information, beneath the Magothy Formation, at a depth of 875-891 feet. This depth is anomalously shallow for the basement surface, suggesting that the material may be weathered clay of either the Woodbridge or South Amboy Fire Clay member of the Magothy. The Woodbridge is Late Cretaceous (late Cenomanian) in age based on pollen (Christopher, 1979) and ammonites (Cobban and Kennedy, 1990). Grades downward into the Raritan Formation, Farrington Sand member. Transition to the Farrington is marked by decreased gamma-ray intensity on geophysical well logs.

Krf RARITAN FORMATION, FARRINGTON SAND MEMBER—Fine-to-coarse quartz sand, some coarse-to-very-coarse sand, minor beds of clay and silt; white and yellow where weathered, gray where unweathered. Sands are horizontally bedded to cross-bedded. As much as 60 feet thick. In subsurface only, penetrated in well 29-9465. Late Cretaceous (Cenomanian) in age based on pollen (Christopher, 1979). Unconformably overlies the Potomac Formation. Contact with Potomac is marked by increased gamma-ray intensity on geophysical well logs.

Description of Geologic Units Shown on Cross-Section A-A' (cont.)

Kp POTOMAC FORMATION—Fine-to-medium quartz sand, some coarse-to-very-coarse sand, with beds of clay and silt; white, red, yellow where weathered, gray where unweathered. Sands are horizontally bedded to cross-bedded, clays are in beds as much as 8 feet thick. More than 90 feet thick, full thickness not penetrated in the Long Branch quadrangle. In subsurface only, partially penetrated in well 29-9465. Late Cretaceous (Albian-Cenomanian) based on pollen (Sugarman and Owens, 1996; Miller and others, 2006), which indicates that the Potomac in this area corresponds to the Potomac Formation, unit 3, of Doyle and Robbins (1977).

APPENDIX B
RI 2015 DATA

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:**
PROJECT NAME: FTMM-RI	**DRILLER:** Joe Barnak (ECDI)	FTMM-53-SB1
PROJECT LOCATION: FTMM-53	**WEATHER:**	**LOCATION DESCRIPTION:**
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	~8 FT East of Gas Pump 1/2
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**
	DATE/TIME START: 9/21/2015; 11:55	Oceanport, New Jersey
WATER LEVEL: ~5.5 ft bgs	**DATE/TIME FINISH:** 9/21/2015; 12:45	
DATE: 09/21/2015	**WEIGHT OF HAMMER:** Not Applicable	
TIME: 12:30	**DROP OF HAMMER:** Not Applicable	
MEASURED FROM: Visual observations	**TYPE OF HAMMER:** Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			0.5	0.0-0.3': Dry concrete	N/A	
	0.5-1.0' @ 12:25		0.0	0.3-1.0': Moist, dense d.gray/black fine SAND, trace M/F gravel. Slight petroleum-like odor.	SW	(0.3-1.0') Slight petroleum-like odor.
1		5.0'/2.5'	0.0			
			0.0	1.0-2.5': Moist, loose orange/tan med. SAND.	SP	
2			0.0			
			-			
3			-			
		NR	-	2.5-5.0': No Recovery.		
4			-			
			-			
5			0.0	5.0-5.5': Moist, loose orange/tan med. SAND.	SP	
			0.0	5.5-6.4': Wet, gray/brown M/F to M/C SAND, slight petroleum-like odor.	SW	(5.5-6.4') Slight petroleum-like odor.
6			2.5			
	6.5-7.0' @ 12:35	5.0'/3.5'	27.2*	6.4-7.5': Wet, m.dense gray/d. gray M/F silty-sand. Strong petroleum-like odor.	SM	(6.4-7.5') Strong petroleum-like odor.
7			1.3			
			6.8	7.5-8.5': Wet, loose brown/gray M/F silty-sand. Strong petroleum-like odor.	SM	(7.5-8.5') strong petroleum-like odor.
8			0.6			
			-			
9		NR	-	8.5-10': No Recovery.		
			-			

Notes:
NR=No Recovery; M/F=Medium to Fine; M/C=Medium to Coarse; d.=dark; v.=very; m.=moderately; *PID(in-bag):525 ppm.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

PARSONS

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:**
PROJECT NAME: FTMM-RI	**DRILLER:** Joe Barnak (ECDI)	FTMM-53-SB1
PROJECT LOCATION: FTMM-53	**WEATHER:**	**LOCATION DESCRIPTION:**
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	~8 FT East of Gas Pump 1/2
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**
WATER LEVEL: ~5.5 ft bgs	**DATE/TIME START:** 9/21/2015; 11:55	Oceanport, New Jersey
DATE: 09/21/2015	**DATE/TIME FINISH:** 9/21/2015; 12:45	
TIME: 12:30	**WEIGHT OF HAMMER:** Not Applicable	
MEASURED FROM: Visual observations	**DROP OF HAMMER:** Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10		5.0'/4.0'	0.0	10.0-11.5': Wet, m.dense mottled (gray/orange/brown) M/F SAND, trace silt.	SW	
			0.0			
11			0.0			
			0.0	11.5-12.5': Wet, loose mottled (gray/brown) M/F to fine SAND, little silt.	SW	
12			0.0			
			0.0	12.5-14.0': Wet, dense mottled (gray/orange/brown) M/F SAND, trace silt.	SW	
13			0.0			
	13.5-14.0' @ 12:25		0.0			
14		NR	0.0	14.0-15.0: No Recovery.		
			0.0			
15				End of Boring 15.0' bgs		
16						
17						
18						
19						

Notes:
NR=No Recovery; M/F=Medium to Fine; M/C=Medium to Coarse; d.=dark; v.=very; m.=moderately.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
	Page 2 of 2	trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:**	
PROJECT NAME: FTMM-RI	**DRILLER:** Joe Barnak (ECDI)	FTMM-53-SB2	
PROJECT LOCATION: FTMM-53	**WEATHER:** Cloudy, 60s	**LOCATION DESCRIPTION:**	
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)		
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**	
	DATE/TIME START: 9/21/2015; 13:50	Oceanport, New Jersey	
WATER LEVEL: ~6.0 ft bgs	**DATE/TIME FINISH:** 9/21/2015; 14:45		
DATE: 09/21/2015	**WEIGHT OF HAMMER:** Not Applicable		
TIME: 14:00	**DROP OF HAMMER:** Not Applicable		
MEASURED FROM: Visual observations	**TYPE OF HAMMER:** Not Applicable		

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			0.0	0.0-0.4': Dry, concrete.		
	0.5-1.0' @ 14:28		0.0	0.4-1.0': Dry/moist, dense gray/brown M/F SAND and d.gray/black M/F SAND.	SW	
1			0.0	1.0-1.8': Moist, m.dense mottled (orange/brown/gray) M/F to fine SAND.	SW	
		5.0'/3.4'	0.0			
				1.8-2.5': Moist, loose orange/tan med. SAND.	SP	
2			0.0			
				2.5-2.7': Moist, m.dense tan fine SAND.	SP	
			0.0	2.7-3.4': Moist, m.dense/loose orange/tan med. SAND.	SP	
3			0.0			
			-	3.4-5.0': No Recovery.		
4		NR	-			
			-			
5			0.0	5.0-5.5': Moist, loose gray med. SAND.	SP	
			0.0	5.5-6.0': Moist, loose d.gray/brown med. SAND.	SP	
6	6.0-6.5' @ 14:31		178*	6.0-6.5': Wet, loose d.gray/d.brown/black M/F to fine SAND, little silt. Strong petroleum-like odor.	SW	(6.0-6.5') Strong petroleum-like odor.
		5.0'/3.3'	23.8			
7			25.9	6.5-7.5': Wet/saturated, gray/d.brown/black M/F to M/C silty-sand. Sheen. Strong Petroleum-like odor.	SM	(6.5-7.5') Sheen. Strong petroleum-like odor.
			5.5	7.5-8.3': Wet, m.dense d.gray/brown M/F SAND, little silt. Medium-Strong petroleum-like odor.	SW	(7.5-8.5') Medium-strong petroleum-like odor.
8			3.0	8.3-10': No Recovery.		
		NR	-			
9		NR	-			
		NR	-			

Notes:
NR=No Recovery; M/F=Medium to Fine; M/C=Medium to Coarse; d.=dark; v.=Very; m.=moderately; *PID(in-bag):264 ppm.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

PARSONS

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:**
PROJECT NAME: FTMM-RI	**DRILLER:** Joe Barnak (ECDI)	FTMM-53-SB2
PROJECT LOCATION: FTMM-53	**WEATHER:** Cloudy, 60s	**LOCATION DESCRIPTION:**
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**
WATER LEVEL: ~6.0 ft bgs	**DATE/TIME START:** 9/21/2015; 13:50	Oceanport, New Jersey
DATE: 09/21/2015	**DATE/TIME FINISH:** 9/21/2015; 14:45	
TIME: 14:00	**WEIGHT OF HAMMER:** Not Applicable	
MEASURED FROM: Visual observations	**DROP OF HAMMER:** Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10		5.0'/3.4'	0.5	10.0-10.5': Wet, m.dense mottled (gray/brown/tan) M/F to med. SAND, trace silt. Mild petroleum-like odor.	SW	(10.0-10.5') Mild petroleum-like odor.
			0.3			
11			0.3	10.5-12.5': Wet, m.dense/loose mottled (tan/orange/gray/brown) M/F to M/C SAND, trace silt.	SW	
			0.2			
12			0.0			
			0.1	12.5-13.4': Wet, dense gray/brown/orange M/F SAND, trace silt	SW	
13	13.0-13.5' @ 1505		0.2			
		NR	-	13.4-15.0': No Recovery		
14			-			
			-			
15		5.0'/3.0'	0.3	15.0-15.8': Wet, m.dense mottled (gray/brown/orange) M/F SAND.	SW	
			0.4			
16			0.3	15.8-17.2': Wet, loose d.gray/d.brown M/C SAND, trace organics (wood fragments).	SW	
			0.2			
17			0.2	17.2-17.5': Wet, m.dense d.brown/d.gray fine SAND, trace silt.	SP	
			0.4	17.5-18.0': Wet, loose d.gray/gray M/C to coarse SAND.	SW	
18		NR		18.0-20.0': No Recovery.		
19						
				End of Boring: 20.0' bgs		

Notes:
NR=No Recovery; M/F=Medium to Fine; M/C=Medium to Coarse; d.=dark; m.=moderately; v.=Very.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:**	
PROJECT NAME: FTMM-RI	**DRILLER:** Joe Barnak (ECDI)	FTMM-53-SB3	
PROJECT LOCATION: FTMM-53	**WEATHER:** Cloudy, Low-60s	**LOCATION DESCRIPTION:**	
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)		
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**	
WATER LEVEL: ~6.2 ft bgs	**DATE/TIME START:** 9/22/2015; 08:02	Oceanport, New Jersey	
DATE: 09/22/2015	**DATE/TIME FINISH:** 9/22/2015; 09:25		
TIME: 08:41	**WEIGHT OF HAMMER:** Not Applicable		
MEASURED FROM: Visual observations	**DROP OF HAMMER:** Not Applicable		
	TYPE OF HAMMER: Not Applicable		

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0		3.0'/2.0'	0.0	0.0-0.4': Dry, concrete.		
				0.4-0.5': Moist, m.dense gray/brown M/F SAND.	SW	
	0.5-1.0' @ 8:40		0.0	0.5-1.0: Moist, dense d.brown/black M/F to fine SAND, trace silt.	SW	
1			0.0	1.0-1.5': Moist, m.dense brown/orange M/F SAND.	SW	
			0.0	1.5-2.0': Moist, m.dense tan/brown M/C SAND.	SW	
2		NR	-	2.0-5.0': No Recovery.		
			-			
3			-			
			-			
4			-			
			-			
5		5.0'/3.4'	0.0	5.0-5.5': Moist, m.dense tan/brown M/C SAND.	SW	
			0.0	5.5-6.2': Moist, m.dense/m.stiff gray/brown M/F silty-sand.	SM	
6	6.5-7.0' @ 08:44		225.0	6.2-7.0': Wet, loose black/gray M/F to fine silty-sand. V.strong Petroleum-like odor.	SM	(6.2-7.0') V.Strong petroleum-like odor.
			717*			
7			97.5	7.0-7.4': Wet, m.dense/loose d.gray/gray M/F SAND, little silt, strong petroleum-like odor.	SW	(7.0-7.4') Strong petroleum-like odor.
			26.8	7.4-8.0': Wet, m.dense gray/ d.gray M/C SAND, trace silt. Mild petroleum-like odor.	SW	(7.4-8.0') Mild petroleum-like odor.
8			9.4	8.0-8.4': Wet, dense d.gray/brown M/F to fine SAND, trace silt. Mild petroleum-like odor.	SW	(8.0-8.4') Mild petroleum-like odor.
		NR	-	8.4-10.0': No Recovery.		
9			-			
			-			

Notes:
NR=No Recovery; M/F=Medium to Fine; M/C=Medium to Coarse; d.=dark; v.=very; m.=moderately; *PID(in-bag):792 ppm.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

PARSONS

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:**
PROJECT NAME: FTMM-RI	**DRILLER:** Joe Barnak (ECDI)	FTMM-53-SB3
PROJECT LOCATION: FTMM-53	**WEATHER:** Cloudy, Low-60s	**LOCATION DESCRIPTION:**
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**
WATER LEVEL: ~6.2 ft bgs	**DATE/TIME START:** 9/22/2015; 08:02	Oceanport, New Jersey
DATE: 09/22/2015	**DATE/TIME FINISH:** 9/22/2015; 09:25	
TIME: 08:41	**WEIGHT OF HAMMER:** Not Applicable	
MEASURED FROM: Visual observations	**DROP OF HAMMER:** Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10		5.0'/3.7'	7.5	10.0-10.8': Wet, m.dense/loose mottled (tan/gray/brown/orange) (w/blue-green hue) M/F SAND, little silt. Slight petroleum-like odor.	SW	(10.0-10.8') Slight petroleum-like odor.
			6.6			
11			2.5	10.8-12.0': Wet, m.dense/loose gray/tan/brown M/F to fine SAND, little silt. V.slight petroluem odor.	SW	(10.8-12.0') V. slight petroleum-like odor.
			1.8			
12			0.0	12.0-12.5': Wet, m.stiff gray/orange clayey-silt, little fine sand.	SM	
	12.5-13.0' @		0.0	12.5-13.7': Wet, m.dense mottled (orange/tan/gray) fine SAND.	SP	
13			0.0			
		NR	-	13.7-15.0: No Recovery.		
14			-			
			-			
15				End of Boring 15.0' bgs		

Notes:
NR=No Recovery; M/F=Medium to Fine; M/C=Medium to Coarse; d.=dark; v.=very; m.=moderately.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:**	
PROJECT NAME: FTMM-RI	**DRILLER:** Joe Barnak (ECDI)	FTMM-53-SB4	
PROJECT LOCATION: FTMM-53	**WEATHER:** Cloudy, mid-60s	**LOCATION DESCRIPTION:**	
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)		
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**	
WATER LEVEL: ~6.4 ft bgs	**DATE/TIME START:** 9/22/2015; 09:56	Oceanport, New Jersey	
DATE: 09/22/2015	**DATE/TIME FINISH:** 9/22/2015; 11:15		
TIME: 10:30	**WEIGHT OF HAMMER:** Not Applicable		
MEASURED FROM: Visual observations	**DROP OF HAMMER:** Not Applicable		
	TYPE OF HAMMER: Not Applicable		

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0		5.0'/3.0'	0.0	0.0-1.4': Dry, concrete.		
			0.1			
1			0.2			
	1.5-2.0' @ 10:35		0.5	1.4-2.0': Moist, m.dense d.brown/d.gray M/F SAND, trace silt.	SW	
2			11.4	2.0-3.0': Moist, dense brown/gray M/F to fine SAND, little silt.	SW	
			4.9			
3		NR	-	3.0-5.0': No Recovery.		
			-			
4			-			
			-			
5		5.0'/3.0'	5.2	5.0-5.8': No Recovery.		
			0.8	5.8-6.4': Moist, v.stiff brown/d.brown silty-clay, mild petroleum odor.	CL	(5.8-6.4') Mild petroleum odor.
6			44.9			
			267.0			
7	7.0-7.5' @ 10:40		935*	6.4-8.0': Wet, gray/d.gray/black M/F SAND, little silt, sheen.	SW	(6.4-8.0') Sheen.
			3.0			
8		NR		8.0-10.0': No Recovery.		
9						

Notes:
NR=No Recovery; M/F=Medium to Fine; M/C=Medium to Coarse; d.=dark; v.=very; m.=moderately; *PID(in-bag):1,011 ppm.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:** FTMM-53-SB4
PROJECT NAME: FTMM-RI	**DRILLER:** Joe Barnak (ECDI)	
PROJECT LOCATION: FTMM-53	**WEATHER:** Cloudy, mid-60s	**LOCATION DESCRIPTION:**
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**
WATER LEVEL: ~6.4 ft bgs	**DATE/TIME START:** 9/22/2015; 09:56	Oceanport, New Jersey
DATE: 09/22/2015	**DATE/TIME FINISH:** 9/22/2015; 11:15	
TIME: 10:30	**WEIGHT OF HAMMER:** Not Applicable	
MEASURED FROM: Visual observations	**DROP OF HAMMER:** Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10			28.4	10.0-10.2': Wet, soft brown/tan silty-clay, mild/med. petroleum-like odor.	CL	(10.0-10.2') Mild/med. petroleum-like odor.
			13.5	10.2-10.9': Wet, m.dense/loose brown/orange/tan M/F to med. SAND, little silt. Mild petroleum-like odor.	SW	(10.2-10.9') Mild petroleum-like odor.
11		5.0'/3.0'	2.2	10.9-11.5': Wet, m.dense gray/tan (with blue/green hue) M/F to M/C SAND, trace silt. Trace odor.	SW	(10.9-11.5') Trace odor.
			1.4	11.5-13.0': Wet, m.dense mottled (orange/gray/brown/tan) M/F to M/C SAND, trace silt.	SW	
12			0.7			
			0.1			
13		NR	-	13.0-15.0: No Recovery.		
			-			
14			-			
			-			
15	15.0-15.5' @ 11:25	5.0'/4.2'	0.0	15.0-17.3': Wet, m.dense/loose mottled (tan/gray/brown/orange) M/F to med. SAND, little silt.	SW	
			0.1			
16			0.1			
			0.1			
17			0.1	17.3-18.5': Wet, m.dense d.gray/d. brown/black (with blue-green hue) M/F SAND, trace silt.	SW	
			0.3			
18			0.2			
			0.5	18.5-19.2': Wet, dense d.gray/brown fine silty-sand.	SM	
19		NR	0.4	19.2-20': No Recovery.		
			-	End of Boring: 20.0' bgs		

Notes:
NR=No Recovery; M/F=Medium to Fine; M/C=Medium to Coarse; d.=dark; v.=very; m.=moderately.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
	Page 2 of 2	trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:** FTMM-53-SB5
PROJECT NAME: FTMM-RI	**DRILLER:** Joe Barnak (ECDI)	
PROJECT LOCATION: FTMM-53	**WEATHER:** Cloudy, Mid-60s	**LOCATION DESCRIPTION:**
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**
WATER LEVEL: ~6.3 ft bgs	**DATE/TIME START:** 9/22/2015; 12:45	Oceanport, New Jersey
DATE: 09/22/2015	**DATE/TIME FINISH:** 9/22/2015; 14:00	
TIME: 13:28	**WEIGHT OF HAMMER:** Not Applicable	
MEASURED FROM: Visual observations	**DROP OF HAMMER:** Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0		5.0'/3.0'	0.2	0.0-0.3': Dry, asphalt.		
				0.3-0.9': Moist, dense d.brown/gray brown fine to M/F SAND, little silt.	SW	
	0.4-0.9' @ 13:25		0.1	0.9-1.5': Moist, dense mottled (brown/gray/orange/d.brown) fine SAND, trace silt.	SP	
1			0.3			
			0.5	1.5-2.5': Moist, dense mottled (tan/orange/gray) M/F SAND, little silt.	SW	
2			0.9			
			0.3	2.5-3.0': Moist, m.dense gray/tan M/F to med. SAND, trace silt.	SW	
3		NR	-	3.0-5.0': No Recovery.		
			-			
4			-			
			-			
5		5.0'/3.0'	0.2	5.0-6.3': Moist, m.dense mottled (brown/orange/tan/gray), silty-clay, strong petroleum odor.	CL	(5.0-6.3') Strong petroleum odor
			2.0			
6			35.8	6.3-7.5': Wet, m.stiff brown/gray fine to M/F sand, some silty-clay, strong petroleum-like odor.	SW	(6.3-7.5') Strong petroleum-like odor
	6.5-7.0' @ 13:30		139*			
7			1.8			
			0.6	7.5-8.0': Wet, loose/m. dense gray brown fine SAND, little silty-clay, med. Petroleum-like odor.	SW	(7.5-8.0') Med. petroleum-like odor
8		NR	-	8.0-10.0': No Recovery.		
			-			
9			-			
			-			

Notes:
NR=No Recovery; M/F=Medium to Fine; M/C=Medium to Coarse; d.=dark; v.=very; m.=moderately; *PID(in-bag):29.0 ppm.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

PARSONS

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:**
PROJECT NAME: FTMM-RI	**DRILLER:** Joe Barnak (ECDI)	FTMM-53-SB5
PROJECT LOCATION: FTMM-53	**WEATHER:** Cloudy, Mid-60s	**LOCATION DESCRIPTION:**
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**
WATER LEVEL: ~6.3 ft bgs	**DATE/TIME START:** 9/22/2015; 12:45	Oceanport, New Jersey
DATE: 09/22/2015	**DATE/TIME FINISH:** 9/22/2015; 14:00	
TIME: 13:28	**WEIGHT OF HAMMER:** Not Applicable	
MEASURED FROM: Visual observations	**DROP OF HAMMER:** Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10		5.0'/4.0'	0.0	10.0-10.5': Wet, loose gray/brown M/F SAND, trace silt.	SW	
			0.0	10.5-11.5': Wet, loose gray/black (with blue-green hue) M/F SAND, trace silt.	SW	
11			0.0			
			0.0	11.5-13.0': Wet, loose mottled (d.gray/orange/tan/brown) M/F to med. SAND, trace silt.	SW	
12			0.0			
			0.0			
13			0.0			
	13.5-14.0' @ 14:10		0.0			
14		NR	-	13.0-15.0': No Recovery.		
			-			
15						
16				End of Boring 15.0' bgs		
17						
18						
19						

Notes:
NR=No Recovery; M/F=Medium to Fine; M/C=Medium to Coarse; d.=dark; v.=very; m.=moderately.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
	Page 2 of 2	trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:**
PROJECT NAME: FTMM-RI	**DRILLER:** Joe Barnak (ECDI)	FTMM-53-SB6
PROJECT LOCATION: FTMM-53	**WEATHER:** Cloudy, High-60s	**LOCATION DESCRIPTION:**
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**
	DATE/TIME START: 9/22/2015; 14:18	Oceanport, New Jersey
WATER LEVEL: ~6.5 ft bgs	**DATE/TIME FINISH:** 9/22/2015; 15:10	
DATE: 09/22/2015	**WEIGHT OF HAMMER:** Not Applicable	
TIME: 14:50	**DROP OF HAMMER:** Not Applicable	
MEASURED FROM: Visual observations	**TYPE OF HAMMER:** Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0		5.0'/2.4'	0.2	0.0-0.7': Dry, asphalt.		
	0.7-1.2' @ 14:55		0.1	0.7-1.0': Moist, dense d.gray/brown M/F to fine SAND, little silt.	SW	
1			0.2	1.0-2.4': Moist, dense brown/tan M/F to med. SAND, little silt.	SW	
			0.1			
2			0.2			
		NR	-	2.4-5.0': No Recovery.		
3			-			
			-			
4			-			
			-			
5		5.0'/3.8'	0.6	5.0-6.5': Moist, m.dense/dense mottled (tan/orange/brown/gray) M/F SAND, little silt, trace clay. Mild petroleum-like odor.	SW	(5.0-6.5') Mild petroleum-like odor.
			14.6			
6			5.5			
	6.5-7.0' @ 15:00		106*	6.5-7.5': Wet, loose gray/d.gray M/C SAND, little silt, v.strong petroleum-like odor.	SW	(6.5-7.5') Very strong petroleum-like odor.
7			4.6			
			14.1	7.5-8.8': Wet, m.dense mottled (d.gray/brown/gray/tan) M/F SAND, little silt, med. petroleum-like odor.	SW	(7.5-8.8') Med. petroleum-like odor.
8			2.1			
			1.9			
9		NR	-	8.8-10.0': No Recovery.		
			-			

Notes:
NR=No Recovery; M/F=Medium to Fine; M/C=Medium to Coarse; d.=dark; v.=very; m.=moderately; *PID(in-bag):426 ppm.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
	Page 1 of 2	trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:** FTMM-53-SB6
PROJECT NAME: FTMM-RI	**DRILLER:** Joe Barnak (ECDI)	
PROJECT LOCATION: FTMM-53	**WEATHER:** Cloudy, High-60s	**LOCATION DESCRIPTION:**
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**
WATER LEVEL: ~6.5 ft bgs	**DATE/TIME START:** 9/22/2015; 14:18	Oceanport, New Jersey
DATE: 09/22/2015	**DATE/TIME FINISH:** 9/22/2015; 15:10	
TIME: 14:50	**WEIGHT OF HAMMER:** Not Applicable	
MEASURED FROM: Visual observations	**DROP OF HAMMER:** Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10		5.0'/4.0'	0.3	10.0-10.8': Wet, loose d.gray/tan/orange M/F to M/C SAND, trace silt, mild petroleum-like odor.	SW	(10.0-10.8') Mild petroleum-like odor.
			1.2			
11			0.2	10.8-12.0': Wet, loose/m.dense orange/brown M/F SAND.	SW	
			0.1			
12			0.2	12.0-14.0': Wet, m.dense d.gray/brown/tam M/F to M/C SAND.	SW	
			0.1			
13			0.2			
	13.5-14.0' @ 15:20		0.3			
14		NR	-	14.0-15.0': No Recovery.		
			-			
15				End of Boring: 15.0' bgs		

Notes:
NR=No Recovery; M/F=Medium to Fine; M/C=Medium to Coarse; d.=dark; v.=very; m.=moderately.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:**
PROJECT NAME: FTMM-RI	**DRILLER:** Joe Barnak (ECDI)	FTMM-53-SB7
PROJECT LOCATION: FTMM-53	**WEATHER:**	**LOCATION DESCRIPTION:**
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT with 2" liners	**LOCATION PLAN**
	DATE/TIME START: 9/23/2015; 11:25	Oceanport, New Jersey
WATER LEVEL: ~7.0 ft bgs	**DATE/TIME FINISH:** 9/23/2015; 13:00	
DATE: 09/23/2015	**WEIGHT OF HAMMER:** Not Applicable	
TIME: 11:55	**DROP OF HAMMER:** Not Applicable	
MEASURED FROM: Visual observations	**TYPE OF HAMMER:** Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			0.0	0.0-0.3': Dry, asphalt.		
				0.3-0.5': Dry, m.dense brown M/F to med. SAND, little/trace M/F subround gravel.	SW	
	0.3-0.8' @ 11:50		0.0	0.5-3.0': Moist, dense gray/d.gray (little brown) M/F SAND, little subround gravel, trace clay, trace silt, trace organics (wood fragments) [@2.5' bgs].	SW	
1		5.0'/3.0'	0.0			
			0.0			
2			0.9			
			0.9			
3				3.0-5.0': No Recovery.		
		NR				
4						
				5.0-10.0': No Recovery. Off-set and drill to 7.0-12.0'.		
7	7.0-7.5' @ 12:35		296*	7.0-8.0': Wet, d.gray/d.brown loose M/F to med. SAND, little silt, trace clay, v.strong petroleum-like odor.	SW	(7.0-8.0') very strong petroleum-like odor.
			3.1			
8		5.0'/2.5'	1.2	8.0-9.0': Wet, d.brown/d.gray soft silty-clay, trace v.fine sand.	CL	
			1.1			
9			11.7	9.0-9.5': Wet, loose d.gray/d.brown M/F SAND, little silt.	SW	
			-	9.5-12.0': No Recovery.		
10			-			
		NR	-			
11			-			
			-			

Notes:
NR=No Recovery; M/F=Medium to Fine; M/C=Medium to Coarse; d.=dark; v.=very; m.=moderately; *PID(in-bag):78.5 ppm.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:** FTMM-53-SB7
PROJECT NAME: FTMM-RI	**DRILLER:** Joe Barnak (ECDI)	**LOCATION DESCRIPTION:**
PROJECT LOCATION: FTMM-53	**WEATHER:**	
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT with 2" liners	**LOCATION PLAN**
WATER LEVEL: ~7.0 ft bgs	**DATE/TIME START:** 9/23/2015; 11:25	Oceanport, New Jersey
DATE: 09/23/2015	**DATE/TIME FINISH:** 9/23/2015; 13:00	
TIME: 11:55	**WEIGHT OF HAMMER:** Not Applicable	
MEASURED FROM: Visual observations	**DROP OF HAMMER:** Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
12			0.6	12.0-12.5': No Recovery.		
		5.0'/3.5'	1.6	12.5-12.8': Wet, m.dense/loose blue/gray fine SAND, little silt, med. petroleum-like odor.	SW	(12.5-12.8') Med. petroleum-like odor.
13			3.2	12.8-14.0': Wet, m.dense/loose mottled (gray/tan/orange) M/F SAND, little silt, trace clay. Slight petroleum-like odor.	SW	(12.8-14.0') Slight petroleum-like odor.
			0.6			
14			1.0	14.0-15.0': Wet, dense d.brown/d.gray fine SAND, little silt.	SW	
			0.6			
15			0.1	15.0-15.5': Wet, m.dense d.gray/blue-gray M/F SAND, trace silt.	SW	
		NR	-	15.5-17.0': No Recovery		
16			-			
			-			
17		3.0'/2.0'	4.5	17.0-18.0': Wet, loose d.gray/blue-green med. to M/C SAND, little silt, trace petroleum-like odor.	SW	(17.0-18.0') Trace petroleum-like odor.
			1.8			
18			0.5	18.0-18.5': Wet, loose gray/d.gray M/C SAND, trace silt.	SW	
	18.5-19.0' @ 13:10		0.2	18.5-19.0': Wet, dense gray/d.brown (with blue-green hue), fine silty sand. No odor.	SM	
19			-	19.0-20.0': Wet, dense gray/d. brown (with blue-green hue), fine silty sand. No odor.	SM	
		NR	-			
20			-			
				End of Boring: 20' bgs		

Notes:
NR=No Recovery; M/F=Medium to Fine; M/C=Medium to Coarse; d.=dark; v.=very; m.=moderately. Push#3: 12.0-17.0' bgs Push#4: 17.0-20.0' bgs

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
	Page 2 of 2	trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:**
PROJECT NAME: FTMM-RI	**DRILLER:** Kenny Atwood (ECDI)	FTMM-53-SB8
PROJECT LOCATION: FTMM-53	**WEATHER:** Cloudy, mid-60s	**LOCATION DESCRIPTION:**
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**
	DATE/TIME START: 9/25/2015; 08:02	Oceanport, New Jersey
WATER LEVEL: ~7.0 ft bgs	**DATE/TIME FINISH:** 9/25/2015;	
DATE: 09/25/2015	**WEIGHT OF HAMMER:** Not Applicable	
TIME: 08:45	**DROP OF HAMMER:** Not Applicable	
MEASURED FROM: Visual observations	**TYPE OF HAMMER:** Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0		5.0'/4.0'	0.0	0.0-0.5': Dry, loose gray/brown fine SAND, some organics (grass+roots).	SP	
	0.5-1.0' @ 8:30		0.0	0.5-1.5': Dry, m.dense d.brown M/F SAND, little M/F subangular gravel.	SW	
1			0.0			
			0.0	1.5-2.5': Dry, m.dense orange/tan med. SAND and med. subround gravel.	SW	
2			0.0			
			0.0	2.5-3.0': Moist, m.dense tan M/F to med. SAND.	SW	
3			0.0	3.0-3.5': Moist, d.brown/gray M/F silty-sand, little clay.	SM	
			0.0	3.5-4.0': Moist, tan/gray M/F to fine SAND.	SW	
4		NR	-	4.0-5.0': No Recovery.		
			-			
5		5.0'/4.0'	0.0	5.0-7.0': Moist, m.dense/loose mottled (tan/orange/brown) M/F SAND, little silty-clay.	SW	
			0.0			
6			0.0			
	6.5-7.0' @ 8:50		0.0			
7			0.0	7.0-7.5': Wet, m.soft gray/brown silty-clay, some fine sand.	SM	
			0.0	7.5-9.0': Wet, dense orange/tan fine SAND, little silt.	SW	
8			0.0			
			0.0			
9		NR	-	9.0-10.0': No Recovery.		
			-			

Notes:
NR=No Recovery; M/F=Medium to Fine; M/C=Medium to Coarse; d.=dark; v.=very; m.=moderately.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:**
PROJECT NAME: FTMM-RI	**DRILLER:** Kenny Atwood (ECDI)	FTMM-53-SB8
PROJECT LOCATION: FTMM-53	**WEATHER:** Cloudy, mid-60s	**LOCATION DESCRIPTION:**
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**
WATER LEVEL: ~7.0 ft bgs	**DATE/TIME START:** 9/25/2015; 08:02	Oceanport, New Jersey
DATE: 09/25/2015	**DATE/TIME FINISH:** 9/25/2015; 08:55	
TIME: 08:45	**WEIGHT OF HAMMER:** Not Applicable	
MEASURED FROM: Visual observations	**DROP OF HAMMER:** Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10		5.0'/5.0'	0.0	10.0-11.0': No Recovery.		
			0.1			
11			0.1	11.0-13.5': Wet, m.dense/loose gray/tan M/F to fine SAND, trace fine subround gravel.	SW	
			0.1			
12			0.1			
			0.1			
13			0.1			
			0.1	13.5-15.0': Wet, loose/soft M/F to fine silty-SAND.	SW	
14			0.1			
	14.5-15.0' @ 9:00		0.1			
15				End of Boring: 15.0' bgs		
16						
17						
18						

Notes:
NR=No Recovery; M/F=Medium to Fine; M/C=Medium to Coarse; d.=dark; v.=very; m.=moderately. Push#3: 12.0-17.0' bgs Push#4: 17.0-20.0' bgs

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:**
PROJECT NAME: FTMM-RI	**DRILLER:** Kenny Atwood (ECDI)	FTMM-53-SB9
PROJECT LOCATION: FTMM-53	**WEATHER:** Mostly Cloudy, Mid-60s	**LOCATION DESCRIPTION:**
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**
	DATE/TIME START: 9/25/2015; 09:20	Oceanport, New Jersey
WATER LEVEL: ~8.5 ft bgs	**DATE/TIME FINISH:** 9/25/2015;	
DATE: 09/25/2015	**WEIGHT OF HAMMER:** Not Applicable	
TIME:	**DROP OF HAMMER:** Not Applicable	
MEASURED FROM: Visual observations	**TYPE OF HAMMER:** Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0		5.0'/3.7'	0.0	0.0-1.0': Dry, loose gray/brown M/F to fine SAND, some organics (grass+roots), trace fine subround gravel.	SW	
			0.0			
1	1.0-1.5' @ 10:10		0.0	1.0-1.5': Dry, m.dense d.brown/black M/F SAND, little subangular gravel.	SW	
			0.0	1.5-2.2': Dry/moist, m.dense orange/tan M/C SAND, some white angular gravel.	SW	
2			0.0	2.2-2.4': Moist, dense d.brown M/F silty-sand, trace fine subround gravel.	SM	
			0.0	2.4-3.7': Moist, dense mottled (brown/orange/tan/gray) M/F to fine SAND.	SW	
3			0.0			
			0.0			
4		NR	-	3.7-5.0': No Recovery		
			-			
5		5.0'/4.0'	0.0	5.0-6.0': Moist, m.dense mottled (orange/tan/gray/brown) M/F SAND.	SW	
			0.0			
6			0.0	6.0-6.1': Lens of M/C white gravel.	GW	
	6.5-7.0' @		0.0	6.1-8.5': Moist/wet, m.dense/m.stiff mottled (orange/gray/brown/tan) M/F silty-sand, little clay.	SM	
7			0.0			
			0.0			
8			0.0			
			0.0	8.5-9.0': Wet, gray/brown M/C SAND.	SW	
9		NR	-	9.0-10.0': No Recovery.		
			-			

Notes:
M/F=Medium to Fine; M/C=Medium to Coarse; m.=medium; d.=dark; v.=very; m.=moderately.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
	Page 1 of 2	trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:**
PROJECT NAME: FTMM-RI	**DRILLER:** Kenny Atwood (ECDI)	FTMM-53-SB9
PROJECT LOCATION: FTMM-53	**WEATHER:** Mostly Cloudy, mid-60s	**LOCATION DESCRIPTION:**
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**
	DATE/TIME START: 9/25/2015; 09:20	Oceanport, New Jersey
WATER LEVEL: ~8.5 ft bgs	**DATE/TIME FINISH:** 9/25/2015;	
DATE: 09/25/2015	**WEIGHT OF HAMMER:** Not Applicable	
TIME:	**DROP OF HAMMER:** Not Applicable	
MEASURED FROM: Visual observations	**TYPE OF HAMMER:** Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10			0.0	10.0-13.0': Wet, loose gray/tan M/C SAND, little silt.	SW	
			0.0			
11			0.0			
			0.0			
12		5.0'/4.5'	0.0			
			0.0			
13			0.0	13.0-13.5': Wet, m.dense/m. stiff gray/tan M/F to fine silty-sand.	SM	
			0.0	13.5-14.0': Wet, m.dense gray/orange/brown med. to M/C SAND, little silt.	SW	
14	14.0-14.5' @		0.0	14.0-14.5': Wet, m.dense/m.still gray/brown fine to M/F silty-sand.	SM	
		NR	-	14.5-15.0': No Recovery.		
15				End of Boring: 15.0' bgs		
16						
17						
18						

Notes:
M/F=Medium to Fine; M/C=Medium to Coarse; m.=medium; d.=dark; v.=very; m.=moderately.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:**	
PROJECT NAME: FTMM-RI	**DRILLER:** Joe Barnak (ECDI)	FTMM-53-SB10	
PROJECT LOCATION: FTMM-53	**WEATHER:** Clear, Mid-70's	**LOCATION DESCRIPTION:**	
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)		
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**	
	DATE/TIME START: 9/24/2015; 09:00	Oceanport, New Jersey	
WATER LEVEL: ~6.2 ft bgs	**DATE/TIME FINISH:** 9/24/2015; 09:55		
DATE: 09/24/2015	**WEIGHT OF HAMMER:** Not Applicable		
TIME: 09:38	**DROP OF HAMMER:** Not Applicable		
MEASURED FROM: Visual observations	**TYPE OF HAMMER:** Not Applicable		

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			3.4	0.0-0.3': Dry, asphalt.		
				0.3-0.7': Dry, m.dense d.brown/black M/F SAND, some M/F ang. gravel.	SW	
	0.3-0.8' @ 0933		0.8			
				0.7-1.0': Moist, m.dense tan/orange M/F SAND, little subround gravel.	SW	
1			0.4			
		5.0'/2.8'	0.0	1.0-2.5': Moist, dense brown/d.brown/gray M/F SAND, trace silt.	SW	
2			0.0			
			0.0	2.5-2.8': Moist, loose tan/orange M/C SAND.	SW	
3			-			
			-			
		NR		2.8-5.0': No Recovery		
4			-			
			-			
5			1.2	5.0-5.5': Moist, m.dense d.brown/gray/brown/orange, M/F to med. SAND, trace silt, mild petroleum-like odor.	SW	(5.0-5.5') Mild-petroleum-like odor.
			9.4	5.5-6.0': Moist, m.dense d.gray/brown/black M/F to fine SAND, little silt. Med. petroleum-like odor.	SW	(5.5-6.0') Med. petroleum-like odor.
6			17.0	6.0-6.2': Moist, m.stiff brown/d.brown silty-clay. Strong petroleum-like odor.	CL	(6.0-6.2') Med. petroleum-like odor.
			848.0			
		5.0'/4.0'				
7			196.0			
			22.1	6.2-9.0': Wet, loose/m.dense gray/tan M/F SAND, some silt, trace gray clay lens [@8.1' bgs]. V.strong petroleum-like odor.	SW	(6.2-9.0') Very strong petroleum-like odor.
8			4.4			
			2.1			
9			-			
		NR		9.0-10.0': No Recovery.		
			-			

Notes:
M/F=Medium to Fine; M/C=Medium to Coarse; m.=moderately; d.=dark; v.=very

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:**
PROJECT NAME: FTMM-RI	**DRILLER:** Joe Barnak (ECDI)	FTMM-53-SB10
PROJECT LOCATION: FTMM-53	**WEATHER:** Clear, Mid-60's	**LOCATION DESCRIPTION:**
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**
	DATE/TIME START: 9/24/2015; 09:00	Oceanport, New Jersey
WATER LEVEL: ~6.2 ft bgs	**DATE/TIME FINISH:** 9/24/2015; 09:55	
DATE: 09/24/2015	**WEIGHT OF HAMMER:** Not Applicable	
TIME: 09:38	**DROP OF HAMMER:** Not Applicable	
MEASURED FROM: Visual observations	**TYPE OF HAMMER:** Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10			3.6	10.0-14.0': Wet, v.loose mottled (gray/brown/tan) med. SAND, little silt. Slight odor (10.0-11.0').	SP	(10.0-11.0') Slight odor.
			0.2			
11			0.7			
			0.1			
12			0.0			
		5.0'/4.8'	0.0			
13			0.0			
			0.0			
14	14.0-14.5' @ 10:00		0.0	14.0-14.8': Wet, loose mottled (gray/brown/tan) med. SAND some silt.	SP	
			0.1	14.8-15.0': No Recovery.		
15				End of Boring:15.0' bgs		
16						
17						
18						

Notes:
NR=No Recovery; M/F=Medium to Fine; M/C=Medium to Coarse; d.=dark; v.=very.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
	Page 2 of 2	trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:**
PROJECT NAME: FTMM-RI	**DRILLER:** Kenny Atwood (ECDI)	FTMM-53-SB11
PROJECT LOCATION: FTMM-53	**WEATHER:** Mostly Cloudy, Mid-70s	**LOCATION DESCRIPTION:**
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**
	DATE/TIME START: 9/25/2015; 13:27	Oceanport, New Jersey
WATER LEVEL: ~6.5 ft bgs	**DATE/TIME FINISH:** 9/25/2015; 14:21	
DATE: 09/25/2015	**WEIGHT OF HAMMER:** Not Applicable	
TIME: 14:08	**DROP OF HAMMER:** Not Applicable	
MEASURED FROM: Visual observations	**TYPE OF HAMMER:** Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0			0.0	0.0-0.5': Dry, asphalt.		
			0.4	0.5-1.0': Dry, dense, d.brown/d.gray/black M/F SAND, some M/F subround gravel.	SW	
1			1.1	1.0-3.5': Dry/moist, dense brown/orange M/F SAND, trace silt.	SW	
		5.0'/3.5'	0.9			
2			0.9			
			0.3			
3	3.0-3.5' @ 14:30		0.3			
			-	3.5-5.0': No Recovery.		
4		NR	-			
			-			
5			0.1	5.0-6.0': Dry/moist, m.dense gray/tan M/F to med. SAND, little silt.	SW	
			0.0			
6	6.0-6.5' @ 14:10		0.1	6.0-6.5': Moist, loose tan M/C SAND.	SW	
			0.1	6.5-9.0': Wet, m.dense orange/tan/gray M/F to med. SAND, little silt.	SW	
		5.0'/4.0'				
7			0.2			
			0.2			
8			0.2			
			0.2			
9			-	9.0-10.0': No Recovery.		
		NR	-			

Notes:
M/F=Medium to Fine; M/C=Medium to Coarse; m.=moderately; d.=dark; v.=very.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Dennis Miller (PARSONS)	**BORING/WELL NO.:**
PROJECT NAME: FTMM-RI	**DRILLER:** Kenny Atwood (ECDI)	FTMM-53-SB11
PROJECT LOCATION: FTMM-53	**WEATHER:** Mostly Cloudy, Mid-70's	**LOCATION DESCRIPTION:**
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**
WATER LEVEL: ~6.5 ft bgs	**DATE/TIME START:** 9/25/2015; 13:27	Oceanport, New Jersey
DATE: 09/25/2015	**DATE/TIME FINISH:** 9/25/2015;	
TIME: 14:08	**WEIGHT OF HAMMER:** Not Applicable	
MEASURED FROM: Visual observations	**DROP OF HAMMER:** Not Applicable	
	TYPE OF HAMMER: Not Applicable	

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10		5.0'/3.5'	0.0	10.0-10.4': Wet, m.dense/loose mottled (gray/tan/orange) M/F to fine SAND, trace silt.	SW	
			0.0	10.4-11.5': Wet, m.dense/m.stiff d.brown silty-sand.	SM	
11			0.0			
			0.0	11.5-12.5': Wet, m.dense gray/d.gray med. SAND, little silt.	SP	
12			0.0			
			0.0	12.5-13.5': Wet, dense d.gray/d.brown (with blue-green hue) M/F to fine SAND, some silt.	SW	
13	13.0-13.5' @ 14:28		0.0			
		NR		13.5-15.0': No Recovery.		
14						
15						
				End of Boring: 15' bgs		

Notes:
M/F=Medium to Fine; M/C=Medium to Coarse; m.=moderately; d.=dark; v.=very.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
	Page 2 of 2	trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Nick Loizus	**BORING/WELL NO.:**	
PROJECT NAME: FTMM-RI	**DRILLER:** Mike Ballando	FTMM-53-MW01	
PROJECT LOCATION: FTMM-53	**WEATHER:** 80, Sunny	**LOCATION DESCRIPTION:**	
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	Behind Building 699	
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**	
	DATE/TIME START: 9/25/2015; 14:10	Oceanport, New Jersey	
WATER LEVEL: N/A	**DATE/TIME FINISH:** 9/25/2015;		
DATE: N/A	**WEIGHT OF HAMMER:** Not Applicable		
TIME: N/A	**DROP OF HAMMER:** Not Applicable		
MEASURED FROM: N/A	**TYPE OF HAMMER:** Not Applicable		

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
0		5'/3.75'	0.0	0-1.75': Dry, light tan, loose F/C sand, little M/F gravel, little silt.	SW	
			0.0			
1			0.0			
			0.0	1.75-3.75': Dry, light red-brown, f.sand, trace silt.	SP	
2			0.0			
			0.0			
3			0.0			
			0.0	3.75-5': No Recovery.		
4		NR	-			
			-			
5		5'/4.1'	0.0	5-6.2': Dry, light red-brown, f.sand, trace silt.	SP	
			0.0			
6			0.0	6.2-8.25': Moist, light gray, dense, f.sand, little clay.	SP	
			0.1			
7			0.0			
			0.0			
8			0.0			
			0.0	8.25-9.1': Wet, red-brown, loose, f.sand, little clay.	SP	
9			-			
			-	9.1-10': No Recovery.		

Notes:
End development date: 10/7/2015.
M/F=Medium to Fine; M/C=Medium to Coarse; f.=fine; m.=moderately; d.=dark; v.=very.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

Soil Boring Log - Geoprobe

CLIENT: USACE	**INSPECTOR:** Nick Loizus	**BORING/WELL NO.:**	
PROJECT NAME: FTMM-RI	**DRILLER:** Mike Ballando	FTMM-53-MW01	
PROJECT LOCATION: FTMM-53	**WEATHER:** 80, Sunny	**LOCATION DESCRIPTION:**	
PROJECT NUMBER: 748810-02110	**CONTRACTOR:** East Coast Drilling, Inc. (ECDI)	Behind Building 699	
GROUNDWATER OBSERVATIONS	**RIG TYPE:** Geoprobe® 7822DT	**LOCATION PLAN**	
	DATE/TIME START: 9/25/2015; 14:10	Oceanport, New Jersey	
WATER LEVEL: N/A	**DATE/TIME FINISH:** 9/25/2015;		
DATE: N/A	**WEIGHT OF HAMMER:** Not Applicable		
TIME: N/A	**DROP OF HAMMER:** Not Applicable		
MEASURED FROM: N/A	**TYPE OF HAMMER:** Not Applicable		

SAMPLE DEPTH	SAMPLE I.D.	ADV/ REC.	PID (ppm)	FIELD IDENTIFICATION OF MATERIAL	STRATA	COMMENTS
10			0.0			
			0.0	10-11.5': Wet, red-brown, dense, f.sand, little clay.	SP	
11			0.0			
			0.0			
12			0.0			
		5'/4.75'	0.0			
13			0.0	11.5-14.75': Wet, black, dense, f.sand, some clay.	SP	
			0.0			
14			0.0			
			0.0			
15			0.0			
			0.0			
16			0.0			
			0.0			
17		5'/4.4'	0.0	15-19.5': Same as above.	SP	
			0.0			
18			0.0			
			0.0			
19			0.0			
		NR	-	End of Boring: 20' bgs		

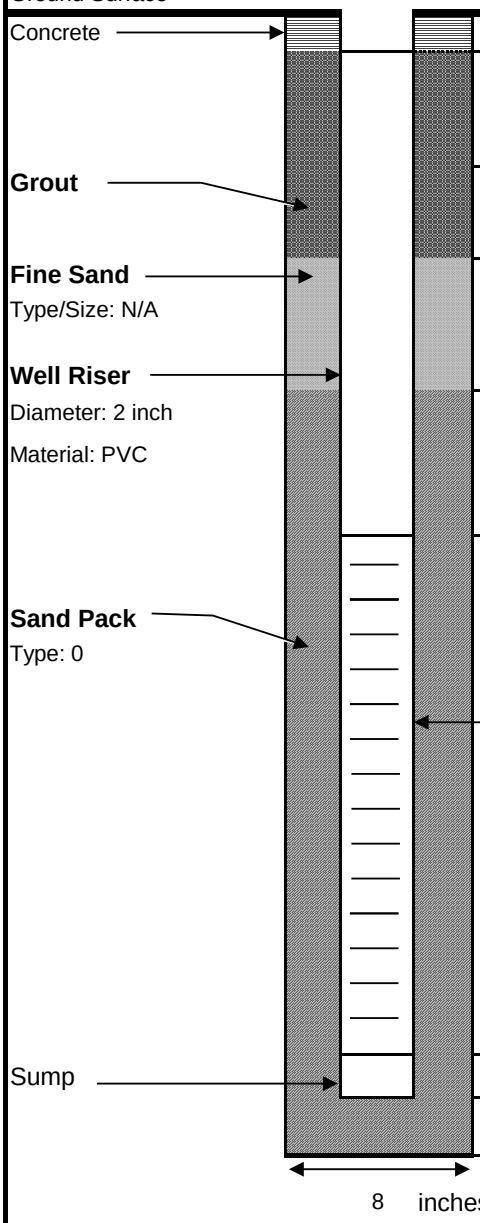
Notes:
End development date: 10/7/2015. Composition of grout: Shall be a mixture of Type I Portland Cement and potable water (approximately 7 gallons).
M/F=Medium to Fine; M/C=Medium to Coarse; f.=fine; m.=moderately; d.=dark; v.=very.

Sample Types	Field Identification Notes:	Gradation Percentages:
S -- Split Spoon A -- Auger Cuttings	moisture, density, color, Gradation, observations (USCS symbol) (Strata)	and - 35 -50%
U -- Undisturbed Tube		some - 20-35%
C -- Rock Core		little - 10-20%
		trace - <10%

Well Construction Detail (Single Cased)

Client: USACE

Well ID:	FTMM-53-MW01	NJBWA Permit No.	E201510641
Date Well Installed:	10/5/2015	Location:	FTMM-53



	Depth Below Ground Surface (ft)
Ground Surface	0.0
Top of Well Casing: 0.3 ft	
Top of Grout	0.5
Top of Fine Sand	N/A
Top of Sand Pack	2.5
Top of Screen	5.0
Well Screen Diameter: 2 inch Slot Size: 0.010 Material: PVC	
Bottom of Screen	15.0
Bottom of Sump	N/A
Bottom of Borehole	15.0

Not to scale

Top of Confining Unit (if present): N/A

* See boring log ICISSVP008 for lithology.

Composition of Grout: Composition of grout: Shall be a mixture of Type I Portland Cement and potable water (approximately 7 gallons)

End Development Date: 10/7/2015

LOW FLOW GROUND WATER SAMPLING - DATA SHEET

SHEET 1 OF 1

PROJECT SITE/LOCATION: FTMM
CONSULTING FIRM: PARSONS
DATE: 11/23/15
FIELD PERSONNEL: A. Feshbach-Mesiney
WEATHER: 41°F, partly cloudy

MONITOR WELL #: 699MW16
WELL DEPTH: 14.0 feet
PUMP INTAKE DEPTH: 9.75 ft to TOC
WELL PERMIT #: 29-33757
WELL DIAMETER: 4 inches
SCREENED/OPEN INTERVAL: 4.0 - 14.0 ft to TOC

PID/FID READINGS:
BACKGROUND: 0 ppm
BENEATH OUTER CAP: 0 ppm
BENEATH INNER CAP: 0 ppm

GAUGING/PUMPING INFORMATION:
INITIAL DEPTH TO WATER (BEFORE PUMP INSTALLATION): 5.5 ft to TOC
DEPTH TO PRODUCT: N/A ft to TOC ; PRODUCT THICKNESS: N/A ft
MAKE/MODEL OF PUMP: QED Sample Pro 175" Bladder Pump

WATER QUALITY METER INFORMATION:
INSTRUMENT MAKE/MODEL: YSI 6920
SERIAL #: 06G2068AB
TEMP. CORRECTION VALUE: -0.15

Time	PURGING	SAMPLING	pH (units) READING	pH (units) CHANGE	SPECIFIC CONDUCTIVITY (mS/cm) READING	SPECIFIC CONDUCTIVITY (mS/cm) CHANGE	REDOX POTENTIAL (mV) READING	REDOX POTENTIAL (mV) CHANGE	DISSOLVED OXYGEN (mg/L) READING	DISSOLVED OXYGEN (mg/L) CHANGE	TURBIDITY (NTU) READING	TURBIDITY (NTU) CHANGE	TEMPERATURE (degrees C) READING	TEMPERATURE (degrees C) CHANGE	PUMPING RATE (ml/min)	DEPTH TO WATER (ft below TOC)	
1348	x		4.44		0.203		359.9		-0.05		8.0		15.15		250	5.70	
1353	x		4.33		0.201		391.5		-0.16		-3.3		15.34		250	5.76	
1358	x		4.31		0.201		398.1		-0.16		-3.6		15.68		250	5.82	
1403	x		4.30		0.201		402.5		-0.3		-3.1		15.60		250	5.87	
1408	x		4.31		0.201		403.4		-0.01		-2.5		15.67		250	5.90	
1413	x		4.31		0.200		404.8		0.01		2.8		15.56		250	5.90	
1418	x		4.31		0.201		406.9		0.06		3.3		15.52		250	5.93	
1423	x		4.30		0.201		408.1		0.03		1.0		15.47		250	5.95	
1428	x		4.30		0.202		409.2		0.12		-3.8		15.56		250	5.95	
1433	x		4.29		0.203		409.1		0.13		-4.4		15.56		250	5.96	
1438	x		4.30		0.203		408.4		0.06		0.0		15.52		250	5.97	
1443	x		4.30		0.203		408.3		0.06		0.0		15.42		250	5.97	✓
1448	x		4.30		0.203		407.7		0.07		0.1		15.47		250	5.96	✓
1453	x		4.29		0.202		407.8		0.07		0.0		15.59		250	5.98	✓
1458	x	x															

SAMPLING INFORMATION:
Sample ID: FTMM-53-GW-699MW16-9.7
Sample Time: 1458
Comments: none

QA/QC INFORMATION:
Duplicate Collected?: no
MS/MSD Collected?: no
Filtering?:

ADDITIONAL OBSERVATIONS/COMMENTS:
Clarity: clear
Odor: none
Other: no

*INDICATOR PARAMETERS HAVE STABILIZED WHEN 3 CONSECUTIVE READINGS ARE WITHIN:
pH: ± 0.1 units ; Spec. Conductivity: ± 3% ; ORP: ± 10mV ; D.O.: ± 10% ; Turbidity: ± 10% (or <1 NTU) ; Temperature: ± 3%. ; Water Level Change: < 0.3 ft

ANALYST NAME & SIGNATURE: Aaron Feshbach-Mesiney
DATE: 11/23/15

REVIEWER NAME & SIGNATURE:
DATE:

LOW FLOW GROUND WATER SAMPLING - DATA SHEET

SHEET 1 OF 1

PROJECT SITE/LOCATION: FTMM
CONSULTING FIRM: PARSONS
DATE: 11/23/15
FIELD PERSONNEL: A. Feshbach-Merrey
WEATHER: 40°F, Sunny

MONITOR WELL #: FTMM-53-MW01
WELL DEPTH: 15.2 feet
PUMP INTAKE DEPTH: 12.94 ft to TOC
WELL PERMIT #: E20151O641
WELL DIAMETER: 2 inches
SCREENED/OPEN INTERVAL: 5.2 - 15.2 ft to TOC

PID/FID READINGS:
BACKGROUND: 0 ppm
BENEATH OUTER CAP: 0 ppm
BENEATH INNER CAP: 0 ppm

GAUGING/PUMPING INFORMATION:
INITIAL DEPTH TO WATER (BEFORE PUMP INSTALLATION): 6.14 ft to TOC
DEPTH TO PRODUCT: N/A ft to TOC ; PRODUCT THICKNESS: N/A ft
MAKE/MODEL OF PUMP: QED Sample Pro 175" Bladder Pump

WATER QUALITY METER INFORMATION:
INSTRUMENT MAKE/MODEL: YSI 6920
SERIAL #: 06G2068 AB
TEMP. CORRECTION VALUE: -0.15

Time	PURGING	SAMPLING	pH (units) READING	pH (units) CHANGE	SPECIFIC CONDUCTIVITY (mS/cm) READING	SPECIFIC CONDUCTIVITY (mS/cm) CHANGE	REDOX POTENTIAL (mV) READING	REDOX POTENTIAL (mV) CHANGE	DISSOLVED OXYGEN (mg/L) READING	DISSOLVED OXYGEN (mg/L) CHANGE	TURBIDITY (NTU) READING	TURBIDITY (NTU) CHANGE	TEMPERATURE (degrees C) READING	TEMPERATURE (degrees C) CHANGE	PUMPING RATE (ml/min)	DEPTH TO WATER (ft below TOC)	
1120	x		4.33		0.228		377.2		0.67		138.2		15.68		200	6.61	
1125	x		4.29		0.231		384.6		0.47		52.0		16.79		200	6.70	
1130	x		4.28		0.230		377.2		0.52		23.4		16.97		200	6.81	
1135	x		4.28		0.227		374.0		0.59		13.9		17.06		200	6.82	
1140	x		4.28		0.225		373.1		0.61		10.5		16.98		200	6.85	
1145	x		4.27		0.224		373.0		0.57		7.1		16.96		200	6.85	
1150	x		4.28		0.224		372.8		0.52		5.0		16.96		200	6.86	
1155	x		4.28		0.223		372.2		0.48		3.8		17.01		200	6.89	
1200	x		4.29		0.223		370.3		0.41		2.3		17.06		200	6.86	
1205	x		4.28		0.223		370.4		0.38		2.0		17.03		200	6.90	✓
1210	x		4.29		0.222		370.0		0.35		1.7		17.10		200	6.88	✓
1215	x		4.29		0.222		369.8		0.33		1.4		17.03		200	6.84	✓
1220	x	x															

SAMPLING INFORMATION:
Sample ID: FTMM-53-GW-MW01-12.9
Sample Time: 1220
Comments: none

QA/QC INFORMATION:
Duplicate Collected?: no
MS/MSD Collected?: no
Filtering?: Yes, on ~~lead~~

ADDITIONAL OBSERVATIONS/COMMENTS:
Clarity: clear
Odor: no
Other: none

*INDICATOR PARAMETERS HAVE STABILIZED WHEN 3 CONSECUTIVE READINGS ARE WITHIN:
pH: ± 0.1 units ; Spec. Conductivity: ± 3% ; ORP: ± 10mV ; D.O.: ± 10% ; Turbidity: ± 10% (or <1 NTU) ; Temperature: ± 3%. ; Water Level Change: < 0.3 ft

ANALYST NAME & SIGNATURE: Aaron Feshbach-Merrey
DATE: 11/23/15

REVIEWER NAME & SIGNATURE:
DATE:

LOW FLOW GROUND WATER SAMPLING - DATA SHEET

SHEET 1 OF 1

PROJECT SITE/LOCATION: FTMM
CONSULTING FIRM: PARSONS
DATE: 11/23/15
FIELD PERSONNEL: A. Feshbach-Mecimey
WEATHER: 35°F, Sunny

MONITOR WELL #: FTMM-53-MW01
WELL DEPTH: 15.2 feet
PUMP INTAKE DEPTH: 8.40 ft to TOC
WELL PERMIT #: E20151064 1
WELL DIAMETER: 2 inches
SCREENED/OPEN INTERVAL: 5.2 - 15.2 ft to TOC

PID/FID READINGS:
BACKGROUND: 0 ppm
BENEATH OUTER CAP: 0 ppm
BENEATH INNER CAP: 0 ppm

GAUGING/PUMPING INFORMATION:
INITIAL DEPTH TO WATER (BEFORE PUMP INSTALLATION): 6.14 ft to TOC
DEPTH TO PRODUCT: N/A ft to TOC ; PRODUCT THICKNESS: N/A ft
MAKE/MODEL OF PUMP: QED Sample Pro 175" Bladder Pump

WATER QUALITY METER INFORMATION:
INSTRUMENT MAKE/MODEL: YSI 6920
SERIAL #: 06G2068 AB
TEMP. CORRECTION VALUE: -0.15

Time	PURGING	SAMPLING	pH (units) READING	pH (units) CHANGE	SPECIFIC CONDUCTIVITY (mS/cm) READING	SPECIFIC CONDUCTIVITY (mS/cm) CHANGE	REDOX POTENTIAL (mV) READING	REDOX POTENTIAL (mV) CHANGE	DISSOLVED OXYGEN (mg/L) READING	DISSOLVED OXYGEN (mg/L) CHANGE	TURBIDITY (NTU) READING	TURBIDITY (NTU) CHANGE	TEMPERATURE (degrees C) READING	TEMPERATURE (degrees C) CHANGE	PUMPING RATE (ml/min)	DEPTH TO WATER (ft below TOC)	
0955	X		4.35		0.310		328.3		1.99		7.4		16.70		350	6.70	
1000	x		4.23		0.261		334.6		1.83		-0.1		17.12		350	7.01	
1005	x		4.26		0.251		336.7		1.76		11.7		16.84		350	7.13	
1010	x		4.28		0.238		334.9		1.61		6.2		16.71		300	7.15	
1015	x		4.31		0.223		337.4		1.54		3.9		16.71		300	7.15	
1020	x		4.32		0.222		338.8		1.45		2.8		16.67		300	7.14	
1025	x		4.32		0.226		340.3		1.34		2.6		16.78		300	7.15	
1030	x		4.31		0.233		343.4		1.29		2.1		16.65		300	7.17	✓
1035	x		4.30		0.237		346.3		1.19		2.1		16.91		300	7.15	✓
1040	x		4.29		0.238		349.2		1.10		1.8		16.64		300	7.18	✓
1045	x	x															

SAMPLING INFORMATION:
Sample ID: FTMM-53-GW-MW01-8.4
Sample Time: 1045
Comments: none

QA/QC INFORMATION:
Duplicate Collected?: No
MS/MSD Collected?: No
Filtering?: Yes, on lead

ADDITIONAL OBSERVATIONS/COMMENTS:
Clarity: clear
Odor: none
Other: no

*INDICATOR PARAMETERS HAVE STABILIZED WHEN 3 CONSECUTIVE READINGS ARE WITHIN:
pH: ± 0.1 units ; Spec. Conductivity: ± 3% ; ORP: ± 10mV ; D.O.: ± 10% ; Turbidity: ± 10% (or <1 NTU) ; Temperature: ± 3%. ; Water Level Change: < 0.3 ft

ANALYST NAME & SIGNATURE: Aaron Feshbach-Mecimey
DATE: 11/23/15

REVIEWER NAME & SIGNATURE:
DATE:

LOW FLOW GROUND WATER SAMPLING - DATA SHEET

SHEET 1 OF 1

PROJECT SITE/LOCATION: FTMM-53 | CONSULTING FIRM: PARSONS
DATE: 11/23/15 | FIELD PERSONNEL: Cureton
WEATHER: 40°F Clear

MONITOR WELL #: 699RW05 | WELL DEPTH: 15 feet | PUMP INTAKE DEPTH: 10 ft to TOC
WELL PERMIT #: | WELL DIAMETER: 6 inches | SCREENED/OPEN INTERVAL: 5-15 ft to TOC

PID/FID READINGS:
BACKGROUND: 0 ppm
BENEATH OUTER CAP: 0 ppm
BENEATH INNER CAP: 0 ppm

GAUGING/PUMPING INFORMATION:
INITIAL DEPTH TO WATER (BEFORE PUMP INSTALLATION): 4.56 ft to TOC
DEPTH TO PRODUCT: NA ft to TOC ; PRODUCT THICKNESS: NA ft
MAKE/MODEL OF PUMP: QED Sample Pro

WATER QUALITY METER INFORMATION:
INSTRUMENT MAKE/MODEL: YSI 6920
SERIAL #: 05G1496AB
TEMP. CORRECTION VALUE: -0.11

Time	PURGING	SAMPLING	pH (units) READING	pH (units) CHANGE	SPECIFIC CONDUCTIVITY (mS/cm) READING	SPECIFIC CONDUCTIVITY (mS/cm) CHANGE	REDOX POTENTIAL (mV) READING	REDOX POTENTIAL (mV) CHANGE	DISSOLVED OXYGEN (mg/L) READING	DISSOLVED OXYGEN (mg/L) CHANGE	TURBIDITY (NTU) READING	TURBIDITY (NTU) CHANGE	TEMPERATURE (degrees C) READING	TEMPERATURE (degrees C) CHANGE	PUMPING RATE (ml/min)	DEPTH TO WATER (ft below TOC)
1435	X		6.14	—	0.299	—	-45.6	—	2.61	—	28.4	—	16.51	—	275	4.86
1440	X		6.18	0.04	0.290	0.009	-45.3	0.3	2.09	0.52	22.6	5.8	16.98	0.47	275	5.01
1445	X		6.23	0.05	0.297	0.007	-47.8	2.5	1.24	0.85	18.2	4.4	16.56	0.42	275	5.30
1450	X		6.19	0.04	0.299	0.003	-48.8	1.0	1.32	0.08	14.5	3.7	16.58	0.02	275	5.57
1455	X		6.18	0.01	0.299	0	-50.0	1.2	1.28	0.04	12.4	2.1	16.53	0.05	275	5.69
1500	X		6.15	0.03	0.299	0	-52.5	2.0	1.26	0.02	11.9	0.5	16.42	0.11	275	5.80
1505		X	6.14	0.01	0.299	0	-54.4	2.4	1.35	0.09	12.3	0.4	16.56	0.14	275	5.91

SAMPLING INFORMATION:
Sample ID: FTMM-53-GW-699RW05-10
Sample Time: 1505
Comments: LEAD, Dissolved LEAD, VOCs

QA/QC INFORMATION:
Duplicate Collected?: No
MS/MSD Collected?: No
Filtering?: yes - LEAD

ADDITIONAL OBSERVATIONS/COMMENTS:
Clarity: Clear
Odor: none
Other: —

*INDICATOR PARAMETERS HAVE STABILIZED WHEN 3 CONSECUTIVE READINGS ARE WITHIN:
pH: ± 0.1 units ; Spec. Conductivity: ± 3% ; ORP: ± 10mV ; D.O.: ± 10% ; Turbidity: ± 10% (or <1 NTU) ; Temperature: ± 3%. ; Water Level Change: < 0.3 ft

ANALYST NAME & SIGNATURE: [signature] DATE: 11/23/15

REVIEWER NAME & SIGNATURE: DATE:

LOW FLOW GROUND WATER SAMPLING - DATA SHEET

SHEET 1 OF 1

PROJECT SITE/LOCATION: FTMM-53 | CONSULTING FIRM: PARSONS
DATE: 11/23/15 | FIELD PERSONNEL: CWATSON
WEATHER: 35°F Clear

MONITOR WELL #: RW03 | WELL DEPTH: 20 feet | PUMP INTAKE DEPTH: 12.8 ft to TOC
WELL PERMIT #: | WELL DIAMETER: 6 inches | SCREENED/OPEN INTERVAL: 5-20 ft to TOC

PID/FID READINGS:
BACKGROUND: 0 ppm
BENEATH OUTER CAP: 0 ppm
BENEATH INNER CAP: 0 ppm

GAUGING/PUMPING INFORMATION:
INITIAL DEPTH TO WATER (BEFORE PUMP INSTALLATION): 5.59 ft to TOC
DEPTH TO PRODUCT: N/A ft to TOC ; PRODUCT THICKNESS: N/A ft
MAKE/MODEL OF PUMP: QED Sample Pro

WATER QUALITY METER INFORMATION:
INSTRUMENT MAKE/MODEL: YSI 6920
SERIAL #: 05G1496AB
TEMP. CORRECTION VALUE: -0.11

Time	PURGING	SAMPLING	pH (units) READING	pH (units) CHANGE	SPECIFIC CONDUCTIVITY (mS/cm) READING	SPECIFIC CONDUCTIVITY (mS/cm) CHANGE	REDOX POTENTIAL (mV) READING	REDOX POTENTIAL (mV) CHANGE	DISSOLVED OXYGEN (mg/L) READING	DISSOLVED OXYGEN (mg/L) CHANGE	TURBIDITY (NTU) READING	TURBIDITY (NTU) CHANGE	TEMPERATURE (degrees C) READING	TEMPERATURE (degrees C) CHANGE	PUMPING RATE (ml/min)	DEPTH TO WATER (ft below TOC)
1040	X		5.77	—	0.486	—	-35.9	—	2.74	—	36.0	—	17.90	—	300	5.68
1045	X		5.87	0.10	0.482	0.004	-34.9	1.0	2.35	0.39	33.0	3.0	18.56	0.66	300	6.09
1050	X		5.94	0.07	0.482	⊘	-30.5	4.4	2.76	0.41	26.8		17.97		250	6.34
1055	X		5.97	0.03	0.478	0.004	-28.7	1.7	2.74	0.02	24.0	2.8	18.00	0.03	250	6.47
1100	X		5.96	0.01	0.480	0.002	-26.0	2.7	2.68	0.06	22.6	1.4	17.83	0.17	250	6.55
1105	X		5.95	0.01	0.482	0.002	-24.7	1.3	2.63	0.05	20.1	2.5	17.85	0.02	250	6.61
1110	X		5.96	0.01	0.482	⊘	-23.0	1.7	2.63	⊘	19.7	0.4	17.87	0.02	250	6.66
1115		X	5.96	⊘	0.483	0.001	-22.5	0.5	2.61	0.02	19.3	0.4	17.91	0.03	250	6.70

SAMPLING INFORMATION:
Sample ID: FTMM-53-GW-C99RW03-12.8
Sample Time: 1115
Comments: LEAD, Filtered LEAD, VOCs

QA/QC INFORMATION:
Duplicate Collected?: NO
MS/MSD Collected?: NO
Filtering?: Lead

ADDITIONAL OBSERVATIONS/COMMENTS:
Clarity: Clear
Odor: Slight odor
Other: None

*INDICATOR PARAMETERS HAVE STABILIZED WHEN 3 CONSECUTIVE READINGS ARE WITHIN:
pH: ± 0.1 units ; Spec. Conductivity: ± 3% ; ORP: ± 10mV ; D.O.: ± 10% ; Turbidity: ± 10% (or <1 NTU) ; Temperature: ± 3%. ; Water Level Change: < 0.3 ft

ANALYST NAME & SIGNATURE: CW | DATE: 11/23/15

REVIEWER NAME & SIGNATURE: | DATE:

LOW FLOW GROUND WATER SAMPLING - DATA SHEET

SHEET 1 OF 1

PROJECT SITE/LOCATION: FTMM-53 | CONSULTING FIRM: PARSONS
DATE: 11/18/15 | FIELD PERSONNEL: A. DiIonno
WEATHER: 55°F, Cloudy

MONITOR WELL #: 699MW01 | WELL DEPTH: 13.26 feet | PUMP INTAKE DEPTH: 11.0 ft to TOC
WELL PERMIT #: 29-23677-1 | WELL DIAMETER: 4 inches | SCREENED/OPEN INTERVAL: 2-15 ft to TOC

PID/FID READINGS:
BACKGROUND: 0.0 ppm
BENEATH OUTER CAP: 0.0 ppm
BENEATH INNER CAP: 0.0 ppm

GAUGING/PUMPING INFORMATION:
INITIAL DEPTH TO WATER (BEFORE PUMP INSTALLATION): 5.60 ft to TOC
DEPTH TO PRODUCT: N/A ft to TOC ; PRODUCT THICKNESS: N/A ft
MAKE/MODEL OF PUMP: QED SamplePro 1.75" Bladder Pump

WATER QUALITY METER INFORMATION:
INSTRUMENT MAKE/MODEL: YSI 6920
SERIAL #: 11H101388
TEMP. CORRECTION VALUE: -0.14°C

Time	PURGING	SAMPLING	pH (units) READING	pH (units) CHANGE	SPECIFIC CONDUCTIVITY (mS/cm) READING	SPECIFIC CONDUCTIVITY (mS/cm) CHANGE	REDOX POTENTIAL (mV) READING	REDOX POTENTIAL (mV) CHANGE	DISSOLVED OXYGEN (mg/L) READING	DISSOLVED OXYGEN (mg/L) CHANGE	TURBIDITY (NTU) READING	TURBIDITY (NTU) CHANGE	TEMPERATURE (degrees C) READING	TEMPERATURE (degrees C) CHANGE	PUMPING RATE (ml/min)	DEPTH TO WATER (ft below TOC)
1227	X		6.21		0.155		122.9		2.87		25.4		20.37		250	5.75
1232	X		6.26		0.157		111.5		2.31		22.1		20.24		250	5.92
1237	X		6.28		0.158		110.7		2.50		17.5		19.88		250	5.90
1242	X		6.28		0.156		108.1		2.68		23.1		19.54		250	5.95
1247	X		6.30		0.156		94.5		2.32		21.1		19.70		250	5.95
1252	X		6.31		0.156		83.6		2.23		19.6		19.65		250	5.95
1257	X		6.30		0.157		65.5		2.23		17.3		19.64		250	5.95
1302	X		6.30		0.157		37.3		2.25		16.8		19.71		250	5.95
1307	X		6.31		0.158		24.6		2.28		16.4		19.63		250	5.95
1312	X		6.31		0.159		31.2		~~2.2~~ 2.14		14.1		19.72		250	5.95
1317	X		6.30		0.160		~~31~~ 30.9		2.28		13.5		19.76		250	5.95
1322	X		6.30		0.162		-7.3		2.20		13.2		19.71		250	5.95
1327	X		6.30		0.162		-12.8		2.14		12.7		19.81		250	5.95
1332	X	X	6.30		0.163		-17.7		2.16		12.5		19.81		250	5.95

SAMPLING INFORMATION:
Sample ID: FTMM-53-GW-699MW01
Sample Time: 1332
Comments: —

QA/QC INFORMATION:
Duplicate Collected?: No
MS/MSD Collected?: No
Filtering?: No

ADDITIONAL OBSERVATIONS/COMMENTS:
Clarity: Clear
Odor: None
Other: —

*INDICATOR PARAMETERS HAVE STABILIZED WHEN 3 CONSECUTIVE READINGS ARE WITHIN:
pH: ± 0.1 units ; Spec. Conductivity: ± 3% ; ORP: ± 10mV ; D.O.: ± 10% ; Turbidity: ± 10% (or <1 NTU) ; Temperature: ± 3%. ; Water Level Change: < 0.3 ft

ANALYST NAME & SIGNATURE: Alex DiIonno Alex D. Ionno | DATE: 11/18/15
REVIEWER NAME & SIGNATURE: | DATE:

LOW FLOW GROUND WATER SAMPLING - DATA SHEET

SHEET 1 OF 1

PROJECT SITE/LOCATION: FTMM-53 | CONSULTING FIRM: PARSONS
DATE: 11/18/15 | FIELD PERSONNEL: A.D:Tonno
WEATHER: 55°F, Cloudy

MONITOR WELL #: 699MW04 | WELL DEPTH: 17.34 feet | PUMP INTAKE DEPTH: 11.5 ft to TOC
WELL PERMIT #: 29-23680-7 | WELL DIAMETER: 4 inches | SCREENED/OPEN INTERVAL: 2-20 ft to TOC

PID/FID READINGS:
BACKGROUND: 0.0 ppm
BENEATH OUTER CAP: 0.0 ppm
BENEATH INNER CAP: 0.0 ppm

GAUGING/PUMPING INFORMATION:
INITIAL DEPTH TO WATER (BEFORE PUMP INSTALLATION): 5.87 ft to TOC
DEPTH TO PRODUCT: N/A ft to TOC ; PRODUCT THICKNESS: N/A ft
MAKE/MODEL OF PUMP: QED Sample Pro 1.75" Bladder Pump

WATER QUALITY METER INFORMATION:
INSTRUMENT MAKE/MODEL: YSI 6920
SERIAL #: 11H101388
TEMP. CORRECTION VALUE: -0.14°C

Time	PURGING	SAMPLING	pH (units) READING	pH (units) CHANGE	SPECIFIC CONDUCTIVITY (mS/cm) READING	SPECIFIC CONDUCTIVITY (mS/cm) CHANGE	REDOX POTENTIAL (mV) READING	REDOX POTENTIAL (mV) CHANGE	DISSOLVED OXYGEN (mg/L) READING	DISSOLVED OXYGEN (mg/L) CHANGE	TURBIDITY (NTU) READING	TURBIDITY (NTU) CHANGE	TEMPERATURE (degrees C) READING	TEMPERATURE (degrees C) CHANGE	PUMPING RATE (ml/min)	DEPTH TO WATER (ft below TOC)
1358	X		6.18		0.317		-5.3		3.96		24.9		19.51		250	5.96
1403	X		6.10		0.322		8.4		1.93		24.1		19.82		250	5.96
1408	X		6.10		0.321		16.7		1.67		27.1		19.79		250	5.96
1413	X		6.12		0.323		15.4		1.65		22.6		19.80		250	5.96
1418	X		6.13		0.325		12.4		1.75		18.8		19.84		250	5.96
1423	X		6.15		0.327		11.3		1.40		17.5		19.82		250	5.96
1428	X		6.16		0.330		7.0		1.55		16.5		19.81		250	5.96
1433	X		6.20		0.333		-0.7		1.08		14.5		19.82		250	5.96
1438	X		6.22		0.335		-2.3		1.05		14.0		19.81		250	5.96
1443	X	X	6.26		0.337		-6.8		1.00		13.8		19.89		250	5.96

SAMPLING INFORMATION:
Sample ID: FTMM-53-GW-699MW04
Sample Time: 1443
Comments: —

QA/QC INFORMATION:
Duplicate Collected?: Yes + Split
MS/MSD Collected?: No
Filtering?: No

ADDITIONAL OBSERVATIONS/COMMENTS:
Clarity: Clear
Odor: slight hydrocarbon odor
Other:

*INDICATOR PARAMETERS HAVE STABILIZED WHEN 3 CONSECUTIVE READINGS ARE WITHIN:
pH: ± 0.1 units ; Spec. Conductivity: ± 3% ; ORP: ± 10mV ; D.O.: ± 10% ; Turbidity: ± 10% (or <1 NTU) ; Temperature: ± 3%. ; Water Level Change: < 0.3 ft

ANALYST NAME & SIGNATURE: Alex D:Tonno Alex D:Tonno | DATE: 11/18/15
REVIEWER NAME & SIGNATURE: | DATE:

LOW FLOW GROUND WATER SAMPLING - DATA SHEET

SHEET 1 OF 1

PROJECT SITE/LOCATION: FTMM
DATE: 11/25/15
WEATHER: 49°F, Fair/Sunny
CONSULTING FIRM: PARSONS
FIELD PERSONNEL: A. Feshbach-Merriey

MONITOR WELL #: 699MW09
WELL PERMIT #: 29-24639
WELL DEPTH: 12.2 feet
WELL DIAMETER: 4 inches
PUMP INTAKE DEPTH: 9.0 ft to TOC
SCREENED/OPEN INTERVAL: 2.2 - 12.2 ft to TOC

PID/FID READINGS:
BACKGROUND: 0 ppm
BENEATH OUTER CAP: 0 ppm
BENEATH INNER CAP: 0 ppm

GAUGING/PUMPING INFORMATION:
INITIAL DEPTH TO WATER (BEFORE PUMP INSTALLATION): 5.8 ft to TOC
DEPTH TO PRODUCT: N/A ft to TOC ; PRODUCT THICKNESS: N/A ft
MAKE/MODEL OF PUMP: QED Sample Pro 175" Bladder Pump

WATER QUALITY METER INFORMATION:
INSTRUMENT MAKE/MODEL: YSI 6920
SERIAL #: 06G2068AB
TEMP. CORRECTION VALUE: -0.15°C

Time	PURGING	SAMPLING	pH (units) READING	pH (units) CHANGE	SPECIFIC CONDUCTIVITY (mS/cm) READING	SPECIFIC CONDUCTIVITY (mS/cm) CHANGE	REDOX POTENTIAL (mV) READING	REDOX POTENTIAL (mV) CHANGE	DISSOLVED OXYGEN (mg/L) READING	DISSOLVED OXYGEN (mg/L) CHANGE	TURBIDITY (NTU) READING	TURBIDITY (NTU) CHANGE	TEMPERATURE (degrees C) READING	TEMPERATURE (degrees C) CHANGE	PUMPING RATE (ml/min)	DEPTH TO WATER (ft below TOC)
1350	x		4.27		0.482		335.5		3.93		17.3		16.02		225	6.17
1355	x		4.18		0.489		352.9		3.28		15.2		16.01		225	6.17
1400 ~~1350~~	x		4.18		0.490		356.5		3.06		11.7		16.04		225	6.16
1405 ~~1355~~	x		4.17		0.490		353.2		2.80		10.2		16.03		225	6.18
1410 ~~1405~~	x		4.17		0.491		~~349.7~~		2.71		10.1		15.91		225	6.18
1415 ~~1420~~	x		4.16		0.491		345.2		2.69		9.8		15.93		225	6.18 ✓
← 1420	x		4.16		0.492		341.6		2.66		9.6		15.92		225	6.19 ✓
1425		x	4.16		0.492		339.1		2.63		9.5		15.94		225	6.19 ✓

SAMPLING INFORMATION:
Sample ID: FTMM-53-GW-MW09-9.0
Sample Time: 1425
Comments: no

QA/QC INFORMATION:
Duplicate Collected?: no
MS/MSD Collected?: Yes
Filtering?: no

ADDITIONAL OBSERVATIONS/COMMENTS:
Clarity: clear
Odor: none
Other: no

*INDICATOR PARAMETERS HAVE STABILIZED WHEN 3 CONSECUTIVE READINGS ARE WITHIN:
pH: ± 0.1 units ; Spec. Conductivity: ± 3% ; ORP: ± 10mV ; D.O.: ± 10% ; Turbidity: ± 10% (or <1 NTU) ; Temperature: ± 3%. ; Water Level Change: < 0.3 ft

ANALYST NAME & SIGNATURE: Aaron Feshbach-Merriey — DATE: 11/25/15

REVIEWER NAME & SIGNATURE: — DATE:

LOW FLOW GROUND WATER SAMPLING - DATA SHEET

SHEET 1 OF 1

PROJECT SITE/LOCATION: FTMM
DATE: 11/25/15
WEATHER: 40° F, Fair, sunny

CONSULTING FIRM: PARSONS
FIELD PERSONNEL: A. Feshbach-Mesiney

MONITOR WELL #: 699 RW11
WELL PERMIT #: 29-28031

WELL DEPTH: 19.56 feet
WELL DIAMETER: 11 inches

PUMP INTAKE DEPTH: 12.8 ft to TOC
SCREENED/OPEN INTERVAL: 4.5-19.5 ft to TOC

PID/FID READINGS:
BACKGROUND: 0 ppm
BENEATH OUTER CAP: 0 ppm
BENEATH INNER CAP: 0 ppm

GAUGING/PUMPING INFORMATION:
INITIAL DEPTH TO WATER (BEFORE PUMP INSTALLATION): 6.10 ft to TOC
DEPTH TO PRODUCT: N/A ft to TOC ; PRODUCT THICKNESS: N/A ft
MAKE/MODEL OF PUMP: QED Sample Pro 175" Bladder Pump

WATER QUALITY METER INFORMATION:
INSTRUMENT MAKE/MODEL: YSI 6920
SERIAL #: 06G2068AB
TEMP. CORRECTION VALUE: -0.15°C

Time	PURGING	SAMPLING	pH (units) READING	pH (units) CHANGE	SPECIFIC CONDUCTIVITY (mS/cm) READING	SPECIFIC CONDUCTIVITY (mS/cm) CHANGE	REDOX POTENTIAL (mV) READING	REDOX POTENTIAL (mV) CHANGE	DISSOLVED OXYGEN (mg/L) READING	DISSOLVED OXYGEN (mg/L) CHANGE	TURBIDITY (NTU) READING	TURBIDITY (NTU) CHANGE	TEMPERATURE (degrees C) READING	TEMPERATURE (degrees C) CHANGE	PUMPING RATE (ml/min)	DEPTH TO WATER (ft below TOC)	
1020	x		7.03		0.290		-134.5		4.46		49.1		15.63		250	6.20	
1025	x		7.05		0.297		-139.2		2.82		63.0		16.07		250	6.21	
1030	x		7.07		0.276		-145.0		1.81		59.0		16.33		250	6.27	
1035	x		7.07		0.275		-147.0		1.49		57.5		16.41		250	6.30	
1040	x		7.05		0.274		-136.5		1.35		55.0		16.62		250	6.35	
1045	x		7.04		0.274		-134.1		1.40		20.2		16.96		250	6.36	
1050	x		7.03		0.275		-132.6		1.36		10.0		17.22		200	6.37	
1055	x		7.01		0.275		-128.3		1.33		10.8		17.31		200	6.38	✓
1100	x		7.01		0.275		-126.2		1.31		11.2		17.40		200	6.37	✓
1105		x	7.00		0.276		-125.7		1.28		11.5		17.42		200	6.38	✓

SAMPLING INFORMATION:
Sample ID: FTMM-53-GW-RW11-12.8
Sample Time: 1105
Comments: none

QA/QC INFORMATION:
Duplicate Collected?: no
MS/MSD Collected?: no
Filtering?: yes, on lead

ADDITIONAL OBSERVATIONS/COMMENTS:
Clarity: cloudy
Odor: none
Other: light brown

*INDICATOR PARAMETERS HAVE STABILIZED WHEN 3 CONSECUTIVE READINGS ARE WITHIN:
pH: ± 0.1 units ; Spec. Conductivity: ± 3% ; ORP: ± 10mV ; D.O.: ± 10% ; Turbidity: ± 10% (or <1 NTU) ; Temperature: ± 3%. ; Water Level Change: < 0.3 ft

ANALYST NAME & SIGNATURE: Aaron Feshbach-Mesiney DATE: 11/25/15

REVIEWER NAME & SIGNATURE: DATE:

LOW FLOW GROUND WATER SAMPLING - DATA SHEET

SHEET 1 OF 1

PROJECT SITE/LOCATION: FTMM
DATE: 11/25/15
WEATHER: 46°F, Sunny
CONSULTING FIRM: PARSONS
FIELD PERSONNEL: A. Feshbach-Merino

MONITOR WELL #: 699MW06
WELL PERMIT #: 29-23809-1
WELL DEPTH: 14.97 feet
WELL DIAMETER: 4 inches
PUMP INTAKE DEPTH: 8.5 ft to TOC
SCREENED/OPEN INTERVAL: 2.0 - 14.97 ft to TOC

PID/FID READINGS:
BACKGROUND: 0 ppm
BENEATH OUTER CAP: 0 ppm
BENEATH INNER CAP: 0 ppm

GAUGING/PUMPING INFORMATION:
INITIAL DEPTH TO WATER (BEFORE PUMP INSTALLATION): 7.65 ft to TOC
DEPTH TO PRODUCT: N/A ft to TOC ; PRODUCT THICKNESS: N/A ft
MAKE/MODEL OF PUMP: QED Sample Pro 175" Bladder Pump

WATER QUALITY METER INFORMATION:
INSTRUMENT MAKE/MODEL: YSI 6920
SERIAL #: 06G2068 AB
TEMP. CORRECTION VALUE: - 0.15°C

Time	PURGING	SAMPLING	pH (units) READING	pH (units) CHANGE	SPECIFIC CONDUCTIVITY (mS/cm) READING	SPECIFIC CONDUCTIVITY (mS/cm) CHANGE	REDOX POTENTIAL (mV) READING	REDOX POTENTIAL (mV) CHANGE	DISSOLVED OXYGEN (mg/L) READING	DISSOLVED OXYGEN (mg/L) CHANGE	TURBIDITY (NTU) READING	TURBIDITY (NTU) CHANGE	TEMPERATURE (degrees C) READING	TEMPERATURE (degrees C) CHANGE	PUMPING RATE (ml/min)	DEPTH TO WATER (ft below TOC)	
1200	x		6.60		0.104		83.8		5.75		~~27~~ 9.1		15.93		225	8.00	x
1205	x		6.54		0.102		101.7		5.70		10.6		16.09		225	8.25	✓
1210	x		6.52		0.103		108.2		5.65		8.6		15.96		225	8.50	
1215	x		6.51		0.103		108.0		5.53		6.3		16.09		175	8.57	
1220	x		6.54		0.102		103.3		6.01		6.1		16.29		175	8.55	
1225	x		6.57		0.102		95.4		6.68		5.2		16.42		175	8.54	
1230	x		6.59		0.102		71.8		7.09		4.6		16.27		175	8.55	
1235	x		6.61		0.103		77.1		7.16		3.9		16.26		175	8.52	✓
1240	x		6.62		0.102		78.7		7.10		3.7		16.29		175	8.55	✓
1245		x	6.62		0.103		76.2		7.14		3.6		16.28		175	8.54	✓

SAMPLING INFORMATION:
Sample ID: FTMM-SS-GW-MW06-8.5
Sample Time: 1245
Comments: none

QA/QC INFORMATION:
Duplicate Collected?: no
MS/MSD Collected?: no
Filtering?: Yes, on lead

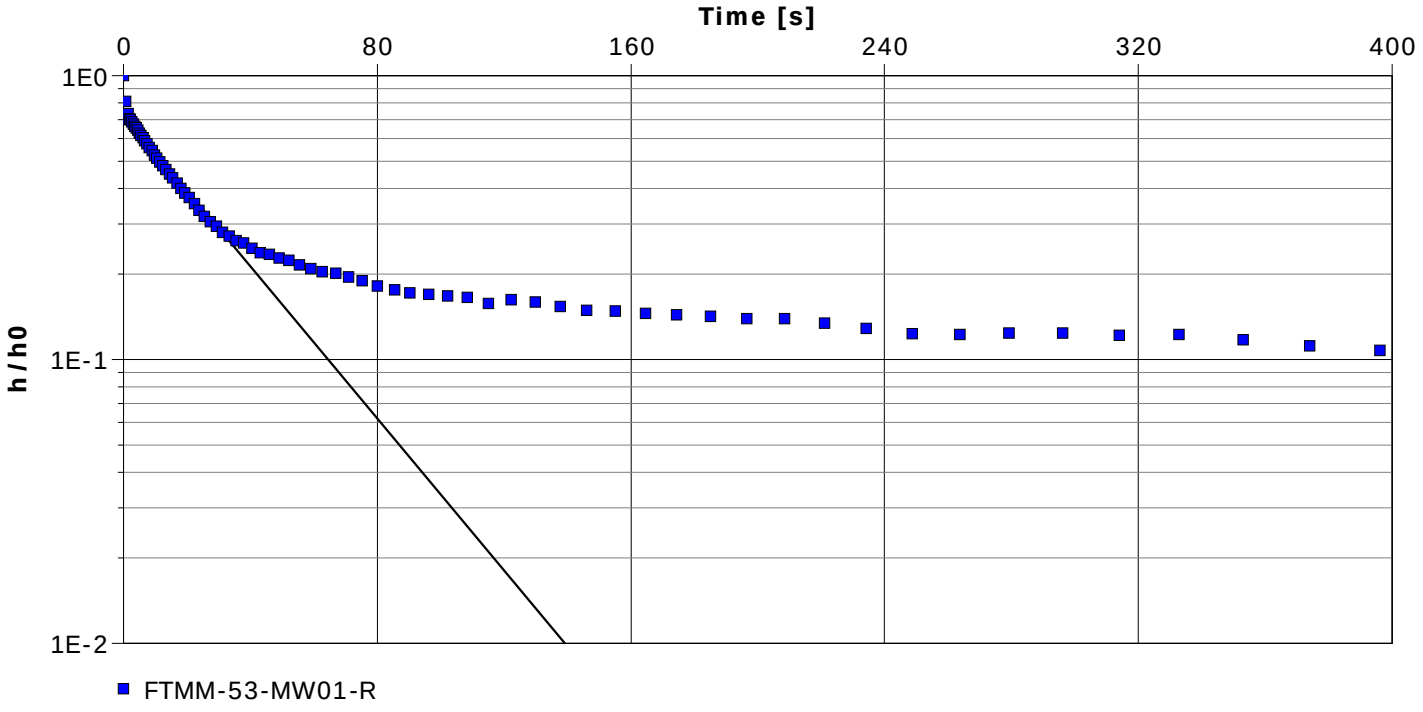
ADDITIONAL OBSERVATIONS/COMMENTS:
Clarity: clear
Odor: none
Other: no

*INDICATOR PARAMETERS HAVE STABILIZED WHEN 3 CONSECUTIVE READINGS ARE WITHIN:
pH: ± 0.1 units ; Spec. Conductivity: ± 3% ; ORP: ± 10mV ; D.O.: ± 10% ; Turbidity: ± 10% (or <1 NTU) ; Temperature: ± 3%. ; Water Level Change: < 0.3 ft

ANALYST NAME & SIGNATURE: Aaron Feshbach-Merino DATE: 11/25/15

REVIEWER NAME & SIGNATURE: DATE:

Location: FTMM-53	Slug Test: FTMM-53-MW01-R	Test Well: FTMM-53-MW01-R
Test Conducted by: Chris Watson		Test Date: 12/16/2015
Analysis Performed by: Meghan Emmert	Bouwer and Rice	Analysis Date: 1/11/2016
Aquifer Thickness: 30.00 ft		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [ft/d]	
FTMM-53-MW01-R	3.59×10^{0}	

Location: FTMM-53	Slug Test: FTMM-53-MW01-R	Test Well: FTMM-53-MW01-R
Test Conducted by: Chris Watson		Test Date: 12/16/2015
Aquifer Thickness: 30.00 ft		

	Analysis Name	Analysis Performe	Analysis Date	Method name	Well	T [ft²/d]	K [ft/d]	S
1	Bouwer and Rice	Meghan Emmert	1/11/2016	Hvorslev	FTMM-53-MW01-R		3.59×10^{0}	

Groundwater Measurements Record

CLIENT: USACE
PROJECT NAME: Fort Monmouth - FTMM 53
PROJECT LOCATION: Ocean port, NJ
PROJECT NUMBER: 748810 - 03000

DATE: 11/16/15
INSPECTOR: A. Pitonzo, A. Frohnhofer, Heathey
CREW: Parsons
WEATHER: 55°F, Sunny

Liquid Indicator:

Note: all depths measured from marked location on riser

Well ID	Time	Depth to NAPL	Depth to Water	Depth Bottom of Well	Breathing Zone PID Reading	Comments
616MW01	0951	N/A	5.65	13.35	0.0	Hard bottom
699MW01	10.36	N/A	8.35	16.49	0.0	
699MW02	1031	N/A	7.78	16.63	0.0	
699MW03	1024	N/A	5.40	12.06	0.0	
699MW04	1003	N/A	5.78	17.34	0.0	
699MW05	1028	N/A	5.61	14.98	0.0	
699MW06	1011	N/A	7.63	14.95	0.0	
699MW08	0942	N/A	6.15	13.25	0.0	Well lid broken
699MW09	1101	N/A	5.91	12.15	0.0	Soft bottom
699MW12	1045	N/A	6.55	14.80	0.0	
699MW15	1038	N/A	5.22	13.95	0.0	
699MW16	1056	N/A	5.85	14.09	0.0	
699RW01	1129	N/A	3.67	3.69	0.0	
699RW02	1136	N/A	3.77	4.32		
699RW03	0954	N/A	5.74	17.70	0.0	Hard bottom
699RW04	1049	N/A	6.47	15.03	0.0	
699RW05	1015	N/A	4.68	12.30	0.0	
699RW11	1007	N/A	6.03	17.00	0.0	Soft bottom
600MW01	-	-	-	-	-	Unable to Locate
FTMM-53-MW01	1128	N/A	6.26	15.20	0.0	

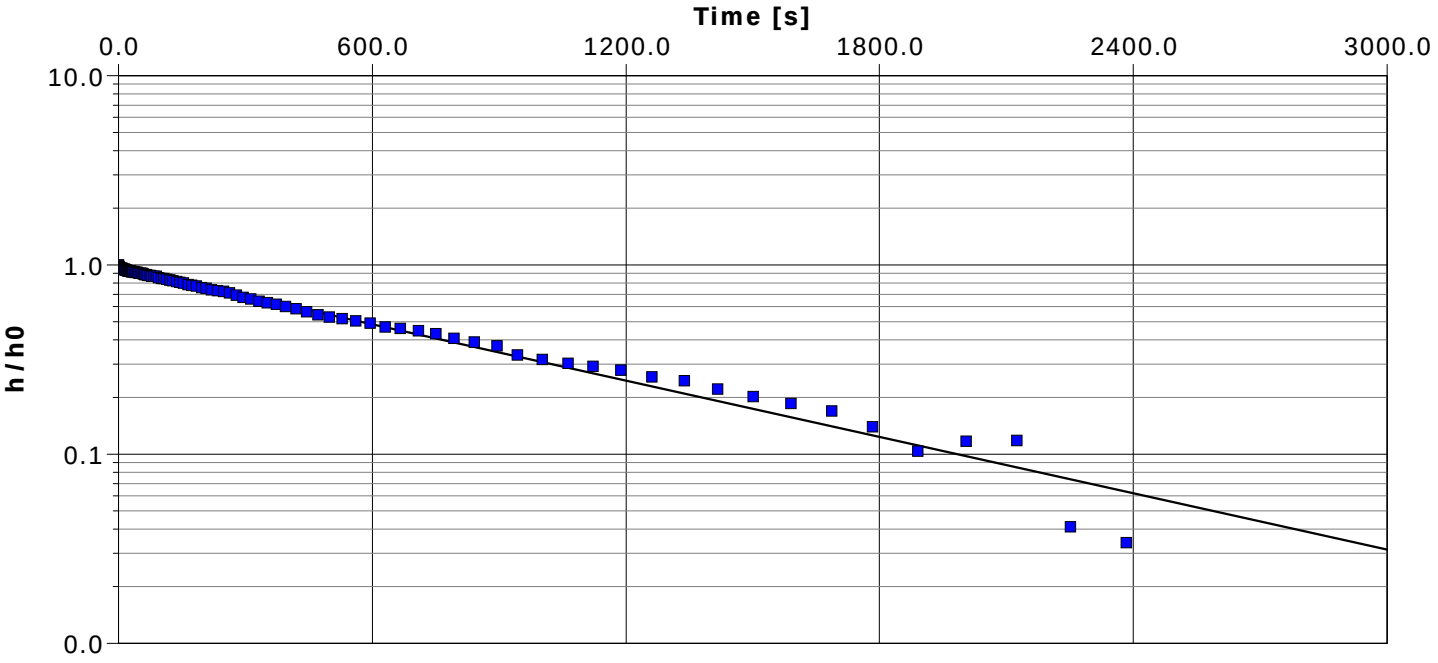
Groundwater Measurements Record

CLIENT: USACE
PROJECT NAME: Fort Monmouth - FTMM 68
PROJECT LOCATION: Oceanport and Monmouth County
PROJECT NUMBER: 148810 -03000
DATE: 11/16/15
INSPECTOR: Parsons
CREW: A. DiFonno A. Feshback - Meriney
WEATHER: 60°F, Sunny
Liquid Indicator:

Note: all depths measured from marked location on riser

Well ID	Time	Depth to NAPL	Depth to Water	Depth Bottom of Well	Breathing Zone PID Reading	Comments
565MW01	1145	N/A	8.73	17.12	6.9	
565MW01D	1147	N/A	9.07	25.40	16.20	
FTMM-68-MW01	1240	N/A	7.90	43.70	0.0	
FTMM-68-MW02	1243	N/A	7.74	28.43	0.0	
FTMM-68-MW03	1255	N/A	8.00	25.27	0.0	
FTMM-68-MW04	1258	N/A	7.70	28.35	0.0	
FTMM-53-MW02	1259	N/A	7.87	24.92	0.0	

Location: FTMM-53	Slug Test: 699MW04-R	Test Well: 699MW04
Test Conducted by: Chris Watson		Test Date: 12/16/2015
Analysis Performed by: Meghan Emmert	699MW04 R	Analysis Date: 1/11/2016
Aquifer Thickness: 50.00 ft		



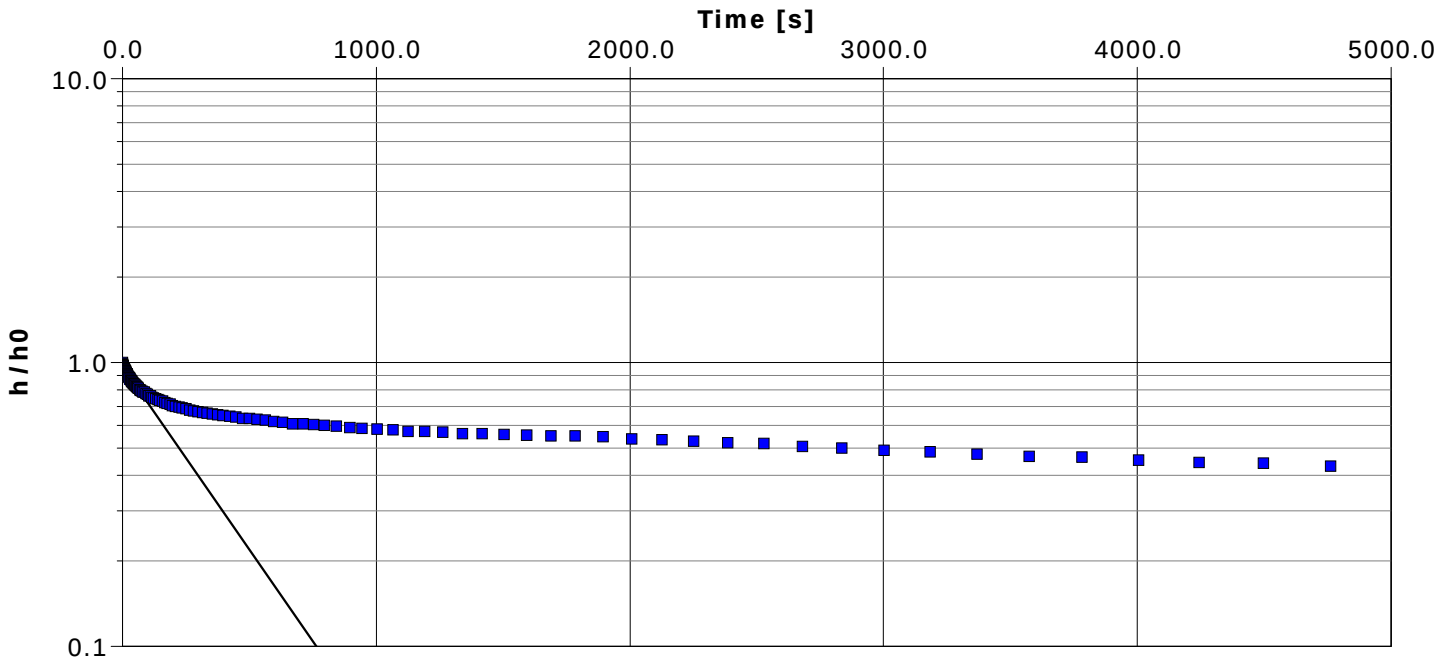
Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [ft/d]	
699MW04	3.60×10^{-1}	

Location: FTMM-53	Slug Test: 699MW04-R	Test Well: 699MW04
Test Conducted by: Chris Watson		Test Date: 12/16/2015
Aquifer Thickness: 50.00 ft		

	Analysis Name	Analysis Performe	Analysis Date	Method name	Well	T [ft²/d]	K [ft/d]	S
1	699MW04 R	Meghan Emmert	1/11/2016	Hvorslev	699MW04		3.60×10^{-1}	

Location: FTMM-53	Slug Test: 699VP11 R	Test Well: 699VP11
Test Conducted by: Chris Watson		Test Date: 12/16/2015
Analysis Performed by: Meghan Emmert	699VP11 R	Analysis Date: 1/11/2016
Aquifer Thickness: 50.00 ft		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [ft/d]	
699VP11	2.98×10^{0}	

Location: FTMM-53	Slug Test: 699VP11 R	Test Well: 699VP11
Test Conducted by: Chris Watson		Test Date: 12/16/2015
Aquifer Thickness: 50.00 ft		

	Analysis Name	Analysis Performe	Analysis Date	Method name	Well	T [ft²/d]	K [ft/d]	S
1	699VP11 R	Meghan Emmert	1/11/2016	Hvorslev	699VP11		2.98×10^{0}	

PARSONS

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WELL DEVELOPMENT REPORT

CLIENT: FTMM	WELL ID: 53-MW-01
PROJECT NAME: FTMM-RI	DATE: 10/7/15
LOCATION: Oceanport, NJ	PROJECT NO.:

DRILLING METHOD (s): HSA	INSPECTOR: PARSONS
PUMP METHOD (s): Whale pump	CONTRACTOR: ECDI
SURGE METHOD (s):	CREW: C. Watson, Andrew (ECDI)
INSTALLATION DATE: 10/5/15	START DEVELOPMENT DATE: 10/7/15
	END DEVELOPMENT DATE:

WATER DEPTH (TOC):	6.72 ft	INSTALLED POW DEPTH(TOC):	15 ft
WELL DIA. (ID CASING):	2" ft	MEASURED POW DEPTH(TOC):	15.12 ft
BORING DIAMETER:	8" ft	SILT THICKNESS:	— ft
		POW AFTER DEVELOPMENT:	15.12 ft

DIAMETER FACTORS (GAL/FT):

DIAMETER (IN):	2	3	4	5	6	7	8	9	10	11	12
GALLONS/ FT:	0.163	0.367	0.654	1.02	1.47	2.00	2.61	3.30	4.08	4.93	5.87

STANDING VOLUME INSIDE WELL = WATER COLUMN X WELL DIAMETER FACTOR = 1.37 GAL. = A

STANDING WATER IN ANNULAR SPACE =

WATER COL. BELOW SEAL(ft) X (BORING DIAM. FACTOR - WELL DIAM. FACTOR) X 0.3 = ~~10~~ 7.34 GAL. = B

10 × (2.61 - 0.163) × 0.3

SINGLE STANDING WATER VOLUME = A + B = ~~2.38~~ 6.17 GAL. = C

MINIMUM VOLUME TO BE REMOVED = 5 X C = ~~10.8~~ 43.55 GALS.

ACTIVITY	START TIME	END TIME	ELAPSED TIME	GALLONS REMOVED	pH (std)	CONDUCTIVITY ( )	TEMP ( )	COLOR	TURBIDITY (ntu)	OTHER
Pumping	1115	1120	5 min	5	3.37	\	19.1	Grey	N/A	Out of Range
	1120	1125	10 min	8	3.81	\	19.0	Grey/clay	141	
Surge	1125	1140	25 min	10	3.88	\	18.9		89.0	Surge
	1240	1250	35 min	15	3.90	\	19.4		79	
Surge	1250	1300	45	20	4.25	\	22.5	Clear	16.3	Surge
	1300	1310	55	25	5.21	\	23.4		28.8	
	1310	1320	65	30	5.01	\	21.4		9.8	
Surge	1320	1330	75	35	5.03	\	22.6		8.1	Surge
Pump	1330	1340	85	40	5.04		21.4	Clear	4.3	
Pump	1340	1350	95	45	5.06		20.9	Clear	1.9	
TOTALS/FINAL										

COMMENTS:

APPENDIX C
DEED NOTICE

(To be Provided Later)