U.S. Army BRAC 2005
Environmental Condition of Property Report
Fort Monmouth
Monmouth County, New Jersey

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Acronyms and Abbreviations

The following lists of acronyms, abbreviations, and definitions are intended to be comprehensive and are contained in this ECP Report.

Acronym	Full Title
°F	Degrees Fahrenheit
µg/L	Micrograms per liter
AAFES	Army and Air Force Exchange Services
ACM	Asbestos-Containing Materials
ACSIM	Assistant Chief of Staff for Installation Management
AEDBR	Army Environmental Database Restoration
amsl	Above mean sea level
AOC	Area of Concern
AR	Army Regulation
ARA	Army Radiation Authorization
ASCS	Agricultural Stabilization and Conservation Service
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
AT&T	American Telephone and Telegraph
AVRADCOM	Aviation Research and Development Command
BEC	Base Realignment and Closure Environmental Coordinator
bgs	Below ground surface
Bldg	Building
BMP	Best Management Practice
BRAC	Base Realignment and Closure
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CA	Chemical Agent
CAA	Clean Air Act
CAO	Certificate of Authority to Operate
CEA	Classification Exception Area
CECOM	U.S. Army Communications and Electronics Command
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CERFA	Community Environmental Response Facilitation Act
CFR	Code of Federal Regulations
CORRACTS	Corrective Action Activity
CWA	Charles Wood Area
CY	Cubic yard
DCE	Dichloroethene
DDD	Dichlordiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethene
DDT	Dichlorodiphenyltrichloroethane
DER	Declaration of Environmental Restriction
DES	Directorate of Emergency Services
DMM	Discarded Military Munitions
DoD	U.S. Department of Defense
DPW	Directorate of Public Works

Acronym	Full Title
DVD	Digital Versatile Disc
EA	Environmental Assessment
EBS	Environmental Baseline Survey
ECOM	U.S. Army Electronics Command
ECP	Environmental Condition of Property
EDR	Environmental Data Resources, Inc.
EEB	Enhanced Bioremediation
EPCRA	Emergency Planning and Community Right to Know Act
EPIC	Environmental Photographic Interpretation Center
EPR	Environmental Program Requirements
ERNS	Emergency Response Notification System database
ETD&L	Electronics Technology Devices Laboratory
EUL	Enhanced Use Leasing
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
FINDS	Facility Index System
FTMM	Fort Monmouth
FTTS	FIFRA/TSCA Tracking System
G.O.	General Officer
gpm	Gallons per minute
GW/SW	Groundwater/Surface Water
GWSL	Groundwater Screening Level
GWTS	Groundwater Treatment System
HIST	Historical
HRC	Hydrogen Releasing Compounds
HRR	Historical Records Review
HSA	Historical Site Assessment
HVAC	Heating, Ventilation, and Air Conditioning
IA	Installation Assessment
IAP	Installation Action Plan
ICIS	Integrated Compliance Information System
ICRMP	Integrated Cultural Resources Management Plan
ID	Identifier
IH	Industrial Hygiene
IMA	Installation Management Agency (Now IMCOM)
IMCOM	Installation Management Command
IRP	Installation Restoration Program
ISRA	Industrial Site Recovery Act
JCP&L	Jersey Central Power & Light Company
kVA	Kilovolt-ampere
kVp	Kilovolt peak
LBP	Lead-Based Paint
LQG	Large Quantity Generator
LRC	Logistics and Readiness Center
LTM	Long-Term Monitoring
LUST	Leaking Underground Storage Tank
mA	Milliamperes
MACOM	Major Army Command
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual

Acronym	Full Title
MC	Munitions Constituents
MEC	Munitions and Explosives of Concern
mg/kg	Milligrams per kilogram
mg/L	Milligrams per liter
MMRP	Military Munitions Response Program
MOA	Memoranda of Agreement
MOBIDIC	Mobile Digital Computer
MP	Main Post
MPPEH	Material Potentially Presenting an Explosive Hazard
MTBE	Methyl tert-butyl ether
MWR	Morale, Welfare, and Recreation
N.J.A.C.	New Jersey Administrative Code
NAGPRA	Native American Graves Protection and Repatriation Act
NEMCRSA	Northeast Monmouth County Regional Sewerage Authority
NEPA	National Environmental Policy Act
NFA	No Further Action
NFRAP	No Further Remedial Action Planned
NJ	New Jersey
NJDEP	New Jersey Department of Environmental Protection
NJPDES	New Jersey Pollutant Discharge Elimination System
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
NRHP	National Register of Historic Places
NWS	Naval Weapons Station
ORC	Oxygen Release Compound
OWS	Oil/Water Separator
PA	Preliminary Assessment
PADS	PCB Activity Database
PAH	Patterson Army Hospital
PAHC	Patterson Army Health Clinic
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethene
pCi/L	PicoCuries per liter
POC	Point of Contact
ppm	Parts per million
PVC	Polyvinyl Chloride
R&D	Research and Development
RA	Remedial Action
RAM	Radioactive Materials
RAO	Remedial Action Operation
RCI	Residential Communities Initiative
RCRA	Resource Conservation and Recovery Act
RDEC	Research, Development & Engineering Center
RDX	Cyclotrimethylenetrinitramine
REC	Recognized Environmental Condition
REMIS	Real Estate Management Information System
RI	Remedial Investigation
RQ	Reportable Quantity

Acronym	Full Title
RR	Railroad
SCR	Single Channel Radio
Shaw	Shaw Environmental, Inc.
SHWS	State Hazardous Waste Site
SI	Site Investigation
SMC	Senior Mission Commander
SPCC	Spill Prevention, Control and Countermeasures
SPCCP	Spill Prevention, Control and Countermeasures Plan
SPPP	Stormwater Pollution Prevention Plan
SQG	Small Quantity Generator
STP	Sewage Treatment Plant
SVE	Soil Vapor Extraction
TAL	Target Analyte List
TCE	Trichloroethene
TCL	Target Compound List
TCP	Traditional Cultural Property
TNT	Trinitrotoluene
TPH	Total Petroleum Hydrocarbons
TPHC	Total Petroleum Hydrocarbon Content
TSCA	Toxic Substance Control Act
TSDF	Treatment, Storage, and Disposal Facility
TVS	TECOM Vinnell Services
TWA	Treatment Works Approval
UPS	Uninterruptible Power Supply
USACE	U.S. Army Corps of Engineers
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USAEC	U.S. Army Environmental Command
USAEHA	U.S. Army Environmental Hygiene Agency
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
USC	United States Code
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Services
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground Storage Tank
UXO	Unexploded Ordnance
VA	Veterans Administration
VCP	Voluntary Cleanup Program
VI	Vapor Intrusion
VOA	Volatile Organic Analysis
VOC	Volatile Organic Compound
VSI	Visual Site Inspection
WOSAC	Worldwide Synchronization of Atomic Clocks

Definitions

Term	Definition
Base Closure Law	The provisions of Title II of the Defense Authorization Amendments and Base Closure and Realignment Act (Pub. L. 100-526, 102 Stat. 2623. 10 United States Codes [USC] 2687 note), or the Defense Base Closure and Realignment Act of 1990 (Pub. L. 101-510. Part A of Title XXIX of 104 Stat. 1808.10 USC 2687 note).
Base Realignment and Closure (BRAC) Environmental Coordinator (BEC)	An employee assigned to provide work as the lead BEC for a wide variety of technical situations and activity operational requirements, directing actions with regard to schedules, priorities, methods, materials, and equipment. The role of the BEC is to provide principle oversight for the Activity Base Commander, Lead Organization, and BRAC Division regarding all BRAC-related environmental programs for the installation.
Closure	All missions of the installation have ceased or have been relocated. All personnel positions (military, civilian and contractor) have either been eliminated or relocated, except for personnel required for caretaking, conducting any on-going environmental cleanup, and disposal of the base, or personnel remaining in authorized enclaves. In the context of this document, this may be referred to as “full closure.”
Discarded Military Munitions (DMM)	Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance (UXO), military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of, consistent with applicable environmental laws and regulations. (10 USC 2710(e)(2))
Disposal	Per Army Regulation (AR) 405-45, any authorized method of permanently divesting the Army of control of and responsibility for real estate and real property.
Environmental Baseline Survey (EBS)	A process by which a characterization of the environmental condition of a facility or property is conducted. An EBS is required by the Army for the transfer or acquisition of real property and identifies potential cleanup requirements and liabilities. See definition for Environmental Condition of Property (ECP).

Term	Definition
Environmental Condition of Property (ECP)	A management approach for providing efficient and effective development of a comprehensive environmental condition/liability characterization for a facility or property. The ECP process applies industry best practices and standards, provides effective oversight and quality assurance, and unifies the EBS and the Munitions and Explosives of Concern (MEC) Archives Search Report steps taken in prior BRAC rounds into a unified effort. The ECP is based on the Initial Site Investigation project approved by the Business Initiative Council. The Army's ECP Report meets Department of Defense (DoD) ECP Report requirements.
Excess Real Property	Per AR 405-45, any real property under the control of any Federal agency that the head of the agency determines is not required for agency needs and discharge of the responsibilities of the agency or the installation where the property is located. The excess status is assigned to the real property once a formal report of excess has been processed. Real property that has been determined excess to the Department of the Army must be screened with other DoD elements before it is excess to DoD.
Garrison Commander	Per General Order 4, August 22, 2002, Garrison commanders, on behalf of the regions and the Installation Management Agency (IMA) (currently known as Installation Management Command [IMCOM]) will have a responsibility to provide a standard level of base support to installation customers listed on the Army Stationing and Installation Plan. The Garrison commander is responsible for ensuring that training support and training enabler functions and activities are responsive to the needs of the senior mission commander on the installation in the execution of the senior mission commander's duties.
Installation	Per AR 405-45, an aggregation of contiguous or near contiguous, common mission-supporting real property holdings under the jurisdiction of or possession controlled by the Department of the Army or by a State, commonwealth, territory, or the District of Columbia, and at which an Army unit or activity (Active, Army Reserve, or Army National Guard) is assigned. An installation is a single site or a grouping of two or more sites for the purposes of real property inventory control. The real property accountability officer is at the installation level.
Installation Commander	Per AR 600-20, the installation commander is normally the senior commander on the installation. In addition to mission functions, the installation commander has overall responsibility for all real estate, facilities, base support operations, and activities on the installation.
Lead Organization	Per the BRAC 2005 Implementation Plan Guidance, the Army organization which will have the lead responsibility for preparation of an installation Implementation Plan. This will generally be the Army organization which has operational control of the installation identified in the BRAC recommendations.

Term	Definition
Local Redevelopment Authority	Any authority or instrumentality established by State or local government and recognized by the Secretary of Defense, through the Office of Economic Adjustment, as the entity responsible for developing the redevelopment plan with respect to the installation, or for directing implementation of the plan.
Material Potentially Presenting an Explosive Hazard (MPPEH)	Material potentially containing explosives or munitions (e.g., munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris); or material potentially containing a high enough concentration of explosives such that the material presents an explosive hazard (e.g., equipment, drainage systems, holding tanks, piping, or ventilation ducts that were associated with munitions production, demilitarization or disposal operations). Excluded from MPPEH are munitions within DoD's established munitions management system and other hazardous items that may present explosion hazards (e.g., gasoline cans, compressed gas cylinders) that are not munitions and are not intended for use as munitions.
Military Installation	Per Section 2910 of Title XXIX. Defense Base Closure and Realignment Act of 1990, as amended, the term "military installation" means a base, camp, post, station, yard, center, homeport facility for any ship, or other activity under the jurisdiction of the DoD, including any leased facility. This term does not include any facility used primarily for civil works, rivers and harbors projects, flood control, or other projects not under the primary jurisdiction or control of the DoD.
Munitions Constituents (MC)	Any materials originating from UXO, DMM, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions. (10 USC 271 0(e)(3)).
Munitions and Explosives of Concern (MEC)	This term, which distinguishes specific categories of military munitions that may pose unique explosives safety risks means: (A) UXO, as defined in 10 USC 2710(e)(9); (B) DMM, as defined in 10 USC 2710(e)(2); or (C) MC (e.g., TNT, RDX), as defined in 10 USC 2710(e)(3), present in high enough concentrations to pose an explosive hazard.

Term	Definition
Military Munitions	Military munitions means all ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the DoD, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants; explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives, and chemical warfare agents; chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, and demolition charges; and devices and components thereof. The term does not include wholly inert items; improvised explosive devices; and nuclear weapons, nuclear devices, and nuclear components, other than non-nuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 USC 2011 et seq.) have been completed. (10 USC 2710(e)(3)(A and B))
Personal Property	According to 41 Code of Federal Regulations (CFR) 102-36.40, personal property is defined as: “Any property except real property. The term excludes records of the Federal Government, and naval vessels of the following categories: battleships, cruisers, aircraft carriers, destroyers, and submarines.” “Related personal property” means any personal property that is an integral part of real property. It is either: 1) related to, designated for, or specifically adapted to the functional capacity of the real property and removal of this personal property would significantly diminish the economic value of the real property, or 2) determined by the Administrator of General Services to be related to the real property.
Real Property	AR 405-90: Real property consists of lands and improvements to land, buildings, and structures, including improvements and additions, and utilities. It includes equipment affixed and built into the facility as an integral part of the facility (such as heating systems), but not movable equipment (such as plant equipment). In many instances, this term is synonymous with “real estate.”
Realignment	Any action that both reduces and relocates functions and DoD civilian personnel positions, but does not include a reduction in force resulting from workload adjustments, reduced personnel or funding levels, skill imbalances, or other similar cause. A realignment may terminate the DoD requirement for the land and facilities on part of an installation. That part of the installation shall be treated as “closed,” and in the context of this document referred to as a “partial closure.”

Term	Definition
Senior Mission Commander (SMC)	The SMC is a General Officer (G.O.) with command oversight of one or more non-G.O. Installation Commanders. The SMC conveys Major Army Command (MACOM) mission priorities to the Installation Commander, and provides executive oversight and communicates installation management priorities not established by Headquarters, Department of the Army or IMA to the Installation Commander and Garrison Commander. SMC's orders from the General Officer Management Office will specify the installations for which they will serve as SMC.
Special Installation	An Army installation which is under administrative control of the Assistant Chief of Staff for Installation Management (ACSIM), yet operated and funded by a MACOM (e.g., Army Ammo Plant, Hospital, etc.) where there is a single Mission/Garrison Commander.
Unexploded Ordnance (UXO)	Military munitions that (A) have been primed, fused, armed, or otherwise prepared for action; (B) have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and (C) remain unexploded whether by malfunction, design, or any other cause. (10 USC 2710(e)(9) (A through C))

1 Executive Summary

Fort Monmouth (FTMM) is an Army installation occupying approximately 1,126 acres in Monmouth County in central New Jersey, approximately 40 miles east of Trenton. Fort Monmouth is comprised of two operational areas known as the Main Post (MP) and Charles Wood Area (CWA). A third area, the Evans Area, is located approximately 12 miles south of the MP. This Environmental Condition of Property (ECP) does not cover the Evans Area as this operational area was covered under an earlier Base Realignment and Closure (BRAC) closure. The coverage of this ECP Report is the entirety of FTMM. Fort Monmouth will hereafter be referred to as FTMM or the "Site" or "Property." When referred to separately the two operational areas will be referred to as CWA or MP. The U.S. Army Corps of Engineers (USACE), Baltimore District, managed the ECP evaluation and the preparation of this report documenting the findings. The MP encompasses the 637 acre area that is generally bounded by State Highway 35 to the west, Parkers Creek to the north, the New Jersey Transit Railroad (RR) to the east, and Main Street and State Highway 71 to the south. The CWA encompasses the 489 acre area bounded by the Garden State Parkway to the west, Tinton Avenue to the north, Maxwell Place and the New Jersey Transit RR to the east, and Pine Brook to the south. The purpose of this ECP is to determine the environmental baseline condition of the Property in preparation for a Real Property Disposal.

This ECP was developed in compliance with the Department of Defense (DoD) Directive 4165.66 guidance, Base Redevelopment and Realignment Manual (1). The Historical Site Assessment (HSA) was undertaken concurrently with the ECP (see **Addendum 1**).

This Executive Summary provides a brief description of the current and former uses of the installation and areas of potential environmental concern that were evaluated during the ECP process. Detailed information associated with the summary presented below is provided in the remaining sections of this document.

1.1 Site Description and Historical Use

The primary mission of FTMM is to provide command, administrative, and logistical support for Headquarters, U.S. Army Communications and Electronics Command (CECOM). The support provided by the Garrison is used by tenant activities in the performance of research, development, procurement, and production of prototype communications and electronics equipment for use by the United States Armed Forces. The MP provides supporting administrative, training, and housing functions, as well as many of the community and industrial facilities for FTMM. These facilities are distributed across the property, with no distinct clustering of functions. The CWA is used primarily for research and development (R&D), testing, housing, and recreation. The CWA research, development, and testing facilities occupy the southwest corner of the subpost. The northwest corner formerly held residential units but is currently undeveloped. Residential units currently occupy the southeastern boundary and the golf course occupies the northeast corner. Currently, the workforce population at FTMM

includes approximately 537 members of the active military, 8,602 civilians, 3,200 permanent contractors, 514 family members, and 30,300 retirees and family members in the area (19,20).

Fort Monmouth is located in the central-eastern portion of New Jersey in Monmouth County, approximately 45 miles south of New York City, 70 miles northeast of Philadelphia, and 40 miles east of Trenton, the State Capital. The Atlantic Ocean is approximately 3 miles to the east. Fort Monmouth falls within the Boroughs of Eatontown, Oceanport, and Tinton Falls. The areas surrounding FTMM are characterized by a mixture of residential, commercial, and light industrial uses. A review of the land use plans for the surrounding municipalities shows that land uses in the surrounding municipalities are compatible with those along the inside perimeter of the Site. Fort Monmouth occupies approximately 1,126 acres and is currently comprised of two operational areas, the MP and the CWA. The two areas are located about 2 miles from one another (3). Formerly FTMM also included the Evans Area which located approximately 12 miles south of the MP. This ECP does not cover the Evans Area as this operational area was covered under an earlier Base Realignment and Closure (BRAC) closure.

Both the MP and CWA are nearly level except for short, steep slopes along streams and waterways. Topographic gradient slopes gently to the east in both areas, within the drainage network of local tributaries to the Shrewsbury River. Elevations at the MP range from about 6 feet above mean sea level (amsl) at stream edges to 30 feet amsl near the center of the post. Elevations at the CWA range from about 27 to 60 feet amsl. The lowest elevations are along Wampum Brook near the eastern property boundary (4).

The MP and CWA were acquired by the Army at different times but have similar pre-military land use. Prior to being acquired by the Army both the MP and CWA were used for recreation, agriculture and to a lesser extent, housing. The historical use of the MP and CWA are summarized below.

1.1.1 Main Post

The original FTMM Army camp, established for signal troop training in 1917, was located at Little Silver, New Jersey. The majority of MP property was previously developed as the Monmouth Park Race Track, dating from 1870 to 1893. The one-mile horse racing track was located in the vicinity of Patterson Army Health Clinic (PAHC) near the intersection of Broad Street and Park Avenue. A larger Monmouth Park was constructed and opened on July 4, 1890. The oval track was centered on present day Greeley Field. Grandstands and a luxury hotel along Parkers Creek were part of the associated land uses. The entire facility encompassed 640 acres of land, the majority of which later became part of MP. Vacated buildings and structures fell into ruin and the hotel burned to the ground in 1915. The land was owned by Melvin Van Keuren when it was evaluated for use by Camp Little Silver. The Army leased 468 acres from Mr. Van Keuren on May 16, 1917. The land was farmed with potato crops for at least four years prior to this lease (5,6).

The MP of FTMM was established on June 17, 1917, as Camp Little Silver. The name of the Camp was changed after 3 months to Camp Alfred Vail. The initial mission of the Camp was to train Signal Corps operators for service in World War I. In the first 19 months of the Camp's existence, 129 semi-permanent structures were built, a tent camp was established on the site of a former swamp, and a parade ground was established on the site of a former marsh. A radio laboratory and an airfield were developed in 1918. After the war, Camp Vail was designated as the site of the Signal Corps School, the only training area for Signal Corpsmen in the country. All but four World War I structures were demolished by 1924 (5,6).

In 1925 the facility became a permanent post and its name was changed to FTMM. The primary mission of FTMM continued to be Signal Corps training and electronics research. In 1934, laboratory operations were consolidated in a new facility, Squier Laboratory (Building 283). Research on radios and radar continued here until the early 1950s. During World War II, the pace of training increased tremendously at FTMM. The expanded laboratory effort was accomplished by starting new laboratories at other post facilities. Squier Laboratory continued to be the principal laboratory on MP until 1954. In 1955 and 1956, 72 World War II wooden structures were demolished to make room for permanent structures. These new buildings were used for residential, administrative, commercial, and recreational purposes. A small number of additional administrative buildings were completed during the 1970s, 1980s, and 1990s (5,6).

During World War II, the Camp was used for training Signal Corpsmen. Antenna shelters were constructed on 26.5 acres of land and used by the Signal Corps Laboratory for R&D purposes (5,6).

1.1.2 Charles Wood Area

The CWA area was acquired by the Army in 1941. The CWA tract included the former Monmouth County Country Club (originally Sun Eagles Country Club), Olmstead Gardens, and areas currently occupied by the golf course and Myer Center. The Sun Eagles Country Club was constructed in the 1920s and included a clubhouse (currently Gibbs Hall), an eighteen-hole golf course, a polo field, and an airfield (6). A 7,000 troop cantonment area was immediately built on the land including barracks, mess halls, a school building, an office building, a recreation hall, a Post Exchange, an infirmary, and a Chapel. The southeast corner of CWA was developed for R&D, including Eatontown Laboratories. Eatontown Laboratory was constructed in 1941-1942. The Eatontown Signal Laboratory was renamed Watson Laboratories in 1945 and subsequently moved to Rome, New York in 1951 (5). A new R&D facility, the Myer Center (Building 2700), was completed in 1954. R&D activities that had formerly been conducted at Squier Laboratory and some activities from the Evans Area were transferred to the Myer Center. To this day, laboratories within the Myer Center facility continue to develop state-of-the-art electronic and communications equipment for use by the U.S. Armed Forces (5,6).

1.2 Areas Assessed for Environmental Concern

The following information was obtained through review of general property information, observation of neighboring properties, research of available historical information, interviews with knowledgeable parties, an environmental records search, and a site reconnaissance.

1.2.1 Installation Restoration Program

The FTMM Installation Restoration Program (IRP) identifies environmental cleanup requirements at each site or area of concern (AOC) on the facility and proposes a comprehensive, installation-wide approach, with associated costs and schedules, to conduct investigations and necessary remedial actions (RAs). Currently, 43 IRP sites are managed or closed under the program. The following site types are listed in the Army Environmental Database Restoration (AEDBR):

- 3 Aboveground Storage Tanks (ASTs)
- 2 Incinerators
- 1 Maintenance Yard
- 4 Sewage Treatment Plants (STPs)
- 1 Surface Disposal Area
- 6 Underground Tank Farms
- 1 Burn Area
- 2 Industrial Discharges
- 3 Pesticide Shops
- 4 Spill Site Areas
- 2 Underground Storage Tanks (USTs)
- 1 Contaminated Fill
- 9 Landfills
- 2 Pistol Ranges
- 2 Storage Areas

Details of each individual IRP site are presented in **Section 5.2.1** of this document. The majority of the IRP sites at FTMM are listed as response complete in the AEDBR database indicating that no further action (NFA) under the IRP is planned by the Army at these sites. The Army currently has 15 active sites on the MP and two active sites in the CWA. The remainder of the sites are listed as response complete.

As part of this ECP, the IRP documents were reviewed to determine if the environmental condition of each IRP site constituted a recognized environmental condition (REC). All RECs are documented in the ECP parcel table contained in **Appendix A**.

1.2.2 Military Munitions Response Program

In 2006, a Historical Records Review (HRR) report was published to document the condition of FTMM regarding munitions use. The HRR was conducted prior to the final BRAC 2005 recommendation. It was conducted as part of the Military Munitions

Response Program (MMRP) and was expedited due to the potential final listing of FTMM for BRAC 2005. The HRR focused on properties eligible for action under the MMRP. This includes sites classified as operational training ranges/areas, and sites classified as other munitions facilities and facilities that were or are used for, or are permitted for, the treatment or disposal of military munitions.

The purpose of the HRR was to collect the appropriate amount of information necessary to document historical information for MMRP eligible sites, operational training ranges/areas, and other munitions-related hazard sites at FTMM. The installation-wide HRR addressed munitions and explosives of concern (MEC), hazards (including unexploded ordnance [UXO]) and discarded military munitions (DMM), as well as munitions constituents (MC).

As part of this ECP, the HRR results were reviewed in conjunction with all other available data. Based on this review, one site (the 1940-1955 Pistol Range) was determined to be a REC. The MMRP is discussed in **Section 5.2.2**.

1.2.3 Compliance Cleanup

No compliance cleanup sites have been identified in the compliance cleanup database for FTMM.

1.2.4 Previous Environmental Investigations

The first extensive, installation-wide environmental investigation completed at FTMM was the 1980 installation assessment (48). This installation assessment was the first systematic evaluation of toxic materials and hazardous waste handling and disposal at FTMM and the potential for these substances to migrate off the installation. This installation assessment identified a number of potential sites for follow-up investigation. A preliminary assessment (PA) was implemented to investigate each of the identified sites, plus additional sites which were identified by the Directorate of Public Works (DPW) and the New Jersey Department of Environmental Protection (NJDEP). Concurrent with this PA phase, a site investigation (SI) work plan was developed. The PA/SI work plan outlined field activities for investigating 23 sites (13 MP sites and 10 CWA sites). The Final SI Report included recommendations for 18 AOCs (11). These sites were addressed in the FTMM IRP and numerous site-specific reports have been completed. The description and status of each of the IRP sites discussed above is addressed in detail in **Section 5.2.1**.

In support of construction activities under the U.S. Army's Residential Communities Initiative (RCI) and Enhanced Use Leasing (EUL) programs, SI, remedial investigation (RI), and RA activities were performed at the 800, 700, and 400 Areas from May 2003 to April 2005 (141). The primary objective of these activities was the characterization of environmental conditions at these three sites and the performance of RAs including the removal and disposal of all soil with concentrations above state criteria. A secondary objective was to identify, locate, and remove historic USTs and/or buried construction debris at each of the areas.

The Final RA Report for the 800, 700, and 400 Areas concluded that all objectives of the SI, RI and RA were met. Soils with concentrations that exceeded the applicable criteria for each area were removed as verified by post-excavation samples and all known USTs were removed and remediated. Therefore, the Army requested that NJDEP issue an NFA letter for the three areas.

The results of these environmental investigations were utilized to evaluate the potential for environmental conditions at FTMM. See **Section 5.2.4** for additional details.

1.2.5 Hazardous Substances

Fort Monmouth has a long history of R&D activity. The majority of this activity has been related to communications and electronic equipment. For the completion of these research activities, FTMM has operated and continues to operate a variety of laboratories. Additionally, FTMM has a significant history of training and housing troops. In support of these activities FTMM has had a full complement of support activities including vehicle maintenance, warehousing, medical and dental services, photo processing and printing. Hazardous substances and radioactive materials (RAM) related to these activities were identified. Fort Monmouth has no operational history of manufacturing chemicals, munitions, or MC. Therefore, no hazardous substances related to those operations were identified.

On the MP, 22 individual parcels were identified that had a history of use/storage of hazardous substances or currently used/stored hazardous substances. These activities were predominantly associated with laboratory operations, vehicle maintenance, hazardous waste storage/disposal, and range activity. At the CWA, nine individual parcels were identified that had a history of use/storage of hazardous substances or currently used/stored hazardous substances. These parcels were predominantly associated with laboratory operations, hazardous waste storage, battery research, and vehicle maintenance. There are a total of 38 FTMM parcels (nine on CWA and 29 on MP) where the potential for a release or a documented release of hazardous substances has occurred. **Section 5.3** includes a full discussion of hazardous substances on FTMM.

1.2.6 USTs/ASTs

The primary fuels used throughout the history of FTMM have been coal, fuel oil, diesel, and gasoline. Until the early 1990s, the primary method of heating for FTMM had been through the use of heating oil. The majority of structures at FTMM were heated by oil burners fired by oil stored in USTs for that individual building. From the 1940s through the 1980s, FTMM utilized USTs/ASTs as the primary fuel storage method. Fuels were brought in by rail and staged in very large ASTs prior to being transported to the individual USTs. The large ASTs used to stage the fuel were two 210,000-gallon ASTs at Building 75 and one 250,000-gallon AST at Building 886. In the early 1990s, the FTMM DPW developed a UST program for managing approximately 474 USTs throughout the FTMM installation (MP and CWA). This program was created to work toward replacing the use of heating oil as a major energy source and to convert to

natural gas. The DPW's approach involved installing new gas lines and new gas-fed boilers and removing the out of service USTs. Only 13 USTs remain in service at MP and CWA, none of which are used to store heating oil. All buildings at the MP and CWA are heated by means of natural gas with the exception of several buildings that are heated and cooled through geothermal heating and cooling systems. It should also be noted that the homes located at the trailer park are propane heated (7,8,9).

Diesel fuel is stored in emergency generator day tanks throughout the facility to maintain critical systems during times of power disruption. Emergency generator unit sizes and locations are discussed in **Section 4.4.4**. Additionally, nine vehicular mobile emergency generators and one skid-mounted emergency generator, ranging in size from 45 to 200 kilowatts, are stored at MP Building 750 for use throughout the facility.

Fort Monmouth has a comprehensive and thorough tank management program. The disposition of current and former UST/ASTs are summarized in **Section 5.4**. This tank disposition was used in determining the potential presence of environmental conditions associated with petroleum storage.

1.2.7 Non-UST/AST Petroleum Storage

As stated above, the majority of fuel storage was in tanks. However, FTMM has multiple areas that were formerly used for motor pools, vehicle repair, and vehicle storage. All of these areas stored small amounts of petroleum.

1.2.8 PCBs

The electrical distribution system located on FTMM properties is owned and operated by the U.S. Army. The electrical distribution system is comprised of transformers, oil switches, circuit breakers and voltage regulators. The MP has approximately 372 oil-filled pieces of electrical equipment of which 194 units are pole mounted, 135 are outside pad mounted and 43 are inside pad mounted. The CWA has approximately 254 oil-filled pieces of electrical equipment of which 171 units are pole mounted and 83 are outside pad mounted. Presently, five electrical substations are maintained and operated by the DPW. Three substations are located on the MP and two are located in the CWA (8).

The FTMM PCB management program consists of determining the level of PCBs in all electrical transformers and removing all PCB-class transformers. Prior to 1988, all oil-filled electrical equipment at FTMM was assumed to be PCB-class equipment and was labeled as such. In November 1988, FTMM initiated a program to sample and analyze all equipment that did not have a manufacturer's label indicating that it was Non-PCB. Testing of all oil-filled transformers, capacitors, voltage regulators, and switches was completed by June 1990. Thirty-three pieces of equipment were identified (CWA, MP and Evans) as being PCB class, 96 as being PCB-contaminated, and 520 as being Non-PCB. In addition, 224 pieces were identified, from the manufacturer's nameplate, as being Non-PCB (10). **Section 5.5.1** presents a summary of the program including sample locations and dates.

As stated above, the majority of the issues related to PCB containing equipment have been resolved. There are some PCB issues that have been addressed as part of the IRP (i.e., CW-7, FTMM-47, and FTMM-09). A few issues related to PCBs remain unresolved. Storage of transformers behind Building 167 took place in the past. No documented spills were noted and no environmental samples were collected in the area. Additionally, a subset of current/former transformer pads had samples of the surrounding soil collected and analyzed for PCBs. PCBs were detected in some soil samples (11). Records of remediation were found, except for Building 292.

1.2.9 Asbestos-Containing Materials

Fort Monmouth has actively investigated and managed asbestos-containing materials (ACM). Out of 470 buildings managed as part of the DPW asbestos program, 191 buildings have been surveyed and an additional 153 buildings are similar enough to surveyed buildings so that survey results can be used to assess the building status. FTMM also has actively removed asbestos as part of building renovations. A total of 72 buildings have been gutted or constructed after 1987 so that there are no ACM concerns. There are 54 buildings where a survey has not been performed. **Section 5.6** presents a summary of asbestos surveys, remediation, and results at FTMM. Due to the age of the facilities and the limited number of buildings remediated thus far, ACM potentially exists at the majority of buildings on FTMM (12,13).

1.2.10 Lead-Based Paint

Most facilities and buildings at FTMM were constructed before the DoD ban on the use of lead-based paint (LBP) in 1978 and are likely to contain one or more coats of such paint. In addition, some facilities constructed immediately after the ban may also contain LBP, because inventories of such paints that were in the supply network were likely to have been used up at these facilities (14,15,18).

The first LBP Risk Assessment was conducted in 1996. The residential buildings assessed were divided into four groups based on similar construction histories and a representative group of surveys was conducted for each area. The majority of the areas where LBP was identified were subsequently demolished or renovated. However, some residential structures have not had any removal or encapsulation performed (14,15,18). Currently there are 177 residential buildings at FTMM, many of which contain multiple housing units. The current status of the 177 residential buildings includes: 29 buildings that have been completely gutted and all exterior LBP surfaces removed or encapsulated; 55 have had all exterior LBP encapsulated; and 93 have had no abatement. **Section 5.7** presents a discussion LBP issues.

1.2.11 Radiological Materials

The presence of RAM at FTMM has been predominantly limited to certain areas and functions of the installation. Historically, laboratory R&D in the areas of radio and electronics, use of vacuum tubes and radium dials, use of ionizing radiation-producing machines, and use of military support equipment such as night vision goggles that contain radioactive commodities, have been among the activities most commonly using

RAM. Facilities, buildings, and rooms that contain or once contained equipment that produce X-rays via AC or DC sources of energy are not sources of radioactive contamination. This equipment, which includes medical and dental diagnostic X-ray machines, X-ray security inspection machines, X-ray diffraction, electron microscopes, X-ray fluorescence equipment, and some high voltage electron tubes, only produce ionizing radiation when energized. Operation of this equipment will result in ionizing radiation fields being produced in and around the equipment only while activated, but will not result in radioactive contamination. Much of the activities of the past were performed as part of the Signal Corps Laboratories, first housed in the Squier Building (Building 283) and then in the Myer Center (Building 2700). Other work was performed in the Evans Area of the base, which was closed in the late 1990s due to BRAC 93 activities, and the work transferred to the CECOM safety office and laboratory in the CWA.

Presently, a research laboratory in Building 2540 in the CWA is the only site to regularly use and store RAM as part of the R&D activities performed on site. A designated storage area is set aside for drums containing material waiting for disposal including tritium exit signs removed from FTMM buildings, smoke alarms containing RAM, and other instruments with associated check sources. These items are periodically taken to Wright Patterson Air Force Base for disposal/recycling. The administrative arm of the CECOM Safety Office is housed in the adjacent Building 2539 where they maintain files pertaining to the use of any RAM on the installation as well as active Nuclear Regulatory Commission (NRC) licenses and Army Radiation Authorizations (ARAs) for FTMM specifically as well as RAM use by the Army worldwide.

Throughout FTMM, equipment containing RAM is noted, particularly as used in chemical and explosives detectors operated by personnel working in security entrance areas, postal facilities, emergency responders, and shipping areas. Electron Capture Detectors containing Ni-63 are used in the Environmental Laboratory to analyze samples for pesticides and PCBs. All of these types of equipment involve the use of sealed sources rather than research-type materials. Sealed sources are also not generally sources of radiological contamination. As reported in the 2007 HSA and summarized above, four (4) buildings at the Property were found to be potentially impacted from historical use of RAM. The buildings and survey areas found to be potentially impacted included building Nos. 275, 283, 292, and 2540. See **Section 5.8** for a full discussion of issues related to RAM at FTMM.

1.2.12 Radon

A comprehensive radon survey was conducted in 1989 by the Directorate of Engineering and Housing's Environmental Office as part of the Army's Radon Reduction Program. The survey was conducted for all of FTMM. Radon detectors were deployed in all structures designated as priority one buildings (daycare centers, hospitals, schools, and living areas). The radon levels measured in all detectors were less then 4 picoCuries per liter (pCi/L). Based upon the U.S. Environmental Protection Agency (USEPA) criteria for radon of 4 pCi/L, radon levels at FTMM do not pose a health risk

and NFA was deemed required for radon at FTMM (16). See **Section 5.11** for a discussion of the FTMM radon program.

1.2.13 Munitions and Explosives

There are 16 active ranges at FTMM in addition to four closed/inactive ranges. Of the 16 active ranges, one is a new modern indoor range and the remaining 15 have no history of munitions use and therefore are not included in the MMRP. Three closed/inactive ranges were recommended for additional evaluation by the 2006 HRR. These include the Former Outdoor Firing Range (1940-1955 Pistol Range), the Former Pistol Range (1935-1940 Pistol Range), and the former skeet range (17).

1.2.14 Surrounding Properties

Potential environmental sites of concern, located within corresponding search radius distances from the Property, were evaluated. Adjacent property use and condition were evaluated by a visual site inspection (VSI) conducted in August 2006. The character of land use surrounding the FTMM properties typifies mixed-use development in New Jersey. Commercial services and shopping centers populate main roads, periodically interspersed with a residential structure, apartments, or an office building. New tracts of housing subdivisions offer privacy from commonly traveled roads. Old residential development is characteristically along grid-style side roads and becoming quickly encroached with small business and commercial service endeavors. Business and light industrial parks are tucked away along highways, streams, and RR tracks. During the adjacent property inspection, properties were observed that were noted in the search of the required databases. Potential impacts from adjacent properties are summarized in **Section 5.18** of the document.

Adjacent properties have impacted the surface water quality of FTMM. Historically, discharges to surface water from industrial properties upstream of MP have impacted FTMM surface water quality. Historically, there was concern that FTMM sewage plants were degrading surface water quality. In response to NJDEP concerns that sewage discharges were causing deleterious effects on Parkers Creek, an evaluation of the effluent and the receiving streams was performed in 1971. The evaluation concluded that the effluent met all written requirements of federal, state and local water pollution agencies. There was no visual evidence of contamination, no noticeable sewage odor and the color and turbidity of the effluent were less than that of the receiving stream (98). A thick black sludge layer was identified in Parkers Creek, which was largely attributable to historically deposited sewage from the MP STP (91). Another evaluation of the impact of wastewater discharges on the environment concluded that the impact was minimal (99). It was noted that the condition of the streams entering the installation were of similar or poorer quality due to a variety of upstream industrial operations such as styrofoam cup manufacturing, metal plating and photo processing as well as domestic discharges. Water samples collected from Wampum Brook upstream of the CWA STP outfall indicated no evidence of life in the brook (91).

Based on the historical assessments of MP surface water discussed above and recent surface water monitoring data, the most severe impacts to surface water were the result of historical discharge from industrial sites upstream of FTMM. Additional discussion of FTMM surface water quality is presented in **Section 4.4.2.2** of this document.

1.3 Recognized Environmental Conditions

Based on the information revealed in this ECP, RECs were identified in connection with the Property.

Recognized Environmental Conditions as defined by American Society for the Testing of Materials (ASTM) D6008-96 (2), Standard Practice for Conducting Environmental Baseline Surveys, are "the presence or likely presence of any hazardous substances or petroleum products on any federal real property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into the environment." As part of the ECP, documented releases of hazardous substances and petroleum were researched and each parcel with a documented release was labeled HR or PR in the ECP parcel label (**Appendix A**). Each parcel with the potential for a release of a hazardous substance or petroleum into the environment was labeled HR(P) or PR(P) in the ECP parcel label. A total of 38 parcels were identified where a documented release/potential release of a hazardous substance occurred. A total of 48 parcels were identified where a documented/potential release of petroleum occurred. It should be noted that releases and potential releases were noted for historic operations. No current FTMM operations were found to have the potential for a release of a hazardous substance or petroleum.

1.4 Conclusions

Nine Community Environmental Response Facilitation Act (CERFA) parcels were identified as uncontaminated property comprising approximately a total of 589.4 acres. Historical records reviewed and the VSI found no indication that the release or disposal of hazardous substances or their derivatives has occurred in these areas, including no migration of these substances from adjacent areas. Additional details on the parcels can be found in **Appendix A**.

2 Purpose

2.1 General

The ECP report meets the U.S. DoD requirement to prepare an ECP Report per DoD 4165.66-M, *Base Redevelopment and Realignment Manual* (21). The ECP was performed to collect reliable information to determine the property's suitability for out grant or transfer and to meet the requirements under Title 40, Code of Federal Regulations (CFR), Part 373, § 373.1, and U.S. Army Regulation (AR) 200-1, *Environmental Protection and Enhancement*. The information gathered during this assessment will also be used with the objective of assisting the U.S. Army, the General Services Administration, and the purchaser in making informed business decisions about the transfer of the property by reducing uncertainty regarding its environmental condition.

The Army prepares an ECP for the following purposes:

- Identify, characterize and document RECs.
- Identify, characterize and document the release or possible release of any hazardous substances or petroleum products from an adjacent property that would likely cause or contribute to contamination at the installation.
- Provide a basis for determining if the property is suitable for transfer, lease, or assignment.
- Provide information to satisfy legal requirements including the following:
    - Notification requirements under §120(h)(1) and (3)(A)(i) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and state or local real property transfer requirements.
    - Uncontaminated parcel identification requirements of Section 120(h)(4) of CERCLA.
    - State or local real property transfer requirements that are applicable to the federal government and the transaction.

The purposes of the ECP as identified in DoD 4165.66-M, C8.3 are as follows:

- Provide the Military Department with information it may use to make disposal decisions regarding the property.
- Provide the public with information relative to the environmental condition of the property.
- Assist in community planning for the reuse of BRAC property.

- Assist Federal agencies during the property screening process.
- Provide information for prospective buyers.
- Assist prospective new owners in meeting the requirements under EPA's "All Appropriate Inquiry" regulations.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and liabilities with other parties to a transaction.

The ECP report contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice accompany contracts for the sale of, and deeds entered into for the transfer of, federal property on which hazardous substances may have been stored, released, or disposed of. CERCLA §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property for one year or more—specifically, quantities exceeding (21) 1,000 kilograms or the reportable quantity (RQ), whichever is greater, of the substances specified in 40 CFR 302.4, or (4) 1 kilogram of acutely hazardous waste as defined in 40 CFR 261.30. A notice is also required if hazardous substances have been disposed of or released on the property in an amount greater than or equal to the RQ. AR 200-1 requires that an ECP address asbestos, LBP, radon, and other substances potentially hazardous to health.

The ECP report is not prepared to satisfy a real property purchaser's duty to conduct an "appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP by any party is outside the control of the Army and beyond the scope of the ECP. The Army, its officers, employees, or contractors make no warranties or representations that any ECP report satisfies any such requirements for any party.

2.2 Scope

The ECP covers all of FTMM in Monmouth County, New Jersey. The ECP includes the 637-acre MP and the 489-acre CWA. This ECP does not cover the Evans Area as this parcel was covered under an earlier BRAC closure. The MP property encompasses the area that is generally bounded by State Highway 35 to the west, Parkers Creek to the north, the New Jersey Transit RR to the east, and Main Street and State Highway 71 to the south. The MP has 397 existing buildings and structures (4). CWA encompasses the area bounded by the Garden State Parkway to the west, Tinton Avenue to the north, Maxwell Place and the New Jersey Transit RR to the east, and Pine Brook to the south. The CWA has 241 existing buildings and structures (4). Each tract is roughly rectangular in shape. A facility location map is provided as **Figure 1**, and current site maps are provided for MP and CWA on **Figures 2 and 3**, respectively.

2.3 Limitations

This ECP report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets at FTMM. Its findings are based on a record search of around 4,551 documents (including documents, images and databases). Extensive environmental investigations and reports and site historical documents were reviewed in support of this ECP. Information obtained from these other studies is reflected within this ECP report by reference. A complete list of references is provided as **Section 8**.

VSIs were conducted from automobiles and on foot as appropriate, to ensure the inspection was conducted to the degree necessary to determine hazardous material storage, use, release or disposal points. The VSI included a driving tour of the entire facility and facility perimeter. Additionally, systematic surveys on foot of some sections of the property were conducted. Therefore, although not all of the buildings were inspected with the same level of detail, all of the facilities were visualized. The number of structures requiring a detailed VSI was reduced by inspecting a representative number of structures and sections of the installation with similar land use at which no potential for environmental release was identified (i.e., a small subset of residential and administrative structures). The list of buildings requiring a detailed VSI was reviewed and approved by FTMM personnel with knowledge of the installation. During the VSIs, the entire perimeter of the installation was driven, along with each road on the installation. In cases where the operational history dictated the potential for hazardous material storage, use, or disposal, those sections of the facility and the interior of buildings were inspected. Accessible common areas, maintenance areas, and a representative sampling of occupied areas were inspected. A total of 74 buildings were visited at the MP and 48 buildings at the CWA. A summary of the buildings visited is included in **Appendix L**.

2.4 Report Organization

The remainder of this report expounds on the ECP setting, method, and findings. **Section 3** describes the methods used to conduct the ECP. The environmental database review is also presented in **Section 3**. **Section 4** provides a description of the FTMM environment and an overview of facility operations, history and utilities. Environmental conditions on FTMM are presented in **Section 5**, including a discussion of permits and licenses, cleanup programs, specific environmental contaminants, and an identification of uncontaminated property. **Section 5.17** addresses outstanding regulatory compliance issues. A summary of findings for the buildings and real property is also included in **Section 5**. A signed copy of approval of requirements and completion is included in **Section 7**. **Section 9** is a listing of the documents referenced in this report.

Addendum 1 is a copy of the HSA report (22).

3 Survey Methodology

3.1 Development of Study Sections

The information gathered during the development of the ECP was used to group areas at FTMM into standardized parcel categories (ECP Parcels) using DoD guidance.

The ECP Category 1 parcels are areas where no release or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas) and a VSI indicates that both the buildings and land are uncontaminated. These ECP Category 1 parcels can have disclosure factors for cultural resources, historic resources, ACM, LBP, radionuclides/radiological issues, radon, PCBs, and UXO, where applicable.

CERFA Disqualified Parcels (Category 2 through 7) are those areas where there has been release or disposal of CERCLA hazardous substances or petroleum products. The designations for each parcel are presented in **Appendix A**.

3.2 Visual Site Inspection

A VSI involving a driving tour of the facility and its perimeter, as well as a systematic survey by vehicle and on foot through each section of the property, was conducted July 10, 2006, through July 21, 2006, to field verify information produced in the document review and to identify potential environmental concerns. All roads on the facility accessible by two-wheel drive vehicle were driven during the VSI. All areas of the facility were visited and all building areas were seen by the VSI team. A VSI was performed for 122 buildings selected as a representative sample from groups of similar buildings. Representative inspections were utilized for sections of FTMM with similar land use and/or building type. Buildings/areas with documented RECs were inspected. Inspections were performed on a subset of buildings for which there was no documentation of a REC or based on operational history, the potential for environmental release was limited. **Appendix L** contains a listing of VSIs performed as part of this ECP and presents the rationale for the selection of representative structures.

A reconnaissance of the base perimeter was conducted to evaluate adjacent property uses that could contribute to any environmental contamination detected on site. The field team drove on roads along the perimeter to visually identify any contiguous properties that appear, in the team's professional judgment, to have contamination that could migrate onto the installation. Typical properties that could pose a contamination risk are dry cleaners, gas stations, and industrial facilities. The findings of the perimeter survey are presented in **Section 5.18**.

3.3 Aerial Photography Analysis

Aerial photographic analysis has been conducted for FTMM. Photographs from fifteen separate years were examined under a stereoscope to potentially identify any significant areas of disturbance for the following purposes:

- Potentially identify any anomalies (e.g., large spills/stains, ground scars, debris piles, pits, possible disposal areas, etc.) that were not identified in previous investigations;
- Assist in tracking the history of FTMM operations; and,
- Assist in verifying the history, location, and extent of previously identified sites of known or suspected contamination.

While informative, aerial photographs alone are rarely conclusive. Anomalies may be attributable to a number of causes unrelated to environmental concerns. Therefore, the results of the aerial photographic analyses were evaluated and cross-referenced with the following:

- Results of the records review;
- Results of previous/ongoing investigations;
- Results of the physical site inspections; and,
- Results of interviews with FTMM employees.

Through a combination of the photographic interpretation and the above-listed factors, information pertinent to the environmental condition of the property was identified and used along with other evidence to determine RECs are present. The RECs identified for FTMM are presented in **Section 5**.

A review of aerial photographic analyses previously performed for FTMM was conducted as part of the ECP. A comprehensive aerial photographic analysis was conducted for the Installation Assessment (IA) Relook Program by the USEPA Environmental Photographic Interpretation Center (EPIC) in 1985 (26). The EPIC assessment covers historical aerial photography taken between 1940 and 1983 for both the MP and CWA of FTMM. An additional Aerial Photographic Site Analysis was prepared covering the CWA in 1993. Photographs covering the entire FTMM facility for the period from 1940 to 1983 were obtained from the Agricultural Stabilization and Conservation Service (ASCS), U.S. Geological Survey (USGS), Aero Service, Inc., and the U.S. Forest Service for the EPIC analysis. Photographs covering the CWA for the period from 1940 to 1991 were obtained from the National Archives and Records Administration, ASCS, USGS, and Integra Information Technology (Houston, Texas) for the Aerial Photographic Site Analysis (27). Twelve years of photography were examined under a stereoscope to identify any significant areas of disturbance. Potentially significant findings are discussed briefly below and are discussed in detail in

subsequent sections to which they are related. The aerial photograph reports reviewed are included in **Appendix J**.

Main Post. The first aerial photographs examined for MP were from 1940. In 1940 the MP was characterized by large swaths of undeveloped land in the central and western part of the facility. All major structures were on the eastern half of the MP. A small golf course is visible on the western half of the facility, which is otherwise relatively undeveloped. A comparison of the 1940 and 1947 aerial photos revealed significant development in the eastern three-fourths of the MP. MP was characterized by the development of the western portion of the facility in both the 1957 and 1963 photographs. The golf course no longer exists in the 1957 photograph and development of the western part of the MP is complete in the 1963 photograph. The most significant changes visible in the photographs from 1963 and those from 1969, 1970, and 1974 involve the creation of Husky Brook Lake on Husky Brook near the southwestern boundary of MP and ongoing land filling activities at IRP sites FTMM-2, 3, 4, 5, 8, 12, and 14. There were no significant changes between the 1974 and 1983 photographs.

Charles Wood Area. The first aerial photographs examined for CWA were also from 1940. In 1940, the CWA had not yet been developed, with large swaths of undeveloped woodland and farmland to the west. The east side of CWA is a golf course. A comparison of the 1940 and 1947 aerial photographs reveals little change on the eastern half of CWA with the exception of housing constructed along the southeastern boundary. Barracks have been constructed throughout the northwestern quarter of CWA. The southwestern quarter has been partially developed, although large swaths of undeveloped woodland remain. The CWA was characterized by the demolition of barracks in the northwestern quarter and the construction of the Myer Center (Building 2700) on the western boundary, which appears to be complete in the 1957 photograph. New buildings have been constructed in the northwest quarter in the 1963 aerial photograph. There were no significant developments between the 1963 and 1991 photographs.

The photographs reviewed are listed in **Table 3-1**:

Table 3-1
Aerial Photographs Reviewed

Date	View	Agency	Frame Number	Scale (Original)
May 10, 1940	MP	ASCS	10(55-57); 25(73)	1:20,000
July 2, 1940	CWA	ASCS, NARS	25(65-67); (73-74)	1:20,000
September 19, 1947	MP, CWA	ASCS	3D(55-57); (64-66); (81-83); (90,96); (90,91)	1:20,000
May 2, 1957	MP, CWA	ASCS	8R(144-146); (115,116), (106,107)	1:30,000; 1:20,000
May 13, 1963	MP, CWA	ASCS	3DD(210-212); 3DD(232-234)	1:20,000
November 30, 1969	CWA	USGS	1(74,75)	1:20,000

Date	View	Agency	Frame Number	Scale (Original)
December 6, 1969	MP, CWA	USGS	2(35-37)	1:24,000
June 13, 1970	MP, CWA	ASCS	1LL(23-25)	1:40,000; 1:20,000
April 1973	CWA	USGS	68(116,117)	1:40,000
March 13, 1974	MP, CWA	TXAERO, Intera	46S(1408-1410); (1426-1428); 45S(426-428)	1:24,000; 1:18,000
April 1975	CWA	USGS	005(1-3)	1:19,000
June 6, 1978	CWA	ASCS	178(10,11)	1:40,000
June 23, 1983	MP	USFS	EPIC# 83/043(054-057)	1:32,500
March 9, 1991	CWA	USGS	2999 (108,109)	1:40,000

Note: Photographs listed above include the Evans Area which is not assessed in the ECP.
TXAERO – Aero Service, Inc.

The review identified 19 storage areas and 21 other areas of potential concern. Nineteen of the areas are within the boundaries of existing IRP sites; and one of the remaining 21 is addressed in the MMRP. The additional areas were evaluated with all other existing information to determine if they should be classified as RECs. This information is presented in **Section 5**.

Main Post

- Coal storage along northern RR – 1940, 1947, 1969, 1970, 1974. This is identified as a REC and is discussed in **Section 5.13.1**.
- Coal storage along mid-post RR – 1947, 1957, 1963. This is identified as a REC and is discussed in **Section 5.13.1**.
- Open storage and revetted tank along northern RR and Parkers Creek – 1947, 1963, 1969, 1970, 1974.
- Vehicle/equipment/open storage near Building 116 – 1947, 1957, 1963, 1969, 1970, 1974.
- Possible incinerator west of Building 271 – 1947. This feature was re-examined and it was determined that the possible incinerator is likely a chimney/vent associated with the building heating unit.
- Fill area south of Building 114 – 1969, 1970, 1974.
- Fill area east of Building 114 –1957.
- Possible incinerator between Buildings 910 & 911 – 1957. This feature was not identified on any subsequent aerial photographs.

- Vehicle/equipment storage east of IRP site M-12 – 1947, 1957, 1963, 1969. No evidence of a release of hazardous substances were identified in this area in **Section 5**.

- Vehicle/equipment storage, historic filling and grading activities (see **Section 5.9**) in far southeast corner of MP – 1947, 1969.

- Ground stain from Building 293 – 1969, 1974. This building is associated with the Squier Laboratory operational area and is discussed in **Sections 4.3.2.1.6 and 5.13.6**. The potential for a releases to the environment caused by historic operations in this area are considered RECs.

- Magazine/Bunkers north of IRP site M-2 (MMRP site) – 1957, 1963. See **Section 5.2.2**.

Charles Wood Area

- Disturbed area and open storage between IRP sites CWA-3, CWA-3A and AOC 7 – 1947, 1957, 1963, 1969, 1974, 1978, 1991.

- Vehicle/equipment storage and wash rack north of Building 2261 – 1947.

- Open storage area with ground stain and ground scar east of Building 2560 – 1947, 1957, 1963, 1974, 1991.

- Ground scarring along northeast boundary – 1978.

- Storage bins east of Building 2525 – 1947, 1957. The potential for a release to the environment from Building 2525 operations associated with the Eatontown and Watson Laboratories is considered a REC and is discussed in **Sections 4.3.2.2.6 and 5.13.7**.

- Open storage and debris south of Building 2262 – 1947, 1957, 1963, 1969, 1991.

- Pit at Building 2290 – 1947.

- Plume emanating from off-post industrial site to Wampum Brook southwest of Building 2705 –1970. See **Section 4.4.3**.

- Open storage and debris southwest of Building 2705 – 1969, 1970, 1974.

3.4 Records Review

3.4.1 Standard Environmental Record Sources

A search of state and federal environmental databases was undertaken for the facility and any listed sites within standard search distances. As part of this ECP, Environmental Data Resources, Inc. (EDR) performed two area studies. The first area study was performed for the MP (23) and the second for the CWA (24). The findings of

the search are summarized below and the complete search results are provided in **Appendix K**.

3.4.1.1 Main Post Standard Environmental Record Results

Table 3-2
Main Post Standard Environmental Record Results

Record(s) Source for FTMM MP	Number of Sites	Minimum Search Distance (miles)
Federal NPL Facilities	0	1.0
Federal RCRA CORRACTS Facilities	1	1.0
Federal CERCLIS Facilities	0	0.5
Federal CERCLIS-NFRAP Facilities	0	0.5
Federal RCRA TSD Facilities	0	0.5
Federal Engineering Controls	0	0.5
Federal Institutional Controls	0	0.5
Federal RCRA Large Quantity Generators	0	0.25
Federal RCRA Small Quantity Generators	21	0.25
Federal ERNS Sites	0	Property only
Federal FINDS Sites	0	Property only
New Jersey State Hazardous Waste Sites	73	1.0
New Jersey Publicly Funded Cleanup Sites	0	1.0
New Jersey CHROME Facilities	1	0.5
New Jersey State Landfill, Historic Landfill, and Approved Class B Recycling Facilities	3	0.5
New Jersey Active LUST Facilities	8	0.5
New Jersey Historical LUST Facilities	22	0.5
New Jersey Engineering Controls	1	0.5
New Jersey Institutional Controls	4	0.5
New Jersey Voluntary Cleanup Program Facilities	126	0.5
New Jersey Registered UST Facilities	19	0.25
New Jersey Hazardous Material Incident Database	10	Property only
New Jersey Spills	2	Property only

FTMM Main Post On-Site Facilities Summary

New Jersey Solid Waste Facility Directory. According to the New Jersey Solid Waste Facility Directory, one listing is reported for a FTMM MP landfill (Facility ID 1338000595) and Historic Landfill (Facility ID 1338001139) on Sherrill Avenue. According to the New Jersey Solid Waste Facility Directory, the 80-acre landfill site status is closed, but the database indicates it was not closed properly. Wastes

accepted include bulky waste and vegetative waste. Information provided during FTMM personnel interviews and 2006 VSI observations verify the reported information in the New Jersey Solid Waste Facility Directory is inaccurate (7). FTMM does not have an 80 acre closed landfill on its properties. Two landfills are located in close proximity to Sherrill Avenue. Landfill M-8 totals 7.2 acres and Landfill M-18 measures 4.1 acres. According to the New Jersey Solid Waste Facility Directory, two additional listings are reported for Historic Landfills on FTMM MP. Although listed as landfills in the New Jersey Solid Waste Facility Directory, they were not landfills. The two facilities were the closed compost facility on Alexander Drive (Facility ID 1338000596) and the closed compost facility near the golf course (Facility ID 1311001109). These facilities previously accepted vegetative waste only. According to facility personnel, only leaves generated from on-site activities were collected and managed at these locations (7). Please refer to **Sections 5.2.1 and 5.9** for additional information about landfills on FTMM property.

New Jersey Hazardous Material Incident Database. Ten incidents are reported for hazardous material releases on the FTMM MP.

- 202/173 Riverside Avenue, UST, 5/23/2005.
- Building 287, UST, 11/29/1993.
- Todd Avenue/Tindall Avenue, UST, 7/30/2003.
- Alexander Avenue/Todd Avenue, UST, 10/03/2003.
- Radio Avenue/Nicodemus Avenue, UST, 4/02/2004.
- Oceanport Avenue/behind Building 116, oil transformer PCB, 7/22/1991 and 1/02/2003.
- Building 296, ten USTs, 11/02/1993.
- Building 166, UST, 6/16/1994.
- Building 270, UST, 7/06/1994.
- Building 419, UST, 10/16/1996.

New Jersey Spills. Two incidents were reported to the Action Line for the FTMM MP.

- Leonard/Hazen Drive, UST, 5/18/2001.
- Building 122, leaking transformer, 6/15/1994.

FTMM Main Post Off-Site Facilities Summary

The following discussions have been organized by database type. Within each database type, the location relative to MP (i.e., upgradient or downgradient) has been

provided. The location of these facilities relative to MP was based on topographic gradient, as identified on the USGS topographic quadrangle maps provided in the EDR report.

Resource Conservation and Recovery Act (RCRA) Corrective Action Activity. One RCRA Corrective Action Activity (CORRACTS) facility is reported within the one-mile radius of FTMM MP. The Lowes Home Center Inc., located at 118 Highway 35 South, Eatontown, is approximately ¾-mile south and upgradient from FTMM MP. The facility is cross-referenced under the name Bendix Corp. Electric Power Division. A site-wide Certification of Remedy Completion or Construction Completion was issued in June 2002 after investigation and remedy investigations dating back to 1992. Additionally, the facility was archived under the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) in 1991. As a RCRA large quantity generator (LQG)/treatment, storage, and disposal facility (TSDF), Bendix received 15 violations related to Generator – All Requirements (Oversight) between 1984 and 1995. New Jersey manifest records are reported for 2004 (Waste Code F002). New York Manifest records are reported for 1991 (Waste Code U080-Methylene Chloride). Based on the facility's status, age of the data records, and distance from FTMM MP, it is not expected that contaminants would migrate to or impact the groundwater of the FTMM MP. Several FTMM personnel interviewed expressed concerns that this facility had discharged contaminants to Husky Brook which then migrated downstream through FTMM MP property. Potential off-post surface water contamination is discussed in **Section 4.4.2**.

RCRA Small Quantity Generators (SQGs). Twenty SQG facilities are reported within the ¼-mile radius of FTMM MP.

- Nine facilities are hydraulically separated from the east corners of FTMM MP by either the Shrewsbury River or Oceanport Creek. The presence of the hydraulic divide is expected to prevent the migration of any potential shallow groundwater contamination from these facilities towards the FTMM MP property.

- Five facilities are hydraulically separated from the southwest corner of FTMM MP by Parkers Creek or the Parkers Creek Lake. The presence of the hydraulic divide is expected to prevent the migration of any potential shallow groundwater contamination from these facilities towards the FTMM MP property.

- The Getty Station, located at 157 Broad Street, Eatontown, is upgradient and approximately 1/8-mile south of FTMM MP (near IRP site M2). No violations are reported in connection with the SQG status. However, the facility is also listed as an active state hazardous waste site (SHWS) with on-site sources of contamination (2004 status date). Four gasoline USTs were removed in 1999. A waste oil UST was removed in 1990. Three gasoline USTs remain in service at the facility. Based on the facility's close proximity and upgradient location to FTMM MP, facility status, and documented sources of contamination, if groundwater has been impacted, contaminants from this facility may migrate towards the FTMM MP.

- The Mobil Oil Corporation, located at Route 35 & Tinton Avenue, Eatontown, is an upgradient adjacent property to the west of FTMM MP. No violations are reported in connection with the SQG listing. However, New Jersey Spills reports a release of gasoline in 1995. If groundwater has been impacted by the facility, contaminants from this facility may migrate towards the FTMM MP.

- The Exxon Service Station, located at Route 35 & Tinton Avenue, Eatontown, is an upgradient adjacent property to the west of FTMM MP. No violations are reported in connection with the SQG listing; however, historical (HIST) leaking underground storage tank (LUST) reports confirmed soil and groundwater contamination in 1991. Potential contaminants from this facility may possibly migrate towards the FTMM MP.

- Duncan Thecker Precast, Eatontown Public Schools, and, Penta S Auto Body are located 1/8 mile south and upgradient to FTMM MP. However, no violations or releases are reported in conjunction with their listings. These facilities are not expected to present a concern to the FTMM MP property at this time.

New Jersey SHWSs. A total of 73 SHWS facilities are reported within the one-mile radius of FTMM MP.

- Seventeen facilities are hydraulically separated from the north boundary of FTMM MP by the Shrewsbury River/Parkers Creek. The presence of the hydraulic divide is expected to prevent the migration of any potential shallow groundwater contamination from these facilities towards the FTMM MP property.

- Thirty-four facilities are hydraulically separated from the northwest area of FTMM MP by the North Branch of Parkers Creek. The presence of the hydraulic divide is expected to prevent the migration of any potential shallow groundwater contamination from these facilities towards the FTMM MP property.

- Three facilities are downgradient and hydraulically separated from the southeast corner of FTMM MP by Oceanport Creek. Potential groundwater contamination from these properties is expected to migrate away from the FTMM MP property.

- Eleven facilities are upgradient and hydraulically separated from the southwest area of FTMM MP by Wampum Brook and Husky Brook. The presence of the hydraulic divide is expected to prevent the migration of any potential shallow groundwater contamination from these facilities towards the FTMM MP property.

- Based on the following facilities' close proximity and upgradient location to FTMM MP, facility status, and documented sources of contamination, if groundwater has been impacted, it is possible that contaminants would migrate to or impact the groundwater of the FTMM MP:

    - The Getty Station, located at 157 Broad Street, Eatontown, is upgradient and approximately 1/8-mile south of FTMM MP (near IRP site M2). The facility is listed as an active SHWS with on-site sources of contamination (2004 status

date). Four gasoline USTs were removed in 1999. A waste oil UST was removed in 1990. Three gasoline USTs remain in service at the facility. No violations are reported in connection with the SQG status.

- Hi Tech Turf, located at 9 Monmouth Park Place, Oceanport, is upgradient and approximately 1/8-mile south of FTMM MP [near Patterson Army Hospital (PAH)]. The facility is listed as an active SHWS with on-site sources of contamination (2004 status date). Hi Tech Turf is also listed in the HIST LUST, LUST, UST, New Jersey Voluntary Cleanup Program (VCP), and New Jersey release databases. An oil fuel UST leak was reported in July 1990. The UST was removed as of August 1990. The facility executed a Memorandum of Agreement under the New Jersey VCP in April 2004.

- The Amoco Service Station, located at 160 Main Street, Eatontown, is upgradient and adjacent to the west of FTMM MP (near visitor gate). The facility is listed as an active SHWS with on-site sources of contamination (2001 status date). The Amoco is also listed in the HIST LUST, LUST, and UST databases. Three USTs were removed in 2000 for which the facility was assigned to the LUST program. One UST was removed in 1992 for which the facility was assigned an NFA status. The LUST programs report confirmed soil and groundwater contamination.

- The Mobil 57257, located at 120 Main Street, Eatontown, is upgradient and adjacent to the west of FTMM MP (near visitor gate). The facility is listed as an active SHWS with on-site sources of contamination (1997 status date). Three active USTs are listed in the UST database.

- The 330 Broad Street, Oceanport listing is an active SHWS with on-site sources of contamination (1997 status date). The location is upgradient and approximately 1/8-mile south of FTMM MP (near track/football field). The facility executed a Memorandum of Agreement under the New Jersey VCP in April 1997.

- The 25 Lake Avenue, Oceanport listing is an active SHWS with on-site sources of contamination (2005 status date). The location is upgradient and approximately 60 yards south of FTMM MP (near track/football field).

- The 37 Tinton Avenue, Eatontown listing is an active SHWS with on-site sources of contamination (2000 status date). The location is upgradient and approximately 1/8-mile west of FTMM MP (near visitor's gate). The facility executed a Memorandum of Agreement under the New Jersey VCP in October 2000.

- The 25 Cloverdale Avenue, Eatontown, listing is an active SHWS with on-site sources of contamination (2005 status date). The location is upgradient and approximately 1/8-mile south of FTMM MP. The facility executed a Memorandum of Agreement under the New Jersey VCP in July 2005.

New Jersey Chromate Chemical Production Waste Sites. One facility, College Tower Apartments, is listed on College Drive in Eatontown in the CHROME database. The listing appears to be an error in plotting, since the site address in the EDR report refers to Jersey City.

New Jersey LUST Sites. Eight LUST facilities are reported within the ½-mile radius of FTMM MP.

- Three facilities are hydraulically separated from the north boundary of FTMM MP by the Shrewsbury River/Parkers Creek. One facility is hydraulically separated from the east boundary of FTMM MP by Oceanport Creek. One facility is hydraulically separated from the west boundary of FTMM MP by Wampum Creek. The presence of the hydraulic divide is expected to prevent the migration of any potential shallow groundwater contamination from these facilities towards the FTMM MP property.

- Based on the following facilities' close proximity and upgradient location to FTMM MP, facility status, and documented sources of contamination, if groundwater has been impacted, it is possible that contaminants would migrate to or impact the groundwater of the FTMM MP:

    - The Amoco Service Station, located at 160 Main Street, Eatontown, is upgradient and adjacent to the west of FTMM MP (near visitor gate). Three USTs were removed in 2000 for which the facility was assigned to the LUST program. One UST was removed in 1992 for which the facility was assigned an NFA status. The LUST programs report confirmed soil and groundwater contamination. The facility is listed as an active SHWS with on-site sources of contamination (2001 status date). The Amoco is also listed in the HIST LUST database.

    - The Mobil 57257, located at 120 Main Street, Eatontown, is upgradient and adjacent to the west of FTMM MP (near visitor gate). Three active USTs are listed in the UST database. The facility is listed as an active SHWS with on-site sources of contamination (1997 status date).

    - Hi Tech Turf, located at 9 Monmouth Park Place, Oceanport, is upgradient and approximately 1/8-mile south of FTMM MP (near PAH). An oil fuel UST leak was reported in July 1990. The UST was removed as of August 1990. The facility is listed as an active SHWS with on-site sources of contamination (2004 status date). Hi Tech Turf is also listed in the New Jersey VCP and New Jersey Release databases. The facility executed a Memorandum of Agreement under the New Jersey VCP in April 2004.

New Jersey Historical LUSTs. The NJDEP no longer updates or maintains this database (as of 2002). Twenty-two facilities are reported in the ½-mile radius of FTMM MP

- Five facilities are hydraulically separated from the north boundary of FTMM MP by the Shrewsbury River. Three facilities are hydraulically separated from the northwest boundary of FTMM MP by Parkers Creek. One facility is hydraulically separated from the southeast boundary of FTMM MP by the Oceanport Creek. Eight facilities are hydraulically separated from the southwest boundary of FTMM MP by Wampum Brook. The presence of the hydraulic divide is expected to prevent the migration of any potential shallow groundwater contamination from these facilities towards the FTMM MP property.

- St. Dortheas Church, located at 240 Broad Street, Eatontown, is upgradient and adjacent to the south of FTMM MP (near track/football field). The site was issued a letter requiring NFA in 1995. One UST was removed and one UST abandoned in place in 1995. Due to the facility status, it is not expected to impact the FTMM MP property.

- Based on the following facilities' close proximity and upgradient location to FTMM MP, facility status, and documented sources of contamination, if groundwater has been impacted, it is possible that contaminants would migrate to or impact the groundwater of the FTMM MP:

    - Hi Tech Turf, located at 9 Monmouth Park Place, Oceanport, is upgradient and approximately 1/8-mile south of FTMM MP (near PAH). An oil fuel UST leak was reported in July 1990. The UST was removed as of August 1990. The facility is listed as an active SHWS with on-site sources of contamination (2004 status date). Hi Tech Turf is also listed in the New Jersey VCP and New Jersey Release databases. The facility executed a Memorandum of Agreement under the New Jersey VCP in April 2004.

    - The Mobil Service Station #15-DJY and Exxon Service Station, located at Route 35 and Tinton Avenue, Eatontown are adjacent to the west and upgradient to the FTMM MP (near visitor gate). The facilities were assigned to the program in 1990 and 1991, respectively.

    - The Amoco Service Station, located at 160 Main Street, Eatontown, is upgradient and adjacent to the west of FTMM MP (near visitor gate). Three USTs were removed in 2000 for which the facility was assigned to the LUST program. One UST was removed in 1992 for which the facility was assigned an NFA status. The LUST programs report confirmed soil and groundwater contamination. The facility is listed as an active SHWS with on-site sources of contamination (2001 status date).

New Jersey Registered Underground Tank Sites. Nineteen UST sites are reported in the ¼-radius of the FTMM MP.

- Three UST sites are hydraulically separated from the north boundary of FTMM MP by the Shrewsbury River. One UST site is hydraulically separated from the southeast corner of FTMM MP by Oceanport Creek. One UST site is

hydraulically separated from the northwest boundary of FTMM MP by Parkers Creek. Seven UST sites are hydraulically separated from the southwest boundary of FTMM MP by Wampum Brook.

- As previously stated, the location of these facilities was based on topographic gradient as identified on the USGS topographic quadrangle. The following seven UST sites are upgradient from FTMM MP:
  - Crystal Motor Lodge, Route 35 – removed 1985.
  - Hi Tech Turf (2 listings), 9 Monmouth Park Place – removed 1990.
  - Getty 56935, 157 Broad Street – four removed 1999, 1 removed 1990, three in use.
  - St. Dortheas Church, 240 Broad Street – 1 removed 1995, 1 abandoned in place 1995.
  - Steelman School, 215 Broad Street – 2 removed 1990.
  - Amoco Service Station, 160 Main Street – 3 removed 2000, 1 removed 1992.

New Jersey Engineering Controls. Engineering controls are reported for the Traffic Lines Little Silver facility at 24 Conover Place. The site is located approximately 1/8-mile north of the FTMM MP, across the Shrewsbury River. Due to the presence of this hydraulic divide, potential contaminants from the site are not expected to migrate towards the FTMM MP property.

New Jersey Institutional Controls. Four institutional control records are reported within the ½-mile radius of FTMM MP. All four facilities are hydraulically separated from FTMM MP by the Shrewsbury River, Oceanport Creek, and Wampum Creek. Due to the presence of this hydraulic divide, potential contaminants from the site are not expected to migrate towards the FTMM MP property.

New Jersey Voluntary Cleanup Program. One hundred twenty-six participants in the VCP are identified in the ½-mile radius of FTMM MP. Memoranda of Agreements (MOAs) have been executed with the participants.

- Twenty sites are hydraulically separated from the north boundary of FTMM MP by the Shrewsbury River. Due to the presence of this hydraulic divide, potential contaminants from the site are not expected to migrate towards the FTMM MP property.
- Two sites are directly east and downgradient of the FTMM MP. Due to the downgradient location, potential contaminant migration is not expected to migrate towards the FTMM MP property.

- Six sites are hydraulically separated from the southeast boundary of FTMM MP by Oceanport Creek. Due to the presence of this hydraulic divide, potential contaminants from the site are not expected to migrate towards the FTMM MP property.
- Sixty-seven sites are hydraulically separated from the northwest boundary of FTMM MP by Parkers Creek. Due to the presence of this hydraulic divide, potential contaminants from the site are not expected to migrate towards the FTMM MP property.
- Twelve sites are hydraulically separated from the southwest boundary of FTMM MP by Wampum or Husky Brook. Due to the presence of this hydraulic divide, potential contaminants from the site are not expected to migrate towards the FTMM MP property.
- Two sites are cross-gradient from FTMM MP.
- Four sites are upgradient to the south of FTMM MP (near Building 1007).
    - 142 South Pemberton Street, MOA on 2/16/2000.
    - Hi Tech Turf, 9 Monmouth Park Pl., MOA on 4/28/2004.
    - 98 Main Street, MOA on 4/28/1997.
    - 99 Pemberton Avenue, MOA on 7/27/1998.
- Five properties are upgradient to the west of FTMM MP on Tinton Avenue (near visitor gate).
    - 35 Tinton Avenue, MOA on 6/29/2004.
    - 37 Tinton Avenue, MOA on 10/02/2000.
    - 166 Tinton Avenue, MOA on 2/02/2005.
    - 172 Tinton Avenue, MOA on 6/07/2002.
    - 34 Taylor Place, MOA on 6/18/1997.
- Three properties are upgradient to the south of FTMM MP (near IRP M2).
    - 47 Cliffwood Avenue, MOA on 6/24/1998.
    - 25 Cloverdale Avenue, MOA on 7/18/2005.
    - 29 Rose Court, MOA on 11/18/1999.

- Five properties are upgradient to the south of FTMM MP (near track/football field).
    - 15 Elizabeth Parkway, MOA on 2/04/2003.
    - 322 Broad Street, MOA on 8/07/1998.
    - 330 Broad Street, MOA on 4/28/1997.
    - 16 Brook Street, MOA on 11/19/1998.
    - 39 Locust Avenue, MOA on 3/24/1998.

Orphans Summary. Database records identified in the EDR report that have incomplete address information are summarized in the Orphans Summary report. The records include address information along with the applicable database in which they were listed; however, database information pertinent to the record is not provided. Each record was reviewed to determine if it fell within the applicable database search radius from FTMM. Records identified as possibly within the appropriate search radius were located using Yahoo Maps or Google Maps. A topographic gradient determination was then made to identify sites upgradient to MP. **Table 3-3** provides a listing of the orphan sites identified on the MP property or upgradient from the MP property.

Table 3-3
Main Post EDR Orphans Summary

Database	Site Name	Site Address	Gradient from MP*	Notes
RCRA LQG CERCLIS-NFRAP	Fort Monmouth	Main Post	Target Property	EDR #1000131287
ISRA FINDS	Fort Monmouth	JCP&L Substation – Oceanport Avenue	Target Property	EDR #S107587770
FINDS	Fort Monmouth	Building 173	Target Property	EDR #1008240023
FINDS	Fort Monmouth	Main Base Bldg	Target Property	EDR #1007040086
FINDS	Fort Monmouth	Bldg 167	Target Property	EDR #1007027827
FINDS	Fort Monmouth	Bldg 501	Target Property	EDR #1008933242
FINDS	Fort Monmouth	Bldg 977 C	Target Property	EDR #1008932808
FINDS	Fort Monmouth	Bldg 1203	Target Property	EDR #1007027907
FINDS	Fort Monmouth	Riverside	Target Property	EDR #1007040413
FINDS	Fort Monmouth	Sherrill Avenue	Target Property	EDR #1007042191
FINDS	Fort Monmouth	Bldg 277	Target Property	EDR #1008968223
FINDS	Fort Monmouth	Route 35	Target Property	EDR #1007025528
FINDS	Fort Monmouth	Bldg 257	Target Property	EDR #1007039150
FINDS	Fort Monmouth	Bldg 678	Target Property	EDR #1007006386
FINDS	Fort Monmouth	Bldg 292 & 289	Target Property	EDR #1007026546
FINDS	Fort Monmouth	Directorate Engineering & Housing	Target Property	EDR #1007025829
FINDS	Fort Monmouth	Oceanport Avenue	Target Property	EDR #1008950067

Database	Site Name	Site Address	Gradient from MP*	Notes
FINDS	Fort Monmouth	Saltzman Ave Fuel Depot	Target Property	EDR #1007038318
NJ Release	Fort Monmouth	Bldg 689-B	Target Property	EDR #S102199608
NJ Release	Fort Monmouth	Auto Shop	Target Property	EDR #S102212152
NJ Release	Fort Monmouth	Route 35	Target Property	EDR #S102204762
NJ Release	Fort Monmouth	Route 35	Target Property	EDR #1000959185
NJ Release	Fort Monmouth	Barker Circle	Target Property	EDR #S102199931
NJ Release	Fort Monmouth	Bldg 491 Riverside	Target Property	EDR #102207304
NJ Release	Fort Monmouth	Bldg 412 Riverside	Target Property	EDR #S102612002
NJ Release	Fort Monmouth	Bldg 413	Target Property	EDR #S102488426
NJ Release	Fort Monmouth	Bldg 200 North Drive	Target Property	EDR #S102225926
NJ Release	Fort Monmouth	Bldg 912	Target Property	EDR #105322716
NJ Release	Fort Monmouth	Bldg 173	Target Property	EDR #S105322361
NJ Release	Fort Monmouth	Bldg 750	Target Property	EDR #S104435531
NJ Release	Fort Monmouth	Bldg 167 DEH	Target Property	EDR #S104433593
NJ Release	Fort Monmouth	Bldg 483	Target Property	EDR #S102613141
NJ Release	Fort Monmouth	Bldg 429	Target Property	EDR #S102488953
NJ Release	Fort Monmouth	Bldg 419 Allen Avenue	Target Property	EDR #S102487506
NJ Release	Fort Monmouth	Bldg 484	Target Property	EDR #S102220445
NJ Release	Fort Monmouth	Bldg 1220	Target Property	EDR #S102218672
NJ Release	Fort Monmouth	Bldg 678	Target Property	EDR #S102208368
NJ Release	Fort Monmouth	Bldg 619	Target Property	EDR #S102208234
NJ Release	Fort Monmouth	Bldg 311-601	Target Property	EDR #S102208064
NJ Release	Fort Monmouth	Bldg 210 off Sherrill	Target Property	EDR #S102201321
NJ Release	Fort Monmouth	Bldg 290	Target Property	EDR #S102199956
NJ Release	Fort Monmouth	Bldg 689A	Target Property	EDR #S102199324
NJ Release	Fort Monmouth	Bldg 161	Target Property	EDR #S102191856
NJ Release	Fort Monmouth	Bldg 553	Target Property	EDR #S102220840
NJ Release	Fort Monmouth	Bldg 430	Target Property	EDR #S102207281
NJ Release	Fort Monmouth	Bldg 1076	Target Property	EDR #S102194796
NJ Release	Fort Monmouth	Marina	Target Property	EDR #S104797298
NJ Release	Fort Monmouth	Bldg 421 Riverside	Target Property	EDR #S102207102
NJ Release	Fort Monmouth	Alexander Avenue	Target Property	EDR #S104700371
NJ Release	Fort Monmouth	Bldg 618	Target Property	EDR #S102208097
NJ Release	Fort Monmouth	Bldg 271	Target Property	EDR #S102205670
NJ Release	Fort Monmouth	Off Oceanport Avenue	Target Property	EDR #S102207078
NJ Release FTTS	Fort Monmouth	Riverside	Target Property	EDR #1008180325
NJ Spills	Fort Monmouth	Marina	Target Property	EDR #S104725059
NJ Spills	Fort Monmouth	Marina	Target Property	EDR #S105346530
NJ Spills	Fort Monmouth	Bldg 657	Target Property	EDR #S107051682
NJ Spills	Fort Monmouth	Bldg 909	Target Property	EDR #S105323944
NJ Spills	Fort Monmouth	Bldg 1007 Alexander Avenue	Target Property	EDR #S104800437
NJ Spills	Fort Monmouth	Bldg 911 Carrier Avenue	Target Property	EDR #S105322781
NJ Spills	Fort Monmouth	Bldg 718	Target Property	EDR #S105326758
NJ Spills	Fort Monmouth	Bldg 1210 Abbey Road	Target Property	EDR #S104363551

Database	Site Name	Site Address	Gradient from MP*	Notes
NJ Spills	Fort Monmouth	Bldg 257	Target Property	EDR #S105324733
NJ Spills	Fort Monmouth	Alexander Avenue	Target Property	EDR #S107047759
NJ Spills	Fort Monmouth	Marina	Target Property	EDR #S105346678
NJ Spills	Fort Monmouth	Bldg 699, Memory Avenue	Target Property	EDR #S107054906
ERNS	Fort Monmouth	Guest House Project	Target Property	EDR #91235430
Hist LF	Fort Monmouth		Target Property	EDR #S105466414
Hist LF	Fort Monmouth	Communications/Electronics	Target Property	EDR #S103618341
Hist LF	Fort Monmouth	DPW Bldg 482	Target Property	EDR #105165647
FTTS	Fort Monmouth	Bldg 173	Target Property	EDR #1007297975
ICIS	Fort Monmouth	Bldg 501	Target Property	EDR #1009265838
ICIS	Fort Monmouth	Bldg 977 C	Target Property	EDR #1009265839
Hist LUST	Fort Monmouth	Bldg 167	Target Property	EDR #S104386716
Hist LUST	Fort Monmouth	Bldg 167 DEH	Target Property	EDR #1002559963
Hist LUST	Fort Monmouth	Bldg 752 Nicodemus/Murray	Target Property	EDR #S104392576
UST	Fort Monmouth	Bldg 173	Target Property	EDR #U000359249
UST	Fort Monmouth	Main Post W	Target Property	EDR #U003294977
UST	Fort Monmouth	Wayside Area	Target Property	EDR #U000371438
CORRACTS	U.S. Army Comm Elec Command	Charles Wood	Upgradient	RCRA LQG, RCRA TSDF, PADS
VCP	Tower Market	37 Route 35	Upgradient	1 block southwest
SHWS	Fort Monmouth	Tinton Avenue	Upgradient	Charles Wood?
SHWS	Exxon R/S 32754	Rt 35 & Tinton	Upgradient	West Adjacent
NJ Inst Control	Exxon 32754	Rt 35 & Tinton	Upgradient	West Adjacent
ISRA	Sir Speedy Printing Center	117 Route 35	Upgradient	West Adjacent
LUST	A&W Imported Auto Parts	54 Route 35	Upgradient	West Adjacent
UST	Exxon R/S 32754	Rt 35 & Tinton	Upgradient	West Adjacent
RCRA SQG	Custom Care Dry Cleaners	37-10 Route 35	Upgradient	West Adjacent
RCRA SQG	Lube It All	141 Route 35	Upgradient	West Adjacent

* Target Property refers to FTMM property.

3.4.1.2 Charles Wood Standard Environmental Record Results

Table 3-4
Charles Wood Standard Environmental Record Results

Record(s) Source for FTMM Charles Wood Area	Number of Sites	Minimum Search Distance (miles)
Federal NPL Facilities	1	1.0
Federal RCRA CORRACTS Facilities	2	1.0
Federal CERCLIS Facilities	1	0.5
Federal CERCLIS-NFRAP Facilities	2	0.5

Record(s) Source for FTMM Charles Wood Area	Number of Sites	Minimum Search Distance (miles)
Federal RCRA TSD Facilities	1	0.5
Federal Engineering Controls	0	0.5
Federal Institutional Controls	0	0.5
Federal RCRA Large Quantity Generators	1	0.25
Federal RCRA Small Quantity Generators	9	0.25
Hazardous Materials Incident Report System	0	Property only
Federal ERNS Sites	0	Property only
Federal FINDS Sites	0	Property only
New Jersey State Hazardous Waste Sites	53	1.0
New Jersey Publicly Funded Cleanup Sites	0	1.0
New Jersey CHROME Facilities	0	0.5
New Jersey State Landfill, Historic Landfill, and Approved Class B Recycling Facilities	3	0.5
New Jersey Active LUST Facilities	4	0.5
New Jersey Historical LUST Facilities	20	0.5
New Jersey Engineering Controls	0	0.5
New Jersey Institutional Controls	3	0.5
New Jersey Voluntary Cleanup Program Facilities	16	0.5
New Jersey Registered UST Facilities	16	0.25
New Jersey Hazardous Material Incident Database	4	Property only
New Jersey Spills	2	Property only

FTMM Charles Wood On-Site Facilities Summary

New Jersey Solid Waste Facility Directory. According to the New Jersey Solid Waste Facility Directory, one landfill, Tinton Falls, is reported on FTMM CWA property along Hope Road (Facility ID 1336000586). According to the New Jersey Solid Waste Facility Directory, the 80 acre landfill site status is closed, but the database indicates it was not closed properly. Wastes accepted include municipal (household, commercial and institutional) and bulky waste. Information provided during FTMM personnel interviews and 2006 VSI observations verify the reported information in the New Jersey Solid Waste Facility Directory is inaccurate (7). FTMM does not have an 80 acre closed landfill on its properties. There is only one documented landfill in the CWA (CW-3A). The CW-3A landfill, approximately 2.6 acres in size, is located due north of Building 2707 along Pearl Harbor Avenue. Please refer to **Sections 5.2.1 and 5.9** for additional information about landfills on FTMM property.

New Jersey Hazardous Material Incident Database. Three incidents are reported for hazardous material releases on FTMM CWA.

- 55 Midway Lane, line blockage caused spill, October 1999.
- 450 Hope Road, UST, May 2005.
- Building 2706, Freon release due to ruptured disc on equipment, May 1999.

New Jersey Spills. Two incidents were reported to the Action Line for FTMM CWA.

- 34 Subic Lane, transformer burst into flames and pole fell causing spill of 30-40 gallons Non-PCB oil; product ran down storm drain, no visible product on land or in drain left due to rain. It should be noted that the New Jersey Spills database contained erroneous information regarding this incident. The description above has been corrected with information gathered as part of this ECP.
- 48 Mitchell Drive, manhole overflow due to blocked line, June 2001.

FTMM Charles Wood Off-Site Facilities Summary

The following discussions have been organized by database type. Within each database type, the location relative to the CWA (i.e., upgradient or downgradient) has been provided. The relative locations to CWA were based on topographic gradient, as identified on the USGS topographic quadrangle maps provided in the EDR report.

National Priorities List (NPL) Facilities. One NPL facility is reported within the one-mile radius of FTMM CWA. The Naval Weapons Station (NWS) Earl is approximately ¾-mile southwest of FTMM CWA in Colts Neck Township. The NWS is west of a topographic ridge of approximately 120 feet between FTMM CWA and the NWS. The NWS drainage area is topographically separated from FTMM CWA, flowing northwest with Pine Brook, which bisects the NWS and merges with the Swimming River, a tributary to the Navisink River. Potential contaminant migration from NWS is expected to flow away from FTMM CWA through this separate drainage network.

RCRA Corrective Action Activity. Two CORRACTS facilities are reported within the one-mile radius of FTMM CWA.

- The NWS Earl is approximately ¾ mile southwest of FTMM CWA in Colts Neck Township. The NWS is west of a topographic ridge of approximately 120 feet between FTMM CWA and the NWS. Potential contaminant migration from NWS is expected to flow away from FTMM CWA through this separate drainage network.
- The Lowes Home Center Inc., located at 118 Highway 35 South, Eatontown, is approximately ½-mile southeast and downgradient from FTMM CWA. The facility is cross-referenced under the name Bendix Corp. Electric Power Division. A site-wide Certification of Remedy Completion or Construction Completion was issued in June 2002. Additionally, the facility was archived under CERCLIS in 1991. Fifteen RCRA LQG/TSDF violation records pertaining to Generator – All Requirements (Oversight) are reported for the facility between 1984 and 1995.

Based on the facility's downgradient location from FTMM CWA, it is not expected that contaminants would migrate to or impact the groundwater of FTMM CWA.

Comprehensive Environmental Response, Compensation, and Liability Information System Facilities. One CERCLIS facility is reported within the ½-mile radius of FTMM CWA. The Metallurgical Industries site is located in Mid-Monmouth Industrial Park (1 Coldstream Way, Industrial Park), adjacent to the south and upgradient of FTMM CWA off Pine Brook Road (south of Buildings 2501 to 2507). Metallurgical Ind. is not on the NPL and participates in a state-lead cleanup program. Discovery was completed in April 1984. The Removal Assessment was completed in June 1997. Metallurgical Industries is also listed in the SQG, SHWS, UST, and Industrial Site Recovery Act (ISRA) databases. Nineteen violations are reported in connection with the SQG listing between 1989 and 1995. The site is listed as active in the SHWS database (status date March 1995) with documented on-site sources of contamination. A bankruptcy triggered an ISRA RI in March 1995. The facility appears as demolished on current satellite imagery. Based on the facility's close proximity and upgradient location to FTMM CWA and facility status, if groundwater has been impacted, it is possible that contaminants would migrate to or impact the groundwater of the FTMM CWA property.

No Further Remedial Action Planned (NFRAP) – CERCLIS Facilities. Two CERCLIS-NFRAP facilities are reported within the ½-mile radius of FTMM CWA. Based on the following facilities' close proximity and upgradient location to FTMM CWA, if groundwater was impacted, it is possible that contaminants would have migrated to or impacted the groundwater of the FTMM CWA property. However, the recorded dates are very old (1980s) in the database and the facilities are not listed with current releases in other databases. Unless the sites have continuing remediation projects, previous contaminants are not expected to impact FTMM CWA at this time.

- Mazel Chemical Company, located at 14 Park Road, is adjacent to the south and upgradient to FTMM CWA (south of Pulse Power buildings). PA was completed in March 1984. The site was archived in March 1984. The facility is not listed in any other database report.

- Hecon Corporation, located at 45 Park Road is approximately ¼-mile south and upgradient to FTMM CWA (south of Buildings 2501 to 2507). PA was completed in September 1989. The site was archived in November 1998. Hecon Corporation is also reported as an SQG and TSDF. One violation was reported in March 1983, for which compliance was achieved in November 1983.

RCRA Transfer, Storage, Disposal Facilities. One facility is reported in the RCRA-TSDF database within the ½-mile radius of FTMM CWA. Hecon Corporation, located at 45 Park Road is approximately ¼-mile south and upgradient to FTMM CWA. One violation was reported in March 1983, for which compliance was achieved in November 1983. Hecon Corporation is also reported on the SQG and CERCLIS-NFRAP databases. The recorded data is very old (1980s) in the databases and unless the site

has a continuing remediation project, previous contamination is not expected to impact FTMM CWA at this time.

RCRA Large Quantity Generators. One facility is reported in the RCRA-LQG database within the ¼-mile radius of FTMM CWA. The Standard Group, located at 100 Park Road, is approximately ¼-mile south and upgradient to FTMM CWA (south of Buildings 2501 to 2507). One violation was reported in August 2004, for which compliance was achieved in September 2004. The Standard Group is also listed in the UST, HIST LUST, and New Jersey Release databases. Three USTs were removed from the site in September 1993 resulting in a release reported to the Action Line. The site was issued a letter of NFA in September 1994. Due to the facility status and age of the LUST, previous contaminants are not expected to impact FTMM CWA at this time.

RCRA Small Quantity Generators. Nine SQG facilities are reported within the ¼ radius of FTMM CWA.

- Three facilities are downgradient from FTMM CWA.

- Tinton Falls Borough has two sites reported at 535 and 556 Tinton Avenue, adjacent and upgradient to the northwest corner of FTMM CWA. The Borough public works facilities are also located along the western property line of FTMM CWA (west of Building 2700). No violations are reported for either address in connection with the SQG listings. However, Borough facilities are also listed in the SHWS, LUST, HIST LUST, UST, New Jersey Spill, and New Jersey Release databases. The Department of Public Works Municipal Garage site was listed in 1995 with confirmed soil and groundwater contamination in the HIST LUST database. Six waste oil, heating oil, diesel, and gasoline USTs were removed from the site between 1995 and 1997. One waste oil UST was abandoned in place in 1995. The 1995 New Jersey Release report was connected to the UST removals. The 1995 New Jersey Spill report was connected to a dispenser nozzle falling out during vehicle fueling. The SHWS status is Active as of October 1999, with documented on-site sources of contamination. Based on the facilities' close proximity, upgradient location to FTMM CWA, and facility status, if groundwater has been impacted, it is possible that contaminants would migrate to or impact the groundwater of the FTMM CWA property.

- The Eatontown Borough has facilities located at 250 Pinebrook Road, along the eastern property line and cross-gradient to FTMM CWA. No violations are reported in connection with the SQG listing. However, Borough facilities are also listed in the SHWS, New Jersey institutional control, HIST LUST, UST, New Jersey Spill, and New Jersey Release databases. The SHWS listing status for the Eatontown Maintenance Garage is Closed with Restrictions (status date August 1995). New Jersey Release data indicates soil contamination during a gasoline UST removal in July 1991. The facility was documented with soil and groundwater contamination in LUST. A letter of NFA was issued in August 1995. One waste oil UST was reportedly removed in 1986, one gasoline UST was abandoned in place in 1989, and one diesel UST was still in use in 1991. Based

on the facilities' close proximity, cross-gradient location to FTMM CWA, and facility status, if groundwater has been impacted, it is possible that contaminants would migrate to or impact the groundwater of the FTMM CWA property.

- Betty Brite Cleaners, located at 613 Hope Road, is upgradient to the south of FTMM CWA (south of Building 2560). One violation is reported in connection with the SQG listing for Generator-Manifest Requirements (1995 compliance date). The facility is not reported with contaminant release in any other EDR database. Due to the absence of documented releases, the facility is not expected to have impacted FTMM CWA at this time.

- The Metallurgical Industries site is located in Mid-Monmouth Industrial Park (1 Coldstream Way, FTMM Industrial Park), adjacent to the south and upgradient to FTMM CWA off Pine Brook Road (south of Buildings 2501 to 2507). Nineteen violations are reported in connection with the SQG listing between 1989 and 1995. Metallurgical Industries is also listed in the CERCLIS, SHWS, UST, and ISRA databases. Metallurgical Ind. is not on the NPL and participates in a state-lead cleanup program. Discovery was completed in April 1984. The Removal Assessment was completed in June 1997. The site is listed as active in the SHWS database (status date March 1995) with documented on-site sources of contamination. A bankruptcy triggered an ISRA RI in March 1995. The facility appears as demolished on current satellite imagery. Based on the facility's close proximity and upgradient location to FTMM CWA and facility status, if groundwater has been impacted, it is possible that contaminants would migrate to or impact the groundwater of the FTMM CWA property.

- Hecon Corporation, located at 45 Park Road is approximately ¼-mile south and upgradient to FTMM CWA. One violation was reported in March 1983, for which compliance was achieved in November 1983. Hecon Corporation is also reported as on the SQG and CERCLIS-NFRAP databases. The recorded data is very old (1980s) in the databases and unless the site has a continuing release, previous contamination is not expected to impact FTMM CWA at this time.

New Jersey SHWSs. Fifty-three SHWS locations are reported within the ½-mile radius of FTMM CWA.

- Twenty-nine sites are hydraulically separated from the northeast corner of FTMM CWA by Parkers Creek. Due to the presence of this hydraulic divide, potential contaminants from the site are not expected to migrate towards the FTMM CWA property.

- Two sites along Hope Road are hydraulically separated from the north property line of FTMM CWA. Due to the presence of this hydraulic divide, potential contaminants from the site are not expected to migrate towards the FTMM CWA property.

- Sixteen sites are downgradient to the southeast or east of FTMM CWA property. Potential contaminant migration from these properties is expected to flow northeast towards Husky Brook and away from FTMM CWA.

- Based on the following facilities' close proximity and upgradient location to FTMM CWA, facility status, and documented sources of contamination, if groundwater has been impacted, it is possible that contaminants would migrate to or impact the groundwater of the FTMM CWA:

    - Tinton Falls Borough has two sites reported at 535 and 556 Tinton Avenue, adjacent and upgradient to the northwest corner of FTMM CWA. The Borough public works facilities are also located along the western property line of FTMM CWA (west of Building 2700). The SHWS status is Active as of October 1999, with documented on-site sources of contamination. Borough facilities are also listed in the LUST, HIST LUST, UST, SQG, New Jersey Spill, and New Jersey Release databases. The Department of Public Works Municipal Garage site was listed in 1995 with confirmed soil and groundwater contamination in the HIST LUST database. Six waste oil, heating oil, diesel, and gasoline USTs were removed from the site between 1995 and 1997. One waste oil UST was abandoned in place in 1995. The 1995 New Jersey Release report was connected to the UST removals. The 1995 New Jersey Spill report was connected to a dispenser nozzle falling out during vehicle fueling. No violations are reported for either address in connection with the SQG listings.

    - Concession Supply Co., located at 539 Tinton Avenue, is upgradient along the northeast property line of FTMM CWA. The SHWS status is Active, with documented on-site sources of contamination, as of May 2002. The facility is also listed in the LUST, HIST LUST, UST, institutional control, and New Jersey Spills databases. LUST records indicate confirmed soil and groundwater contamination on the site. The New Jersey Spills record in June 2001 was related to the UST removal. New Jersey Institutional Controls were established in August 2005, listing the company in the Synthetic Organic Chemicals – Non-Carcinogen category. One gasoline UST was removed in June 2001.

    - CECOM, located at 600 Tinton Avenue, is upgradient to the west of the northwest corner of FTMM CWA. The SHWS status is Active, with documented on-site sources of contamination, as of December 2005. A diesel UST was removed in 1990. This is not an Army owned property.

    - The Eatontown Borough has facilities located at 250 Pinebrook Road, along the eastern property line and cross-gradient to FTMM CWA. Borough facilities are also listed in the New Jersey institutional control, HIST LUST, UST, SQG, New Jersey Spill, and New Jersey Release databases. The SHWS listing status for the Eatontown Maintenance Garage is Closed with Restrictions (status date August 1995). New Jersey Release data indicates

soil contamination during a gasoline UST removal in July 1991. The facility was documented with soil and groundwater contamination in LUST. A letter of NFA was issued in August 1995. One waste oil UST was reportedly removed in 1986, one gasoline UST was abandoned in place in 1989, and one diesel UST was still in use in 1991. No violations are reported in connection with the SQG listing.

- The Metallurgical Industries site is located in Mid-Monmouth Industrial Park (1 Coldstream Way, FTMM Industrial Park), adjacent to the south and upgradient of FTMM CWA off Pine Brook Road (south of Buildings 2501 to 2507). The site is listed as active in the SHWS database (status date March 1995) with documented on-site sources of contamination. Metallurgical Industries is also listed in the CERCLIS, SQG, UST, and ISRA databases. A bankruptcy triggered an ISRA RI in March 1995. The facility appears as demolished on current satellite imagery. Nineteen violations are reported in connection with the SQG listing between 1989 and 1995. Discovery was completed in April 1984. The Removal Assessment was completed in June 1997.

- Monmouth County Highway Dist 3&6 is reported on Pine Brook Road, upgradient along the southwest corner of FTMM CWA. The site is listed as active in the SHWS database (status date November 1995) with documented on-site sources of contamination. The site is also listed in the LUST, HIST LUST, and UST databases. Two gasoline USTs were removed in 1993. Two gasoline USTs remain in use as of 1991.

New Jersey Historic Solid Waste Facility Directory. Two HIST solid waste facility sites are reported with the ½-mile radius of FTMM CWA. Tinton Falls Borough Compost, located at Pine Brook Road and Pearl Harbor Road, is upgradient and adjacent to the west of FTMM CWA. The facility was classified as a recycling center accepting vegetative waste. The facility status is Not Operating. All County Recycling, located at 1861 Wayside Road, is upgradient to the southwest corner of FTMM CWA. The facility was classified as a recycling center with a facility status of Closed.

New Jersey Institutional Controls. Three facilities are listed for institutional control within the ½-mile radius of FTMM CWA. The Eatontown Borough Department of Public Works, located at 131 Lewis Street is downgradient to the east of FTMM CWA. The two following facilities are located upgradient to FTMM CWA. If groundwater has been impacted by these upgradient sites, it is possible that contaminants would migrate to or impact the groundwater of the FTMM CWA.

- Concession Supply Co., located at 539 Tinton Avenue, is upgradient to the northwest corner of FTMM CWA. Institutional controls were established for the facility in August 2005, listing the company in the Synthetic Organic Chemicals – Non-Carcinogen category. The facility is also listed in the SHWS, LUST, HIST LUST, UST, and New Jersey Spills databases. The SHWS status is Active, with documented on-site sources of contamination, as of May 2002. LUST records

indicate confirmed soil and groundwater contamination on the site. The New Jersey Spills record in June 2001 was related to the UST removal. One gasoline UST was removed in June 2001.

- Eatontown Borough Board of Education Maintenance Garage, located at 250 Pine Brook Road, is along the eastern property line and cross-gradient to FTMM CWA. Institutional controls were established for the facility in August 1995. Borough facilities are also listed in the SHWS, HIST LUST, UST, SQG, New Jersey Spill, and New Jersey Release databases. The SHWS listing status for the Eatontown Maintenance Garage is Closed with Restrictions (status date August 1995). New Jersey Release data indicates soil contamination during a gasoline UST removal in July 1991. The facility was documented with soil and groundwater contamination in LUST. A letter of NFA was issued in August 1995. One waste oil UST was reportedly removed in 1986, one gasoline UST was abandoned in place in 1989, and one diesel UST was still in use in 1991. No violations are reported in connection with the SQG listing.

New Jersey LUST Sites. Four LUST sites are reported within the ½-mile radius of FTMM CWA. Eatontown Borough Recycling Center is downgradient to the east of FTMM CWA on Lewis Street. Two sites are located upgradient along the northwest boundary of FTMM CWA: Tinton Falls Borough on 556 Tinton Avenue and Concession Supply Co. on 539 Tinton Avenue. One site, Monmouth County Hwy Dist 3&6 on Pine Brook Road, is located upgradient from the southwest corner of FTMM CWA. If groundwater has been impacted by these upgradient sites, it is possible that contaminants would migrate to or impact the groundwater of the FTMM CWA. All three upgradient facilities are discussed above in SHWS.

New Jersey Historical LUST Sites. Twenty HIST LUST sites are located within the ½-mile radius of FTMM CWA. Three sites are in cross-gradient locations to the northwest and southeast corners of FTMM CWA. Six sites are in downgradient locations to the east of FTMM CWA.

- The following upgradient sites were issued letters of NFA:
  - Ranney School, 235 Hope Road, December 1995,
  - Stanwick Management, 600 Tinton Avenue, February 1992,
  - Eatontown Borough, 250 Pine Brook Road, August 1995,
  - The Standard Group, 100 Park Road, September 1994,
  - Marpal Inc., 1831 Wayside Road, January 2000,
  - Country Store, Wayside Road & Pine Brook Road, June 1995, and
  - Monmouth County Mosquito Commission, 143A Wayside Road, June 1992.

- The following four facilities are upgradient sites without letters of closure. If groundwater has been impacted by these upgradient sites, it is possible that contaminants would migrate to or impact the groundwater of the FTMM CWA.

    - Tinton Falls Department of Public Works Municipal Garage, located at 556 Tinton Avenue, is upgradient to the northwest corner of FTMM CWA (west of Building 2700). The Department of Public Works Municipal Garage site was listed in 1995 with confirmed soil and groundwater contamination in the HIST LUST database. Six waste oil, heating oil, diesel, and gasoline USTs were removed from the site between 1995 and 1997. One waste oil UST was abandoned in place in 1995. Borough facilities are also listed in the SHWS, LUST, UST, SQG, New Jersey Spill, and New Jersey Release databases. The 1995 New Jersey Release report was connected to the UST removals. The SHWS status is Active as of October 1999, with documented on-site sources of contamination. No violations are reported for either address in connection with the SQG listings.

    - Monmouth Regional High School, located at 535 Tinton Avenue, is hydraulically separated from FTMM CWA by Parkers Creek Branch. The site is also listed in the UST and SQG databases. Two heating oil USTs removed January 1988. One gasoline UST removed 1991. One other UST abandoned in place December 1986. No violations are reported in connection with the SQG listing. Shallow groundwater contaminant migration may not have impacted the FTMM CWA property due to the presence of Parkers Creek acting as a hydrologic divide. However, deeper groundwater contaminant migration pathways are possible due to irrigation well withdrawals on the CWA Golf Course.

    - Concessions Supply Company, located at 539 Tinton Avenue, is upgradient to the northwest corner of FTMM CWA. LUST records indicate confirmed soil and groundwater contamination on the site. The facility is also listed in the SHWS, LUST, UST, institutional control, and New Jersey Spills databases. The SHWS status is Active, with documented on-site sources of contamination, as of May 2002. New Jersey Institutional Controls were established in August 2005, listing the company in the Synthetic Organic Chemicals – Non-Carcinogen category. One gasoline UST was removed in June 2001. The New Jersey Spills record in June 2001 was related to the UST removal.

    - Monmouth County Hwy Dist 3&6 on Pine Brook Road, is located upgradient from the southwest corner of FTMM CWA. LUST records indicate confirmed soil and groundwater contamination on the site. The site is also listed in the SHWS, LUST, and UST databases. The site is listed as active in the SHWS database (status date November 1995) with documented on-site sources of contamination. Two gasoline USTs were removed in 1993. Two gasoline USTs remain in use as of 1991.

New Jersey Registered Underground Tank Sites. Sixteen UST sites are reported in the ¼-mile radius of FTMM CWA.

- Six sites are downgradient to the east of FTMM CWA.
- The following four sites are upgradient to the northwest corner of FTMM CWA and are not located on FTMM property:
    - Tinton Falls Borough, 556 Tinton Avenue. Six waste oil, heating oil, diesel, and gasoline USTs were removed from the site between 1995 and 1997. One waste oil UST was abandoned in place in 1995.
    - Concession Supply Co., 539 Tinton Avenue. One gasoline UST was removed in June 2001.
    - Tinton Falls Borough Board of Ed Monmouth Regional High School, 535 Tinton Avenue. Two heating oil USTs removed January 1988. One gasoline UST removed 1991. One other UST abandoned in place December 1986.
    - CECOM, 600 Tinton Avenue. A diesel UST was removed in 1990.
- Republic Services of New Jersey LLC DB, located at 1861 Wayside Road, is upgradient to the west of FTMM CWA. Four gasoline and diesel USTs were removed in December 1991. Two gasoline and diesel USTs remain in use at the facility since 1990. The site is not reported in any other EDR database.
- The following three sites are upgradient along the FTMM CWA southwest property line:
    - Metallurgical Industries Inc, 1 Coldstream Way. One gasoline UST removed in July 1994.
    - Monmouth County Hwy Dist 3&6, Pine Brook Road. Two gasoline USTs were removed in 1993. Two gasoline USTs remain in use as of 1991.
    - Standard Roofings Inc., 100 Park Road. Three gasoline and diesel USTs were removed in September 1993.
- Eatontown Maintenance Garage, located at 250 Pine Brook Road, is cross-gradient to the east of FTMM CWA. One waste oil UST was reportedly removed in 1986, one gasoline UST was abandoned in place in 1989, and one diesel UST was still in use in 1991.
- Eatontown Senior Citizens Housing, located at 1329 Grant Avenue, is upgradient to the southeast corner of FTMM CWA. One heating oil UST was removed in January 1982. The site is not reported in any other EDR database.

New Jersey Voluntary Cleanup Program. Sixteen participants in the VCP program are listed within the ½-mile radius of FTMM CWA. MOAs have been executed with the participants.

- Seven sites are located downgradient to the east of FTMM CWA.
- Three sites are located cross-gradient to the southeast corner of FTMM CWA.
- One site is located cross-gradient to the northwest corner of FTMM CWA.
- Two sites are located upgradient to the north of FTMM CWA along Hope Road. The sites are hydraulically separated from FTMM CWA by Parkers Creek Branch.
- The following two sites are located upgradient adjacent to the north property line of FTMM CWA:
  - 463 Tinton Avenue, MOA executed September 1998.
  - 495 Tinton Avenue, MOA executed November 1996.
- 264 Hope Road is located upgradient to the north of FTMM CWA along Hope Road. A MOA was executed April 2004.

Orphans Summary. Database records identified in the EDR report that have incomplete address information are summarized in the Orphans Summary report. The records include address information along with the applicable database in which they were listed; however, database information pertinent to the record is not provided. Each record was reviewed to determine if it fell within the applicable database search radius from FTMM. Records identified as possibly within the appropriate search radius were located using Yahoo Maps or Google Maps. A topographic gradient determination was then made to identify sites upgradient to CWA. **Table 3-5** provides a listing of the orphan sites identified on the MP property or upgradient from the CWA property.

Table 3-5
CWA EDR Orphans Summary

Database	Site Name	Site Address	Gradient from CWA*	Notes
RCRA LQG & TSDF, CORRACTS	Fort Monmouth	Charles Wood Area	Target Property	EDR #1000155688
SHWS	Fort Monmouth	Tinton Avenue	Target Property	EDR #S107495684
Hist LUST	Fort Monmouth	Bldg 2700 Corrigedor Road	Target Property	EDR #S104391240
Hist LUST	Fort Monmouth	Tinton Road Bldg 9061 Maintenance Bldg	Target Property	EDR #S104391291
UST	Fort Monmouth	Charles Wood Area	Target Property	EDR #U000358584
UST	Fort Monmouth	Charles Wood Area	Target Property	EDR #U000371474

Database	Site Name	Site Address	Gradient from CWA*	Notes
FINDS	Fort Monmouth	Pine Brook Road	Target Property	EDR #1007018978
FINDS	Fort Monmouth	Tinton Ave & Pine Brook Road	Target Property	EDR #1007025727
FINDS	Fort Monmouth	Rt 35 Charles Wood	Target Property	EDR #1007462659
FINDS	Fort Monmouth	Tinton Avenue	Target Property	EDR #1007023367
FINDS	Fort Monmouth	Wayside Area	Target Property	EDR #1006986896
NJ Spills	Fort Monmouth	Bldg 3214 83 Mitchel Boiler Room	Target Property	EDR #S107054076
NJ Spills	Fort Monmouth	Bldg 2501	Target Property	EDR #S104442027
NJ Spills	Fort Monmouth	Charles Wood Area	Target Property	EDR #S102210238
NJ Spills	Fort Monmouth	Hope Road Shoppette	Target Property	EDR #S102486364
NJ Spills	Fort Monmouth	Bldg 2043 – 35 Megill Dr	Target Property	EDR #S105324731
NJ Spills	Fort Monmouth	Bldg 2700	Target Property	EDR #S105324237
NJ Release	Fort Monmouth	Bldg 2603	Target Property	EDR #S105349182
NJ Release	Fort Monmouth	Bldg 2537	Target Property	EDR #S102614402
NJ Release	Fort Monmouth	Bldg 2504	Target Property	EDR #S102219765
NJ Release	Fort Monmouth	Storage Hope Road	Target Property	EDR #S107101610
RCRA SQG	NJDOT	Hope Road	Upgradient	Adjacent
RCRA SQG	Monmouth County Hwy District 3&6	Pine Brook Road	Upgradient	West Adjacent
RCRA SQG	Clayton Ralph & Sons	Maxwell Road	Cross-Gradient	East Adjacent
RCRA SQG	Country Store	Wayside & Pine Brook	Upgradient	West Adjacent

* Target Property refers to FTMM property.

3.4.2 Additional Record Sources

A review of reasonably accessible Army environmental documents, County and City records, and aerial photographs of the property were reviewed to investigate land uses at the site. Local authorities were contacted to learn about historic uses of buildings and lands on the site. Available information on past land uses and their potential impacts was assessed. Other documents and resources of historical importance that were used include:

- Readily available records and files documenting where hazardous substances are stored and used on site (a summarized list is included in **Section 5.3**).
- Historic deed research to document the historic use of the property. This inquiry reviewed recorded deeds, leases, mortgages, easements, and other appropriate documents. See **Appendix B** for a Summary of Historic Deed Information Reviewed and **Appendix C** for Real Estate Easement Information.
- Files at the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) were reviewed for documents addressing human health matters.

- Environmental documents and files at the U.S. Army Environmental Command (USAEC).

- Report files of any notices of violations concerning the site were reviewed from the AEDBR (25).

3.5 Interviews

Individuals with historic or current knowledge of FTMM were interviewed to provide information concerning environmental conditions at the facility. The interviews were conducted to aid in the identification of environmental conditions at the installation. The interviews included topics of general environmental interest and specific areas of interest identified during the records review and VSIs. **Appendix P** includes FTMM personnel interview summary sheets. **Table 3-6** lists the individuals interviewed for the preparation of this ECP.

Table 3-6
List of Interviewed Personnel

Title of Interviewee	Dates of Employment
Interviews Conducted as Part of ECP	
DPW, Environmental Branch, Team Leader	1988 to Present
DPW (TVS), Air Quality Scientist (Air Program)	2005 to Present
DPW, Environmental Branch, Environmental Protection Specialist	1994 to Present
DPW, Master Planning, Team Leader	1986 to Present
DPW, Environmental Branch, Environmental Engineer, NEPA Program	1982 to Present
DPW - Chief of Facilities	1982 to Present
DPW (TVS), Water Quality Scientist, Potable Water and Wastewater	2005 to Present
DPW, Environmental Engineer	2001 to Present
DPW (TVS), Facility Engineering, Environmental Field Supervisor	2001 to Present
DPW, Environmental Branch, Environmental Protection Specialist, Hazardous Waste and Hazardous Materials	2002 to Present
Garrison RSO, Health and Safety Officer	1981 to Present
Evans Area BEC, Former DPW Environmental Employee, UST Program (1991-1998)	1991 to Present
Individuals Contacted During VSIs or During the HSA	
DPW Administrative Assistant	--
RSO, ARL (Adelphi)	--
Garrison Supply Receiving Department Manager	--
Equipment Manager, CERDEC	--
Environmental Testing Facility Operator	--

Title of Interviewee	Dates of Employment
Administrator, CERDEC (Building 2705)	--
Chief of Business Office for PMDCASS	--
Chief of Building 2506	--
Fire Chief	--
Garrison Supply Excess Department Manager	--
Security, Wackenhut/Alutiiq	--
Mechanical Engineer Technician	--
Radiological Technologist/Chief of X-ray Clinic	--
Works at Fire Training Facility, Charles Wood Area	--
Garrison Supply Facility Manager	--
Mechanical Engineer Technician	--
Foreman, 2500-series buildings	--
Postal Worker	--
Program Analyst for the BRAC team for CHISR	--
Supervisory Industrial Hygienist	--
Facility Manager, Building 2535	--
Chief, Physical Security Division	--
Machinist Manager of Building 2503	--
Museum Curator	--
Assistant Fire Chief	--
CECOM RSO, POC for radiological commodities	--
Environmental Laboratory Supervisor/Director	--
DPW Building Manager	--
Environmental Testing Facility Operator	--
Postal Worker	--

-- the dates of employment were only documented for interviewees

3.6 Data Management

The environmental conditions at the installation, developed as described above, were evaluated facility wide, and findings were compiled in hard copy and electronic format.

The majority of information used in the evaluation of the environmental condition is included in the appendices of this report. Other information is included in an electronic database provided in DVD format. This includes electronic versions of reports reviewed for the ECP, digital photographs taken during the VSIs, and VSI checklists compiled after the inspections. All electronic data items are listed in a Microsoft Excel® spreadsheet containing the descriptive name of the item as well as electronic filename.

4 Property Description

The environmental conditions at the Property, developed as described above, were evaluated facility wide, and the findings are presented in **Section 5**. The following sections provide summary information on past and present land use and the nature of major processes and operations.

4.1 Installation Location and Description

Fort Monmouth is located in the central-eastern portion of New Jersey in Monmouth County, approximately 45 miles south of New York City, 70 miles northeast of Philadelphia, and 40 miles north of Trenton, the State Capital. The Atlantic Ocean is approximately 3 miles to the east. Fort Monmouth falls within the Boroughs of Eatontown, Oceanport, and Tinton Falls. The areas surrounding Fort Monmouth are characterized by a mixture of residential, commercial, and light industrial uses. A review of the land use plans for the surrounding municipalities shows that land uses in the surrounding municipalities are compatible with those along the inside perimeter of the Site. Fort Monmouth occupies approximately 1,126 acres and is currently comprised of two operational areas, the Main Post and the Charles Wood Area. The two areas are located about 2 miles from one another (3).

The primary mission of Fort Monmouth is to provide command, administrative, and logistical support for CECOM Headquarters (4). The support provided by the installation is used by tenant activities in the performance of research, development, procurement, and production of prototype communications and electronics equipment for use by the United States Armed Forces. The Main Post provides supporting administrative, training, and housing functions, as well as many of the community and industrial facilities for Fort Monmouth. These facilities are distributed across the property, with no distinct clustering of functions. The Charles Wood Area is used primarily for R&D, testing, housing, and recreation. The Charles Wood Area research, development, and testing facilities occupy the southwest corner of the subpost, residential areas are located in the northwest corner and along the southeastern boundary, and the golf course occupies the northeast corner (4). Currently, the workforce population at Fort Monmouth includes approximately 537 members of the active military; 8,602 civilians; 3,200 permanent contractors; 514 family members; and 30,300 retirees and family members in the area (19,20).

4.1.1 Main Post

The Main Post encompasses approximately 637 acres and contains a total of 397 buildings and structures (4). The Main Post is bounded by State Highway 35 to the west, Parkers Creek to the north, the New Jersey Transit RR to the east, and Main Street and State Highway 71 to the south. Universal Transverse Mercator coordinate locations (NAD83, Zone 18, meters) for the Main Post include:

- Northeast Corner: 582178.33995, 4463977.92694

- Southeast Corner: 582755.27789, 4463525.90188
- Northwest Corner: 579532.14255, 4462789.29460
- Southwest Corner: 579698.14842, 4462269.63793.

4.1.2 Charles Wood Area

The Charles Wood Area, located 2 miles west of the Main Post, is composed of approximately 489 acres and contains a total of 241 buildings and structures (4). The Charles Wood Area is bounded by the Garden State Parkway to the west, Tinton Avenue to the north, Maxwell Place and the New Jersey Transit RR to the east, and Pine Brook Road to the south. Universal Transverse Mercator coordinate locations for the Charles Wood Area (NAD83, Zone 18, meters) include:

- Northeast Corner: 578997.83200, 4462033.09195
- Southeast Corner: 579386.98486, 4460899.58327
- Northwest Corner: 577293.44846, 4461472.84017
- Southwest Corner: 577466.30241, 4460271.56946.

Prior to 1996, Fort Monmouth also included a third operational area – the Evans Area – located approximately 12 miles south of the Main Post. The Evans Area is excluded from this assessment due to the fact that it is being managed under the BRAC 1993 program (3).

Both the Main Post and the Charles Wood Area are nearly level except for short, steep slopes along streams and waterways. Topographic gradient slopes gently to the east in both areas, within the drainage network of local tributaries to the Shrewsbury River. Elevations at the Main Post range from about 6 feet amsl at stream edges to 30 feet amsl near the center of the post. Elevations at the Charles Wood Area range from about 27 to 60 feet amsl, the lowest elevations are along Wampum Brook near the eastern property boundary (4).

4.2 Historic Land Use

4.2.1 Main Post

The original Fort Monmouth Army camp, established for signal troop training in 1917, was located at Little Silver, New Jersey. The historic land use of the area included a one-mile horse racing track, Monmouth Park, established in 1870. The track was located in the vicinity of PAHC near the intersection of Broad Street and Park Avenue. Monmouth Park operated for twenty years. A larger Monmouth Park was reconstructed and opened on July 4, 1890. The oval track was centered on present day Greeley Field. The entire facility encompassed 640 acres (almost all of the Main Post area). Grandstands and a luxury hotel along Parkers Creek were part of the associated land uses. The Monmouth Park Race Track closed in 1893. Vacated buildings and structures fell into ruin and the hotel burned to the ground in 1915. The land was owned by Melvin Van Keuren, when it was evaluated for use by Camp Little Silver. The Army leased 468 acres from Mr. Van Keuren on May 16, 1917. The land was farmed with potato crops at least for the previous four years. The leased area was bounded on the

north by Shrewsbury River, on the west and south by a stone road from Eatontown, and on the east by the Oceanport-Little Silver Road. Parkers Creek crossed the property near the north. The land also included approximately 600 feet of rail siding. The condition of the land was reported as overgrown and infested with poison ivy. The land was purchased by the government in 1919 (5,6). Historical Army uses of the Fort Monmouth Main Post property are well documented in "A Concise History of the U.S. Army Communications-Electronics Life Cycle Management Command and Fort Monmouth, New Jersey" (5) and "Fort Monmouth: Landmarks and Place Names" (6).

4.2.2 Charles Wood Area

The Charles Wood Area was acquired by the Army in 1941. The Charles Wood Area tract included the former Monmouth County Country Club (originally Sun Eagles Country Club), Olmstead Gardens, and areas currently occupied by the golf course and Myer Center. Fort Monmouth personnel indicated an orchard was located in the golf course area prior to Army acquisition (see **Section 5.12**). The Sun Eagles Country Club was constructed in the 1920s and included a clubhouse (currently Gibbs Hall), an eighteen-hole golf course, a polo field, and an airfield (6). A 7,000 troop cantonment area was immediately built on the land, including barracks, mess halls, a school building, an office building, a recreation hall, a Post Exchange, an infirmary, and a Chapel (5,6). Historical Army uses of the Fort Monmouth Charles Wood Area property are well documented in "A Concise History of the U.S. Army Communications-Electronics Life Cycle Management Command and Fort Monmouth, New Jersey" (5) and "Fort Monmouth: Landmarks and Place Names" (6).

4.2.3 Historic Deed Records

Historic deed records were obtained from the Real Estate Management Information System (REMIS) General Tract Record database maintained at the USACE, New York District, Real Estate Division. Additional documents were obtained from the Fort Monmouth historian and DPW's Master Planning Office. **Appendix B** includes a printout of the REMIS data record and a summary of the historical deed documents reviewed for Main Post and the Charles Wood Area. Acquisition maps for each post, identifying the tract and previous owner, are also included in **Appendix B**. The majority of the Main Post property was purchased from Bungalow Sites Company in 1919 and Monmouth Park Villa Site Company in 1921. The majority of the Charles Wood Area was purchased in 1942 from Philrush Realty and Allenhurst National Bank & Trust Company and in 1952 from the Department of the Air Force.

4.2.4 Summary

The majority of Main Post property was previously developed as the Monmouth Park Race Track, dating from 1870 to the time the track was closed in 1893. Portions of the property were cultivated for potato farming from that time until the Army leased the property in 1917.

The majority of Charles Wood Area property was previously developed as the Sun Eagles Country Club and residential housing prior to Army purchase in 1941. Additional

portions of the property were purchased from private land owners over the next several decades.

4.3 Facility History

The Main Post of Fort Monmouth was established on June 17, 1917, as Camp Little Silver. The name of the Camp was changed after 3 months to Camp Alfred Vail. The initial mission of the Camp was to train Signal Corps operators for service in World War I. In the first 19 months of the Camp's existence, 129 semi-permanent structures were built, a tent camp established on the site of a former swamp, and a parade ground established on the site of a former marsh. A radio laboratory and an airfield were developed in 1918. After the war, Camp Vail was designated as the site of the Signal Corps School, the only training area for Signal Corpsmen in the country. All but four World War I structures were demolished by 1924 (5).

In 1925 the facility became a permanent post and its name was changed to Fort Monmouth. The primary mission of Fort Monmouth continued to be Signal Corps training and electronics research. In 1934, laboratory operations were consolidated in a new facility, Squier Laboratory (Building 283). Research on radios and radar continued here until the early 1950s. During World War II, the pace of training increased tremendously at Fort Monmouth. The expanded laboratory effort was accomplished by starting new laboratories at other post facilities. Squier Laboratory continued to be the principal laboratory on Main Post until 1954. In 1955 and 1956, 72 World War II wooden structures were demolished to make room for permanent structures. These new buildings were used for residential, administrative, commercial, and recreational purposes. A small number of additional administrative buildings were completed during the 1970s, 1980s, and 1990s (5).

Camp Charles Wood was purchased in 1941 and opened in 1942. The eastern half of the property was formerly a golf course and the western half was residential and farmland. During World War II, the Camp was used for training Signal Corpsmen. Antenna shelters were constructed on 26.5 acres of land and used by the Signal Corps Laboratory for R&D purposes (5).

A new R&D facility, the Myer Center (Building 2700), was completed in 1954. R&D activities that had formerly been conducted at Squier Laboratory and some activities from the Evans Area were transferred to the Myer Center. To this day, laboratories within the Myer Center facility continue to develop state-of-the-art electronic and communications equipment for use by the U.S. Armed Forces (5).

4.3.1 Operational History

Upon the establishment of Camp Little Silver in 1917, Major Mitchell organized the Reserve Officers' Training Battalion and two tactical units, the 5th Telegraph and 10th Field Signal Battalions. The curriculum included cryptography, the heliograph, semaphore, wig-wag, motor vehicle operation, physical training, dismounted drill, tent

pitching, interior guard duty, map reading, tables of organization for Signal, Infantry, and Calvary units, camp sanitation, personal hygiene, first aid, and equitation (5).

The camp achieved semi-permanent status and was re-named Camp Alfred Vail in September 1917. A six-week intensive training course on foreign codes and languages was initiated at Camp Alfred Vail. The 11th Reserve Telegraph Battalion located to the camp. Additional units followed, including a Radio Operator Detachment, the 408th Telegraph Battalion, the 52nd Telegraph Battalion, and the 1st Field Signal Battalion (5).

Forty-three semi-permanent laboratory buildings devoted to wireless communication technology development for World War I were completed in January 1918. By 1919, all Signal Corps schools were located at Camp Vail. The school was designated "The Signal Corps School, Camp Alfred Vail, New Jersey." The initial curriculum included an officer's division, subdivided into radio engineering, telegraph engineering, telephone engineering, signal organization, and supply. The radio specialist course consisted of radio electricity, photography, meteorology, and gas engine and motor vehicle operation.

Two air-fields and four hangars were also constructed east of Oceanport Avenue. The radio laboratory was charged with the development of radio equipment. Research initially centered on vacuum tubes, circuits of existing equipment, the testing of apparatus submitted by manufacturers, and the application of new inventions. The radio equipment produced required testing, resulting in 90 to 95 airplane flights a week. The camp's flying activity peaked during this period, operating twenty aircraft. This represented the largest number of aircraft ever housed at Camp Vail. By November 1918, all flying activities at the camp ceased and aeronautical property was shipped to other locations. The school used the hangars as workshops and classrooms, since the cessation of aerial activity in 1918 (5). The Signal Corps Pigeon Breeding and Training Section was established at the camp in October 1919. The Department of the Army discontinued its pigeon service in 1957 (5).

Training of Reserve Officer Training Corps personnel developed into a major function of the school in June 1920. Training began for National Guard and Reserve officers the following year. The name of the school was officially changed to "The Signal School" in 1921 to reflect this expanded mission. The name was retained until 1935 when it reverted to "The Signal Corps School." The school was regrouped into four departments between 1922 and1923, including the Communications Engineering Department, the Applied Communications Department, the General Instruction course, and the Department for Enlisted Specialists. Meteorological instruction began in January 1920. Photographic instruction began in 1919; however, laboratory facilities were not available until 1926. Instruction in motion picture techniques was initiated in 1930. These courses reverted to the Army War College in 1932. A training literature section was formed in 1921. It supplied the technical and field manuals needed to instruct in operations and maintenance of Signal Corps equipment. The section remained one of the major departments of the school until 1941 when the Signal Corps Publications Agency assumed its duties (5).

The installation was granted permanent status and renamed Fort Monmouth in 1925. Although overshadowed by the Signal School, the Radio Laboratory remained one of the most important facilities at Fort Monmouth. The Signal Corps concluded after World War I that adequate research facilities for the design and development of Army communications equipment were necessary. A ground telephone and telegraphy set for artillery fire control was developed in 1926. Additional developments included air-ground liaison equipment, portable telegraphy units, artillery nets, boat to shore contact equipment, and 100-mile telephone transmitters. Other experimentation was performed on items such as tube testers, crystal controller oscillators, unidirectional receivers, and non-radiating phantom antennas. The first radio-equipped weather balloon was launched at Fort Monmouth in 1929 (5).

The function of the laboratory prior to 1929 had been primarily to design and test radio sets and some field wire equipment. The Signal Corps Electrical Laboratory, the Signal Corps Meteorological Laboratory, and the Signal Corps Laboratory at the Bureau of Standards moved to Fort Monmouth in 1929. The laboratories became known as the "Signal Corps Laboratories." The Subaqueous Sound Ranging Laboratory transferred to Fort Monmouth in 1930 (5).

The 51st Signal Battalion and the 1st Signal Company comprised two other long-term organizations at Fort Monmouth. Technical subjects included radio and telegraph operation, electricity, maintenance, line construction, and meteorology. The Military Affiliate Radio Station was born at Fort Monmouth in 1925 under the Army Amateur Radio Service. The Army Amateur Radio Service mission included providing world-wide radio communications and training a reserve of skilled radio operators (5).

The hospital in Building 209, Allison Hall, was completed on Main Post in 1928. A new hospital, constructed as Building 1075, was completed in 1961. The 51st Signal Battalion was reorganized in 1933 to prepare for field training on a large scale. Its new missions included providing instructors and overhead for the Signal Corps School, organizing a provisional radio intelligence detachment, and forming the nucleus of a General Headquarters signal service, to include a meteorological, photographic, and radio intelligence company (5).

The Signal Corps Laboratories consolidated at Fort Monmouth in 1929. No physical changes occurred at the laboratories until 1935. Appropriations were received for the construction of a permanent, fireproof laboratory building and shops in 1934. Squier Laboratory was completed in March 1935. Much of the communications equipment used by American forces during World War II was designed and developed at Fort Monmouth during the 1930s. The laboratories completed six field radio sets, artillery pack sets, a single channel radio (SCR)-197 mobile transmitter, the SCR-300 Walkie-Talkie, switch boards, field wire, and radio receivers. Radar was also developed during this time. In 1937, the Signal Corps embarked on projects for development of a searchlight control and gun laying detector, a surface vessel detector, and a long-range aircraft detector (5).

Eleven double sets of Noncommissioned Officer Quarters were completed, along with the West Wing, and an addition to the North end of the Hospital in 1934. A blacksmith shop, incinerator, bakery, warehouses, band barracks, and utility shops were also completed that year. Construction activities in 1935 included the fire station, guardhouse, Signal Corps Laboratory (Squier Hall), three sets of quarters for field officers, and three sets for company grade officers (5).

The Signal School "training literature section," whose mission was to write and publish training manuals, regulations, school texts, and other technical manuals was granted authorization to construct a print plant at Fort Monmouth in 1927. The Fort Monmouth Signal Corps Publications Agency was activated in November 1943. By 1944, the organization occupied 16 buildings on Main Post and had 500 products pending (5).

Camp Charles Wood was established in 1942. The Replacement Training Center was in operation at Charles Wood Area by mid-1942. The unit-training center was deactivated in November 1943. Eatontown Laboratory was constructed in 1941-1942. The Eatontown Signal Laboratory was renamed Watson Laboratories in 1945 and subsequently moved to Rome, New York in 1951 (5). A new R&D engineering laboratory, Building 2700, was constructed at Charles Wood Area in 1954 (5).

The Signal Corps School was re-designated the Eastern Signal Corps School in June 1942 (deactivated in 1946). The school offered training in message center and messenger procedures, wire construction, and radio and wire communications. The first Weather Radar and the first synthetically produced large quartz crystals were developed at Fort Monmouth in 1948. Auto-assembly of printed circuits commenced in 1949. The Signal Corps Center was established at Fort Monmouth in 1949, consolidating the Signal Corps Engineering Laboratories, the Signal Corps Board, the Signal School, the Signal Corps Publications Agency, the Signal Corps Intelligence Unit, the Pigeon Breeding and Training Center, the Army portion of the Armed Services Electro Standards Agency, and all Signal Corps troop units. The Signal Corps Electronic Warfare Center and the 9460th Technical Service Unit were relocated to the west coast in 1950 (5).

The Signal Corps Laboratories employed approximately 4,500 scientists and supporting personnel between 1951 and 1953. Responsibilities included production engineering of equipment designed since World War II. Significant advances were made on smaller and lighter forward-area equipment, wire communications, meteorological and photographic equipment, nucleonics, radar, and thermionics. The 9463rd Technical Service Unit, Radio Propagation Unit, transferred to Fort Monmouth in January 1954. The Signal Corps Engineering Laboratories played an important role in the International Geophysical Year between 1957 and 1958, conducting upper air research and measurement of winds and temperatures by means of rockets. Support was also provided in the earth satellite program. Scientists developed instrumentation for meteorological measurements. Fort Monmouth scientists developed a method for measuring polar ice by using radar in 1957. The U.S. Army Signal Corps Engineering Laboratories were re-designated the U.S. Army Signal Corps Research Development Laboratory in April 1958. Fort Monmouth developed the complete electronics package

for the Vanguard II infrared scanning satellite in 1959. Scientists at Fort Monmouth participated in Project WOSAC for global standardization of time measurement between 1959 and 1960. The world's first mobile, van-mounted computer, MOBIDIC, was produced in 1961 at Fort Monmouth. The laboratories developed portable, hand-held radar in early 1962, using the latest micro-miniaturization technology (5).

The U.S. Army Electronics Command (ECOM) was established at Fort Monmouth in August 1962. The ECOM mission was to exercise integrated commodity management of assigned material within the concept of cradle-to-grave management. The command was responsible for research, design, development, product and maintenance engineering, industrial mobilization planning, new equipment training, wholesale inventory management, supply control, and technical assistance to users in the commodity areas or communications, electronic warfare, combat surveillance, automatic data processing, radar, and meteorological material. The laboratories were designated the U.S. Army Electronics Laboratory in 1964. The Electronics Laboratory was segregated into six laboratories in 1965, including the Electronic Components Laboratory, Communications/ADP Laboratory, Atmospheric Sciences Laboratory, Electronic Warfare Laboratory, Avionics Laboratory, and Combat Surveillance and Target Acquisition Laboratory (5).

ECOM provided equipment and services to Southeast Asia and the Pacific during Vietnam for efficient, reliable telephone and data communications. The Command delivered 20,000 VRC-12 and 33,000 PRC-25 radios to Southeast Asia in three and a half years. These radios were designed at Fort Monmouth, but manufactured elsewhere. ECOM developed a trailer-mounted four-channel multiplexed radio to support communications in air-mobile operations. A helmet-mounted receiver and transmitter were developed in 1967. During Vietnam, transistors and integrated circuits replaced tubes. ECOM supplied combat troops with night vision devices, mortar locators, aerial reconnaissance equipment, surveillance systems, sensors, and air traffic control systems (5).

Fort Monmouth's last class in signal communications graduated in June 1976. ECOM Avionics and Combat Surveillance R&D activities were transferred to other locations in 1977. The Electronics R&D Command and Communications R&D Command were activated in January 1978. The functions of acquisition and readiness were separated with this reorganization. The two commands were merged in May 1981 to become CECOM. CECOM was charged with the research, development, engineering and acquisition of assigned communications and electronic systems and management of all material readiness functions associated with these systems and related equipment. CECOM innovations included the first televised weather satellite, the first large-scale mobile computer, the first high capacity communications satellite, hand held radar, Morse Code readout, multi-channel laser relay, microelectronics, night vision, radio ground beacon, defibrillator pacemaker, carbon dioxide communications laser, lithium battery, mortar and artillery locating radars, automatic telephone central office, and the laser mini-rangefinder. Research facilities of the command included the Center for Tactical Computer Systems, which conducted R&D in computer science and systems, including hardware and software for diverse applications; the Center for

Communications Systems, which researched programs to produce advanced communications technology, equipment and systems; and the Center for Systems Engineering and Integration, the Army's system engineer for Tactical Command, Control and Communications. The command added a Software Development and Support Center in October 1984. The CECOM Logistics and Readiness Center (LRC) was established in November 1987 (5).

Tenant organizations operating at Fort Monmouth included the Joint Tactical Command, Control, and Communications Agency of DoD, established in 1984; the U.S. Army Chaplain Center and School, established in 1979; the U.S. Army Information Systems Management Activity/Project Manager, Defense Communications Systems, established in 1984; and the 513th Military Intelligence Group, established in 1982 (5).

CECOM developed new secure communications systems throughout the 1980s, including the Signal Channel Ground and Air Radio System and Mobile Subscriber Equipment. CECOM was responsible for equipping and sustaining the Gulf War troops with communications and electronics equipment. Troops were equipped with radios, jammers, night vision, and intelligence systems. CECOM also supported war efforts through the purchase of commodities, including consumables, repair parts, and replacement items. Batteries represented a huge challenge for CECOM during operations. Maintaining the right stock and ensuring the right equipment received the right battery became a logistical concern (5).

As part of BRAC 1993 the CECOM office in Tinton Falls was vacated and 2300 employees moved to Fort Monmouth. Building 1207 became the new CECOM Headquarters in 1996. Belvoir Research, Development and Engineering and Aviation and Troop Command functions were realigned to Fort Monmouth. Team C4IEWS (Command, Control, Communications, Computers, Intelligence, Electronic Warfare and Sensors) was established in 1993. All of the information management, acquisition, engineering, and procurement operations of the Army Information Systems Command were assigned to CECOM in 1996. The realignments of 1997 gave CECOM responsibility for information technology across the full spectrum of operations, from the sustaining base to the battlespace (5).

The Enroute Mission Planning and Rehearsal System was developed by CECOM in 2000. The new system, installed on a modified cargo aircraft, allowed soldiers to maintain situational awareness while in the air. CECOM quickly recognized the need for better communications, more integrated response plans, and quicker response times following September 11, 2001. Homeland Security became a top initiative for CECOM. Operation Noble Eagle was assigned to Fort Monmouth in October 2001 to protect the Fort Monmouth community, its facilities, and personnel stationed on post. Fort Monmouth's preparations for Operation Enduring Freedom began in the weeks following September 11th to supply equipment and fulfill emergency requisitions. The highest demand items initially requisitioned were lithium batteries, Firefinder, and night vision equipment. CECOM developed a prototype unit for "down well" viewing (5).

The Research, Development and Engineering Command was established with additional reorganizations in 2002. Today, the Communications–Electronics Research, Development, and Engineering Center is the Army's information technologies and integrated systems R&D center (5).

4.3.2 Process Descriptions (Industrial Facilities Only)

The purpose of this section is to provide an overview of past or current industrial processes. In compiling this section a number of resources were utilized. Historical reports including the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) installation assessment and numerous U.S. Army Environmental Hygiene Agency (USAEHA) archive reports were reviewed. Other documents reviewed were the Stormwater Pollution Prevention Plan (SPPP), environmental investigation reports, RCRA waste inventories, and the 1999 facility-wide chemical inventory. Information was also gathered during the 2006 VSIs performed as part of this ECP and interviews of facility personnel.

The descriptions of specific industrial processes have been compiled for use in determining the environmental condition of the property. Specific determinations regarding the environmental condition of the property relative to the buildings and areas discussed below are addressed in **Section 5** of this document.

4.3.2.1 Main Post

4.3.2.1.1 Printing and Photo Processing

The 1980 initial installation assessment (48) documented printing operations in Buildings 104, 105, and 106 on the MP. Photo processing has historically taken place in Buildings 10, 100, and 814 on the MP. As previously stated, the Fort Monmouth Signal Corps Publications Agency occupied 16 buildings on Main Post in 1944; however printing operations were noted only in the above-referenced buildings. Information regarding the photo processing operations in Buildings 10, 100, and 814 appeared in a limited number of industrial hygiene (IH) reports. This may indicate that the photo processing operations in these buildings were limited in scope and/or duration. Buildings 10 and 100 have been demolished. Building 814 was used as a dental clinic and is discussed further in **Section 4.3.2.1.4**. No information indicating environmental concerns were identified for Buildings 10 or 100. IH reports from 1950, 1952 and 1953 (32,33) noted photo processing and printed material reproduction operations at Building 288, including photographic equipment experimentation and repair. Environmental conditions associated with Buildings 104, 105, 106, and 288 are discussed in **Section 5.13.3** of this report.

U.S. Army Field Printing Plant (Temporary Buildings 104, 105, and 106)

Former Buildings 104, 105, and 106 were located directly north of the intersection of Oceanport Avenue and Riverside Avenue. These buildings were constructed in the 1940s and served as printing and photo processing facilities until they were demolished in the 1980s. Building 495 currently stands in the area of former Building 104 and an

open grassed area is present southeast of Building 495 where Buildings 105 and 106 previously existed. The printing plant employed 54 workers and was located in the ground floor of two temporary wood structures that covered approximately 13,900 square feet of floor space (39). Operations included Xerox, photographic, offset press, and lithographic plate making rooms. Water vapor and ammonia from an ozalid machine were controlled by local exhaust. An ozalid process is a method of duplicating printed matter onto chemically treated paper. Lead fumes, dust, and combustion products from a gas-burning linotype metal remelting furnace were discharged outdoors by local exhaust. This furnace was reported to be used twice per month. According to IH reports, lead fumes and dust from the linotype machine, gases, mists, and vapors from developing, printing, and plate-making solutions, toner dust from the Xerox process; and ozone and nitrogen oxides from the operation of arc lamps were not well controlled by mechanical ventilation. Additional operations, including use of standard chemicals in the photographic process, use of special materials in the Xerox process, operating of arc lamps, and use of lithographic plate-making were conducted. Methyl and ethyl alcohol vapors were produced from mimeograph processes. Production layouts of the area are included as appendices in the reference report (39).

IH survey reports spanning 1952 to 1984 identified various printing operations at Building 104, including photographic reproduction, lithographic reproduction, carbon arc reproduction, zinc plate sensitizing, and cleaning of equipment with various organic solvents (33,34,35,36,37,40). Offset printing operations in Building 104 utilized a blanket wash solution containing 25 percent carbon tetrachloride, 15 percent toluene and/or xylenes, and 60 percent petroleum hydrocarbons (35). IH reports from 1952 and 1954 also noted the forming of lead ingots in Building 104 (33,34). Melting of antimony and tin was noted in 1955 (35).

Building 104 was located in the footprint of the current Credit Union (Building 495). Building 104 and Building 107 (oil heating plant for Building 104) were investigated in 1997 as part of an environmental assessment conducted prior to the construction of Building 495. The subsurface investigation involved the analysis of soil and groundwater samples for TPHCs, VOCs, and heavy metals. No contaminants were detected in groundwater above NJ Groundwater Quality Criteria. A 3,000-gallon UST and all contaminated soil were excavated and transported off site for disposal at a NJDEP approved facility (138).

Building 105 was listed as part of the Printing Plant in 1975 and 1986 (41,42). Operations in Building 105 included the use of tetrachloroethene (PCE) during 1981 (43). Operations noted at Building 106 in 1950 and 1958 included arc lamp photography, letter press printing, photograph developing, and carbon arc sensitizing (32).

4.3.2.1.2 Surface Coating

Building 280 – Carpenter's Shop. Building 280 serves as the current MP paint shop. The shop is responsible for all painting activities associated with post maintenance. The storage of paint also takes place at this facility. The waste generated by the

painting activities is hazardous and includes waste paint thinner, waste paint chips with lead, waste oil-based paint, aerosol paint cans, and aerosol solvent cans. Trench floor drains and a sump were noted during the VSI. The sump and drains are part of a vacuum pit and pipe trenches for the heating system (formerly steam). Building plan maps specify said system did not handle water and did not have a discharge point (49). No evidence of release to the environment associated with this operation was identified as part of this ECP.

Building 450 – Marina. Routine boat maintenance and painting are done at this facility. Waste oil-based paint (hazardous waste) is generated during painting operations. The marina is only open to active duty military personnel, retired military personnel, and Army civilians and contractors working on base. Routine maintenance activities are performed by the boat owners themselves, not by the installation. The DPW Environmental Branch provides waste management support and other environmental services to marina patrons (2006 VSI observations). No evidence of release to the environment associated with this operation was identified as part of this ECP.

Other Surface Coating Operations. Additional painting operations have been noted at Buildings 163, 165, 277, 283, 294, L-3, 482, 484 and 1122 on the MP.

- A paint shack associated with Post Transportation (motor pool) in 1955 was utilized for spray painting, brush painting, and stenciling at Building 163 (35). No evidence of release to the environment associated with this operation was identified as part of the ECP. Building 163 has been demolished.

- Brush painting was reported at Former Building 165 in the early to mid-1950s (33,34,35). IH reports did not discuss any other industrial processes associated with Building 165. IH reports discussed painting taking place between 1952 and 1957. Therefore, this operation's duration was likely limited. This operation no longer takes place at this location. No evidence of release to the environment associated with this operation was identified as part of this ECP.

- Spray painting was reported at Building 277 in 1958 (36), Building 482 during the 1970s when it was used as a furniture shop (38), and at Building 484 from 1950 through 1978 during operation as a Post Ordnance Shop facility (32,33,34,35,36). Building 484 was formerly used for vehicle maintenance. The back section of the building is now used as a recycling room. Buildings 482 and 484 are currently equipped with secondary containment systems to capture liquids in the event of a spill. Floor drains and sumps noted in Buildings 482 and 484, during the 2006 VSIs, are part of these secondary containment systems. The secondary containment systems have no connections to the sanitary or storm sewer systems. These containment systems were not present during the historic spray painting operations. Spray painting no longer takes place at these locations. No evidence of release to the environment associated with these operations was identified as part of this ECP.

- Painting operations were noted at Buildings 283, 294 and L-3 within the former Squier Laboratory Complex. Building 283, which has been converted to administrative functions, operated a Paint Shop for spray painting and the baking of paints, enamels and varnishes, as noted in IH Survey reports of the 1950s (32,33,34). Spray painting was noted at Building 294 in 1952 (33). Paint experimentation involving paints, lacquers, enamels, and solvents was reported at Building L-3 in 1950 and 1954 (32,34). These operations no longer take place at these locations. No evidence of release to the environment associated with these operations was identified as part of this ECP.

- Furniture paint stripping was reported in the Woodworking Craft Shop section of Building 1122 in 1973 (37). Environmental conditions associated with Building 1122 are discussed in **Section 5.13.4** of this report.

4.3.2.1.3 Storage Areas

Building T-65 – Pesticide Storage and Mixing. Former Building T-65 was used for storage and mixing of pesticides, including diazinon and Malathion. A 1981 Hazardous Waste Management Survey identified dichlorodiphenyltrichloroethane (DDT) and 2,4,5-Silvex stored at Building T-65 (37,38). Pesticide mixing and storage at Building T-65 is addressed in the FTMM IRP as site FTMM-17. Environmental conditions associated with Building T-65 is discussed in **Section 5.12** of this report.

Building 79 – Salt Storage. Roadway salt piles are stored in a large domed structure with one access doorway. Two plastic liquid calcium chloride tanks are located just outside Building 79. The liquid is pumped directly from the tanks into a tank truck for the de-icing of base roadways. Sand is also stored on the concrete pad along the exterior side of the building. The sand is not required to be covered due to the large distance to storm drains. Metal beams and planks may also be stored on occasion in this area (50). No evidence of release to the environment associated with this operation was identified as part of this ECP.

Buildings 105, 106, and 116 – Excess Storage and Recycling Yard. A dedicated temporary central storage area for recyclables is located behind Buildings 105, 106, and 116. Materials are held here on a periodic basis before being shipped to the Defense Reutilization and Marketing Office. Items containing hazardous materials, such as refrigerants, are drained prior to being stored in this area. Hazardous materials extracted from the equipment are stored in the hazardous waste storage area. Contaminated soils from UST removals are stored on the curbed concrete pad and covered with a tarp when needed (50). During the VSI, a storm drain, connected to the storm system, was noted in the concrete loading dock depression for Building 116.

The majority of the larger recyclable material is stored directly on the ground surface. Scrap metal is stored in five individual roll-offs and several trailers are used to house various electronics, computers, and office furniture prior to recycling. An area for the cleaning of tank carcasses is located on a concrete pad between Buildings 105 and 106. On the east side of Buildings 105 and 106 are two large storage piles of wood scraps and vegetation/tree limbs. Additionally, several empty metal trash cans, empty

ASTs, and metal piping are stored on the ground surface to the east of Buildings 105 and 106 (50). No evidence of release to the environment associated with these operations was identified as part of this ECP.

Building 117 – Material/Equipment Storage Area. This area contains two outdoor storage locations of various materials, including wire cabling, hoses, plastic tubing, polyvinyl chloride (PVC) piping, air conditioning units, miscellaneous metals, metal beams and piping, storm drain piping, manhole covers, emergency generators, high voltage switches, bricks, rebar, wood fencing, asphalt roofing shingles, and plastic siding material. Materials are stored on asphalt surfaces and/or metal shelving, and the asphalt shingles are covered with a tarp (51). No evidence of release to the environment associated with this operation was identified as part of this ECP.

Building 159 – Debris Storage. The debris storage area is located east of Riverside Avenue and adjacent to Building 159. The location is utilized for the temporary storage of clean fill and concrete (with or without rebar) prior to disposal and/or recycling off site. The materials are segregated into several categories in four separate storage bins for economy of disposal costs. Various sized dump trucks deposit materials into the appropriate categories, then front-end loaders push and lift the material into stockpiles. The materials are loaded into trailers for transport off site. This area is designed to allow rainwater to drain away from the stockpiled material. No evidence of release to the environment associated with this operation was identified as part of this ECP.

Buildings 12, 63, 484, and 488 – Outdoor Storage Area. According to the 2006 SPPP, this storage area is located just north of the Building 159 Debris Storage Area and just east of Buildings 279/280. The outdoor storage area is comprised of Buildings 12, 63, 484, and 488. The area is used for the outdoor storage of materials and transformers (50).

Transformers are stored on a curbed concrete pad that is fenced and locked. This pad is located behind Building 12. Approximately 40-50 new or usable transformers are stored on a specially designed containment pad behind Building 12. The containment pad is managed under the DPW's Spill Prevention, Control and Countermeasures (SPCC) program. The transformers are predominantly pad mounted of varying sizes and are designated and labeled as Non-PCB equipment. The transformers contain dielectric fluid. No evidence of release to the environment associated with this operation was identified as part of this ECP.

The eastern exterior of Buildings 279/280 is used for the storage of used oil filters, used antifreeze, used aerosol paint cans, used solvent cans, used lead acid batteries, used gel batteries, used electrical ballasts, used smoke detectors, crushed fluorescent bulbs, nickel cadmium batteries, waste paint thinner, paint chips, waste oil based paint, waste latex paint, refrigerant oil, and oil spill debris. The waste materials are stored in 55-gallon drums within secondary containment Poly Safety Paks (50). Used oil is stored in three 995 gallon steel double-walled ASTs next to Building 484. Used oil filters are stored inside a 1.5 cubic yard (CY) liquid-tight container located next to Building 484.

A storage facility next to Building 488 is utilized by the DPW for storing replacement transformers and related types of electrical equipment (52). The equipment contains insulating oils (mineral oils), which are defined as being Non-PCB Class oils. The storage area consists of a 100-by-30-foot concrete reinforced pad. The pad is surrounded by a six-inch concrete curb that serves as secondary containment. The concrete curb surrounding the transformer storage pad is designed to hold up to 11,220 gallons. At the time it was evaluated for the SPPP, approximately 150 transformers were stored on the pad. The transformers ranged in size from 10 to 500 kilovolt-ampere (kVA) transformers. A 10 kVA transformer may contain as little as nine gallons of mineral oil. A 500 kVA transformer may contain as much as 200 gallons of mineral oil. Based upon the total number of transformers in storage (150), the DPW estimated the total volume to be 7,500 gallons. The transformers themselves contain steel compartments (tanks) that house the insulating oils. These operations are modern and actively managed by the FTMM DPW. Storage within the fenced area behind Building 488 includes metal light stanchions, metal light heads, wire and cable, telephone poles, metal pylons and piping, and PVC piping (50). No evidence of release to the environment associated with this operation was identified as part of this ECP.

Buildings 480 (Custodial Shop) and 481 (Make it Happen Center). The Landscape Material Storage facility is located behind the "Make it Happen" Center (Building 481) and is used to store various bulk materials such as topsoil, peat moss, stone, etc. for use by the residents of FTMM. Material such as stone, sand, soil, and mulch is stored in 15 "U" shaped concrete storage bins. The entire facility is surrounded by a locked fence and gate system.

As seen during the 2006 VSI, a small outdoor storage area is located between Buildings 480 and 481, across from the Landscape Material Storage area. Wood pallets are used to store several different types of bricks, a forklift under a canopy structure, a household hazardous waste storage shed, and a small used oil AST inside an enclosure. The DPW Environmental Branch manages the Household Hazardous Waste Storage Shed and the 275-gallon double-walled steel AST. Used oils collected from post residents are stored within the AST.

Half of Building 480 is currently utilized as a custodial services shop. Janitorial chemicals are stored and concentrated cleaning products are diluted inside the building. Satellite accumulation containers (fluorescent light bulbs and aerosol cans) are stored in secondary containment packs outside the building for collection by DPW. The other half of Building 480 is used for general storage, shipping, and receiving of computers and miscellaneous electronics. These operations are modern and actively managed by the FTMM DPW. No evidence of release to the environment associated with this operation was identified as part of this ECP.

Building 623 – Out-of-Service Equipment. Formerly, Building 623 served as the central storage area for out of service transformers, capacitors, switches, and other types of electrical equipment which contained PCB, PCB-contaminated, and Non-PCB oils. Building 623 was a one-story wood structure which was constructed on a concrete pad. The building had the following size dimensions: 102' x 26' x 12'. Secondary

containment was provided at the facility in the form of a concrete dike. The dike lined the entire inside perimeter of the building and was constructed to a height of 8". The decision to close the facility was based on two factors, the location and the age of the facility.

In December of 1992, a contract was awarded to decontaminate the interior of Building 623. The cleanup involved scarifying all concrete surfaces within the building. Contaminants generated from the scarifying process were containerized and sent to Aptus, Inc. for thermal treatment. Final cleanup was completed in February and the building was demolished in May of 1993 (53). Following the demolition, soil samples were collected at the site to document the closure of the facility. The sample results verified that no PCBs were released to the environment. The facility was replaced by a new building. No evidence of release to the environment associated with this operation was identified as part of this ECP.

4.3.2.1.4 Medical, Dental, and Veterinary Operations

Building 1075 – Patterson Army Hospital. Current facilities observed during the 2006 VSI include: an X-ray clinic (with developer), microbiology lab, dental clinic, and a maintenance shop. During the 2006 VSIs, numerous floor drains were observed in the basement that lead to the pneumatic sewage ejector and into the sanitary sewer (54). Currently, X-ray development is now digital except for one mammography processor and two dental film processors. All fixers (X-ray development chemicals) are channeled through pipes to the basement, captured in a secondary containment area using 55-gallon drums, then processed as hazardous waste. Medical waste is labeled and stored in an outdoor shed for pick up prior to off-site disposal.

PAH was originally located in Building 209, which was built in 1928. By 1968, Building 209 was converted to house the headquarters of the U.S. Army Satellite Communications Agency (55). The hospital was reported to be relocated to Building 572 in a 1954 report (56). Room 2 and Room 3 of Building 572 both contained a radiographic fluoroscopic machine. A mobile radiographic unit was also utilized (56). Building 1075 was constructed in 1961 to accommodate hospital services (55). Therefore, it is likely that the hospital operations in Building 572 took place during a limited period of time, potentially as short as seven years.

Documentation from 1972 indicates that PAH provided all laboratory, radiological, electrocardiographic, and audiometric support in Building 1075 (57). Special consultative services, emergency care, and hospitalization were also provided, including services for occupational illness and injury. In addition to ambulance service from the main hospital, each satellite clinic had local ambulance service. The Main Facility provided care for 4,244 employees. A satellite dispensary at the Myer Center (Building 2700) area provided services for 2,610 employees. The Myer Center Health Clinic was also noted in a 1978 report (58). FTMM personnel did not recollect health facilities located at Building 2700 (59,157).

The 1978 report summarized inspection results in the following service areas located at PAH: Pathology in Room 1A65, the Morgue in Room 11, Physical Therapy in Room 1D65, a Urology Clinic, a Medical Clinic, a Carpenter Shop, and a Machine Room (58).

The following PAH rooms were itemized in a 1984 report (60):

Room 1A11 – Pharmacy

Room 1A25A – X-ray Developing

Room 1A66 – Lab

Room 1A67 – Serology Lab

Room 1A85 – Chemistry Lab with fume hoods

Room 1B37 – Clinic

Room 1D22 – Medical Clinic

Room 1D46 – Medical Clinic

Room 1D67 – Podiatry/Dermatology

Room 1D83 – Emergency

Room 1D95 – Pediatrics

Room 2A36 – OR Suite

Room 3C13 – Gynecology

Morgue

Additional buildings associated with hospital activities in 1978 included Building 501 – Social Work, Building 833 – Property and Equipment Management Branch, Building 876 – Preventive Medicine, Building 893 – Medical Warehouse, and Building 898 – Medical Warehouse (58). FTMM personnel indicated that Building 292 was used as a Medical Warehouse which was closed between 1999 and 2004 (59). FTMM personnel had no further information regarding the other medical/storage facilities mentioned above (59,157). No information was identified which would indicate an environmental concern associated with medical warehouse operations.

In 1995, PAH was downgraded from a hospital to a health clinic. A Pollution Prevention Opportunity Assessment done in late June 1995 (51) showed the following areas present at PAHC: Emergency Room, Operating Room, Laboratory, Radiology, Outpatient Pharmacy, and a Dental Clinic. Information provided by FTMM personnel indicated the morgue was closed in the early 1990s. Operating rooms were closed in approximately 1995/1996 (59,157).

According to a 1999 USACHPPM report, regulated medical waste was picked up from PAHC every Tuesday by a contractor, Environmental Control Company, who transported it off post to an incinerator (62).

The hospital generates hazardous waste by the use of equipment that contains mercury (61). The development of X-rays and other medical images create chemical waste streams. Malfunctioning spray cans generate hazardous waste as well. Typical waste includes mercury spill debris and aerosol lubricant cans.

Radiological Areas

Diagnostic X-ray systems reported at PAH during a May 1972 Radiation Protection Survey (57) included: 1) Chest X-ray Room – Radiographic Unit; 2) X-ray Room 1 –

Radiographic fluoroscopic unit with image intensifier; 3) X-ray room, Physical Examination Center – Photofluorographic unit; 4) Room E Dental Clinic.

A 1983 report (63) identified similar units in the following areas: 1) Chest X-ray Room, Radiographic unit; 2) Head X-ray Room, Radiographic unit; 3) Room 1 – Radiographic Fluoroscopic unit; 4) Room 2 – Radiographic Fluoroscopic unit; 5) Two Mobile Radiographic units.

Equipment surveyed in the Radiology Department in November 1994 (64) included:

- Triple phase fluoroscopic unit with a maximum tube potential of 125 kilovolt peak (kVp) and maximum fluoroscopic tube current of 2.5 milliamperes (mA) (Room 1A26).
- Triple phase radiographic unit with a maximum tube potential of 150 kVp and maximum tube current of 320 mA (Room 1A26).
- Triple phase radiographic/tomographic unit with a maximum tube potential of 150 kVp and maximum tube current of 400 mA (Room 1A17).
- Triple phase fluoroscopic unit with a maximum tube potential of 120 kVp and maximum tube current of 2.1 mA (Room 1A17).
- Single phase dedicated chest radiographic unit with a maximum tube potential of 125 kVp and maximum tube current of 600 mA (Room 1A36).
- Two mobile radiographic systems with maximum tube potential of 125 kVp and maximum tube current-time of 200 mA (portable equipment).

The waste fixer from two X-ray processors at PAHC's Radiology Section was directed sequentially through an active (electrolytic) and passive (cartridge) silver recovery unit. Approximately 240 gallons of developer was used each year and approximately 230 gallons of fixer was used each year (62). The active and passive silver recovery units at the PAHC radiology section previously lacked secondary containment, allowing the possibility of damage to floors and walls, and discharge to floor drains noted during the VSI, due to spillage (52). As stated above, floor drains within Building 1075 discharged to the sanitary sewer system. Secondary containment was in place at the time of the 2006 VSIs.

The only radioactive isotope used in the In-Vitro clinic was iodine-125 (63). Due to the small weekly volume of in-vitro tests performed, all tests were batch run each Wednesday. Health and Safety monitoring for iodine-125 contamination was reportedly done at the end of the workday. The 1983 Radiation Protection Survey (63) reported that waste disposal procedures consisted of flushing all liquids down a designated sink. Bottles, flasks, and similar items were flushed with large amounts of cold water and monitored for residual contamination. Clean items had all their radioactive labels defaced and were disposed of as normal laboratory waste. Items with residual contamination would be rewashed until clean. The report concluded that there were no

health hazards associated with ionizing radiation, and that the program was conducted in accordance with existing directives for radiation protection.

Laboratories and Pharmacy

According to a 1995 survey (51), by late 1994 the Chemistry Laboratory was using "dry chemistry" equipment. The PAHC Chemistry Laboratory used two Ektachem dry chemistry blood analyzers. The Microbiology Lab used two Vitek System Analyzers with plastic cards disposed as regulated medical waste. The Ames Clinitek 200 analyzer used multi-test sticks that discharged to a tray from which they were disposed of as regulated medical waste (51).

Other active laboratories in 1995 included Serology, Hematology, and Histology (51). By 1999, Microbiology, Histology, Cytology laboratories had been closed, thus reducing hazardous waste generation. Active laboratories reported in 1999 included Chemistry, Serology, Urinalysis, Phlebotomy, Hematology, and the Blood Bank (62).

The Histology Laboratory was still using wet chemistry, but was scheduled for closing in early 1996. Ethanol, xylenes, and formalin were used in the Tissue Tek Vacuum infiltration processor. The Stainer model 172 analyzer was used to coat slides with various stainers and dyes, including ammonia and alcohol. By 1999, the Histology Laboratory was reported as closed (62).

The Radiology Clinic utilized a X-OMAT 48ORA film processing unit with a ARU silver recovery. The second X-OMAT unit used a X-Rite silver recovery unit. Approximately 10 gallons a week of effluent underwent reduction of the silver concentration before transfer to a 55-gallon drum. One effluent sample result was reported at 825 milligrams per liter (mg/L) of silver (51). Collection and sampling of effluent did not begin until June 1994. Safety Kleen was contracted for removal of the collected waste fixer. Approximately 30 gallons of spent fixer was collected monthly and waste X-ray film was collected as needed. A new silver recovery unit was installed in 1996 (65). The washwater from both recovery units was discharged untreated to the sanitary sewer system (51). Washwater was required to contain less than 0.2 mg/L of silver at the junction of the FTMM and the regional sewage authority system. Washwater sampling was conducted and DPW confirmed the silver limits were within the Publicly Owned Treatment Works restrictions (62). Radiology still operated the equipment in 2002, with the waste effluent collected and managed by DPW. The washwater was still discharged to the sanitary sewer. The units were scheduled for replacement (except for mammography) with digital equipment by the end of 2002 (66).

Room 1A11 was identified as the Pharmacy in 1978 and 1984 (58,60). FTMM personnel indicated the pharmacy has always been located in the same room (59,157). In 1993 the pharmacy discontinued accepting empty dram bottles (amber colored pill containers). PAHCs prime vendor system had been in place for about 18 months. The pharmacy had a contract with Guaranteed Returns, Inc. that required the firm to take back waste and expired pills (51).

Buildings 814, 834/835 – Dental Clinics. Buildings 834 and 835 housed Dental Clinic activities beginning in 1951. The buildings were originally constructed in 1941 as barracks. Documentation reviewed did not mention dental activities in Buildings 834 and 835 after 1983. Additionally, FTMM personnel believed dental activities in Buildings 834 and 835 ceased by 1980 (59). A replacement facility for the Dental Clinic was under consideration in 1968 (55). The first available information for an additional facility was reported as Building 814 in 1981 (67). FTMM personnel indicated during the 2006 VSI that the Dental Clinic vacated Building 814 in approximately 2003. The building is currently used as a locker room by the Prep School.

A 1978 medical review of the hospital and Dental Clinic (Buildings 834 and 835) found a lack of drip trays for mercury transfer operations and amalgam preparation. Procedures were found to be inadequate for containment and cleanup of mercury spills and they noted a lack of mercury spill cleanup supplies and equipment. Residual contamination was found in hand brushes used in dental operatories (Room 27). Spilled mercury was also noted inside mobile dental chests and the sponges were saturated with mercury in the operatory, Building 834/835. Notice was also given that floors were not sealed, allowing for possible spills to migrate through the flooring (58). Additional dental facilities which have been identified include: Dental Clinic Room 18, used for oral surgery; Dental Clinic darkroom; Dental Clinic Laboratory, (1st floor, Building 835); and a sterilization room (58).

In 1983, four dental systems were in place (63):

<u>Building 814</u>

- SS White Intra Oral unit
- GE Panelipse II
- Siemens Heliodent Intra Oral unit (newly installed)

<u>Building 834, Room 17</u>

- Orthopantomograph (scheduled for return in 90 days)

<u>Building 835, X-ray Room</u>

- SS White Intra Oral unit

<u>Building 1075 (PAH), Room 1A96</u>

- SS White Intra Oral unit (scheduled for return in 90 days)

Dental laboratory facilities were reported in Building 814 in 1984, including labs in Rooms E12 and E16. Dental lathe machines were used in Room E12 (60). Activities at the Dental Clinic that generated hazardous waste were related to routine dental work for military and dependent personnel. Occasionally, malfunctioning spray cans that contain

product generate hazardous waste. The typical hazardous wastes generated included lead foil wrap, waste fixer, mercury amalgam, waste developer, and aerosol spray cans (63). Dental laboratory facilities were also reported in Building 814 in 1999 (62).

A 1994 Radiation Assessment noted that Dental Clinic Room D2 housed two single phase intraoral X-ray units (fixed tube potential of 70 kVp and a current of 7 mA) and a single phase panographic X-ray unit (maximum tube potential of 81 kVp and maximum tube current of 10 mA). Dental Clinic Room F1 housed a single phase intraoral X-ray unit (fixed tube potential of 70 kVp and current of 7 mA) (64).

One A/T 2000 film processor was reported in the Dental Clinic in a 1995 Pollution Prevention Assessment (51). Spent fixer solution was sent to the PAHC for silver recovery. Washwater was discharged untreated to the sanitary sewer.

According to a 1995 USAEHA report, waste amalgam was collected dry at each work station and turned in to the Property Book for precious metal recovery (51). A few grams per month, containing mercury, silver, and other compounds were sent to DPW in 1999 (62). An estimated 16 pounds of lead foil waste was generated annually at the clinic in 1999 (62).

A Healthcare Facility Waste Management survey in 2002 noted that photographic chemical containers in Building 814 were not stored in an area provided with secondary containment. Additionally, the photo processing machine was observed to be leaking and the machine was not in an area provided with secondary containment (66). Capped floor drains were noted in Building 814 during the VSI. Floor plans indicate that the drains are connected to the sanitary sewer system (67). No evidence of an environmental release associated with the dental clinics was identified as part of this ECP.

Building 810 – Veterinary Clinic. The veterinary facility Building 810 was built in 1941 (55). The 1999 chemical inventory report showed compressed gas cylinders of oxygen, formaldehyde, and other medical products were used in this area. FTMM personnel indicated during the 2006 VSI that Building 876 [demolished in 2005 (53)] was also previously used for the Veterinary Clinic. Documentation reviewed, however, indicated that Building 876 was used for a medical supply warehouse during 1978 and 1987 (58,68). During the VSI of Building 810, floor drains were noted in the kennel area. According to a 1982 renovations drawing, the floor drains were replaced and additional drains were added just outside of the kennels. These drains were connected to the existing piping. This piping is separate from the sink/toilet plumbing although it is also connected to the sanitary sewer system (69). FTMM personnel stated during the VSI that X-ray film is developed at PAHC and all medical waste material is sent to PAHC. Environmental conditions associated with the veterinary clinic are discussed in **Section 5.13.5** of this report.

4.3.2.1.5 Waste Treatment and Disposal

Building 697 – Classified Waste Incinerator (1971 to 1990). A multiple chamber, in-line incinerator was formerly located in Building 697. The building was demolished in

2003 (53). The incinerator was designed to burn ten tons per day of general refuse and was later used one day per week to burn one to two tons of classified paper (28). In 1974, approximately ten tons of classified material was incinerated each month (29). Normal operation was to fire the incinerator with wood and then charge it continuously with cardboard boxes and paper sacks filled with classified waste. Records state the incinerator did not comply with the New Jersey particulate emission standard of 0.2 grams per standard cubic foot.

A new incinerator was installed in Building 697 to dispose of classified documents, computer paper, and computer cards (153). The Kelley 380 waste incinerator was installed in 1981 and was fed using a hydraulic ram charging system. The incineration occurred in the main combustion chamber and in the stack where a thermal reactor burner was located. Both burners were fired with natural gas. USEPA Region 2 requested documentation that this incinerator could meet New Jersey air emission standards. The initial tests in December 1982 showed that the incinerator exceeded particulate emissions standards. USAEHA and the manufacturer assisted FTMM in making the necessary corrections to assure compliance with the standards (63). The incinerator operated until 1990. The incinerator ashes were taken to the FTMM landfills, such as Landfill M-8. Since 1990, classified paper has been shredded. In 1991, three samples of material were taken from the incinerator stock, gasket, and lining and analyzed for asbestos. Asbestos was not detected and no additional sampling was recommended as there was no evidence of contamination (10). The incinerator was dismantled in 1993. No evidence of an environmental release associated with this operation was identified as part of this ECP.

Building 1076 – Medical Waste Incinerator (1970 to 1993). A pathological waste incinerator was located west of Building 1076, the Boiler Plant. The unit was installed in 1970. It was a Plibrico multiple chamber retort pathological incinerator designed to burn 50 pounds per hour of Type 4 waste, equipped with both primary and secondary auxiliary gas burners. The inside was lined with fire brick and fired by propane. The incinerator was approximately five feet wide, six feet long and six feet high. Approximately 30 pounds per day of infectious paper and plastic material (Type O waste) from PAH was burned in this incinerator. A USAEHA report concluded the incinerator did not comply with the New Jersey particulate emission standard of 0.1 gram per standard cubic foot (28).

The 1974 USAEHA Solid Waste Survey indicates the original incinerator was replaced in 1974 (29). No state permit was required because the incinerator was operating before the 1977 revision to the Clean Air Act (CAA). The replacement incinerator, Dean Model S-200 controlled air pathological incinerator, was designed to destroy Type 4 hospital waste (animal solids and organic wastes – 100 percent animal and human tissue) at a rate of 100 pounds per hour. The incinerator was dual chambered. Incinerator ash was originally disposed in the FTMM landfill (Site M-8). After that landfill was closed, the ash was disposed off site. In December 1989, the incinerator was proven to be emitting particulates in excess of state standards. The incinerator was closed in December 1992. In 1993, the interior of the incinerator and the grounds

around the incinerator appeared to be free of ash and debris. The incinerator was demolished in November 1993. Pathologic waste is now shipped off site for disposal.

An apparent incinerator smokestack was noted on the roof of PAHC (Building 1075) during the 2006 VSI. According to FTMM personnel, an incinerator was located on the third floor of Building 1075. It was only operated for trial burns, and was shut down in 1975, shortly after it was placed online (70). No evidence of an environmental release associated with this operation was identified as part of this ECP.

Building 1150 – Vail Hall Paper Waste Incinerator. During the 2006 VSI interviews, FTMM personnel stated that a paper incinerator had been removed from the basement of Vail Hall between September and December of 1993 (70). This paper waste incinerator was not discussed in a 1971 or 1974 air pollution engineering survey which evaluated other paper waste incinerators in use at that time. It is not known if the Building 1150 paper waste incinerator was in use at that time or if it had been constructed yet. No evidence of an environmental release associated with this operation was identified as part of this ECP.

Building 1210 – Classified Waste Incinerator. A multiple chamber incinerator was noted on the roof of Building 1210 in a 1971 air pollution engineering survey. This unit was used to destroy 300 to 500 pounds of classified paper during a 3-hour burn, two to three days per week. The 1971 report indicated the unit would not meet New Jersey particulate emission standards and it was recommended that the incinerator either be upgraded or its use discontinued (28). A solid waste survey conducted in 1974 states that classified waste was incinerated at Building 697, with no mention of an incinerator existing at Building 1210 (29). No incinerator currently exists at Building 1210 and personnel who worked at FTMM during the 1970s have no knowledge of an incinerator previously existing at Building 1210 and further stated the building was converted from a flat roof to an “A” frame roof in the late 1970s (30). No evidence of an environmental release associated with this operation was identified as part of this ECP.

Building 274 – Incinerator. According to historical documentation, an incinerator was constructed on MP in 1934 (5). Although this documentation does not identify the location of this incinerator, review of site plans from the 1930s indicates the presence of an incinerator west of Building 551. The site plans identify the incinerator as Building 274. There was no documentation regarding the use of the incinerator however, it is likely that the use was for the destruction of classified waste. Analysis of aerial photographs from 1940 does not identify the incinerator (26). Therefore the operational lifetime of this incinerator was likely short. No evidence of an environmental release associated with this operation was identified as part of this ECP.

4.3.2.1.6 Laboratory/Research Facilities

Squier Laboratory Complex. The Squier Laboratory Complex included Buildings 283, 285, 288, 292, 293, 298, S-5, S-6, S-6 Annex, S-9, S-10, S-11, S-12, and S-15; Buildings 289, 290, 291, 294, 295, L-3, T-45, X-9, X-7, 551 are also described in this section.

In 1934, FTMM laboratory operations were consolidated in a new facility, Squier Laboratory. Squier Laboratory continued to be the principal laboratory on post until 1954 when the new R&D facility, Myer Center (Building 2700), was opened.

In 1943, research was conducted by the Signal Corps Laboratories relative to battery and electronics coatings designed to inhibit moisture, mold, fungus, and insects. A variety of chemicals, including pyridyl mercury compounds and pentachlorophenols, were likely used in ventilated booths for spray finishing products. Products were spray finished with impregnated varnishes and lacquers prior to equipment deployment to the South Pacific during World War II (71).

By the 1950s, Squier Laboratories encompassed multiple buildings. The following paragraphs detail the buildings and operations that were part of the Squier Laboratories.

Rooms and shops reported within Building 283 were an Electric Repair Room, Carpenter Shop, Plating Shop, Paint Shop, Machine Shop, Welding Shop, Foundry, and a Blacksmith Shop. Chemical usage in these areas included carbon tetrachloride, chromic acid, trichloroethene (TCE), and hydrochloric acid (32). Small amounts of mercury used in various laboratory instruments, including some spillage, were documented during a 1950 IH Survey. Building 283 contained a heat treating operation where heat treating was performed on various metal parts by means of gas-fired furnaces. Bay 184 was used for growing various types of radio and electronic crystals. Multiple chemicals were used in small quantities including hydrogen sulfide, hydrogen selenide, benzol, carbon tetrachloride, cadmium and other laboratory chemicals. Processes involving cadmium and selenium at high temperatures had been proposed (32).

By 1952, operations included the above as well as free silica used for sandblasting in the foundry. A chemistry physics section conducted physical chemistry measurements using mercury (33). In 1954, the following operations were noted in Building 283 (34):

Location	Operation	Material Utilized
Bay 137	Parts cleaning	Carbon tetrachloride
	Crystal Grinding	
Bay 136	Measurements	Mercury containing instruments
	Machine shop	
	Paint shop	
	Welding shop	Forging, arc, and acetylene welding
	Foundry	Casting metal, heat treatments
Bay 122	Electroplating	Silver, copper, zinc, and sodium cyanides; copper and nickel sulfate; chromic oxide; cadmium oxide
	Pickling metal parts	Muriatic acid
	Stripping nickel from parts	Sulfuric acid
	Alkaline dip/Cleaning parts	Solution of sodium metasilicate
	Vapor flush/Degreasing parts	TCE

At the time of the 2006 VSI, all functions within Squier Hall (Building 283) were administrative. Within the basement of the building, floor drain troughs were observed that discharge to a sump, located directly underneath an out of service steel hot water tank. These are the only floor drains noted in the building. Original blue prints detail a boiler room sump; however, no connections to the sump are shown. An additional sump was identified in the work bench area of the basement. All floors within the basement were wet due to frequent groundwater intrusion. Although the sumps were likely installed for seasonably high water levels within the basement rather then waste disposal, it is possible that contamination could be present within the sumps due to the historic uses of the building.

Building 288 contained multiple, diverse operations including the Micromeritics section which conducted work on semi-conductors using alcohol and acetone. The reproduction section used ammonia in an ozalid process (development of negatives and tracings) and methyl alcohol in a ditto process to reproduce printed materials, as well as carbon arc reproduction. The rewind room used acetates and acetone for rewinding and splicing of film. A work shop was present to repair and perform experimental work on photographic equipment in which carbon tetrachloride was used. The heating of mercury compounds was noted in the building in 1954 (32,33,34). All of Building 288 has been converted for use as administrative space. Building 288 is currently used in that capacity.

Building 289 housed the Power Branch and included dynamometer testing of gasoline engines. The building was also used for administrative purposes. Building 290 housed the Power Branch machine shop (32). Both buildings have been demolished. During the 2006 VSI, the area of former Building 290 was under construction. A new foundation was being placed.

Building 291 housed the Crystal Section where crystals were cut (chemicals used included crystal oil and carbon tetrachloride). The frequency section, where frequency measurements were made on crystals, used chemicals including carbon tetrachloride. Another crystal operation was performed called “lapping” where crystals were fastened to flat jigs by means of a hard wax before being placed in a machine used to lap the surfaces of the crystals to the right condition. The wax was softened by heating and during this process, fumes emanated from the heated surface. After lapping, the crystals were removed from the jig and carbon tetrachloride was used as a final step in the process to clean the wax from the crystals and jig prior to re-use. In the 1952 and 1954 IH Surveys, chemical research was noted in this building, utilizing various chemical reagents. Manufacturing, research, and development of batteries was also noted in the 1952 and 1954 IH Surveys. Research in solder and fluxes was done in 1954 using chemicals such as potassium hydroxide, sulfuric acid, and acid mists. Casting and melting of resins in ovens was reported in 1954 (32,33,34). This building has been converted into administrative space. No laboratory operations currently take place in Building 291.

Building 292 housed the Climatic Section where testing of Signal equipment was done in temperature extremes of 60 degrees below zero using ammonia. The capacitor test

group conducted similar testing on capacitors for temperature extremes of -60 to -135 degrees Fahrenheit (°F). Room 107 was used to conduct electrical testing and intermittent use of mercury was employed in various types of instruments (32,33,34). By 1954, room 101 was used for analyses of phosphors and room 107 was used for making mercury electrodes (34). The 1954 report noted a closet 6' x 4' x 2' with shelves was used to store bulk mercury, instruments in glass, metal containers and pans, many of which were open. Mercury globules were present on the shelving and floor. Room 202 tested the life of selenium rectifiers under normal operating conditions and charging of lead acid plastic batteries was done. Climatic testing of motors, batteries and other equipment continued. In 1955, charging and discharging of batteries continued using sulfuric acid and potassium hydroxide (154). During the 2006 VSI, part of Building 292 was being used for Museum and Directorate of Logistics storage. The other part of Building 292 is currently utilized by the High Frequency Radio program. A former pigeon coop is located above the High Frequency Radio offices. Personnel reported during the VSI, that Building 292 had previously been used for medical storage, and that the space occupied by the High Frequency Radio program had been used as an electronics testing laboratory prior to 2000 (59).

Building 293 is currently used for the environmental conditions testing of various types of batteries. Testing of batteries in this building has been reported since 1952 (33). In 1954, the mixing of electrolytes and testing of batteries was being performed (34). In 1955, charging and discharging of batteries continued using sulfuric acid and potassium hydroxide (35). A fire occurred at Building 293 in the mid-1980s and the facility was reconstructed. During the 2006 VSI, a floor drain was noted in a utility room adjacent to the satellite accumulation areas (used batteries) for exempt, universal, and non-hazardous waste and a former foundation was observed adjacent to the existing building where the former building may have been located prior to the fire in the mid-1980s. Floor plans indicate that the drains are connected to the sanitary sewer (72). No evidence of the ground stain observed in the 1969 and 1974 aerial photographs was visible at the time of the 2006 VSI.

Operations conducted at Building 294 included spray painting, development of rubber and plastic, and the use of organic solvents and compound resins (33,34). Building 294 was used to test equipment for shock and vibration resilience. Three electrodynamic and two reaction type shakers tested components under simulated vibration conditions. These operations moved from Building 294 to Bay OA411 of the Myer Center (Building 2700) in 1956 (35). Building 294 was demolished in 2000 (53).

Building 295 was used for fabrication of reinforced plastics in 1954. Acetone and styrene were both used in the labs. One enclosed oven was present (34). This testing activity no longer takes place in Building 295. Building 295 has been renovated and is currently used for administrative space.

A Quonset hut housed the ceramics laboratory where plastics were used for experiments. An additional Quonset hut adjacent to Building 551, was used for analytical work on photographic chemicals including acids, carbon tetrachloride, benzol, and other photographic chemicals. By 1954, the hut was being used for recovering

silver and other products with exchange resins. Other uses included darkroom photography with developer and fixer solutions and synthesizing phosphors using silver nitrate, copper chloride, and nickel chloride (32,34). This Quonset hut has been demolished.

Operations in Buildings S-5, S-9, S-10, S-11, and S-12 used various laboratory chemicals in hoods for the manufacture and testing of dry cell batteries (32). By 1954, S-5 and S-12 were being used for chemical analyses of battery materials, degreasing using TCE and carbon tetrachloride, polarographic analysis, and mercury reclamation (34). Building S-6 housed the refrigeration section where carbon tetrachloride was used for cleaning and repair of laboratory equipment. The S-6 annex was used for testing power units (32). An open area near Building S-15 was used for testing diesel generators and gasoline engines (33). DPW records indicate that Building S-6 was demolished in 1980 or 1981, and Building S-5 was demolished at an unspecified date. None of the remaining buildings were identified during the 2006 VSI and it is likely that all have been demolished. Building L-3 was used for paint experimentation. Various types of paint and other surface coatings were made and tested in this building. Various used solvents, including acetates, alcohols, benzol, petroleum solvent, and others were placed into a large tank located against one wall of the building. No information was provided in the report as to how the contents of the tank were later handled (32). In 1954, spraying of paints, lacquers, and enamels was done in a paint spray booth (34). The 1954 IH survey was the last to reference Building L-3. This building has been demolished.

Building T-45 was used for experimental manufacturing of storage batteries. Approximately 10 workers were located in this area. Two laboratory hoods had been provided for use when charging batteries. Lead, cadmium, zinc, and other metallic oxide dusts, along with benzol, carbon tetrachloride, ethylene dichloride, and various organic solvents were used (32). Building T-45 was not present at the time of the 2006 VSIs.

Building X-9 and the X-9 Ramp were used in 1954 for examination of engine generator sets and testing gasoline engines, both in and outdoors (34). Building X-7 was used for mixing acid, namely sulfuric acids (35). These buildings have been demolished.

Environmental concerns associated with the Squier Laboratory complex are discussed in **Section 5.13.6** of this ECP report.

DPW Laboratory Facilities. Buildings 173 and 174 house the DPW administrative offices and in-house environmental laboratory. Chemical reagents for use in the laboratory and satellite accumulation areas for hazardous waste were noted during the 2006 VSI. This is a modern laboratory operation with waste handling procedures that are actively managed by the FTMM DPW. No evidence of an environmental release associated with this operation was identified as part of this ECP.

Former Building 680 – Water Quality Laboratory. A 1976 IH Survey noted chemical analyses for water quality using standard laboratory chemicals being performed at

Building 680. The report also recommended decontamination of sodium azide in laboratory lead pipes (38). Storage of cyanide salts and mercury bichloride at Building 680 was reported in a 1981 Hazardous Waste Management Survey (43). The building has since been demolished. Potential environmental concerns associated with this operation are discussed in **Section 5.13.7** of this report.

Building 901 – Electromechanical Section, Quality Training Branch. According to a 1988 IH Study, training classes for instruction in wave soldering were held in Room 16 of Building 901. Wave soldering is a process whereby electronic components are affixed to printed circuit boards by bathing the bottom of the boards in a standing wave of molten solder. Related operations included vapor degreasing of the boards with a Freon 113™-based solvent and electrical resistivity testing while the boards were immersed in isopropyl alcohol (47). Neither this process nor Building 901 was referenced in previous or subsequent IH Survey reports. Building 901 is currently used in an administrative capacity. No evidence of an environmental release associated with this operation was identified as part of this ECP.

4.3.2.1.7 Maintenance and Engineering Shops

Building 142 – Packing and Crating. Building 142 is the Packing and Crating Shop where items including hazardous materials are packaged for shipment. Facility personnel reported during the 2006 VSI that there have been no spills of hazardous materials in this building. The only floor drain is located in the bathroom. No plans for the building were found in the DPW map and engineer drawings repository. No evidence of an environmental release associated with this operation was identified as part of this ECP.

Building 279 – Heating, Ventilation, and Air Conditioning (HVAC) Shops. Building 279 is referenced as the Ordnance Field Shop, Post Ordnance Shop, or similar title in IH Survey reports throughout the 1950s. Operations described included auto repair, parts cleaning and battery charging (32,33,34,35,36). A 1973 IH Survey referred to Building 279 as the Wheel Track Vehicle Shop, which performed vehicle testing and repairs (37). Automotive maintenance was reported during a Hearing Conservation Survey in 1978 (41). Motor Pool operations included former waste oil ASTs and trichloroethene (TCE) parts cleaners. All TCE parts cleaners were eliminated from use (MP and CWA) in February of 1994 under Environmental Program Requirements (EPR) Project FM0094F088. In 1993, USAEHA included this building in the air emissions report. Environmental conditions associated with these historical processes are discussed in **Sections 5.4.2 and 5.13.8** of this report.

Building 279 has recently been used for engineering and housing maintenance and repair. In 2003, as well as during the 2006 VSIs, the building had shops for heat, CPM, plumbing and HVAC. Activities at Building 279 generate hazardous waste and include numerous satellite accumulation areas. Materials generated include used aerosol paint and solvent cans, used oil filters and antifreeze, used smoke detectors, used lead acid gel batteries, electrical ballasts, waste batteries, fluorescent tubes, waste refrigerant oil, oil spill debris, waste paint thinners, paint chips, and oil and latex paints. During the

2006 VSI, a sump was noted. The sump is part of the vacuum pit and pipe trenches for the heating system (formerly steam). The plan prints specify that this system is not connected to the sanitary or storm sewer system (49).

Building 280 – Carpentry Shops. Historically, Building 280 has been used as a carpentry shop in support of post maintenance. Woodworking activities have been noted at this building since 1950 (32). According to the 1999 chemical inventory, this building also housed a welding shop. Machining, grinding, welding, soldering, and blacksmithing have also been reported in Building 280 since the 1950s (33,35). At the time of the 2006 VSIs, Building 280 was still utilized as a carpentry and metals/welding shop. Trench floor drains and a sump were noted during the VSI. The sump and drains make up the vacuum pit and pipe trenches for the heating system (formerly steam). The plan prints specify that this is a waterproof system without drainage (49).

Operations in Building 280 generate hazardous waste and there are various satellite accumulation areas (see **Section 4.1** for full details on MP and CWA satellite accumulation facilities). In 1999, the chemicals stored in the building included compressed gas cylinders, including bulk storage (154 pounds) of oxygen (73). Hilti guns are used and safety boosters are stored on site for use in this equipment. No evidence of an environmental release associated with this operation was identified as part of this ECP.

Building 281 – Refrigerating Equipment Repair. Based on available IH reports, Building 281 was used for repairing refrigerant containing equipment from the 1950s into the 1970s. Chemicals utilized included carbon tetrachloride, Freon (and other refrigerants), methyl chloride, sulfur dioxide, Varsol and methyl chloroform (trichloroethane). According to the 1950 IH Survey, Building 281 also housed a machine shop where machining and blacksmithing was performed and silver brazing occasionally using cadmium containing brazing wire was reported in 1973. A 1976 IH Survey reported the handling and mixing of asbestos and asbestos cement in Building 281 (32,36,37,38). At the time of the 2006 VSI, Building 281 has been renovated to a security office and stored security system components and electronics. Environmental conditions associated with these historical processes are discussed in **Section 5.13.8** of this report.

Historic Motor Pool and Shop Facilities. Additional motor pool and/or shop operations were noted in:

- Building 159 (testing/tuning engines, parts cleaning – alkaline solutions, welding) (33,34,35,36,37). Building 159 has been demolished. Environmental conditions associated with this operation are discussed in **Section 5.4.2** of this report.

- Building 161 (testing/tuning engines, battery charging – sulfuric acid, machining, welding, steam cleaning using alkaline cleaner) (33,34,35,36). Building 161 was demolished prior to 1997 (53). Environmental conditions associated with this operation are discussed in **Section 5.4.2** of this report.

- Building 163 (testing/tuning engines, parts cleaning, welding) (33,35,36,37). Building 163 was demolished. Environmental conditions associated with this operation are discussed in **Section 5.4.2** of this report.

- Building 166 (machining, welding, battery filling – sulfuric acid, vehicle repair, auto body work) (35,36,37,38). Building 166 currently houses the facility sign shop, roads and grounds shop, and administrative offices. Environmental conditions associated with this operation are discussed in **Section 5.4.2** of this report.

- Building 197 (lawn mower repair and parts cleaning) (88). Building 197 was previously located across from Building 280. Building 197 has been demolished. Environmental conditions associated with this operation are discussed in **Section 5.4.2** of this report.

- Building 277 (welding, grinding, woodworking, stenciling, spray painting, soldering, brazing) (36,37,38). Building 277 currently houses administrative offices. No evidence of an environmental release associated with this operation was identified as part of this ECP.

- Building 403 (brazing, finishing – lacquer/thinner) (38). Building 403 was demolished in 1999 (53). No evidence of an environmental release associated with this operation was identified as part of this ECP.

- Building 464 (heavy equipment maintenance/repair, parts cleaning – alkaline solutions) (34,35,36,37,44). Building 464 was demolished. Environmental conditions associated with this operation are discussed in **Section 5.4.2** of this report.

- Building 483 (soldering, parts cleaning – organic solvents and dry cleaning fluid) (36). Building 483 was demolished prior to 1997 (facilities reduction spreadsheet). Environmental conditions associated with this operation are discussed in **Section 5.13.8** of this report.

- Building 484 (spray painting, auto body work – lead filler, welding) (32,33,34,35,36,37,38). Building 484 is currently a processing facility for the Class D Universal Waste Recycling Center (see **Section 5.1.1**). Environmental conditions associated with historical operations at this building are discussed in **Section 5.13.8** of this report.

- Building 485 (cleaning and repair of electrical equipment – organic solvents) (32,34,35,36). Building 485 was demolished in 1997 (53). Environmental conditions associated with historical operations at this building are discussed in **Section 5.4.2** of this report.

- Building 900 (Former Tactical Motor Pool – waste oil, TCE). This building has been used for general storage since approximately 1996. The building formerly had a TCE parts washer and waste oil tank (removed). Environmental conditions

associated with historical operations at this building are discussed in **Section 5.4.2** of this report.

- Building 1105 (silver brazing) (37). Building 1105 is currently used for administrative purposes by the Directorate of Emergency Services (DES) Police Union (building trustee list). No evidence of an environmental release associated with this operation was identified as part of this ECP.

4.3.2.1.8 Pool Chlorinator Facility

Building 114 – Main Post Indoor Pool. The FTMM MP Indoor Pool (Building 114) was built in 1954 and has a 160,600-gallon recirculation type heated pool. It has one pump with a design recirculation capacity of 400 gallons per minute (gpm) and a vacuum type diatomaceous earth filter with a surface area of 300 square feet. Originally, disinfection was accomplished by the continuous addition of chlorine gas to the recirculated water and the chlorinator was not separated from the pool personnel offices. USAEHA personnel recommended enclosing the chlorinator area to separate it from the office area for safety concerns associated with the chlorine gas (31). There have been no reported problems with the water quality at this pool. At the time of the VSI, the chlorinator was located in a separate small building adjacent to Building 114 which was dedicated to the chlorinator and the storage of pool treatment chemicals. Chlorination is currently performed through the addition of liquid sodium hypochlorite. A review of the DPW map and engineering drawings repository showed pool drain and backwash connections leading from Building 114 to sewage pump station Building 114A. Sanitary and storm mains are shown connected to Building 114A; although the storm piping is labeled "normally closed" (74). No evidence of an environmental release associated with this operation was identified as part of this ECP.

4.3.2.1.9 Commercial

Building 282 – Fire Station. Building 282 is the MP fire station. Floor drains were noted in the building, and a sump was located in the basement during the VSI. According to plans from 1933, both are connected to the sanitary sewer system (75). No evidence of an environmental release associated with this operation was identified as part of this ECP.

Building 1002 – Post Exchange. Building 1002 is the FTMM Post Exchange which sells pre-packaged household cleaning supplies, garden supplies and pesticides. During the 2006 VSI, floor drains were noted in the basement, and stormwater intakes (possible dry wells) were located in the courtyard outside the building. No plans for the building were found in the DPW map and engineering drawings repository. Transformers currently located on a concrete pad are Non-PCB class equipment. Previous transformers were designated PCB-contaminated class equipment [50-499 parts per million (ppm)] (see **Section 5.2.1.2**, Site FTMM-47). No evidence of an environmental release associated with these current operations was identified as part of this ECP.

Building 1007 – Commissary. Building 1007 is the FTMM commissary which sells pre-packaged household chemicals (commonly sold in supermarkets) to base and other military personnel. Floor drains were noted throughout the warehouse area during the VSI. In a 1997 floor plan, the floor drains shown were connected to the sanitary sewer (76). A large refrigeration unit is located on the second floor in the warehouse area. No evidence of an environmental release associated with this operation was identified as part of this ECP.

4.3.2.2 Charles Wood Area

4.3.2.2.1 Printing and Photo Processing

Photo processing has taken place in Buildings 2700, 2705, and 2525 in the CWA. A 1978 IH Survey reported ozalid reproduction in room 5101 of Building 2525 (38). At the time of the Initial IA team visit in 1980 (48), only one photographic laboratory was operational and that was located in Building 2700. During the 2006 VSI, it was observed that photographic processing and printing in Building 2700 had ceased. All imaging services are currently performed digitally. Previous operational equipment was removed from the building during renovations in 2003. Environmental conditions associated with these operations are discussed in **Section 5.13.3** of this report.

Building 2700. According to the 1991 IH Study (45), two photolithography laboratories were located in rooms 4D116/4D120 and 4C129/4D130. Chemicals in these areas included n-butyl acetate, chlorobenzene, 2-ethoxyethanol, 2-ethoxyethylacetate, methylene chloride, methyl isobutyl ketone, and xylenes. During the 2006 VSI performed as part of this ECP, the photolithography laboratories were observed to be converted to administrative offices and computer labs. Previous operational equipment was removed from the building during renovations in 1997.

The Navy Printing Shop does megagraphic printing and houses 11 Xerographic machines. The print shop operated daily 8 hours per day. It is currently under Navy control. Volatile organic compound (VOC) emissions were the primary concern for the emissions assessment done by USAEHA (88) and Table L-1 of their report documented the daily emission load from this operation. Navy personnel were not available to inspect the area during the VSI.

The Engineering Prints Reproduction Section in Building 2700 (Room 1B126-200) employed 31 workers occupying 6700 square feet of floor space at the U.S. Army Signal R&D Laboratory in 1958. Mechanical supply and exhaust ventilating systems diluted and exhausted heated air, water vapor, and miscellaneous contaminants released by reproduction equipment processes. Three large diazo process machines, two continuous blueprinting machines, and combustion products from arc lamps were properly controlled by local exhaust ventilating machine enclosures or overhead canopy hoods. A small ozalid machine and dryer as well as a number of smaller duplicating machines and similar types of reproduction machines, were not controlled by local exhaust. Reproduction operations noted during IH Surveys include ozalid reproduction, carbon-arc photography, carbon-arc sensitizing, film development and printing, Xerography, Diazo reproduction, printing, and lithography (36,37,40). USAEHA noted

that this area generated a significant amount of industrial waste in 1974, but by 1978 waste had been reduced due to improved operations and use of a waste collection vendor. Impacts were also reduced by the reduction-in-force, attrition, and better processing techniques, such as the use of new papers, rinse controllers, etc (46). During the 2006 VSI performed as part of this ECP, the Graphic Studio (1AB200) and the Photo Lab (1B200) were observed to use only digital equipment.

According to the pollution prevention plan (61), the photo processing laboratory at the Myer Center was based on a wet chemical process that used either a silver bromide solution or other hazardous chemical solutions. At the time the pollution prevention plan was published, approximately 5000 (8”x10”) photos and 18,000 (4”x6”) photos were processed annually at the laboratory. The chemical process was converted to digital technology in 2003. This pollution prevention initiative eliminated both silver and photo-fixer waste streams (61).

The Photo Optics Labs (Rooms 4D108, 110, 114 and 4C111 and 113) in Building 2700 conducted photo processing research, dealing with both black and white and color chemistry, including the mixing of photographic chemicals (37). Waste chemicals were generated from pilot-bench size operations and were likely small quantities (few gallons per week) of 3 to 10 percent solutions of either commercial formulations or new formulations developed in the laboratory. There was no silver recovery, although two units were in the area for research purposes. USAEHA noted that there appeared to be little problem with regard to industrial wastes but that silver recovery should be implemented (46). During the 2006 VSI performed as part of this ECP, the previous Photo Optics lab spaces were confirmed to be converted to administrative conference room and office space. Previous operational equipment was removed from the building during renovations in 1997.

Environmental concerns associated with these operations formerly housed in the Myer center are discussed in **Section 5.13.3** of this report.

4.3.2.2.2 Surface Coating

Building 2506 – Paint Spray Booth Operation. According to the Equipment and Source Operations Inventory in the FTMM air permit, Building 2506, Research, Development & Engineering Center (RDEC) Paint Shop, was FTMM’s only paint booth used in the painting of Army equipment and vehicle components (50). At the time of the VSI in 2006 the paint spray booth operation had ceased and the paint booth had been dismantled. No evidence of environmental conditions associated with the spray booth operations was identified as part of this ECP.

Building 2700 – Paint Spray Booths. Paint spraying booths were located in rooms 4D132, 1B114, 1B205 and 1B208 (35,36). Paint mixing and a paint roller mill were also reported in room 4D132. A 1978 USAEHA report identified spray painting operations in Building 2700 in room 1B207. According to the report, the paint spray booths were washed out infrequently (46). During the 2006 VSI performed as part of this ECP, Room 1B207 was confirmed to be used for office supply storage. Previous operational equipment was removed from the building during renovations in 1997. No evidence of

environmental conditions associated with the spray booth operations was identified as part of this ECP.

4.3.2.2.3 Storage Tanks

Building 2707 – Former Pulse Power Facility. Building 2707 was used by the Electronics Technology Devices Laboratory (ETD&L) until their move to Adelphi, Maryland as part of the BRAC 91 realignment initiative. Previous ETD&L activities at the facility included the R&D of high power/high voltage components and sub-systems for military applications. Five USTs were located within the facility during ETD&L's tenure. Four of the five tank systems were constructed of fiberglass. The remaining tank (tank # 1) was of double wall, stainless steel construction.

- Tank # 1 had a 1,000-gallon capacity and was used to store waste solvents. The UST was equipped with continuous leak detection monitoring which was accomplished through the use of a liquid leak sensor that was placed in the interstitial space of the tank. Tank # 1 was removed from service in 1992.

- Tank # 2 had a 2,000-gallon capacity and served as a spill retention tank for the East and West High Bay Areas. The UST system was constructed of a single wall of fiberglass and had no leak detection system.

- Tank # 3 had a 4,000-gallon capacity and was used to store a copper sulfate and water solution. The UST was constructed of double-walled fiberglass. It had continuous leak detection monitoring which was accomplished through the use of liquid leak sensors that were placed in the interstitial spaces of the tank and piping. In addition, spill and overfill prevention devices were installed on the tank system.

- Tank # 4 also had a 4,000-gallon capacity and was used to store ethylene glycol. The UST was constructed of double-walled fiberglass. It had continuous leak detection monitoring which was accomplished through the use of liquid leak sensors that were placed in the interstitial spaces of the tank and piping. In addition, spill and overfill prevention devices were installed on the tank system.

- Tank # 5 had a capacity of 10,000 gallons and was used to store Non-PCB electrical oil. The UST was constructed of double-walled fiberglass. It had continuous leak detection monitoring which was accomplished through the use of liquid leak sensors that were placed in the interstitial spaces of the tank and piping. In addition, spill and overfill prevention devices were installed on the tank system.

All five tank systems were removed from the site in September of 1998 (52).

During the 2006 VSI performed as part of this ECP, the East Bay of Building 2707 was observed to be used for vehicle component fabrication. The West Bay of Building 2707 was observed to be used for computer research. The UST supply lines were observed to have remained intact throughout the area. During the 2006 VSI, floor troughs were

observed in the bay areas. The troughs were being used as wiring conduits. No outlet piping from the troughs was observed. It is likely that the outlet piping previously connected to UST #2 has been capped. The remainder of the building is used for administrative purposes. Floor plans indicate that the floor drains and sinks are connected to the sanitary sewer (77). No environmental conditions associated with the current operations or former pulse power operations were identified as part of this ECP.

4.3.2.2.4 Maintenance & Engineering Shops

RDEC Sheet Metal, Machine, and Fabrication Shops. Building 2502, RDEC Sheet Metal Shop; Building 2503, RDEC Machine Shop; and Building 2506, RDEC Fabrication Shop are listed in the Pollution Prevention Plan as areas where malfunctioning aerosol lubricant cans may generate hazardous waste (61). During the 2006 VSI, operations in this area were found to be following waste handling procedures. No evidence of an environmental release associated with current operations was identified during this ECP.

4.3.2.2.5 Waste Treatment and Disposal

Building 2700, Myer Center – Paper Waste Incinerator. During the 2006 VSI interviews, FTMM DPW personnel stated that an incinerator had been removed from Building 2700 in 1993. No evidence of an environmental release associated with operation of this paper waste incinerator was identified during this ECP.

4.3.2.2.6 Laboratory/Research Facilities

Building 2700. Various laboratory processes were noted in a 1955 IH Survey, following the construction of the Myer Center. Operations included electrochemical research, growing and shaping of crystals, various plating operations, mixing of magnetic powders, machining, welding, spray painting, use of solvents for equipment cleaning, and other miscellaneous laboratory operations utilizing standard laboratory chemicals (35). By 1959, additional operations included shock and vibration testing of certain components, glass blowing, a Plastics Laboratory which made plastic castings, laminates, and forms sprayed with polyester resins, and a Ceramics Laboratory (36).

In the summer of 1978, USAEHA was asked to provide assistance in a study of wastewater discharges from the Myer Center complex as part of a project being done to connect to the regional sewer authority (46). During this time period (1978), the Myer Center contained a wide variety of laboratories where experimentation with such materials as batteries, crystals, and photo chemicals was conducted. In addition to the laboratories, there were many shops including photo processing, metal surface preparation, painting, and etching. A recent reorganization had greatly reduced activities in the building from a previous study done by USAEHA in 1974-1975. The reorganization had left the Myer Center nearly devoid of activity and USAEHA found a profound effect on the nature of the effluent streams directly related to both the reorganization as well as the implementation of waste management activities recommended by the previous review team in 1975.

Prior to the reorganization, and as a recommendation from USAEHA in 1975, FTMM hired a vendor to dispose of concentrated wastes, the most significant of which were etchants and organic solvents.

The report generated by USAEHA from this 1978 consultation visit noted the following activities:

- Former Aviation Research and Development Command (AVRADCOM) tenants have moved out of the Myer Center to Building 2525. They no longer have laboratory or shop activities in Building 2700.

- Electronics Technology and Devices Laboratory and Combat Surveillance and Target Acquisition Laboratory are organizations involved with R&D of a wide variety of communications-electronics devices. They operated approximately three dozen small laboratories and shops throughout the Myer Center. Each of these areas at times discharged small amounts of acid, base, organic solvents, or heavy metals to the industrial waste collection system. The Electronic Technology and Devices Laboratory produced prototype semiconductors of different materials using molecular beam epitaxy and photolithography processes (81). Operations were conducted in Rooms 4D116/4D120 and 4C129/4D130. The molecular beam epitaxy was performed in Class 10 (10 particles of dust per cubic foot) in 4D116/4D120 and Class 1000 (1000 particles of dust per cubic feet) level clean rooms 4C129/4D130 using only minute quantities of chemicals. The associated photolithography operation used small, ventilated, open surface tanks. During the 2006 VSI performed as part of this ECP, Rooms 4D116/4D120 and 4C129/4D130 were confirmed to be used for administrative offices and computer labs. Previous operational equipment was removed from the building during renovations in 1997.

USAEHA estimated a discharge by these tenants in 1978 of no more than a few hundred gallons/month of concentrated pollutants. The following areas were surveyed in 1978:

Room	Activity	Discharges
4D303-315	Environmental Testing	Cooling water
4C319	Air scrubber with drain	Scrubber water
3C143	Battery Research	Acids
3D200	Inactive Chemical Laboratory	
2D306	Crystal Manufacturing	Acids and solvents
1B311-313	Environmental Testing	Cooling water
1B206-208	Paint shop	Paints and solvents
1B126-200	Photographic and Reproduction	Photographic chemicals
0A418-500	Etching	Ammonium persulfate and copper
0A338-402	Inactive Plastics Laboratory	
OA330-332	Inactive ceramics laboratory	

Three laboratory hoods in the basement (Rooms 0A407, 0A415, and 0A502) of the Myer Center were equipped with wet scrubbers. The hoods were used primarily to vent inorganic acids, gaseous hydrogen, and small quantities of phosphorous and arsenic. These scrubbers were intended to utilize once through water at a rate of 3 gpm and discharge it to the storm sewer system and then to Wampum Creek. In 1978, all three scrubbers were operating without water; therefore, there was no discharge to the storm sewer/Wampum Creek. A project was pending to tie the wastewater from these scrubbers to the sanitary sewer system. Base personnel interviewed for the VSI reported that the scrubbers were removed in the early 1980s.

Tanks of very strong alkaline and acidic cleaners and water rinse tanks were used for metal surface preparation in the Metal Fabrication Area (Room 1B213A). Effluents from the rinse tanks flowed to the industrial waste lines. Two or three times per year, the two acid and two caustic tanks were considered spent and then purged to the industrial waste sewer. Each tank was approximately 33 gallons in capacity. At the time of the USAEHA study, the two alkali tanks were empty. The acid tanks were awaiting plumbing repairs so that they could be purged. During the 2006 VSI performed as part of this ECP, Room 1B213A was confirmed to be used for storage. Previous operational equipment was removed from the building during renovations in 1997.

The Etching Facility in Room 4D203 generated a waste stream of ferric chloride etchant, heavily laden with copper. In the past, approximately 15-20 gallons of concentrated etching solution at a time would be discharged to the industrial waste lines. Spent etchant was pumped to a drum, along with the solution resulting from two rinses of the tank. Any drums were then removed by a waste collection vendor; what was left in the tank was washed down the drain. According to FTMM personnel, all chemical waste discharges to the sanitary sewer system ceased by the mid-1980s.

Grab sampling by USAEHA during the 1974 visit found wastewater discharges described as a white cloudy liquid likely from the paint spray booth wash and a dark red sample, likely rinse from spent ferric chloride etchant contaminated with copper.

In 1975, with the help of ECOM personnel, it was determined that a blue green effluent found to be heavy in copper and high in ammonia emanated from the Myer Center printed circuit manufacturing shop. This was a copper etching operation in which the etchant used was sodium persulfate. Two pounds of ammonium persulfate were added per gallon of water. Mercuric chloride (3.6 ounces per gallon) was also added. Fresh batches of 17 gallons were added monthly to the spray etching machine. The spent solution was then disposed down the drain. A sample taken from the machine in February 1975 matched the sample seen in 1974 and verified this was the source. The disposal technique used in the shop involved flushing the spent solution into the drainage line with plenty of cold water. Disposal instructions for this operation were later provided by USAEHA. According to FTMM personnel, all chemical waste discharges to the sanitary sewer system ceased by the mid-1980s. During the 2006 VSI performed as part of this ECP, Room 4D203 was confirmed to be used as a computer lab. Previous operational equipment was removed from the building during renovations in 1997.

Radiological systems were documented in the Diffraction Studies Room 2C131 in 1958 and 1972 (82,83). Five units were used in X-ray diffraction studies; all of which were present during the 1972 survey. Spectrograph studies conducted in Room 2C131 utilized a 60 kVp, 50 mA X-ray Spectrograph. Two electron microscopes were present in Rooms 2D128A and 2C129. Additional equipment was included in this inventory for Rooms 2D127, 2D134, 2D309, 2D310, and 4D214A. During the 2006 VSI performed as part of this ECP, the Radiological Systems and Diffraction Studies Rooms were confirmed to be used for administrative offices and computer labs. Room 2D310 is used as a Crystal Research Lab. Previous operational equipment was removed from the building during renovations in 1997.

Dental Clinic. A satellite dispensary was present in 1972 that serviced 2,610 employees in the Myer Center (84). During the 2006 VSI performed as part of this ECP, the Dental Clinic was no longer operational at Building 2700. The ETD&L area was completely renovated in 1997 after the previous occupants vacated the second floor, fourth floor and basement.

Currently, battery R&D is conducted in Building 2700. The battery laboratories test lead acid batteries for life cycle, durability, and performance in extreme temperature and moisture conditions. Building 2700 is the largest generator of all types of batteries for recycling (85). Battery testing is conducted in Rooms 2C201, 2C203, 2C205, 2C311, 2D210, and 2D212, as confirmed during the 2006 VSI.

Environmental conditions associated with these processes in Building 2700 are discussed in **Section 5.13.7** of this report.

Building 2525 – AVRADCOM/Former Eatontown Labs. During the 2006 VSI, it was reported that Building 2525 had been a chemical laboratory known as Eatontown Labs around the 1940s. This information was confirmed by FTMM site plans showing the Eatontown Laboratory complex. Plan No. 6148/1015 dated September 3, 1941, shows Building 2525 (numbered 1,2,3,4,5, and 6 for the six bays) and nine other buildings numbered 7,8,9,10,11,12,13,14, and 15. This plan also depicts three separate septic tanks and leach fields and one underground transformer vault. After Eatontown Labs, Building 2525 was part of the Watson Laboratory complex in the mid-1940s. In 1951, the laboratories were moved to Rome, New York (5). A review of the DPW map and engineering drawings repository indicated a 2-inch “acid proof drain” leading from Bay 1 to a dry well southeast of the building. Floor drains were shown to discharge to the brook northwest of the building (78). After use as part of the Watson Laboratory complex, the AVRADCOM Laboratory was moved from the Myer Center to Building 2525. This laboratory operation occupied the building until 1978. Building revitalization plans show all floor drains connected to the sanitary sewer system (79). No sumps or floor drains were noted during the VSI. Prior to 1997, the building was used to house electronics laboratories. The electronics laboratories had no chemical usage. Building 2525 has been completely gutted and renovated as administrative space. The use of the building has been strictly administrative since the late 1990s. Environmental conditions associated with these processes in Building 2525 are discussed in **Section 5.13.7** of this ECP.

Building 2535 – RDEC Battery Test Facility. This building is currently the RDEC Battery Test Facility. According to site personnel, approximately five tests per week are currently conducted. Although as many as 300 tests per week were typical during times such as Desert Storm. Periodic battery explosions from stress testing are contained within a group of approximately 14 field shelters. Residue from this testing operation is currently collected and disposed of properly. However, these residues may have historically been discharged to the ground surface. VSI observations included a capped floor drain, multiple trailers used for small work spaces, and a satellite accumulation area. Additionally, facility personnel reported a former cistern was located between Buildings 2535 and 2700 (Myer Center). The cistern was used for fresh water storage for fire control purposes. It was approximately 20 feet deep in the shape of a square with 30 foot sides. The cistern was installed some time in the late 1920s and removed in 2000. All construction materials were removed except the concrete base and the area was back filled with clean fill (86). No plumbing plans were found in the DPW map and engineering drawings repository. However, a plot plan from 1952 indicated a water storage tank southeast of Building 2700 and southwest of Building 2525 (80). Environmental conditions associated with these processes in Building 2535 are discussed in **Section 5.13.7** of this ECP.

Former Watson Laboratories. According to engineering site plans, the Watson Laboratory facility included Building 2525 and other buildings south and east of 2525, which were formerly associated with Eatontown Labs. Watson Laboratory also included multiple temporary structures across Parkers Creek from Building 2525. Crystal growing and processing operations were conducted in the Watson Laboratories located in the southwest area of the CWA in the early 1950s. Operations included cleaning of crystals, quartz etching, soldering, and gold (and other metal) plating conducted in Building 2532. These operations involved chemicals such as carbon tetrachloride, ammonium bifluoride, cadmium sulfate, and sulfuric acid. Crystal etching was also noted in Building 2538 using ammonium bifluoride. Other processes associated with the Watson Laboratories included machining of metals and remelting lead in Building 2533; growing of crystals and physical chemistry in Building 2534; and machining of crystals in Building 2538 (33,34,35). The 2006 VSI confirmed the former Watson Laboratory buildings are demolished with the exception of Building 2525, which has been renovated as administrative space. Environmental conditions associated with the area of the former Watson laboratories are discussed in **Section 5.13.7** of this ECP.

Building 2704 – Environmental Test Facility. Building 2704 was constructed in 1965 as a large high temperature – high humidity test chamber. During this timeframe, the building was used to test electronic equipment under these conditions. The building was later converted to conduct many different environmental tests on electronic equipment. The building is still used in that capacity today. The building's testing equipment uses hydraulic oil. The building currently follows modern waste disposal procedures and, according to FTMM personnel with knowledge dating to 1981, has done so during that time period. The building has multiple floor drains, which are shown to discharge to the storm sewer on engineering drawings. Environmental conditions associated with Building 2704 are discussed in **Section 5.13.10**.

4.3.2.2.7 Recreation Operations

Building 2020 – Charles Wood Area Outdoor Pools. Two swimming pools are located at the Officer's Club (Building 2019) – an adult pool and a wading pool. Both pools are recirculation type heated pools, utilizing high-rate filters. The adult pool is an approximately 90,000-gallon pool, while the wading pool has a volume of approximately 2,400 gallons. Disinfection is accomplished by the continuous addition of calcium hypochlorite solution to the recirculated water (87). Both pools are still in use according to the 2006 VSI observations and interviews with FTMM personnel.

4.3.3 Occupancy, Lease and Easement Records

The REMIS Outgrant Document Record as of December 2006 is summarized in **Table 4-1**. In addition to the records presented in **Table 4-1**, documents reviewed at DPW Master Planning revealed a lease with Omnipoint Facilities Network for a telecommunications tower on MP. Outgrant No. DACA65-3-05-03 was executed on July 5, 2005. Copies of the REMIS 2006 report, the Omniport lease, and an historical Real Estate Easement table are provided in **Appendix C**.

Table 4-1
REMIS Outgrant Document Records

Post	Outgrant No.	Name	Purpose	Expiration Date
MP	DACA51-1-01-078	AT&T	Lease	January 2007
MP	DACA51-9-85-94	AT&T	Right of Entry	January 2000
MP	DACA51-1-98-032	County of Monmouth	Housing	February 2009
MP	DACA51-4-96-156	Defense Security Service	Permit	February 2004
MP	DACA51-4-81-7	FBI	Permit	September 2005
MP	DACA51-1-92-109	FDM Dorm Inc	Other	May 2005
MP	DA-30-75-ENG-5465	First Energy Corp of Akron	Easement	August 2053
MP	DA-30-75-ENG-9361	First Energy Corp of Akron	Easement	January 2010
MP	NYDRE(M) 3913	First Energy Corp of Akron	Easement	July 2008
MP	DACA51-2-87-95	First Energy Corp of Akron	Easement	May 2037
MP	DACA51-2-90-36	First Energy Corp of Akron	Easement	December 2039
MP	DACA51-1-00-016	Forth Monmouth Credit Union	Banking	January 2026
MP	DACA51-1-75-42	FTMM Credit Union	Banking	April 2007
MP	DACA51-2-00-132	JCP&L	Easement	December 2050
MP	NYDRE(M) 3670	Marlboro Realty	Lease	January 2013
MP	NYDRE(M) 2954	New Jersey Highway Authority	Easement	March 2006
MP	DACA51-2-70-294	Northeast Monmouth County Regional Sewer Authority	Easement	November 2049

The Veterans Administration (VA) leases 6,200 square feet of PAHC from the DoD. This lease agreement is documented in a VA and DoD sharing agreement dated February 1, 2003. This sharing agreement indicates an expiration date of September 30, 2008. A separate support agreement from the DoD indicates that the VA lease was initiated April 22, 2002, and has an indefinite term.

4.3.4 Range Operations

In 2006, an HRR report was published to document the condition of FTMM regarding munitions use. The HRR was conducted prior to the final BRAC 2005 recommendation. It was conducted as part of the MMRP program and was expedited due to the potential final listing of FTMM for BRAC 2005. The HRR focused on properties eligible for action under the MMRP. This includes sites classified as operational training ranges/areas, sites classified as other munitions facilities and facilities that were or are used for, or are permitted for, the treatment or disposal of military munitions (17).

The purpose of the HRR was to collect the appropriate amount of information necessary to document historical information for MMRP eligible sites, operational training ranges/areas, and other munitions-related hazard sites at FTMM. The installation-wide HRR addressed MEC hazards (including UXO) and DMM, as well as MC (17).

There are typically three phases within the Army Range Program. The first phase involves a questionnaire called the Advanced Range Survey. This phase was not completed for FTMM. The second phase involved inventory of operational ranges and was conducted on FTMM on March 12, 2002. The 2002 Phase 2 inventory concluded that nine percent of FTMM was operational range area. A total of 15 ranges were identified (17). In 2003, the Phase 3 inventory was conducted to assess the potential for closed, transferring, transferred ranges and sites with MEC (UXO or DMM) and/or MC sites that were potentially eligible for the MMRP. The Phase 3 inventory identified one MMRP eligible site at FTMM (89). In addition to the 15 active ranges identified by Malcolm Pirnie, Inc., there is a new indoor small arms range, Building 2627 located in the CWA.

There are 16 active ranges at FTMM. Additionally, there are six closed/inactive ranges at the installation. A description of these ranges is provided in **Table 4-2**.

Table 4-2
Ranges at Fort Monmouth

MP/ CWA	Range	Status	Acreage	Current Use/ IRP Site Status	Historic Use (including dates)	Types of Munitions	Land Use Restrictions in Place	Included in MMRP
CWA	Building 2627	Active		Indoor Small Arms Range/NA	None listed	Small arms	Fort Monmouth Security Restricts Access	No
CWA	Area 1	Active	3.89	Field training and land maneuvers/NA	None listed	None	Fort Monmouth Security Restricts Access	No
CWA	Area 2	Active	8.00	Field training and land maneuvers/NA	None listed	None	Fort Monmouth Security Restricts Access	No
CWA	Bivouac	Active	23.22	None listed/NA	Field training and land maneuvers (until 1960s)	None	Fort Monmouth Security Restricts Access	No
MP	Commo Training 1	Active	12.80	Field training involving antenna set-up/NA	None listed	None	Fort Monmouth Security Restricts Access	No

MP/ CWA	Range	Status	Acreage	Current Use/ IRP Site Status	Historic Use (including dates)	Types of Munitions	Land Use Restrictions in Place	Included in MMRP
MP	Commo Training 2	Active	2.99	Field training involving antenna set-up/NA	None listed	None	Fort Monmouth Security Restricts Access Contains fenced area, use unknown	No
MP	Commo Training 3	Active	1.87	Field training involving antenna set-up/NA	None listed	None	Fort Monmouth Security Restricts Access Contains fenced area, use unknown	No
MP	Cowan Park	Active	5.93	Ceremonial activities (firing blanks), Parade/drill field/NA	None listed	None	Fort Monmouth Security Restricts Access	No
CWA	EOD Area	Active	2.25	Light demolition range, Administrative only/NA	Administrative only (no dates)	None	Fort Monmouth Security Restricts Access	No
CWA	Fire Training Center	Active	4.27	Fire and rescue training/NA	None listed	None	Fort Monmouth Security Restricts Access	No
MP	Greely Parade Field	Active	25.32	Drill and Parade/NA	Parade Field (No dates)	None	Fort Monmouth Security Restricts Access	No
MP	Helipad 1	Active	0.87	Rotary wings landing and take offs/NA	Rotary wings landing and take offs (first appearance on 1944 map)	None	Fort Monmouth Security Restricts Access	No
CWA	Helipad 2	Active	0.25	Rotary wings landing and take offs/NA	Rotary wings landing and take offs (first appearance on 1960 map)	None	Fort Monmouth Security Restricts Access	No
MP	K-9 Training Area	Active	1.07	K-9 Training, firing blanks/NA	None listed	None	Fort Monmouth Security Restricts Access	No
MP	MEDDAC Training Area	Active	4.05	MEDDAC training/NA	None listed	None	Fort Monmouth Security Restricts Access	No
MP	Prep School Training Area	Active	6.96	Physical training, recreational activities/NA	None listed	None	Fort Monmouth Security Restricts Access	No
MP	Former Pistol Range (1935-1940 Pistol Range)	Closed /Inactive	0.42	Grass covered area, currently undeveloped/ NFA for Sanitary TPH (fenced) area in firing fan, but no testing in range area	1935-1940 Small Arms Range	Small arms	Fort Monmouth Security Restricts Access	Yes
MP	Former Outdoor Firing Range (1940-1955 Pistol Range)	Closed	0.16	Maintained grass covered areas for over 40 years, currently undeveloped/ Response Complete in IRP, w/o sampling	1940- ~1955 Small Arms Training Range	Small arms	Fort Monmouth Security Restricts Access	Yes
CWA	Former Indoor Small Arms Range (Building T-2537)	Closed/ Inactive		None listed/ Post RA report being prepared recommending NFA	1945- ? Small arms range	Small arms	Fort Monmouth Security Restricts Access	No
MP	Former Magazine Area	Closed/ Inactive	0.86	1989 Demolished, currently undeveloped/NA	Storage of explosives until 1998	Class 1.1 Explosives <300 lbs.	Fort Monmouth Security Restricts Access	No

MP/ CWA	Range	Status	Acreage	Current Use/ IRP Site Status	Historic Use (including dates)	Types of Munitions	Land Use Restrictions in Place	Included in MMRP
MP	Former Training Area	Closed/ Inactive	4.1	None listed/ CEA for GW, LTM- GW/SW, 2003 NFA for GW and LTM for SW recommended (pending)	Army Signal training area, M-18 Landfill	None	Fort Monmouth Security Restricts Access. CEA for GW	No
MP	Former Skeet Range	Closed/ Inactive	0.63, 41.2 incl. SDZ	None listed/NA	1940-1955 Skeet Range	Small arms		Yes

CEA Classification Exception Area
LTM Long-Term Monitoring
GW/SW Groundwater/Surface Water
RA Remedial Action
TPH Total Petroleum Hydrocarbons
NA Not Applicable ("IRP Site Status" is not applicable to many of the sites in this table because they are not included in the Installation Restoration Program)

The following sites were determined to have no munitions history that would necessitate inclusion in the MMRP.

Building 2627, Current Indoor Small Arms Range, Charles Wood Area.
Construction of this building has recently been completed in the CWA. The building is located southwest of the CWA composting area.

Area 1, Charles Wood Area. This area is situated directly east of administrative offices and in an area zoned as research, development and testing. The 2006 HRR concluded that it is unlikely that training activities conducted in this area used munitions (17).

Area 2, Charles Wood Area. This area is situated directly east of Area 1 on land zoned as operations. The 2006 HRR concluded that it is unlikely that training activities conducted in this area used munitions (17).

Bivouac, Charles Wood Area. This area is currently not used for training and is located on the southern border of CWA. The area is zoned as reserved land/buffer and recreation. The 2006 HRR concluded that the training activities conducted here were not munitions related (17).

Commo Training 1, Main Post. This area is located near the north central border of MP. The 2006 HRR concluded that no munitions related activity took place at this site; however, it should be noted that Former Outdoor Firing Range (1940-1955 Pistol Range) and the Former Skeet Range are located within the footprint of Commo Training 1 (17).

Commo Training 2 and 3, Main Post. Both of these areas are located in highly developed areas of MP. The 2006 HRR concluded that the training activities conducted here were not munitions related (17).

Cowan Park, Main Post. This site is located in the northeastern region of MP on land that is zoned for administration. The site is used for ceremonial activities including

cannon and rifle salutes (17). Munitions use at Cowan Park is limited to blank ammunition used for ceremonies.

EOD Area, Charles Wood Area. This site is limited to administrative areas that are used to train troops in the identification of various MEC. All of the training is conducted utilizing inert props. The 2006 HRR concluded that the training activities conducted here were not munitions related (17).

Fire Training Area, Charles Wood Area. This site is located in the southwestern corner of CWA in an area zoned for supply/storage and research, development and testing. The area is used for firefighting and rescue training. The 2006 HRR concluded that the activities conducted here were not munitions related (17).

Greely Parade Field, Main Post. This site is situated on MP in an area zoned for recreation. The area has residential housing directly to the north and south. The 2006 HRR concluded that the activities conducted here were not munitions related (17).

Helipad 1, Main Post. This area is located in the north central region of the MP adjacent to Greely Field. The area is used for helicopter landings and take offs. There are residential housing units located directly to the north. The 2006 HRR concluded that the activities conducted here were not munitions related (17).

Helipad 2, Charles Wood Area. This area is located directly east of Area 1 in CWA. The area is used for helicopter landings and take offs. This area is zoned for operations. The 2006 HRR concluded that the activities conducted here were not munitions related (17).

K-9 Training Area Main Post. This area is located in the eastern border of MP. This area is used for the training of K-9s and the utilization of blank ammunition (17). Munitions related activities are limited to the blank ammunition firing.

MEDDAC Training Area, Main Post. This area is located in the south central area of MP on land zoned for supply/storage and medical/dental. The 2006 HRR concluded that the activities conducted here were not munitions related (17).

Prep School Training Area, Main Post. This area is located on the west side of MP in an area zoned as recreational. The area is used for physical training and recreation. The 2006 HRR concluded that the activities conducted here were not munitions related (17).

Former Indoor Small Arms Range (Building T-2537), Charles Wood Area. Associated building records, historical records, and interviews with installation personnel specify this indoor range was used only for small arms. An RI was performed in 1997 which identified lead contamination in the soil. An RA was performed (took place from June 1997 through July 1997) and included removing spent rounds, casings, and contaminated soil outside of the structure. A post-RA report was submitted to the NJDEP in October of 2005. The report included a recommendation for NFA.

Former Magazine Area, Main Post. Four former magazines were located just south of Avenue of Memories, adjacent to Mill Creek and encompassed 0.86 acres at the MP. Associated building records, historical records, and interviews with installation personnel specify this area was used to store Class A (1.1) Explosives. The magazine area was demolished in 1989, and this area is currently undeveloped. MC are not anticipated at concentrations that pose a risk to human health or the environment (due to the fact the area was comprised of indoor structures that have since been removed and no historical evidence of disposal exists). The BRAC recommendation is NFA.

Former Training Area, Main Post. A Former Training Area was identified at the MP located between Parkers Creek to the north and Buildings 283, 289, 293, and 294 to the south. Historical records and interviews with installation personnel indicated this area was used for military training exercises (non-munitions related activities only). This 4.1 acre area overlaps the M-18 Landfill area. Groundwater and surface water sampling commenced in 1997 and continues to the present. Near surface soil (soil cover) sampling was conducted in 1999. Sediment sampling was conducted in 2000. Metals analysis identified several metals at elevated concentrations; however, concentrations are linked to the M-18 Landfill activities and not former training activities). NFA for groundwater and long-term monitoring (LTM) for surface water was recommended in 2003 for M-18 Landfill area (pending approval).

The remaining areas were determined to have a history of munitions activity and are further discussed in **Section 5.2.2**.

4.4 Installation Utilities (Historic and Current)

The following subsections present a summary of readily available information regarding the current and historical FTMM utilities. Utilities presented in these subsections include water, industrial sewer, sanitary sewer, stormwater, electrical and heating. A complete historical timeline for the utilities was not located during the ECP data compilation. However, all readily available historical information is presented.

4.4.1 Water Systems

Currently, the facility purchases potable water from New Jersey American Water Company (formerly Monmouth Consolidated Water Company) through 1,500 service connections across the installation. Only interconnections are metered (94). Because water is not metered at each building, individual water usage for each shop, house, unit or operation is not available. Water is distributed throughout the installation by a series of underground water mains and feeder lines, totaling approximately 33.9 miles. The water system includes two elevated storage tanks and one ground storage tank. The 500,000-gallon ground storage tank is not currently in use. The 250,000-gallon elevated water storage tank located on the MP is closed and contains water to be used in the event of fire or other emergency (61). The 250,000-gallon elevated water storage tank in the CWA contains water to be used in the event of fire or other emergency for Building 2525 and Building 2700 (95). Water consumption in 2005 was approximately 112.8 million gallons (93).

In addition to the potable water system, FTMM also maintains five irrigation wells which service the Suneagles Golf Course in the CWA. The water systems at FTMM are depicted on **Figure 4** (MP) and **Figure 5** (CWA).

4.4.2 Industrial and Sanitary Sewers and Treatment Plants

FTMM has a modern sewage collection system that currently discharges to the regional sewage authority. Historically, FTMM owned and operated STPs. The following sections present a summary of current and historic practices related to sanitary sewers and treatment plants.

4.4.2.1 Current Sewage Operation

Currently, sanitary sewage collected within the facility is discharged to the Two Rivers Water Reclamation Authority Treatment Plant, located in Monmouth Beach on the Shrewsbury River. Sanitary sewage has been discharged in this way since 1975. Maps of the sanitary sewer systems are included on **Figure 6** (MP) and **Figure 7** (CWA).

For the purpose of pumping sewage from buildings and facilities throughout the base, FTMM maintains a sewage collection system consisting of approximately 23 miles of underground distribution lines and a total of 19 sewage pump stations, five of which are located at the CWA, with the remaining pump stations located throughout the MP (50). A 1998 study of the wastewater utility system reported that the majority of the distribution lines were constructed of terra cotta clay (90). The sewage collection system ultimately connects to the local sewerage authority (Two Rivers Water Reclamation Authority) at two junction points, one at the MP and one at CWA (90). Wastewater generation in 2005 was approximately 141.5 million gallons (96).

Analytical sampling conducted in mid-2002 of the sewage discharge at both junction points indicated that FTMM is not a significant industrial user and does not require any treatment of the discharge nor does FTMM require a significant industrial user permit from the NJDEP.

4.4.2.2 Historic FTMM Sewage Operation

Historically, FTMM operated on-site STPs at the MP and the CWA. A pre-1941 STP operated at the MP has been investigated as part of the IRP (FTMM-20) and an RI report was submitted to the NJDEP in March 2004. No response has been received from the NJDEP. A new MP plant was built in 1941 and treated all domestic wastewater generated on the MP. The plant had a 700,000 gallons per day capacity and was manned 24 hours per day, 7 days per week. It was an activated sludge secondary treatment facility consisting of a bar screen and grit chamber, a comminutor, a primary sedimentation tank, a mixing and aeration tank, a secondary clarifier, and a baffled chlorination tank. Sludges were treated through 3-stage anaerobic digestion, followed by drying in covered, underdrained sand beds. Dried sludge was then used throughout post as a fill and soil conditioner. Treated sanitary wastewater from the MP

was discharged to Parker's Creek (92). The MP STP has been investigated as part of the IRP (FTMM-19) and the NJDEP approved the recommendation for NFA in 1996.

The CWA plant was built in 1942 and treated all domestic wastewater generated at CWA. The plant had an 800,000 gallons per day capacity and was manned 16 hours per day, 7 days per week. It operated at about 50 percent capacity and was a trickling filter secondary treatment plant. The primary treatment consisted of grit chamber, screening, comminutor, and primary settling. Secondary treatment consisted of a constantly and uniformly dosed biofilter, followed by secondary clarification and chlorination. Sludge was treated in one of the two digesters, dewatered, and concentrated. It was then drawn off onto underdrained open sand beds for drying. Supernatant liquid from each digester and drainage from the drying beds were routed back to the plant influent. A tributary to Wampum Brook received the CWA STP effluent (92). The CWA STP was investigated as part of the IRP (FTMM-27) and NFA was approved by the NJDEP.

The government-owned treatment plants were deactivated and the systems tied into the regional system in September of 1975. The MP and CWA treatment plants were demolished in 1983 (8).

In response to NJDEP concerns that sewage discharges were causing deleterious effects on Parkers Creek, an evaluation of the effluent and the receiving streams was performed in 1971. The evaluation concluded that the effluent met all written requirements of federal, state and local water pollution agencies. There was no visual evidence of contamination, no noticeable sewage odor and the color and turbidity of the effluent were less than that of the receiving stream (98). A thick black sludge layer was identified in Parkers Creek, which was largely attributable to deposited sewage from the MP STP (91). Another evaluation of the impact of wastewater discharges on the environment concluded that the impact was minimal (99). It was noted that the condition of the streams entering the installation were of similar or poorer quality due to a variety of upstream industrial operations such as styrofoam cup manufacturing, metal plating and photo processing as well as domestic discharges. Water samples collected from Wampum Brook upstream of the CWA STP outfall indicated no evidence of life in the brook (91).

In order to monitor surface water quality at FTMM, quarterly surface water sampling has been conducted throughout the MP since April 1997. The monitoring program includes surface water sampling locations entering the MP, locations exiting the MP, and locations associated with MP IRP sites. The analytical program includes volatile organic compounds +15, PCBs and metals. Long-term monitoring of groundwater and surface water is currently performed on a quarterly basis, in conjunction with groundwater remediation systems to treat VOCs at IRP sites FTMM-02, FTMM-03, and FTMM-05. The long-term monitoring program is a key component of the selected remedial alternatives. Throughout the monitoring period (1997 to present), concentrations of chlorinated solvents entering MP have gone down. However, measurable amounts of chlorinated solvents still enter MP in Husky Brook. In the spring 2006 monitoring round, a sample of Husky Brook surface water contained measurable

amounts of vinyl chloride and cis-1,2-dichloroethene. The vinyl chloride concentration was in excess of the NJDEP surface water quality criterion. Concentrations of chlorinated solvents in Husky Brook are greatest in surface water entering MP and go down as the creek flows through MP. None of the FTMM landfills contribute to the degradation of surface water quality.

Based on the historical assessments of MP surface water discussed above and recent surface water monitoring data, the most severe impacts to surface water were the result of historical discharge from industrial sites upstream of FTMM.

4.4.2.3 Building 2700 Sewage Discharge History

Wastewater at FTMM consisted almost entirely of domestic sewage in the mid-1970s. One significant source of wastewater was Building 2700, the Myer Center in the CWA. This building comprised nearly 10 percent of the 0.4 million gallons/day influent to the CWA STP (91). At that time, the Myer Center contained a relatively wide variety of shops and laboratories from which an even wider variety of industrial type wastes emanated. USAEHA concluded that wastes were discharged to the building's sanitary sewer collection system. The acid neutralization tanks in the courtyard and across the street received the majority of variant waste materials. These neutralization tanks were later addressed under the FTMM installation restoration program as sites FTMM-22 (CWA-1) and FTMM-23 (CWA-2). Wastewater was discharged to the sanitary sewer system from the neutralization tanks (91).

The USAEHA sampling from 1974-1975 showed discharges of alkaline cleaning agents, high concentrations of (hexavalent) chromium that was likely rinse water from a chrome plating operation, 93 to 94 percent sodium hydroxide slugs, sulfuric acid that was likely a dip solution used to activate a metal surface for plating, copper pickling waste, sodium dichromate as part of a cleaning agent, parabenzoquinone likely from photographic processing effluent, ammonium persulfate from the printed circuit manufacturing shop, and acetone (91).

A total of five air-cooled water towers were present in 1974-1975 on the roof of the Myer Center. They were rated at 200 tons each and four were in use. Each tower contained 600 gallons of water that was recirculated throughout the building. Two chemical feeds were used (sodium-magnesium-polyphosphate and a slime control algaecide with quaternary ammonium compound with organometallic chelate). Wastes generated from the towers included bleed-off to the sanitary sewer and products of tower cleanup (91).

As discussed above, in 1975 the government owned and operated STPs were removed from service. When the government plants were shut down FTMM sewage discharge was redirected to the regional sewage authority. In preparation for this change, a review of effluents to the sewage system was undertaken. The USAEHA 1976 Water Quality Engineering Special Study stated that effluents from the Myer Center posed a threat to the acceptability of waste discharged from the CWA of FTMM to the regional sewer authority. Strong acids and bases discharged from the facility were a cause for concern, should the connection to the regional sewer authority occur (91).

Following the initial visits by the USAEHA in 1975 and 1976, an extensive effort was undertaken to locate sources of industrial waste in the Myer Center. Various samples from shops were forwarded by the ECOM Environmental Office to USAEHA for chemical analysis and walkthrough inspections of labs were made. Disposal recommendations were made by USAEHA. The Facilities Engineer also worked with USAEHA on options for use of the CWA STP as a pre-treatment facility. According to FTMM personnel, no chemical wastes have been discharged to the sanitary sewer since the mid-1980s. Activities at Building 2700 have since been converted primarily to administrative functions. Current waste management practices prohibit the discharge of any materials, other than water and biodegradable soaps, into the sanitary sewer system.

4.4.3 Stormwater System

There are separate sewer systems for conveying sanitary wastewater and stormwater runoff at MP and CWA. All measures are taken to ensure that spills do not reach any sewer system on the installation (50). The storm sewer system is excluded from being a spill control/cleanup resource. Maps of the storm sewer systems are included on **Figure 8** (MP) and **Figure 9** (CWA). The surface water drainage pattern is discussed in **Section 4.5.3**.

NJDEP regulations require that an SPPP be developed for each installation covered by a New Jersey National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharges. FTMM has prepared a SPPP covering both of the former New Jersey NPDES permits and the new Public Complex General permits for both the MP and CWA (50). Eighteen Best Management Practice (BMP) areas are delineated throughout the MP and the CWA and are associated with many stormwater outfall locations.

FTMM has a Stormwater Pollution Prevention Team assigned with overall responsibility for implementation and management of the SPPP and the FTMM stormwater program. The team reports to the Environmental Quality Control Committee and has been delegated responsibility from the installation commander to achieve compliance with all aspects of the SPPP. Quarterly compliance inspections are conducted for all BMP areas and outfall locations. The updated SPPP and quarterly inspection reports are housed at the Directorate for Public Works, Building 173.

4.4.3.1 Boiler Blowdown Discharges History

FTMM operated seven small boiler plants on the MP and one at CWA in the mid-1970s (91). Boiler blowdown from MP Buildings 209, 287, and 977 were discharged directly to the ground surface for disposal by leaching and evaporation. Buildings 292 and 976 discharged boiler blowdown once per week into stormwater sewers. Treated blowdown from Building 292 eventually entered Parker's Creek; untreated blowdown from Building 976 eventually entered Husky Brook. Boiler blowdown from Buildings 1076 and 1220 on the MP (treated with sodium metaphosphate, caustic soda, and tannin) emptied into Husky Brook and Lafetra Brook, respectively.

The Myer Center (Building 2700) also discharged to stormwater sewers (91). Between 1974 and 1975 USAEHA reported that the Myer Center had four boilers, two of which operated at a time, discharging a total of 2,000 gallons of blowdown per month. Boiler makeup water was treated with sodium metaphosphate, caustic soda, and tannin. The stormwater carrying the blowdown water from Building 2700 emptied into a tributary of Wampum Brook. Boiler blowdown from the new Myer Center boilers does not enter the stormwater system.

4.4.3.2 Vehicle Washwater Operations

During the 1970s, three motor pools were present and the motor pool on MP contributed the only significant amount of wastewater to the natural drainage system. This wastewater contained oil and grease generated from steam cleaning vehicles (91). Several vehicles were steam cleaned each day in the summer months, primarily in an open bay area between Buildings 482 and 484. The washwater then drained to a storm sewer manhole with a grease trap. The sewer discharged to an open ditch along the boundary of FTMM which eventually led to Oceanport Creek.

Current vehicle wash racks at FTMM are located at Building 166, Building 750, Building 1122 and Building 2046. As confirmed during the VSI, each of the current wash racks has a closed loop washwater recycling system.

4.4.3.3 Scrubber Discharges to Storm Sewer

Three former laboratory fume hoods in the basement of the Myer Center were connected to three separate scrubbers located at ground level. The fume hoods were designed to draw 100 feet per minute and were used in the mid-1970s for work with mineral acids and gaseous hydrogen (91). The wet scrubbers used water in a once through spray system at a rate of 3 gpm each. This water was subsequently discharged through storm sewers to the unnamed northern tributary to Wampum Brook. In 1978, all three scrubbers were operating without water; therefore, there was no discharge to the storm sewer or Wampum Creek.

4.4.4 Electrical System

Jersey Central Power and Light Company supplies electricity to FTMM through two 34,500-volt, three-phase, 60-hertz transmission lines. The power is transformed at three substations on the MP. The total capacity of the three substations is approximately 28,000 kVA. FTMM averages a per capita peak energy consumption of approximately 1 kVA, and electricity consumption is well within the capacity of the system (4). **Figure 10** depicts the general electrical schematic for MP. The CWA electric schematic is presented on **Figure 11**.

The electrical distribution system located on FTMM is owned and operated by the U.S. Army. The electrical distribution system is comprised of transformers, oil switches, circuit breakers and voltage regulators. Approximately 626 oil-filled pieces of electrical equipment make up the entire distribution system. The MP has approximately 372 oil-filled pieces of electrical equipment of which 194 units are pole mounted, 135 pieces are

outside pad mounted units and 43 pieces are inside pad mounted units (8). The CWA has approximately 254 oil-filled pieces of electrical equipment of which 171 units are pole mounted and 83 pieces are outside pad mounted units (8). Electrical equipment found on FTMM range in size from 5 kVA to 10,000 kVA units. Pole mounted transformers range in size from 5 kVA to 100 kVA units. However, the majority of pole mounted transformers found on FTMM range in size from 5 kVA to 50 kVA units. Pad mounted equipment ranges in size from 100 KVA to 10,000 kVA units. All electrical equipment currently in use or storage at FTMM is defined as Non-PCB Class equipment. During the 2006 VSI, no labels were seen which indicated the electrical equipment was PCB or PCB-contaminated.

4.4.4.1 Substations

Presently, five electrical substations are maintained and operated by the DPW. Three substations are located on the MP, two substations are located in the CWA. Secondary containment is provided at all five substations and each site is managed under the DPW's SPCC program (8).

Main Post – Building 288. This facility is an electrical substation located northeast of Building 288. The substation consists of a 34,500-volt, 3,000 kVA transformer and a 4,160-volt air switch. The transformer contains 520 gallons of Non-PCB oil. The air switch is a dry unit and contains no oil.

Main Post – Building 978. This facility is an electrical substation located adjacent to Building 978, and also serves as the delivery point for metering of electrical power to the MP. The substation consists of three 34,500-volt, 5,000 kVA transformers and six 167 KVA transformers. The first 5,000 kVA transformer, manufactured by General Electric, contains 2,155 gallons of Non-PCB oil. The second 5,000 kVA transformer, also manufactured by General Electric, contains 1,540 gallons of Non-PCB oil. The third 5,000 kVA transformer, manufactured by Allis Chalmers, contains 1,313 gallons of Non-PCB oil. The six 167 kVA transformers each contain 546 gallons of Non-PCB oil.

Main Post – Building 1231. This facility is an electrical substation located adjacent to Building 1231. The substation consists of two 34,500-volt, 5,000 kVA transformers, one large circuit breaker and one pole mounted type transformer (50 kVA). One 5,000 kVA transformer contains 2,704 gallons of Non-PCB oil. The second 5,000 kVA transformer contains 3,100 gallons of Non-PCB oil. The circuit breaker contains 220 gallons of Non-PCB oil. The 50 kVA transformer contains approximately 40 gallons of Non-PCB oil.

Charles Wood Area – Building 2700. This facility is an electrical substation that supports the Myer Center (Building 2700) facility. The substation consists of two 12,500-volt, 7,500 kVA transformers. Each transformer contains 1,523 gallons of Non-PCB oil.

Charles Wood Area – Building 2716. This facility is an electrical substation located adjacent to Building 2704. The substation consists of two 34,500-volt, 10,000 kVA transformers that both contain 2,142 gallons of Non-PCB oil.

4.4.4.2 Uninterruptible Power Supply

FTMM utilizes uninterruptible power supply (UPS) facilities in various locations throughout both the MP and CWA to provide uninterrupted power in the event of electrical failure. UPS locations are provided in **Table 4-3**.

Table 4-3
Location of Uninterruptible Power Supplies

Post	Building No.	Location/Designation
MP	166	Generator 663
MP	167	GEN 686
MP	200	GEN 639
MP	257	GEN 634
MP	282	DEH 601
MP	286	GEN 644
MP	288	GEN 684
MP	362	GEN 657
MP	364	GEN 658
MP	400	GEN 632
MP	456	GEN 674
MP	491	GEN 622
MP	600	GEN 671
MP	600	Rm. 194
MP	750	DEH 613
MP	750	DEH 617
MP	750	DEH 618
MP	752	GEN 626
MP	949	GEN 621
MP	977	GEN 656
MP	978	Electrical Substation
MP	979	GEN 633
MP	1007	GEN 672
MP	1075	GEN 638
MP	1075	GEN 640
MP	1075	GEN 689
MP	1150	GEN 664
MP	1150	GEN 675
MP	1150	Basement Battery Room

Post	Building No.	Location/Designation
MP	1150	Room 108
MP	1150	Room 111
MP	1152	Room 10
MP	1203	Central Plant
MP	1205	DEH 614
MP	1209	GEN 678
MP	1209	GEN 679
MP	1210	GEN 683
MP	1220	DEH 619
MP	1221	GEN 627
MP	1227	GEN 648
MP	1231	Electrical Substation
MP	T125	GEN 688
CWA	2021	GEN 624
CWA	2023	GEN 665
CWA	2043	GEN 631
CWA	2525	Rm. 1208 Bay 1
CWA	2525	Rm. 2202 Bay 2
CWA	2525	Rm. 429 Bay 4
CWA	2525	Rm. 328A Bay 3
CWA	2525	Rm. 328 Bay 3
CWA	2525	Rm. 318 Bay 3
CWA	2525	Rm. 414 Bay 4
CWA	2525	Rm. 518A Bay 5
CWA	2525	Bay 6 TMD Lab
CWA	2525	Bay 6 Office Space
CWA	2525	PMGCC2 Lab Bay 6
CWA	2525	Rm. 621A Bay 6
CWA	2525	Front Room Bay 6
CWA	2525	Rm. 528A Bay 5
CWA	2525	Rm. 4211 Bay 4
CWA	2525	Rm. 422 Bay 4
CWA	2560	GEN 676
CWA	2603	GEN 625
CWA	2700	Rm. 2C210A
CWA	2700	Rm. 2D106
CWA	2700	Rm. 3C143
CWA	2700	Rm. 4D121

Post	Building No.	Location/Designation
CWA	2700	Rm. L3 - #2 - Tier 3
CWA	2700	OA Fl Adjacent Stairway 13
CWA	2700	1st Fl 100 Area
CWA	2700	1st Fl Corr. 2
CWA	2700	1st Fl 300 Area Adj 1B309
CWA	2700	OA Fl Adjacent Boiler Rm
CWA	2700	OA Fl Adjacent Stairway 11
CWA	2700	GEN 635
CWA	2700	GEN 636
CWA	2700	GEN 642
CWA	2700	GEN 677
CWA	2705	GEN 637
CWA	2705	Rm. 304
CWA	2705	Rm. 825
CWA	2705	Rm. 837 South Closet
CWA	2705	Rm. 404 North Closet
CWA	2707	Rm. 114
CWA	2707	Rm. 218 Vault 2
CWA	2707	Rm. 107
CWA	2708	GEN 651
CWA	2709	Warehouse
CWA	2716	Electrical Substation
CWA	2717	Electrical Substation

Source: (97,118).

4.4.4.3 Emergency Generators

Emergency power generators are used throughout the facility to maintain critical systems during times of power disruption. Emergency generator unit sizes and locations are listed in **Table 4-4**. Additionally, nine vehicular mobile emergency generators and one skid-mounted emergency generator, ranging in size from 45 to 200 kilowatts, are stored at MP Building 750 for use throughout the facility.

Table 4-4
Emergency Generator Locations

Building	Description	Size (kW)
MP – 166	Engineering/Housing Maintenance	60
MP – 167	General Purpose Administrative	60
MP – S200	Radio Tower	60

Building	Description	Size (kW)
MP – 257	Sewage Lift Station	30
MP – 282	Fire Station	60
MP – 286	Russell Hall (Building 549)	100
MP – 288	PM Sig Warfare/Administrative	60
MP – 292	DPTM/Administrative/Storage	60
MP – 362	Guest Housing	10
MP – 364	Guest Housing	10
MP – 400 Area	Wetland Area Adjoining Parker Creek	30
MP – 456	PM TRCS/Administrative	70
MP – 490	Sewage Lift Station	30
MP – 491	Sewage Lift Station	17.5
MP – 600	McAfee Center	250
MP – 601	General Purpose Instrument Storage	
MP – 750	Garrison Transportation	100
MP – 752	Sewage Lift Station	30
MP – 906	Admin/Testing/Space & Terrestrial	1.75
MP – 906	Admin/Testing/Space & Terrestrial	1.75
MP – 949	Sewage Lift Station	17.5
MP – 977	Police/MP Station	80
MP – 979	Sewage Lift Station	30
MP – 1007	Commissary	80
MP – 1075	Patterson Army Health Clinic	100
MP – 1075	Patterson Army Health Clinic	100
MP – 1075	Patterson Army Health Clinic	60
MP – 1150	Vail Hall	500
MP – 1152	Info Tech Serv/Computer Ops	250
MP – 1203	FBI Leased- Turbine Generator on roof	900
MP – 1203	FBI Leased- Turbine Generator on roof	900
MP – 1209	CECOM Ops Center/Admin	280
MP – 1210	Software Engineering Lab	50
MP – 1220	MP Boiler Plant	60
MP – 1220	MP Boiler Plant	60
MP – 1221	Sewage Lift Station	45
MP – 1227	Sewage Lift Station – Previous MP 170D	20
MP	East Gate	60
CWA – 2018	Sewage Lift Station	30
CWA – 2021A	Sewage Lift Station	17.5
CWA – 2043	Sewage Lift Station	17.5
CWA – 2290	Charles Wood Youth Center	60
CWA – 2291	Sewage Lift Station	20
CWA – 2560	Fire Station	60
CWA – 2603	Sewage Lift Station	45

Building	Description	Size (kW)
CWA – 2700	Myer Center – Substation 2	135
CWA – 2700	Myer Center – Substation 4	135
CWA – 2700	Myer Center – Substation 6	75
CWA – 2700	Myer Center – Courtyard	395
CWA – 2705	Elec Warfare	75
CWA – 2708	Pulse Power Center	125

Source: (97).

4.4.4.4 Heating Systems

FTMM uses natural gas and propane heating. Natural gas is the primary heating fuel, supplied by New Jersey Natural Gas Company. The schematics for the natural gas systems are presented on **Figures 12 and 13** for MP and CWA, respectively. The natural gas lines were upgraded when the entire installation was converted from fuel oil heating to natural gas heating. Prior to upgrade, the system's pressure capacity was not sufficient to meet the installation's total demand. Propane heat is utilized in the trailer park located in the 400 Area of the MP. Propane is supplied by a private contractor with no limit of supply (68).

4.4.4.5 Boiler Plants

Main Post – Building 1076. Historically, this facility served as a boiler plant providing heat and hot water to PAH. The plant consisted of two gas/oil fired boilers and one 20,000-gallon UST. Natural gas was the primary source of fuel used at the site and heating oil served as a secondary source of fuel. Building 1076, boilers, and all associated equipment were dismantled or demolished in 2005 (53).

Main Post – Building 1220. This facility is a boiler plant that provides heat and hot water to the 1200 area of the MP. The plant consists of three gas-fired boilers. Prior to January 1998, nine 30,000-gallon USTs were used to store various grades of fuel oil. All nine tanks have been removed from the site and an NFA approval has been granted by the NJDEP. Currently, natural gas is the only source of fuel used at the site. Fuel oil is no longer stored at the site. Floor drains were noted in Building 1220 during the 2006 VSI. No engineering drawings indicating the discharge point of these floor drains were found in the DPW map and engineering drawings repository.

Charles Wood Area – Building 2700. Historically, a boiler plant located in the basement of Building 2700 provided heat and hot water to the Myer Center. The plant originally consisted of four fuel oil burning boilers. Two of the boilers were removed in 1986 and 1990. Both remaining boilers are still in place; however, they are not active. There are no future plans to reactivate the boiler plant in the basement of Building 2700. Prior to March 1998, five 25,000-gallon USTs were used to store various grades of fuel oil. Following the removal of the UST system, natural gas was the only source of fuel used at the site. The current boiler plant for Building 2700 is located within Building

2706. There are two boilers in Building 2706. These boilers are fired using natural gas. Fuel oil is no longer stored at the site.

4.5 Environmental Setting – Natural and Physical Environment

4.5.1 Climate

FTMM is situated in the temperate zone of the middle Atlantic states, creating a moderate temperature variation and range on a yearly basis. Humidity is high in the area because of the proximity to the Atlantic Ocean, and as a result, summers are relatively cooler and winters milder than elsewhere at the same latitude. Weather conditions are affected by northwest and southwest winds. Normal ocean temperatures range from an average near 37°F in January to near 72°F in August. The coldest temperatures occur in January, ranging from 23 to 41°F, but winter temperatures rarely fall below 0°F. Summer temperatures range from 65 to 84°F and frequently reach 90°F from late May through early September (100,4).

The precipitation at FTMM is considered moderate, with an average monthly rainfall or snow and rain mixture of 3.5 inches and an annual average of 45 inches. Summer thunderstorms occasionally combine high winds with heavy rainfall, though destructive storms are infrequent in Monmouth County. Heavy rains have occurred in connection with hurricanes, which sometime move northward along the mid-Atlantic coast. The average date of the last freezing temperature in spring is April 20 and of the first freeze in autumn, October 19. The average seasonal snowfall for Monmouth County is 25 inches; at least one inch of snow is present on the ground an average of nine days a year (100,4).

4.5.2 Topography

Topography at the MP and CWA is characterized generally by level land areas. Elevations amsl range from 5 to 34 feet and 26 to 60 feet, respectively. Topographic gradient slopes from west to east in both areas. Historic excavation and filling activities have altered the natural topography on FTMM. The dominant topographic feature affecting contaminant transport and fate is the network of tributaries throughout FTMM that drain to the Shrewsbury River. The drainage network is discussed in detail in the next section (8). Wetland areas are discussed in **Section 4.6.1**.

4.5.3 Surface Water Hydrology

The facility is in the Atlantic Coast Drainage Basin and the Shrewsbury River Watershed, which contains tributary streams with a low gradient. The MP is drained by a number of waterways that flow generally from west to east. Mill Creek enters FTMM along its southwestern boundary and flows partially through the post before turning north and meeting Lafetra Creek. Lafetra Creek originates off post and, along with Parkers Creek, forms the northern boundary to the MP. Parkers Creek originates at the confluence of Lafetra Creek and Mill Creek and flows along the northern boundary of

FTMM until it discharges into the Shrewsbury River, directly to the east of the MP. Parkers Creek is a shallow tidal estuary having an average depth of 3 feet at mean tide. The northern half of the MP is located within the Parkers Creek sub-watershed (8).

Husky Brook, a fresh water stream originating off post, drains the southern half of the MP lying within the Husky Brook sub-watershed. A portion of the brook has been dredged, widened and dammed to form Husky Brook Lake that is used for recreational purposes (4). Husky Brook Lake mainly serves as a picnic area for FTMM personnel. Downstream from the lake, Husky Brook is piped underground for several hundred feet before it again surfaces and eventually runs into Oceanport Creek. Oceanport Creek, to the east of the Oceanport Avenue bridge, is periodically dredged by an NJDEP permitted contractor in order to maintain a marina for FTMM personnel (8). Oceanport Creek is a tidal stream that flows along the southern boundary of the MP before emptying into the Shrewsbury River (50). The Shrewsbury River is a tidal estuary that empties into Sandy Hook Bay and is separated from the Atlantic Ocean by a narrow barrier beach ending at Sandy Hook (101). The Atlantic Ocean is within 3 miles of the MP.

The CWA is located approximately one mile southwest of the MP. It is separated from the MP by a portion of the borough of Eatontown. The southern portion of the CWA is drained by two streams that unite at a point near the eastern boundary. Its southernmost branch originates south of the CWA; the other stream originates within a lowland wooded area in the vicinity of the old STP. These two streams become the main stem of Wampum Brook, which flows through Eatontown and forms a small fresh water pond called Wampum Lake. Wampum Lake gives rise to Mill Creek, which eventually flows into the MP (50).

Another stream ("northern tributary to Wampum Brook") originates near the CWA's western boundary and flows through the area and into the golf course. This tributary unites with Wampum Brook at a point east of the CWA boundary (8).

An extensive stormwater drainage system was constructed at FTMM about 55 years ago. The system was designed to supplement the natural drainage and prevent localized flooding. The stormwater drainage system discharges at various points into Wampum Brook, Husky Brook, Husky Brook Lake, Lafetra Creek, Mill Creek, Parkers Creek, and Oceanport Creek. The storm drainage system in the 600 area of the MP adequately carries stormwater drainage and is not subject to flooding. Some of the stormwater drainage system outfalls on the MP are below the elevation of the mean high tide, particularly along Oceanport Creek and Parkers Creek. Thus, during high tides water backs up into the stormwater drainage system. The extreme southeastern portion of the MP is subject to flooding during high tides combined with heavy rains (4). The CWA is identified as an area of undetermined, but possible, flood hazard on the Borough of Eatontown Flood Insurance Rate Map (102). However, the 100-year base flood elevation for Wampum Creek at the eastern boundary of the CWA is 26 feet, while ground surface elevations at the CWA range from 27 to 60 feet amsl (4).

4.5.4 Geology

FTMM is located on the Outer Coastal Plain, one of five physiographic provinces in New Jersey. To the northwest is the boundary between the Outer and Inner Coastal Plains, marked by a line of hills extending southwest, from the Atlantic Highlands overlooking Sandy Hook Bay, to a point southeast of Freehold, New Jersey, and then across the State to the Delaware Bay. The Outer Coastal Plain is low, flat, cut by streams, and slopes gently to the east (101).

The earliest Atlantic Coastal Plain was formed by the deposition of sediments on metamorphic rocks. During the Cretaceous period and the Tertiary era, this land was successively inundated and exposed, and deposits were lain down. As a result, unconsolidated sediments characterize the geology of the region. Period formations have been identified in northern Monmouth County, to a depth of more than 1,200 feet below sea level. Bedrock is approximately 1,300 feet below sea level. The eastern half of the MP is underlain by the Red Bank formation, ranging in thickness from 0 to 140 feet. The western half of the MP is underlain by the Hornerstown formation, ranging in thickness from 20 to 30 feet. The predominant formation underlying the CWA is also Hornerstown, with small areas of the Vincentown formation intruding in the southwest corner. Sand and gravel deposited in recent geologic times lie above these formations. Interbedded sequences of clay serve as semi-confining beds for groundwater (103,101).

Urban land is the primary classification of soils on FTMM, which have been modified by excavating or filling. Soils at the MP include Freehold sandy loam, Downer sandy loam, and Kresson loam. Freehold and Downer are somewhat well drained, while Kresson is a poorly drained soil. The CWA has sandy loams of the Freehold, Shrewsbury, and Holmdel types. Shrewbsury is a hydric soil; Kresson and Holmdel are hydric due to inclusions of Shrewsbury. Downer is not generally hydric, but can be (4).

The water table is relatively shallow at the installation and fluctuates with the tidal action in Parkers and Oceanport creeks at the MP. The depth to groundwater on the installation is between 5 and 12 feet. The Hornerstown formation acts as an upper boundary of the Red Bank aquifer, but it might yield enough water within its own outcrop to supply individual household needs. The Red Bank outcrops along the northern edges of FTMM. The Red Bank contains two members, an upper sand member and a lower clayey sand member. The upper sand member functions as the aquifer and is probably present on some of the surface of the MP and at a shallow depth below the CWA. The Red Bank supplied many domestic wells with water at one time. The Hornerstown and Red Bank formations overlay the larger Wenonah-Mount Laurel aquifer (103,101).

Five groundwater-supplied irrigation wells are active on the CWA golf course (104,105).

4.5.5 Demography and Land Use

Most of the FTMM workforce living off post resides in Middlesex, Monmouth, and Ocean counties. At the time of the 2000 Census, the total combined population in the three counties was approximately 1.88 million persons (Middlesex County, 750,162;

Monmouth County, 615,301; and Ocean County, 510,916), compared to the total 2000 population of 8.4 million for the entire state of New Jersey. The population density in the counties surrounding FTMM averages 1,509 persons per square mile which is typical of northern New Jersey counties, the most densely populated state in the nation (106,107).

The FTMM population includes approximately 537 members of the active military; 8,602 civilians; 3,200 permanent contractors; 514 family members; and 30,300 retirees and family members in the area (19,20).

FTMM is primarily suburban in character, being surrounded by the communities of Shrewsbury to the north, Oceanport to the east, and Eatontown to the south. The New Jersey Garden State Parkway forms the western boundary. Agricultural areas are found in the region, while recreational developments are along the ocean shore. The areas surrounding FTMM are characterized by a mixture of residential, commercial, and light industrial uses. Land uses in the surrounding municipalities are compatible with those along the inside perimeter of the MP and CWA (4).

The MP provides supporting administrative, training, and housing functions, as well as many of the community and industrial facilities for FTMM. These facilities are distributed across the property, with no distinct clustering of functions. The CWA is used primarily for R&D, testing, housing, and recreation. Research, development, and testing facilities occupy the southwest corner of the CWA, residential areas are located in the northwest corner and along the southeastern boundary, and the golf course occupies the northeast corner. Both the MP and the CWA contain ample green space (4).

4.6 Biological and Cultural Resources Summary

4.6.1 Biological Resources

4.6.1.1 Biota

Upland Habitats on FTMM can be divided into two general types – maintained or developed, and forested. The maintained or developed areas consist of landscaped grounds surrounding buildings and other maintained grounds, such as recreational fields and large expanses of lawns. Lawns, ball fields, parade grounds, and roadside areas are planted in grass mixtures that may include Kentucky bluegrass, Merion bluegrass, Chewings fescue, and perennial ryegrass. Forest habitat is very limited on the MP. Most of the forest habitat occurs in the southern portion of the CWA. It consists of secondary hardwood growth in a closed canopy and moderate to dense undergrowth. Oak, white birch, and American holly are dominant species. Additional vegetative species found in natural areas at FTMM include pine, honey locust, black locust, huckleberries, and ferns. A variety of grasses and wildflowers are also present in upland sites on the installation. Reeds, sedges, and marsh grasses are common along the banks of Oceanport Creek and Parkers Creek on the MP (4).

Most of FTMM consists of developed areas with open lawns and scattered ornamental trees and shrubs that provide little habitat for wildlife. Vegetative buffer areas along the creeks in FTMM provide food and cover for species that commonly occur in Monmouth County. Mammal species commonly seen at FTMM include woodchuck, eastern cottontail rabbit, eastern gray squirrel, raccoon, skunk, chipmunk, muskrat, rat, whitetail deer and red fox. FTMM provides habitat for a variety of avian neotropical bird species, including songbirds, wading birds, and shorebirds. Bird species that commonly occur in Monmouth County, and that may occur at FTMM, include Canada goose, herring gull, mallard, blue jay, European starling, American robin, Carolina chickadee, tufted titmouse, northern mockingbird, house sparrow, red-winged blackbird, northern cardinal, house finch, and song sparrow. Locally-occurring amphibians that are likely to occur at FTMM include the red back salamander, spring peeper, wood frog, bullfrog, and green frog. Commonly-occurring reptiles likely to occur at FTMM include the common snapping turtle, eastern box turtle, northern brown snake, northern water snake, and eastern garter snake. Parkers Creek and Oceanport Creek are brackish, tidally influenced creeks that may include species of menhaden, blueback herring, and alewife. The freshwater creeks (Mill Creek, Lafetra Creek, Husky Brook, and Wampum Brook) may include species of white perch, carp, catfish, sunfish, and crappie. Largemouth bass have also been introduced into the lake (4).

4.6.1.2 Threatened and Endangered Species

No federally listed or proposed threatened or endangered flora or fauna are known to occur at FTMM. The U.S. Fish and Wildlife Service (USFWS) has indicated that no federally listed or proposed endangered or threatened flora or fauna under USFWS jurisdiction are known to exist on the MP. However, a breeding pair of osprey (Pandion haliaetus) maintain an active nest on MP. Breeding pairs of osprey are a New Jersey-listed Threatened Species. A vegetation survey and wetland delineation conducted at the CWA found no endangered, threatened, or rare species or any evidence to suggest that such species might inhabit the Site. Suitable habitat for swamp pink might exist on the MP, but the species was not encountered on the Site during a wetland delineation study conducted in August 1998 (108). The swamp pink is federally listed as a threatened plant species. There are no preserves, officially designated critical habitats, or special habitats for endangered, threatened, or rare species on the site (4).

4.6.1.3 Floodplains

A 100-year floodplain extends north of Oceanport Creek and south of Parkers Creek on MP. **Appendix E** includes the MP floodplain map (111). Flood plains have not been delineated in the CWA (112).

The MP and CWA are not mapped on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps. However, the land adjacent to each area has been documented. **Appendix E** includes the FEMA maps. A 100-year floodplain (A6 designation) surrounds Parkers Creek, between 250 and 500 feet to the north and south, as it flows along the MP northern property line. The Parkers Creek floodplain zone narrows upstream as it crosses Main Street and is designated A4, extending only about 115 feet from the creek. As Shrewsbury Creek enters the MP (near Kelly's Lane),

the 100-year flood zone is designated A8, extending approximately 170 feet north and south of the creek. Another 100 feet north of the A8 zone is Zone B, indicating an area between the 100-year and 500-year floodplain. The 340-foot area to the north and south of Husky Brook is designated Zone B as it enters MP near Broad Street. The 100-year floodplain (A6 designation) surrounds Oceanport Creek as it exits the MP near Murphy Drive (109,102).

As Wampum Brook exits the CWA, the 100-year flood zone, designated A3, is a 285-foot area to the north and south of the creek. No further floodplain information is available for the CWA (109,102).

4.6.1.4 Wetlands

Wetlands on the Site were delineated, mapped, and described in 1998 during a wetlands delineation project (108). Approximately 12.36 acres of wetlands occur on the MP and 29.6 acres occur on the CWA (4). After an earlier wetland delineation, the NJDEP provided a letter of interpretation (January 20, 1995) verifying the jurisdictional boundary of the freshwater wetlands in the CWA (113). The area encompasses approximately 55 acres in the southern portion of the CWA. The delineated boundary line, as verified by the NJDEP on October 13, 1994, is recorded in file #1336-94-0006.1. A jurisdictional boundary determination for MP has not been issued.

Most of the wetland areas located within the MP are associated with Parkers Creek, Oceanport Creek, and Husky Brook. Central and eastern Parkers Creek wetland areas are characterized by the common reed/narrow-leaved cattail/Japanese knotweed association. The western section is a narrow forested community dominated by green ash, red maple, and pin oak. Mill Brook has a narrow margin of herbaceous wetland on each bank in the northern section, dominated by reed canary grass and stinkweed. A shrub/scrub community consisting of silky dogwood, southern arrowwood, and Japanese knotweed is also found along Mill Brook, south of the Avenue of Memories. The western end of Husky Brook Lake has an alder thicket community dominated by speckled alder and black willow. The rest of the perimeter of the lake has a narrow shrubby community dominated by silky dogwood and speckled alder. Wetlands along Oceanport Creek are generally herbaceous, dominated by saltwater cordgrass and common reed (4).

The USFWS National Wetland Inventory Long Branch quadrangle maps indicate the presence of several wetlands at the MP and CWA. In the CWA, the golf course, in proximity to Mill Brook, is classified as palustrine open water/unknown bottom. Herbaceous wetlands here include jewelweed, tearthumb, and reed canary grass. Several of the unnamed tributaries of Wampum Brook are classified as palustrine forested wetland, broad-leaved deciduous. The forested wetland of the CWA borders the RR tracks and is dominated by red maple and sour gum (Nyssa slyvatica), with a shrub layer of swamp azalea, sweet pepperbush, and southern arrowwood (4).

4.6.2 Cultural Resources

The Integrated Cultural Resources Management Plan (ICRMP) (110) outlines U.S. Army policies, procedures, and responsibilities for meeting cultural resources compliance and management requirements at FTMM. The document was prepared in accordance with AR 200-4 and Department of the Army Pamphlet 200-4. The policies described are designed to ensure that the Installation Management Command and FTMM personnel make informed decisions regarding the cultural resources under their control, comply with public laws, support the military mission, and are consistent with sound principles of cultural resources management (110).

The ICRMP is a 5-year plan (2006-2010) updating the previous ICRMP prepared in 2003 (3). It is being prepared in response to BRAC recommendations authorized under the Defense Base Realignment and Closure Act of 1990, as amended through FY05 Authorization Act. It is designed to be a component of the installation Master Plan, to complement other FTMM plans and to serve as the installation's decision document for the conduct of cultural resources management actions. The FTMM ICRMP is an internal Army compliance and management plan designed to integrate the entirety of the installation's cultural resources program with ongoing mission activities, allow for ready identification of potential conflicts between the installation's mission and the cultural resources management program, and identify compliance actions necessary to maintain the availability of mission-essential properties and acreage (110).

4.6.2.1 Prehistoric and Historic Archaeological Resources

Three archaeological studies have been conducted on FTMM. These studies have primarily included archival research; only one has included subsurface testing. Eight prehistoric/Native American sites and one historical archaeological site have been recorded at the installation, but subsurface testing failed to relocate the reported location of one of the sites (28M0138) (110).

4.6.2.2 Historic Buildings, Structures, and Districts

Six architectural inventories have been conducted at FTMM. A total of 136 buildings or structures at FTMM have been determined eligible for the National Register of Historic Places (NRHP). The majority of these buildings are contributing elements to one or two NRHP-eligible historic districts identified at FTMM: the FTMM Historic District and the CWA Historic District (110). See **Appendix D** for a listing of the eligible buildings.

4.6.2.3 Monuments

One monument, the World War II Memorial, has been determined eligible as a contributing element to the FTMM Historic District (110).

4.6.2.4 Collections

Currently, there are no cultural remains housed at FTMM nor are any housed at an off-post permanent curation facility. According to the 1995 USACE Native American Graves Protection and Repatriation Act (NAGPRA) compliance report, the only reported

archaeological collections from FTMM are prehistoric artifacts still in the possession of a private individual who collected them during his employment at FTMM. The NAGPRA compliance report stated that no human remains, funerary objects, or other objects subject to NAGPRA were present within the collection. The collected locations and descriptions of the artifacts were documented (110).

4.6.2.5 Traditional Cultural Properties

There have been no Traditional Cultural Properties (TCPs) identified at FTMM. A systematic inventory of TCPs has not been undertaken (110).

4.6.2.6 Paleontological Resources

There are no known paleontological resources at FTMM. Systematic paleontological investigations have not been undertaken (110).

4.6.2.7 Documents

An extensive archive of original documents, including published works, memoranda, maps, photographs, and motion pictures relating to the military history of FTMM, the Signal Corps, and the Communications-Electronic Command are housed in the FTMM Communications-Electronics Museum and are in the custody of the Command Historian and the curator of the Museum (110).

Prehistoric Resources. The 2006 ICRMP summarized archeological studies conducted at FTMM since 1984. There are 446 acres at FTMM that are ranked highly likely to contain archeological sites, 156 acres that are considered to have a medium potential for containing archeological sites, and approximately 602 acres that are ranked as having low potential (110).

Previously, eight Native American sites (six on the MP and two sites in the CWA) were identified. These are the only known Native American archeological resources located on FTMM. **Table 4-5** lists the identified sites. Additionally, research was conducted to identify potential historic archaeological sites that may have been associated with early military use, with pre-military use dating to the nineteenth century, or with the period AD 1660-1765. The locations of 208 non-extant historic structures were identified, dating from the following periods: AD 1660-1765, 1765-1810, 1800-1865, 1865-1917, and Military occupation (110). **Table 4-5** identifies these locations. No archeological survey work has been initiated to determine the presence or absence of these potential site locations, except for Site 28 M0138. See **Section 4.6.2.1** of this report.

Table 4-5
Native American Archeological Resources
Located on Fort Monmouth

Post	Building Area	Location	Description
MP	292, 293, 289	Parkers Creek	Late Archaic to Middle Woodland; lithics (fully grooved ax, jasper biface), ceramics, shell suggestive of midden.
MP		Husky Brook Lake, south bank	Late Archaic, lithics (small stemmed point, broad stemmed point).
MP	600 area	Parkers Creek	Late Archaic/Woodland; lithics (triangular and other quartz points).
MP		Lafetra Brook, south bank	Early Woodland; lithics (Meadowood point).
MP	689	Mill Brook	Late Archaic; lithics (stemmed argillite point).
MP		Tindall Avenue, south of shopping center	Unknown prehistoric.
CWA		North of lagoon on south side of Tinton Avenue	Unknown prehistoric; lithics (black chert biface)
CWA	2000		Late Woodland; lithics (triangular point)

Source: (110).

Historic Resources. The 2006 ICRMP summarized architectural surveys conducted at FTMM since 1984. The initial survey in 1984 identified one potential historic district on the MP which consists of ca. 1920-1930 era buildings associated with the early post (110).

A draft nomination was submitted to the New Jersey State Historic Preservation Officer and approved in 1991. In total, 136 buildings or structures within FTMM have been recommended NRHP-eligible or are contributing elements to the NRHP-eligible historic districts. The MP historic district includes 94 contributing early post-era structures. The properties were considered eligible due to the design/construction criterion and retain a high degree of integrity associated with the Colonial Revival design.

The CWA historic district includes five eligible early post-era properties. The properties were considered eligible due to the design/construction criterion and typify a style and era of construction related to Tudor Revival architecture. Five additional buildings are eligible for the National Register on the CWA; however, they are not located within the proposed historic district (110). **Appendix D** includes a description of the NRHP-eligible buildings and structures.

5 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

FTMM is registered with the USEPA as an LQG of hazardous waste. The MP RCRA registration number is NJ3210020597. The CWA RCRA registration number is NJ2210020978. Being identified as an LQG, hazardous waste can only be stored at this site for a period of 90 days or less. The 2005 FTMM Hazardous Waste Generation Report is included in **Appendix E** (7).

FTMM is registered with the NJDEP as a Class D Recycling Center under Facility ID 155411, permit number CDG050001. Recycling Center approval was issued in June 2002 and expires in February 2010 for operations at Buildings 482, 484, and 2625. Permitted recyclable materials include antifreeze, batteries, latex paint, oil-based finishes and lamps. Used oil recycling no longer requires specific approval in the general permit, provided that no processing of used oils is performed [New Jersey Administrative Code (N.J.A.C.) 7:26A-1 as amended]. Oil filters are accepted and crushed in the Environmental Recycling Facility (Building 484), although no permit is required for this activity. Crushed filters are sent for recycling to Advanced Liquid Recycling in Bridgeport, New Jersey. Oil from the crushing process is stored in ASTs at the facility (85). The Class D Recycling Center accepts material from FTMM and area DoD installations. Paint is consolidated by crushing cans of liquid and aerosol paint. An air permit exists for operation of the paint can crusher. Further information pertaining to the air permit is located in **Section 5.1.7**.

FTMM received a Certificate of Authority to Operate (CAO) for can crushing operation for non-halogenated solvents and oils. The CAO was issued on June 25, 2002. The processing limit is one ton per month. The solvent/oil residue is mixed with oil-based paint consolidated at the Class D facility and sent for fuel blending.

FTMM received a CAO a Beneficial Use Project (permit number CT0050001) for Oil Spill Debris from the NJDEP in June of 2002. The CAO was modified in November 2003 to allow the direct shipment of oil spill debris to Wheelabrator Falls, Inc. in Morrisville, Pennsylvania. The CAO was modified a second time in October 2005 to allow the shipment of oil and paint spill residue to Wheelabrator Falls, Inc. The authorized annual tonnage for shipment was also increased from 240 tons to 324 tons. Permit documentation and the 2005 annual summaries of materials received and processed are provided in **Appendix E** (7).

5.1.1.1 Charles Wood Area

The central 90-day hazardous waste storage area in CWA is located at Buildings 2630, 2631, and 2632. Shower/eye wash facilities, perimeter fencing with barbed wires, and alarms are also present. The facility itself consists of three prefabricated storage buildings and one outside drum storage pad. All four structures are situated on a

concrete reinforced pad. Fluorescent lamps are stored inside a storage shed located on the northeast corner of the facility. Building 2625, located just southeast of the central 90-day hazardous waste storage area, serves as a secondary storage area for Class D recyclable batteries. No other Class D materials are authorized for storage at Building 2625 (8) (2006 VSI).

Buildings 2630 and 2631 are used to store a variety of hazardous wastes, including flammables, combustibles, corrosives, reactives, oxidizers, poisons, RCRA listed wastes and RCRA characteristic wastes. The buildings stand side by side (20 x 10 x 9 feet, 5 inches each) and are constructed of concrete. The structure is compartmentalized into six equal size sections that enables incompatible wastes to be stored separately. Each compartment has a sump serving as secondary containment. The structure is temperature controlled and has fire suppression systems within each compartment. These buildings replaced former Building 2624 (same location) in 1992.

Building 2632 is used to store Class D Recyclables including, spent batteries (zinc, lead acid, Nickel-Cadmium) and out of service electrical equipment which contain Non-PCB oils (85). The building is constructed of concrete and is 20 x 28 x 10 feet in size. Secondary containment is provided in the form of a six inch concrete dike which lines the inside perimeter of the storage area. The storage area is equipped with a thermostat controlled exhaust fan and has a built in fire suppression system (8) (2006 VSI).

The outside drum storage pad is constructed of concrete and is 20 x 10 x 1.5 feet in size. The pad is designed to hold 32 55-gallon drums and has one large sump which serves as secondary containment. This sump can hold up to 900 gallons. Drums stored on the outside storage pad are protected by polyethylene covers which prevent rainwater from coming into contact with the drums. Rainwater does however enter the containment sump. Before the rainwater is discharged it is visually inspected for the presence of a sheen. The containment sump has a manually operated valve that allows accumulated rainwater to be drained out when the valve is in the open position (8) (2006 VSI).

A 995-gallon, a 750-gallon, and two 275-gallon ASTs are located at the site. The 995-gallon AST is the only tank currently used to facilitate the proper collection and temporary storage of used oils. The 750-gallon AST and the two 275-gallon ASTs are kept at the 90-day hazardous waste storage area for safe keeping. The tanks are of double wall steel construction and come equipped with a view port for inspecting the interstitial space between the primary and secondary tank wall for potential leaks. The tanks are designed to industry standards and are capable of effectively containing the enclosed oil. Furthermore, the tanks are compatible with the oil they contain. The outer containment walls are sufficiently impervious to contain the used oil in the event of a leak from the primary tank. The tanks feature a low profile design for easy access and use. The tanks are visually inspected on twice weekly for signs of leaks, proper labeling and general site conditions (8) (2006 VSI). It should be noted that the inspection of the 90-day sites and these ASTs are performed under separate programs. The 90-day sites are inspected daily and the tanks are inspected twice weekly.

Building 2625 serves as a secondary storage area for Class D Recyclables. The building is a concrete structure that is 100 by 24 by 9 feet in size. The building's interior is divided into ten storage areas of equal size. Each storage area is separated by a concrete dividing wall, which extends 16 feet from the rear wall and 6 feet toward the ceiling. The DPW utilizes only half of the facility, or five storage bays, for managing universal wastes. A solid concrete dividing wall separates the two sides of the building. Each storage bay can safely store up to 18 55-gallon drums. Utilizing all five bays, the facility has the capacity to store 90 55-gallon drums (8) (2006 VSI).

The DPW utilizes spill control berms as a means of providing secondary containment for each storage bay. The berms are portable, non-absorbent, and made from polyurethane materials. Each berm is 2¼ inches in height and ten feet in length. By utilizing the spill control berms, each storage bay has a secondary containment capacity of up to 213 gallons (8) (2006 VSI).

Thirteen buildings house satellite accumulation areas in the CWA. Each building typically contains multiple satellite accumulation areas. **Table 5-1** lists the CWA satellite accumulation areas. **Appendix E** includes the designated buildings and a description of the containers in each area (114).

Table 5-1
Charles Wood Satellite Accumulation Areas

Building	Area	Number of Satellite Accumulation Areas
2071	Golf Course Maintenance Shop	8
2502	RDEC Sheet Metal Shop (C2SID)	1
2503	RDEC Machinist Shop (C2SID)	6
2506	RDEC Fabrication Shop (C2SID)	2
2507	Tactical Vehicle Repair Shop (C2SID)	7
2535	RDEC Battery Test Facility	12
2540	DRMS Laboratory	1
2560	FTMM Fire Department Compressor Room	1
2627	Pistol Range	2
2700	RDEC Room 2C201, Lab Area 1	3
	RDEC Room 2C201, Lab Area 2	10
	RDEC Room 2C205	1
	RDEC Room, 2C211	3
	RDEC Room 2D212	6
	Room 2 DC (Dry Room)	3
	Loading Dock	12
	Maintenance Shop	5
	Self Service Supply Center	3

Building	Area	Number of Satellite Accumulation Areas
2704	R & D Building	2
2705	Elec Warfare	1
2719	754th Explosive Ordnance Detachment	3

Source: (114).

5.1.1.2 Main Post

5.1.1.2.1 Main Post Central Hazardous Waste Storage Area

The central 90-day hazardous waste storage area in MP is located at Buildings 121, 122, and 123. The facility itself consists of three prefabricated storage buildings and two outside drum storage pads. All five structures are situated on a concrete reinforced pad. Shower/eye wash facilities, perimeter fencing with barbed wires, and alarms are also present (8) (2006 VSI).

Buildings 121 and 122 are used to store a variety of hazardous waste, including flammables, combustibles, corrosives, reactives, oxidizers, poisons, RCRA listed wastes and RCRA characteristic wastes. The buildings stand side by side (20 x 10 x 9 feet, 5 inches each) and are constructed of concrete. The structure is compartmentalized into six equal size sections which enables incompatible wastes to be stored separately. Each compartment also has a sump which serves as secondary containment. Each of these sumps can hold up to 270 gallons. The structure is temperature controlled and has a fire suppression system within each compartment (8) (2006 VSI).

Building 123 is used to store out-of-service transformers, capacitors, switches, and other types of electrical equipment that contain non-PCB oils (85). Batteries are also stored within this structure. The building is also constructed of concrete and is 12 feet x 24 inches x 12 feet in size. One large storage room is found inside the structure and underneath the grated flooring is a sump which serves as secondary containment. The sump can hold up to 1,300 gallons. The building is equipped with a thermostat controlled exhaust fan and has a fire suppression system (8) (2006 VSI).

The outside drum storage pads are constructed of concrete and are 20 x 10 x 1.5 feet in size. The pads are designed to hold thirty-two 55-gallon drums and each pad has one large sump which serves as secondary containment. Each sump can hold up to 900 gallons. Drums stored on the outside storage pads are protected by polyethylene covers which prevent rainwater from coming into contact with the drums. Rainwater does however enter the containment sump and before it is discharged it is visually inspected for the presence of a sheen. The containment sumps have manually operated valves that allow accumulated rainwater to be drained out when the valves are in the open position (8) (2006 VSI).

A single 275-gallon AST is located at the site and is used to facilitate the proper collection and temporary storage of used oils. The tank is of double wall steel construction and comes equipped with a view port for inspecting the interstitial space between the primary and secondary tank wall for potential leaks. The tank is designed to industry standards and is capable of effectively containing the enclosed oil. Furthermore, the tank is compatible with the oil it contains. The outer containment wall is sufficiently impervious to contain the used oil in the event of a leak from the primary tank. The tank also features a low profile design for easy access and use. The tank is visually inspected twice weekly for signs of leaks, proper labeling and general site conditions (8) (2006 VSI). It should be noted that the inspection of the 90-day sites and this AST are performed under separate programs. The 90-day sites are inspected daily and the tanks are inspected twice weekly.

Thirty-five buildings house satellite accumulation areas on the MP. Each building typically contains multiple satellite accumulation areas. **Table 5-2** lists the MP satellite accumulation areas. **Appendix E** includes the designated buildings and a description of the containers in each area (114).

Table 5-2
Main Post Satellite Accumulation Areas

Building	Area	Number of Satellite Accumulation Areas
116	Excess Warehouse	2
117	Self Service Supply Center	3
166	Sign Shop Inside Storage	1
173 & 174	Environmental Laboratory	23
270	Lodging Office	1
273	Fueling Station	1
279	HVAC/Heat/CPM Shop	12
	Plumbing Shop	1
280	Building Trades	1
	MP Paint Shop	7
281	TVS Alarm Shop	3
291	LRC New Equipment Training Division	2
293	LRC Battery Test Facility	9
450	Marina	3
480	Custodial Shop	2
481	Make It Happen Center	6
484	Recycling Shop	15
	Electrical Shop	2
488	Drum Washing	3
500	MP Chapel	1

Building	Area	Number of Satellite Accumulation Areas
600	I2WD Administrative	1
601	I2WD Warehouse	1
603	I2WD Robinson Prototyping Facility	1
699	AAFES MP Gas Station	7
750	Installation Transportation Motor Pool	13
	Firearm Repair Shop	1
753	Automotive/Vehicle Repair Shop	4
754	Forklift/Lawn Mower Repair Shop	6
760	Radio Repair Shop	3
801	Outdoor Recreation Shop	2
906	Space & Terrestrial Facility	4
1075	Patterson Army Hospital, X-ray Clinic	2
	Patterson Army Hospital, Microbiology Lab	1
	Patterson Army Hospital, Maintenance Shop	6
	Patterson Army Hospital, Air Handling Room	1
	Patterson Army Hospital, Dental Clinic	4
1122	Special Services Autocraft Shop	8
1203	FBI Facility	5
1205	Prep School Mess Hall	1
1210	PX Snack Bar	1
1212	Prep School Porch	1
1220	MP Boiler Plant	3

Source: (114).

5.1.1.2.2 Main Post Hazardous Materials Receiving, Storage and Distribution Facility and Universal Waste/Class D Material Recycling Center

Building 482 was renovated in 2001 with the intent of serving a dual-purpose as the central receiving point for hazardous materials and Class D wastes. However, the plan for Building 482 to serve as a central receiving point for hazardous material was not implemented due to funding constraints. Building 482 is used to store some hazardous materials and serves as the central receiving and storage area for the inbound Universal/Class D materials. Used oils, off-specification fuels, oil filters, oil spill debris, antifreeze, oil based paints, latex paints, batteries (all types), and fluorescent lamps are received, consolidated, and stored at this facility (8) (2006 VSI).

The building is a poured concrete structure with inside dimensions of approximately 89 feet by 71 feet, plus an attached garage with inside dimensions of 32 feet by 25 feet. The building has a platform on one side for truck access. Four separate storage rooms are utilized for corrosives, flammables/combustibles, general hazardous materials, and

special hazardous materials that need to be segregated (e.g., reactive materials, etc.). Building 482 has the capacity to store approximately 366 55-gallon drums. The approximate distribution of these 366 drums by storage area is 28 drums in the corrosives storage room, 130 drums in the flammables/combustibles storage room, 184 drums in the general hazardous material storage room, and 24 drums in the special hazardous material storage room. Operation of the Class D Recycling Center primarily uses space in the flammables/ combustibles and general hazardous materials storage rooms (8) (2006 VSI).

The trench/sump network provides a total secondary containment capacity of approximately 8,600 gallons for the facility. This is a closed loop system. The total secondary containment capacity is divided among the various storage rooms as follows: 3,600 gallons for the flammables/combustibles storage room; 3,600 gallons for the general hazardous materials storage room; 1,000 gallons for the corrosives storage room; and, 400 gallons for the special hazardous materials storage room (8) (2006 VSI).

5.1.1.2.3 Main Post Environmental Recycling Facility

Building 484 serves as the primary recycling and processing area for Class D/Universal waste materials generated at FTMM and area DoD facilities. The building is equipped with a self-contained secondary containment system. Waste materials recycled and/or processed at the facility include antifreeze, oil filters/oil spill debris, aerosol paints and solvents. Empty metal drums/containers are crushed and recycled off site after being triple rinsed at Building 488 (8) (2006 VSI).

The antifreeze recycling system is comprised of a 100-gallon storage tank constructed of high density polyethylene material and two distillation units. Distilled water is tested and then sent to an evaporator. The evaporator unit is used to process the distilled water from the antifreeze recycling system and other aqueous wastes including the aqueous cleaning solutions from on-site parts washers. Each source stream is analyzed for metals, Total Petroleum Hydrocarbons (TPH), and volatile organics prior to processing. Depending on the test results, the stream is evaporated or sent off to the appropriate disposal facility. The evaporator unit has been in service for three years (85). A log is maintained of all the antifreeze that is recycled and the log is kept at the facility. The recycled antifreeze is reused in the FTMM vehicle fleet (8) (2006 VSI).

The DPW operates an oil filter crushing unit at Building 484. The oil filter operation involves crushing used oil filters and collecting the liquid oil in a 55-gallon drum. The crushed oil filters are first placed into a 55-gallon drum and when the drum becomes full, the crushed oil filters are transferred to a 1.5 CY container that is liquid tight. Said container is located on a concrete pad outside of Building 484. The oil filters are disposed of through Advanced Liquid Recycling in Bridgeport, New Jersey. Advanced Liquid Recycling's management of the oil filters first involves shredding the filters and then separating the paper filter element from the metal filter housing. The paper filter elements are shipped off for fuel blending purposes and the filter housing is managed as scrap metal (8) (2006 VSI).

The paint can crushing system is an electrically powered hydraulic system which crushes the aerosol or liquid paint cans. The liquid and gas contents of the can are recovered into one container and the crushed can into another. All off-gasses generated as part of this operation are covered in the FTMM Title V Air Permit (**Appendix E**). Oil based and latex paints are always run as separate batches. However, non-halogenated solvent aerosol cans are utilized during oil based paint runs to keep the can crushing system lubricated. Using the non-halogenated solvents does not change the waste characteristic of the oil based paint. When a 55-gallon drum of oil based paint/solvent becomes full, it is relocated to Building 482, Class D Storage pending off-site disposal. The oil based paints and solvents are shipped to a USEPA-permitted TSDF where the waste materials are fuel blended (8) (2006 VSI).

Empty metal containers/drums which previously held a hazardous material/waste are triple rinsed at the state of the art drum washing facility located inside Building 488. After the containers/drums have been steam cleaned and rinsed, they are taken to Building 484 where they are crushed. Following this, the clean scrap metal is placed into a roll-off container that is situated at the south end of Building 484. The scrap metal is sent to a local metal recycler (8) (2006 VSI).

Three 995-gallon ASTs are located at the site and are used to facilitate the proper collection and temporary storage of generated used oils. The tanks are of double wall steel construction equipped with a view port for inspecting the interstitial space between the primary and secondary tank wall for potential leaks. The steel tanks are designed to industry standards and are capable of effectively containing the enclosed oils. Furthermore, the steel tanks are compatible with the oils they contain. The outer containment wall of each tank is sufficiently impervious to contain the used oil in the event of a leak from the primary tank. The tanks also feature a low profile design for easy access and use. The tanks are visually inspected on a twice weekly basis for signs of leaks, proper labeling and general site conditions (8) (2006 VSI).

5.1.2 Solid Waste Permits

FTMM does not hold any solid waste permits other than for the Class D/Universal Waste Recycling Center and for composting. Since 1982, solid waste has been collected by private contractors. Currently, FTMM contracts with Marpal Co. in Tinton Falls for solid waste and recyclables removal from the base. Solid waste is disposed of at the Monmouth Reclamation Center in Tinton Falls (115).

Generation of solid waste at FTMM comes from such sources as administrative offices, industrial shops, food service, facility engineering shops, and tenant activities. Facility engineering shops provide routine services such as plumbing, carpentry, HVAC, and roads and grounds maintenance. Additionally, construction contractors generate construction debris as part of construction and renovation projects. Construction debris is tracked separately and is part of the contractor responsibility under the construction contract. Currently, FTMM has a paper recycling program that recycles white and colored paper, computer paper, bond paper, cardstock, newspaper, and other non-glossy paper (61).

Class A recyclable material, as defined by N.J.A.C. 7:26A-1, includes non-putrescible metal, glass, paper, plastic containers, and corrugated and other cardboard. Class A recyclable materials generated at FTMM and recycled through the FTMM Class A recycling program include metal, glass, paper, plastic containers, and corrugated cardboard (85).

Class B recyclable material, as defined by N.J.A.C. 7:26A-1, includes non-putrescible waste, concrete, asphalt, brick, block, asphalt-based roofing scraps, wood waste, trees, brush, leaves that are not composted, scrap tires, and petroleum-contaminated soil. Class B recyclable materials generated at FTMM and recycled through the FTMM Class B recycling program include waste concrete, waste asphalt, wood waste, metal such as scrap wire, other metals from demolition, trees, brush etc., tires, and petroleum-contaminated soil (85).

Class C recyclable material, as defined by N.J.A.C. 7:26A-1, includes compostable/organic material such as food waste, biodegradable plastic, and yard trimmings. Class C recyclable materials generated at FTMM and recycled through the FTMM Class C recycling program include yard trimming and leaves (85).

Class D recyclable material, as defined by N.J.A.C. 7:26A-1, includes the following used oils: used lubricant oil, used coolant oil, and used emulsion oil. Class D recyclable materials generated at FTMM and area DoD facilities and recycled through the FTMM Class D recycling program include used oil, antifreeze, latex paint, lamps, oil-based finishes (paint), and batteries (85).

5.1.3 Underground/Aboveground Storage Tank Permits

The UST program at FTMM involves the management of 13 USTs currently located on the MP and the CWA (7). All 13 tanks are currently equipped with leak detection monitoring, corrosion protection, and spill and overfill protection as required by USEPA and NJDEP regulations. Each tank is of fiberglass construction and is designed to industry standards. The fiberglass material is compatible with the petroleum products they store and said tanks are capable of effectively containing the enclosed fuel products. In the case of double-walled tanks, the outer containment wall is sufficiently impervious to contain the fuel product in the event of a leak from the primary tank (8).

The DPW replaced the use of heating oil as a major energy source and converted FTMM facilities to natural gas. The program involved installing new gas lines, new boilers which are gas fed, and removing the unnecessary USTs. This action has been completed for both regulated USTs and also for non-regulated (residential) USTs that were used to store heating oil for on-site consumption. The remaining 13 USTs are used to store gasoline and diesel fuel for use in government vehicles and emergency generators (7,8).

A total of 13 ASTs (9 on MP, 4 on CWA) are utilized by installation repair and maintenance shops to facilitate the proper collection and temporary storage of generated used oils, ranging in size from 275 gallons to 995 gallons. A total of 23 ASTs

(15 on MP, 8 on CWA) are used for installation fuel storage, ranging in size from 125 gallons to 1,000 gallons (9).

Section 5.4 provides a description of FTMM UST and AST locations, capacities, and contents. **Table 5-3** identifies the USTs registered with the NJDEP, for the period between December 2006 and December 2009. The registration certificates are provided in **Appendix E** (9).

Table 5-3
Underground Storage Tank Location Registrations

Area	Building	Tank Number	Capacity	Contents	Registration #
MP	273	65	6000	Diesel	UST060002
MP	273	66	10000	Unleaded Gas	UST060002
MP	273	67	10000	Unleaded Gas	UST060002
MP	699	185	10000	Unleaded Gas	UST060001
MP	699	186	10000	Unleaded Gas	UST060001
MP	699	187	10000	Unleaded Gas	UST060001
MP	699	188	10000	Unleaded Gas	UST060001
MP	699	189	10000	Unleaded Gas	UST060001
MP	699	190	10000	Unleaded Gas	UST060001
MP	1203	227	10000	Diesel	UST060001
CWA	2567	66	10000	Unleaded Gas	UST060001
CWA	2567	67	10000	Unleaded Gas	UST060001
CWA	2567	68	10000	Unleaded Gas	UST060001

Source: (9).

5.1.4 National Pollutant Discharge Elimination System Permits

5.1.4.1 Main Post

FTMM holds one Public Complex Stormwater General Permit, authorized by the NJDEP [New Jersey Pollutant Discharge Elimination System (NJPDES) #NJG0148555], for the MP. The general permit was issued in 2004, covering a period of five years, until February 2009. The Public Complex permit applies to public facilities with at least 1,000 personnel and authorizes new or existing stormwater discharges to surface water and groundwater from municipal separate storm sewers owned by the facility. FTMM maintains a SPPP to maintain compliance with the Public Complex permit conditions. The most recent SPPP update was conducted in September 2006 according to interviews with FTMM personnel (119,120). The MP Public Complex permit is included in **Appendix E**.

Prior to the Public Complex Stormwater General Permit, the facility previously possessed an individual NPDES permit for MP. The MP Individual NPDES permit

number NJ0106763 was closed as of May 2006. All permit conditions were incorporated into the MP Public Complex permit (120).

The NJDEP issued a permit to construct and operate a treatment works on the MP. The most recent information obtained covered the Treatment Works Approval (TWA) permit # 01-0020 for the period between February 2001 and February 2003. The TWA authorized the connection of the groundwater pump and treat system located at Building 699 to the sanitary sewer. The specified work was completed with the allotted time period (7). The MP TWA authorization is included in **Appendix E**.

5.1.4.2 Charles Wood Area

FTMM holds one Public Complex Stormwater General Permit, authorized by the NJDEP (NJPDES #NJG0148571), for the CWA. The general permit was issued in 2004, covering a period of five years, until February 2009. The Public Complex permit applies to public facilities with at least 1,000 personnel and authorizes new or existing stormwater discharges to surface water and groundwater from municipal separate storm sewers owned by the facility. FTMM maintains a SPPP to maintain compliance with the Public Complex permit conditions. The most recent SPPP update was conducted in September 2006 according to interviews with FTMM personnel (119,120). The CWA Public Complex permit is included in **Appendix E**.

Prior to the Public Complex Stormwater General Permit, the facility previously possessed a general NPDES permit for CWA. The CWA Basic NPDES permit number NJ0088315 was closed as of May 2006. All permit conditions were incorporated into the CWA Public Complex permit (120).

The NJDEP issued a permit to construct and operate a treatment works in the CWA. The TWA permit # 02-0226 was issued for the period between March 2002 and March 2004. The TWA authorized the connection of the groundwater pump and treat system located at Building 2700 to the sanitary sewer. The specified work was completed within the allotted time period (7). The CWA TWA authorization is included in **Appendix E**.

5.1.5 Drinking Water Permits

FTMM purchases potable drinking water from the New Jersey American Water Company. The base is registered with the NJDEP Water Supply Administration Bureau of Safe Drinking Water under Facility ID 13110011. The registration allows FTMM to operate the water distribution network as a public community (7).

5.1.6 Water Allocation Permits

A water allocation permit is issued to the FTMM CWA Golf Course by the NJDEP Bureau of Water Allocation under Program Interest ID 2486P, Activity Number WAP960001. The permit was issued in January 2004 and expires in December 2013. The allocation permit allows irrigation water to be diverted from five irrigation supply wells and an irrigation pond on the golf course. The irrigation pond is supplied by an

un-named tributary of Wampum Brook and diversion is limited to 21 million gallons per year. The five irrigation water supply wells are supplied by groundwater and diversion is limited to 2.4 million gallons per month. Monthly withdrawal and water level monitoring is reported to the NJDEP. Annual water samples are submitted for chloride concentration in the supply wells (120). A copy of the water allocation permit is included in **Appendix E**.

5.1.7 Air Permits

5.1.7.1 Main Post

One Title V operating permit is issued for FTMM MP by the NJDEP Division of Air Quality under Program Interest Number 21140, Permit Activity Number BOP020002. The permit was issued in August 1998 and expires in August 2008. A new permit application will be submitted in May 2007 for the August 2008 renewal. FTMM will propose combining the MP and CWA permits at this time. Known permit modifications, proposed for the May 2007 application, are noted in the following discussion (123). Compliance reports are submitted by FTMM annually. An Air Pollution Control Pre-Construction Permit Equivalency was issued by NJDEP allowing use of an air stripper and air sparging with the soil vapor extraction (SVE) system at Building 699. Facility Identification Number 20013, Permit Activity Identification Number PCP010001 covers the period between July 2001 and July 2011 (121). A copy of the MP Title V permit, the Equipment and Source Operations Inventory, and the Pre-construction Permit Equivalency are included in **Appendix E**.

The following source types are identified in the MP Title V permit (please see **Appendix E** for source details and locations):

Table 5-4
Main Post Title V Source Types

Source Type	Emission Type	Number of Sources
Surface Coating	Fugitive	Facility Wide
Landfill	Fugitive	MP
Boilers <1MMBtu/hr	Insignificant Source	Facility Wide
Emergency Generators*	Insignificant Source	19
ASTs	Insignificant Source	15
USTs	Insignificant Source	1
Dental Clinic Fume Hoods	Insignificant Source	1
Cuda Zip II detergent/hot water degreasers	Insignificant Source	8
Boilers >1MMBtu/hr	Equipment Inventory	48
USTs	Equipment Inventory	11
Building 280 Saws, Planers, and Sanders	Equipment Inventory	14
Emergency Generators*	Equipment Inventory	8
Hot Water Heaters	Equipment Inventory	5

Source Type	Emission Type	Number of Sources
Paint Crusher System	Equipment Inventory	1
Neutralization Treatment System	Equipment Inventory	11

An inventory of FTMM emergency generators is provided in **Section 4.4.4, Table 4-4**.
Source: FTMM Main Post Title V Permit in **Appendix E** and (123).

FTMM will propose the removal of surface coating and landfill fugitive sources in the May 2007 application. The new permit will identify 29 emergency generator sources less than 100 kW. The Dental Clinic fume hoods formerly used in the 800 area are no longer operable since the Dental Clinic was moved to PAH. Boilers and UST numbers in the equipment inventory will also change in the new permit application due to the decommissioning of equipment and closing of fueling stations. Three boilers greater than 1MM Btu/hr have been removed from Buildings 207, 208, and 287. Fort Monmouth also plans to take the Building 1220 boiler plant offline and replace it with a geothermal system. There is no definitive schedule for this action. Two USTs have been removed from Building 750 and one has been removed from Building 1076. Additionally, the removal of six USTs from the AAFES fuel station is planned for the Spring of 2007 and will be replaced by two ASTs. Several hot water heaters have been removed (Buildings 1204 and 1205) and the remaining hot water heaters will be re-categorized into the boiler category. According to the N.J.A.C. 7:27-31.4, a facility must Opt-In to receive and trade emission credits. FTMM does not participate in the emissions trading program and will not receive emission credits for closing its sources of emissions (123).

The following control devices are reported in the Title V permit for MP:

Table 5-5
Main Post Title V Control Devices

Control Device	Description	Location
Vapor Recovery	OPW G-70-36-AA (fueling operations)	Building 699
Vapor Recovery	EMCO Wheaton G-70-17-AA (fueling operations)	Building 273
Vapor Recovery	EMCO Wheaton G-70-17-AA (fueling operations)	Building 750*
Cyclone	Cyclone – woodworking	Building 482
Particulate Filter	Rotoclone dust collector-woodworking	Building 1122
Adsorber	Carbon Filter 1-paint crushing	Building 484
Adsorber	Carbon Filter 2-paint crushing	Building 484
Particulate Filter	Media Filter-paint crushing	Building 484

Source: FTMM Main Post Title V Permit in **Appendix E** and (123).
* The Building 750 fueling station and equipment were removed in February 2005 (123).

5.1.7.2 Charles Wood Area

One Title V operating permit is issued for FTMM CWA by the NJDEP Division of Air Quality under Program Interest Number 21141, Permit Activity Number BOP020001. The permit was issued in August 1998 and expires in August 2008. A new permit application will be submitted in May 2007 for the August 2008 renewal. FTMM will propose combining the MP and CWA permits at this time. Known permit modifications, proposed for the May 2007 application, are noted in the following discussion (123). Compliance reports are submitted by FTMM annually. An Air Pollution Control Pre-Construction Permit Equivalency was issued by NJDEP allowing use of an air stripper and air sparging with the SVE system at Building 2700. Facility Identification Number 21345, Permit Activity Identification Number PCP020001 covers the period between May 2002 and May 2007 (121).

A copy of the CWA Title V permit, the Equipment and Source Operations Inventory, and the Pre-construction Permit Equivalency are included in **Appendix E**.

The following source types are identified in the CWA Title V permit (please see **Appendix E** for source details and locations):

Table 5-6
Charles Wood Area Title V Source Types

Source Type	Emission Type	Number of Sources
Surface Coating	Fugitive	Facility Wide
Welding Operations	Fugitive	Facility Wide
Boilers <1MMBtu/hr	Insignificant	1038
Emergency Generators*	Insignificant	9
Fuel Oil Tanks	Insignificant	5
Surface Cleaners	Insignificant	Facility Wide
Boilers >1MMBtu/hr	Equipment Inventory	12
USTs	Equipment Inventory	5
Fire Simulation/Training	Equipment Inventory	4
Paint Spray Booth**	Equipment Inventory	1
Emergency Generators*	Equipment Inventory	4

* An inventory of FTMM emergency generators is provided in **Section 4.4.4, Table 4-4**.
** The Paint Spray Booth, previously located in Building 2506, was dismantled June 2006 per interview (121) and VSI site contact and visual observation.
Source: FTMM Charles Wood Title V Permit in **Appendix E** and (123).

FTMM will propose the removal of the surface coating fugitive sources in the May 2007 permit application since the spray paint booth was removed in June 2006. Many boiler emissions are planned for elimination due to the geothermal system coming online at CWA. This does not include Building 2706 which is the boiler plant for the Myer Center. As each building is connected to the system, the boilers are decommissioned. Three

boilers in Building 2543 were removed in May 2006 as that building was connected to the geothermal system. It is very likely that the geothermal system will serve all buildings in the CWA, with the exception of the Myer Center, by the 2007 heating season. The removal of this major source of emissions may qualify FTMM to qualify for a Subchapter 8 general permit, whereby the Title V permits will no longer be needed. The majority of the small boilers serve housing areas on the CWA. Many housing areas are currently vacant and, if they remain so, the boilers will not be used. According to the N.J.A.C. 7:27-31.4, a facility must Opt-In to receive and trade emission credits. FTMM does not participate in the emissions trading program and will not receive emission credits for closing its sources of emissions (123).

The following control devices are reported in the Title V permit for CWA:

Table 5-7
Charles Wood Area Title V Control Devices

Control Device	Description	Location
Vapor Recovery	EMCO G-70-17-AA (fueling operations)	Building 2567
Particulate Filter*	Arrestor Pads-Paint Spray Booth	Building 2506

The Paint Spray Booth, previously located in Building 2506, was dismantled June 2006 per interview (121) and VSI site contact and visual observation.

Source: FTMM Charles Wood Title V permit in **Appendix E** and (123).

5.1.8 Nuclear Regulatory Commission Licenses

The following NRC Licenses and ARAs are applicable to FTMM (122):

- An NRC License is held by the U.S. Army Tank-Automotive & Armaments Command at Rock Island, Illinois for use by all DoD installations (including FTMM) and job sites as BML 12-0072-06. This license is for RAM use in armaments and artillery systems.

- An NRC License is held by the U.S. Army Armament & Chemical Acquisition and Logistics Activity at Rock Island, Illinois for use by all DoD installations (including FTMM) and job sites as BML 12-0072-13. This license is for RAM use in Chemical Agent Detectors.

- An NRC License is held by the U.S. Army Armament & Chemical Acquisition and Logistics Activity at Rock Island, Illinois for use by all DoD installations (including FTMM) and job sites as BML 12-0072-14. This license is for RAM use in Chemical Agent Monitors.

- An NRC License is held by the U.S. Army Soldier & Biological Chemical Command at Aberdeen Proving Ground MD for use by all DoD installations

(including FTMM) and job sites as BML 19-30563-01. This license is for RAM use in Chemical Agent Detectors and Monitors.

- An NRC License was held by the U.S. Army CECOM Safety Office at FTMM, New Jersey for use at FTMM or other temporary job sites as BML 29-01022-06. This license was for the use of byproduct RAM in R&D and instrument calibrations. This license expired 2/28/2005.

- An NRC License is held by the U.S. Army CECOM Safety Office at FTMM, New Jersey for use at Building 2540A in the CWA of FTMM as BML 29-01022-07. This license is for the use of radiological materials in R&D, for instrument calibrations, analysis of test samples, as check sources, and for the storage of radiological materials. This license expires 10/31/2012.

- An NRC License was held by the U.S. Army CECOM Safety Office at FTMM, New Jersey for use at DoD installations and job sites as BML 29-01022-14. This license was for the use of radiological materials in instrument calibrations. This license expired 10/31/2003.

- An ARA was held by the U.S. Army CECOM Safety Office at FTMM, New Jersey for use at DoD installations and job sites as ARA 24-12-07. This authorization was for the use of radiological materials in lensatic compasses. The authorization expired 1/31/2005.

- An ARA was held by the U.S. Army CECOM Safety Office at FTMM, New Jersey for use at DoD installations and job sites as ARA 29-10-06. This authorization was for the use of radiological materials as radioluminous paint. The authorization expired 1/31/2005.

- An ARA was held by the U.S. Army CECOM Safety Office at FTMM, New Jersey for use at DoD installations and job sites as ARA 29-10-10. This authorization was for the use of radiological materials in electronic equipment. The authorization expired 1/31/2005.

- An ARA was held by the U.S. Army CECOM Safety Office at FTMM, New Jersey for use at DoD installations and job sites as ARA 29-10-12. This authorization was for the use of radiological materials in Night Vision Devices. The authorization expired 1/31/2005.

5.1.9 Other Permits/Licenses/Registrations

5.1.9.1 Medical Waste Registrations

FTMM is registered as a Medical Waste Generator with the NJDEP under Generator Number 0131825, Category 5. Medical wastes are generated at the PAHC, Building 1075 on MP. A copy of the 2006 program invoice is included in **Appendix E** (7).

5.1.9.2 Marina Operators License

The FTMM Marina on Oceanport Creek is licensed under File #86-0586 with the New Jersey Bureau of Tidelands Management. The license covers the use and maintenance of the marina on State lands under tidewater for a period of seven years, beginning in August 2004. Slip rental income reports must be submitted to the State annually. A copy of the marina license is included in **Appendix E** (7).

5.1.9.3 Wetlands Related Permits

Numerous wetland permits have been obtained by FTMM on a project by project basis and are maintained on record in DPW at Building 173. A license for the construction of the Husky Brook Nature Trail Bridge was issued in January 2005 by the NJDEP Land Use Regulation Program (File #04-0033-T). The license covers the seven year period between January 2005 and January 2012. A copy of the permit equivalency is provided in **Appendix E** (7).

5.2 Environmental Cleanup

5.2.1 Installation Restoration Program

The FTMM IRP identifies environmental cleanup requirements at each site or AOC on the facility and proposes a comprehensive, installation-wide approach, with associated costs and schedules, to conduct investigations and necessary RAs. Currently, 43 IRP sites are managed or closed under the program. The following site types are listed in the AEDBR (124):

- 3 ASTs
- 2 Incinerators
- 1 Maintenance Yard
- 4 STPs
- 1 Surface Disposal Area
- 6 Underground Tank Farms
- 1 Burn Area
- 2 Industrial Discharges
- 3 Pesticide Shops
- 4 Spill Site Areas
- 2 USTs
- 1 Contaminated Fill
- 9 Landfills
- 2 Pistol Ranges
- 2 Storage Areas

5.2.1.1 Main Post Active IRP Sites

The following IRP sites listed in **Table 5-9** for MP are active in the FTMM AEDBR.

Table 5-9
Main Post Active Installation Restoration Program Sites

AEDB-R Number	Site Name	Status
FTMM-02	M-2 Landfill	Near Surface Soils (Cover Soil) – NFA recommendation submitted to the NJDEP, awaiting response. Below Grade Soils – The DPW incorporated a document equivalent to a Declaration of Environmental Restriction (DER) into the FTMM Installation Master Plan for PCB soil contamination. Groundwater – CEA established with the NJDEP. RAO – ORC injection program is approved by the NJDEP and currently underway through FY08. LTM – Monitoring of groundwater and surface water continues on a quarterly basis.
FTMM-03	M-3 Landfill	Near Surface Soils (Cover Soil) – NFA recommendation submitted to the NJDEP, awaiting response. Groundwater – CEA currently being prepared for subsequent submission to the NJDEP. RAO – Monitored Natural Attenuation program is approved by the NJDEP and is currently underway. LTM – Monitoring of groundwater and surface water continues on a quarterly basis.
FTMM-05	M-5 Landfill	Near Surface Soils (Cover Soil) – NFA recommendation submitted to the NJDEP, awaiting response. Groundwater – CEA currently being prepared for subsequent submission to the NJDEP. RAO – HRC injection program is approved by the NJDEP and currently underway through FY08. LTM – Monitoring of groundwater and surface water continues on a quarterly basis.
FTMM-08	M-8 Landfill	Near Surface Soils (Cover Soil) – NFA recommendation submitted to the NJDEP, awaiting response. Below Grade Soils – The DPW incorporated a document equivalent to a DER into the FTMM Installation Master Plan for PCB soil contamination. Groundwater – CEA currently being prepared for subsequent submission to the NJDEP. RAO – Monitored Natural Attenuation program is approved by the NJDEP and is currently underway. LTM – Monitoring of groundwater and surface water continues on a quarterly basis.
FTMM-12	M-12 Landfill	Near Surface Soils (Cover Soil) – NFA recommendation submitted to the NJDEP, awaiting response. Groundwater – CEA submitted to NJDEP, awaiting response. LTM – Monitoring of groundwater and surface water continues on a quarterly basis until CEA approval.
FTMM-18	M-18 Former Training Area	Near Surface Soils (Cover Soil) – NFA recommendation submitted to the NJDEP, awaiting response.

AEDB-R Number	Site Name	Status
		Groundwater – CEA submitted to NJDEP, awaiting response. LTM – Monitoring of groundwater and surface water continues on a quarterly basis until CEA approval.
FTMM-53	Building 699	Groundwater – CEA currently being prepared for subsequent submission to the NJDEP. RAO – Continue operation of groundwater pump and treat system, air sparge/SVE system. LTM – Monitoring of groundwater continues on a quarterly basis.
FTMM-54	Building 296	Groundwater – CEA submitted to the NJDEP, awaiting response. LTM – Monitoring of groundwater continues on a quarterly basis until CEA approval.
FTMM-55	Building 290	Groundwater – CEA submitted to the NJDEP, awaiting response. LTM – Monitoring of groundwater continues on a quarterly basis until CEA approval.
FTMM-56	Building 80	Groundwater – CEA submitted to the NJDEP, awaiting response. LTM – Monitoring of groundwater continues on a quarterly basis until CEA approval.
FTMM-57	Building 108	Groundwater – CEA submitted to the NJDEP, awaiting response. LTM – Monitoring of groundwater continues on a quarterly basis until CEA approval.
FTMM-59	Building 1122	Groundwater – CEA submitted to the NJDEP, awaiting response. RAO – Commence HRC injection program in FY07 and continue through FY08. LTM – Monitoring of groundwater and surface water continues on a quarterly basis.
FTMM-61	Building 283	Groundwater – CEA submitted to the NJDEP, awaiting response. RAO – Commence ORC injection program in FY07 and continue through FY08. LTM – Monitoring of groundwater and surface water continues on a quarterly basis.
FTMM-64	Building 812	Groundwater – CEA submitted to the NJDEP, awaiting response. RAO – Continue HRC injection program through FY08. LTM – Monitoring of groundwater continues on a quarterly basis.
FTMM-66	Building 886	Groundwater – CEA currently being prepared for subsequent submission to the NJDEP. RAO – Monitored Natural Attenuation recommendation is awaiting NJDEP approval. LTM – Monitoring of groundwater continues on a quarterly basis.

CEA Classification Exception Area
HRC Hydrogen Releasing Compounds
LTM Long-Term Monitoring
NFA No Further Action
ORC Oxygen Release Compound
RAO Remedial Action Operation
SVE Soil Vapor Extraction

A summary of each site listed above in **Table 5-9** follows. Unless otherwise noted, all information pertaining to these sites was obtained from communications with FTMM DPW personnel during document reviews associated with the assembly of this report.

The IRP documents were reviewed to determine if the environmental condition of each IRP site constituted a REC. All RECs are documented in the ECP parcel table contained in **Appendix A**.

FTMM-02: M-2 Landfill. The M-2 landfill is located in the southwestern corner of the MP, on the south bank of Mill Creek. The 6.5-acre landfill operated from 1964 until 1968. The types of materials disposed of in the landfill have been reported to include: construction debris, scrap metal, ACMs, 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. Metal, concrete and other types of landfill debris can be observed protruding from the stream bank along Mill Creek. Under the SI phase, three monitoring wells were installed to evaluate groundwater quality. In addition, surface water samples were collected from Mill Creek. All samples were analyzed for target compound list (TCL) + 30 parameters, target analyte list (TAL) metals and cyanide. Chlorobenzene, arsenic and lead were detected in downgradient monitoring wells above NJDEP Groundwater Quality Criteria. TCE and PCE were detected in surface water above NJDEP Surface Water Criteria. Under an enhanced SI phase, seven additional monitoring wells were installed to further evaluate groundwater quality. Subsequently, consecutive quarterly rounds of groundwater samples have been collected for analysis. Benzene, chlorobenzene, cadmium and lead have been detected in six of the seven downgradient monitoring wells above NJDEP Groundwater Quality Criteria. An RI to delineate compounds of concern within groundwater and soil has been completed. PCBs were identified in site soils at two separate areas within the boundary of the landfill. A second RI that evaluated the potential for environmental contaminants being present within the existing landfill cover material has also been completed. An NFA recommendation has been made regarding the landfill cover material. A remedial design that addresses soil erosion problems along Mill Creek was completed in June of 1999. An RA to correct the soil erosion problems commenced in October of 1999 and was completed in June of 2001. A remedial design that addresses groundwater and soil contamination was submitted and approved by the NJDEP. The remedial alternative approach selected for the M-2 landfill involved the injection of Enzyme Enhanced Bioremediation (EEB) products into shallow groundwater to accelerate contaminant degradation. The DPW utilized a Geoprobe® sampling vehicle as the means for injecting the EEB products into the aquifer. A Classification Exception Area (CEA) for site groundwater was filed with the NJDEP as part of the RA Work Plan submittal. The CEA restricts the use of groundwater within a defined area until such time that contaminants of concern achieve compliance with the NJDEP Groundwater Quality Criteria. In addition, the DPW incorporated a document equivalent to a Declaration of Environmental Restriction (DER) into the FTMM Installation Master Plan for the PCB soil contamination. RA work activities were completed in June of 2001. Subsequent remedial action operations (RAOs) activities involved injecting Oxygen Release Compound (ORC) materials into

shallow groundwater to further enhance contaminant degradation. Currently, as part of a monitoring program, sixteen groundwater monitoring wells are sampled on a quarterly basis. Operation of the RA (ORC injection) will end in FY08.

The cleanup strategy includes continued compliance monitoring of groundwater and surface water as a key component of natural attenuation. Sixteen groundwater monitoring wells will continue to be sampled on a quarterly basis to include surface water sampling until 2011.

FTMM-03: M-3 Landfill. The M-3 landfill is located between North Drive and Lafetra Creek in the west-central part of the MP. The 5.9-acre landfill operated from 1959 until 1964. The types of materials disposed of in the landfill have been reported to include: construction debris, scrap metal, ACMs, 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. Under the SI phase, three monitoring wells were installed to evaluate groundwater quality. In addition, surface water samples were collected from Lafetra Creek. All samples were analyzed for TCL + 30 parameters, TAL metals and cyanide. Chlorobenzene and lead were detected in downgradient monitoring wells above NJDEP Groundwater Quality Criteria. No compounds of concern were detected in surface water samples collected during the SI phase. Surface water samples collected under a now expired NJPDES permit identified PCE above NJDEP Surface Water Criteria. Under an enhanced SI phase, five additional monitoring wells were installed to further evaluate groundwater quality. Subsequently, consecutive quarterly rounds of groundwater samples have been collected for analysis. Benzene, chlorobenzene, cadmium and lead were detected in all five downgradient monitoring wells above NJDEP Groundwater Quality Criteria. Contaminant levels are consistent with the levels identified during the SI phase and subsequent quarterly LTM results for surface water and groundwater at the M-3 landfill. An RI that evaluated the potential for environmental contaminants being present within the existing landfill cover material was completed.

An NFA recommendation was made regarding the landfill cover material. A remedial design that addresses groundwater contamination was submitted and approved by the NJDEP. The remedial alternative approach selected for the M-3 landfill involves the use of monitored natural attenuation. At present, vinyl chloride is the only contaminant of concern to exceed the NJDEP Groundwater Quality Criteria. Vinyl chloride has recently been detected at MW07 at concentrations ranging from ND to 33.27 micrograms per liter (µg/L). The Groundwater Quality Criteria for vinyl chloride is 1 µg/L. Currently, eight groundwater monitoring wells are sampled on a quarterly basis. The cleanup strategy includes the continued monitoring of groundwater and surface water as a key component of the monitored natural attenuation program. NFA is expected by 2011.

FTMM-05: M-5 Landfill. The M-5 landfill is located just north of the M-4 landfill in the area bounded by North Drive to the south, an unpaved road south of Building 198 to the north, Wilson Avenue to the east and Mill and Parkers Creek to the west. The 3.2-acre

landfill operated from 1952 until 1959. The types of materials disposed of in the landfill have been reported to include: construction debris, scrap metal, ACMs, 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. Under the SI phase, two monitoring wells were installed to evaluate groundwater quality. All samples were analyzed for TCL + 30 parameters, TAL metals and cyanide. Elevated levels of PCE were detected in one monitoring well. The compound of concern exceeded the NJDEP Groundwater Quality Criteria by a factor of 130. Subsequently, consecutive quarterly rounds of groundwater samples have been collected for analysis. Surface water samples collected under a now expired NJPDES permit identified PCE above NJDEP Surface Water Criteria. Under the RI phase, approximately 260 groundwater and soil samples were collected by means of a Geoprobe® sampling device. Following the Geoprobe® investigation, thirteen additional monitoring wells were installed to further evaluate groundwater quality. At present, the extent of the PCE plume has been delineated both vertically and horizontally within site soil and groundwater. A remedial design that proposes injecting Hydrogen Releasing Compounds (HRC) into the aquifer to remediate the PCE plume was submitted and approved by the NJDEP. The DPW utilized a Geoprobe® sampling vehicle as the means for injecting the HRC into the aquifer. A CEA for site groundwater will be filed with the NJDEP as part of the RA Progress Report submittal. The CEA restricts the use of groundwater within a defined area until such time that the contaminant of concern achieves compliance with the NJDEP Groundwater Quality Criteria. A second RI that evaluated the potential for environmental contaminants being present within the existing landfill cover material was also completed. An NFA recommendation was made regarding the landfill cover material. Currently, ten groundwater monitoring wells are sampled on a quarterly basis. Operation of the RA (HRC injection) will end in FY 2008. Final Site Closeout is anticipated for 2011.

FTMM-08: M-8 Landfill. The M-8 landfill is located north of Buildings 692 and 697 in a bend of Parkers Creek. The 7.2-acre landfill operated from 1962 until 1981. Following closure of the M-8 landfill, all solid wastes generated at FTMM were directed to the Monmouth County landfill. The types of materials disposed of in the landfill have been reported to include: construction debris, scrap metal, ACMs, 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. Under the SI phase, four monitoring wells were installed to evaluate groundwater quality. All samples were analyzed for TCL + 30 parameters, TAL metals and cyanide. Benzene and chlorobenzene were detected in downgradient monitoring wells above NJDEP Groundwater Quality Criteria. Under an enhanced SI phase, seven additional monitoring wells were installed to further evaluate groundwater quality. Benzene and chlorobenzene were detected in four downgradient monitoring wells above NJDEP Groundwater Quality Criteria. Contaminant levels are consistent with the levels identified during the SI phase and subsequent quarterly LTM results for surface water and groundwater at the M-8 landfill. PCB soil contamination was

identified at one location within the M-8 landfill. A second RI that evaluated the potential for environmental contaminants being present within the existing landfill cover material was also completed. An NFA recommendation has been made regarding the landfill cover material. A remedial design that addresses groundwater contamination was submitted and approved by the NJDEP. The remedial alternative approach selected for the M-8 landfill involves the use of monitored natural attenuation. A CEA for site groundwater will be filed with the NJDEP as part of our RA Progress Report submittal. The CEA restricts the use of groundwater within a defined area until such time that contaminants of concern achieve compliance with the NJDEP Groundwater Quality Criteria. In addition, the DPW incorporated a document equivalent to a DER into the FTMM Installation Master Plan for the PCB soil contamination. Currently, as part of a monitoring program thirteen groundwater monitoring wells are sampled on a quarterly basis. Continuous monitoring of thirteen groundwater monitoring wells and surface water is a key component of our monitored natural attenuation program.

FTMM-12: M-12 Landfill. The M-12 landfill is located on the MP, on the south side of Husky Brook, west of Murphy Drive. Dates of operation for the 1.4-acre landfill are unknown. The types of materials disposed of in the landfill have been reported to include: construction debris, scrap metal, ACMs, 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. Metal, concrete and other types of landfill debris can be observed protruding from the stream bank along Husky Brook. Under the SI phase, three monitoring wells were installed to evaluate groundwater quality. All samples were analyzed for TCL + 30 parameters, TAL metals and cyanide. Arsenic, cadmium, mercury and lead were detected in site monitoring wells slightly below NJDEP Groundwater Quality Criteria. Subsequently, consecutive quarterly rounds of groundwater samples have been collected for analysis. An RI of site groundwater has been completed and eight additional monitoring wells have been installed at the site. Arsenic was detected consistently in two monitoring wells above NJDEP Groundwater Quality Criteria. An RI that evaluated the potential for environmental contaminants being present within the existing landfill cover material was completed. An NFA recommendation was made regarding the landfill cover material. A remedial design that addresses groundwater contamination was submitted to the NJDEP. The remedial alternative approach selected for the M-12 landfill involves the use of monitored natural attenuation. A CEA for site groundwater was filed with the NJDEP. The CEA restricts the use of groundwater within a defined area until such time that the contaminant of concern achieves compliance with the NJDEP Groundwater Quality Criteria. A remedial design that addresses soil erosion problems along Husky Brook was completed in 1999. An RA to correct the soil erosion problems commenced in 1999 and was completed in 2001. An RI Report, which presents a groundwater flow and transport model to evaluate the migration of arsenic in groundwater, was submitted to the NJDEP in October 2003. An NFA determination was requested for the site. Currently, eleven groundwater monitoring wells are sampled on a quarterly basis. Compliance monitoring will continue for eleven groundwater monitoring wells and surface water on a quarterly basis pending NJDEP review.

FTMM-18: M-18 Former Training Area. The M-18 site is a former training area utilized by the Army Signal School and other Army units. The M-18 site is located on the MP, between Parkers Creek to the north and Buildings 283, 289, 293 and 294 to the south. The 4.1-acre site is partially paved and the remaining portion is an open sandy area. A tidal marsh adjoins the site. The 1980 IA report (USAEC) identifies diesel and gasoline generators along with other types of military vehicles being used at this site. The report goes on to state that numerous fuel spills occurred at the site as a result of these activities. Under the SI phase, nine soil borings in a grid pattern were drilled at the site. Two soil samples were collected from each boring, either 6 to 12 inches or 12 to 18 inches below the bottom of the asphalt (to avoid bias) and either from intervals with visible staining or from just above the water table. Soil samples were analyzed for VOCs and TPH. No compounds of concern were detected above NJDEP Direct Contact Soil Cleanup Criteria. Two soil boring locations were converted to monitoring wells in order to evaluate groundwater quality. One existing monitoring well was also used to evaluate groundwater quality. Groundwater samples were analyzed for TCL + 30 parameters, TAL metals and TPH. Arsenic, lead, and 4,4'-dichlordiphenyldichloroethane (DDD) were detected in downgradient monitoring wells above NJDEP Groundwater Quality Criteria. Under an enhanced SI phase, three additional monitoring wells were installed to further evaluate groundwater quality. Subsequently, consecutive quarterly rounds of groundwater samples have been collected for analysis. Benzene and lead were detected in four of the six site monitoring wells above NJDEP Groundwater Quality Criteria. A geophysical survey was also conducted under the SI phase in order to determine whether the M-18 site was a former landfill. The data gathered from geophysical survey identified waste materials buried at the site. Subsequent trenching work confirmed the presence of construction debris at the site. An RI that evaluated the potential for environmental contaminants being present within the existing landfill cover material was completed. An NFA recommendation was made regarding the landfill cover material. A remedial design that addresses groundwater contamination was submitted to the NJDEP. The remedial alternative approach selected for the M-18 site involves the use of monitored natural attenuation. A CEA for site groundwater was filed with the NJDEP. The CEA restricts the use of groundwater within a defined area until such time that contaminants of concern achieve compliance with the NJDEP Groundwater Quality Criteria. An RI Report which presents a groundwater flow and transport model to evaluate the migration of benzene and metals in groundwater was submitted to the NJDEP in October 2003. An NFA determination was requested for the site. Currently, two groundwater monitoring wells are sampled on a quarterly basis. In addition, monitoring wells associated with this site are sampled at Building 290 site (2 wells) and Building 296 site (7 wells). Compliance monitoring of two groundwater monitoring wells and surface water will continue pending NJDEP review.

FTMM-53: Building 699. Site FTMM-53 is an active gasoline service station operated by the Army and Air Force Exchange Services (AAFES) organization. The station is located on Saltzman Avenue which is situated in the center portion of the MP. The tank system is comprised of six 10,000-gallon USTs with two remote pumping islands. The USTs store various grades of gasoline. On November 5, 1984, a tank tightness test identified a .333 gallon per hour leak in two of the USTs. No action was taken until

1989 when a line leak was identified; subsequently the piping was excavated and replaced. Since that time a groundwater pump system (to recover free product and to control the plume) has been operating in conjunction with a quarterly groundwater monitoring program. Thirteen monitoring wells were installed at the site in order to delineate the extent of the contaminant plume. Subsequently, consecutive quarterly rounds of groundwater samples have been collected for analysis. Benzene, ethyl benzene, toluene, xylene, and methyl tert-butyl ether (MTBE) have been detected both in soil and groundwater above NJDEP Direct Contact Soil Cleanup Criteria and Groundwater Quality Criteria. An RA work plan specifying the installation of an air sparging/SVE system, plus an expanded groundwater pump and treat system was submitted and approved by the NJDEP. In addition, the use of Enzyme EEB products were stipulated for the localized treatment of soils in dense silt and clay areas. Construction of the selected remedial alternative was completed in January of 2001. Currently, as part of a monitoring program, thirteen groundwater monitoring wells are sampled on a quarterly basis. The clean up strategy is to continue RA operation (air sparge, SVE, pump & treat system) activities and monitoring efforts at the Building 699 site. Shutdown of the treatment system is expected in FY08 and quarterly groundwater monitoring of 13 wells will be performed for two years after shutdown.

FTMM-54: Building 296. Site FTMM-54 is a former fuel distribution facility which was abandoned and then rediscovered during a renovation project at Building 296. The facility dates back to the 1940s and is located on Sherrill Avenue. The UST system was comprised of ten 1,000-gallon tanks which stored various types of fuel products. These products were distributed from remote pumping islands located over 450 feet from the UST field and within 50 feet of Parkers Creek (a sensitive estuarine marsh area). Between November and December 1993, the previously unknown fuel distribution system was removed and the source of contamination was eliminated. Since that time seven monitoring wells were installed in order to delineate the extent of contamination at the site. Benzene and lead were initially detected above NJDEP Groundwater Quality Criteria. Subsequently, consecutive quarterly rounds of groundwater samples have been collected for analysis. Benzene and lead were detected in site monitoring wells above NJDEP Groundwater Quality Criteria. A remedial design that addresses groundwater contamination was submitted to the NJDEP. The remedial alternative approach selected for the Building 296 site involves the use of monitored natural attenuation. A CEA for site groundwater was filed with the NJDEP. The CEA restricts the use of groundwater within a defined area until such time that contaminants of concern achieve compliance with the NJDEP Groundwater Quality Criteria. The Building 296 site, the Building 290 site, and the M-18 Landfill are located in close proximity to one another. Due to the close proximity, the remedial investigation results for all three sites were reported in one RI Report. This report, submitted to the NJDEP in October 2003, presents a groundwater flow and transport model to evaluate the migration of benzene and metals in groundwater. An NFA determination was requested for this site. Currently, as part of the monitoring program, seven groundwater monitoring wells are sampled on a quarterly basis. The cleanup strategy is to continue compliance monitoring of seven groundwater monitoring wells pending NJDEP review.

FTMM-55: Building 290. FTMM-55 is the site of a former UST system which was located at Building 290. The site formerly served as a motor pool for a military unit that has since left FTMM. The tanks were used to store gasoline and they were both removed on September 2, 1994. The tank site was reported to the NJDEP as a discharge to the environment, Case # 93-11-30-1246-27. In accordance with NJDEP UST Site Assessment activity requirements, the DPW was required to install two monitoring wells to determine any adverse impact to the environment. One monitoring well was installed within ten feet of the UST excavation and the second well was installed down gradient of the potential discharge area. On July 2, 1996, a construction activity identified gasoline-contaminated soil within 50 feet of the former UST site. The contaminated area was suspected to be the previously unknown dispenser area for the UST system. Soil samples were collected and test results identified TPH levels in excess of 17,000 milligrams per kilogram (mg/kg). Soils were removed and disposed of in accordance with NJDEP requirements. Additional soil and groundwater samples were collected in March 1998 to further delineate the area of contamination. No additional contaminated soils were identified within the AOC. The results of the initial groundwater assessment identified lead above the NJDEP Groundwater Quality Criteria. Subsequently, consecutive quarterly rounds of groundwater samples have been collected for analysis. Arsenic and lead were detected in site monitoring wells above NJDEP Groundwater Quality Criteria. A remedial design that addresses groundwater contamination was submitted to the NJDEP. The remedial alternative approach selected for the Building 290 site involves the use of monitored natural attenuation. A CEA for site groundwater was filed with the NJDEP. The CEA restricts the use of groundwater within a defined area until such time that contaminants of concern achieve compliance with the NJDEP Groundwater Quality Criteria. The Building 296 site, the Building 290 site, and the M-18 Landfill are located in close proximity to one another. Due to the close proximity, the remedial investigation results for all three sites were reported in one RI Report. This report, submitted to the NJDEP in October 2003, presents a groundwater flow and transport model to evaluate the migration of benzene and metals in groundwater. An NFA determination was requested for this site. Currently, as part of the monitoring program, two groundwater monitoring wells are sampled on a quarterly basis. The cleanup strategy is to continue compliance monitoring of two groundwater monitoring wells pending NJDEP review.

FTMM-56: Building 80. FTMM-56 is a former UST site (Building 80) which is located off Riverside Drive and is situated in the eastern section of the MP. The UST was a fiberglass reinforced plastic tank which stored # 2 fuel oil. The tank was installed in 1984 and was removed on June 16, 1994. The site was reported to the NJDEP as a discharge to the environment, Case # 94-06-16-1127-25. The Building 80 site serves as an operational area for DPW equipment and maintenance activities. Although the discharge was identified during the UST closure, the discharge is believed to have come from activities prior to and not related to the UST removal (pre-1984). In accordance with NJDEP UST Site Assessment activity requirements, the DPW was required to install monitoring wells down gradient of the potential discharge area in order to evaluate any adverse impact to the environment. Since the time of tank closure, two monitoring wells were installed at the site. Groundwater samples have been collected and analyzed for volatile organic analysis (VOA) + 15 and BN+15.

Benzene was initially detected at levels up to 1.7 µg/L and chlorobenzene up to 5.20 µg/L. Benzene was above the NJDEP Groundwater Quality Criteria of 1.0 µg/L and chlorobenzene was above the standard of 4 µg/L. Subsequently, consecutive quarterly rounds of groundwater samples have been collected for analysis. Benzene, chlorobenzene, 4,4'-DDD, cadmium and lead were detected in site monitoring wells above NJDEP Groundwater Quality Criteria. A remedial design that addresses groundwater contamination was submitted to the NJDEP. The remedial alternative approach selected for the Building 80 site involves the use of monitored natural attenuation. A CEA for site groundwater was filed with the NJDEP. A CEA restricts the use of groundwater within a defined area until such time that contaminants of concern achieve compliance with the NJDEP Groundwater Quality Criteria. An RI report requesting an NFA determination from the NJDEP at this site has been completed and was submitted to the NJDEP in May 2005. The Army is still awaiting approval of this submission. Currently, as part of a monitoring program, six groundwater monitoring wells are sampled on a quarterly basis. The cleanup strategy is to continue compliance monitoring of six groundwater monitoring wells pending NJDEP review.

FTMM-57: Building 108. FTMM-57 is located off of Riverside Avenue in the eastern section of the MP. The DPW removed five USTs in the area of Building 108 on 2 November 1993. The site was reported to the NJDEP as a discharge to the environment, Case # 93-04-12-1939-29. In accordance with NJDEP UST Site Assessment activity requirements, monitoring wells were installed at the site to determine any adverse impact to the environment. Four shallow monitoring wells were installed to help delineate the extent of the contaminants at the site. Benzene, chlorobenzene and lead were initially detected at levels above NJDEP Groundwater Quality Criteria. Subsequently, consecutive quarterly rounds of groundwater samples have been collected for analysis. Arsenic and lead were detected in site monitoring wells above NJDEP Groundwater Quality Criteria. A remedial design that addresses groundwater contamination was submitted to the NJDEP. The remedial alternative approach selected for the Building 108 site involves the use of monitored natural attenuation. A CEA for site groundwater was filed with the NJDEP. A CEA restricts the use of groundwater within a defined area until such time that contaminants of concern achieve compliance with the NJDEP Groundwater Quality Criteria. An RI report requesting an NFA determination from the NJDEP is complete. This report was submitted to the NJDEP in November 2004. The Army is still awaiting approval of this submission. Currently, as part of a monitoring program, four groundwater monitoring wells are sampled on a quarterly basis. The cleanup strategy is to continue compliance monitoring of four groundwater monitoring wells pending NJDEP review.

FTMM-59: Building 1122. Site FTMM-59 is located on Alexander Avenue, adjacent to Mill Creek on the MP. The DPW removed one UST located next to Bldg. 1122 (a self help vehicle repair shop) in June 1994. The UST was a single wall steel tank used for storing # 2 fuel oil. During tank closure activities, a petroleum discharge to site soil and groundwater was identified. Upon further investigation, the DPW identified a second UST which was removed from the same area during the late 1980s. Discussions with site personnel leads us to believe that the tank was removed because of inventory control problems. It is assumed that the site was not fully remediated during the first

UST closure. In accordance with NJDEP UST Site Assessment activity requirements, all petroleum contaminated soils have been removed and disposed of. In addition, the DPW has installed two monitoring wells to determine any adverse impact to groundwater. TCE was initially detected at levels above NJDEP Groundwater Quality Criteria. Subsequently, consecutive quarterly rounds of groundwater samples have been collected for analysis. Surface water sampling points (Mill Creek) currently exist downgradient from the site and are being monitored. TCE continues to be quantified in one of the two site monitoring wells above NJDEP Groundwater Quality Criteria. A remedial design that addresses groundwater contamination was submitted to the NJDEP. The remedial alternative approach selected for the Building 1122 site involves the use of monitored natural attenuation. A CEA for site groundwater was filed with the NJDEP. A CEA restricts the use of groundwater within a defined area until such time that contaminants of concern achieve compliance with the NJDEP Groundwater Quality Criteria. A Geoprobe® investigation was performed in April 2004 to further evaluate site groundwater conditions and potential contaminant migration. The investigation determined there was a release of # 2 fuel oil to the site. The investigation to determine the extent of the petroleum contamination was conducted in house and concluded that the extent of the release was localized. A well sump was installed for the removal of free-phase product. No free-phase product has been observed. An RI report summarizing these findings was submitted to the NJDEP in October of 2005. To date, no response has been received from the NJDEP. Currently, as part of the monitoring program five groundwater monitoring wells are sampled on a quarterly basis. The cleanup strategy is to continue compliance monitoring of surface water and five groundwater monitoring wells as a key component of monitored natural attenuation. In addition, two years of HRC injections will be used to enhance monitored natural attenuation. HRC will be injected into a localized area in 2007 and 2008. Site closeout is anticipated to occur in 2011.

FTMM-61: Building 283. Site FTMM-61 is located off of Sherrill Avenue in the northern section of the MP. On August 28, 1997, a 3,000-gallon steel UST (No. 0081533- 229) was removed. The tank was used to store gasoline. The UST was located within the courtyard of Building 283. Following its removal, the UST was inspected for corrosion holes. Numerous holes were noted in the UST. Soils within the tank excavation which corresponded with the locations of the holes were dark in color and appeared to be contaminated. Based on site assessment activities, it was concluded that a discharge to the environment had taken place. The NJDEP hotline was notified and the site was assigned case # 97-8-28-1330-33. Approximately 400 CY of contaminated soil was removed and disposed of in accordance with NJDEP requirements. Groundwater was encountered at 12.0 feet below grade and a sheen was observed on the groundwater. In response to this observation, one groundwater sample was collected. The sample was analyzed for VOCs to include a calibration for xylene plus 15 tentatively identified compounds. Benzene, ethyl benzene, toluene, and lead were detected above the NJDEP Groundwater Quality Criteria. Subsequently, consecutive quarterly rounds of groundwater samples have been collected for analysis. Benzene was detected at a concentration of 2,238.10 µg/L, above the Groundwater Quality Criteria of 1.0 µg/L. Ethyl benzene was detected at a concentration of 797.4 µg/L, above the Groundwater Quality Criteria of 700.0 µg/L. Toluene was detected at a concentration of 1,084.57

µg/L, above the Groundwater Quality Criteria of 1,000 µg/L. Lead was detected at a concentration of 22.0 µg/L, above the Groundwater Quality Criteria of 10.0 µg/L. Two additional monitoring wells were installed downgradient of the site for the purpose of serving as sentinel wells. A remedial design that addresses groundwater contamination was submitted to the NJDEP. The remedial alternative approach selected for the Building 283 site involves the use of monitored natural attenuation. A CEA for site groundwater was filed with the NJDEP. A CEA restricts the use of groundwater within a defined area until such time that contaminants of concern achieve compliance with the NJDEP Groundwater Quality Criteria. An RA work plan proposing the injection of ORC to accelerate attenuation of VOCs in groundwater and to continue monitored natural attenuation at this site was prepared and submitted to the NJDEP in February 2006. Fort Monmouth is waiting for comments to this document. Currently, as part of the monitoring program, six groundwater monitoring wells are sampled on a quarterly basis. The cleanup strategy is to inject ORC for two years and continue compliance monitoring of groundwater (six wells quarterly) and surface water. This is a key component of monitored natural attenuation. ORC injection is anticipated for 2007 and 2008.

FTMM-64: Building 812. Based upon historical records, site FTMM-64 has been identified as a former gasoline distribution area. The former gasoline station was located off Murphy Drive in what is now a parking lot for Building 812. The former site sits directly across from the PAHC. Aerial photographs dating from 1947 through 1961 clearly identify the gasoline station. The next aerial photograph, taken in August of 1971, no longer identifies the station at the site. In order to determine any adverse environmental impacts from the former gasoline station, an SI was initiated in September of 1999. Utilizing our Geoprobe® sampling vehicle, a total of five borings were completed at the site. Soil and groundwater samples were collected and analyzed for VOA + 15 parameters, plus lead. The groundwater sample collected from boring # 5 contained the following VOCs above the NJDEP Groundwater Quality Criteria: benzene, total xylene, PCE, TCE, dichloroethene (DCE), vinyl chloride, and lead. Benzene was detected at a concentration of 12.0 µg/L, above the Groundwater Quality Criteria of 1.0 µg/L. Total xylenes were detected at a concentration of 92.0 µg/L, above the Groundwater Quality Criteria of 40.0 µg/L. PCE was detected at a concentration of 2.7 µg/L, above the Groundwater Quality Criteria of 1.0 µg/L. TCE was detected at a concentration of 5.0 µg/L, above the Groundwater Quality Criteria of 1.0 µg/L. DCE was detected at a concentration of 15,879.5 µg/L, above the Groundwater Quality Criteria of 10.0 µg/L. Vinyl chloride was detected at a concentration of 98.1 µg/L, above the Groundwater Quality Criteria of 5.0 µg/L. Lead was detected at a concentration of 160.2 µg/L, above the Groundwater Quality Criteria of 10.0 µg/L. Ethyl benzene and toluene were also detected; however, both compounds of concern were measured below the NJDEP Groundwater Quality Criteria. The soil sample collected from boring # 5 contained both PCE and DCE; however, both measurements were below the NJDEP Residential Direct Contact Soil Cleanup Criteria. Commencing in December of 1999, an RI was initiated to further delineate compounds of concern. Again, the Geoprobe® sampling vehicle was utilized for sample collection. A total of 164 borings were completed. One aqueous sample and a minimum of one soil sample were collected from the interval just above the water table for each bore hole sampled. The soil column was visually inspected from the interval extending from the surface layer to

the saturated zone. In addition, soils were screened in 4-foot increments utilizing a Flame Ionization Detector/Photoionization Detector field reading instrument. Additional soil samples were collected based upon visual and field observations. Soil and groundwater samples were analyzed for VOA + 15 parameters, plus lead. Out of the 164 groundwater samples collected under the RI phase, eight samples contained VOCs above the New Jersey Groundwater Quality Criteria. Five of the boring locations are in close proximity to bore hole # 5 which continues to measure the highest VOC levels. Soil samples collected under the RI phase continue to show that all compounds of concern are below the NJDEP Residential Direct Contact Soil Cleanup Criteria. In May of 2000, fourteen monitoring wells were installed to delineate the vertical and horizontal extent of the groundwater contaminant plume. Subsequently, consecutive quarterly rounds of groundwater samples have been collected for analysis. All aqueous samples were analyzed for VOA + 15 parameters, plus lead. At present, the extent of the contaminant plume has been delineated both vertically and horizontally within site soil and groundwater. A remedial design that proposes injecting HRC into the aquifer to remediate the contaminant plume was approved by the NJDEP. The DPW utilized our Geoprobe® sampling vehicle as the means for injecting the HRC into the aquifer. A CEA for site groundwater was filed with the NJDEP. The CEA restricts the use of groundwater within a defined area until such time that contaminants of concern achieve compliance with the NJDEP Groundwater Quality Criteria. RA work activities were completed in June of 2001. Subsequent RA operation activities involve injecting additional HRC materials into shallow groundwater to further enhance contaminant degradation. Currently, as part of the monitoring program, eight groundwater monitoring wells are sampled on a quarterly basis. Operation of the RA (HRC) will end in FY08. The cleanup strategy is to continue compliance monitoring of eight groundwater monitoring wells as a key component of monitored natural attenuation.

FTMM-66: Building 886. Based upon historical records, site FTMM-66 has been identified as a former fuel oil storage area. Aerial photos indicate a former AST was located adjacent to Building 886, located off Murphy Drive on the MP. The AST had a storage capacity of 250,000 gallons and stored # 2 fuel oil. The AST has been identified on base maps dating back to 1956. FTMM records show the AST being removed during the 1970s. Soil contamination was identified at the site during the removal of a 1,000-gallon, steel, fuel oil UST located on the west side of Building 886. In order to determine the extent of environmental impacts in the area of Building 886, an SI was initiated in March 2002. Utilizing our Geoprobe® sampling vehicle, a total of 48 soil borings were completed at the site from March to April 2002. Soil samples were collected at 2-foot interval from the surface to a total depth of 12 feet below ground surface (bgs) and analyzed for Total Petroleum Hydrocarbon Content (TPHC). Eight of the soil boring locations contained soils, which exceeded the NJDEP Residential Direct Contact Soil Cleanup Criteria for TPHC (>10,000 ppm). Twenty-four soil samples collected from boring locations containing soils exceeding 1,000 ppm were analyzed for VOA + 15 parameters. None of these samples contained VOA concentrations that exceeded the NJDEP Residential Direct Contact Soil Cleanup Criteria. Concurrently, 27 temporary piezometer points were installed for depth to water measurements. Free-phase petroleum hydrocarbons (product) was observed in twelve of the piezometers at a thickness ranging from 1/16 to 5-inches. Two groundwater samples were collected

from soil borings located adjacent to the piezometer locations, which contained the highest product thickness. Groundwater samples were collected using the Geoprobe® and analyzed for VOA +15 and semivolatile constituents. No concentrations detected exceeded the NJDEP Groundwater Quality Criteria for those constituents tested. The extent of the contaminated soil has been delineated both vertically and horizontally as well as the areal extent of floating product. Limited migration of contaminants from the source area has occurred. Based on the results of the investigation, a remedial design consisting of the excavation and removal of contaminated soil exceeding the NJDEP Residential Direct Contact Soil Cleanup Criteria for TPHC of 10,000 ppm and the recovery of free-phase petroleum hydrocarbons was initiated in November 2002. Soil excavation activities were completed in February 2003. An estimated 4,000 tons of excessively contaminated soil was removed from the site. In January 2003, five monitoring wells were installed to establish the areal extent of petroleum hydrocarbon impacts to groundwater and serve as sentinel wells. Groundwater samples are collected on a quarterly basis. The installation of an automated product recovery system consisting of eight 6-inch diameter recovery wells and air driven product recovery pumps was completed in February 2003. Although the system was constructed, it was never used due to an insufficient amount of product to recover. An RA report is currently being prepared and will be submitted to the NJDEP upon its completion. Currently, as part of the monitoring program, five groundwater monitoring wells are sampled on a quarterly basis and five recovery wells are sampled on an annual basis. The cleanup strategy is to perform compliance monitoring of five groundwater monitoring wells as a key component of monitored natural attenuation.

5.2.1.2 Main Post NFA IRP Sites

The following sites at MP are listed as response complete in the FTMM AEDBR. An NFA determination for seven of these sites (FTMM-07, FTMM-09, FTMM-10, FTMM-11, FTMM-13, FTMM-17, and FTMM-21) was approved by the NJDEP in 1994. An NFA determination for FTMM-19 was approved by the NJDEP in 1996. One site, FTMM-47, is described in the Installation Action Plan (IAP) as NFA approved; however, the date of NJDEP approval is not indicated. NJDEP approval of an NFA determination for sites FTMM-04, FTMM-14, FTMM-15, FTMM-16, and FTMM-20 has yet to be received. **Table 5-10** lists the MP NFA IRP sites.

Table 5-10
Main Post No Further Action Installation
Restoration Program Sites

AEDB-R Number	Site Name	Associated Buildings	Status
FTMM-04	M-4 Landfill	none	NFA pending NJDEP approval
FTMM-06	M-6 Burning Area	none	NFA (incorporated into FTMM-03)
FTMM-07	M-7 Burning Area	Building 697 incinerator	NFA approved by NJDEP 1994

AEDB-R Number	Site Name	Associated Buildings	Status
FTMM-09	M-9 Former PCB Transformer Site	Buildings 1150 and 1152	NFA approved by NJDEP 1994
FTMM-10	M-10 Asbestos Storage Area	Building 1220	NFA approved by NJDEP 1994
FTMM-11	M-11 Elevated Water Tank	Building 557	NFA approved by NJDEP 1994
FTMM-13	M-13 Pathogenic Waste Incinerator	PAHC, Building 1076	NFA approved by NJDEP 1994
FTMM-14	M-14 Landfill	none	NFA pending NJDEP approval
FTMM-15	M-15 Water Tank	Building 486	RI with NFA recommendation will be submitted
FTMM-16	M-16 Former Pesticide Storage Area	Building 498	RA report with NFA recommendation will be submitted
FTMM-17	M-17 Former Pesticide Storage Area	Former Building 65	NFA approved by NJDEP 1994
FTMM-19	AOC 3 Former MP Sanitary Treatment Plant	none	NFA approved by NJDEP 1996
FTMM-20	Pre-1941 Former MP Sanitary Treatment Plant	none	NFA pending NJDEP approval
FTMM-21	Former MP Firing Range	none	NFA approved by NJDEP 1994
FTMM-47	Former PCB Transformer Sites	Buildings 292, 686, 718, 1002, 1004, 1208, 1209, 1220	NFA approved (date unknown)

A summary of each site listed above in **Table 5-10** follows. Unless otherwise noted, all information pertaining to these sites was obtained from communications with FTMM DPW personnel during document reviews associated with the assembly of this report.

FTMM-04: M-4 Landfill. The M-4 landfill is located on MP in the area bounded by Avenue of Memories to the south, North Drive to the north, Mill Creek to the west and Wilson Avenue to the east. The 1.4-acre landfill operated from 1955 until 1956. The types of materials disposed of in the landfill have been reported to include: construction debris, scrap metal, ACMs, 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. Under the SI phase, three monitoring wells were installed to evaluate groundwater quality. All samples were analyzed for TCL + 30 parameters, TAL metals and cyanide. A single pesticide (4,4'-DDT) was detected in an upgradient monitoring well above NJDEP Groundwater Quality Criteria. As of 2002, 15 consecutive quarterly rounds of groundwater samples had been collected for subsequent analysis. Lead was initially

detected in site monitoring wells above NJDEP Groundwater Quality Criteria. It has been determined that sufficient groundwater data has been collected to seek an NFA determination from the NJDEP and an RI report has been submitted to the NJDEP. No response has been received from the NJDEP concerning the RI report. An RI that evaluated the potential for environmental contaminants being present within the existing landfill cover material was completed. An NFA recommendation was made by the Army regarding the landfill cover material. No response has been received from the NJDEP.

FTMM-06: M-6 Burning Area. The M-6 burning area consisted of open-air wood burning in small pits located within the M-3 landfill on MP. Specific pit locations cannot be discerned from aerial photographs or site reconnaissance. According to interviews with FTMM personnel, the open-air wood burning practices were conducted to reduce the volume of waste materials being placed into the M-3 landfill. The investigation of the M-6 site was incorporated into field activities referenced for the M-3 landfill (FTMM-03).

FTMM-07: M-7 Burning Area. The 1980 IA report prepared by USATHAMA (48) identified the M-7 burning site as a potential AOC. The M-7 burning area was a former incinerator located within Building 697 on MP. The site is located in the north central area of the MP near the M-8 landfill. The incinerator was used until 1990 for burning classified documents. Since 1990, all classified documents have been shredded. Prior to closure, the incinerator operated under a NJDEP air permit. The incinerator was dismantled in November 1993. An NFA determination was approved by the NJDEP in 1994 (November 7, 1994, NJDEP correspondence, included in **Appendix N**).

FTMM-09: M-9 Former PCB Transformer Site. The 1980 IA report (48) identified the M-9 site as a PCB transformer location. The site is located near Buildings 1150 and 1152. These buildings are found in the western portion of the MP, south of Avenue of Memories. Records review and site reconnaissance work conducted under the PA phase revealed no transformers at the M-9 site were leaking in 1980 or at any other time. Prior to 1989, the policy at FTMM was to label all transformers as containing PCBs unless available test data proved otherwise. An EPR project (FM0089F005) was implemented in 1989 to sample and test all transformers with no available data for PCB content. The survey was completed in 1990. Test results for the transformers located at the M-9 site revealed PCB levels all below 50 ppm. Under the Toxic Substance Control Act (TSCA), all transformers containing PCBs at levels less than 50 ppm are considered Non-PCB Class Equipment. An NFA determination was approved by the NJDEP in 1994 (November 7, 1994, NJDEP correspondence, included in **Appendix N**).

FTMM-10: M-10 Asbestos Storage Area. The 1980 IA report (48) identified the M-10 site as an asbestos storage area. The report identifies the site as being adjacent to Building 1220 which is located in the northwest area of the MP. Building 1220 is the main boiler plant which provides heat and hot water for all buildings located in the 1200 area. Interviews with DPW personnel indicate that the storage area was located across the street to the west of Building 1220. Containers of new spray-on asbestos were stored in a metal shed until they were used elsewhere in the facility. The shed has sheet metal walls and is built on a concrete pad. The primary purpose of the shed has

always been to store machine parts for the boiler plant. Under the PA phase, the metal shed was inspected for evidence of ACMs; however, none were found. An NFA determination was approved by the NJDEP in 1994 (November 7, 1994, NJDEP correspondence, included in **Appendix N**).

FTMM-11: M-11 Elevated Water Tank. The 1980 IA report (48) identified the M-11 site as a potential AOC. The M-11 site consists of a large elevated tank that contains water. The tank was constructed in the 1940s and is located in the center of the MP. The tank is used to boost the water pressure in the water distribution system for fire-fighting purposes. Under the PA phase, site reconnaissance work revealed no visible stains, stressed soil or vegetation at the site. In addition, no visible debris (such as paint chips) was observed. An NFA determination was approved by the NJDEP in 1994 (November 7, 1994, NJDEP correspondence, included in **Appendix N**).

FTMM-13: M-13 Pathogenic Waste Incinerator. The 1980 IA report (48) identified the M-13 site as a potential AOC on the MP. The pathogenic waste incinerator formerly located on the west side of Building 1076 was constructed in 1975. Building 1076 is the former site of a boiler plant which provided heat and hot water for Patterson Army Community Hospital (Building 1075). The incinerator was an approximately 5 by 6 by 6-foot-high metal unit, which was propane fired. The incinerator was used to burn medical waste generated from the hospital. The unit was tested for compliance with NJDEP air standards and achieved compliance at a maximum charging rate of 57 pounds per hour in 1977. No state permit was required because the incinerator was operating before the 1977 revision to the CAA. In accordance with a written agreement with the NJDEP, the pathogenic waste incinerator was taken out of service in December 1992. A contract for off-site disposal of all generated medical waste was established prior to unit closure. Under the PA phase, site reconnaissance work revealed no ash or debris in or around the incinerator unit. The incinerator was dismantled in November 1993. An NFA determination was approved by the NJDEP in 1994 (November 7, 1994, NJDEP correspondence, included in **Appendix N**).

FTMM-14: M-14 Landfill. The M-14 landfill is located on the MP, on the north side of Husky Brook, west of Murphy Drive. The 6.9-acre landfill operated from 1965 until 1966. The types of materials disposed of in the landfill have been reported to include: construction debris, scrap metal, ACMs, 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. Metal, concrete and other types of landfill debris were previously observed protruding from the stream bank along Husky Brook.

Under the SI phase, three monitoring wells were installed to evaluate groundwater quality. In addition, surface water samples were collected from Husky Brook. All samples were analyzed for TCL + 30 parameters, TAL metals and cyanide. Lead was detected in one downgradient monitoring well above NJDEP Groundwater Quality Criteria. As of 2002, eleven consecutive quarterly rounds of groundwater samples had been collected for subsequent analysis. Arsenic was detected in one site monitoring

well above NJDEP Groundwater Quality Criteria. Lead and 1,2-DCE were detected in surface water samples slightly below NJDEP Surface Water Quality Criteria.

An RI was also conducted to evaluate the potential for environmental contaminants being present within the existing landfill cover. A remedial design that addresses soil erosion problems along Husky Brook was completed in June of 1999 and the RA to correct the soil erosion problems was completed in June of 2001. Two RI reports with NFA recommendations were submitted to the NJDEP. One RI report presented an evaluation of site groundwater and the other RI report presented an evaluation of site near surface soils (soil cover). No response has been received from the NJDEP for either report.

FTMM-15: M-15 Water Tank. The 1980 IA report (48) identified the M-15 site as a potential AOC. A 500,000-gallon AST is located at the M-15 site. The tank was built in 1941 and is of steel construction. It has always been used for the storage of potable water. The tank is located in the northeast section of the MP next to Parkers Creek; a tributary of the Shrewsbury River. Under the SI phase, environmental contaminants in the form of pesticides and heavy metals were identified in site soil. Two pesticides, 4,4'-DDE and 4,4'-DDT, were identified above NJDEP Direct Contact Soil Cleanup Criteria. It was determined that the pesticide contamination was the result of past over spraying practices. Three heavy metals—cadmium, lead and zinc—were also identified above NJDEP Direct Contact Soil Cleanup Criteria. Under the RI phase, environmental sampling confirmed that the contaminants of concern had migrated horizontally towards Parkers Creek. A corrective action was implemented at the M-15 site involving the removal of the contaminated soil from the site thereby eliminating the contaminants of concern. Final remedial activities were completed in November of 1999. An RA report will be submitted to NJDEP in February 2007 with an NFA recommendation from the Army.

FTMM-16: M-16 Former Pesticide Storage Area. A former pesticide storage and mixing area was located at the M-16 site on MP. The facility (Building 498) is a brick structure and was constructed in 1939. Pesticide management practices were conducted at the site until the late 1950s. Following this, the operation was moved to Building 65. Under the SI phase, a total of 10 pesticide compounds were detected above laboratory quantitative limits in site soil. Five pesticide compounds were found at concentrations exceeding the NJDEP Direct Contact Soil Cleanup Criteria. Environmental sampling confirmed that the contaminants were migrating horizontally in the direction of Oceanport Creek. The creek is located approximately 250 feet down gradient of the M-16 site. A corrective action was implemented to remove the contaminated soil from the site and final remedial activities were completed in February of 1999. An RA report will be submitted to NJDEP with an NFA recommendation in the future.

FTMM-17: M-17 Former Pesticide Storage Area. Pesticide storage and mixing operations on MP were moved from the M-16 site (FTMM-16) to the M-17 site (FTMM-17) in the late 1950s. Pesticide operations at the M-17 site continued until the early 1980s. Prior to closing the M-17 site, an outside contract was established for pesticide services.

The former pesticide operation was located in Building 65. Prior to demolition, Building 65 was located in the southeastern section of the MP. In March 1990, 16 soil samples were collected from eight borings, two of which were located outside the building. Soil samples were collected from 6 to 12 inches bgs and from a deeper interval (6 inches beginning at either 38, 41, 48, or 60 inches bgs). Each soil sample was analyzed for a complete pesticide scan. A monitoring well was installed outside the former pesticide storage room during the removal of a UST. The only pesticide compound to be identified was chlordane. It was also detected in two of the 16 soil samples. Chlordane was detected in two separate borings, one located inside the building and the other just outside the structure. Both chlordane detections were at the 6- to 12-inch sampling intervals. The chlordane result for the interior boring measured 47 mg/kg and 1.4 mg/kg for the soil sample collected from the building exterior. The localized nature of these detections and the concentrations are consistent with termite control practices used on base until April 15, 1988, when all use of chlordane was banned in the U.S. Chlordane was not detected in groundwater samples collected from the monitoring well located approximately 1 foot east of the soil boring in which chlordane was detected outside the building. An NFA determination was approved by the NJDEP in 1994 (November 7, 1994, NJDEP correspondence, included in **Appendix N**).

FTMM-19: AOC-3 – Former Main Post Sanitary Treatment Plant. The former STP was located on Parkers Creek north of Sherrill Avenue, between Building 292 to the east and Building 697 to the west. This site was identified by the NJDEP as an AOC in an 8 June 1990 letter. The STP was built in 1941 to handle 700,000 gallons of sewage per day. As described in the 1980 IA (48), the STP consisted of a bar screen and grit chamber, comminutor, primary and secondary settling tanks, a mixing and aeration tank, and a baffled contact chlorination tank. Effluent from the STP was discharged to Parkers Creek. Sludge was treated in a three-stage anaerobic digester and discharged to underdrained sand beds for drying. According to the IA and DPW employees, sludge was transported to the CWA golf course and to landfills. The STP was closed on September 3, 1975 when the MP sewer system was connected to the Northeast Monmouth County Regional Sewerage Authority (NEMCRSA) system. In 1981, all sludges and supernatant liquids were removed from the STP and the facility was cleaned and disinfected. The removal contractor was Modern Transportation Company of Kearny, New Jersey. The physical facility was demolished in 1983. At present, this area is flat and grass covered. Under the SI phase, two soil samples were collected in the former area of the sludge drying beds. In addition, one sediment sample was collected from the former wastewater discharge point at Parkers Creek. All three samples were analyzed for TCL + 30 parameters, TAL metals and cyanide. No compounds of concern were detected above NJDEP Direct Contact Soil Cleanup Criteria or Sediment Criteria. An NFA determination was approved by the NJDEP in April of 1996 (correspondence received from NJDEP included in **Appendix N**).

FTMM-20: Pre-1941 Former Main Post Sanitary Treatment Plant. The pre-1941 STP for the MP was located on Parkers Creek in an area north of Allen Avenue in approximately the same location as current Building 259. The date of construction and period of operation are unknown, although the STP presumably operated until the second MP STP (AOC-3) came on line in 1941. Under the SI phase, one sediment sample was

collected from the former wastewater discharge point at Parkers Creek. The sediment sample was analyzed for TAL metals. Arsenic, cadmium, chromium and zinc were detected at concentrations slightly exceeding NJDEP Sediment Criteria and background levels. Under the RI phase, additional sediment samples were collected to further delineate the extent of the heavy metal contamination at the site. The RI work was completed in April 2000. The findings of the RI revealed that heavy metal concentrations at the site were consistent with background metal concentrations from nearby, undisturbed locations. An RI report requesting an NFA determination was submitted to the NJDEP in March of 2004. No response has been received from the NJDEP.

FTMM-21: Former Main Post Firing Range. Evidence of an outdoor pistol range located in the 1200 area of the MP was uncovered during preparation of the PA report. The former range was located just east of Building 1220, along North Drive. A long-term DPW employee indicated that the pistol range was operational between the late 1930s and the early 1950s. The range was closed with the onset of construction activities in the 1200 area. Small arms training was moved to NWS Earle following closure of the MP facility. The former location of the pistol range has been developed for some forty years, no evidence of the former range exists at this time. Grounds in the general vicinity of the former range, which were not affected by construction, are completely grass covered. An NFA determination was approved by the NJDEP in 1994 (November 7, 1994, NJDEP correspondence, included in **Appendix N**).

FTMM-47: Former PCB Transformer Sites. FTMM-47 was investigated under the IRP. The following is a description of work done under the IRP. For additional discussion of FTMM transformers, refer to **Section 5.5**. All locations where PCB transformers had formerly been located were inspected for evidence of spills. Eight sites were identified where a PCB transformer was either formerly located over soil and/or concrete with signs of visible oil staining. The former PCB transformer locations on MP are as follows: Buildings 292, 686, 718, 1002, 1004, 1208, 1209, and 1220. PCB transformers formerly utilized at Buildings 292, 686, 718, and 1004 were located over soil. Transformers formerly utilized at Buildings 1002, 1208, and 1209 were located over concrete. Transformers formerly utilized at Building 1220 were located both over soil and concrete. Under the SI phase, soil and concrete chip samples were collected for PCB analysis. PCB results for all soil samples were detected below the NJDEP Direct Contact Soil Cleanup Criteria. Elevated PCB levels were identified in the concrete samples collected from Buildings 1002, 1208, and 1209. Upon further evaluation conducted under the IRP, the oil staining at each of these locations is generally minor in nature, both in their horizontal distribution and in the depth at which the staining penetrates the concrete. These minor source areas are not a threat to human health or the environment. At present the active use of transformers at Buildings 1002, 1208, and 1209 preclude the possibility of any remedial work. At such time when the transformers are replaced or removed from service, the minor PCB source areas shall be addressed accordingly. An NFA determination was approved by the NJDEP.

5.2.1.3 Charles Wood Area Active IRP Sites

The following IRP sites listed in **Table 5-11** at CWA are active in the FTMM AEDBR.

Table 5-11
Charles Wood Area Active Installation
Restoration Program Sites

AEDB-R Number	Site Name	Current Status
FTMM-22	CW-1 Wastewater Treatment Lime Pit	GW RAO and LTM
FTMM-58	Building 2567	GW RAO and LTM

A summary of each site listed above in **Table 5-11** follows. Unless otherwise noted, all information pertaining to these sites was obtained from communications with DPW personnel during document reviews associated with the assembly of this ECP.

FTMM-22: CW-1 Wastewater Treatment Lime Pit. The CW-1 site is one of two wastewater treatment lime pits located next to the Myer Center facility (Building 2700) in the CWA. The Myer Center facility is located in the CWA of FTMM at the intersection of Pearl Harbor Avenue and Corregidor Road. The CW-1 wastewater treatment lime pit can be found in the courtyard area of Building 2700. The wastewater treatment lime pit was constructed concurrently with the Myer Center facility in 1952. The pit was designed to treat corrosive wastes generated from laboratory activities operating within the facility. The pit was a concrete vault measuring 7 by 13 by 8 feet in height and contained limestone chips. Corrosive waste discharge lines originating from the north and west wings of Building 2700 were plumbed to the pit. The effluent discharge line exiting the pit was connected to the sanitary sewer. In fiscal year 1992, DPW personnel collected limestone and sludge samples from the pit to evaluate the potential for environmental contaminants being present. Analytical testing of the sample material identified elevated levels of organic contaminants.

A cleanup action ensued which generated ninety-two 55-gallon drums of RCRA waste. Following the cleanup action, fresh limestone chips were placed into the pit as a precautionary measure. Current hazardous waste management practices prohibit the discharge of corrosive wastes into the wastewater treatment lime pit system. Due to the presence of elevated levels of organic contaminants being identified in the pit prior to the cleanup action, the focus of the SI was to evaluate the potential impact to soil and groundwater.

Under the SI phase, soil borings were drilled on each side of the lime pit. In the absence of field instrument readings and visible staining, one soil sample was collected from each boring at an interval just above the water table. In addition, each boring was converted to a monitoring well in order to evaluate groundwater quality. Both soil and groundwater samples were analyzed for TCL + 30 parameters and TAL metals. In reference to the four soil samples, no compounds of concern were detected above NJDEP Direct Contact Soil Cleanup Criteria. TCE, PCE, and 1,2-DCE were detected in

downgradient monitoring wells above NJDEP Groundwater Quality Criteria. At their peak, contaminant levels within the groundwater were 7,440 times higher than the NJDEP Groundwater Quality Criteria.

Under the RI phase, a passive soil gas survey was conducted at the CW-1 site in March 1996 to delineate the extent of lateral soil contamination at the site and aid in the placement of additional monitoring wells. Results of the soil gas survey determined that compounds of concern were migrating horizontally in site soil. Three new monitoring wells were installed at the CW-1 site during the first week of May 1996. One deep well was installed next to the lime pit to determine the vertical extent of contamination both in soil and groundwater. The other two wells were placed downgradient of the contaminant plume. The RI phase delineated the vertical and horizontal extent of the contaminant plume.

At present, the contaminant plume has not encroached upon the Myer Center facility. However, the downgradient migration pathway for said contaminants is in the direction of the referenced building. It should be noted that the Myer Center facility has a basement level.

A remedial design was completed and approved by the NJDEP in August 1997. The selected remedial technologies involved using a combination of air sparging and SVE techniques. Construction of the selected remedial alternative was completed in April 1998. In January 2002, two groundwater recovery wells (RW-1 & RW-2) were installed in the source area and two additional air sparge points (SPG-3 and SPG-4) were installed to further enhance source area remediation. Groundwater recovery system wells RW-1 and RW-2 were connected to a newly constructed groundwater treatment system (GWTS). The GWTS was designed to capture and treat contaminated groundwater in the source area and reduce the elevated concentrations of detected chlorinated hydrocarbons as well as achieve hydraulic control in the source area and beyond. The GWTS utilized an air stripper to remove dissolved-phase chlorinated hydrocarbons from impacted groundwater extracted from the recovery wells. The air stripper effluent was polished via two in-series 500-pound granular activated carbon units prior to final discharge to the sanitary sewer.

In addition to groundwater extraction, recovery wells RW-1 and RW-2 and source area monitoring wells MW-28 and MW-29 were tied into the SVE system to further enhance removal of vapor phase chlorinated hydrocarbons in the source area. Air sparge wells SPG-1, SPG-2, SPG-3, and SPG-4 were installed to enhance the stripping of volatile chlorinated hydrocarbons from source area groundwater, where they were subsequently captured by the vapor extraction at RW-1, RW-2, MW-28, MW-29, SVE-1, and SVE- 2. The vapor phase carbon units were upgraded from two in-series 55-gallon drums to two in-series 1,000-pound vapor phase units capable of a substantial SVE airflow increase. The flow upgrade resulted in a substantial increase of contaminant mass removal rates. As part of the 2002 system upgrade, the wastewater treatment lime pit was demolished and all existing limestone was removed and properly disposed of. A new sewer pipe was installed in order to maintain the existing sewer connection.

The GWTS was turned off in May of 2005 based upon available groundwater data. To date, the GWTS remains inactive. The DPW will commence injecting HRC into site groundwater during FY07 and FY08 with the goal of achieving groundwater compliance by FY10. Currently, twelve groundwater monitoring wells are sampled on a quarterly basis.

FTMM-58: Building 2567. Site FTMM-58 is an active gasoline service station operated by the AAFES organization. The station is located at the corner of Hope Road and Laboratory Road in the CWA. Five single walled steel USTs were removed as part of a renovation project that was initiated as a result of one UST failing a tightness test. At the time, a determination was made to remove the existing tank system and replace it with a new fiberglass double-walled tank system. The tank system was removed (February 1993) and approximately 1,000 CY of petroleum contaminated soil was excavated and stock piled for off-site disposal. A PA was conducted at the site and five monitoring wells were installed. Groundwater samples have been collected and analyzed for VOA + 15 and lead. Benzene, 1,2-DCE, MTBE, and lead were initially detected above NJDEP Groundwater Quality Criteria.

Subsequently, consecutive quarterly rounds of groundwater samples have been collected for analysis. Benzene, xylene, tert-butyl alcohol, and MTBE were detected in two of the five site monitoring wells above NJDEP Groundwater Quality Criteria. A remedial design that addresses groundwater contamination was submitted to the NJDEP. The remedial alternative approach selected for the Building 2567 site involves the use of monitored natural attenuation. A CEA for site groundwater was filed with the NJDEP. A Geoprobe® investigation was performed in early 2004 to further evaluate site groundwater conditions. An RI report summarizing these findings was prepared and was submitted to the NJDEP in February 2006. The Army is waiting for NJDEP approval of this document. Currently, as part of a monitoring program, seven groundwater monitoring wells are sampled on a quarterly basis. The cleanup strategy includes ORC injections and the continued monitoring of groundwater as a key component of the monitored natural attenuation program. ORC injections will be performed in 2007 and 2008. Site closeout is anticipated for 2011.

5.2.1.4 Charles Wood Area NFA IRP Sites

The following sites at the CWA are listed as response complete in the FTMM AEDBR. An NFA determination has been approved for the following five sites: FTMM-24 (1996), FTMM-27 (1996), FTMM-30 (1994), FTMM-31 (1996), and FTMM-32 (1996). NJDEP approval of an NFA determination for sites FTMM-23, FTMM-25, FTMM-26, FTMM-28, FTMM-29, and FTMM-63 has yet to be received. **Table 5-12** lists the CWA NFA IRP Sites.

Table 5-12
Charles Wood Area No Further Action Installation
Restoration Program Sites

AEDB-R Number	Site Name	Status
FTMM-23	CW-2 Wastewater Treatment Lime Pit	NFA pending NJDEP approval
FTMM-24	CW-3 Suspected Landfill	NFA approved by NJDEP (January 5, 1998)
FTMM-25	CW-3A Suspected Landfill	NFA pending NJDEP approval
FTMM-26	CW-4 Indoor Small Arms Range	NFA pending NJDEP approval
FTMM-27	CW-5 Former Charles Wood Sanitary Treatment Plant	NFA approved by NJDEP (April 4, 1996)
FTMM-28	CW-6 Former Pesticides Storage Building 2044	NFA pending NJDEP approval
FTMM-29	CW-7 Former PCB Transformer Location	NFA pending NJDEP approval
FTMM-30	CW-8 Sewage Lift Pumping Station	NFA approved by NJDEP (1994)
FTMM-31	CW-9 Sludge Disposal Site	NFA approved by NJDEP (April 4, 1996)
FTMM-32	AOC-7 Temporary Hazardous Waste Storage Area	NFA approved by NJDEP (April 4, 1996)
FTMM-63	UST, Gasoline, Building 2603	NFA pending NJDEP approval

The following is a summary of information obtained from communications with DPW personnel pertaining to NFA sites in the CWA:

FTMM-23: CW-2 Wastewater Treatment Lime Pit. The CW-2 site is the second wastewater treatment lime pit located next to the Myer Center facility (Building 2700) in the CWA. The CW-2 wastewater treatment lime pit is located on the east side of the Myer Center facility, near the former electrical substation. The wastewater treatment lime pit was constructed concurrently with the Myer Center facility in 1952. The pit was designed to treat corrosive wastes generated from laboratory activities operating within the facility. The pit was a concrete vault measuring 7 by 13 by 8 feet in height and contained limestone chips. Corrosive waste discharge lines originating from the south and east wings of Building 2700 were plumbed to the pit. The effluent discharge line exiting the pit was connected to the sanitary sewer.

In fiscal year 1992, DPW personnel collected limestone and sludge samples from the pit to evaluate the potential for environmental contaminants being present. Analytical testing of the sample material identified elevated levels of organic contaminants. A cleanup action ensued which generated ninety-one 55-gallon drums of RCRA waste. Following the cleanup action, fresh limestone chips were placed into the pit as a precautionary measure. Due to the presence of organic contaminants being identified in the pit prior to the cleanup action, the focus of the SI was to evaluate the potential impact to soil and groundwater. Under the SI phase, soil borings were drilled on each side of the lime pit. In the absence of field instrument readings and visible staining, one

soil sample was collected from each boring at an interval just above the water table. In addition, each boring was converted to a monitoring well in order to evaluate groundwater quality.

Both soil and groundwater samples were analyzed for TCL + 30 parameters and TAL metals. In reference to the four soil samples, only PCBs were detected in one soil sample slightly above NJDEP Direct Contact Soil Cleanup Criteria. PCE was detected in one downgradient monitoring well slightly above NJDEP Groundwater Quality Criteria. As of 2002, 15 consecutive quarterly rounds of groundwater samples had been collected for subsequent analysis. Arsenic and lead were detected in three of the four site monitoring wells above NJDEP Groundwater Quality Criteria. Under the RI phase, a passive soil gas survey commenced at the CW-2 site in December 1995. The purpose of the soil gas survey was to delineate the lateral extent of soil contamination at the site and to use the survey data to aid in the placement of additional monitoring wells if required. Results of the soil gas survey were negative.

An RI report requesting an NFA determination was submitted to the NJDEP. No response has been received from the NJDEP. The CW-2 Wastewater Treatment Lime Pit was demolished in 2002. All limestone was removed from the pit prior to demolition activities. The limestone was properly disposed of.

FTMM-24: CW-3 Suspected Landfill. The 1980 IA report (48) identified the CW-3 site as a former landfill area. The suspected landfill is located in the southwestern part of the CWA, otherwise known as the 2600 area. According to the IA report, administrative-type wastes and wood debris were placed into the one-acre landfill during 1940s. Interviews with long-term DPW employees conducted during the PA phase concluded that a landfill did not exist at the site in question. During the 1980s and into the early 1990s, the CW-3 site was utilized as a surface disposal site for the accumulation of construction debris. Materials observed at the site during the PA phase included: concrete, brick, asphalt, wood demolition debris, wood pallets, vegetative debris, metal, and PVC pipes. Cleanup of the construction debris started in October 1994 and was completed in May 1995. On September 25, 1997, DPW personnel excavated 29 test pits at the former surface disposal area. No waste materials were encountered within any of the test pits. The various soil horizons within each test pit were clearly undisturbed.

An NFA determination was approved by the NJDEP in a letter dated January 5, 1998 (included in **Appendix N**).

FTMM-25: CW-3A Suspected Landfill. The CW-3A site was identified as a suspected landfill area during the PA phase study. Interviews with long-term DPW employees suggested that a former landfill might be present at the site in question. The suspected landfill is located north of the Pulse Power facility (Building 2707) which is also located in the southwestern part of the CWA.

On September 25, 1997, several test pits were excavated at the CW-3A site to ascertain whether the site was previously utilized as a landfill. Upon excavating the test

pits, waste materials, mostly in the form of construction debris, were observed within the test pits. The debris itself consisted of concrete, asphalt, brick, wood, glass, and assorted scrap metals. Coal ash was also observed within each of the test pits.

To further evaluate the potential impact the landfill may have had on site soils and groundwater, four shallow monitoring wells were installed at the site. During monitoring well construction, continuous split spoon soil samples were collected in 4-foot increments. Based upon field observations and measurements, soil samples were collected at the following intervals: 0 to 6 inches, 18 to 24 inches, and just above the water table. Samples collected at the 18- to 24-inch interval were collected solely for VOAs to include a gas chromatography/mass spectrometry library search. Samples collected at the 0- to 6-inch interval were analyzed for TCL + 30 parameters, minus the VOA parameters, TAL metals, and cyanide. Samples collected just above the water table were analyzed for TCL + 30 parameters, TAL metals, and cyanide. A coal ash sample was also collected on December 17, 1997, and was analyzed for TCL + 30 parameters, TAL metals, and cyanide. During the week of January 12, 1998, groundwater samples were collected from each of the four wells. A second round of groundwater samples was collected during the week of January 26, 1998. All groundwater samples were analyzed for TCL + 30 parameters, TAL metals, and cyanide.

Benzo(a)anthracene, benzo(a)pyrene, and cadmium were detected within site soils slightly above NJDEP Direct Contact Soil Cleanup Criteria. Benzene and lead were detected in three downgradient monitoring wells slightly above NJDEP Groundwater Quality Criteria. Arsenic, chromium, and lead were detected in one upgradient monitoring well slightly above NJDEP Groundwater Quality Criteria. As of 2002, eight consecutive quarterly rounds of groundwater samples had been collected for subsequent analysis. A second RI that evaluated the potential for the presence of environmental contaminants within the existing landfill cover material was also completed.

The RI report that evaluates subsurface soils and groundwater was submitted to the NJDEP in May of 2005. The RI report that evaluates near surface soils was submitted to the NJDEP in March of 2004. No response has been received from the NJDEP for either report.

FTMM-26: CW-4 Indoor Small Arms Range. An indoor small arms range was located at the CW-4 site in the CWA. The range was a one story concrete structure (Building 2537), built in 1945. Spent rounds and shell casings were visible at the surface of a bare patch of soil approximately 5 feet in diameter northeast of the building. The area of contamination was located within 10 feet of a side entrance to the facility. Environmental sampling confirmed the presence of lead in soil at the CW-4 site. Lead levels were identified above the NJDEP Direct Contact Soil Cleanup Criteria. Sampling activities also confirmed that the lead was migrating both horizontally and vertically in soil. The Youth Activity Center (Building 2566) is located approximately 250 feet from the AOC. An RA was implemented to remove the spent rounds, casings and contaminated soil from the site thereby eliminating the contaminant of concern.

Cleanup work commenced in June 1997 and was completed in July 1997. Building 2537 has since been demolished.

An RA report was submitted to the NJDEP in October 2005 recommending NFA. No response has been received from the NJDEP.

FTMM-27: CW-5 Former Charles Wood Sanitary Treatment Plant. The former STP was located in the center of the CWA, bounded by Hope Road to the east, Corregidor Road to the north, Guam Lane to the west, and Laboratory Road to the south. The STP was built in 1942 to handle 800,000 gallons of sewage per day. As described in the 1980 IA (48), the STP consisted of a grit chamber screen, comminutor, primary and secondary settling tanks, biofilters, and a baffled contact chlorination tank. Sludge was treated in two anaerobic digesters and discharged to underdrained sand beds for final drying. Supernatant liquid from digester sludge and drainage from the sand beds were recycled through the STP for additional treatment. The chlorinated effluent was discharged to a tributary of Wampum Brook on the east side of Hope Road. According to the IA (48) and DPW employees, sludge was transported to the CWA golf course and to landfills. The STP was closed on October 29, 1975, when the CWA sewer system was connected to the NEMCRSA system. In 1981, all sludges and supernatant liquids were removed from the STP and the facility was cleaned and disinfected. The removal contractor was Modern Transportation Company of Kearny, New Jersey. Mercury used in the distributor seal on the biofilter was removed and disposed of by the Directorate of Logistics. The physical facility was demolished in 1983. In 1993, a youth center was constructed on the site. Under the SI phase, two soil samples were collected in the former area of the sludge drying beds. In addition, one sediment sample was collected from the former wastewater discharge point. All three samples were analyzed for TCL + 30 parameters, TAL metals, and cyanide. No compounds of concern were detected above NJDEP Direct Contact Soil Cleanup Criteria or Sediment Criteria.

An NFA determination was approved by the NJDEP in 1996 (included in **Appendix N**).

FTMM-28: CW-6 Former Pesticide Storage Building 2044. Building 2044 was part of a small complex of buildings located in the southwest section of the CWA golf course. The complex also included Building 2070, a large metal shed and two smaller metal igloos. Currently, Buildings 2070, 2071, and 2046 are located in the area as confirmed by the VSI. Building 2070 is used to store golf course maintenance and landscaping equipment, such as mowers and tractors. Building 2071 is used as the equipment repair facility. Building 2046 is used as a golf cart and equipment wash area (closed loop) and was also used for pesticide mixing until 2001. The golf course maintenance complex may predate the purchase of the golf course by the Army. Pesticides and herbicides may have been stored and mixed in this area prior to Army ownership of the property. The 1980 IA report (48) contains a 1979 inventory of pesticides and herbicides that were used on the golf course and stored in Building 2044. Pesticides that were present in significant quantities include: malathion, floriable sevin, resmithrin, Borocel IV, chlordane, and Dibrom. The IA also discusses a pest control program that was in effect in 1979. The compounds that were used in large quantities include carbaryl (sevin), malathion, chlordane, and diazinon. Some of the herbicides mentioned

in the IA include 2,4-dichlorophenoxyacetic acid, Dacthal, 2,4,5-trichlorophenoxyacetic, and sodium arsenite (48).

The course groundskeeper, who had been part of the grounds crew for 33 years (1960 to 1993) was interviewed during the PA phase. The groundskeeper stated that pesticides and herbicides were also stored inside the two metal igloos and former mixing activities generally took place directly outside the two igloos. Pesticides and herbicides are not currently stored or mixed on site. The facility has hired an outside contractor to apply pesticides and herbicides.

Under the SI phase, soil borings were completed at two locations where pesticide mixing was documented to occur. Two soil samples were collected from each boring, one surface sample and the other sample from the interval just above the water table. In addition, each boring was converted to a monitoring well in order to evaluate groundwater quality. Both soil and groundwater samples were analyzed for TCL + 30 parameters. Dieldrin was identified in one soil sample slightly above NJDEP Direct Contact Soil Cleanup Criteria. Benzene was detected in one groundwater sample above NJDEP Groundwater Quality Criteria. Two additional monitoring wells were installed during the IRP RI phase. As of 2002, fifteen consecutive quarterly rounds of groundwater samples had been collected for subsequent analysis. Heptachlor epoxide and arsenic were initially detected in two of the four site monitoring wells above NJDEP Groundwater Quality Criteria. Alpha-chlordane, gamma-chlordane and 4,4'-DDD were also detected in the two monitoring wells; however, said contaminants were identified slightly below the NJDEP Groundwater Quality Criteria.

An RI report requesting an NFA determination from the NJDEP was submitted in May of 2005. No response has been received from the NJDEP.

FTMM-29: CW-7 Former PCB Transformer Location. The 1980 IA report (48) identified the CW-7 site as a PCB transformer location in the CWA. Prior to its removal, the referenced transformer was located near the front entrance of the Officers Club (Building 2000). The Officers Club is located on the same grounds as the CWA golf course. Prior to 1989, the policy at FTMM was to label all transformers as containing PCBs unless available test data proved otherwise.

An EPR project (FM0089F005) was implemented in 1989 to sample and test all transformers with no available data for PCB content. The survey was completed in 1990. Test results for the transformer located at the CW-7 site revealed PCB levels at 223,091 ppm. The PCB Class transformer was removed from service on September 10, 1990 and shipped for off-site disposal on September 24, 1990.

Under the SI phase, four surface soil samples were collected to evaluate the potential impact the transformer had on site soils. PCBs were detected above NJDEP Direct Contact Soil Cleanup Criteria in all four samples. The sample with the highest PCB concentration was 204 times greater than the applicable standard. The NJDEP cleanup action level for PCBs in soil is 0.49 mg/kg. Sampling conducted under the SI phase demonstrated that PCBs were migrating horizontally within the soil column.

In May 1996, an RI was implemented to completely delineate PCB levels both horizontally and vertically within the soil column. The RI was a combination of field screening techniques and sample collection for laboratory analysis. Environmental data gathered under the RI phase identified PCBs as migrating both horizontally and vertically within the soil column. A corrective action was implemented to remove the contaminated soil from the site thereby eliminating the contaminant of concern. Cleanup work commenced in November 1997 and was completed in February 1998. Off-site disposal of PCB-contaminated soils was completed in June 1998.

An RI report was submitted to the NJDEP in September 2004 recommending NFA. No response has been received from the NJDEP.

FTMM-30: CW-8 Sewage Lift Pumping Station. The 1980 IA report (48) identified the CW-8 site as a potential AOC in the CWA. The CW-8 site is a sewage lift station (Building 2603) located north of the Wherry Housing area off Pinebrook Road. This site was misidentified in the IA as an STP. There has never been an STP at this site. A 1940 aerial photograph shows this area as being heavily wooded (27,26). The sewage lift station was constructed in 1954 when the Wherry Housing area was built to pump sewage into the forced main that went to the CWA STP (CW-5). The lift station building appears on several aerial photographs dating from 1957 through 1986 (27,26). At present, the sewage lift station is connected to the FTMM sewage collection system. The FTMM sewage collection system ultimately discharges to the Two Rivers Water Reclamation Authority system.

An NFA determination was approved by the NJDEP in 1994 (November 7, 1994, NJDEP correspondence, included in **Appendix N**).

FTMM-31: CW-9 Sludge Disposal Site. A sludge disposal site (CW-9) as identified in the 1980 IA report (48) was located in the southwest section of the CWA golf course, south and southeast of Building 2070 and west of Green 11 and Tee 12. Since the 1940s, sludge generated from both the MP and CWA STPs were stored in this area before being used as a soil conditioner and fertilizer on the golf course. Sludge piles are visible on aerial photographs dating from 1957 through 1981. Under the SI phase, two monitoring wells were installed, one subsurface soil sample and nine surface soil samples were collected to evaluate the impact to groundwater and soil as a result of past site activities. All samples were analyzed for TCL + 30 parameters and TAL metals. No compounds of concern were detected above NJDEP Direct Contact Soil Cleanup Criteria or Groundwater Quality Standards.

An NFA determination was approved by the NJDEP in 1996 (included in **Appendix N**).

FTMM-32: AOC-7 – Temporary Hazardous Waste Storage Area. This site was identified by the NJDEP as an AOC in an June 8, 1990 letter. A temporary hazardous waste storage area (AOC-7) was located in the southwest section of the CWA. At the time, the site was an unpaved, open, sandy lot, approximately one-acre in size, surrounded by a 7-foot-high fence. The site is just east of Building 2708. According to

DPW records, the site was used for a six month period in 1987 for the temporary storage of hazardous waste (in drums).

During the PA phase study, an interview was conducted with the Hazardous Waste Disposal Officer who was present at the time of the drum operation. Comments made by the Disposal Officer confirm that the site was used for a six month period in 1987 to accumulate drums of hazardous waste. Drums were stored on pallets along the interior fence line at the site. At the end of the six month period, all drums stored at the site were removed by a permitted hazardous waste disposal company. Following this action, the area was no longer used for the temporary storage of hazardous waste.

Under the SI phase, six soil borings were drilled at the site and samples collected in order to evaluate the potential impact to site soil as a result of the former hazardous waste accumulation activities. Soil boring locations were biased towards the fence line, which coincides with the areas of drum storage. In the absence of field instrument readings and visible staining, one soil sample was collected from each boring at an interval just above the water table. All six soil samples were analyzed for TCL + 30 parameters and TAL metals. No compounds of concern were detected above NJDEP Direct Contact Soil Cleanup Criteria.

An NFA determination was approved by the NJDEP in 1996 (included in **Appendix N**).

FTMM-63: Building 2603. Site FTMM-63 is a sewage lift station (Building 2603) located north of the Wherry Housing area off Pinebrook Road in the CWA. At present, the sewage lift station is connected the FTMM sewage collection system. The FTMM sewage collection system ultimately discharges to the Two Rivers Water Reclamation Authority system. On April 14, 1998, a 275-gallon steel UST (#0081515-60) was removed. The tank was used to store diesel fuel. Soils and groundwater within the tank excavation were observed to be impacted by a petroleum substance. The NJDEP hotline was notified and the site was assigned case # 98-04-16-1603-19. Approximately 225 CY of contaminated soil was removed and disposed of in accordance with NJDEP requirements. A groundwater sample was collected from the excavation prior to being backfilled with certified clean material. The sample was analyzed for TCL + 30 parameters, plus lead. Benzene was detected at a concentration of 20.0 µg/L, above the Groundwater Quality Criteria of 1.0 µg/L. Total xylenes were detected at a concentration of 786.1 µg/L, above the Groundwater Quality Criteria of 40.0 µg/L. Ethyl benzene was detected at a concentration of 141.5 µg/L, below the Groundwater Quality Criteria of 700.0 µg/L. Toluene was detected at a concentration of 113.3 µg/L, below the Groundwater Quality Criteria of 1,000 µg/L. Lead was detected at a concentration of 175.0 µg/L, above the Groundwater Quality Criteria of 10.0 µg/L. The referenced contaminants are not generally recognized as being constituents of diesel fuel. However, they are generally recognized as being constituents of gasoline.

It is possible that the site was impacted from an older UST which contained gasoline or possibly an aboveground spill involving gasoline. An unnamed creek located 15 feet downgradient of the tank site was also sampled. The sample was analyzed for TCL + 30 parameters, plus lead. No compounds of concern were identified in the creek

sample. A 4-inch monitoring well was installed within the former tank excavation in July 1999.

Two rounds of groundwater samples have since been collected. Samples were analyzed for TCL + 30 parameters and TAL metals. Ethyl benzene, total xylene and lead were detected in both rounds; however, the results are below the NJDEP Groundwater Quality Criteria. Post-excavation soil samples have identified remaining soils as within the NJDEP Residential Direct Contact Soil Cleanup Criteria. Currently, the DPW has collected sufficient groundwater data to seek an NFA determination from the NJDEP.

An RI report requesting an NFA determination from the NJDEP was prepared. No response has been received from the NJDEP.

5.2.2 Military Munitions Response Program

As discussed in **Section 4.3.4**, the 2006 HRR concluded that three sites had a history of munitions use (17). The document recommended these three sites for further investigation. These sites are the Former Pistol Range (1935-1940 Pistol Range), the Former Outdoor Firing Range (1940-1955 Pistol Range), and the Former Skeet Range. See **Figure 14** for the former range locations.

Former Outdoor Firing Range (1940-1955 Pistol Range). The Former Outdoor Firing Range was identified during the Phase 3 Inventory; however, based on the research for the HRR, the location identified during the Phase 3 Inventory was found to be incorrect. The Former Outdoor Firing Range was used from approximately 1940 through 1955. The small arms firing that occurred at the Former Pistol Range (1935-1940 Pistol Range) was relocated to the Former Outdoor Firing Range (1940-1955 Pistol Range) location around 1940 when the STP was constructed on the old range location. Range structures and the backstop berm at the Former Outdoor Firing Range are assumed to have been removed/demolished. Munitions associated with the Former Outdoor Firing Range are assumed to be small arms ammunition only; therefore, no MEC and limited MC are anticipated. The primary MC associated with small arms ranges is lead. Other MC include antimony, arsenic, copper, tin, zinc, iron, strontium, magnesium, and lead azide. Sampling has not been conducted at the Former Outdoor Firing Range; therefore, further investigation of the site for MC impacts may be warranted (17).

This site was originally included in the IRP. The IRP recommendation was for NFA. This determination was approved by the NJDEP. However, this site has been reclassified for possible further investigation under MMRP (17). This site is considered a REC.

Former Pistol Range (1935-1940 Pistol Range). The Former Pistol Range was identified through the research for the HRR. It was used from approximately 1935 through 1940. Range structures and the backstop berm were assumed to have been removed/demolished in 1940 for the construction of the STP. Munitions associated with the Former Pistol Range are assumed to be small arms ammunition only; therefore, no

MEC and limited MC are anticipated. Small arms ammunition is mainly comprised of lead (approximately 85 percent by weight of the projectile). As such, the primary MC of concern associated with small arms ranges is lead. Other MC may include antimony, arsenic, copper, zinc, and constituents associated with black or smokeless powder. MC, if present, would likely be located in surface soils adjacent to the backstop berm, and possibly near the firing line. The HRR concluded that no investigations of the Former Pistol Range, including sampling activities, have been conducted within the berm area; therefore, further investigation of lead impacts may be warranted (17). However, the land in this area has been extensively re-worked since 1940. Additionally, the area of the former pistol range has been extensively sampled as part of the FTMM IRP. This site is not considered to be a REC.

Former Skeet Range. The Former Skeet Range was identified through research for the HRR. The range was used from 1940 until approximately 1955. Range structures are assumed to have been removed/demolished. Munitions associated with the Former Skeet Range are assumed to be small arms ammunition only; therefore, no MEC and limited MC are anticipated. The primary MC associated with small arms ammunition is lead. Other MC may include antimony, arsenic, copper, nickel, zinc, and constituents associated with black or smokeless powder. Because clay targets are assumed to have been used at the former range, polynuclear aromatic hydrocarbons associated with the targets would also be expected at the site. MC would likely be located in surface soils of the firing arc. For skeet and trap ranges, the area where the clay targets typically accumulated during the active life of the range extended 300 feet from the firing arc; lead shot accumulated to approximately 600 feet. The HRR concluded that sampling has not been conducted at the Former Skeet Range; therefore, further investigation of the site for MC impacts may be warranted (17). However, the land in this area has been extensively re-worked since 1955. Additionally, the area of the former pistol range has been extensively sampled as part of the FTMM IRP. This site is not considered to be a REC.

5.2.3 Compliance Cleanup

No compliance cleanup sites have been identified in the compliance cleanup database for FTMM.

5.2.4 Previous Environmental Investigations

In 1976, an Installation Environmental Impact Assessment was conducted for FTMM (125). The assessment includes discussions of environmental setting; natural resources; activities occurring at FTMM, including research, training, health care, testing, installation support; current land use; and plans for future land use. Additional environmental assessment (EA) reports were prepared in 1984 and 1987 (111,126). The EA reports contain information that was relevant to the existing facilities, physical conditions, regional characteristics, historic aspects, environmental conditions and assessed installation layout, land use, and operational activities.

The first extensive installation-wide environmental investigation completed at FTMM was the 1980 installation assessment (48). The installation assessment was the first systematic evaluation of toxic materials usage and hazardous waste handling and disposal at FTMM. The potential for these substances to migrate off site was evaluated. The assessment report discussed the environmental setting; land-use patterns; past and present industrial and laboratory operations; training operations across the post; handling and storage of industrial chemicals, chemical agents, biological agents, radiological materials; pesticide/herbicide/fertilizer usage; disposal operations (liquid and solid waste treatment); demolition and burning grounds; and existing water quality data. This report identified several sites with known or suspected waste materials on the MP and CWA (48).

A PA (10) was implemented to investigate each of the identified sites, plus additional sites which were identified by the DPW and the NJDEP. The PA commenced in August of 1993 and was completed in December of that same year.

A total of 32 sites at the MP and CWA became the subject of this investigation. A total of 21 sites were located on the MP and eleven sites were located in the CWA. The 32 areas of environmental concern included closed landfills, suspected landfills, a sludge disposal site, former PCB transformer sites, former pesticide storage and mixing areas, closed incinerator sites, former STPs, neutralization pits, indoor/outdoor small arms ranges, a former training area, and a former temporary hazardous waste storage area.

An SI work plan was developed concurrently during the PA phase. The PA/SI work plan outlined field activities for investigating 23 sites (13 MP sites and 10 CWA sites). An NFA determination was proposed for 9 sites (8 MP sites and 1 CWA site). The PA/SI work plan was submitted to the NJDEP in December 1993 and subsequently approved by said agency in April 1994. Implementation of the SI work plan commenced in November 1994. Field activities conducted under the SI phase included subsurface geophysical investigations, surface and subsurface soil sampling, sediment and surface water sampling, groundwater monitor well installation and sampling and tidal monitoring. Field activities under the SI phase were completed in May 1995 (124).

The primary compounds of concern identified in the SI report include TCE, PCE, chlorobenzene, benzene, 1,2-DCE, TPH, pesticides, PCBs, arsenic, cadmium, and lead. These compounds were identified in soil, sediment, surface water, groundwater, and concrete.

The final SI report was completed and presented to the NJDEP in December 1995 (11). The SI phase identified 16 sites with contaminant levels above NJDEP regulatory standards in one or more environmental medium. Contaminant levels at six sites were below regulatory concern. Two AOCs were still in the SI phase. The Final SI Report includes recommendations for the 18 AOCs. These sites are addressed in the FTMM IRP and numerous site-specific reports have been completed under the FTMM IRP. The NJDEP approved the final SI report in April 1996. Since the completion of SI activities, ten additional sites have been added to the IRP (124). The description and status of each of the IRP sites discussed above is addressed in detail in **Section 5.2.1**.

In support of construction activities under the U.S. Army's RCI and EUL programs, SI, RI, and RA activities were performed at the 800, 700, and 400 Areas from May 2003 to April 2005. The primary objective of these activities was the characterization of environmental conditions at these three sites and the performance of RAs including the removal and disposal of all soil with concentrations above NJDEP criteria. A secondary objective was to identify, locate and remove historic USTs and /or buried construction debris at each of the areas.

The geophysical surveys and subsequent backhoe investigation of the anomalies identified 17 USTs in the three areas. All 17 tanks were removed; seven of the tank locations indicated releases and excavation of impacted soils was performed as necessary (141).

The SI phase identified 16 sample locations with contaminant levels above NJDEP regulatory standards in the soil (141). The RI phase included delineation of the contaminated soils identified during the SI. Contamination was delineated at 14 of the 16 locations by drilling soil borings around the locations of the elevated SI levels. The remaining two locations were not delineated, because the pesticide contamination resulted from the routine application of pesticides to landscaped areas. During the RA phase, all soil where SI and RI samples indicated concentrations in excess of the NJDEP criteria were excavated and disposed or recycled off base.

The Final RA Report for the 800, 700, and 400 Areas (141) concluded that all objectives of the SI, RI, and RA were met. Soils with concentrations that exceeded the applicable criteria for each area were removed as verified by post-excavation samples, and all known USTs were removed and remediated. Therefore, the Army requested that NJDEP issue an NFA letter for the three areas.

5.3 Hazardous Substances

This section discusses the environmental conditions associated with the use, storage and disposal of hazardous substances. Available information has been summarized to identify the current and historical types and quantities of hazardous substances on FTMM. Also presented is an analysis of the potential for hazardous substance release.

Hazardous substances and waste management are governed by specific environmental regulations. In this section the terms hazardous substance and hazardous waste are defined by CERCLA, 42 United States Code (USC) 9601-9675, as amended, codified at 40 CFR §302.4 (a); and the Solid Waste Disposal Act, as amended by RCRA, 42 USC 6901-6992, as amended, codified at 40 CFR §261, Subpart C and Subpart D.

This section identifies all hazardous substances stored for one year or more. Further, the section identifies all hazardous substances stored in quantities that necessitate notification under CERCLA §120(h). Under CERCLA, notification is required if storage of a hazardous substance exceeds the greater of 1,000 kilograms or the CERCLA RQ.

FTMM provides annual reports to the NJDEP under the Federal Emergency Planning and Community Right to Know Act (EPCRA) program. The MP reports are submitted

under Facility ID 99942203002. The CWA reports are submitted under Facility ID 99942203000. Copies of the 2005 survey signature pages are included in **Appendix E**.

FTMM has a long history of R&D activity. The majority of this activity has been related to communications and electronic equipment. For the completion of these research activities, FTMM has had a variety of laboratories. Hazardous substances related to these activities are identified. FTMM also has a significant history of training and housing troops. In support of these activities, FTMM has had a full complement of support activities including vehicle maintenance, warehousing, and medical and dental services. Hazardous substances related to these activities are identified. Additionally, hazardous substances related to the generation of electrical power such as UPS batteries and generators are identified. FTMM has no operational history of manufacturing chemicals, munitions or MC. Therefore, no hazardous substances related to those operations were identified.

A comprehensive listing of source material was reviewed to compile the list of hazardous substances at FTMM. The hazardous substances identified as part of this ECP were discovered through review of USACHPPM reports (including historical parts washing equipment); EPCRA submissions; IRP documents; spill prevention, control, and countermeasures reports; the 1999 base-wide chemical inventory; UPS database; and current inventory of parts washing equipment. While the current parts washers in service at FTMM are industry standard and do not utilize hazardous substances, the listing of current parts washers was used to extrapolate areas that may have had parts washing equipment that did utilize hazardous substances. FTMM is registered with the USEPA as an LQG of hazardous waste. Being identified as an LQG, hazardous waste can only be stored at the site for a period of 90 days or less. This information was reviewed in generating the listing of hazardous substances. FTMM is currently in the process of completing a base-wide chemical inventory. The complete inventory was not yet completed and draft information could not be used due to security considerations. Storage of chemicals that would be considered de minimus in quantity were not reported. Common cleaning products that may contain low concentrations of hazardous substances were also not reported. **Table 5-13** summarizes the FTMM Hazardous Substances and is located in **Appendix F**. Hazardous substance storage locations for MP and CWA are presented on **Figures 17 and 18**, respectively.

5.4 Petroleum and Petroleum Products

Petroleum Products. In the early 1990s, the FTMM DPW developed a UST program for managing approximately 474 USTs throughout the FTMM installation (MP, CWA, and Camp Evans areas). This program was created to work toward replacing the use of heating oil as a major energy source and to convert to natural gas. The DPW's approach involved installing new gas lines and new gas-fed boilers and removing the USTs. Since 1990, approximately 97 percent of the aforementioned USTs at FTMM have been removed (461 USTs were removed and 13 USTs remain active).

A listing of historic and current storage locations on MP and CWA is included in **Appendix G**. The locations of current and former petroleum storage areas are

presented on **Figure 15** (MP) and **Figure 16** (CWA). This list was assembled through the review of information from the current FTMM DPW UST database (9), the SPPP (50), the Spill Prevention, Control and Countermeasures Plan (SPCCP), current tank inspection forms (9), and UST certification information obtained from DPW personnel during interviews and VSIs, and historic drawings obtained through Master Planning. The information obtained from DPW personnel for current USTs and ASTs at the facility and historic figures are included in **Appendix G**. The entire tank database and associated closure reports utilized to summarize removed tanks are located at the FTMM DPW. For the MP, a total of 358 tanks are documented in the FTMM tank database to have been removed and 10 USTs and 23 ASTs currently exist. For the CWA, a total of 103 tanks are documented to have been removed and 3 USTs and 12 ASTs currently exist.

All of the information sources discussed above were reviewed to determine if releases had occurred at the former tank locations. Former tanks with evidence of a release are considered a REC. Former tank locations that are considered a REC are listed in the parcel summary table contained in **Appendix A**. No active FTMM tanks are considered a REC.

Plan No. 506, "Gas and Fuel Storage Tanks Distribution System," dated March 22, 1956, was reviewed for MP and Plan No. 520, "Gas Distribution, Gasoline and Fuel Storage, CWA," dated January 16, 1956, was reviewed for CWA. Both plans depict numerous fuel storage areas that existed at FTMM in 1956. These maps are included in **Appendix O**. An evaluation of these historic plans was conducted in relation to the maintained tank removal database to determine areas in which historic tanks may have previously existed that have not been documented to have been addressed. Overall, the majority of these historic tank locations coincide with locations at which removals have been conducted under the current tank program and/or the RCI/EUL initiatives. However, a few tank locations depicted on these historic figures did not correlate to documented removals in the tank database or the RCI initiative (141). These locations were the former housing in the 300 Building Area (Buildings 337 – 344) on MP, the former housing area in the northeast corner of the CWA (former Buildings 2004 – 2011, 2014, 2015, and 2016), former housing area in the northwest portion of the CWA, and former USTs within the footprint of the 750 motor pool area. The 750 motor pool was constructed prior to modern UST management practices and documentation requirements. Therefore the USTs in this area may not have been removed. When these tanks were removed there was no requirement to document the removal. Due to this lack of documentation, the potential for a release from these tanks is a REC. RECs are documented in the parcel summary table contained in **Appendix A**.

Numerous minor petroleum product leaks and corrective measures taken are documented in Appendix E of the SPCCP (8). The majority of documented spills are related to ruptured fuel tanks on vehicles, minor leaks associated with fuel oil tank refueling, fill pipes left uncovered, and ruptured hydraulic lines on heavy equipment. These minor spills are not considered a REC. One notable large leak (11,000 gallons) of gasoline occurred from a UST at Building 699 in 1989. This release is addressed in the IRP as part of FTMM-53. This site is considered a REC.

Oil/water separators (OWSs) formerly existed at Building 750 as part of the wash rack; and in Building 1220, Building 1122 on MP, and Building 2707 in CWA. The OWS at Building 1220 was improperly plumbed and a minor discharge occurred to the nearby creek that is recorded in the spill history files maintained at FTMM The minor discharge was remediated and an NFA determination was issued by the local regulatory agency. A modern oil/water separator currently exists at the Fire House (2560) and one was reportedly removed from Building 2525. Active OWS systems are currently in use at vehicle wash racks located at Buildings 169 and 750, the Do-It-Yourself Car Wash located at Building 1124, and the drum/container washing facility located at Building 488 (all on MP). It is also possible that other oil water separators previously existed throughout both areas (MP and CWA) related to previous vehicle maintenance areas discussed below. Historic OWSs with evidence of a release are considered a REC. The former OWSs at Buildings 750, 1220, 1122, and 2707 are considered a REC. Because they are modern waste handling systems that are actively maintained by FTMM, none of the active OWSs are considered to be a REC.

5.4.1 Charles Wood Area Vehicle Repair, Maintenance, and Fueling Operations

Vehicle repair, maintenance, and fueling operations currently and/or previously conducted in the CWA include the following:

- Buildings 2070 and 2071 – Golf Course equipment storage, repair, and fueling
- Buildings 2506/2507 – Outdoor Vehicle Storage Area, installation of vehicular electronics, and paint booth (recently removed)
- Building 2567 – mini-mart and gasoline station
- Building 2562 – former fueling location for golf course and vicinity of former motor pool

Buildings 2070 and 2071 – Charles Wood Area Golf Course. Building 2070 serves as a storage area for vehicles and equipment used in the upkeep of the FTMM Golf Course. Small containers of fuel are stored in the flammables storage cabinet. Maintenance and repairs are made to both equipment and vehicles at Building 2071. Used oil filters, used fuel filters, and used oil rags are generated during repair operations. Various quantities of virgin motor oil are stored in the building on shelves and in flammable storage cabinets. A 275-gallon used oil AST sits inside containment housing on a concrete pad on the east exterior of Building 2071. A mobile refueling AST (100 gallons) is stored on the asphalt to the west of Building 2071. Also located at this building are six satellite accumulation areas for exempt, universal, and non-hazardous waste (114). Two 500-gallon ASTs, with attached fuel dispensing pumps, are also located north of Building 2070. One tank stores unleaded gasoline and the other tank stores diesel fuel. Both are inside containment housing and on a concrete pad. Small tractors and equipment are also stored on the asphalt and concrete pads south and west of the buildings. The VSI conducted in 2006 as part of this ECP verified

the above storage and use of petroleum products at Buildings 2070 and 2071 (50,8). There are no RECs associated with these operational areas.

Buildings 2506/2507 – Vehicle Component Fabrication Staging Area. This large outdoor area consists of Buildings 2506 and 2507 and the surrounding area. Building 2506 formerly housed FTMM's only paint booth used in the painting of Army equipment. Building 2507 is used for the installation of equipment (i.e., electronics, antennas, etc.) in Army vehicles. Some of the installation work is conducted outside of the building. Building 2507 contains three vehicle access bays with one having a concrete pad in front of the bay for the temporary holding of Army vehicles/equipment awaiting access to the building for work. The entire area is paved with asphalt and is used for the storage of Army vehicles (Humvees and Jeeps) and equipment, materials, and a satellite accumulation area. One storm drain outfall is located just southwest of the site on the south end of the RR tracks.

According to the latest revision of the SPPP, in addition to the Army vehicles and equipment, a 275 (used oil) gallon AST is present inside a containment structure. Two Twin Poly-Pacs are in use at Building 2507. One Poly-Pac houses a 5-gallon pail used in the collection of waste aerosol lubricant cans and a 55-gallon drum used in the collection of spent antifreeze. The second Poly-Pac houses a 30-gallon drum used in the collection of oily rags and a 55-gallon drum used in the collection of oil spill debris. In addition, a 4-drum Poly-Pac is used at the site to temporarily store lead acid batteries. A 95-gallon overpack drum houses a 30-gallon drum used in the collection of off-spec gasoline. All referenced containers/drums are managed under the DPW hazardous waste management program. The site is in total compliance with applicable regulations. No outside storage of waste materials takes place at Building 2506. A 5-gallon pail used for the collection of waste aerosol lubricant cans and a fiber drum used in the collection of spent fluorescent lamps are located inside Building 2506. All referenced containers/drums are managed under the DPW hazardous waste management program. The site is in total compliance with applicable regulations. A total of four Army metal equipment shelters were stored along the north side of Building 2506. A 100-gallon metal diesel fuel tank on a concrete pad and five gasoline cans are also stored on the concrete pad along the north fence line. A locked and rusted metal flammable storage cabinet labeled methanol was also present (50, **Section 4.3.2**). The VSI conducted in 2006 as part of this ECP identified the same storage structures. No RECs were identified as a result of current operations in this area. This area is considered a REC based on the potential for releases during historical operations.

Building 2567 – AAFES. This facility is a combination mini-mart and gasoline station. The facility sells gasoline and other household commodities to active, reserve, retired military personnel and their dependents. No automotive repair work is conducted at this site. The gasoline portion of the facility consists of three USTs and two fuel dispensing pumps. Each pump is equipped with six hose attachments for dispensing fuel. All three tanks are 10,000 gallons in capacity and store various grades of unleaded gasoline.

The tanks and piping at the site are constructed of double-walled fiberglass. Continuous leak detection monitoring at the site is accomplished through the use of

liquid leak sensors that have been placed in the interstitial spaces of the tanks and piping. Automatic tank gauges have also been installed within the tanks which continuously monitor the product levels within each tank (8). This building correlates to IRP site FTMM-58.

Six single-walled steel USTs were replaced by the existing tanks as part of a renovation project that was initiated as a result of one UST failing a tightness test. Tank removals included three 10,000-gallon gasoline USTs, one 6,000-gallon gasoline UST, one 1,000-gallon heating oil UST, and one 550-gallon used oil UST. The four gasoline USTs were removed in February 1993. The heating oil and used oil USTs were both removed in December 1991. The cleanup strategy for the site includes injection of ORC for two years followed by compliance monitoring of seven wells as a key component of monitored natural attenuation (see **Section 5.2.1** for additional information, IRP Site FTMM-58). This site is considered a REC based upon historic UST leaks.

Building 2562 – Charles Wood Area. This facility formerly served as a storage area for grass cutting equipment which was used in the CWA of FTMM. One UST and one fuel dispensing pump were located at the site. The tank was 5,000 gallons in capacity and stored unleaded gasoline. Unleaded gasoline is no longer stored at the site. This facility is no longer in use.

The UST was constructed of single-wall steel and was removed in 1993. Commencing on August 16, 1993, the UST and associated piping was removed from the site. An RI and subsequent cleanup action was conducted at the site. Site cleanup was completed in 1993. All remedial activities conformed to the requirements as specified in the Technical Requirements for Site Remediation regulations (N.J.A.C. 7:26E) (8). This building was located in the area that was identified in historic aerial photographs as outdoor storage and ground staining and was formerly the motor pool area for CWA. Building 2562 has since been demolished. This site is considered a REC.

Another vehicle and/or fuel related areas that were identified in CWA included a former vehicle storage area identified in the 1947 aerial photograph in the north central portion of CWA directly west of the intersection of Guam Lane and Hemphill Road. Additionally, FTMM personnel reported during personnel interviews and the 2006 VSI that a former motor pool also existed at Building 2501 (9). The VSI escort indicated the motor pool was there in the 1950s and was abandoned some time between 1980 and 1990. This site is considered a REC.

5.4.2 Main Post Vehicle Repair, Maintenance, and Fueling Operations

Vehicle Repair, Maintenance, and Fueling Operations currently and/or previously conducted on MP include the following:

- Building 273 – Garrison Fuel Station
- Building 699 – MP AAFES Gas Station

- Buildings 750, 751, 753, 754, and 756 – Motor Pool
- Building 1122 – Do it Yourself Autoshop
- Building 450 – Marina
- Former Building 44 – Former motor vehicle maintenance and repair (48)
- Former Building 64 – Former motor vehicle and heavy equipment repair
- Former Building 108 – Former Motor Pool
- Former Building 109 – Former vehicle fuel storage
- Former Building 159 – Former Roads and Grounds – motor vehicle and large equipment repair
- Former Building 161 – Former post transportation motor pool
- Former Building 163 – Former motor vehicle maintenance and repair
- Former Building 166 – Former motor vehicle repair – large diesel engines
- Former Building 197 – Former lawn mower repair
- Building 279 – Former vehicle repair shop
- Building 290 – Former military motor pool and vehicle maintenance
- Former Building 464 – Former repair shop for heavy equipment and engines
- Building 900 – Former Tactical Motor Pool
- Former Building 485 – Former repair shop for electrical equipment

Building 273. This gas station, built in 1991, is located at the intersection of Leonard and Riverside Avenues and provides gasoline and diesel fuel to motor vehicles that are operated by FTMM personnel. The facility consists of three USTs, two of which are 10,000 gallons in capacity; the remaining tank is 6,000 gallons in capacity. In addition, there are three fuel dispensing pumps at the site. There are two concrete pump islands with three pumps (two gasoline and one diesel) associated with three USTs. The tanks and piping at the site are constructed of double-walled fiberglass. The two 10,000-gallon tanks store unleaded gasoline and the 6,000-gallon tank stores diesel fuel. Continuous leak detection monitoring at the site is accomplished through the use of liquid leak sensors that have been placed in the interstitial spaces of the tanks and piping. Automatic tank gauges have also been installed within the tanks that continuously monitor the product levels within each tank (50,8). A storm drain is located at the fueling point. No RECs associated with current operations were identified.

Building 699 – Army/Air Force Exchange Services Gas Station. Building 699 is a full service gas station and convenience store located on the south side of Saltzman

Avenue in the central portion of the MP. Building 699 was constructed in 1953 and has been used as a service station since that time.

In October 1989, it was discovered that approximately 11,000 gallons of gasoline had leaked from several product lines at the site and caused contamination to both soil and groundwater. Since that time, an active remediation program has been in place to recover the lost product from the groundwater. As a result of the leak, all tank piping was replaced and the entire tank system was modified to meet current NJDEP standards.

Six USTs were removed from the site between 1992 and 1999. A 1,000-gallon waste oil UST behind the building was removed in 1992. A 2,000 gallon heating oil UST was removed in 1998. Four 4,000-gallon gasoline USTs were removed in 1999. At the time of removal all of the gasoline USTs were out of service. This fueling location correlates to IRP site FTMM-53. RAs at this site are discussed in **Section 5.2.1** (50,8).

Building 699 is currently used as a fueling station and service station with modern environmental controls. The 2006 VSI confirmed fueling operations, automotive repair services, and car detailing services are currently ongoing at this location. Six 10,000-gallon fiberglass USTs, installed since 1974, store unleaded gasoline. The fuel dispensing pumps are equipped with a fuel vapor recovery system permitted in the FTMM Title V air permit. Additionally, the system is electronically monitored for leak detection (2006 VSI observations).

The current USTs at the site are constructed of a single wall of fiberglass and the tank piping is constructed of double-walled fiberglass. The tanks are manifolded together in pairs with three product lines running from the tank field to the fuel dispensing islands. The product lines are sloped from the fuel dispensing islands back to a sump that is situated atop of one of the paired tanks systems. Liquid leak sensors have been installed inside the sumps and serve as continuous leak detection monitors for the piping. Automatic tank gauges have been installed within each tank and they continuously monitor the product levels within the tanks (50,8).

Automotive repair services are performed in the middle bays of the building. Car detailing services are performed in the last bay at the east end of the building. Antifreeze work is not conducted on site. New automotive car batteries and quarts of motor oil are offered for sale and stored in the middle bay as well. Propane gas cylinders offered for sale are stored in front of the building on the sidewalk in a locked enclosure. Lubricants, spray paint, solvents, and car preparation chemicals are stored in metal flammable storage cabinets inside the work areas. During the 2006 VSI, nineteen cans of tire glue containing TCE were observed in a storage cabinet located in the middle bay. An aqueous parts washer is located in the middle bay. Used oil, used oil filters, oily rags, and aerosol cans are stored inside the middle bay in various containers (55-gallon drums and 5-gallon buckets) for transfer to DPW. Two operable hydraulic lifts and one abandoned hydraulic lift are located in the middle service bays. Two abandoned hydraulic lifts are located in the last bay at the east end of the building where car detailing services are provided (2006 VSI observations).

Used tires are stored outside to the south of the building in a dumpster for recycling. A 745-gallon used oil AST is located to the south exterior of the building, along with a public collection box for used oil. Along the southeast corner of the parking lot are Poly Paks for the collection of used batteries. A storm drain is located in the western area of the parking lot. A grassy stormwater swale is located to the east of the building. Car detailing washwater from the east bay was observed draining across the parking lot into the grassy stormwater swale. The swale discharges to the ditch between Husky Brook Lake and Oceanport Creek (2006 VSI observations). This site is considered a REC based on historical operations. No RECs associated with current operations were identified.

Building 750 – Main Post Motor Pool. This facility is used by the Directorate of Logistics as a storage area for the installation fleet vehicles. The facility was formerly the 513th Military Motor Pool from 1987 until the mid-1990s. The Motor Pool collectively includes Buildings 750, 753, 754, and 756. Building 751 was previously associated with fuel dispensing operations in this area, but has since been demolished. Two USTs and four product dispensing pumps were also located at the site. The 15,000-gallon diesel fuel UST and the 8,000-gallon unleaded gasoline UST were removed in February 2005. In addition, a fuel tanker truck with a 1,200-gallon capacity is parked at this facility when not engaged in making fuel deliveries. The vehicle is used to store diesel fuel that is used at various on-site emergency generators. A permanent secondary containment system for the fuel tanker truck has been constructed (8).

In addition to being a storage area, complete automotive repairs are made to the vehicles at this site. Refrigerant R134 is used and chlorinated solvents were formerly utilized for automotive parts cleaning prior to converting to aqueous parts cleaning units. Two out of service outdoor service pits are present to the east of Building 750 from which oil was drained directly into pipes leading to the former OWS that was present in the grassed area north of the service bays. The current wash rack facility was formerly connected to the OWS. The wash rack facility was upgraded several years ago and a new OWS system was added to the wash rack equipment (2006 VSI observations and discussions with site personnel).

A small firearm repair shop is also located within Building 750 in which small amounts of solvents are utilized in firearms service and repair (2006 VSI observations and discussions with site personnel). This site is considered a REC based on the potential for environmental releases from historical operations. No RECs associated with current operations were identified.

Building 753 – Automotive/Vehicle Repair Shop. This facility was formerly a storage building and was converted for routine maintenance of vehicles. Three hydraulic lifts are utilized and a Cuda aqueous parts washer is present. Minor stains, typically present in auto repair facilities, were noticeable on the concrete floor and a floor drain is located in the corner of the building near the emergency eye wash center. Plans from 1987 show that the floor and shower drains are connected to the sanitary sewer system (146). Satellite accumulation areas are also present. No RECs were identified based on these operations.

Building 754 – Forklift/Lawnmower Repair Shop. Small engine repairs are currently conducted in this facility. One caged area inside the building is a former machine shop. Floor and shower drains were observed in this facility while conducting the VSI. Plans from 1987 show that the floor and shower drains are connected to the sanitary sewer system (146). No RECs were identified based on these operations.

Building 756. Building 756 is an open side building previously used by the military for generator storage. It is currently used for storage of material associated with the motor pool, including lead acid batteries, empty fuel cans, and gas cylinders. No RECs were identified based on these operations.

Building 1122 – Auto Craft Shop. The Auto Craft Shop houses a modern "do-it-yourself" vehicle repair shop. All vehicle repairs are done by FTMM personnel and are performed inside the building. Degreasing solvents are used and generate hazardous waste from these operations (61).

Pneumatic lifts are present. Floor drains in the bays and satellite accumulation room were noted during the 2006 VSI. A 1993 renovation plan, which details the replacement of the floor drains, shows that the drains are connected to the sanitary sewer system (147). The 2006 SPPP states "Floor drains, located near the pneumatic lifts, have been closed off." A former oil water separator was associated with this building. Used oil is collected in a 55-gallon drum stored inside the shop. When filled, the contents are pumped into a 995-gallon double-walled AST located between the repair shop and the car wash (Building 1124). The enclosed car wash facility is located to the east of the repair shop. All washwater is recycled and reused and an active OWS is in place (50).

Groundwater contamination at this location continues to be addressed in the IRP as part of FTMM-59. See **Section 5.2.1** for more information. This site is considered a REC.

Building 450 – Marina. The Directorate of Morale, Welfare, and Recreation (MWR) operates and maintains a marina at this site. The marina contains several storage bays for recreational boats and the main building is bordered by Riverside Avenue to the north and Oceanport Creek to the South. A 1,000-gallon double-walled AST with an attached fuel dispensing pump is maintained and operated within the facility grounds. The AST is located on the west side of the entrance to the Marina from Riverside Avenue. The tank is situated on a curbed concrete pad which serves as secondary containment (50,8). This site is not considered a REC.

Former Building 44. Building 44 was a motor vehicle maintenance and repair facility per the 1980 Installation Assessment (48). The building was located directly east of the southeast corner of Building 116. No other information was obtained for this former building during record searches. This site is considered a REC.

Former Building 64. Former Building 64 was identified as a motor vehicle and heavy equipment repair facility in 1954 (34). In 1958, engineer vehicle maintenance and 1st and 2nd echelon operating engines were identified at this location (36). Former Building 64 was located directly north of Building 167. This site is considered a REC.

Former Building 108. Former Building 108 was the Motor Pool on MP and is included in the FTMM IRP as site FTMM–57. See **Section 5.2.1** for additional information. This site is considered a REC.

Former Building 109. Former Building 109 was a vehicle fuel storage building that was located north of Building 108 along the RR track on the northeast boundary of the facility. No other information is readily available for this building. See **Section 5.2.1** for additional information pertaining to environmental restoration activities conducted in this vicinity (FTMM-57). This site is considered a REC.

Former Buildings 159, 159a, and 159b. Former Buildings 159, 159a, 159b were the roads and grounds shop with motor vehicle and large equipment repair facilities located in the northeast corner of MP behind Buildings 167 and 173. Mounded material, identified as possible debris storage, was noted at this location on the 1969 aerial photograph (26). The Chief Facility Engineer also indicated that this is a likely area of historic fill activities for the purpose of increasing site elevations to meet various engineering requirements. A 1952 USACHPPM archive report (33) noted motor pool operations in this building including testing and tuning of engines, cleaning of parts with kerosene, and steam cleaning using alkali products. In 1954, a USACHPPM (34) archive noted engine tuning, acetylene welding, steam cleaning and automotive maintenance was conducted in this area. This site is considered a REC.

Former Buildings 161 and 163. Former Buildings 161 and 163 served as the Post transportation motor pool and were located directly south of Building 159. USACHPPM archives noted motor pool operations in this building including testing and tuning engines, battery charging, and parts cleaning with kerosene in 1952 (33); testing and tuning of gas engines, acetylene welding, and battery charging operations were noted in 1954 and 1957 (34,44). The 1958 USACHPPM archives indicate outdoor steam cleaning of vehicles with alkaline cleaners and battery charging were also conducted at this facility (36). This site is considered a REC.

Building 166. Building 166 was formerly a motor vehicle repair shop for large diesel engines. Motor vehicle maintenance and repair for large diesel engines, including charging and filling of batteries with sulfuric acid, is documented to have previously occurred in 1956 (44,36).

Building 166 currently houses the facility Sign Shop, the Roads and Grounds shop, and administrative areas. Associated with the Sign Shop are a portable generator, a flammables storage cabinet with thinners and isopropyl alcohol, an acids and corrosives storage cabinet, and a satellite accumulation area for aerosol cans. The roads and grounds portion of the facility houses a flammables cabinet with paint, diesel conditioner, de-icer materials, and oil. The only floor drain observed in the building during the 2006 VSI was located in a bathroom in an area of the building used for office space. No plans were found in the DPW map and engineering drawings repository. Gas powered tools and a natural gas emergency generator is located directly adjacent to the building. IRP site FTMM-56 is directly to the south of Building 166. This site is considered a REC.

Former Building 197. Former Building 197 was utilized for lawn mower repair and a 1993 USAEHA air report lists a TCE parts cleaner having been present at this facility (88). Building 197 was formerly located across the street from Building 280 in the northern portion of MP. This site is considered a REC.

Building 279. Building 279 is a former vehicle repair shop and currently houses HVAC and plumbing shops. Building 279A and 279B have been demolished. The HVAC portion of the building is where vehicle maintenance was formerly conducted. A flammables cabinet (soot remover, pump oil, refrigerator oil, boiler treatment lime scale dissolver, and pump aid) and corrosives cabinet (york oil, PVC cement, oil, and Ty Ion C81-M) was present during the VSI associated with the HVAC shop; and drums of antifreeze, sewer deodorizer, a paint storage cabinet, PVC cleaner/primer/cement was contained in the plumbing shop. A sump was identified in this building during the VSI. The sump is part of the vacuum pit and pipe trenches for the heating system (formerly steam). The plan prints specify that this system does not transport water and is not connected to the sanitary or storm sewer systems (144).

Historic USAEHA reports detail parts cleaning with Stoddard solvent in a covered tank, testing and tuning of engines, use as the Ordnance 3rd Echelon Field Shop for repair of automotive equipment; light machining metals, battery charging, and woodworking as historic activities in Building 279 (44,32,36). This site is not considered a REC.

Former Building 290. Former Building 290 was a military motor pool and vehicle maintenance area and is included within the FTMM IRP under site FTMM-55. See **Section 2.5.1** for additional information related to this location. This site is included in the FTMM IRP due to releases from USTs. Consequently, this site is a REC.

Former Building 464. Former Building 464 is demolished. It is detailed in the 1957 USAEHA report as containing lubricating and repair activities for heavy equipment and testing and tuning of engines (44). Former Building 464 was located west of Buildings 116 and 117. This site is considered a REC.

Building 900. Building 900 is a former tactical motor pool. It has been utilized for general storage for approximately the past 10 years. The building formerly contained a waste oil tank immediately outside the building that was connected by a fill pipe originating from inside the building (removed). Oil stains were observed on the concrete floor inside the building during the VSI. A storm sewer inlet was also observed in the parking lot in close proximity to the building. A boiler was formerly located outside the building. A 1993 USAEHA report cites a TCE parts cleaner and 500-gallon aboveground waste oil tank being present at the building at the time of the 1993 site visit (88). The tank has been removed from the building. This site is considered a REC.

Building 80. Former Building 80 is included in the IRP under site FTMM-56 and is discussed in **Section 5.2.1.1** (105). Building 80 is considered a REC.

Former Building 485. Building 485 was used for the cleaning and repair of electrical equipment. Historical operational use of the building included using organic solvents

(32,34,35,36). Building 485 was demolished in 1997 (53). Building 485 is considered a REC due to the potential for releases from historical operations.

5.5 PCBs

PCB-Class oils are defined by TSCA as oils containing 500 ppm PCBs or greater. PCB-contaminated oils are defined by TSCA as oils containing between 50 ppm and 499 ppm of PCBs. Non-PCB oils are defined by TSCA as oils containing less than 50 ppm PCBs. Electrical oil having PCB concentrations at or less than 49 ppm is considered a Class D recyclable material in the state of New Jersey (8).

5.5.1 Transformers

The electrical distribution system located on FTMM properties is owned and operated by the U.S. Army. The electrical distribution system is comprised of transformers, oil switches, circuit breakers, and voltage regulators. The MP has approximately 372 oil-filled pieces of electrical equipment of which 194 units are pole mounted, 135 pieces are outside pad mounted units and 43 pieces are inside pad mounted units. The CWA has approximately 254 oil-filled pieces of electrical equipment of which 171 units are pole mounted and 83 pieces are outside pad mounted units. Presently, five electrical substations are maintained and operated by the DPW. Three substations are located on the MP, and two substations are located in the CWA (8).

The FTMM PCB management program consists of determining the level of PCB in all electrical transformers and removing all PCB-class transformers. Prior to 1988, all oil-filled electrical equipment at FTMM was assumed to be PCB-class equipment and was labeled as such. In November 1988, FTMM initiated a program to sample and analyze all equipment that did not have a manufacturer's label indicating that it was non-PCB. Testing of all oil-filled transformers, capacitors, voltage regulators, and switches was completed by June 1990. Thirty-three pieces of equipment were identified (CWA, MP and Evans) as being PCB class, 96 as being PCB-contaminated, and 520 as being Non-PCB. In addition, 224 pieces were identified from the manufacturer's nameplate as being Non-PCB (10).

To fulfill the requirements of TSCA, FTMM initiated an action to remove or remediate all PCB-class equipment. Of the 33 PCB-class pieces of equipment, all of which were transformers, 29 were removed. The other 4 transformers were drained, and the PCB oil was replaced with Non-PCB oil. The four transformers were resampled and tested for PCB content within 90 days after being retrofilled. All four transformers now have PCB levels less than 50 ppm and are classified as being Non-PCB. Therefore, there are currently no PCB-class pieces of equipment at FTMM (10).

Per the 1993 Investigation of Suspected Hazardous Waste Sites at Fort Monmouth (10), the locations of each of the 33 former PCB-class transformers were visually inspected for evidence of leaks or spills and sampling was proposed. A list of these locations can be found in the report. Of the samples collected, four of the eight transformers at the MP (Buildings 1002, 1208, 1209, and northwest side of 292) were found to have PCBs

in soil or concrete above applicable cleanup criteria. A final report in 1995 stated that additional soil sampling was to be conducted at Building 292 (11). No records were identified indicating that this sampling had been carried out. One of four samples at the CWA (northeast of Building 2000) was found to have PCBs in soil or concrete above applicable cleanup criteria (11). Building 2000 is the CW-7 IRP site. These sites are discussed further in this section. PCB-contaminated (50 to 500 ppm) transformer areas were not evaluated.

At the time of the Investigation of Suspected Hazardous Waste Sites (10), FTMM had begun to remove and/or retrofill PCB-contaminated equipment. Since 2003, all transformers on FTMM have been Non-PCB. The CWA was completed in 1996 and the MP was completed in 2003 (7). The PCB Annual Document Reports are included in **Appendix M**. During the 2006 VSI, numerous transformer pad sites and substations were inspected. During these inspections, there were no transformers labeled as PCB and no signs of active leaks or spills. No RECs are associated with these activities.

CW-7: Building 2000, Former PCB Transformer Site. The 1980 IA report (48) listed Site CW-7 at CWA as "PCB (transformers)" but did not provide any additional information. The location identified on the site map is where Buildings 2000, 2018, 2019, 2020, 2021, and 2067 are located. Three transformers from this area were determined to be PCB transformers and were removed in 1990 (10). The CW-7 site (FTMM-29) exhibited elevated levels of PCBs within site soil. Under the RI phase, additional soil samples were collected to further delineate the extent of the PCB contamination at the site. The RI work was completed in July 1996. The RA for the CW-7 site (FTMM-29) involved the removal and off-site disposal of soil contaminated by PCBs. Cleanup activities for the CW-7 site were completed in June 1998. An RA report was submitted to NJDEP recommending NFA. No response has been received from NJDEP (124). This site is considered to be a REC.

FTMM-47: Buildings 1002, 1208, and 1209 Former PCB Transformer Site. Elevated PCB levels were identified in the concrete samples collected from Buildings 1002, 1208, and 1209. Upon further evaluation, the oil staining at each of these locations is generally minor in nature, both in their horizontal distribution and in the depth at which the staining penetrates the concrete. These minor source areas are not a threat to human health or the environment. At present, the active use of transformers at Buildings 1002, 1208, and 1209 preclude the possibility of any remedial work. At such time when the transformers are replaced or removed from service, the minor PCB source areas shall be addressed accordingly. NFA determination was approved by the NJDEP (124). During the 2006 VSI of Building 1002, stormwater intakes (possible dry wells) were located in the courtyard outside the building. No engineering drawings for the building were found in the DPW map and engineering drawings repository. This site is considered a REC.

FTMM-09: Buildings 1150 and 1152 (Main Post) Former PCB Transformer Site. The 1980 IA report (48) listed Site M-9 on the MP as "PCB (Transformer)" but did not provide any additional information. The location identified in the IA is where Buildings 1150 and 1152 are located. In the 1995 SI, it was reported that these transformers had

been tested and that there was no evidence that this site has ever had transformers that contained PCBs at a concentration greater than 50 ppm. No further sampling was recommended at this site (11). An NFA determination was approved by the NJDEP in 1994 (November 7, 1994, NJDEP correspondence, included in **Appendix N**).

Former Transformer Storage Area Behind Building 167. According to a conversation with the DPW in August 2006 (127), transformers were previously stored in an area behind Building 167 in the early to mid-1990s. The transformers were either new or in workable condition and classified as Non-PCB. All transformers were removed from the area in the mid-1990s, but no environmental sampling has been conducted in the area. This site is considered a REC.

Buildings 456 and 454 Spill. There is a recorded spill of 75 gallons of PCB-contaminated transformer oil on December 11, 1992, near Buildings 456 and 454. The spill was due to a storm-fractured wooden pole. Three pole-mounted 50 KVA transformers were knocked to the ground as a result of the storm. The contents of two of the transformers leaked onto the ground. The third transformer did not leak. All three of the transformers were PCB-contaminated class. Pads, pillows and booms were set down and drummed and the affected area was covered with polyethylene plastic. The transformers were properly disposed of along with PCB-contaminated soil. Analytical samples were collected (8). Initially, removal of soil could not be conducted due to frozen ground. After the ground was sufficiently thawed for soil excavation to take place, 45 CY of soil was removed and disposed of off site, and post-excavation samples were collected and analyzed for PCBs and TPH. One post-excavation sample out of the 16 initially collected contained PCBs (5.73 mg/kg) and TPH (7,685 mg/kg) in excess of the NJDEP soil standard. The area of this sample was over excavated and an additional 5 CY of soil was removed and disposed of off site. Post-excavation samples collected after this second excavation were non-detect for PCBs and showed levels of TPH below the NJDEP standard. The DPW also collected an additional 20 surface soil samples surrounding the perimeter of the entire excavation. These samples were analyzed for TPH. None of these samples contained TPH in excess of the NJDEP soil standard. This site is considered a REC.

5.5.2 Storage

Site Number 12, Buildings 121, 122 & 123 – Main Post Central Hazardous Waste Storage Area. This facility serves as the central hazardous waste storage area for the MP. The facility itself consists of three prefabricated storage buildings and two outside drum storage pads. All five structures are situated on a concrete reinforced pad.

Buildings 121 and 122 are not storage areas for PCB material. Building 123 is used to store out of service transformers, capacitors, switches, and other types of electrical equipment which contain PCB-contaminated and Non-PCB oils. Underneath the grated flooring of Building 123 is a sump which serves as secondary containment. The outside drum storage pads are constructed of concrete and are designed to hold thirty-two 55-gallon drums and each pad has one large sump which serves as secondary containment. The containment sumps found at this site are sufficiently impervious to

contain the various hazardous wastes that are stored should a release occur from a primary storage container (i.e., 55-gallon drum). All potential spills would be controlled by secondary containment; therefore, spills pose no threat to the outside environment.

Essentially, there is no drainage from the three storage buildings. Drainage from these buildings can only be accomplished by pumping directly out of the containment sumps. Any materials removed from these sumps would be evaluated for being a potential hazardous waste and disposed of accordingly. Drums stored on the outside storage pads are protected by polyethylene covers which prevent rainwater from coming into contact with the drums. Rainwater does, however, enter the containment sump and is visually inspected for the presence of a sheen before it is discharged. If no contaminants are visually observed, the rainwater is released to the adjacent area (8). This site is not considered a REC.

Site Number 13, Building 2630, 2631 & 2632 – Charles Wood Central Hazardous Waste Storage Area. This facility serves as the central hazardous waste storage area for the CWA. The facility itself consists of three prefabricated storage buildings and one outside drum storage pad. All four structures are situated on a concrete reinforced pad.

Buildings 2630 and 2631 are not reported as storage areas for PCB material. Building 2632 is used to store spent batteries and out of service electrical equipment which contain PCB-contaminated and Non-PCB oils. Secondary containment is provided in the form of a 6-inch concrete dike which lines the inside perimeter of the storage area. The outside drum storage pad is constructed of concrete and is designed to hold thirty-two 55-gallon drums and the pad has one large sump which serves as secondary containment. The containment sumps found at this site are sufficiently imperious to contain the various hazardous wastes that are stored should a release occur from a primary storage container (i.e., 55-gallon drum). All potential spills would be controlled by secondary containment; therefore, spills pose no threat to the outside environment.

Essentially, there is no drainage from the three storage buildings. Drainage from these buildings can only be accomplished by pumping directly out of the containment sumps. Any materials removed from these sumps would be evaluated for being a potential hazardous waste and disposed of accordingly. Drums stored on the outside storage pad are protected by polyethylene covers which prevent rainwater from coming into contact with the drums. Rainwater does, however, enter the containment sump and is visually inspected for the presence of a sheen before it is discharged. If no contaminants are visually observed, the rainwater is released to the adjacent area (8). This site is not considered a REC.

Site Number 15, Building 623 – PCB Storage (Main Post). This facility served as the central storage area for out of service transformers, capacitors, switches, and other types of electrical equipment which contained PCB, PCB-contaminated and Non-PCB oils. The building is no longer in use and was demolished in 1993. The facility has been replaced by a new building which is located at Site Number 12. Secondary containment was provided at the facility in the form of a concrete dike. The dike lined the entire inside perimeter of the building and was constructed to a height of 8 inches.

Any spills originating from inside the building would have been contained by the concrete dike (8).

Essentially, there was no drainage from this facility. Drainage from the building could only be accomplished by pumping directly out of the secondary containment. Any spill materials that were removed from within the dike would have been classified as TSCA waste and disposed of as such (8).

In December of 1992, a contract was awarded to Doolan Environmental, Inc. to decontaminate the interior of Building 623. The cleanup involved scarifying all concrete surfaces within the building. Contaminates generated from the scarifying process were containerized and sent to Aptus, Inc. for thermal treatment. Final cleanup was completed in February and the building was demolished in May of 1993. Following the demolition, soil samples were collected at the site to document the closure of the facility. The sample results verified that no PCBs were released to the environment (8). This site is not considered a REC.

Building T-65, 498 (MP) and T-2044 (Charles Wood Area). PCBs were stored in the pesticide storage areas until 1977. The material was acquired as a pesticide, but reportedly was never used (48). These sites were not considered RECs based on PCBs.

5.5.3 Other PCB Contamination

CW-2 Wastewater Treatment Lime Pit (FTMM-23), Building 2700. The CW-2 site is the second wastewater treatment lime pit located next to the Myer Center facility (Building 2700). The CW-2 wastewater treatment lime pit is located on the east side of the Myer Center facility, near the former electrical substation. Four soil samples were collected and PCB analysis was part of the prescribed analytical program. PCBs were detected in one soil sample slightly above NJDEP Direct Contact Soil Cleanup Criteria (124). An NFA determination was approved by the NJDEP in a letter dated April 4, 1996. See **Section 5.2.1** for additional details related to this location (IRP Site FTMM-23). This site is considered a REC.

M-2 and M-8 Landfills. PCB soil contamination was identified at the M-2 and the M-8 landfills. See **Section 5.2.1** for additional details related to these locations. These sites are considered a REC.

5.5.4 Other Sites Related to Non-PCB Oils

A total of 13 ASTs are utilized by installation repair and maintenance shops to facilitate the proper collection and temporary storage of generated used oils. Tanks used to store electrical oil must have PCB concentrations at or less than 49 ppm as per DPW policy (8).

It should be noted that all sites referenced in this section have been built in secondary containment structures.

Building 2707 – Pulse Power (Charles Wood Area). UST #5 (10,000 gallons) was used to store Non-PCB electrical oil. All USTs at this site were removed in September of 1998 (8). No RECs associated with the storage of non-PCB oil were identified at Building 2707.

Building 488 – Transformer Storage Pad (Main Post). Building 488 – Transformer Storage Pad (MP) is utilized by the DPW for storing replacement transformers and related types of electrical equipment. Said equipment contains insulating oils (mineral oil) which are defined as being Non-PCB Class oils (8). No RECs associated with this transformer pad were identified at Building 488.

Building 288 – Electrical Substation (Main Post). This facility is an electrical substation located northeast of Building 288. The transformer contains Non-PCB oil (8). No RECs associated with potential environmental releases from this transformer pad were identified at Building 288.

Building 978 – Electrical Substation (Main Post). This facility is an electrical substation located adjacent to Building 978. The substation consists of nine transformers, all containing Non-PCB oil (8). As noted during the 2006 VSI, pits inside the building and secondary containment from the transformers drain to a sump under one of the large transformers. The content of the sump is monitored per the SPPP before being discharged to the rear of the building towards Oceanport Creek. No RECs associated with potential environmental releases from this substation were identified.

Building 1231 – Electrical Substation (Main Post). This facility is an electrical substation located adjacent to Building 1231. The substation consists of two transformers, one large circuit breaker and one pole mounted type transformer, all containing Non-PCB oil (8). No RECs associated with potential environmental releases from this substation were identified.

Building 2700 – Electrical Substation (Charles Wood Area). This facility is an electrical substation that supports the Myer Center (Building 2700) facility. The substation consists of two transformers, each containing Non-PCB oil (8). No RECs associated with potential environmental releases from this substation were identified.

Building 2716 – Electrical Substation (Charles Wood Area). This facility is an electrical substation located adjacent to Building 2704. The substation consists of two transformers that both contain Non-PCB oil (8). No RECs associated with potential environmental releases from this substation were identified.

See the 2005 SPCCP for records of Non-PCB (less than 50 ppm PCBs) oil spills (8).

5.6 Asbestos-Containing Materials

Four phases of asbestos surveys were completed for FTMM. The majority of surveys took place from 1989 to 1992 and from 1997 to 2002. The surveys included all walkthrough and similar buildings. Walkthrough surveys were conducted for the purpose of establishing whether the “walkthrough” building is similar to the reference

building with respect to construction and suspect materials. The data presented on the walkthrough and similar buildings provide a general guideline on the type and quantity of ACM that can be found in these buildings. This data is used as a management tool. See **Appendix H** for the asbestos survey status for existing buildings and structures.

Since the surveys, several buildings have been demolished or renovated (gutted with all asbestos removed). The following **Table 5-14** provides a summary of the status of FTMM buildings with regard to asbestos.

Table 5-14
Fort Monmouth Buildings
Asbestos Status

Building Type	Number
Existing Buildings Fully Gutted or Constructed After 1987	72
Total Surveyed Buildings	191
Total Buildings Listed as Similar to Surveyed Buildings	153
Total Buildings Requiring Surveys	54
Total Number of Buildings	470

Source: Fort Monmouth DPW, December 2006.

Asbestos Storage and Disposal. Asbestos at one time was disposed of at installation landfills (48). See **Section 5.9** for further information on landfills.

The USATHAMA 1980 IA report (48) identified Site 10 on the MP as Asbestos Storage, and indicated that the lined, covered pits located behind Building 1220 were used for temporary storage of asbestos. The exact location of the storage area could not be pinpointed from the document. The IA stated that the storage area started operating in the 1970s and was still in use in 1980. Interviews with Department of Environmental Health personnel that were conducted as part of the assessment indicated that the storage area was located across the street to the west of Building 1220 in the grassy park.

Containers of the new spray-on asbestos were kept temporarily in a metal shed until they could be used elsewhere on the facility. The shed has sheet metal walls and is built on a concrete pad. The primary purpose of the shed has always been to store machine parts for the boiler plant. The metal shed was inspected during the 1993 site inspection and it contained metal parts only (10). Under the PA phase, the metal shed was inspected for evidence of ACMs; however, none were found. An NFA determination was approved by the NJDEP (124).

There were no RECs identified based on ACM.

5.7 Lead and Lead-Based Paint

Most facilities and buildings at FTMM were constructed before the DoD ban on the use of LBP in 1978 and are likely to contain one or more coats of such paint. In addition, some facilities constructed immediately after the ban may also contain LBP, because inventories of such paints that were in the supply network were likely to have been used up at these facilities.

The first LBP Risk Assessment was conducted in 1996. The residential buildings assessed were divided into four groups based on similar construction histories and a representative group of surveys was conducted for each area. Only results from existing buildings in groups 1-4 and 5-6 are discussed herein. Buildings belonging to the other groups have since been demolished. Survey locations are listed in **Table 5-15**.

Table 5-15
Lead-Based Paint Risk Assessment Groups

Area	Location	Building	# of Units Surveyed
MP			
1-4	Russel	261	3
1-4	Russel	262	13
1-4	Russel	218	26
1-4	Russel	219	28
1-4	Allen	226	9
1-4	Allen	225	15
1-4	Allen	226	11
1-4	Allen	227	7
1-4	Carty	266	4
1-4	Carty	266	6
1-4	Carty	268	18
1-4	Gosselin	250	35
1-4	Gosselin	235	6
1-4	Gosselin	256	45
1-4	Gosselin	255	46
CWA			
5-6	Hope	2234	336
5-6	Hope	2234	344
5-6	Hope	2233	360
5-6	Hope	2231	392
5-6	Hemphill	2235	21

Area	Location	Building	# of Units Surveyed
5-6	Hemphill	2236	20
5-6	Hemphill	2237	23
5-6	Hemphill	2240	26
5-6	Megill	2029	29
5-6	Megill	2034	37
5-6	Megill	2033	43
5-6	Megill	2031	49
5-6	Megill	2039	58

The final results of the LBP Risk Assessment for FTMM indicate that the greatest levels of LBP hazards were found in Areas 1-4. These housing units had the greatest level of exposure on the interior and exterior painted surfaces. Areas 5-6 had the next highest potential of exposure with most of the hazard stemming from chipping paint on the exterior surfaces. The analytical results show there are a few locations where the dust and soil levels were above the action level. Below is a brief summary of the findings in each of the areas assessed (14):

Housing Areas 1-4 Findings (14)

1. Most interior trim and some walls tested positive for LBP.

2. Chips and dust tested positive and exceeded the action level for lead content on exterior surfaces.

3. The highest potential lead exposure due to amount and condition of the LBP (by address):

35 Gosselin	9 Allen
6 Gosselin	4 Carty
26 Russel	6 Carty

Housing Areas 5 & 6 Findings (14)

1. Minimal interior lead dust and chips hazard.

2. Porch and exterior surfaces have deteriorating LBP.

3. Areas (by address) with greatest threat to children under the age of 6:

29 Megill	43 Hemphill
336 Hope	43 Megill
50 Megill	37 Megill
21 Hemphill	344 Hope

An LBP risk reevaluation assessment was conducted in 2000 to document any changes in existing or potential lead hazards since the initial assessment in 1996. After the 1996 assessment, housing areas 1-4 had undergone significant reconstruction, adaptive reuse, and/or were not addressed in the reevaluation. Therefore, only results from Areas 5-6 reevaluation are presented here (15).

Housing Areas 5 & 6 Findings (15)

1. Exterior surfaces have LBP in deteriorating condition and require exposure controls.

2. Some interior surfaces also require exposure controls.

Currently, the only housing areas that remain in the CWA are: Megill, Hope, Hemphill, Helms, Pinebrook, and Mitchell. All other housing listed from the CWA has been demolished. The housing on MP includes: Russel, Allen, Carty, and Gosselin. The assessments identified several areas where LBP posed hazards.

Since the assessments in 1996 and 2000, FTMM has renovated most of the Officer's Units. All of the Units on Gosselin and Carty, and half of the units on Russel were completely gutted and all exterior painted surfaces were removed or encapsulated with a LBP bonding material. Only 18 units on Russel and Allen remain that were not gutted; however, all LBP was encapsulated. Exterior LBP encapsulation was performed on 26 of the units on Megill. The Hope Road and Hemphill areas have not had any removal or encapsulation performed (13). There were no RECs identified based on LBP.

As part of the 2006 VSI, a representative number of residential units were inspected. Residential units were inspected in the 200 and 300 areas of MP and 2000 area and 3000 area of CWA. During the VSI, minor paint peeling was noted in the 200 building area of MP. However, the majority of the units were found to be in good condition.

Currently there are 177 residential buildings at FTMM. Many of these buildings contain multiple housing units. The current status of these 177 residential buildings includes: 29 buildings that have been completely gutted and all exterior LBP surfaces have been removed or encapsulated, 55 have had all exterior LBP surfaces encapsulated, and 93 have had no abatement. **Appendix H** presents a summary of LBP status by building.

Lead in Potable Water. FTMM MP and CWA have had water quality problems throughout the years with the water distribution system due to the system's age. The majority of the problems were related to corrosion and bacteria. However, there have been instances associated with lead in drinking water. As of 1998, a portion of the potable water system was still quite old (90).

Two specific problems related to lead in water were documented in Building 2700 and Building 118. One sample collected in Building 118 on May 5, 1994, showed a lead concentration above the action level. However, a second sample collected May 13, 1994, was below the action level, it was not considered a health risk (129). Sampling and testing of water fountains and sinks in Building 2700 revealed high lead levels in

certain areas of the building. Installation of a new water line into the building in 2000 completed remediation (130).

FTMM obtains potable water from the New Jersey American Water Company and maintains a State-certified water-testing laboratory, which is operated by a commercial activity contractor. The laboratory meets the requirements of the New Jersey Drinking Water Act by annually testing its potable water for bacteria, limited chemical parameters, and inorganic compounds. Samples are tested annually to meet New Jersey drinking water standards. Samples are analyzed as requested by any facility personnel (10). There were no RECs identified based on lead in potable water.

5.8 Radioactive Material

Concurrent with the performance of this ECP, a HSA was conducted to evaluate the historical use of RAM at FTMM. The HSA is included as **Addendum 1**. The presence of RAM at FTMM has been predominantly limited to certain areas and functions of the installation. Historically, laboratory R&D in the areas of radio and electronics use of vacuum tubes and radium dials, the use of ionizing radiation-producing machines, and military support equipment such as night vision goggles that contain radioactive commodities, have been among the most common uses of RAM. Facilities, buildings, and rooms that contain or once contained equipment that produce X-rays via AC or DC sources of energy are not sources of radioactive contamination. This equipment, which includes medical and dental diagnostic X-ray machines, X-ray security inspection machines, X-ray diffraction, electron microscopes, X-ray fluorescence equipment, and some high voltage electron tubes, only produce ionizing radiation when energized. Operation of this equipment will result in ionizing radiation fields being produced in and around the equipment only while activated, but will not result in radioactive contamination. Much of the activities of the past were performed as part of the Signal Corps Laboratories, first housed in the Squier Building (Building 283) and then in the Myer Center (Building 2700). Other work was performed in the Evans Area of the base, which was closed in the late 1990s due to BRAC 1993 activities and the work transferred to the CECOM safety office and laboratory in the CWA.

Presently, a research laboratory in Building 2540 in the CWA is the only site to regularly use and store RAM as part of the R&D activities performed on site. A designated storage area is set aside for drums containing material awaiting disposal, including tritium exit signs removed from FTMM buildings, smoke alarms containing RAM, and other instruments with associated check sources. These items are periodically removed to Wright Patterson Air Force Base for disposal/recycling (156). Floor drains in Building 2540 are connected to the sanitary sewer (148). The administrative arm of the CECOM Safety Office is housed in Building 2539, where they maintain files pertaining to the use of any RAM on the installation as well as active NRC licenses and ARAs for FTMM specifically as well as RAM use by the Army worldwide.

Throughout FTMM, equipment containing RAM is noted, particularly as used in chemical and explosives detectors operated by personnel working in security entrance areas, postal facilities, emergency responders, and shipping areas. Electron Capture

Detectors containing Ni-63 are used in the Environmental Laboratory to analyze samples for pesticides and PCBs. All of these types of equipment involve the use of sealed sources rather than research-type materials. Sealed sources are also not generally sources of radiological contamination.

Twenty-two buildings, building complexes, or open areas at Fort Monmouth have been identified as areas where RAM was used, stored, or potentially disposed (Cabrera Services, 2007). Historical information was reviewed to determine if there was sufficient data to declare buildings as "Impacted" or "Non-Impacted" in accordance with Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) methodology. According to MARSSIM, areas are divided into risk categories defined as follows:

Impacted (MARSSIM Class 1 and 2) – Areas with moderate to high probabilities of potential contamination.

Impacted (MARSSIM Class 3) – Areas with very low potential for contamination but with insufficient information to justify a non-impacted classification.

Non-Impacted (No Survey Needed) – Areas with no potential for residual contamination.

A summary of the buildings or areas where RAM was used, stored, or potentially disposed is provided in **Table 5-16**.

Table 5-16
Fort Monmouth Building/Areas with RAM Use/Storage History

Building Number	Classification	Building/Area Name & Use	Current Tenant and Conditions
116	Non-Impacted	Warehouse/Shipping & Receiving	Existing; used by Base Contractor for Garrison Supply, contains secure radiological storage areas.
173	Non-Impacted	Environmental Laboratory	Existing; Electron Capture Detectors are used for environmental sample analysis in designated room.
205	Non-Impacted	Wackenhut/Alutiiq Security Office	Existing; three explosives detectors are stored in Room 136.
275	Impacted, MARSSIM Class 3	Museum	Existing; several display items contain radioactive materials.
282	Non-Impacted	Main Post Fire Department	Existing; once used explosive detectors containing sources, have been removed.
283	Impacted, MARSSIM Class 3 (in unrenovated areas)	Squier Building (Administrative)	Existing; housed Signal Laboratories before they were moved to 2700, renovated to administrative space.
292	Impacted, MARSSIM Class 3	Museum Storage	Existing; several items in storage contain radioactive materials.

Building Number	Classification	Building/Area Name & Use	Current Tenant and Conditions
451	Non-Impacted	Postal Facility	Existing; once used explosive detectors containing sources, have been removed.
602	Non-Impacted	High Security Fabrication & Testing	Existing; once used explosive detectors containing sources, have been removed.
1075	Non-Impacted	Patterson Health Clinic	Existing; used radioisotopes in thyroid treatment in late 1960s - early 1970s; may have used incinerator on the grounds that has since been demolished.
2535	Non-Impacted	Battery Test Facility	Existing; battery testing facility.
2502-2507	Non-Impacted	Fabrication and Integration	Existing; CERDEC fabrication and integration of materials into military vehicles.
2539	Non-Impacted	Communications and Electronics Command (CECOM) Safety Office	Existing; administrative area.
2540	Impacted, MARSSIM Class 1	Communications and Electronics Command (CECOM) Laboratory	Existing; research and development laboratory.
2560	Non-Impacted	Charles Wood Fire Department	Existing; FTMM fire department. The building is in new condition.
2700	Non-Impacted	Myers Center (Administrative)	Existing; once used explosive detectors containing sources, have been removed.
2701	Non-Impacted	Charles Wood Entry Area	Existing; once used explosive detectors containing sources, have been removed.
2704	Non-Impacted	Environmental Test Facility	Existing; military environmental conditions testing facility.
2705	Non-Impacted	U.S. Army Communications, Engineering, Research, and Development Center (CERDEC) (formerly Army Research Laboratory (ARL))	Existing; formerly contained a Night Vision lab and had radioactive source use, currently administrative.

As reported in the 2007 HSA and summarized above, four buildings at the Property were found to be potentially impacted from historical use of RAM. The buildings and survey areas found to be potentially impacted included building Nos. 275, 283, 292, and 2540.

No comprehensive inventory of tritium exit signs within existing facilities has been completed at FTMM. However, a program was instituted in 2003 by the FTMM DPW to identify and properly dispose of all exit signs that contained tritium (H-3) in buildings

prior to demolition. As part of the Building Demolition Checklist utilized by the FTMM demolition contractor, all tritium exit signs are identified, removed and given to CECOM Safety for proper disposal, prior to the building demolition. There were no RECs identified associated with RAM.

5.9 Historical Landfills

Nine landfills were historically used at FTMM. Most of the disposal sites were out of use by the 1960s to early 1970s, with one in use (M-8) until approximately 1981. These nine landfills have been investigated under the IRP and are discussed in **Section 5.2.1**. **Table 5-17** is a summary of the landfills.

Table 5-17
Summary of Historic Landfills at Fort Monmouth

Area	Name	IRP Site	Year Opened	Year Closed	Area (acres)
CWA	CW-3A	FTMM-25	1942	1957	2.6
MP	M-2	FTMM-02	1964	1968	6.5
MP	M-3	FTMM-03	1959	1964	5.9
MP	M-4	FTMM-04	1955	1956	1.4
MP	M-5	FTMM-05	1952	1959	3.2
MP	M-8	FTMM-08	1962	1981	7.2
MP	M-12	FTMM-12	1950	1966	2.1
MP	M-14	FTMM-14	1965	1966	6.9
MP	M-18	FTMM-18	1968	1969	4.1

Structural Filling/Grading. In addition to the above listed landfills, other locations were identified during personnel interviews as historic fill areas where soils or other suitable materials were added for the purpose of increasing site elevations to meet various engineering requirements. One location in particular was the northeastern corner of MP behind Buildings 159, 167, and 173. This area was highlighted by the current Chief Facility Engineer during personnel interviews in July 2006 as an area of potential historic fill and vehicle maintenance/fuel storage operations (115). A review of the aerial photograph reports (26) indicate mounded material in photographs from the 1940s and the presence of storage vessels in subsequent years.

Oceanport Creek was dredged to create Husky Brook Lake in the 1960s. The dredged material was likely deposited elsewhere on FTMM to raise the land elevation (115). Aerial photographs were reviewed to determine areas of excavation and fill related to Husky Brook Lake. Review of aerial photographs prior to the creation of Husky Brook Lake (1963) and after the creation of Husky Brook Lake (1969), indicate activities would have been limited to areas immediately adjacent to the banks of the water body due to the presence of structures (residential dwellings) (26).

Other areas where filling operations have been suspected to occur include (115,26,27):

- Building 360 area due to the straightening of Parkers Creek bank between 1940 and 1947;
- Regrading and filling of the Building 2700 area that occurred during construction of the facility;
- Historic fill activities in marina area to build bank and annual dredging;
- Historic fill activities for the 3000 area housing due to swampy conditions prior to construction;
- Historic fill around the fire training area; and,
- The 1200 area was cleared and bulldozed during construction of the existing facilities.

Over the last 80 years, the natural topography of FTMM has been altered by excavation and filling activities prior to and during military ownership. It should be noted that it is likely that historic fill operations have occurred to some extent throughout the entire FTMM Property. In fact, urban land is the primary classification of soils on FTMM, which have been modified by excavating or filling. This is due to the shallow depth to groundwater and proximity to water bodies (Oceanport Creek, Parkers Creek, etc.). Though filling operations may have been conducted to some extent throughout the property, it is likely that the majority of these operations were conducted for engineering/structural and grading purposes, not waste disposal/landfilling. Though it is possible that waste disposal/landfilling could have been conducted at other locations, it is likely that the majority of landfilling operations occurred at the above listed locations already addressed in the IRP. Identified RECs associated with landfilling were all FTMM IRP sites.

5.10 Explosive-Contaminated Structures

There has been no history of the manufacture, storage or disposal of bulk high explosives at FTMM and there has been no record of explosive-contaminated structures.

According to the facility history, FTMM has had companies of troops based at the facility and the signal corps; therefore, ammunition magazines would have been present during these times. According to **Section 5.2.2** (MMRP) the Former Pistol Range (1935-1940 Pistol Range), the Former Outdoor Firing Range (1940-1955 Pistol Range), and the Former Skeet Range were the only documented areas that used ammunition at the installation. Small arms are the only MEC known to have been used at FTMM; therefore, explosives contamination is not likely. There were no RECs identified associated with explosive contaminated structures.

5.11 Radon

A comprehensive radon survey was conducted in 1991 by the Directorate of Engineering and Housing's Environmental Office as part of the Army's Radon Reduction Program. The survey was conducted for all three areas of FTMM (MP, CWA, and Evans Area). Radon detectors were deployed in all structures designated as priority one buildings (daycare centers, hospitals, schools, and living areas). The radon levels measured in all detectors were less then 4 pCi/L. Based upon the USEPA criteria for radon of 4 pCi/L, radon levels at FTMM do not pose a significant health risk and NFA was deemed appropriate for radon at FTMM (16). Test results and the cited memorandum of record are included in **Appendix I**. **Table 5-18** below is an overview of building addresses at which the radon surveys were conducted at MP and CWA. Addresses for all individual structures included in the survey are included in **Appendix I**. There were no RECs identified associated with Radon.

Table 5-18
Summary of Radon Testing Conducted at Fort Monmouth

Installation Area	Address (#)	Street
Charles Wood	Various	Helms Dr.
Charles Wood	018 through 029	Hemphill Rd.
Charles Wood	002, 004, 006, 008, 010, 012, 014	Hope Rd.
Charles Wood	Various	Megil Circle
Charles Wood	Various	Megil Dr.
Charles Wood	Various	Midway Ln.
Charles Wood	Various	Mitchell Dr.
Charles Wood	Various	Olangapo Ln.
Charles Wood	Various	Pinebrook Rd.
Charles Wood	Various	Subic Ln.
Charles Wood	Various	Vaughn Ct.
Charles Wood	Various	Wake Rd.
Charles Wood	101, 103, 105, 107	Corregidor Rd.
Charles Wood	001 through 014, 030, 032	Guam Ln.
Charles Wood	Various	Marshall Rd.
Main Post	002 through 032	Carty Ave.
Main Post	001, 002, 004 through 049, and 051	Gosselin Ave.
Main Post	202A & 202B	Riverside Ave.
Main Post	Various	Russel Ave.

5.12 Pesticides

Current Pesticide Operations. FTMM has an Installation Pest Management Plan which covers both MP and CWA (131). The pest management plan describes the pest management requirements and outlines the resources necessary for surveillance and control of pests. It also describes the administrative, safety, and environmental requirements of the program. The program involves contracted New Jersey-certified pesticide applicators, staff from the DPW, Director of Personnel and Community Activities, FTMM Medical Department Activity, Pest Management Coordinator, building occupants, and facility managers. Pests included in the plan are household and nuisance pests (flies, cockroaches, wasps, bees, etc.), disease vectors and medically important arthropods (ticks, mosquitoes, spiders), real property pests (termites, carpenter ants, powder post beetles), animal pests (rodents, snakes, birds), stored product pests, ornamental plant and turf pests (bagworms, white grubs), undesirable vegetation and microbial organisms, and carcass removal.

The Installation Pest Management Plan indicates that all current pesticide mixing operations are conducted at Buildings 2070 and 2071 in the southwest corner of the CWA golf course. The mixing pad is 12 x 20 feet and is constructed of reinforced concrete. A 2½-inch curb surrounds the mixing pad and serves as secondary containment. However, it should be noted that during the 2006 VSI, golf course personnel indicated that the Army currently uses a contractor for pesticide application at the golf course. A similar finding was reported by USAEHA in 1990 (142). Further, they indicated that the contractor mixed the pesticides off site and no mixing was currently being conducted at the facility. Both MWR and the DPW maintain contracts with licensed vendors for applying pesticides at FTMM. The contracts maintained by MWR are solely for the purpose of maintaining the golf course. The contracts maintained by the DPW are utilized for the purpose of maintaining all other areas of FTMM. No pesticides and/or herbicides are stored on site by either activity and all chemicals are provided under contract by the licensed vendors. The contract specifications do not allow any vendor to store any pesticide or herbicide on FTMM. Contracted application of pesticides has been in place since the mid-1980s for all of FTMM.

A current listing of the pesticides and herbicides used at FTMM is found in Appendix H of the Installation Pest Management Plan for 2001-2006 (131). All chemicals must be applied under the proper conditions or be retained off site by the vendor. The Facilities Management Division maintains a current inventory of potential use and approved contractor pesticides and copies of the inventory are sent to the Fire Department every six months.

Pest control services are provided to all tenant activities on FTMM. This includes the Health Clinic, all Reserve Centers, the Golf Course, Commissary, Post Exchange, and the Defense Reuse and Marketing Office. No RECs were identified associated with current pesticide operations.

Historic Pesticide Use. Building 2044 was formerly a pesticide mixing location at FTMM as were other locations on the facility. From review of USAEHA pest

management reviews (132,133,134,136,137,142), the 1980 IA report (48), the 1995 SI (11), and communications with FTMM DPW personnel, historic pesticide storage and mixing occurred at the following sites:

- Building T-65 – MP (FTMM-17)
- Building 498 – MP (FTMM-16)
- Building 2044 – CWA (FTMM-28)

USAEHA pest management reviews and Army environmental compliance assessments have been conducted that identified various deficiencies and inadequacies pertaining to pesticide storage and mixing operations (132,133,134).

Until the late 1950s, a pesticide storage and mixing area was located in Building 498 on the MP. The operation was subsequently moved to Building 65, which has since been demolished. Pesticide operations at Building 65 continued until the early 1980s. Both locations have been investigated as part of the IRP. Building 498 was investigated under IRP site FTMM-16 and Building 65 was investigated under IRP site FTMM-17. Five pesticide compounds were found at concentrations exceeding the NJDEP Direct Contact Soil Cleanup Criteria under the SI phase of the IRP at Building 498. A corrective action was implemented to remove the contaminated soil from the site and final remedial activities were completed in February of 1999. An NFA recommendation for FTMM-16 (Building 498) is pending NJDEP approval. Building 498 is currently used by DPW for document storage. The potential for environmental releases from former operations at Buildings 498 and 65 are considered RECs.

Chlordane residues were found in and around Building T-65 in 1990; however, sampling results indicated that the detected chlordane was from proper application (135). Localized detections of chlordane in soil were identified in the SI phase of the IRP program for this site and no chlordane was detected in groundwater. An NFA determination for FTMM-17 was approved by the NJDEP in 1994. See **Section 5.2.1** for additional information pertaining to environmental sampling conducted at these locations as part of the IRP.

An Installation Pest Management Program Survey (132) indicates that a pesticide storage room and pesticide formulation room were present in Building 167. This report was in error; there was no pesticide storage or formulation in Building 167. The information was corrected in a 1995 report to indicate that pesticide storage and pesticide formulation was located in Building 498. At the time of the 1976 survey, several holes were bored through the concrete floor in the mixing area by pest control operators testing drilling equipment used in termite treatment. As mentioned above, the 1995 SI Report (11) indicates that Building 498 was misidentified as Building 167 in the 1980 IA report (48); therefore, Building 498 was investigated due to historic pesticide storage and mixing activities as part of the IRP in lieu of Building 167.

Previous pesticide storage and mixing operations in CWA were related to golf course maintenance and occurred at Building 2044 (133,134). This building, which has subsequently been demolished, was investigated within the IRP under site FTMM-28. Building 2044 was part of a small complex of buildings located in the southwest section of the CWA golf course. The complex also included Building 2070, a large metal shed and two smaller metal igloos. Currently, Buildings 2070, 2071, and 2046 are located in the area as confirmed by the VSI. Building 2070 is used to store golf course maintenance and landscaping equipment, such as mowers and tractors. Building 2071 is used as the equipment repair facility. Building 2046 is used as a golf cart and equipment wash area and was also used for pesticide mixing until 2001.

During the IRP SI of Building 2044 (FTMM-28), soil borings were completed at two locations where pesticide mixing was documented to occur. Each boring was converted to a monitoring well in order to evaluate groundwater quality. Dieldrin was identified in one soil sample slightly above NJDEP Direct Contact Soil Cleanup Criteria. Benzene was detected in one groundwater sample above NJDEP Groundwater Quality Criteria. Two additional monitoring wells were installed during the IRP RI phase. Heptachlor epoxide and arsenic were initially detected in two of the four site monitoring wells above NJDEP Groundwater Quality Criteria. Alpha-chlordane, gamma-chlordane and 4,4'-DDD were also detected in the two monitoring wells; however, all these contaminants were identified slightly below NJDEP Groundwater Quality Criteria. Approval of an NJDEP NFA determination for FTMM-28 is pending. See **Section 5.2.1** for additional information pertaining to environmental sampling conducted at Building 2044 as part of the IRP. The potential for environmental releases from former pesticide operations at Building 2044 is considered a REC.

Previous pesticide container disposal practices included the disposal of unwashed containers in site landfills (132,11,48). See **Sections 5.2.1 and 5.8** for details of investigations conducted for landfills at FTMM. The landfills included in the FTMM IRP are considered a REC.

Previous pesticide use documented in 1974 (146) included dibrom-14 (mosquito control) and malathion (mosquito and housefly control), diazinon (cockroach control), chlordane (termite control), carbaryl (ornamental and other economic pests), warfarin (rodent control), and amitrole (weed control). Chlordane analysis in soils in the vicinity of the residence at 51 Olongapo Lane was conducted in 1984 and 1985. The highest detected concentration in soil was 36 ppm in one location (136,137). This pesticide use is not considered a REC.

FTMM personnel indicated during interviews in July 2006 that an orchard was previously (prior to Army ownership) located in CWA at the location of the current golf course and arsenic was detected in soil as part of a limited investigation of soil in the vicinity of the current clubhouse (105). Additionally, the golf course located on the eastern half of CWA was utilized as a golf course prior to Army ownership. Therefore, pesticide application would have taken place in this area prior to Army ownership. This pesticide application was likely done in accordance with the intended use of the pesticide and prior to Army ownership of the property. This is not considered a REC.

Previous pesticide use along the current and former RR lines and fences for weed control is also likely. No investigations pertaining to the potential for contamination along the former and current RR lines have been conducted to date. This pesticide application was likely done in accordance with the intended use of the pesticide. This is not considered a REC.

Sale and Distribution of Pesticides/Tenant Self Help Programs. The "Self-Help"/"Make-it-Happen" program is located in Building 481. FTMM offers a mandatory class once a month for active duty personnel. Self-Help information is available and maintained at the Self Help Store. Pest control items are available to family housing residents through the Self Help Store. Records are kept of items issued to housing occupants. This is not considered a REC. The products recommended for distribution are as follows:

1. Maxforce bait stations for cockroach and ant control;
2. Glue traps for cockroach and mouse control;
3. Boric acid for cockroach control;
4. Glue boards/single use snap traps for mouse control; and,
5. Fly paper.

The Self Service Supply Center in Building 116 does not presently offer pesticides for use and all products are pre-packaged commercially available items. This is not considered a REC.

As confirmed during the 2006 VSI, Building 1000 AAFES and Building 1007 Commissary offer pesticides for sale. These include products for pets, repellents, household, and lawn and garden use. The products are registered by the USEPA for general use; restricted use products are not sold. All pesticide products are pre-packaged and ready-to-use. Building 800 Four Seasons AAFES previously offered pesticides for sale that were registered by the USEPA for general use. These included products for pets, repellants, household, and lawn and garden use. Building 810 Veterinary Clinic offers products containing pesticides for sale to customers that are registered by USEPA and are labeled for application to animals. Animals are not treated (i.e., dipped) for fleas, ticks, or other ectoparasites in the Clinic (131). This is not considered a REC.

In 1990, USAEHA conducted a review of operations utilizing pesticides at FTMM (142). The Main AAFES facility sold a few concentrated pesticides which had a "caution" warning label/sign. No cleanup materials were readily available. The Four Seasons Store sold a few concentrated pesticides which had a "caution" warning label/sign. No cleanup materials were readily available. The Charles Wood Shoppette only sold "ready-to-use" pesticides. No details were provided on whether cleanup materials were available during that timeframe (142). Current procedures do not allow personnel to cleanup hazardous materials spills. Personnel are instructed to call 911 in the event of

a HAZMAT spill. The FTMM fire department and the environmental branch personnel respond accordingly to all HAZMAT spills. This pesticide use did not result in a REC.

5.13 Other Identified Concerns

5.13.1 Former Coal Storage Areas

Historic site plans, aerial photographs, and information obtained during personnel interviews indicates two coal storage areas formerly existed on MP – one adjacent to the RR in the northern most portion of the facility in the vicinity of Building 75 and one in the south central portion of MP along the former RR in the vicinity of Buildings 1007 and 801. Potential coal storage areas were identified along the northern RR line in aerial photographs taken in 1940, 1947, 1969, 1970, and 1974. The mid-post potential coal storage areas were identified in photographs from 1947, 1957, and 1963 (26). The former coal storage areas are considered to be RECs.

5.13.2 Vapor Intrusion

Vapor Intrusion (VI) is the migration of volatile chemicals from the subsurface into overlying buildings (149). Per NJDEP guidance and consistent with USEPA policy, the NJDEP recommends investigation of vapor intrusion where structures are within 100 feet horizontally or vertically of shallow groundwater contamination in excess of groundwater screening levels (GWSLs). In the case of the presence of petroleum hydrocarbon contamination (particularly benzene, toluene, ethylbenzene, and xylenes [BTEX]), a 30-foot distance criteria is utilized (150). Groundwater has been extensively evaluated at FTMM through the FTMM IRP and analysis of groundwater samples in conjunction with individual UST closures under the FTMM UST program. Based on the location of existing buildings and comparison of groundwater analytical results to the GWSL, VI is a potential concern at the following locations:

- Main Post:
    - FTMM-53 (Building 699) – BTEX and MTBE have been detected in groundwater above the GWSLs
    - FTMM-59 (Building 1122) – TCE has been detected in groundwater above the GWSL
    - FTMM-61 (Building 283) – BTEX have been detected in groundwater above the GWSLs
    - FTMM-64 (Building 812) – Benzene, xylene, PCE, TCE, and DCE have been detected in groundwater above the GWSLs
- CWA:
    - FTMM-22 (CW-1, Building 2700) – PCE, TCE, and DCE have been detected in groundwater above the GWSLs

- FTMM-58 (Building 2567) – Benzene, DCE, and MTBE have been detected in groundwater above the GWSLs

The Indoor Air Quality Management Plan for FTMM provides guidance to prevent adverse concerns and potential health effects from indoor air pollutants such as chemical substances (e.g., carbon dioxide, carbon monoxide) or biological substances such as mold (144). Building inspections are conducted to identify problem areas, determine the source of the problem and initiate corrective action, when necessary. Mold remediation guidelines are also presented in the plan.

5.13.3 Former Printing/Photo Processing

There have been a number of former printing/photo processing operations at MP and the CWA. Refer to **Section 4.3.2** for a description of all of the printing/photo processing operations. Environmental conditions were identified for some of the printing/photo processing operations based on the size and intensity of the operational history and the timeframe during which the operational history took place. Environmental concerns associated with printing/photo processing operations include the use of metals and solvents during a time period when waste handling procedures may not have been sufficiently protective to preclude a release to the environment. The potential for releases to the environment from printing and photo processing operations in the following buildings are considered to be RECs:

- Army Field Printing Plant Buildings 104, 105, and 106 – These buildings housed a printing operation from the early 1950s until the early 1980s. Available documentation indicates heavy use of these buildings with as many as 54 employees. There were many processes taking place that utilized chemicals including chlorinated/non-chlorinated solvents, lead, zinc, and ammonia.

- Photo processing in Building 288 – Available documentation indicates that there was a photo processing operation in this building in the early 1950s. This building was part of the extensive Squier Laboratory operation in this area throughout this timeframe.

- Photo processing in CWA Buildings 2700, 2705, and 2525. According to a 1974 IH survey, photo processing was being conducted in all three of the buildings listed above. The operations in Building 2705 and 2525 had ceased by 1980. The 2006 VSI confirmed that both of these buildings have been completely renovated. The photo processing operations were conducted on a larger scale and over a longer time period in Building 2700. This operation may have discharged photo chemicals to the sanitary sewer prior to modern waste handling procedures being implemented. The 2006 VSI indicated that the photo processing operation in Building 2700 had been converted to digital operation.

5.13.4 Former Painting/Surface Coating

There have been a number of former painting/surface coating operations at MP and the CWA. Please refer to **Section 4.3.2** for a discussion of painting and surface coating

operations. Environmental conditions were identified for some of the painting/surface coating operations based on the size and intensity of the operational history and the timeframe during which the operational history took place. Environmental concerns associated with painting/surface coating operations include the use of paints and solvents during a time period when waste handling procedures may not have been sufficiently protective to preclude a release to the environment. The potential for releases to the environment from painting operations in the following buildings are considered to be RECs:

- Painting in Buildings 283, 294, and L-3. IH surveys indicate an extensive painting operation at these buildings in the 1950s. Operations included spray painting, use of enamels, varnishes, and solvents.

- Painting in the Woodworking Shop in Building 1122. According to IH reports, the woodworking shop was used for furniture stripping during the 1970s.

5.13.5 Former Medical/Dental/Veterinary Services

There have been a number of medical services operations at MP and the CWA. Please refer to **Section 4.3.2** for a discussion of medical, dental and veterinary services. Environmental conditions were identified for some of the medical services operations based on the size and intensity of the operational history and the timeframe during which the services took place. Environmental concerns associated with medical services include the use of solvents, radioisotopes, X-ray developer, and mercury when waste handling procedures may not have been sufficiently protective to preclude a release to the environment.

- PAH in Building 1075. Building 1075 was constructed in 1961 to house PAH. Building 1075 has been used continuously since that time although it was downgraded to PAHC in 1995. Operations in the 1960s, 1970s, and 1980s included X-ray processing and laboratory operations. Operations in the building extensively used mercury containing equipment. The potential for a release to the environment from Building 1075 operations is considered to be a REC.

- Former Hospital in Building 209. Building 209 was used from the late 1920s until the 1950s as an Army hospital. Operations included X-ray processing and laboratory operations. Operations in the building extensively used mercury containing equipment. The potential for a release to the environment from Building 209 operations is not considered to be a REC.

- Veterinary Clinic in Building 810. Building 810 was constructed in 1941 and has been used for a number of years as a veterinary clinic, including storage and use of formaldehyde and other medical products per the 1999 Chemical Inventory (73). X-ray development and waste handling was carried out at Building 1075. The potential for a release to the environment from Building 810 operations is considered to be a REC.

- Former Hospital in Building 572. According to historical documents Building 572 was used as a hospital facility for a limited time period. The potential for a release to the environment from Building 572 operations is not consider to be a REC.

5.13.6 Squier Laboratory Complex

The Squier Laboratory Complex included Buildings 283, 285, 288, 292, 293, 298, S-5, S-6, S-6 Annex, S-9, S-10, S-11, S-12, and S-15. Buildings 289, 290, 291, 294, 295, L-3, T-45, X-9, X-7, and 551 have a similar operational history and are discussed in **Section 4.3.2** along with the Squier Laboratory buildings. In 1934, FTMM laboratory operations were consolidated in a new facility, Squier Laboratory. Squier Laboratory continued to be the principal laboratory on post until 1954 when the new R&D facility, Myer Center (Building 2700), was opened. The Squier Laboratory complex supported the Signal Corps Laboratories' research into batteries and electronics coatings. Environmental conditions were identified for some of the laboratory operations based on the size and intensity of the operational history and the timeframe during which the services took place. A detailed description of process operations that took place in this area is presented in **Section 4.3.2**. Environmental concerns associated with Squier Laboratory operations include the use of chemicals, solvents, radioisotopes, and metals when waste handling procedures may not have been sufficiently protective to preclude a release to the environment. The potential for a release to the environment from laboratory operations in the following buildings is considered to be a REC:

- Squier Laboratory in Building 283. Building 283 has a long and extensive history of laboratory operations.
- Building 288 was historically used for reproduction and photo processing.
- Building 291 formerly housed the Crystal Section where crystals were grown.
- Building 292 formerly housed the Climatic Section where testing of electronic equipment at environmental extremes was conducted.
- Former Building 293 housed a battery testing operation. A ground stain was observed emanating from the vicinity of Building 293 in aerial photographs taken in 1969 and 1974 (26). This Building 293 was destroyed by a fire. A second Building 293 was constructed. The new building is currently used for battery testing. Current battery testing operations are not considered a REC.
- Building 294 formerly housed a shock and vibration testing operation.
- Building 295 was used for R&D fabrication for reinforced plastics.
- Operations in Buildings S-5, S-9, S-10, S-11, and S-12 used various laboratory chemicals in hoods for the manufacture and testing of dry cell batteries.
- Building L-3 was used for paint experimentation.

- Building T-45 was used for the experimental manufacture of storage batteries.
- Building X-9 was used for testing gasoline engines.
- Building X-7 was used for mixing acids.

5.13.7 Former Laboratories

There have been a number of laboratory operations at MP and the CWA. Please refer to **Section 4.3.2** for a discussion of former laboratory operations. Environmental conditions were identified for some of the laboratories operations based on the size and intensity of the operational history and the timeframe during which the activities took place. Environmental concerns associated with laboratories include the use of solvents, X-ray developer, and mercury when waste handling procedures may not have been sufficiently protective to preclude a release to the environment. The potential for a release to the environment from laboratory operations in the following buildings is considered to be a REC:

- Former Water Quality Laboratory in Building 680. A 1976 IH Survey noted chemical analyses for water quality, using standard laboratory chemicals, performed at Building 680. The report also recommended decontamination of sodium azide in laboratory lead pipes. Storage of cyanide salts and mercury bichloride at Building 680 was reported in a 1981 Hazardous Waste Management Survey. The building has since been demolished.

- Former Eatontown Laboratory Area in Building 2525. AVRADCOM electronic and chemical laboratories were transferred to Building 2525 from the Myer Center. Facility personnel reported that additional chemical and electronic laboratories were housed in this building both prior and subsequent to AVRADCOM. The entire building has been renovated since its laboratory days and is currently used in an administrative capacity. A review of the DPW map and engineering drawings repository indicated a 2-inch “acid proof drain” leading from Bay 1 to a dry well southeast of the building. Floor drains were shown to discharge to the brook northwest of the building. The main sanitary sewer line from the building is shown to discharge to septic tank and leach field east of the building. Building revitalization plans show all floor drains were later connected to the sanitary sewer system.

- Battery Testing Operation in Building 2535. Battery testing has been conducted in the Area of Building 2535 since the early 1940s. Battery tests are carried out in trailers in the Area of Building 2535. If a battery test fails, the battery may release its contents. Although the current operation performs modern waste handling, historically this may not have been the case.

- Laboratory Operations at the Myer Center in Building 2700. Building 2700 has an extensive history of laboratory operations. These operations have resulted in releases that are addressed within the installation restoration program earlier in

this section. A description of operations at the Myer Center is presented in **Section 4.3.2** of this report.

5.13.8 Former Shops

There have been a number of shops within the MP. Environmental conditions were identified for some of the shop operations based on the size and intensity of the operational history and the timeframe during which the activities took place. Environmental concerns associated with shops include the use of solvents, petroleum products, and metals when waste handling procedures may not have been sufficiently protective to preclude a release to the environment. The potential for a release to the environment from shop operations in the following buildings is considered to be a REC:

- Shop in Building 279. Building 279 is referenced as the Ordnance Field Shop, Post Ordnance Shop, or similar title in IH Survey reports throughout the 1950s. Operations described included auto repair, parts cleaning and battery charging. A 1973 IH Survey referred to Building 279 as the Wheel Track Vehicle Shop, which performed vehicle testing and repairs. Automotive maintenance was reported during a Hearing Conservation Survey in 1978. Motor Pool operations included former waste oil ASTs and TCE parts cleaners. All TCE parts cleaners were eliminated from use (MP and CWA) in February of 1994 under EPR Project FM0094F088.

- Refrigerator Equipment Repair in Building 281. Based on available IH reports, Building 281 was used for repairing refrigerant containing equipment from the 1950s into the 1970s. Chemicals utilized included carbon tetrachloride, Freon (and other refrigerants), methyl chloride, sulfur dioxide, Varsol and methyl chloroform (trichloroethane). According to the 1950 IH Survey, Building 281 also housed a machine shop where machining and blacksmithing was performed and silver brazing occasionally using cadmium containing brazing wire was reported in 1973.

- Former Shop Operations in Building 483. Building 483 was historically used for soldering and parts cleaning using organic solvents and dry cleaning fluid. Building 483 was demolished prior to 1997.

- Former Shop Operations in Building 484. Building 484 was formerly used as a spray painting and for auto body work utilizing lead filler and welding.

5.13.9 Halon

Halons are a group of chemical compounds which can contain bromine, chlorine, and fluorine. Halons are used as fire extinguishing agents, both in built-in systems and in hand-held portable fire extinguishers. They are low toxicity, chemically stable compounds that, as long as they remain contained in cylinders, are easily recycled for reuse. Because halons are safe and leave little residue, they gained widespread acceptance for use in computer rooms, communications centers, electronic centers, and in military applications. Two forms of halon, halon-1211 and halon-1301, are commonly

used as fire suppressants. However, halon-1211 is not documented to have been utilized at FTMM. Halon production in the U.S. ended on December 31, 1993, because they contribute to ozone depletion (151).

A total of 1,343 pounds of halon-1301 fire suppressant is currently present in Building 1203 at FTMM, below the quantity that necessitates notification under CERCLA §120(h). The halon-1301 present in Building 1203 is owned by a tenant federal agency, not the Army. No other halon fire suppressant is present at FTMM. A comprehensive removal initiative was conducted in 2003 to remove halon-1301 from all other facilities at FTMM. **Table 5-19** summarizes the buildings from which halon-1301 was removed during this initiative (152).

Table 5-19
Summary of Former Halon 1301 Locations at Fort Monmouth

Building	Room	# of Tanks	Total LBS	Volume cu ft
Main Post				
199	-	1	336	13440
	-	1	338	13520
	-	1	338	13520
	-	1	226	9040
	-	1	220	8800
	-	1	220	8800
1150	-	1	303	12120
1152	-	10	95	38000
1209	312	1	35	1400
	311A	1	25	1000
	314	1	15	600
	314	1	158	6320
	314	1	30	1200
	314	1	80	3200
	315	1	161	6440
	315	1	161	6440
	315	1	161	6440
	315	1	82	3280
	315	1	161	6440
	316	1	35	1400
	319	1	87	3480
	320	1	20	800
	320	1	153	6120
	321	1	15	600
1210	107	1	60	-
	107	1	194	7760
	106	2	196	7840
	104	1	320	14400
	104	1	325	14400

Building	Room	# of Tanks	Total LBS	Volume cu ft
	104	1	320	14400
	103	1	325	14400
	103	1	173	6920
	103	1	320	14400
	103A	1	60	2400
	103	1	112	4400
	103	1	60	2400
	103	1	60	2400
	103	1	196	7840
	103	1	60	2400
	108	1	205	8200
	108	1	169	8200
	G01	1	360	14400
	G01	1	90	3600
	G01	1	250	10000
	G01	1	250	10000
	G01	1	300	12000
	G03	1	75	3000
	G03	1	375	15000
	G03	1	375	15000
	G27	1	156	6240
	G28	1	162	6480
	G15	1	235	9400
	G15	1	0	0
	G11	10	1	400
	G3	1	15	600
	G10	1	-	-
	G03	1	60	-
	104	4	60	-
	105	1	60	-
	108	1	60	-
Charles Wood Area				
2700	4D330	1	250	10000
	4D330	1	250	10000
	4D330	1	300	10000
	4D330	1	300	10000
	4D404	1	275	11000
	4D404	1	275	11000
	4D404	1	275	11000
	4D410	1	170	6800
	4D406	1	345	13800
	4D206	1	584	23360
	Mach Rm 43	1	554	22160
	4C415	1	345	13800
	4C415	1	345	13800

Building	Room	# of Tanks	Total LBS	Volume cu ft
	4C415	1	345	13800
	3C321	1	248	9920
	3C321	1	264	10560
	3C321	1	280	11200
	3C321	1	282	11280
	3C321	1	150	6000
	3C321	1	288	11520
	3C321	1	248	9920
	3D324	1	250	10000
	3D324	1	245	9800
	3D324	1	285	11400
	3D324	1	275	11000
	3D324	1	275	11000
	3D402	1	330	13200
	3D404	1	295	11800
	3D406	1	295	11800
	3D410A	1	295	11800
	3D410A	1	295	11800
	3D410	1	260	10400
	3D409	1	135	5400
	2D404	1	348	13920
	2D404	1	348	13920
	1B400	1	90	3600
	1B400	1	0	0
	1B400	1	0	0
	1B400	1	0	0
	1B400	1	0	0
	1B400	1	0	0
	OA415	1	240	9600
	OA336	1	290	11600
	OA336	1	290	11600
	OA334	2	1007	44320
	OA337	1	0	0
	OA337	1	0	0
2705	-	1	50	2000
	-	1	101	4040
	-	3	150	6000
	-	2	0	0
2707	-	1	103	4120
	-	1	86	3440

5.13.10 Building 2704 Environmental Test Chamber Facility

Building 2704 has been used as an environmental test chamber since 1965. Chemical use in this building is limited to hydraulic fluid and standard shop chemicals (i.e., petroleum-based solvents, oils and greases). While current waste handling practices are modern, historical waste handling practices are unknown. The building has multiple floor drains which, according to engineering drawings, are connected to the storm sewer. The potential for a release to the environment from historical building operations is considered a REC.

5.13.11 Sanitary Sewer System

Currently, FTMM maintains a sewage collection system that consists of approximately 23 miles of underground distribution lines and 19 sewage pump stations. Five of the pump stations are located at CWA and the remainder of the pump stations are located throughout MP (50). The sewage collection system ultimately connects to the local sewerage authority (Two Rivers Water Reclamation Authority) at two connection points, one at the MP and one at CWA (90). Analytical sampling conducted in mid-2002 of the sewage discharge at both junction points indicated that FTMM is not a significant industrial user and does not require any treatment of the discharge nor does FTMM require a significant industrial user permit from the NJDEP.

Prior to the current configuration of the sewage system, FTMM maintained two government-owned STPs. One STP on MP and the other on CWA. The MP had a pre-1941 STP and a second STP constructed in 1941 when that one was taken offline. The CWA STP was constructed in 1942. Sewage was treated at government owned plants until 1975 when the FTMM collection system was tied into the regional system. Review of FTMM engineering drawings as part of this ECP there were numerous sinks and floor drains tied into the sanitary sewage collection system at laboratories and testing facilities. Because these connections to the sewage collection system were made prior to modern waste handling procedures, discharge of hazardous substances to the collection system was likely. Of particular concern is the potential for recalcitrant chemical such as mercury. The FTMM sewage connection system is of concern. Waste handling procedures were improved by 1975. By the mid-1980s, there were no chemical waste streams being discharged to the sanitary sewer.

5.14 Identification of Uncontaminated Property

The U.S. Army's ECP process characterizes the existing environmental conditions at a given site. Properties were classified according to their environmental condition based on DoD guidance into the following categorization:

- ***ECP Category 1 – Areas Where No Release Or Disposal Of Petroleum Products Has Occurred (Including Migration).*** ECP Category 1 parcels areas are areas where no release or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas). A parcel cannot be designated as Category 1 unless a site-specific

assessment has been made, as required by Sec. 120(h)(4) of CERCLA. The assessment must include a review of the property chain of title documents, records search and review, review of aerial photographs, a visual inspection of the area, and interviews with current and former employees and military personnel regarding their knowledge of past and current activities at the area. If the assessment indicates that hazardous substances or petroleum products have been released, or disposed of at the area, it is disqualified as an ECP Category 1 parcel and must be placed in one of the six other categories.

- Five ECP Category 1 parcels at the MP (totaling 297.8 acres) were identified as "uncontaminated" property. Four ECP Category 1 parcels at the CWA (totaling 291.6 acres) were identified as "uncontaminated" property. The combined acreage of "uncontaminated" properties comprises approximately 589.4 acres. Historical records reviewed and the VSI found no indication that the release or disposal of hazardous substances or their derivatives has occurred, including no migration of these substances from adjacent areas. The uncontaminated properties are listed in **Appendix A**.

- A total of 86 ECP Category 2 through 7 Parcels consisting of 536.6 acres were identified on MP (339.2 acres) and CWA (197.4 acres). Parcel numbering was assigned to each area where a REC was identified.

Areas of the installation that contained other qualifying issues, including asbestos, LBP, PCBs, radon, UXO, and radionuclides have also been identified in separate qualified parcels. Parcels with qualifying issues overlap ECP Category 1 through 7 parcels. A summary of the parcels located at FTMM is attached as **Appendix A**. Parcels with ECP and qualifying issues are shown on **Figures 19 and 21** for MP and **Figures 20 and 22** for CWA, respectively.

5.15 Description of Remaining Property

Properties other than Category 1 are classified as Categories 2 through 7. Property classifications of Categories 2 through 7 have RECs or the potential for environmental release with insufficient documentation to be classified as ECP Category 1. The ECP classification descriptions for Categories 2 through 7 are as follows:

- ***Category 2 – Areas Where Only Release or Disposal of Petroleum Products Has Occurred.*** Category 2 parcel designation is limited to those areas where only release or disposal of petroleum products occurred. Category 2 includes those areas where an assessment documents release or disposal of petroleum. A determination of this area type must be made in accordance with the same requirements of Sec. 120(h)(4) of CERCLA described for Category 1 parcels. Twenty-six locations on MP and 22 locations on CWA qualified as Category 2 properties.

- ***Category 3 – Areas of Contamination Below Action Levels.*** Category 3 parcels are defined by CERFA as areas where investigation indicates that

storage, release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that are below levels requiring any removal or remedial response action to protect human health and the environment. This category designation cannot be made without sampling and analytical results of affected environmental media. Two locations on MP and one location on CWA were designated as Category 3 properties.

- ***Category 4 – Areas Where All Necessary RAs Have Been Taken.*** Category 4 parcels are areas where storage, release, disposal, and/or migration of hazardous substances occurred, and all removal or RAs necessary to protect human health and the environment have been taken. Category 4 includes those areas where an assessment documents release or disposal, but all RAs have already been taken to meet the requirements of Sec. 120(h)(3) of CERCLA. Sec. 12(h)(4)(B)(I) of CERCLA clarifies the meaning of "all RA has been taken." Nine locations on MP and three locations on CWA were designated as Category 4 properties.

- ***Category 5 – Areas Of Known Contamination Where Release, Disposal and/or Migration of Hazardous Substances Has Occurred, and Removal and/or RA Underway.*** Category 5 parcels are defined as areas where storage, release, disposal, and/or migration of hazardous substances has occurred and removal and/or RAs are underway, but all required RAs have not yet been taken. Category 5 parcels are documented by sampling and analysis as containing environmental media contaminated at concentrations that exceed applicable regulatory action levels. RAs for the Category 5 parcel may be in the design or implementation phases but not yet fully demonstrated to USEPA as successful. Eight locations on MP and two locations on CWA were designated as Category 5 properties.

- ***Category 6 – Areas of Known Contamination Where Required Response Actions Have Not Been Taken.*** Category 6 parcels are areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, but required response actions have not yet been taken. Category 6 parcels are documented by sampling and analysis as containing environmental media contaminated at concentrations that exceed applicable regulatory action levels, and required RAs have not yet been selected, implemented, or demonstrated. No locations on MP and no locations on CWA were designated as Category 6 properties.

- ***Category 7 – Areas That Are Not Evaluated or Require Further Evaluation.*** Category 7 parcels are defined as those areas where storage, release, disposal, and/or migration of hazardous substances is suspected, but are either not evaluated, or require additional evaluation to determine the environmental condition of the parcel. This parcel type lacks adequate documentation to fit into any of the six previous categories. Ten locations on MP and three locations on CWA were designated as Category 7 properties.

Areas of the installation that contained other qualifying environmental or safety issues, including asbestos, LBP, PCBs, radon, UXO, and radionuclides have also been identified in separate qualified parcels. Parcels with qualifying issues overlap ECP Category 1 through 7 parcels. A summary of the parcels located at FTMM is attached as **Appendix A**. Parcels with ECP and qualifying issues are shown on **Figures 19 and 21** for MP and **Figures 20 and 22** for CWA, respectively.

5.16 National Environmental Policy Act

The Army's BRAC mission is to close or realign installations, conduct environmental cleanup, and expeditiously transfer excess real properties. The first step in the environmental cleanup process is to determine whether any contamination is present and, if so, determine whether it presents a potential threat to future users of the subject real property. In the past, comprehensive data gathering activities were performed independently from one another during the development of DoD required reports and surveys (i.e., archives search report, radiological survey report, etc.). Since these activities were performed independently, sharing of resources, budget, information, analysis, safety issues, etc., may not have been adequate. The ECP process combines the efforts of archives search report, radiological survey report, and other data gathering activities (e.g., natural/cultural resources, munitions response investigations, etc.). Likewise, the ECP process provides timely and pertinent information into the National Environmental Policy Act (NEPA) process. Collectively, this results in a more cost-effective, streamlined approach, providing a comprehensive environmental characterization and expedited property transfer. There is a statutory requirement for the performance of an EA which is currently being performed.

Recent NEPA Documentation. As of the date of this report, initiation of the 2006 NEPA review was pending at FTMM. However, the EA conducted for the Credit Union Facility (Building 495) was available (138). It was noted during the VSI interview with the DPW NEPA Coordinator that an EA was conducted in 1993 and modified in 1995, and an EA was conducted in 2004 in relation to the formerly proposed Residential Communities Initiative (145).

5.17 Applicable Regulatory Compliance Issues

The Army currently tracks issues concerning compliance with environmental laws and regulations through the Environmental Quality Report and formerly used the Army Compliance Tracking System. The installation is required to enter lawsuits, notices of violation and warning letters into the system and to track response actions. **Table 5-20** lists pertinent compliance/noncompliance data from inspections of FTMM (25).

Table 5-20
Pertinent Compliance/Noncompliance Data

Date	Statute	Description	Status
4/30/1997	Air Emissions/CAA	Equipment operated without a permit. No further description provided.	Resolved
5/27/2003	Air Emissions/CAA	MP Building 207 natural gas fired boiler was a significant source operating without a valid permit. Permit modification submitted on 6/10/2003.	Resolved
5/17/2005	Air Emissions/CAA	Operated a natural gas emergency generator during periods in 2003 that were not involuntary power curtailments, maintenance problems, or for testing the generator	Resolved
4/21/2006	Air Emissions/CAA	Late annual compliance certification form submission.	Administratively Resolved

A multimedia inspection conducted in 2000 by the USEPA found two programmatic area deficiencies for USTs and SPCC (139). The leak detection system in Building 273 was found outdated and the sump sensors were not working properly. Several deficiencies were noted in the SPCC program, including the plan did not address oil-filled transformers, the plan did not address secondary containment for tank truck loading areas, transformer substation by Building 801 did not have secondary containment, and loading areas for the marina and golf course ASTs did not have secondary containment. Follow-up correspondence received from the USEPA on November 8, 2002 (140) confirmed the above deficiencies in the SPCC program had been corrected.

5.18 Adjacent Properties

The character of land use surrounding the FTMM properties typifies mixed use, small town development in New Jersey. Commercial services and shopping centers populate main roads, periodically interspersed with a residential structure, apartments, or an office building. Boundaries between towns are typically unnoticeable, although each town still tries to maintain a downtown “Main Street” shopping district. New tracts of housing subdivisions offer privacy from commonly traveled roads. Old residential development is characteristically along grid-style side roads which are quickly becoming encroached with small business and commercial service endeavors. Business and light industrial parks are tucked away along highways, streams, and RR tracks. **Figure 23** presents a schematic representation of general land use categories surrounding FTMM.

Main Post. The FTMM MP is surrounded by four towns. Little Silver lies to the northeast, Oceanport to the southeast, Eatontown to the southwest, and Shrewsbury to the northwest. The northeast boundary of MP is bordered by the Shrewsbury River, from the northeast corner to the area north of Battery Avenue, where the water narrows and becomes known as Parkers Creek. The downtown commercial and business district of Little Silver runs along Oceanport Avenue. Light industrial businesses are located east of Oceanport Avenue, commercial businesses, including an animal hospital

are located along the west side of Oceanport Avenue. An apartment complex is also located along the west side of Oceanport Avenue. Gas stations, the RR station, and various stores surround the intersection of Oceanport Avenue and Sycamore Avenue. Further to the east, development is primarily residential. The eastern boundary of FTMM MP is the RR tracks with residential development along Horseneck Point Road.

The southeast boundary of MP is bordered by Oceanport Creek, from the southeast corner to Wallington Avenue, where the water narrows. The area south of Oceanport Creek and east of the RR tracks is developed with residential structures. Monmouth Park Racetrack is just west of the RR, south of Bridgewaters Drive. Main Street in Oceanport borders FTMM MP to the south, west of Oceanport Avenue. Residential houses, a church, and houses converted to small service businesses are located along Main Street to the south. The land immediately adjacent to MP, north along Main Street, is residential development and a fire station. Another small area of residences border the south boundary of MP north of the intersection of Main Street and Broad Street. The Eatontown Sewage Authority, a church, residences, apartments, and the Eatontown municipal building are adjacent to the south of MP along Throckmorton Avenue.

The intersection of Broad Street and Main Street, Eatontown is located to the southwest of FTMM MP. Small commercial stores, restaurants, and gas stations line Main Street in this area. A park surrounds Wampum Lake north of West Street. Storage USA is immediately adjacent along the southwest boundary of MP, developed with an office and six self-service storage buildings. Two gas stations are located at the intersection of Main Street and Tinton Avenue. North along Main Street, the area is developed with banks, hotels, office buildings, and shopping centers. The Revmont Park Office Building is immediately adjacent to MP on the northwest corner of the property, followed by Register Plaza Office Park, and a shopping center. As Main Street heads north towards Sycamore Avenue, development trends towards older residential structures. North of MP, Lafetra Creek runs along the property line. North of the creek are wooded areas with new subdivision housing developments. The entire area north of MP to Sycamore Avenue is primarily residential development.

Table 5-21 highlights specific properties observed during the adjacent property survey and the regulatory database review. The properties highlighted were documented with releases of contaminants or were observed with potentially hazardous substances on their premises.

Table 5-21
Properties Observed During Main Post Property Survey

Location	Property	Concern	Potential Impact
Oceanport & Main	Abandoned Shell Gas Station	Observed monitoring wells. SHWS – Closed with restrictions 3/2005 (1).	Low due to hydraulic separation by Oceanport Creek.
61/63 Main Street	Residence	Observed AST along MP fence line.	High if there is a release.

Location	Property	Concern	Potential Impact
9 Monmouth Park Place	Hi Tech Turf	Observed 55-gallon drum and AST. SHWS – Active 4/2004 (2).	High due to status and upgradient location.
25 Lake Avenue		SHWS – Active 10/2005 (3).	High due to status and upgradient location.
330 Broad Street		SHWS – Active 04/1997 (4).	Moderate due to date and upgradient location.
25 Cloverdale Ave		SHWS – Active 09/2005 (5).	High due to status and upgradient location.
29 Rose Court	Residence	New Jersey Spills & VCP – 11/1999 (6).	Moderate due to date and upgradient location.
Broad & Rose	Getty Gas Station	Observed monitoring wells. SHWS – Active 08/2004 (7).	High due to status and upgradient location.
Route 35 & Tinton	LukOil Gas Station – previous location of Mobil Station	SHWS – Active 04/1997 (8).	Moderate due to date and upgradient location.
Route 35 & Tinton	Exxon Gas Station	HIST LUST 1991 (9).	Moderate due to date and upgradient location.
160 Main Street (Rt. 35)	Abandoned Amoco Gas Station	Observed monitoring wells. SHWS – Active 01/2001 (10).	High due to status and upgradient location.
37 Tinton Avenue	Residence	SHWS – Active 10/2000 (11).	High due to status and upgradient location.

1. Pages 222 to 230 in EDR report.
2. Pages 239 to 244 in EDR report.
3. Page 271 in EDR report.
4. Page 261 in EDR report.
5. Pages 332 to 333 in EDR report.
6. Pages 258 to 260 in EDR report.
7. Pages 251 to 258 in EDR report.
8. Pages 369 to 372 in EDR report.
9. Page 323 in EDR report.
10. Pages 226 to 230 in EDR report.
11. Page 324 in EDR report.

Source: (23,24).

Charles Wood Area. The FTMM CWA is surrounded by two towns. Eatontown lies to the east and south and Tinton Falls lies to the west and north. Tinton Avenue runs along the entire northern boundary of the CWA. North of the Golf Course, across Tinton Avenue, the land is developed with apartment complexes and the Ranney School. The northern branch of Parkers Creek also bisects this area. The land area north of Tinton Avenue and west of Hope Road is developed with apartments, residential structures and the Monmouth Regional High School. Further west on Tinton Avenue, across the Garden State Parkway, a nursery business occupies a large tract of land.

Tinton Falls Borough DPW facilities are located along the entire western property line of the CWA. Construction of new buildings is underway closest to Tinton Avenue. South of the new construction are the police department buildings. Further south are DPW storage warehouses for equipment, sand, and mulch, parking, a fueling station, and the equipment/truck storage yard. The DPW also operates a recycling collection center in this area. The southwest adjacent land appears to be cultivated with rows of bushes or

trees. West of the DPW facilities is the Garden State Parkway and the Monmouth County Highway Department Site 3&6. Materials, equipment, sand, and mulch are stored outside in this area.

The southern boundary of the CWA is Pine Brook Road. A light industrial park is located along Park Road, from the southwest corner of the CWA to Hope Road. Businesses in this area include Standard Co., Hatteras Press, the Residence Inn, Garden State Delivery, IROC, DRS Technologies, Comcast, Ranger Industries, the Mariott, and Appleby's. Several commercial establishments are located along Pine Brook Road, south of the CWA, including an air conditioning and heating contractor, a construction contractor, and a 7-11.

East of Hope Road, along Pine Brook Road to the south, the area is developed with office buildings and apartment complexes. Further south is Route 36. Apartment complexes and the Veter School are located adjacent to the southeast corner of the CWA. The Eatontown DPW is located to the east of the CWA along Pine Brook Road. The facility has storage buildings, outside storage of materials and equipment, and a fueling station. An RR switch storage yard and the Indian Head Enterprises (utility, pipe, and sewer company) is also located in this area along Pine Brook Road. Another RR materials and equipment storage yard boarders the CWA property to the east off of Maxwell Road. The Borough of Eatontown also operates a recycling collection center along Lewis Street to the east of the CWA.

Maxwell Road runs along the eastern border of the CWA golf course. Fiore Paving facilities are located along Maxwell Road next to the RR tracks. Further north along Maxwell the area is developed with residential structures. Several residences were observed to have ASTs.

Table 5-22 highlights specific properties observed during the adjacent property survey and the regulatory database review. The properties highlighted were documented with releases of contaminants in the EDR report or were observed with potentially hazardous substances on their premises.

Table 5-22
Properties Observed During Charles Wood Area Property Survey

Location	Property	Concern	Potential Impact
539 Tinton Avenue	Concession Supply Co.	Observed AST & Cylinders. SHWS – Active 05/2002. Inst Control – 08/2005 (1).	High due to status and upgradient location.
535 & 556 Tinton Avenue	Tinton Falls Borough	Observed AST and outside equipment /materials storage. SHWS – Active 10/1999 (2).	High due to status and upgradient location.
600 Tinton Avenue	CECOM (7)	SHWS – Active 12/2005 (3).	High due to status and upgradient location.

Location	Property	Concern	Potential Impact
Pine Brook Rd & GSP	Monmouth Co. Highway Dist 3&6	Observed outside storage of equipment/materials. SHWS – Active 11/1995. Class. Exempt area (4).	High due to status and upgradient location.
100 Park Road	Standard Co	Observed outside storage of equipment/materials. HIST LUST/New Jersey Release.	Low due to NFA 09/1994.
45 Park Road	Hecon Corporation	CERCLA – NFRA TSDF	Low due to NFA 11/1998.
14 Park Road	Mazel Company	CERCLA-NFRA	Low due to NFA 04/1984.
1 Coldstream Way	Metallurgical Industries	Area observed to be vacant field. CERCLIS – RA 06/1997. SHWS – Active 03/1995. ISRA – 03/1995 (5).	High due to status and upgradient location.
Pinebrook & Hope Road	Fitzpatrick & Associates	Observed outside equipment/materials storage.	High if there is a release.
250 Pine Brook Road	Eatontown Borough	Observed AST and outside equipment /materials storage. SHWS – Closed with Restrictions - 08/1995. Inst Control - (6)	Moderate due to continued fueling operations and closure status with restrictions.
37 Maxwell Road	Fiorri Paving	Observed outside equipment/materials storage. New Jersey Manifest.	High if there is a release.
Maxwell & Mill	Residence	Observed AST.	High if there is a release.

1. Pages 137 to 139 & 146 to 148 in EDR report.
2. Pages 128 to 137 in EDR report.
3. Pages 153 to 155 in EDR report.
4. Pages 217 to 221 in EDR report.
5. Pages 208 to 217 in EDR report.
6. Pages 157 to 162 in EDR report.
7. CECOM leased this office building until 1995/1996

1.-6. Source: (23,24).
7. Source: (95).

Adjacent properties have impacted the surface water quality of FTMM. Historically, discharges to surface water from industrial properties upstream of MP have impacted FTMM surface water quality. Historically, there was concern that FTMM sewage plants were degrading surface water quality. In response to NJDEP concerns that sewage discharges were causing deleterious effects on Parkers Creek, an evaluation of the effluent and the receiving streams was performed in 1971. The evaluation concluded that the effluent met all written requirements of federal, state and local water pollution agencies. There was no visual evidence of contamination, no noticeable sewage odor and the color and turbidity of the effluent were less than that of the receiving stream (98). A thick black sludge layer was identified in Parkers Creek, which was largely attributable to historically deposited sewage from the MP STP (91). Another evaluation of the impact of wastewater discharges on the environment concluded that the impact was minimal (99). It was noted that the condition of the streams entering the installation were of similar or poorer quality due to a variety of upstream industrial operations such as styrofoam cup manufacturing, metal plating and photo processing as well as

domestic discharges. Water samples collected from Wampum Brook upstream of the CWA STP outfall indicated no evidence of life in the brook (91).

Based on the historical assessments of MP surface water discussed above and recent surface water monitoring data, the most severe impacts to surface water were the result of historical discharge from industrial sites upstream of FTMM. Additional discussion of FTMM surface water quality is presented in **Section 4.4.2.2** of this document.

6 Conclusions

Based on a review of all available environmental reports, related documents, historical documentation and environmental databases as well as interviews with knowledgeable parties and VSIs, the following conclusions were reached.

Five ECP Category 1 parcels were identified as uncontaminated property on the MP, totaling approximately 297.8 acres. Four ECP Category 1 parcels at the CWA were identified as uncontaminated property, totaling approximately 291.6. Together these parcels comprise approximately 589.4 acres. Historical records reviewed and the VSI found no indication that the release or disposal of hazardous substances or their derivatives has occurred, including no migration of these substances from adjacent areas.

Fort Monmouth maintains an active and thorough environmental program. No RECs were identified as a result from ongoing operations. RECs were identified from historical operations. Fort Monmouth has a significant history of heating oil and gasoline storage utilizing USTs. While nearly all (97 percent) of the USTs have been removed and NJDEP approval of the closures secured, parcels have been identified based on leaks that occurred in the past that have already been remediated. ECP Category 2 is assigned for all releases regardless of the status of the cleanup of each release. Other RECs identified in the ECP were predominantly the result of historic laboratory operations, historic motor pool operations, and shops which supported mission activities.

Fifty-five areas on the MP and 31 parcels in the CWA were identified as ECP Category 2-7 Parcels measuring approximately 536.6 acres as follows:

- Category 2 – Areas where only release or disposal of petroleum products has occurred. A total of 48 parcels were assigned ECP Category 2 – 22 on Charles Wood Area and 26 on Main Post. Areas measuring approximately 268.4 acres are classified as ECP Category 2 property (86.4 acres on Charles Wood Area and 182.0 acres on Main Post).

- Category 3 – Areas of contamination below action levels. A total of three parcels were assigned ECP Category 3 – one on Charles Wood Area and two on Main Post. Areas measuring approximately 4.1 acres are classified as ECP Category 3 property (1.6 acres on Charles Wood Area and 2.5 acres on Main Post).

- Category 4 – Areas where all necessary RAs have been taken. A total of 12 parcels were assigned ECP Category 4 – three on Charles Wood Area and nine on Main Post. Areas measuring approximately 29.2 acres are classified as ECP Category 4 property (1.1 acres on Charles Wood Area and 28.1 acres on Main Post).

- Category 5 – Areas where an RA is underway but not yet completed. A total of ten parcels were assigned ECP Category 5 – two on Charles Wood Area and eight on Main Post. Areas measuring approximately 55.7 acres are classified as ECP Category 5 property (2.7 acres on Charles Wood Area and 53 acres on Main Post).

- Category 7 – Areas that are not evaluated or require further evaluation. Thirteen parcels were assigned ECP Category 7 – three on Charles Wood Area and ten on Main Post. ECP Category 7 areas measure approximately 179.2 acres (105.7 acres on Charles Wood Area and 73.5 acres on Main Post).

7 Certification

All information/documentation provided accurately reflects the condition of the property. This report meets the DoD requirements for completion of an ECP Report.

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Fort Monmouth

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