U.S. Army BRAC 2005
Environmental Condition of Property Report
Walter Reed Army Medical Center, Main Post
Washington, D.C.

Final 15-December-2006

Table of Contents

List of Figures

List of Tables

List of Appendices

Addendum

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
µCi	microCuries
µg/100 sq cm	micrograms per 100 square centimeters
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
AAI	All Appropriate Inquiry
ACM	Asbestos-Containing Material
ACSIM	Assistant Chief of Staff for Installation Management
AEC	Atomic Energy Commission
AEDB-R	Army Environmental Database-Restoration
AFIP	Armed Forces Institute of Pathology
AIR	Air Photographics, Inc.
AIRS	Aerometric Information Retrieval System
AMC	Army Medical Center
amsl	above mean sea level
AR	Army Regulation
ARA	U.S. Army Radiation Authorization
ARNG	Army National Guard
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
BEC	BRAC Environmental Coordinator
BRAC	Base Realignment and Closure
CAA	Clean Air Act
CAFO	Consent Agreement and Final Order
CC	Compliance-Related Cleanup
CERC-NFRAP	CERCLIS No Further Remedial Action Planned database
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
CICS	Chemicals in Commerce Information System
CONSENT	Consent Decrees database listing from Superfund/CERCLA
CORRACTS	Corrective Action Report (Federal Database)
CWA	Clean Water Act
D.C.	District of Columbia
DCERA	District of Columbia Environmental Regulation Agency
DD	Decision Document
DMM	Discarded Military Munitions
DoD	U.S. Department of Defense
DPW	Department of Public Works
DRMO	Defense Reutilization and Marketing Office
DRO	Diesel-Range Organic
EA	EA Engineering, Science and Technology, Inc.
EA	Environmental Assessment
EBS	Environmental Baseline Survey

Acronym	Full Title
ECP	Environmental Condition of Property – Site assessment and characterization, including CERFA clean parcel designations
EDR	Environmental Data Resources, Inc.
EQR	Environmental Quality Report
ERI	Environmental Research, Inc.
ERNS	Emergency Response Notification System database
FATES	FIFRA and TSCA Enforcement System
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FINDS	Facility Index System
FRDS	Federal Reporting Data System
FTTS	FIFRA/TSCA Tracking System
FUDS	Formerly Utilized Defense Sites
FURS	Federal Underground Injection Control
G.O.	General Officer
GEO	Garrison Environmental Office
HMIRS	Hazardous Materials Information Reporting System database
HSA	Historical Site Assessment
HSMS	Hazardous Substances Management System
HUD	Housing and Urban Development
IAP	Installation Action Plan
ICIS	Integrated Compliance Information System
ICRMP	Integrated Cultural Resources Management Plan
IMA	Installation Management Agency
IRP	Installation Restoration Program
kg	kilograms
LBP	Lead-Based Paint
LQG	Large Quantity Generator
LRA	Local Redevelopment Authority
LUST	Leaking Underground Storage Tank
MACOM	Major Army Command
mCi	milliCuries
MEC	Munitions and Explosives of Concern
MINES	Mines Master Index File
MLTS	Material Licensing Tracking System database from the NRC
MMRP	Military Munitions Response Program
MPPEH	Material Potentially Presenting an Explosive Hazard
NFA	No Further Action
NHL	National Historic Landmark
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
O&M	Operation and Maintenance
ODI	Open Dump Inventory database
p/y	pounds per year
PADS	PCB Activity Database
PCB	Polychlorinated Biphenyl
pCi/L	picoCuries per liter
PCS	Permit Compliance System
PEPCO	Potomac Electric Power Company

Acronym	Full Title
POC	Point of Contact
ppm	parts per million
RAATS	RCRA Administrative Action Tracking System
RAM	Radiological Materials
RBC	Risk-Based Concentration
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RMW	Regulated Medical Waste
RQ	Reportable Quantity
SEP	Supplemental Environmental Program
SIA	Surface Impoundments
SMC	Senior Mission Commander
SOP	Standard Operating Procedure
SPCC	Spill Prevention, Control, and Countermeasures
SQG	Small Quantity Generator
SSTS	Section 7 Tracking Systems of the FIFRA
TRIS	Transportation Research Information Service
TSCA	Toxic Substance Control Act
TSD	Treats, Stores, or Disposes (of hazardous waste) database
TSDF	Treatment, Storage, and Disposal Facility
UMTRA	Uranium Mill Tailings Sites database
USACE	U.S. Army Corps of Engineers
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USAEHA	U.S. Army Environmental Hygiene Agency
USAIDR	U.S. Army Institute for Dental Research
USARDA	U.S. Army Regional Dental Activity
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
USEPA	U.S. Environmental Protection Agency
UST	Underground Storage Tank
UXO	Unexploded Ordnance
VSI	Visual Site Inspection
WASA	Water and Sewer Authority
WRAIR	Walter Reed Army Institute of Research
WRAMC	Walter Reed Army Medical Center
XRF	X-ray Fluorescence

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 U.S.C. § 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 U.S.C § 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 principal 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 of the base, or personnel remaining in authorized enclaves. In the context of this document, this may be referred to as "full closure."
Compliance-related Cleanup (CC)	Refers to the cleanup of contamination resulting from operations that have occurred since October 1986 (i.e., non-Defense Environmental Restoration Program at Army active (including Reserve), excess, and special installations, as well as remediation at Army overseas installations and cleanup at Non-Federally owned, Federally supported Army National Guard (ARNG) sites.
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 U.S.C. 2710(e)(2))
Disposal	Per 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 (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's (DoD's) ECP Report requirement.
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, 22 August 2002, Garrison commanders, on behalf of the regions and the Installation Management Agency (IMA), 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 (D.C.), and at which an Army unit or activity (Active, Army Reserve, or ARNG) 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 (LRA)	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 and Explosives of Concern (MEC)	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 U.S.C. 2710(e)(3)). MEC includes UXO, as defined in 10 U.S.C. 2710(e)(9); DMM, as defined in 10 U.S.C. 2710(e)(2); and munitions constituents (e.g., TNT, RDX) 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, 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 U.S.C. 2011 et seq.) have been completed. (10 U.S.C. 101(e)(4)(A) through (C))
Personal Property	According to 41 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: • 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 • Determined by the Administrator of General Services to be related to the real property.
Real Property	Per 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.'

Term	Definition
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."
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. SMCs' 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) IMA, yet operated and funded by a MACOM (e.g., Army Ammo Plant, Hospital, etc.) where there is a single Mission/Garrison Commander.
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 U.S.C. 101(e)(5)(A) through (C))

1 Executive Summary

This Environmental Condition of Property (ECP) Report has been prepared for the Walter Reed Army Medical Center (WRAMC) Main Post, which is hereafter referred to as the "Property." The purpose of this ECP Report is to determine the environmental condition of the Property in preparation for a Real Property Disposal as a result of the Base Realignment and Closure (BRAC) 2005 Division recommendation to close the Property. This ECP was developed in accordance with the Department of Defense (DoD) 4165.66-M, Base Redevelopment and Realignment Manual dated 1 March 2006.

The Property is located at 6900 Georgia Avenue N.W., Washington, District of Columbia (D.C.), between Rock Creek Park and Georgia Avenue near the Maryland and D.C. boundary. The tract is roughly rectangular in shape and encompasses approximately 113 acres and is comprised of 48 buildings. Included in the Property is Building 18 formerly known as the Walter Reed Inn located on the corner of Georgia Avenue and Butternut Street at the southeast corner of the property. In addition to the Main Post Property, WRAMC also controls two non-contiguous properties; the Forest Glen Annex in Forest Glen, Maryland, and the Glen Haven Annex in Wheaton, Maryland. These other two annex properties are not evaluated in this ECP Report.

The primary activity at the Property is medical care for patients and medical training for professionals. To support the mission, there is a hospital, clinical laboratories, research and development facilities, administrative offices, resident housing accommodations, maintenance facilities, heating and cooling plants, and other supporting facilities.

Prior to the construction of the original Walter Reed General Hospital in 1908, the Property land use was agricultural, low-density residential, and open land.

Currently, surrounding properties are predominately residential to the north and south, and are commercial, retail, and residential to the east. The property to the west is a park. Overall, none of the adjacent properties exhibited environmental conditions that have a probability of adversely affecting environmental conditions at the Property.

Based on a review of property reports and documentation, a visual site inspection (VSI), research of available historical information, interviews with knowledgeable parties, and an environmental database search, the following information has been assembled:

Wastewater: Previous assessment reports have listed areas of use on the Property from which wastewater was discharged to the sanitary sewer. Several of these historical areas have either been repurposed or demolished. The Preliminary Assessment (Preliminary Assessment, Weston, 1990) reported the following areas as having discharged wastewater into the sanitary sewer prior to 1980:

- All Research Labs (Buildings 1, 2, 40, 83, 91, and 54)
- The former Office Machine Repair Shop (in demolished Building 33, then in Building 1 [area now repurposed])

- Print Shops that were in Buildings 1 and 40
- Laundry that was in Building 56 (now demolished)

Previous assessment reports have listed areas of use on the Property that have discharged to the storm sewer; however, these historical areas have either been repurposed or demolished:

- Washrack water from former Building 41 and current Building 82 (the Auto Crafts Building/former PX Gasoline station)
- Degreasing wastewater from the Vehicle Maintenance Shop (Building 32) (now demolished)

As summarized under "Permits and Notices of Violations (NOVs)" (see below), WRAMC has received NOVs with regard to wastewater discharges, primarily mercury. Based upon the age of the sewer systems and the documentation of discharges (listed above), there may be environmental concerns related to past sewer system discharges; however, there is no assessment documentation to support this concern. Waste streams involving recalcitrant chemicals, such as chlorinated solvents, and mercury are of the greatest concern.

Permits and NOVs:

- **Air Emissions:** The Property has a Title V Clean Air Act (CAA) permit from the D.C. Department of Health to operate the boilers for Building 15 and generators throughout the Property. The original Title V permit (#004) was issued on 28 July 2000 and the expiration date of the permit was 28 July 2005. WRAMC filed the application to reissue the permit for the Property, but the renewed permit has not yet been issued. There have been two prior NOVs associated with Air Emissions/CAA that have been resolved.

- **Polychlorinated Biphenyls (PCBs)/Toxic Substance Control Act (TSCA):** A Notice of Noncompliance was issued to WRAMC in October 1999 for failing to prepare and provide a waste manifest to accompany a shipment of PCB wastes. Per the U.S. Environmental Protection Agency's (USEPA's) direction, WRAMC provided USEPA with a copy of PCB disposal standard operating procedures (SOPs), correct manifests, and certificate of disposal, which WRAMC completed and the notice was resolved in November 1999.

- **Resource Conservation and Recovery Act (RCRA):** The Property is a Large Quantity Generator (LQG) of RCRA regulated hazardous waste with an ID number of DC4210021156. Two designated 90-Day Hazardous Waste Storage Areas are currently maintained at Building 54. One area is operated by Armed Forces Institute of Pathology (AFIP) personnel to collect wastes from satellite accumulation points within AFIP, while the other area is maintained by the Garrison and is the designated storage facility for the entire Property. There have been three prior NOVs associated with RCRA Hazardous Waste that have been resolved. One NOV, issued on 1 July 2005, was listed as open and was related to a USEPA inspection that found multiple hazardous waste and universal waste violations at the point of generation. According to agency documents,

WRAMC proposed to address the NOV by developing an Environmental Compliance Campaign Action Plan to improve training and accountability. According to WRAMC GEO staff, this NOV has since been settled with the EPA.

- **Solid Waste:** The Property is not required to have a solid waste permit. There has been one prior NOV associated with solid waste that has been resolved. The NOV was issued in 1999 due to three separate incidents of regulated medical waste (RMW) being found in solid waste shipments from the Property going to municipal landfills in Virginia.

- **Tanks:** There are nine underground storage tanks (USTs) permitted with the D.C. Department of Health, UST Division. All of the known USTs on the Property are registered. One of the registered USTs, MP-33, is physically labeled as MP-31 at the Property. This tank was previously registered as MP-31 with D.C. However, the registration has been changed to MP-33. There have been three prior NOVs associated with UST/RCRA that have been resolved. These NOVs were issued due to a heating oil spill in 1997, USTs not permanently closed within standards in 1998, and USTs not being registered in 1998.

- **Wastewater:** A wastewater discharge permit (#045-5) was issued by the D.C. Water and Sewer Authority (WASA) in 2001. The wastewater discharge permit for the Property covers general discharges to the sanitary sewer system on the Property. A Semi-Annual Self Monitoring program is conducted at the Property. As of the reporting period ending June 2006, the Property is in compliance.

  There have been eight prior NOVs associated with wastewater/Clean Water Act (CWA) that have been resolved. The majority of these NOVs were due to exceedences of mercury in the wastewater. WRAMC and WASA entered into a consent agreement under this permit in January 2002, for violations of mercury limits. The consent agreement detailed additional manhole monitoring requirements, required a mercury source investigation and required implementation of site-specific Best Management Practices. This agreement was amended in April 2003 based on the results of weekly sampling. Additional monitoring requirements were instituted via this amendment. The conditions of the consent agreement and amendment were satisfied and closed in 2004.

  WRAMC applied for a National Pollutant Discharge Elimination System (NPDES) industrial wastewater permit for Cooling Tower discharge from Building 20 (Mologne House) to the storm sewer in 2005, however this building was tied to the sanitary system in May 2006, therefore a permit is no longer needed. WRAMC applied for a permit for the Hospital (Building 2) for floor drains on the 9th floor for non-contact cooling water and air compressor condensate. The permit application is pending and was sent a second time in August 2006.

Cleanups

No Military Munitions Response Program (MMRP) sites or Compliance-related Cleanup (CC) sites have been identified on the Property. The reported cleanups on the Property are the three Installation Restoration Program (IRP) sites (WRAMC-01, WRAMC-03, and WRAMC-06):

- **WRAMC-01** – This site was a former hazardous waste storage bunker south of Building 40 and was used to temporarily store hazardous wastes from about 1986 to 1991. Federal Facility Compliance Agreement No. III-FF-RCRA-001, 29 March 1990 instructed WRAMC to submit closure plans and a schedule for closure. Sampling in 1991 found high concentrations of cadmium. Cleanup and resampling was conducted in 1992 and cadmium was not detected. The creation of an Army Environmental Database-Restoration (AEDB-R) site appears to be a result of the above stated compliance agreement and not based on a confirmed release to the environment. Thus, this site is not eligible for IRP funding and is therefore response complete under the IRP. The site status was revised to "Response Complete" on 1 March 2000 (Installation Action Plan, WRAMC, 2004/2005, and Draft 2006).

- **WRAMC-03** – This site is a concrete pad outside the west side of the hospital (Building 2) that was used to temporarily store the solid waste and medical waste generated at the hospital prior to 1993. There is no documentation available to determine whether any releases were reported for this site. This site was listed as "discontinued" in October 1992. Medical and solid wastes continue to be stored there, making the site an active site. Thus, this site was included in AEDB-R, but was not considered eligible for IRP funding. The site is considered "response complete" under the IRP (Installation Action Plan, WRAMC, 2004/2005).

- **WRAMC-06** – This site is located adjacent to the Rumbaugh Parking Garage (Building 3). PCB soil contamination was discovered during the construction of the garage. The source of the PCBs was a transformer that was removed during the garage construction. The area was excavated in 1992 and again in 1993. A letter dated 19 November 1993 from USEPA Region 3, concurred with the decision to backfill the excavation provided that an additional PCB investigation was completed and that a statement would then be added to the "deed" of the property to alert future owners of the presence and location of PCB contamination left on site. Further investigation was conducted by the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) in August and October 1996 to determine the extent of PCB contamination in the groundwater. Monitoring wells were installed and a sampling program was initiated in 1996. Low levels of PCBs were periodically detected in the downgradient wells. In 2004, WRAMC completed a Conceptual Site Model that showed low potential risks. Therefore, in 2005 a decision document recommending No Further Action (NFA) was prepared and submitted to USEPA. Correspondence dated 10 August 2006 from the USEPA concurred that an NFA decision was appropriate for this site. Closure of the monitoring wells is pending.

Hazardous Substances and Hazardous Waste: Substances designated as hazardous under section 102 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) have been used and stored at the Property in amounts necessary to support medical research and treatment as well as base operations. Some of the quantities were stored in excess of their corresponding CERCLA reportable quantities. There is no evidence that the chemicals used or stored were improperly handled, released, or disposed at the Property except for the NOVs listed in the Permits and NOV summary.

Petroleum Substances-USTs/ASTs Incidents: Nine permitted USTs and 17 aboveground storage tank (ASTs) are currently present on the Property. Three separate minor spills were reported in 1987, 1988 and 1994 during filling operations; however, none of these incidents were reported to have caused impairment or impact that required remediation.

An environmental investigation is ongoing for an area adjacent to the Boiler Plant (Building 15). During the construction of a replacement electrical switching station (Building 95) in the spring of 2006, an oily substance was encountered in the subsurface abutting the Boiler Plant. The source was assumed to have been from past operations. Further investigation at this location is ongoing. The soil was found to contain elevated levels of diesel-range organic (DRO) constituents, which is consistent with historic fuel usage at the Boiler Plant. Further investigation at this location is ongoing. This site constitutes a recognized environmental condition (REC).

A review of available records identified 24 USTs that have been removed from the property. These USTs were used for the storage of gasoline, diesel fuel, heating oil, and kerosene. Closure documentation was identified for one of these tanks (MP-10). The closure documentation for this UST indicated that samples collected after tank removal did not indicate contamination above levels of concern. No closure documentation was located for the remaining 23 USTs. However, the Leaking Underground Storage Tank (LUST) database lists four heating oil tanks and one kerosene tank as being closed. The LUST database does not contain the tank ID for these five USTs. While it is likely that all of the tanks have been removed, the site conditions after removal are unknown. Therefore, these remaining 23 USTs constitute a REC.

PCBs: Documents reviewed for this ECP indicate that 46 PCB-containing transformers were located on the Property and there have been 66 total PCB transformers between the Property (Main Post) and the WRAMC Forest Glen Annex. According to WRAMC personnel, all of the PCB-containing transformers on the Property have been removed and replaced with non-PCB transformers. WRAMC indicated this removal in a letter to the USEPA in 1995, which explained that all PCB containing materials had been removed from the Property, with the exception of fluorescent light ballasts (USEPA Letter, November 1995). However, the documents reviewed for the preparation of this ECP accounted for the removal of 62 transformers, leaving four without replacement documentation. It is unclear whether these four exist at the Property or at the Forest Glen Annex.

There have been six areas of documented PCB impact on the Property:

- An underground vault north of Building 40 – Previous reports document an area of limited PCB impact in soil at an underground transformer vault outside of Building 40. The soil became impacted when rainwater that had collected in the concrete vault was pumped out and discharged onto the ground. A phased soil assessment indicated that the area of impacted surface soil was limited to an area approximately 55 feet by 55 feet and 2-feet deep. A work plan has been submitted to the USEPA Regional Administrator and the D.C. Department of Health proposing a self-implemented plan to remove impacted soil via excavation. This work is expected to begin in December 2006. This site constitutes a REC and remediation is planned for the near future.

- The former machine shop in the basement of Building 40 – The decommissioning report for Building 40 documented a limited area of PCB impact in the former machine shop. This area was cleaned and low levels of PCBs remain. An occupancy restriction is required to be listed on the building's deed to address the residual PCB impact. This site constitutes a REC, although it is to be managed through institutional controls.

- The former transformer near the Rumbaugh Garage (Building 3) IRP site WRAMC-06 – Summarized above under "Cleanups," this site received an NFA from the USEPA in August 2006.

- Transformer in the basement of Building 54 – Per an undated internal WRAMC memo (circa November 1992), post wipe samples from an area of the concrete basement floor in Building 54 indicated PCB impact as high as 73.7 micrograms per 100 square centimeters (µg/100 sq cm). A recommendation was made to encapsulate the floor with epoxy paint. No further documentation was found. Current WRAMC personnel have no information about whether this recommendation was completed. Although the basement floor was noted to have been painted during the VSI, it is unknown if this particular area was encapsulated.

- Transformer explosion in manhole #29 near Building 1 – Per an internal WRMAC memo dated 25 November 1992, PCB transformer #104845 exploded on 23 November 1992 in outdoor underground vault/manhole #29 adjacent to Building 1. The transformer had contained about 290 gallons of ASKAREL, which is 100% PCB Oil. A recommendation was made to clean up all visible oil and remove an area of soil adjacent to the manhole approximately 5 feet wide by 10 or 12 inches deep and to conduct sampling. No details have been found regarding any testing or cleanup activities. No other details have been found on this issue. WRAMC Industrial Hygiene POC and GEO personnel remember this site being cleaned, but documentation of this cleanup effort was not discovered in the document review done to complete the ECP.

- Building 14 Transformer Explosion – In 1992, an exploded transformer was replaced and PCBs were cleaned up at Building 14. No further documents were discovered during the ECP research.

Due to the PCB findings at the Building 40 transformer vault (described above), a sampling program was conducted in late 2005 through early 2006 to evaluate existing in-ground transformer vaults and transformer pads across the Property. The sampling consisted of 57 surface wipe samples from eight of the in-ground transformer vaults and three above ground transformer pads. Additionally, 16 water samples were taken from eight transformer vaults that were flooded at the time of the testing. The wipe sampling indicated that eight of the sampled vaults/pads had PCB levels that would require disposal of the material as PCB waste when the units are removed from service. The water sampling indicated that seven vaults had detectable PCBs in the water, but at levels less than the regulatory limit of 200 micrograms per liter (µg/L) for PCB containing waste for non-contact use in a closed system. Since these vaults are in low contact areas, the PCB containing water can remain in place provided that it is not disturbed. Should the water be disturbed, it would need to be disposed of as PCB waste.

Due to the age of many of the buildings on the property, it is known that some PCB containing light ballasts remain in older light fixtures. As these light fixtures are routinely changed, they are replaced with non-PCB containing ballasts. The old PCB ballasts are collected and disposed of in accordance with all applicable Federal, state, and Army regulations through the Defense Reutilization and Marketing Office (DRMO).

Asbestos-Containing Materials (ACMs): Asbestos surveys have been performed at 34 buildings and the steam tunnel network. Asbestos surveys have not been completed at 13 buildings, as they are either new construction, already renovated or under renovation, scheduled for demolition, or used for equipment storage. The remaining building is the Red Cross Building (Building 41), which has been renovated; however, ACM abatement documentation could not be located. Of the 35 structures surveyed, 27 were found to have friable and non-friable asbestos materials. All of the buildings that contain ACMs have an Operation and Maintenance (O&M) Plan in place, with the exception of the housing quarters, which are managed under the WRAMC Post-wide Asbestos Management Plan (2005).

Lead and Lead-Based Paint (LBP): The DoD Guidelines for LBP in Military Housing (AR 420-70 Buildings and Structures, Department of the Army, 1997) specifies that LBP surveys and risk assessments are required for residential housing units. Currently, there is not a comprehensive or programmatic report for the residential housing units on the Property. Many of the buildings at the Property 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. Therefore, the practice on the Property is to test for LBP in areas prior to building renovations or demolition. All housing quarters have been surveyed for the presence of LBP and the results are detailed in individual reports for each unit. For the residential buildings, the sampling contractors recommended that the component types that tested positive for lead be abated in accordance with Housing and Urban Development (HUD) Guidelines, 29 Code of Federal Regulations (CFR) 1910.1025 and 29 CFR 1926.62. Renovations or abatement activities have been performed on some of the structures

where LBP positive components have been identified. However, documentation of renovations or abatement activities are not always maintained on file or annotated on drawings. Thus, the number of buildings and building components containing LBP may be less than identified.

Radiological Materials (RAM): Since the Property is a functioning hospital and research facility, RAM have historically been used at the Property. As reported in the RAM Survey, seven buildings on the Property were found to be "impacted" from historical use of RAM (Historical Site Assessment, Cabrera, 2006). The buildings classified as impacted are Buildings 1, 2, 7, 41, 54, 91, and 92. Building 92 is now part of Building 1. One hundred and two rooms or laboratories within these seven buildings have been classified as "impacted." No radiologically impacted outdoor areas or release points were identified during the records search for the Property. Based upon the identified radiological impacts, these areas constitute a REC.

Decommissionings: Two buildings (Building 40 and Building T-2) have undergone radiological decommissioning. A medical nuclear reactor was located in the basement of Building 40 from 1961 to 1972. The reactor was decommissioned in accordance with Nuclear Regulatory Commission (NRC) regulations with all fuel, waste and irradiated components disposed off site. Building 40 is currently vacant. Building T-2 was decommissioned and removed from the WRAMC NRC License in 2005 (Federal Register February 23, 2005). A Finding of No Significant Impact accompanied the Environmental Assessment (EA). Correspondence from the NRC was provided to document that Buildings 40 and T-2 were "released for unrestricted use." Based on assessment results provided by WRAMC, the building met NRC criteria for unrestricted use.

Radon: The Property has a Radon Management Plan (U.S. Army Center for Public Works, 1999) that lists the Army's policies for identifying, assessing and mitigating indoor levels of radon at U.S. Army facilities. A radon survey was conducted for the Property in August 1991 and follow-up surveys were conducted in 1998 and 2001 for buildings where radon levels exceeded the 4.0 picoCuries per liter (pCi/L) action level or have been newly constructed or renovated. Buildings 2, 6, 7, 17, 20, and 54 were sampled and all detections for radon were below the 4 pCi/L.

Pesticides: Per the 2004 Integrated Pest Management Plan for the Property, all current pesticide mixing/storage has been moved off-Property and is at the Forest Glen Annex (Integrated Pest Management Plan for WRAMC, WRAMC GEO, 2004). Maintenance activities and materials related to pesticides are managed under the Integrated Pest Management Plan. The Property historically had three known areas of pesticide mixing and storage prior to 1975: Building 50, Building 51, and Building 16. Buildings 50 and 51 were greenhouses near the southern end of the Property and are now deconstructed. The 1984 Installation Assessment indicated that pesticide disposal possibly occurred under benches in the greenhouse Buildings 50 and 51, and in the sanitary sewer during this time (Installation Assessment, U.S. Army Toxic and Hazardous Materials Agency [USATHAMA], 1984). It was also documented in a 1974 internal audit that there were two areas where residual pesticides were discharged to the ground (the Building and Structures Department disposed of pesticides via a

soaking pit and Roads and Grounds Department disposed of pesticides via a gravel driveway); however, there was no description where these disposal areas were located, and the possibility exists that this may have occurred off-Property at another WRAMC facility such as Forest Glen Annex. Also, per the 1945 historic site map, an apple orchard was near the far northwestern extent of the Property. Apple orchards were historically treated with arsenic containing pesticides that are resistant to degradation and persist in the environment; however, the AFIP Building (54) and the associated parking areas were constructed over the former orchard.

CONCLUSIONS

Based on the information documented in this ECP Report, the above-listed RECs were found at the Property. These RECs were used to determine the ECP parcel designations that address Federal real property transfers. This applies to property owned by the DoD and on which the U.S. plans to terminate Federal government operations. Federal entities with control over such properties must identify those areas that have had hazardous substances or petroleum products/derivatives stored for more than one year, or where such products have been released or disposed.

The following ECP parcel category table provides the information required for each parcel at the Property (the parcels are depicted on Figure 8). Parcels are classified according to environmental condition based on the following categorization:

ECP Classification System

Category 1 – 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 visual inspection indicates that both the buildings and the land are uncontaminated.

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

Category 3 – Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial response.

Category 4 – Areas where release, disposal and/or migration of hazardous substances has occurred, and all removal or remedial actions to protect human health and the environmental have been taken.

Category 5 – Areas where release, disposal and/or migration of hazardous substances has occurred, and removal or remedial actions are underway, but all required remedial actions have not yet been taken.

Category 6 – Areas where release, disposal and/or migration of hazardous substances has occurred, but required actions have not yet been implemented.

Category 7 – Areas that are not evaluated or require additional evaluation.

1

ECP Categorization

Parcel No. & Label	Approx Size	Area	ECP Category	Basis	Source of Evidence	Remediation / Mitigation
1(1)	16.6 acres	Residential Area	1	This parcel is associated with the residential area in the western portion of the Property. These are areas where there has been no documented release, disposal, or known migration from adjacent properties of hazardous substances or petroleum products.	No documented release of hazardous substances or petroleum products.	NA
2(1)	93.5 acres	Remaining Land	1	This parcel encompasses all of the land area between smaller parcels on the Property.	No documented release of hazardous substances or petroleum products.	NA
3(2)PS/PR	2.6 acres	Petroleum Issues in the area of Building 15 and former Tank Farm	2	Multiple USTs removed from the area. No documentation was located for the closure of USTs MP-3, MP-11, MP-12, MP-14, MP-15, MP-16*, MP-16, MP-17, MP-18, MP-19, MP-20, MP-21, MP-22, and MP-23. Petroleum product (oil) observed in excavation for new construction.	WRAMC UST Registration documents Visual Site Inspection	Ongoing in one area east of Building 15. Unknown in other areas.
4(4)HS/HR	4,342 square feet	WRAMC-06	4	PCB release from a transformer. PCBs were detected in soil and groundwater. The soil was remediated under the Installation Restoration Program. WRAMC GEO received an NFA letter from USEPA Region 3 in August 2006.	FY 2006 IAP report and WRAMC GEO	Soils were removed from the site. Groundwater monitoring was conducted.
5(4)HS/HR	3,403 square feet	WRAMC-01	4	Detection of cadmium contamination during installation restoration sampling.	FY 2006 IAP report	The storage building was cleaned in 1992 which resolved the cadmium issue.
6(5)HS/HR	2,184 square feet	Transformer Vault Adjacent to Building 40	5	Discharge of PCB contaminated rainwater from an underground electrical transformer vault.	EBS for Building 40	WRAM GEO awarded a contract to excavate and dispose of the contaminated soil.

Parcel No. & Label	Approx Size	Area	ECP Category	Basis	Source of Evidence	Remediation / Mitigation
7(7)HS/HR	4,347 square feet	Area surrounding Manhole 29 adjacent to Building 1	7	Explosion of PCB transformer in manhole 29. Surrounding soil was reportedly removed however no documentation of post excavation samples was located.	Internal WRAMC memo dated 25 November 1992	Soil was recommended to have been removed after explosion. Documentation of remediation not located.
8(7)HS/HR	3,972 square feet	PCB transformers exploded in the area of Building 14	7	Explosion of PCB transformers in the area of Building 14. Documentation exists regarding the PCB cleanup and replacement of the transformers. No documentation was found regarding the collection of post excavation soils.	EPR System Report Project Number WR0092F080	Cleanup was conducted after explosion.
9(2)PS/PR(P)	Not defined	MP-1 Building 1	2	500-gallon UST that has been removed. No documentation was available regarding the condition of the tank at closure.	WRAMC UST Registration documents	None apparent
10(2)PS/PR(P)	Not defined	MP-2 Building 4	2	3,000-gallon UST that has been removed. No documentation was available regarding the condition of the tank at closure.	WRAMC UST Registration documents	None apparent
11(2)PS/PR(P)	Not defined	MP-4 Building T-2	2	2,000-gallon UST that has been removed. No documentation was available regarding the condition of the tank at closure.	WRAMC UST Registration documents	None apparent
12(2)PS/PR(P)	Not defined	MP-5 Building 2	2	10,000-gallon UST that has been removed. No documentation was available regarding the condition of the tank at closure.	WRAMC UST Registration documents	None apparent
13(2)PS/PR(P)	Not defined	MP-6 Building 2	2	10,000-gallon UST that has been removed. No documentation was available regarding the condition of the tank at closure.	WRAMC UST Registration documents	None apparent
14(2)PS/PR(P)	Not defined	MP-7 Building 54-E	2	2,000-gallon UST that has been removed. No documentation was available regarding the condition of the tank at closure.	WRAMC UST Registration documents	None apparent
15(2)PS/PR(P)	Not defined.	MP-8 Building 54-W	2	6,000-gallon UST that has been removed. No documentation was available regarding the condition of the tank at closure.	WRAMC UST Registration documents	None apparent

Parcel No. & Label	Approx Size	Area	ECP Category	Basis	Source of Evidence	Remediation / Mitigation
16(2)PS/PR(P)	Not defined.	MP-9 Building 41	2	3,000-gallon UST that has been removed. No documentation was available regarding the condition of the tank at closure.	WRAMC UST Registration documents	None apparent
17(2)PS/PR(P)	Not defined	MP-13 Building 54	2	1,500-gallon UST that has been removed. No documentation was available regarding the condition of the tank at closure.	WRAMC UST Registration documents	None apparent
18(2)PS/PR	Not defined	Building 18	2	Leaking UST identified in UST Database.	EDR, 2006	Site listed as closed.
Other Issues						
1Q/A/L/RD	NA*	Building 1 (includes appended Building 5 and 92)	1	Asbestos Surveys identified friable and non-friable asbestos.	Kemron, 1994 Lukmire Partnership, 1998 GP, 2002a	O&M Plan
				Lead-Based Paint based on the age of the building (1908-1953) and Former Paint shop in appended Building 5.	NA	None apparent
				Classified as impacted by RAM.	Cabrera, 2006	None apparent
2Q/A/L/RD	NA*	Building 2	1	Asbestos Survey identified non-friable asbestos.	EA, 1999	O&M Plan
				Lead-Based Paint based on the age of the Building (1977).	NA	None apparent
				Classified as impacted by RAM.	Cabrera, 2006	None apparent
4Q/L	NA*	Building 4	1	Lead-Based Paint Survey identified LBP positive components.	GP, 1999	None apparent
7Q/A/L/RD	NA*	Building 7	1	Asbestos Surveys identified friable asbestos.	Dynamac, 1995 GP, 2002b	O&M Plan
				Lead Based Paint based on the age of the building (1910).	NA	None apparent
				Classified as impacted by RAM.	Cabrera, 2006	None apparent
8Q/A/L	NA*	Building 8	1	Asbestos Survey identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan
				Lead-Based Paint Survey identified positive components.	Aerosol Monitoring, 1994	None apparent
9Q/A/L	NA*	Building 9	1	Asbestos Survey identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan
				Lead-Based Paint Survey identified positive components.	Aerosol Monitoring, 1994	None apparent

Parcel No. & Label	Approx Size	Area	ECP Category	Basis	Source of Evidence	Remediation / Mitigation
11Q/A/L	NA*	Building 11	1	Asbestos Surveys identified friable asbestos.	GP, 2002c EA, 1997	O&M Plan
				Lead-Based Paint base on age of building (1929, 1931, 1933).	NA	None apparent
12Q/A/L	NA*	Building 12	1	Asbestos Surveys identified non-friable asbestos.	GP, 2002d EA, 1997	O&M Plan
				Lead-Based Paint base on age of building (1911, 1934).	NA	None apparent
14Q/A/L	NA*	Building 14	1	Asbestos Surveys identified friable and non-friable asbestos.	GP, 2002e EA, 1997	O&M Plan
				Lead-Based Paint based on age of building (1976).	NA	None apparent
15Q/A/L	NA*	Building 15	1	Asbestos Surveys identified friable and non-friable asbestos.	GP, 2003/2005a Dynamac, 1995	O&M Plan
				Lead-Based Paint based on age of building (1918).	NA	None apparent
16Q/L	NA*	Building 16	1	Lead-Based Paint based on age of building (1920).	NA	None apparent
17Q/A/L	NA*	Building 17	1	Asbestos Surveys identified friable and non-friable asbestos.	GP, 2002f Dynamac, 1995	O&M Plan
				Lead-Based Paint based on age of building (1920, 1944).	NA	None apparent
18Q/A/L	NA*	Building 18	1	Asbestos Surveys identified friable and non-friable asbestos.	GP, 2002g Dynamac, 1995	O&M Plan
				Lead-Based Paint based on age of building (1967).	NA	None apparent
19Q/A/L	NA*	Building 19	1	Asbestos Surveys identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan
				Lead-Based Paint Survey identified positive components.	Aerosol Monitoring, 1994	None apparent
21Q/A/L	NA*	Building 21	1	Asbestos Surveys identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan
				Lead-Based Paint Survey identified positive components.	Aerosol Monitoring, 1994	None apparent
22Q/A/L	NA*	Building 22	1	Asbestos Surveys identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan
				Lead-Based Paint Survey identified positive components.	Aerosol Monitoring, 1994	None apparent
25Q/A/L	NA*	Building 25	1	Asbestos Surveys identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan

Parcel No. & Label	Approx Size	Area	ECP Category	Basis	Source of Evidence	Remediation / Mitigation
				Lead-Based Paint based on age of building (1919).	NA	None apparent
26Q/A/L	NA*	Building 26	1	Asbestos Surveys identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan
				Lead-Based Paint Survey identified positive components.	Aerosol Monitoring, 1994	None apparent
29Q/A/L	NA*	Building 29	1	Asbestos Surveys identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan
				Lead-Based Paint based on age of building (1915).	NA	None apparent
30Q/A/L	NA*	Building 30	1	Asbestos Surveys identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan
				Lead-Based Paint Survey identified positive components.	Aerosol Monitoring, 1994	None apparent
31Q/L	NA*	Building 31	1	Lead-Based paint based on age of building (1921).	NA	None apparent
35Q/A/L	NA*	Building 35	1	Asbestos Surveys identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan
				Lead-Based Paint Survey identified positive components.	Aerosol Monitoring, 1994	None apparent
40Q/A/L/P	NA*	Building 40	1	Asbestos Surveys identified friable and non-friable asbestos.	Kemron, 1992 GP, 2002h	O&M Plan
				Lead-Based Paint based on age of building (1924, 1932, 1962).	NA	None apparent
				Residual PCBs on floor of Room B003 following cleanup and building decommissioning.	WRAMC, EBS, 2004	Managed with low occupancy
41Q/L/RD	NA*	Building 41	1	Lead-Based Paint based on age of building (1927, 1944).	NA	None apparent
				Classified as impacted by RAM.	Cabrera, 2006	None apparent
48Q/A/L	NA*	Building 48	1	Asbestos Surveys identified friable and non-friable asbestos.	Dynamac, 1995 GP, 2003/2005b	O&M Plan
				Lead-Based Paint based on age of building (1961).	NA	None apparent

Parcel No. & Label	Approx Size	Area	ECP Category	Basis	Source of Evidence	Remediation / Mitigation
52Q/A/L	NA*	Building 52	1	Asbestos Surveys identified friable and non-friable asbestos.	Dynamac, 1995 GP, 2002i	O&M Plan
				Lead-Based Paint based on age of building (1930).	NA	None apparent
53Q/A/L	NA*	Building 53	1	Asbestos Surveys identified friable and non-friable asbestos.	Dynamac, 1995 GP, 2002j	O&M Plan
				Lead-Based Paint based on age of building (1954).	NA	None apparent
54Q/A/L/P/RD	NA*	Building 54	1	Asbestos Surveys identified friable and non-friable asbestos.	EA, 1997 AMI, 2000 GP, 2002k	O&M Plan
				Lead-Based Paint based on age of building (1954/1971).	NA	None apparent
				PCBs detected on the concrete floor of the basement.	WRAMC, Internal Memo, c. 1992	VSI performed as part of the ECP indicated the floor was painted; however, the exact location of the detection could not be located.
				Classified as impacted by RAM.	Cabrera, 2006	None apparent
57Q/A/L	NA*	Building 57	1	Asbestos Surveys identified friable and non-friable asbestos.	Dynamac, 1995 GP, 2004	O&M Plan
				Lead-Based Paint based on age of building (1931).	NA	None apparent
82Q/A/L	NA*	Building 82	1	Asbestos Surveys identified non-friable asbestos.	Dynamac, 1995 GP, 2002l	O&M Plan
				Lead-Based Paint based on age of building (1942, 1958).	NA	None apparent
83Q/A/L	NA*	Building 83	1	Asbestos Based on the age of the building.	NA	None apparent
				Lead-Based Paint based on age of building (1942, 1944).	NA	None apparent
84Q/L	NA*	Building 84	1	Lead-Based Paint based on age of building (1942).	NA	None apparent
88Q/A/L	NA*	Building 88	1	Asbestos Surveys assumed non-friable asbestos.	Dynamac, 1995 GP, 2002m	Base-wide O&M Plan
				Lead-Based Paint based on age of building (1945).	NA	None apparent
90Q/A/L	NA*	Building 90	1	Asbestos Surveys identified friable asbestos.	EA, 1997 GP, 2002n	O&M Plan
				Lead-Based Paint based on age of building (1946).	NA	None apparent

Parcel No. & Label	Approx Size	Area	ECP Category	Basis	Source of Evidence	Remediation / Mitigation
91Q/A/L/RD	NA*	Building 91	1	Asbestos based on age of building (1956).	EA, 1997 GP, 2002/ 2005a	O&M Plan
				Lead-Based Paint based on age of building (1956).	NA	None apparent
				Classified as impacted by RAM.	Cabrera, 2006	None apparent
95Q/A/L	NA*	Building 95	1	Asbestos and lead paint based on age of building (1962).	NA	Base-wide Asbestos O&M Plan
				Lead-Based Paint based on the age of the building (1962).	NA	None apparent
T-2Q/A/L	NA*	Building T-2	1	Asbestos Surveys identified non-friable asbestos.	Dynamac, 1995 GP, 2002/ 2005b	O&M Plan
				Lead-Based Paint based on age of building (1972).	NA	None apparent
T-20Q/A/L	NA*	Building T-20	1	Asbestos Surveys identified friable and non-friable asbestos.	Dynamac, 1995 GP, 2002/ 2005c	O&M Plan
				Lead-Based Paint based on age of building (1972).	NA	None apparent
100Q/A	NA*	Steam Tunnels (multiple)	1	Asbestos Surveys identified friable and non-friable asbestos.	Dynamac, 1995 GP, 2002o	O&M Plan
100Q/P	NA*	Transformer Pads (multiple)	1	Eight sampled transformer vaults/pads/encroached water contained levels of PCBs that will require disposal as PCB waste after the use of the pad is complete.	EA, 2006	None

1 NA*-Not Applicable. Individual areas of ACM & LBP continue to be discovered and abated during
2 renovations, therefore the size of any remaining areas of impact has not been defined.

2 Purpose

2.1 General

This ECP meets the DoD requirement to prepare an ECP Report per DoD 4165.66-M, Base Development and Realignment Manual. The ECP was performed to collect reliable information regarding the environmental condition of the property to determine the property's suitability for out grant or transfer, and to meet the requirements under Title 40, 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 (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 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 when they become final.
- 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 Army has prepared this 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:
    - Notification requirements under §120(h)(1) and (3)(A)(i) of CERCLA and state or local real property transfer requirements;
    - Uncontaminated parcel identification requirements of Section 120(h)(4) of CERCLA; and,
    - State or local real property transfer requirements that are applicable to the federal government and the transaction.

The ECP contains the information required to comply with the provisions of CERCLA §120(h) 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. 40 CFR 373 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 (1) 1,000 kilograms (kg) or the reportable quantity (RQ), whichever is greater, of the substances specified in 40 CFR 302.4, or (2) 1 kg 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 United States Army and beyond the scope of the ECP. The United States 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 Property is the 113-acre Main Post Area of WRAMC, Washington, D.C. The Property is located in the northern section of Washington, D.C., approximately 5 miles directly north of the White House. The Property contains the main hospital complex and is bounded by 16th Street on the west, Alaska Avenue N.W. to the northwest, Fern Street N.W. to the north, Georgia Avenue N.W. (U.S. Route 29) to the east, and Aspen Street N.W. to the south. The Property also includes Building 18, formerly known as the Walter Reed Inn. WRAMC also controls two non-contiguous properties in Forest Glen, Maryland, and Wheaton, Maryland (Glen Haven), however, these properties not evaluated in this report. A site location map is provided as **Figure 1**.

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 the Property. Its findings are based on a record search of over 1,040

documents and site reconnaissance conducted between 20 June through 23 June 2006. Extensive environmental investigations and reports and Property 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 7**, References.

A representative number of buildings were visually inspected during the Property reconnaissance. Specifically, of 48 structures that are currently at WRAMC, 39 structures were visited. A 100 percent visual inspection of all buildings was not practical because of the number of buildings and the large square footage area of many of the multi-story buildings. No sampling or analysis was conducted during this survey.

2.4 Report Organization

The remainder of this report presents the ECP setting, method and findings. **Section 3** describes the methods used to conduct the ECP. **Section 4** provides a description of the Property environment, an overview of facility operations and history, and a summary of previous environmental investigations. Findings of the ECP, organized by relevant environmental "issues" (e.g., contaminant, contamination matrix, facility or operation), are elaborated in **Section 5**. **Section 5.16** addresses outstanding regulatory compliance issues. A summary of findings for the buildings and real property is included in **Section 6**. The final **Section 7** is a listing of the documents referenced in this report.

The appendices are arranged to allow the reader to determine the full range of environmental issues relating to the Property. **Appendix A** is a listing of the buildings and sections on the Property and their names and locations. Historical information and site background information is provided in **Appendix B** (Aerial Photographic Analysis), **Appendix C** (Sanborn Maps), and **Appendix D** (Historical Topographic Maps). **Appendix E** provides the Regulatory Database Report for the Property. **Appendix F** provides copies of Property Deeds, the Boundary Map, and a description of the metes and bounds. **Appendix G** provides information from the site interviews. **Appendix H** is a comprehensive listing of removed PCB transformers previously located on the Property. **Appendix I** provides the 1990 CERCLA Preliminary Assessment. **Appendix J** provides information on pesticide use, disposal and soil sampling. **Appendix K** provides information on the storage of hazardous substances. **Appendix L** provides the most recent Environmental Quality Report. **Addendum 1** is the Historical Site Assessment for the Property that addresses areas at the Property that had operations involving radioactive materials.

3 Survey Methodology

3.1 Development of Study Sections

The Property is a specialized medical hospital and training facility, with all of areas of the property supporting this function. The facility is relatively small in size and very densely developed. The property is characterized as urban/suburban with little or no undeveloped or open land area. These characteristics are such that the division of the property into artificial study areas would not provide any organization efficiency or make the presentation of the environmental condition clearer. Due to the small number of buildings, discussion of individual structures has been presented in this ECP Report. Based on these factors, the property was not divided into separate study sections.

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 between 20 June through 23 June 2006 to field-verify information produced in the document review and to identify potential environmental concerns. All roads on the facility that were accessible were driven during the VSI. A VSI was performed for 39 buildings (**Appendix A**, WRAMC Parcels and Buildings) selected as a representative sample from groups of similar buildings.

A reconnaissance of the adjacent properties that surround the Property was conducted to evaluate if adjacent property uses could contribute to any environmental contamination detected on the Property. The field team walked on roads along the perimeter to visually identify any contiguous properties that appear, in the team's professional judgment, to have potential contamination that could migrate to the Property. Typical of 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 5.17**.

3.3 Aerial Photographic Analysis

A previous aerial photographic analysis was conducted in October 1983 by the Environmental Photographic Interpretation Center. Photographs covering the entire Property for the period from 1951 to 1970 were obtained from the U.S. Geological Survey (Sioux Falls, South Dakota) and the Agricultural Stabilization and Conservation Service (Salt Lake City, Utah). Four years of photography were examined under a stereoscope to identify any significant areas of disturbance. There were no significant findings for the Property.

A comprehensive aerial photographic analysis was conducted as part of this ECP; a complete copy of the report, including the photos, is included in **Appendix B**, Aerial Photographic Analysis, Environmental Research, Inc. (ERI), 2005.

Photos covering the Property for the period from 1948 to 1982 from Air Photographics, Inc. (AIR) of Martinsburg, West Virginia, were obtained and interpreted. Five years of photography were examined under a stereoscope to identify any significant areas of disturbance. Potentially significant findings are discussed briefly below and the significance of these findings is discussed in detail in **Section 5**.

The photographs reviewed are as follows:

Table 1 – Aerial Photographs Reviewed

Date	Source*	Mission, Roll & Frame Number	Scale
March 1948	AIR	– -10/16,17	1:19,200
March 1959	AIR	141R-28A,29	1:12,000
February 28, 1965	AIR	V652-61,62	1:12,000
February 12, 1973	AIR	DC-11/11-12	1:12,000
January 1982	AIR	V821-213,414	1:18,000

* AIR – Air Photographics, Inc., Martinsburg, West Virginia

The earliest aerial photo (1948) indicated that the Property was already developed in most areas. The aerial photo review identified three areas of probable excavation and fill. These areas were located in the northwest of the Property in the vicinity of a ball field/recreation area, in the far west of the Property that later became the officer residential area, and near the eastern-central portion of the Property, just off from the main road. In the vicinity of the ball field, a large graded area was noted with smaller areas of possible excavations, mounded materials and a ground scar. The disturbed areas in the western part were described as probable fill with dark and light material or objects. Based upon interviews at the Property, this area had been used in the past by the groundskeeper for landscape debris and brush cuttings. The final area described by ERI was off from the main road and may depict a small excavation with mounded material. Based upon site maps depicting the Property utilities (**Section 4.4**), there is a 22-inch stormwater main, an 8-inch water supply piping, and a 12-inch tile clay sanitary sewer that runs in this area. Based upon the size and location of the noted excavation it may have been related to underground utility repairs or upgrades.

Also in the 1948 photo, ERI identified a stream near the south-central portion of the Property, which exited the site, traversed toward Aspen Street, and ran across the adjacent lot. This lot is now a residential development. An area of probable staining was identified in the northeast quadrant of the Property between old buildings 5 (the Quartermaster Stables/Carpenter Shop), 32 (the Quartermaster Garage/Motor Transport) and 33/33A (Medical Warehouse and addition). This area has been completely redeveloped and is now the underground parking structure (Building 4) for the new hospital (Building 2) and would have been extensively excavated to accommodate construction. During the Property visit conducted in June 2006, no staining was observed.

In the subsequent 1959 photo, the three areas that were previously identified as disturbed were not observed. The area that was located in the northwest, in the vicinity of a ball field/recreation area, appeared to have been developed into a parking lot with the ball field being re-positioned toward the north. The disturbed area that had been identified at the far west of the Property appeared to have been developed into the officer residential area. The third identified disturbed area near the east-central portion of the Property, just off from the main road was not present. The stream that was identified in 1948 was not indicated in 1959. One area of probable excavation and grading with mounded material was noted near the southeastern corner of the Property, in the area of the electrical switching station located just southeast of the Boiler Plant (Building 15). The smokestacks on the Boiler Plant are noted by ERI.

In the next photo dated 1965, it appears that continued construction is occurring around the Boiler Plant (Building 15). Some staining was identified by ERI in this area. Also, just east of the Boiler Plant, two gas pumps with staining were noted. On a 1964 map obtained from the Department of Public Works (DPW) Master Planning-Real Property Manager, this area was associated with the Exchange Service Station (Building 82), which was the gas station for the Property. This building is now used as the Auto Crafts Shop and the gasoline USTs have been removed. This area was visited and a patched area in the asphalt was noted from where the tanks were removed. No stains or stressed vegetation was observed during the Property visit. In the area of the former Medical Warehouse, a container/drum and a vertical tank was noted. As mentioned above, this area has since been completely razed, excavated and rebuilt as the underground parking structure (Building 4) and no signs of former impact were noted.

In the subsequent 1973 photographic analysis, ERI made very few notations. A very large excavation was noted in the northern portion of the Property. This location correlates to the construction of the new hospital (Building 2). Just east of this excavation was the former Medical Warehouse, and the vertical tank and an area of probable staining was noted (this entire area has been razed, excavated and rebuilt as the underground parking structure [Building 4] with no current signs of impact).

Also, in the area of the Boiler Plant (to the southeast), a dumpster was noted. At the nearby Exchange Service Station (Building 82), areas of staining at the front and the back of the building were noted. This building is now used as the Auto Crafts Shop and the gasoline USTs have been removed and no stains or stressed vegetation were observed during the property visit.

In the final photo reviewed by ERI (dated 1982), very few notations were made. The new Hospital (Building 2) had been completed. A vertical tank was noted near the northwestern corner of this building. The Property visit determined that this tank did not contain petroleum products, but contained compressed gasses for hospital use, and refrigeration trailers for temporary waste storage. All of the buildings that were located to the east had now been removed and the underground parking structure (Building 4) had been completed. Also, in the area of the Boiler Plant (Building 15, to the southeast), an area of probable staining was noted northwest of this building and the Troop Housing (Building 14). This area was visited and no stains or stressed vegetation were observed.

As an addendum to the photo review described above, additional photos were obtained from other sources for review and interpretation. The oldest photo, dated September 1919, was obtained from the National Archives. This photo provides a limited panoramic view of the Property with Building 7 (former Barracks and current Outpatient Clinic) at the center of the photo. The photo appears to have been taken from the roof of Building 12 (the former Nurse's Quarters and current Provost Marshal Administration Building). In the background left, the original Walter Reed General Hospital with the cupola (Building 1) can be observed. All of the rectangular buildings in the foreground were barracks (former Buildings 11, 12, 13, 14, and 15, from right to left) and the two rectangular buildings behind Building 11 and 12 (Buildings 16 and 17) have since been razed. The single-family residences in the background are most likely along Georgia Avenue and are off-post. No areas of environmental significance were determined from this photo.

A second photo obtained from the WRAMC Garrison Environmental Office (GEO) was not dated; however, based upon previous record research, this photo dates from around the mid 1950s to the mid-1960s. This photo provides an oblique view of most of the Property from south to north; however, due to the scale of the photo, a detailed analysis is not possible. No areas of environmental significance were determined from this photo.

3.3.1 Sanborn Map Review

Copies of Sanborn Maps (historical fire insurance maps) were obtained and reviewed for the Property (Sanborn Map Report, Environmental Data Resources, Inc. [EDR] 2005a). Maps were reviewed for nine years (1927, 1960, 1977, 1985, 1989, 1990, 1991, 1992, and 1995). The Sanborn maps separate the Property across two pages for each year obtained. Copies of these maps are included are included in **Appendix C**.

For all of the maps reviewed, the map notes indicate *"Admittance Refused-Data From Plans in Office."* For this reason, the Sanborn maps very closely resemble the historic maps obtained from the Master Planning-Real Property Manager at WRAMC, which are generally more detailed than the Sanborn maps. None of the Sanborn Maps include the roadways on the Property. Other than specifics on building construction materials, not much additional information can be obtained to supplement the review and interpretation from aerial photography.

3.3.2 Historical Topographic Map Review

Copies of the Historical Topographic Maps were obtained and reviewed for the Property (Historical Topographic Map Report, EDR, 2005b). Topographic maps were reviewed for five years (1951, 1956, 1965, 1971, and 1980). Copies of these maps are included in **Appendix D**.

The maps indicate that the elevation of the Property varies from 330-feet above mean sea level (amsl) near the northwestern corner to 250-feet amsl near the southern Property boundary in the vicinity of the Boiler Plant (Building 15). The grade primarily slopes toward the south and west, toward Rock Creek Park. The maps indicate that

prior to surface grading, construction and urbanization both on- and off-post, natural drainage flowed off the Property from the Boiler Plant (Building 15) area and followed southwest along what is now Luzon Avenue N.W. and a short segment of Military Road where the surface water entered Rock Creek Park about one mile from the Property.

The topographic maps provide a general indication of the chronology of building and road construction changes over the years. However, the historical maps provided by the Master Planning-Real Property Manager at WRAMC provide more details for review and interpretation.

3.4 Records Review

3.4.1 Standard Environmental Record Sources

EDR performed research into environmental regulatory agency database listings (Data Map Area Study, EDR, 2006). The EDR report for the Property was obtained on August 31, 2006. The purpose of the database review is to identify reported environmental issues for the Property and other properties in the vicinity that could affect the Property.

Reported release sites identified in the regulatory agency database search report were evaluated with respect to the following criteria:

- Nature and extent of a given release;
- Distance of the reported release site from the Property; and,
- Assumed gradient inferred from the topography.

Generally, reported release sites located with 1/4-mile upgradient or 1/8-mile cross-gradient or adjacent downgradient are considered to have a potential to have impacted the Property. Sites that were listed in the database search report, but not identified as a release site, and sites that were listed as being “closed” were evaluated by closure date, history of operation, and location to the Property. The addresses listed in the summary information are the addresses provided in the database.

The remainder of this section describes the findings from the first the Federal, then the State and Local database listings.

FEDERAL DATABASE FINDINGS

The findings of the Federal database search are summarized below in **Table 2** and a complete copy of the database report is provided in **Appendix E**.

Table 2 – Environmental Federal Record Review Summary

Record(s) Source	Number of Sites Plotted	Search Distance for Report (Miles)
Federal NPL Sites	0	1
Federal Proposed NPL Sites	0	1
Federal Delisted NPL Sites	0	1
Federal NPL Recovery Sites	0	Target Property
Federal CERCLIS Sites	**1**	0.5
Federal CERC-NFRAP Sites	0	0.5
Federal CORRACTS Sites	0	1
Federal RCRA TSD Sites	0	0.5
Federal RCRA LQG	**1**	0.25
Federal RCRA SQG	**5**	0.25
Federal ERNS Sites	**3**	Target Property
Federal HMIRS Sites	0	Target Property
Federal U.S. Engineering Control Sites	0	0.5
Federal U.S. Insect Control Sites	0	0.5
Federal DoD Sites	0	1
Federal FUDS Sites	0	1
Federal U.S. BROWNFIELD Sites	0	0.5
Federal CONSENT Sites	0	1
Federal Record of Decision Sites	0	1
Federal UMTRA Sites	0	0.5
Federal ODI Sites	0	0.5
Federal TRIS Sites	0	Target Property
Federal TSCA Sites	0	Target Property
Federal FTTS Sites	0	Target Property
Federal SSTS Sites	0	Target Property
Federal ICIS Sites	0	Target Property
Federal PADS Sites	**1**	Target Property

Record(s) Source	Number of Sites Plotted	Search Distance for Report (Miles)
Federal MLTS Sites	0	Target Property
Federal MINES Sites	0	0.25
Federal FINDS Sites	**8**	Target Property
Federal RAATS Sites	0	Target Property

Details on the Property listings and other adjacent sites from the Federal database search are discussed below.

Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS): The CERCLIS database is a registry of hazardous waste, pollutant, or contaminated sites identified by the USEPA that are suspected or confirmed to have adversely impacted the environment and may require cleanup. CERCLIS database contains sites proposed for or on the National Priorities List (NPL) registry, and which are in the USEPA screening and assessment process phase for possible inclusion on the NPL.

The following was identified in the CERCLIS database:

- **The Property** – WRAMC located at 6825 16th Street N.W. The Property is listed as a Federal Facility-Lead Cleanup site. September 8, 1989, is listed as the CERCLIS assessment History Discovery date. A preliminary assessment was completed on October 30, 1990, and was deferred to RCRA (Subtitle C). Another preliminary assessment was started on February 21, 1994, and completed on May 23, 1994, and give a priority level of high.

RCRA: RCRA Information is USEPA's comprehensive information system, providing access to data supporting the RCRA of 1976 and the Hazardous and Solid Waste Amendments of 1984. The database includes selective information on sites that generate, transport, store, treat and/or dispose of hazardous waste as defined by RCRA. Conditionally exempt small quantity generators generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month LQGs generate over 1,000 kg of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator off site to a facility that can recycle, treat, store, or dispose of the waste. Treatment, Storage, and Disposal Facilities (TSDFs) are facilities that treat, store, or dispose of the waste.

The following was identified in the RCRA LQG database:

- **The Property** – WRAMC located at 6825 16th Street N.W. There were 47 violation records reported; however not all of the violations were for the Property.

A portion of the violations were for the Forest Glen Annex. See **Section 5.1** for additional details on permit violations.

The following were identified in the RCRA SQG database:

- Dunifab, Inc. located at 7401 Georgia Avenue N.W. is located adjacent to the Property. There is one violation record listed for this site. The Dunifab, Inc. is upgradient of the Property.

- Rex Cleaners located at 7346 Georgia Avenue N.W. is located adjacent to the Property. No violations were found. Rex Cleaners is upgradient of the Property.

- Tito Contractors, Inc. located at 7308 Georgia Avenue N.W. is located adjacent to the Property. There are 8 violation records listed for this site. Tito Contractors is upgradient of the Property.

- PEP Boys No. 408 located at 6501 Georgia Avenue N.W. is located approximately a 1/4-mile south of the Property. No violations were found. PEP Boys is downgradient of the Property.

- Sunoco Service Station located at 6450 Georgia Avenue N.W. is located approximately a 1/4-mile south of the Property. No violations were found. Sunoco is downgradient of the Property.

Emergency Response Notification System (ERNS): The ERNS database is a registry of reported releases of oil and hazardous substances. The database contains information from spill and emergency response reports provided by the National Response Center, Department of Transportation, USEPA, and U.S. Coast Guard.

The following were identified in the ERNS database:

- **The Property** – Two reports are for WRAMC located at 6825 16th Street N.W.

  - 20 July 1987 – Due to operator error, an overfill of a No. 2 fuel oil tank occurred, resulting in a spill of about 3-gallons to the asphalt. This was cleaned up with “quick-dry” sorbent. The specific location of the spill was not listed in the report.

  - 7 December 1988 – Due to operator error, an overfill of a No. 2 fuel oil tank occurred, resulting in a spill to the sanitary sewer. This was cleaned up with vacuum techniques. Neither the volume of the spill nor the specific location was listed in the report.

- Private Residence located at 6900 Georgia Avenue N.W. (adjacent to the Property). No further details were provided by the EDR report. This residence is downgradient of the Property.

PCB Activity Database (PADS): The PADS Database identifies generators, transporters, commercial storers and/or brokers and disposers of PCBs who are required to notify the USEPA of such activities. The source of this database is the USEPA.

The following was identified in the PADS database:

- **The Property** – WRAMC located at 6825 16th Street N.W. No further details were provided by the EDR report.

Facility Index System (FINDS): The FINDS listing is a broad database that contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRA Information System; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System); FTTS (FIFRA/TSCA Tracking System); CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); Transportation Research Information Service (TRIS); and TSCA. The source of this database is the USEPA/National Technical Information Service.

The following were identified in the FINDS database:

- **The Property** – WRAMC located at 6825 16th Street N.W. No further details were provided by the EDR report.
- Dunifab, Inc. located at 7401 Georgia Avenue N.W. is located adjacent to the Property. No further details were provided by the EDR report. Dunifab, Inc. is upgradient of the Property.
- Rex Cleaners located at 7346 Georgia Avenue N.W. is located adjacent to the Property. No further details were provided by the EDR report. Rex Cleaners is upgradient of the Property.
- Tito Contractors, Inc. located at 7308 Georgia Avenue N.W. is located adjacent to the Property. No further details were provided by the EDR report. Tito Contractors is upgradient of the Property.
- Longfellow Colorado Associates located at 6939 Georgia Avenue N.W. is located adjacent to the Property. No further details were provided by the EDR report. Longfellow Colorado Associates is downgradient of the Property.
- WRAMC Drycleaner located at 6800 Georgia Avenue N.W. is located adjacent to the WRAMC property. This site is not associated with the Property. No further details were provided by the EDR report. WRAMC Drycleaner is downgradient of the Property.

STATE AND LOCAL DATABASE FINDINGS

The findings of the State and Local databases are summarized below in **Table 3** and a complete copy of the database report is provided in **Appendix E**.

Table 3 – Environmental State and Local Record Review Summary

Record(s) Source	Number of Sites Plotted	Search Distance for Report (Miles)
MD State Hazardous Waste Sites	0	1
DC State Hazardous Waste Sites	0	1
MD State Landfill Sites	0	0.5
DC State Landfill Sites	0	0.5
MD SWRCY Sites	0	
DC LUST Sites	**21**	0.5
MD OCPCASES Sites	0	
MD Historical LUST Sites	0	
MD UST Sites	0	0.25
DC UST Sites	**25**	0.25
MD Historical UST Sites	0	
MD AST Sites	0	0.25
DC AST Sites	**1**	0.25
MD Insect Control Sites	0	0.5
MD VCP Sites	0	0.5
DC VCP Sites	0	0.5
MD DRYCLEANER Sites	0	0.25
MD BROWNFIELDS Sites	0	0.5
MD AIRS Sites	0	
MD LEAD Sites	0	

Details on the Property listings and other adjacent sites from the State and Local database search are discussed below.

D.C. LUSTs: The LUST Incident Reports contain an inventory of reported LUST incidents. The data come from the Department of Consumer and Regulatory Affairs' D.C. LUST Cases list.

The following were identified in the D.C. LUST database:

- **The Property** – WRAMC located at 6825 16th Street N.W. The LUST consisted of four heating oil tanks and one kerosene tank. The database does not contain the tank IDs for these five tanks. The EDR lists the notification date and entry date as October 7, 1993, for the four heating oil tanks. The notification date and entry date for the kerosene tank is October 14, 1993. The EDR lists the tanks as closed.

- **The Property** – Walter Reed Apartments (Building 18) located at 6939 Georgia Avenue N.W. is located across Georgia Avenue from the Main Post. Walter Reed Apartments are included within the Property. The LUST was a heating oil tank. The EDR lists the notification date and entry date as November 21, 1995. Facility status is listed as closed.

- Exxon Service Station No. 2-1357 located at 7825 Georgia Avenue N.W. is located approximately a 1/2-mile north of the WRAMC property. The LUST consists of five 3,000-gallon gasoline tanks and one 3,000-gallon used oil tank. The EDR lists the tanks a permanently out of use. Exxon Service station is upgradient of the Property.

- Dunifab, Inc. located at 7401 Georgia Avenue N.W. is located adjacent to the Property. The LUST was a gasoline tank. The EDR lists the notification date and entry date as July 29, 1987. Facility status is listed as NFA. Dunifab, Inc is upgradient of the Property.

- Former District Glass Co., Inc. located at 7058 Spring Place N.W. is approximately a 1/4- to 1/2-mile east of the Property. The EDR lists the notification date as March 14, 2002, and the entry date as April 17, 2002. The EDR lists the tanks as closed. Former District Glass Co. is downgradient of the Property.

- Willis Ltd. Partnership located at 7019 Georgia Avenue N.W. is located adjacent to the Property. The LUST was a heating oil tank. The EDR lists the notification date and entry date as April 30, 1997. Facility status is listed as closed. Willis Ltd. Partnership is downgradient of the Property.

- Former Amoco located at 7000 Blair Road N.W. is located approximately a 1/4- to 1/2-mile east of the Property. The EDR lists the notification date and entry date as August 25, 1989. The EDR lists the tanks as open. The former Amoco station is downgradient of the Property.

- Aspen Investment Company located at 6666 Georgia Avenue N.W. is located approximately a 1/8-mile south of the Property. The LUST was a heating oil tank. The EDR lists the notification date and entry date as January 7, 2000. Facility status is listed as closed. Aspen Investment Company is downgradient of the Property.

- Lightview Cooperative, Inc. located at 6626 Georgia Avenue N.W. is located approximately a 1/8-mile south of the Property. The LUST was a heating oil tank. The EDR lists the notification date and entry date as November 8, 1994. Facility status is listed as closed. Lightview Cooperative, Inc. is downgradient of the Property.

- Lightview Cooperative Association located at 6616 Georgia Avenue N.W. is located approximately a 1/8-mile south of the Property. The LUST was a heating oil tank. The EDR lists the notification date and entry date as May 3, 1995. Facility status is listed as closed. Lightview Cooperative is downgradient of the Property.

- Lightview Cooperative, Inc. located at 6606 Georgia Avenue N.W. is located approximately a 1/8-mile south of the Property. The LUST was a 2,000-gallon heating oil tank. Facility status is listed as permanently out of use. Lightview Cooperative is downgradient of the Property.

- Winchester Luzon located at 6600 Luzon Avenue N.W. is located approximately a 1/8- to 1/4-mile south of the Property. The LUST was a heating oil tank. The EDR lists the notification date and entry date as May 5, 1997. Facility status is listed as closed. Winchester Luzon is downgradient of the Property.

- Safeway Stores, Inc. located at 6501 Georgia Avenue N.W. is located approximately a 1/8- to 1/4-mile south of the Property. The LUST consists of three gasoline tanks. The EDR lists the notification date and entry date for tank one as November 10, 1989. The EDR lists this tank as closed. The EDR lists the notification date and entry date for tank two as July 14, 1992. The EDR lists this tank as closed. The EDR lists the notification date and entry date for tank three as July 19, 1991. The EDR lists this tank as closed. Safeway Stores, Inc. is downgradient of the Property.

- Sunoco Service Station located at 6450 Georgia Avenue N.W. is located approximately a 1/4-mile south of the Property. The LUST was a gasoline tank. The EDR lists the notification date and entry date as January 22, 1997. Facility status is listed as closed. The Sunoco Service Station is downgradient of the Property.

- Former BP Oil Station located at 6431 Georgia Avenue N.W. is located approximately a 1/4- to 1/2-mile south of the Property. The LUST was a gasoline tank. The EDR lists the notification date and entry date as May 21, 1993. Facility status is listed as closed. The former BP station is downgradient of the Property.

- Shell located at 6419 Georgia Avenue N.W. is located approximately a 1/4- to 1/2-mile south of the Property. The LUST consists of one waste oil and one gasoline tank. The EDR lists the waste oil tank notification date and entry date as January 18, 1996, and the gasoline tank notification date and entry date as

March 16, 2001. Facility status of the waste oil tank is listed as closed, and the gasoline tank is listed as open. Shell is downgradient of the Property.

- Amoco located at 6401 Georgia Avenue N.W. is located approximately a 1/4- to 1/2-mile south of the Property. The LUST was a gasoline tank. The EDR lists the notification date and entry date as December 12, 1989. Facility status is listed as closed. Amoco is downgradient of the Property.

- Exxon Service Station located at 6350 Georgia Avenue N.W. is located approximately a 1/4- to 1/2-mile south of the Property. The LUST consists of two waste oil tanks. The EDR lists the waste oil tanks notification date and entry date as December 11, 1992, and November 3, 1995, respectively. Facility status of the waste oil tanks is listed as closed. The Exxon service station is downgradient of the Property.

- Metropolitan Health Group located at 6323 Georgia Avenue N.W. is located approximately a 1/4- to 1/2-mile south of the Property. The LUST was a heating oil tank. The EDR lists the notification date and entry date as May 19, 1994. Facility status is listed as open. Metropolitan Health Group is downgradient of the Property.

- Paks Properties LLC located at 6300 Georgia Avenue N.W. is located approximately a 1/4- to 1/2-mile south of the Property. The LUST was a gasoline tank. The EDR lists the notification date and entry date as January 24, 1997. Facility status is listed as open. Paks Properties LLC is downgradient of the Property.

- Berry Mullenddre located at 1370 Sheridan Street N.W. is located approximately a 1/4- to 1/2-mile south of the Property. The LUST was a heating oil tank. The EDR lists the notification date and entry date as August 23, 2002. Facility status is listed as closed. Berry Mullenddre is downgradient of the Property.

Summary of EDR Report Records Findings

The EDR search listed the Property and some of the adjacent properties within the various environmental databases. The records searched did not indicate any reported environmental conditions at any of these sites that will directly affect the environmental condition of the Property.

3.4.2 Additional Record Sources

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

- Readily available records and files documenting where hazardous materials are stored and used on site (a summarized list is included in **Section 5**).

- Proof of ownership documentation via acquisition deeds and property maps were obtained through the DPW Master Planning-Real Property Manager and the U.S. Army Corps of Engineers (USACE) office in Baltimore, Maryland, and were reviewed to ascertain the historic use of the property. This inquiry included a search for recorded deeds, leases, mortgages, easements, and other appropriate documents. A copy of the proof of ownership documentation is presented in **Appendix F**.

- Files at the USACHPPM were reviewed for documents addressing human health matters.

- Environmental documents and files at the U.S. Army Environmental Center.

- Historical documents and maps at the National Archives and Records Administration (College Park, Maryland) on-line record search. Information is presented in **Section 3.3**.

3.5 Interviews

Several interviews of key past and current facility employees were conducted to aid in identifying environmental conditions at the Property. The following persons were interviewed:

Table 4 – Listing of Interviewed Personnel

WRAMC BRAC Environmental Coordinator
WRAMC Hospital & Forest Glen Point of Contact (POC)
WRAMC Hazardous Waste Bunker Operations
WRAMC Air, Wastewater, Stormwater POC
WRAMC Asbestos, Lead-based Paint, Radon POC
WRAMC Storage Tanks, Spill Plans POC
WRAMC Pipe Shop Building 11 Personnel
WRAMC Space Coordinator/Real Property Manager
WRAMC Electronics Shop Foreman
WRAMC Cultural Resource Manager
WRAMC Building 54 Engineer and Escort

The interviews included topics of general environmental interest and specific areas of interest identified during the records review and VSI. Copies of the interview reports are included in **Appendix G**. Pertinent information regarding environmental impacts is included in **Section 5** of this report.

3.6 Data Management

The environmental conditions at the Property, developed as described above and findings were compiled in hardcopy and in 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 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 file name.

4 Property Description

The following sections provide summary information on past and present land use and the nature of major processes and operations at the Property. A comprehensive list of buildings/sites and associated use, processes and activities is located in **Appendix A**.

4.1 Installation Location and Description

The Property is located in a mixed-use area of residential, commercial and retail properties in northwest Washington, D.C., approximately 5 miles north of the White House. Rock Creek Park and the Washington communities of Shepherd Park, Takoma Park, and Brightwood surround the Property. Georgia Avenue N.W., 16th Street, Aspen Street, Fern Street, and Alaska Avenue border the installation. The geographic location is latitude 38 degrees, 58 minutes north, and longitude 77 degrees, 2 minutes west. Vicinity characteristics are shown on Figure 1.

The installation is named for Major Walter Reed (1851 to 1902)—doctor, teacher, and scientist. He is most famous for his work against typhoid and especially in combating yellow fever.

Major William Cline Borden, Commander of the Hospital at Washington Barracks (now Fort McNair), was one of the first to envision a complete medical center capable of carrying on research, teaching, and the care of the sick and wounded. He championed a bill that Congress passed in 1905 authorizing construction of Walter Reed General Hospital. WRAMC has continued this mission and is now comprised of a tertiary-care medical center, which provides general and specialized medical care—inpatient and outpatient—for eligible beneficiaries.

The Property is approximately 113 acres. There are 48 buildings, some of which are interconnected and were constructed as early as 1908. By the 1930s, much of the Property looked much as it appears today. In addition to the original hospital (Building 1) and the new hospital (Building 2), other functional buildings at the Property are used for research, training, administration, entertainment/recreation, housing, supply, support, and parking. The Property has a campus-like setting and is accessed from manned security gates on the east (Georgia Avenue N.W.) and west (16th Street). The main drive traverses sinuously east to west across the property. Open communal areas for recreation and reflection are at various locations. The area surrounding the Property is residential to the north (Fern Street and beyond) and south (Aspen Street and beyond). To the west is Rock Creek Park, an urban recreational area. To the east is Georgia Avenue N.W., a major north-south access way, with commercial and multi-story residential units along Georgia Avenue.

4.2 Historic Land Use

The general vicinity of the Property was largely unsettled until the late eighteenth and early nineteenth centuries. The area was incorporated into D.C. in 1790, however, there was limited development until 1822. Besides the community of Brightwood, which

developed south of the current Property, the area was sparsely settled and consisted of heavy woodlands and large-acre farm tracts (Section 106 Report, Kise Franks & Straw, Inc., 1994). In 1905, the US Government acquired 42 acres of property for the Walter Reed General Hospital. When this parcel was acquired, it contained a frame farmhouse, barn, lift chamber, and springhouse located near Cameron's Creek, a tributary of Rock Creek.

The Property was expanded to approximately 113 acres in 1918 when the Army acquired an additional 71.7 acres (WRAMC Integrated Cultural Resources Management Plan, R. Christopher Goodwin and Associates, Inc., 1999).

In 1989, WRAMC purchased an additional parcel of land that included Building 18, formerly known as the Walter Reed Inn. This parcel is located on the southeast corner of Butternut Street and Georgia Avenue. This property is currently used for military housing. Prior to acquisition, this property had been leased by WRAMC for enlisted housing.

According to the WRAMC DPW Real Property Manager, a formal title abstract has not been developed for the Property. A copy of the summary of deeds for the Property was acquired from the USACE (**Appendix F**). This summary of deeds shows who owned the parcels prior to acquisition by the Army. Based upon historical record research, there is no indication that prior to being used as a hospital and research institution, the Property was anything other than residential, agricultural or undeveloped.

4.3 Facility History

The original 80-bed Walter Reed General Hospital opened on 1 May 1909 (Master Plan – Analysis of Existing Facilities and Environmental Assessment, RTKL Associates, Inc., 1976). The hospital gradually expanded until the beginning of World War I. At that time, a building expansion program increased the hospital's capacity to 2,500 beds. In 1923, the Army Medical School, located in the central Washington, D.C. business district, joined with the Veterinary School, the Army Dental School, and the Army School of Nursing to form the Medical Department Professional Schools and moved to the Walter Reed General Hospital site. On 1 September 1923, a War Department Order, signed by General John J. Pershing, designated the hospital and Medical Department Professional Schools as the Army Medical Center (AMC), and assigned them under direct control of the Surgeon General of the Army (Installation Assessment, USATHAMA, 1984).

The hospital expanded during World War II, handling up to 3,000 patients per day. During this time, Walter Reed General Hospital was designated as a specialized treatment center for cases involving tumors, fractures, loss of hearing, and neurological and thoracic surgery. The hospital continued to have a large patient load during the Korean Conflict. On the 100th anniversary of the birth of Army Doctor (Major) Walter Reed (September 13, 1951), AMC was officially renamed the Walter Reed Army Medical Center (Master Plan – Analysis of Existing Facilities and Environmental Assessment, RTKL Associates, Inc., 1976).

The WRAMC organization has continued its physical expansion as well as expansions in many areas of medical development. The hospital averages 16,000 admissions annually and has one of the largest outpatient services in the Army. In April 1973, WRAMC was reassigned from the jurisdiction of the Surgeon General to the Commander, Health Services Command (Installation Assessment, USATHAMA, 1984).

Some of these changes to the Property, as described above, can be seen in maps from 1920 through present day. These maps are presented as **Figure 3-1** (1920 Parcel Map), **Figure 3-2** (1927 Map), and **Figure 3-3** (1956 Map). See **Figure 2** for the current site map.

Important events in the facility's development, administration, and mission are summarized in **Table 5**:

Table 5 – Chronology of the Property
WRAMC, Washington, D.C.

Year	Description
1905	42 acres of property were acquired by the US Government for the WRAMC site in Washington, D.C.
1909	Original 80-bed Walter Reed General Hospital opened.
1918	The Property was expanded when the Army acquired an additional 71.7 acres, totaling approximately 113 acres. See **Figure 3-1**.
1923	The Army Medical School, located in the central Washington, D.C. business district, joined with the Veterinary School, the Army Dental School, and the Army School of Nursing to form the Medical Department Professional Schools and the schools moved to the Walter Reed General Hospital area. Also this year, War Department Order designated the hospital and Medical Department Professional Schools as the AMC, and assigned them under direct control of the Surgeon General of the Army. See **Figure 3-2** for a time approximation.
1955	The North Wing of the AFIP (Building 54) was competed.
1964	The National Museum of Health and Medicine housed in Building 54 since 1971 was designated a National Historic Landmark. This was previously known as the Army Medical Museum.
1980	New Hospital (Building 2) completed.
2005	On 13 May 2005, the BRAC Commission called for the closure of the facility

4.3.1 Operational History

This section describes the various missions that have been performed during the history of the Property in order to identify past and current processes that may have released contaminants to the environment. See **Section 4.3.2** for details regarding the processes that use chemicals or generate wastes.

Since inception, the primary mission of WRAMC has been to provide medical and surgical care for members of the Armed Forces, including retired military personnel,

military dependents, and hospital support to the U.S. Army Military District of Washington.

Specific missions of various elements of WRAMC on the Property are outlined below.

Walter Reed Hospital

Prior to 1979, Building 1 and a complex of surrounding buildings were used to provide clinical and patient care facilities. Since the completion of the new hospital in 1979, the diagnostic laboratories and treatment facilities for patients have been in Building 2.

Walter Reed Army Institute of Research (WRAIR)

WRAIR was formerly located on the Property in Building 40 from 1925 to 1999. WRAIR's mission is to conduct biomedical research that is responsive to DoD and U.S. Army requirements. Originally built as the Army Medical Department Professional Service School, the facility became known in 1947 as the U.S. Army Medical Department Research and Graduate School. In 1950 it became WRAIR. WRAIR relocated to the Forest Glen Annex in 1999 at which time the building was decommissioned and Building 40 has since been vacated.

Armed Forces Institute of Pathology (AFIP)

In 1955, Building 54 was constructed on the Property for the AFIP. AFIP has been in operation since 1955 and is a tri-service organization that conducts medical research and development and teaches pathology to military and civilian physicians. AFIP's mission is to provide worldwide scientific consultation, research, and more recently, education services in the field of forensic DNA analysis to the DoD and other agencies and to provide DNA reference specimen collection, accession, and storage. In addition to the AFIP research areas, Building 54 also houses the National Museum of Health and Medicine of the AFIP, the American Registry of Pathology, and WRAMC-TV. WRAMC-TV is a closed-circuit system with four channels.

U.S. Army Institute for Dental Research (USAIDR)

Formerly located in Building 40, USAIDR operated from 1962 to 1993 when it was dis-established. The mission of this organization was to conduct research in the etiology, prevention and control or oral diseases; to develop simplified techniques for rapid and effective dental treatment; to conduct investigations on the properties of dental materials; and to conduct educational and training programs in dentistry.

U.S. Army Regional Dental Activity (USARDA)

Formerly in Building 91, USARDA operates two dental clinics in Building 2. The mission of USARDA is to fabricate and repair dental prostheses, provide consultations, and to assist the USAIDR by providing prosthodonic training aids and instructional assistance in dental courses and participating in research activities.

4.3.2 Process Descriptions

To support the primary mission of WRAMC as outlined in **Section 4.3.1**, industrial-type operations have been and continue to be conducted at the Property.

This section discusses the various industrial-type activities, current and past, which have used or currently use chemicals or generate wastes. **Appendix A** presents a list of the buildings on the Property that have operated or continue to operate industrial-type processes use uses of potential environmental significance.

Basic infrastructure operations are conducted at the steam boiler plant (Building 15), cooling plant & stand-alone chillers (Building 48), and the pipe shop/plumbing (Building 11, basement). Motor vehicle maintenance shops, laundry facilities, print shops and paint shops currently or historically have been in operation at the Property. A summary of these areas and their operations are listed below:

Auto-Crafts Shop (Building 82) Former Post Exchange Gasoline Service Station – This building was constructed in 1942 and first used as a gasoline service station, then as the Auto-Crafts Shop. The gasoline tanks were removed from this area in 1993 (see **Section 5.4** for more information on USTs). The Auto-Crafts Shop is used to provide skills for automotive maintenance.

The former Designated Institutional Official (DIO) Motor Pool Shop (former Building 41) – Prior to 1975, automobile maintenance activities were conducted at former Building 41, which was demolished when the new hospital (Building 2) was constructed. After 1975, these activities were transferred to the Forest Glen Annex (Installation Assessment, USATHAMA, 1984). No other documentation was found detailing this use.

Steam Boiler Plant (Building 15) and the Steam Heating System – Five steam boilers are present at the Property. Four boilers are dual fuel boilers using natural gas and No. 2 fuel oil and are located in Building 15. One natural gas fired boiler serves Building 18, which was formerly known as the Walter Reed Inn, located across Georgia Avenue from the Property. One No. 2 fuel oil fired boiler was formerly located at Building 88 (the therapeutic swimming pool) (Installation Assessment, USATHAMA, 1984). (Refer to **Section 4.4**, Installation Utilities for more information on the steam heating system).

Laundry Facility (Building 56) – Prior to relocation in 1976, the post laundry facility was located at the Property. Only detergent and liquid chlorine bleach were reported to have been used. No dry cleaning operations were located at the Property (Installation Assessment, USATHAMA, 1984).

Print Shops – Two print shops were located on the Property; one in Building 1 (since 1977, but has since been converted into a copy center) and one in Building 40 (since 1954 until relocation off Property in 1999). Solvents for cleaning presses and photographic chemicals were used (Installation Assessment, USATHAMA, 1984).

Office Machine Repair Shop (Buildings 33 and 1) –The office machine repair shop was located in Building 1 to about 1977; prior to this, the shop was located in Building 33 (demolished). The office machine repair shop provided cleaning and routine maintenance of the various types of office machines. Prior to the early 1970s, a 3-percent perchloroethylene solution was used as a cleaning solvent, then a benzene petroleum distillate solution and trichloroethylene were used as cleaning solvents (Installation Assessment, USATHAMA, 1984).

Paint Shop (Building 5) – Prior to relocation in 1972, provided interior maintenance painting and linoleum flooring services. This operation was transferred to the Forest Glen Annex in 1972 (Installation Assessment, USATHAMA, 1984). Building 5 has been renovated and repurposed into the MRI facility and is now part of Building 1.

Cooling Plant (Building 48) – Building 48 houses the primary cooling plant for the Property .

Pipe Shop (Building 11, basement) – The pipe shop is responsible for plumbing repairs and maintenance.

Backup Power Generators – WRAMC has multiple backup power systems ranging from smaller backup generators to a large power generation arrangement primarily for the main hospital.

Laboratory Operations – Numerous laboratory operations are associated with the medical and dental (clinical) and research and development activities conducted on the Property. The major biological, medical, and chemical laboratory complexes are the Main Hospital (Building 2), the AFIP (Building 54), and the Department of Clinical Investigation (DCI) (Building 7).

4.3.3 Occupancy, Lease and Easement History

The main post area is owned in fee simple and was purchased in 1905 (42 acres) and 1918 (71.7 acres) (Installation Assessment, USATHAMA, 1984). In 1989, the parcel of property that included Building 18, formerly known as the Walter Reed Inn, which is located at the southeastern corner of Butternut Street and Georgia Avenue, was acquired from an individual. This property is currently used for housing and is Building 18.

One out grant was reported during the Installation Assessment conducted in February 1984. It was granted to D.C. for construction of a sidewalk in connection with Georgia Avenue. A lease was also given to Riggs National Bank for 2510 square feet in Building 1; this has since expired.

WRAMC is in the process of considering an Enhanced Use Lease of Buildings 40 and 18 on the Property and an EBS was conducted in 2004 to document the condition of the buildings. The EBS will be used to meet DoD and Army requirements for proposed out grant or transfer of certain properties at WRAMC (EBS Enhanced Use Lease Project, Buildings 40 & 18, WRAMC DPW, 2004).

4.3.4 Range Operations

There is one non-operational indoor firing range located in the basement of Building 54. The ECP VSI team visited the indoor range and confirmed that it is non-operational. This small indoor firing range was formerly used to conduct ballistic testing.

The WRAMC Industrial Hygiene Office collected dust wipe samples of walls and floors to assess potential lead contamination from the previous range operations and reported that all sample results were well below any action levels for lead (Personal communication WRAMC Industrial Hygiene Office, 2006). According to WRAMC staff, the firing range was closed because the ventilation system did not adequately protect workers from lead dust. There are no known operational, non-operational or historical outdoor firing ranges at the Property.

No unexploded ordnance (UXO), discarded military munitions (DMM) or munitions constituents were present at the range.

Indoor ranges are excluded from the Army MMRP and the Army Operational Range Assessment Program.

4.4 Installation Utilities (Historic and Current)

This section summarizes the water supply, sanitary sewer, stormwater, electrical and heating distribution systems that are used at the Property. The source for this information is primarily from the Installation Master Plan 2005; this information has been supplemented with interviews from WRAMC GEO.

4.4.1 Water Systems

The potable water for the Property is obtained from the D.C. WASA. The Washington Aqueduct Division of the Baltimore District, USACE supplies D.C. with water. Water is obtained from the Potomac River above the Great Falls area and is treated at the Dalecarlia Reservoir. The water supply network on the Property consists of approximately 22,620 linear feet of piping including 237 fittings, 165 valves, and 44 fire hydrants. The water is distributed throughout the Property by a network of 6- and 8-inch cast iron pipes, which serve both domestic and fire protection functions. Recently, a direct 12-inch water main was installed at Building 54 due to projected demands on the system.

The water system was built progressively beginning in 1908, and much of the system is more than 50 years old. There are no water storage facilities on the Property. The Master Plan 2005 reports that the existing source of supply is considered to be reliable. The water utilities for the Property are depicted on **Figure 4-1**.

The Property ties into the existing 12-inch water distribution mains, which are owned by D.C. Recently, meters have been installed at all active connections to the 12-inch mains to monitor water consumption to the Property. It is estimated that water demand exceeds 1.33 million gallons per day.

4.4.2 Industrial and Sanitary Sewers and Treatment Plants

The wastewater network at the Property is comprised of approximately 16,500 linear feet of pipe and 128 manhole structures. Most of the system is more than 50 years old and is comprised of clay pipe (WRAMC Main Section Master Plan, Woolpert LLP, 2005). The exception is that hospital has some glass lines that were tied into certain labs that have been moved several times. These lines discharge into the sanitary sewer. No pretreatment takes place and there does not appear to be a corrosive problem from the labs (Personal communication with Air, Wastewater and Stormwater POC, WRAMC GEO, 5 December 2006d). The Property has separate storm and sanitary sewer systems. The sanitary sewer utilities for the Property are depicted on **Figure 4-2**.

Although there are no industrial sewers on the Property, Building 54 has a wastewater handling/disinfection system for wastes generated at that building. WASA participated in reviewing the system and is aware of the system, but did not issue a permit. The system disinfects using steam and pressure, only. Quenching water is automatically added to reduce the discharge temperature. Following this processing, this waste is discharged to the sanitary sewer. (Personal communication with Air, Wastewater and Stormwater POC, WRAMC GEO, 5 December 2006e).

The wastewater network has five major trunk connections and several minor connections. The wastewater collection system consists of 6- and 8-inch diameter lateral lines from the buildings that connect to 10- to 21-inch diameter roadway lines that enter into the main trunk. The Master Plan 2006 reports that at least two buildings use sanitary sewer injection pumps to lift the effluent to the main interceptors.

Wastewater from the Property is discharged into the WASA sewer system. The WASA sewer flows through the Property, entering at Georgia Avenue and Dahlia Street, flowing west and then southwest to exit at Luzon Avenue and Aspen Street.

There are two oil/water separators on the Property. The first is located at Building 82, which is the auto crafts building and was the former PX gasoline station. According to WRAMC GEO staff, this unit connects to a floor drain in the center of Building 82 and the unit is pumped out periodically. Due to the low flow through this unit, biomass accumulates within this unit and signage at the manhole states “biological sludge.” The second oil/water separator is in Building 2, on the floor below the compactors. This unit is a sump that was retrofitted to an oil/water separator.

There are five grease traps located at the Property. Buildings 1, 54, and the Mologne House (hotel) each have one grease trap, while two are located at the Hospital (Building 2). The grease trap in Building 54 is no longer used.

Previous assessment reports have listed areas of use on the Property that have discharged to the sanitary sewer. Several of these historical areas have either been repurposed or demolished. The Preliminary Assessment (Preliminary Assessment, Weston, 1990) included the USEPA CERCLA hazard-ranking summary that reported

the following areas as having discharged wastewater into the sanitary sewer prior to 1980:

- All Research Labs (Buildings 1, 2, 40, 83, 91, 54, and T-2);
- The former Office Machine Repair Shop (in demolished Building 33, then in Building 1 (area now repurposed);
- Print Shops that were in Buildings 1 and 40; and,
- Laundry that was in Building 56 (now demolished).

WRAMC has received NOVs with regard to wastewater discharges, primarily related to mercury concentrations. All of the listed violations have been resolved. (See **Section 5.16** Applicable Regulatory Compliance Issues).

Based upon the age of the sanitary sewer system and the documentation of discharges (listed above), there may be environmental concerns related to past sanitary sewer system discharges; however, there is no assessment documentation to support this concern.

4.4.3 Stormwater System

As previously stated, the Property has separate storm and sanitary sewer systems. The stormwater utilities for the Property are depicted on **Figure 4-3**.

The storm water drainage system for the Property consists of catch basins, curb inlets, yard drains, manholes, sand filters, and 10- to 36-inch-diameter pipelines that discharge to the WASA Luzon Avenue storm drainage tunnel. The tunnel, which enters the Property at Georgia Avenue and Dahlia Street, runs southwest under the Rose Garden and discharges into Rock Creek Park across 16th Street. According to the Master Plan 2005, the stormwater system is reported to be in fair condition, adequate for drainage of the Property, and meets local quantity and quality requirements. WRAMC GEO staff stated that in 2005, the local area was investigated to determine the source of chlorine discharges into the storm sewer. D.C. determined that the Property did contribute to some of the chlorine in the stormwater discharge; however, chlorine was also detected in the stormwater upgradient of the Property. No action was required on this issue.

Previous assessment reports have listed areas of use on the Property that have discharged to the storm sewer. All of these historical areas have either been repurposed or demolished. The Preliminary Assessment (Preliminary Assessment, Weston, 1990) included the USEPA CERCLA hazard-ranking summary that reported the following areas as having discharged wastewater into the storm sewer prior to 1980:

- Washrack water from former Building 41 (now demolished) and current Building 82 (the Auto Crafts Building/former PX Gasoline station); and,
- Degreasing wastewater from now demolished Vehicle Maintenance Shop (Building 32).

No documentation was found detailing these areas and the listed discharges. WRAMC GEO staff stated that the washrack at Building 82 was not installed.

Currently, non-contact cooling water is discharged into the storm sewer with volumes estimated at 20,000 to 30,000 gallons per day, year round.

No NOVs have been found regarding discharges to the storm sewer.

4.4.4 Electrical System

The Property purchases electricity from Potomac Electric Power Company (PEPCO). The electrical utilities for the Property are depicted on **Figure 4-4**.

The Property is serviced by three normal-supply feeders and one emergency-supply feeder. The feeders terminate and are metered at the main switching station in Building 95 located near the intersection of Georgia Avenue and Aspen Street. The AFIP (Building 54) is served by two PEPCO 13.2 kV feeders entering the installation at 14th Street and Alaska Avenue and routed directly to the AFIP.

During the VSI for this ECP, a new electrical switching station was being built and is expected to be on line by the end of 2006. The new electrical switching station is located adjacent to the Boiler Plant (Building 15), and will replace the existing electrical switching station (Building 95).

The 1990 Preliminary Assessment Report (Weston, 1990) indicates that 66 transformers (38 pad-mounted and 28 in underground vaults) were located on the Property. See **Section 5.5** for more details regarding transformers and PCBs.

4.4.5 Steam Heat Distribution

The existing heat distribution system uses steam tunnels, trenches, and direct buried, pre-insulated piping. The Central Heating Plant is located in Building 15. This is a high-pressure steam plant, which generates 110-psi steam for heating. This plant is comprised of four dual-fuel high-pressure steam boilers, feed water equipment, water treatment, and other ancillary equipment. The primary energy source for the boilers is natural gas and No. 2 fuel oil is used during periods of natural gas curtailment.

4.5 Environmental Setting – Natural and Physical Environment

4.5.1 Climate

Washington has a temperate climate typical of the Mid-Atlantic/Northeast U.S., with four distinct seasons. Summer tends to be hot and humid with daily high temperatures in July and August averaging in the high 80s° to low 90s°F (about 30° to 33°C). The combination of heat and humidity makes thunderstorms very frequent in the summer. Spring and fall are mild with high temperatures in April and October averaging in the high 60s°F (about 20°C). Winter can bring cold temperatures, frozen precipitation and, on occasions, major snowstorms. Average highs tend to be in the 40s (4° to 8°C) and

lows in the 20s (-6° to -2°C) from mid December to mid February. While hurricanes (or the remnants of them) occasionally track through the area in the late summer and early fall, they have often weakened by the time they reach Washington. Spring is the most favorable time of year, with low humidity, mild temperatures and blooming foliage. This period generally lasts from late March until mid May.

The average annual snowfall is 15 inches (381 mm) and the average high temperature in January is 43°F (6°C); the average low for January is 27°F (-3°C). The highest recorded temperature was 106°F (41°C) on July 20, 1930, and August 6, 1918, and the lowest recorded temperature was -15°F (-26°C) on February 11, 1899 (EBS Enhanced Use Lease Project, Buildings 40 & 18, WRAMC DPW, 2004).

4.5.2 Topography

The Property is located along the eastern edge of the Piedmont Plateau physiographic province of the Appalachian Highlands. The Piedmont's topography is characterized by gently rolling hills and level uplands strongly dissected by streams that have steep valley walls. The grading and building that have occurred at the Property over the years have extensively altered minor variations in the original topography. The Property has an overall drop-off to the south, with two low areas that drain the Property to the southeast, into Rock Creek. The slopes on the Property are gentle enough to allow for full development of the Property. Today there are a few steep slopes on the Property left from grading for building sites, roads and parking lots (EBS Enhanced Use Lease Project, Buildings 40 & 18, WRAMC DPW, 2004).

4.5.3 Surface Water Hydrology

There are no streams on the Property; however, Rock Creek is located approximately 1/4-mile to the west. D.C. groups waters of the District into Beneficial Use Classes. Rock Creek is classified as a Class B and C stream by D.C. Class B waters are protected for secondary contact recreation and aesthetic enjoyment. Class C waters are protected for aquatic life, waterfowl, shore birds, and water-oriented wildlife.

Rock Creek is also designated as an anti-degradation segment. Under this designation, the following requirements apply: (1) new point source discharges are prohibited; (2) non-point discharges shall be controlled to the extent feasible, with best management practices and regulatory programs; (3) construction projects shall be considered on a case-by-case basis to ensure that there will be no long-term adverse water quality effects; and, (4) short-term water quality effects on anti-degradation segments, resulting from construction projects, shall be subject to intergovernmental coordination and public participation requirements. The entire installation is outside the 100-year flood plain of Rock Creek.

As discussed in Section 4.4.3, the storm water drainage system for the Property consists of catch basins, curb inlets, yard drains, manholes, sand filters, and 10- to 36-inch-diameter pipelines that discharge to D.C.'s Luzon Avenue storm drainage tunnel. The tunnel, which enters the Property at Georgia Avenue and Dahlia Street, runs southwest under the Rose Garden and discharges into Rock Creek Park across 16th

Street. The system is in fair condition, is adequate for drainage of the Property at this time, and meets state and local quantity and quality requirements (EBS Enhanced Use Lease Project, Buildings 40 & 18, WRAMC DPW, 2004).

4.5.4 Geology

WRAMC is located over the Piedmont Plateau, which is composed of hard crystalline igneous and metamorphic rock of the Precambrian and Paleozoic age, roughly 600 million years old. The metamorphic rock structure takes the form of complex folds and thrust faults that have been subsequently intruded by igneous rock, pegmatite, and veins of quartz. Bedrock in the eastern portion of the Piedmont consist of schist, gneiss, gabbroic, and other highly metamorphosed sedimentary and igneous rocks of probable volcanic origin. These bedrocks provide an excellent foundation support and exist in an area of low seismic activity.

No groundwater supplies are used at the Property. Public groundwater supplies provide less than 3 percent of the water currently consumed in this region, and for economic reasons, it is likely to remain a minor supplement. The amount of water that can be stored underground depends on the porosity of the underlying rocks, which, at the Property, is comprised of hard crystalline rocks of low porosity. From available data, the water table is estimated to exist within the bedrock and near bedrock surface. The source of groundwater recharge is precipitation, and the groundwater gradient at the Property roughly parallels local surface topography. Building foundations and drainage systems alter some of the local gradients. The depth of the seasonal high water table is from 5 to 6 feet. The average yield of area wells developed in crystalline rock is 10 to 20 gallons per minute from bedrock aquifers 40 to 140 feet below the surface (EBS Enhanced Use Lease Project, Buildings 40 & 18, WRAMC DPW, 2004).

4.5.5 Demography and Land Use

The current population of WRAMC, Main and Forest Glen Sections is 8,502 personnel. Military personnel account for 3,630 of the total and the number of civilian personnel is 4,872 (ASIP, 2005). The WRAMC provides very limited family housing on-post at the Property. Two homes are provided for general officers on the eastern side of the Property and there are eight senior officer homes to the west side (EBS Enhanced Use Lease Project, Buildings 40 & 18, WRAMC DPW, 2004).

Per the WRAMC Main Section Master Plan, which covers the Property, the existing land use, categorized per TM 5-803-1, is as follows:

Table 6 – Existing Land Use Allocations

Category	Approximate Acreage	Percent of Total
Administration	19.75	17.48
Community Facilities	12.93	11.44
Family Housing	8.74	7.73
Utilities	4.19	3.70
Medical	24.44	21.63
Recreation	13.88	12.28
Research and Development	12.30	10.88
Unaccompanied Housing	4.20	3.72
Training	1.97	1.74
Operations	0.28	0.25
Buffer Zone	10.16	8.99
Total	**113.00**	**100.00**

4.6 Biological and Cultural Resources Summary

4.6.1 Biological Resources

4.6.1.1 Vegetation

Bailey (Descriptions of the Ecoregions of the United States, 1980) categorizes the Washington, D.C. area as being in the Southeastern Mixed Forest Province lowland ecoregion, within the Subtropical Division of the Humid Temperate Domain. WRAMC occurs within the Piedmont section of the Oak-Chestnut forest region. Dominant trees within this area historically included black oak (Quercus velutina), white oak (Quercus alba), hickory (Carya spp.), and tulip poplar (Liriodendron tulipifera). American beech was typically present on ravine slopes (Astore, 1992).

General floristic studies have not previously been conducted at WRAMC. Existing wooded areas at WRAMC are representative of second growth forests, as original virgin forest no longer occurs in the region. Nevertheless, since little or no logging has occurred within the last 80 years or so at the Property, there is a substantial density of large oak (Quercus spp.) and tulip poplar trees. Understory vegetation varies considerably within the Property woodlands. At the Property, the remnant oak-dominated woodland between 16th Street N.W. and the Mologne House is heavily infested with exotic shrubs and vines such as wineberry (Rubus phoenicolasius), multiflora rose (Rosa multiflora), winged euonymous (Euonymous alatus), garlic mustard (Alliaria petiolata), English ivy, and Japanese honeysuckle.

There exists no meadow or old field habitat within the boundaries of the Property. Residential areas at the Property are dominated by horticultural plant species associated with mowed lawn or otherwise landscaped areas. Field investigations for rare and endangered species of flora were conducted in 1997 and 1998 by Woolpert LLP biologists. No rare species were noted at the Property (Rare, Threatened, and Endangered Species Survey, Woolpert LLP, 1999a).

4.6.1.2 Wildlife

The Property is located along the eastern edge of the Piedmont Plateau physiographic province of the Appalachian Highlands (Astore, 1992). This region has a diverse array of native vertebrate fauna in suitable natural habitats. Studies of animal diversity conducted within the Maryland portion of the Rock Creek watershed recorded 22 species of amphibians, 25 species of reptiles, 34 species of mammals, and 144 species of birds (Environmental Assessment: Forest Glen Section, Rogers et al., 1990).

Natural habitat areas in the form of woodlands occur only in small wooded pockets at the Property. The 3-acre hillside woodlot along 16th Street N.W. at the Property is too small to provide habitat for wildlife other than urban-tolerant mammals and common species of resident birds.

During 1997 and 1998 field investigations, one mammal and 19 species of birds were observed at the Property. The eastern gray squirrel (Sciurus carolinensis) was the only mammal noted, while resident birds frequently observed included rock dove (Columba livia), blue jay (Cyanocitta cristata), American crow (Corvus brachyrhynchos), European starling (Sturnus vulgaris), northern cardinal (Cardinalis cardinalis), and house sparrow (Passer domesticus). No reptiles or amphibians were observed at the Property. Non-breeding migrant birds noted in spring at the Property included species such as veery (Catharus fuscescens), blackpoll warbler (Dendroica striata), and American redstart (Setophaga ruticilla) (Environmental Assessment, Master Plan Update, Main Section, Woolpert LLP, 2002).

4.6.1.3 Rare, Threatened, and Endangered Species

During 1997 and 1998 surveys, a three-season methodology was employed to better assess the presence or absence of rare flora and fauna within the boundaries of the Property in compliance with Army regulations 200-1 and 200-3. After the first site reconnaissance from September 30, 1997, to October 2, 1997, it was determined that no rare flora or fauna were observed during field investigations at the Property. Potential habitat for rare and endangered species on the Property is virtually nonexistent. At adjacent Rock Creek Park within D.C., some 25 plant species and five animal species have been documented that are considered rare, though most sighting records date back 85-120 years. The federally threatened arctic peregrine falcon (Falco peregrinus tundrius) may find transitory perches on the highest structures on the Property (Environmental Assessment, Master Plan Update, Main Section, Woolpert LLP, 2002).

4.6.2 Cultural Resources

4.6.2.1 Archeological Resources

Construction and land management during its long history have extensively disturbed the grounds of the Property. As part of a Section 106 report prepared in 1994 to address the implementation of the installation master plan, a reconnaissance survey and literature search was conducted. This research revealed no archeological resources within the Property boundaries (Section 106 Report, Kise Franks & Straw,

Inc., 1994). Due to extensive land disturbance, the report concluded that there is little probability that significant archeological resources would be found on the installation (Section 106 Report, Kise Franks & Straw, Inc., 1994).

4.6.2.2 Architectural/Historic Resources

Numerous surveys and reports have been prepared to identify historic resources and make recommendations for the management of those resources. The installation has an Integrated Cultural Resources Management Plan (ICRMP) that identifies all cultural resources eligible for listing on the National Register of Historic Places, and makes recommendations for maintenance and management of those resources. A Section 106 Report was prepared by Kise Franks & Straw for the 1994 Main Section Master Plan (Section 106 Report, Kise Franks & Straw, Inc., 1994).

Walter Reed Historic District

A proposed historic district, consisting of 60 resources (39 contributing resources and 21 noncontributing), was identified in the 1994 Main Section, WRAMC, Washington, D.C., Section 106 Report as being eligible for listing on the National Register. A map depicting the areas of historical significance is presented on **Figure 5**.

One resource, the National Museum of Health and Medicine, is designated a National Historic Landmark. The National Register-eligible historic district incorporates most of the installation with the exception of the area north of Dahlia Street and east of 14th Street. This historic district contains resources that are primarily related to the original Walter Reed General Hospital and the WRAIR (Section 106 Report, Kise Franks & Straw, Inc., 1994). The historic district includes resources from many years of development at the Property; however, the design of those resources and overall master planning was consistent. The Property development adhered to Beaux Arts planning concepts and the predominant architectural style is Georgian Revival (Section 106 Report, Kise Franks & Straw, Inc., 1994). Consisting of 39 contributing and 21 noncontributing resources, the district is eligible "as a result of its historical significance in the field of military medicine (Criterion A) and for its architecture and design (Criterion C)." The identified period of significance for the district is between 1908 and World War II. The district includes a group of contributing residential buildings (Buildings 19, 21, 22, 25, 26, 29, 29A, 30, and 35) that were originally part of the Sixteenth Street Heights Subdivision and were purchased by WRAMC for use as officer housing when the installation expanded in the 1920s (Environmental Assessment, Master Plan Update, Main Section, Woolpert LLP, 2002).

Building 54

Building 54 is potentially individually eligible for the National Register of Historic Places. The ICRMP for the Property identified Building 54 as potentially eligible under Criterion Consideration G. The ICRMP also stated that Building 54, completed in 1955, was the "first and only building constructed in the United States that was designed and built to survive a hydrogen-bomb explosion" (ICRMP, Goodwin and Associates, 1999).

National Museum of Health and Medicine

The Army Medical Museum and Library, now called the National Museum of Health and Medicine, presently housed in Building 54, was declared a National Historic Landmark (NHL) in 1964, at which time the museum was located in a brick building on the National Mall. In 1966, it was determined that the NHL status of the museum was associated with the museum collection, not the building in which it was housed (Section 106 Report, Kise Franks & Straw, Inc., 1994). The building on the Mall was subsequently demolished, and the collection was moved to Building 54 at the Property, where it retains its NHL status. Parts of the museum's collections are now housed off-installation in leased space. Currently the museum is open to the public from 10:00 to 17:30 daily. It is closed Christmas day. The number of visitors in 1999 was approximately 60,000 to 65,000 (Environmental Assessment, Master Plan Update, Main Section, Woolpert LLP, 2002).

4.7 Site Maps

The following site maps are used in this ECP to provide both a current and historical overview of the Property. These maps have been obtained from site research and prior reports and have been updated as needed:

- Site Location Map (**Figure 1**)
- General Site Map updated from 1997 Master Plan (**Figure 2**)
- Historic Site Maps, including:
    - 1920 Map with Original Parcels (**Figure 3-1**)
    - 1927 Map with Historical Building Descriptions (**Figure 3-2**)
    - 1956 Map showing WRAMC prior to construction of the new hospital building, which is currently Building 2 (**Figure 3-3**)
- Utility Maps, including:
    - Water System (**Figure 4-1**)
    - Sanitary Sewer System (**Figure 4-2**)
    - Stormwater System (**Figure 4-3**)
    - Electrical System (**Figure 4-4**)
- Historical Resources ([from EA 2003 Master Plan] **Figure 5**)
- Storage Tank Locations for ASTs & USTs ([from EA 2003 Master Plan] **Figure 6**)

- Hazardous Substance Storage Locations ([updated from the Preliminary Assessment Report, Weston, 1990, which was developed for the USEPA CERCLA Hazardous Ranking System Scoring process] **Figure 7**)
- Environmental Condition of Property Categories Parcel Map (**Figure 8**)
- Qualified Parcel Map (**Figure 9**)

5 Environmental Conditions

5.1 Environmental Permits and Licenses

5.1.1 RCRA Status

In 1980, WRAMC filed a Notification of Hazardous Waste Activity with the USEPA to generate hazardous waste at the Property. WRAMC is an LQG of RCRA regulated hazardous waste with an ID number of DC4210021156.

According to the Installation Assessment (USATHAMA, 1984), USEPA has not requested that WRAMC submit either Part A or B of the RCRA permit application. WRAMC is not a permitted TSDF (Preliminary Assessment, Weston, 1990).

Two designated 90-Day Hazardous Waste Storage Areas are currently maintained at Building 54. One area is operated by AFIP personnel to collect wastes from satellite accumulation points within AFIP, while the other area is maintained by the Garrison and is the designated storage facility for the entire Property. A former hazardous waste storage facility was located south of Building 40 and was closed in 1993 (corresponds to IRP site WRAMC-01). See **Section 5.2.1** for more information on the IRP sites. Also see **Section 5.3.1** for information on hazardous waste.

5.1.2 Solid Waste Permits

WRAMC has never possessed solid waste permits for the Property.

5.1.3 UST/AST Permits

A list of all registered tanks is located in **Section 5.4**. The primary usage of all current tanks is storage of diesel fuel and/or No. 2 heating oil for boilers and emergency generators.

5.1.4 NPDES Permits

WRAMC holds a wastewater discharge permit, #045-5 for the Property, under the purview of the WASA. The permit covers discharges to the sanitary sewer system on the Property and became effective on 1 December 2001. WRAMC and WASA entered into a consent agreement under this permit in January 2002, for violations of mercury discharge limits. The consent agreement detailed additional manhole monitoring requirements, a mercury source investigation, and implementation of site-specific Best Management Practices. This agreement was amended in April 2003 based on the results of weekly sampling. Additional monitoring requirements were instituted via this amendment. The conditions of the consent agreement and amendment were satisfied and closed in 2004.

WRAMC also applied for an NPDES industrial wastewater permit for Cooling Tower discharge from Building 20 (the Mologne House) in 2005. This was tied to the sanitary system in May 2006; therefore a permit is no longer needed. WRAMC applied for a

permit for the Hospital (Building 2) for floor drains on the 9th floor for non-contact cooling water and air compressor condensate. The permit application is pending and was sent a second time in August 2006 (Personal communication with Air, Wastewater and Stormwater POC, WRAMC GEO, 18 July 2005 and updated on 4 August 2006 and 5 December 2006a).

5.1.5 Drinking Water Permits

WRAMC does not maintain any drinking water permits for the Property. Water for the Property is supplied by the WASA. The Washington Aqueduct Division of the Baltimore District, USACE supplies D.C. with water. Water is obtained from the Potomac River above the Great Falls area and is treated at the Dalecarlia Water Treatment Plant at the Dalecarlia Reservoir. Water is supplied to the Property via eight metered 8-inch mains. Water is distributed through out the Property by a system of 6-inch and 8-inch cast iron pipes.

5.1.6 Air Permits

WRAMC completed an air emissions inventory and submitted a Title V (CAA) permit application for the Property to the D.C. Department of Health. The original Title V permit (#004) was issued by D.C. on 28 July 2000. The expiration date of the permit was 28 July 2005. WRAMC filed the application to reissue the permit for the Property, but D.C. has not finished drafting the document, to date (Personal communication with Air, Wastewater and Stormwater POC, WRAMC GEO, 2006b).

The original permit stated that Boilers 1, 2, and 4 were permitted to burn natural gas and No. 2 fuel oil, while Boiler 3 was permitted to burn natural gas as the primary fuel. Emissions of carbon dioxide, carbon monoxide, sulfur dioxide, volatile organic compounds, and particulate matter (as per 20 DCMR 300) are not measured. Nitrogen oxide, oxygen, and opacity are measured. The percent sulfur of the fuel is measured quarterly. The entire District of Columbia is within the Washington, DC-MD-VA non-attainment-area and has been classified as “moderate non-attainment” based upon the 8-hour ozone standard. The elevated ozone is primarily as a result of automobile traffic during times of atmospheric inversions in the summer (Integrated Natural Resources Management Plan, Woolpert LLP, 1999b), and Statistics for 8-Hour Ground-level Ozone Designations, USEPA Region 3, 2006).

Permits to construct/operate emergency generators are also issued to WRAMC for the Property by D.C.

5.1.7 NRC Licenses

Radioactive materials use at the Property is conducted under NRC Licenses, and Department of the Army Radioactive Authorizations issued to the WRAMC. The following is a list of active and terminated licenses and permits issued to WRAMC for the Property:

- NRC License No. 08-01738-02, Expiration Date 30 April 2015 (original Atomic Energy Commission [AEC] License) was issued on February 18, 1959.

Operations are conducted at the Property (the Main Post in D.C.), the Forest Glen Annex in Maryland, and at leased facilities (laboratories) in Rockville, Maryland. License 08-01738-02 allows possession and use of any byproduct radionuclide with mass numbers between 1 and 83 up to 480 milliCurie (mCi) each, plus many nuclide-specific possession and use limits pertaining to nuclear medicine and bio-medical research activities. A copy of NRC License No. 08-01738-02 is provided in **Addendum 1**.

- Terminated NRC License No. 08-01738-03, terminated on 17 August 2004 (possession and use of gamma cell irradiators transferred to NRC License No. 08-01738-02).
- U.S. Army Radiation Authorization (ARA) No. 08-01-97, Expiration Date 30 June 2004 (under timely renewal dated 1 June 2004). [Use of radium in medical treatment and research predates the 1957 AEC License and multiple ARAs through the years.]
- Historically, prior to obtaining its own NRC License during the 1990s, the U.S. Army Medical Research Institute of Infectious Diseases, Fort Detrick, Maryland, was also listed as a facility user on the WRAMC NRC License.
- U.S. Army Reactor Office Reactor Permit No. DORF-1-97, issued to Director, Army Research Laboratory, for the Diamond Ordnance Radiation Facility, Building 516, Forest Glen Annex, WRAMC. The permit retains control of the building to ensure that the building's residual radioactivity remains fixed in place and does not become loose or airborne. The reactor facility was never fully decommissioned in 1978, when WRAMC continued to use this building under its NRC License No. 08-01738-02 for its radioactive waste operations from medical procedures and research. There are unknown materials under the 20 feet of concrete in the reactor pool area, as well as neutron activation of the concrete walls of the exposure cells and other areas in the former reactor building.

Correspondence from the NRC was provided to document that certain buildings formerly used for radioactive materials use under NRC License No. 08-01738-02, are now "released for unrestricted use." These include:

- Decommissioned Building 40, (NRC Letter dated 26 May 2004)
- Decommissioned Building T-2, (NRC Letter dated 10 March 2005)
- Decommissioned U.S. Army Medical Laboratory Building, Fort Meade, Maryland (NRC Letter dated 24 April 2005)
- The research reactor that was located in the basement of the Building 40 was operated under AEC license Number AEC Sub 603 and AEC SNM 472. The Building 40 Research Reactor was de-fueled in 1971 and partially decontaminated in 1972. The AEC license was terminated at this time. Complete decommissioning of the sub-basement and basement levels of Building 40 was completed in 2001.

5.1.8 Other Permits/Licenses

No other permits or licenses are held by WRAMC for the Property.

5.2 Environmental Cleanup

5.2.1 Installation Restoration Program

WRAMC-06 PCB Cleanup At Rumbaugh Garage Site

This site is located along the northern Property boundary, near the intersection of Fern Street and 13th Place, approximately 70 feet north of the Rumbaugh Parking Garage. A subsurface transformer vault was installed at the site in 1961. The transformer and the vault were removed in 1992 during the construction of the Rumbaugh Parking Garage. PCB soil contamination was detected and excavated in 1992 and again in 1993. A letter dated 19 November 1993 from USEPA Region 3 concurred with the decision to backfill the excavation provided that additional PCB investigation was completed (soil and groundwater sampling), and that a statement would then be added to the "deed" of the property to alert future owners of the presence and location of PCB contamination left on site (Installation Action Plan, WRAMC, FY 2006).

An investigation was conducted by USACHPPM in August and October 1996 to determine the extent of PCB contamination in the groundwater. No PCBs were detected in the groundwater. One soil sample had detectable PCBs (1.18 micrograms per kilogram [µg/kg]), which is well below the USEPA decontamination requirement. Per USEPA guidance, soil is regulated for disposal if the PCB concentration is >1 part per million (ppm). In 1997, the monitoring wells were re-sampled: no PCBs were detected and WRAMC began site closure activities. However, in October 2000 and again in February 2001, PCBs were detected in two downgradient monitoring wells at 0.9 and 1.1 µg/L, and 1.3 and 0.84 µg/L, respectively. Two additional monitoring wells were installed further downgradient in June to verify the direction of groundwater flow and the extent of the plume. One of the newer wells contained low levels of PCBs.

WRAMC conducted quarterly groundwater monitoring from September 2000 through September 2004. Using sample results from these quarterly sampling events WRAMC completed a Conceptual Site Model in FY04. Because the contamination is confined to the general site area and does not appear to be migrating, there is no risk for human exposure. In August 2005, a decision document recommending NFA was prepared and submitted to USEPA. Correspondence dated 10 August 2006 from the USEPA concurred that an NFA decision was appropriate for this site. Closure of the monitoring wells is pending.

WRAMC-01 Hazardous Waste Storage Facility, Bldg 40

WRAMC-01 is located south of Building 40 in a small storage building. This building was used to temporarily store hazardous wastes from 1986 (perhaps earlier) to 1991. Federal Facility Compliance Agreement No. III-FF-RCRA-001, 29 March 1990 instructed WRAMC to submit closure plans and a schedule for closure of WRAMC-01. Sampling was performed at the site on 4-5 November 1991 that found high concentrations of cadmium. The site was cleaned and re-sampled on 10 June 1992.

Cadmium was not detected. Recommendations to formally close the site were provided in a letter to WRAMC from U.S. Army Environmental Hygiene Agency (USAEHA) (now USACHPPM) dated 20 July 1992. No documentation could be found to determine whether this site has been formally closed. The USACE and the D.C. Government have been solicited for documentation records. The WRAMC-01 was listed as "discontinued" in June 1993. The creation of an AEDB-R site appears to be a reaction of the above stated compliance agreement and not based on a confirmed release to the environment. Thus, this site is not eligible for IRP funding and is therefore response complete under the IRP. This site's status was revised to "Response Complete" on 1 March 2000. (Installation Action Plan, WRAMC, 2004, and Draft 2006)

WRAMC-03 RMW Storage Facility

WRAMC-03 is a concrete pad along the west side of the hospital (Building 2) used to temporarily store the solid waste and medical waste generated at the hospital prior to 1993. There is no documentation available to determine whether any releases were reported for this site. This site was listed as "discontinued" in October 1992. Medical and solid wastes continue to be stored there, making the site an active site. The medical waste; however, is now stored in refrigerated trailers adjacent to the loading dock. Thus, this site was included in AEDB-R, but was not considered eligible for IRP funding. This site is considered response complete under the IRP. (Installation Action Plan, WRAMC, 2004)

5.2.2 Military Munitions Response Program

Available documentation indicates that there was only one small arms range located on the Property. This was the small arms range located in Building 54. This range is ineligible for the MMRP because it was an indoor range. Therefore, no MMRP sites have been identified on the Property.

5.2.3 Compliance Cleanup

Compliance-related cleanup (CC) refers to the cleanup of contamination resulting from operations that have occurred since October 1986 (i.e., non-Defense Environmental Restoration Program) at Army active (including Reserve), excess, and special installations, as well as remediation at Army overseas installations and cleanup at Non-Federally owned, Federally supported Army National Guard (ARNG) sites. No CC sites have been identified at the Property.

5.2.4 Previous Environmental Investigations

Sanitary Sewer Discharges

Installation Assessment June 1984, details pre-1980 practices of discharging laboratory and other wastes from industrial operations directly into the sanitary sewer system (Installation Assessment, USATHAMA, 1984). No details are provided on sumps or the sewer system itself to document whether or not historical releases may have occurred.

Incinerators

A pathological waste incinerator was operated prior to 1980 at Building 54. Documents state that the incinerator was shut down due to performance problems. Incinerator decommissioning was documented in 2000 (Sampling and Analyses Report for the AFIP Medical Waste Incinerator in Building 54, General Physics, 2000). The February 1976 Environmental Impact Assessment by USAEHA characterized the waste input as paper (100 pounds per year [p/y]); corncob getting, hardwood chips, and cedar shavings (130,000 p/y); animal carcass and infectious material (26,000 p/y); body tissues and plushes (7,280 p/y); and, pathology and autopsy (9,120 p/y).

Another incinerator at Building 16 was identified as operational prior to 1960. No documentation was discovered to assess the waste stream introduced into this unit. This incinerator is no longer present.

Medical Nuclear Reactor-Building 40

A nuclear reactor was located in Building 40 from 1961 to 1972. The reactor is documented to have been decommissioned and all fuel, wastes and irradiated components disposed off site. This was performed in accordance with the NRC regulations.

Mercury and PCB Impact–Building 40

In the report titled “Environmental Baseline Survey for Buildings 40 & 18, WRAMC,” dated July 2004, it was documented that hazardous substances and mercury were known to have been released inside Building 40 and subsequently cleaned up during decommissioning in 2002. The report indicates that residual PCB contamination in room B003 restricts the future use to ‘low occupancy’ use (less than 335 hours per year). It was also noted in the Site Inspection for the EBS that lead shielding in x-ray rooms was still present.

Additionally, the EBS assigned an ECP Category of “6” to Building 40 due to the PCB contamination near a vault northwest of the building (see **Section 5.5** below). Rainwater collecting in an underground concrete vault has historically been pumped from the vault onto the surrounding ground. A soil assessment was conducted to determine the extent of PCB impact from the PCB laden water. Since this property has had an EBS as part of an enhanced use lease evaluation, the status of further action at this location has not been determined.

Building T-2 Decommissioning

Building T-2 was removed from the WRAMC NRC License in 2005 (Federal Register February 23, 2005). A Finding of No Significant Impact accompanied the EA. Correspondence from the NRC was provided to document that Buildings 40 and T-2 were “released for unrestricted use” (Historical Site Assessment, Cabrera, 2006). Based on assessment results provided by WRAMC GEO staff, the building met NRC criteria for unrestricted use.

Weathered Fuel Oil Impact-Boiler Plant (Building 15)

During the construction of a replacement electrical switching station (Building 95) in the spring of 2006, an oily substance was encountered in the subsurface abutting the Boiler Plant (Building 15). Since this location is at the lowest point on the Property and due to the shallow water table, the hydrocarbon was found free-phase in the excavation. Analyses determined the sample to be a heavy weathered fuel fraction. At the time of the site visit, WRAMC had notified the D.C. Department of Health and WASA of the situation and the excavation was proceeding with precautions to minimize any off-site impacts. To accommodate the construction, water and product was being periodically pumped from the excavation and was being contained in a frac tank. Due to the low immiscibility of the heavy residual fuel with the water, the local authorities granted permission to periodically release the water from the tank to the sanitary sewer. Further investigation at this location is ongoing.

5.3 Hazardous Substances

This section discusses the historical use and storage of hazardous substances at the Property.

In this section, hazardous substances are defined by CERCLA, 42 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. Petroleum products and radiological substances are not discussed in this section. Please reference **Section 5.4** for details on petroleum products and **Section 5.8** for radiological substances.

Hazardous substances have been primarily used on the Property to facilitate conducting medical activities and in research and development functions. Building 2 (hospital) and Building 54 (AFIP) are the primary users of hazardous substances. Furthermore, activities that support the hospital and research components also use hazardous substances.

Based on records reviews conducted for completion of this ECP Report, the hazardous substances stored on the Property for one year or more are identified in **Table 7**. See **Figure 7** for a depiction of Hazardous Substance Storage Locations. This information was obtained from prior WRAMC EPCRA Tier II Reports for 2004 and 2005; the Preliminary Assessment, Weston, 1990; and the WRAMC Spill Prevention, Control, and Countermeasures (SPCC) Plan, USACE, 2001. **Table 7** also identifies which of those hazardous substances were stored in quantities that necessitate notification under CERCLA §120(h). That notification is required if storage of a hazardous substance exceeds the greater of 1,000 kg (2,200 lbs) at any one time or the CERCLA RQ which is specific to each hazardous substance as defined in 40 CFR 302.4. Storage of chemicals that meet the definition of hazardous substances, but were only on the Property in small quantities, such that they weren't required to be included on EPRA Tier II report were not included in this table. Common cleaning products that may contain low concentrations of hazardous substances were also not included in this Table.

Table 7 redacted.

WRAMC currently tracks hazardous substances on the Property through the use of a database called the Hazardous Substances Management System (HSMS). The intent of HSMS is to track hazardous substances from "cradle to grave," or from the point they enter the Property until they are disposed of or used. WRAMC began using HSMS in 2000 as required by a Supplemental Environmental Program (SEP) under a Consent Order dated 18 August 1999 with the USEPA Region 3. WRAMC entered into this agreement to settle a 30 September 1998 complaint for violations of RCRA hazardous waste storage regulations at the facility (FFEO Report, USEPA, 2000). Since Section 312 of EPCRA allows for an exemption of "any substance to the extent that it is used as a research laboratory a hospital other medical facility under the direct supervision of a technically qualified individual," storage of these chemicals was not examined.

5.3.1 Hazardous Waste

Hazardous waste is generated on the Property as part of conducting medical, clinical, research and development functions. Building 2 (hospital) and Building 54 (AFIP) are the primary generators of hazardous waste. WRAMC GEO is in the process of finalizing a Hazardous Waste Management Plan for the Property.

The Property is registered with the USEPA as a LQG of hazardous waste with an ID number of DC4210021156. See **Section 5.1.1** for more information on the RCRA status.

There are two designated 90-Day Hazardous Waste Storage Areas on the Property and both are currently maintained at Building 54 (AFIP). One area is operated by AFIP personnel and is used to collect wastes from satellite accumulation points within AFIP. The second area is maintained by the Garrison and is the designated storage facility for the remainder of the Property. Toxic, corrosive, and ignitable wastes are segregated in the three containment areas of the Building 54 Bunker. The containment areas are

estimated at 280-gallons, 340-gallons, and 370-gallons, respectively. These volumes are reported to be sufficient to contain the full volume of material typically stored in each containment area (WRAMC SPCC Plan, USACE, 2001). Within each containment area, small amounts of hazardous waste are labeled and stored on shelves. The bunker floor and each containment wall are made of concrete.

A completed WRAMC Form 2090-R (WRAMC internal manifest) or Department of Defense Form 1348-1 must accompany all hazardous wastes turned in to 90-day storage areas. Hazardous waste is placed on a disposal contract through the DRMO and transported off Property for disposal within a 90-day total accumulation period. Hazardous waste is transported off the Property only by licensed hazardous waste transporters in possession of completed Uniform Hazardous Waste Manifests.

Hazardous wastes associated with WRAMC activities include radiological materials, solvents, paints, strong acids and bases, preservatives, heavy metals, and other materials associated with laboratory operations and building maintenance. Photographic processing waste is also generated at various laboratories (WRAMC Main Section Master Plan Revision, Woolpert LLP, 2005).

Table 8 presents a summary of the hazardous wastes that were generated and disposed of in 2006. This data was obtained from the USEPA Biennial Hazardous Waste filing for 2006. A complete copy of this form is presented in **Appendix K**.

Table 8 – Hazardous Waste Generation and Disposal 2006
WRAMC, Washington, D.C.

Waste Code	Waste Description	Amount (lbs) 2006 Report
D001	Maintenance/repair waste (filter changes, coolant change outs, etc.)	176
D001	Paint & paint related items, regulated (ignitable, lead, etc.)	348
D001	Aerosols, regulated	59
D001	Used/spent alcohols (excluded "F" listed)	1,195
D001 D002	Discarded/expired commercial chemicals, ignitable	1,184
D001 D002	Laboratory analytical wastes, flammable or ignitable, excludes "F" listed, not otherwise classified.	8,645
D001, D002, D011, D007	Discarded/expired commercial chemicals, oxidizers	131
D001, D003	Discarded/expired commercial chemicals, reactive	5
D001, U154, U162, U019, D018, U002, U117, U196, U003, U123, U220, U188, U165, U226, U122, U136, U007, U080	Discarded/expired commercial chemicals, "U" listed	275
D002	Discarded/Expired commercial chemicals, corrosive, caustic, ph=12.5 or higher	1,446

Waste Code	Waste Description	Amount (lbs) 2006 Report
D002	Used/spent acid solutions (pH=2.5 or lower)	1,179
D002	Used/spent caustic solutions (pH=12.5 or higher)	67
D002, D001, D007, D009, D008	Discarded/Expired commercial chemicals, corrosive, acidic, ph=2.5 or lower	1,028
D008, D005, D009, D022, D007, D011	Discarded/Expired commercial chemicals, toxic (D004-D043) excludes elemental mercury, D009)	40
D008, D007	Site remediation/Spill clean-up waste	2,753
D009	Fluorescent light tubes, broken, not universal waste	88
D009	Mercury contained in manufactured articles (excludes fluorescent light tubes [universal waste])	127
D009, D011, D007, D022	Laboratory analytical wastes, toxic, Not otherwise classified	2,339
D011	Used/spent photographic chemicals	14
F003 D001	Used/spent solvents & solvent mixtures/blends, Non-halogenated	8,928
P087, P105	Laboratory analytical wastes "P" listed	36
P087, P105, P116, P003, D001, P119, P030, P106	Discarded/Expired commercial chemicals, "P" listed	14
	2006 Totals:	**30,077**

5.3.2 Regulated Medical Waste

RMW is also generated on the Property. According to the EPA, medical waste is often described as any solid waste that is generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals. RMW is primarily generated at the hospital, the clinical labs, Building 54 (AFIP), and the dental clinic on the Property. RMW generated within Building 54 are autoclaved and disposed of through a medical/infectious waste disposal contract. (WRAMC Main Section Master Plan Revision, Woolpert LLP, June 2005). During the contract year 2006 (August 2005 through July 2006), the Property generated approximately 960,000 lbs of RMW (Personal communication with WRAMC GEO staff, 2006).

5.4 Petroleum and Petroleum Products

Petroleum products stored at the Property include fuel oil, automotive gasoline, diesel fuel, and kerosene. This section provides a listing of all current and former petroleum storage locations at the Property. This listing is provided below as **Table 9**.

Table 9 redacted.

See **Figure 6** for a depiction of petroleum storage locations.

CLOSURE

In **Table 9**, ASTs and USTs listed as current are known to be present on the Property. ASTs and USTs listed as former are believed to no longer be present. While it is likely that all of the former USTs on the Property have been removed, little documentation was found when conducting records review for this report that would provide information about the conditions during the tank removals. Furthermore, there was little documentation available from D.C. that indicated their acceptance of the closure of these former tanks. Therefore, it is possible that some of the removals were not conducted according to regulatory standards.

A closure report was located for UST MP-10, formerly located at Building 15. This closure report indicates that the tank was removed without documentation in 1995. In 1997, the District of Columbia Environmental Regulation Agency (DCERA) collected samples that indicated contamination at levels in excess of DCERA standards. In response, the Army planned a soil removal for the site. After re-excavating the area in 1998, no soils were found to have concentrations of total petroleum hydrocarbons in excess of the 100 milligrams per kilogram DCERA standard.

All of the USTs known to be present at the facility are currently registered with the D.C. Department of Health Environmental Health Administration Bureau of Hazardous Materials and Toxic Substances UST Division. One of the registered USTs, MP-33, is physically labeled MP-31 at the property. This tank was previously registered as MP-31 with D.C. However, the registration has been changed to MP-33. This tank is listed as MP-31 on **Table 9**.

As listed in **Table 9** above, during the VSI the ECP team identified a 100-gallon tank at Building 2 that does not appear in other tank documentation.

VIOLATIONS

There have been a small number of regulatory actions related to the USTs program at the Property. The majority of these actions resulted from management, monitoring or administrative actions related to USTs. All of these actions have been resolved. In June of 1998 WRAMC was fined by D.C. for not closing temporary USTs in accordance with standards. The Army administratively resolved this issue (Army Environmental Database, 2005). In August of 1998, D.C. sent a letter to WRAMC for failure to register and/or renew registration for USTs and for depositing/dispensing regulated substances from an unregistered tank. This issue was resolved administratively (Army Environmental Database, 2005).

In April 2002, WRAMC and the USEPA entered into a Consent Agreement to address historic violations of UST regulations (USEPA, 2002). The Consent Agreement and Final Order (CAFO) was issued on May 14, 2002. This CAFO pertains to the Forest Glen Annex and Glen Haven Annex as well as the Property. The CAFO was developed due to not reporting suspected releases from USTs, not reporting releases in a timely fashion, not conducting tightness tests after a suspected release, or failure to install spill protection equipment. The CAFO required that WRAMC carry out an SEP for the installation of tank leak detection and centralized tank monitoring alarm systems. This order pertained to ASTs as well as USTs. On March 9, 2004, the USEPA determined that the Army had satisfactorily completed the SEP and satisfied its obligations under the CAFO (USEPA, 2004).

5.5 Polychlorinated Biphenyls

POTENTIAL PCBs AT THE PROPERTY

Transformers

Historic WRAMC documents indicate that there have been approximately 66 PCB-containing transformers located on the Property and the WRAMC Forest Glen Annex combined. Thirty-eight were pad mounted and 28 were in underground vaults. The transformers were tested for PCBs in 1986 and 46 contained greater than 500 ppm of PCBs and 20 contained between 15 and 500 ppm (Preliminary Assessment, Weston, 1990). Documents reviewed for this ECP indicate that 46 of those PCB transformers were located on the Property. **Appendix H** lists the 46 PCB transformers that were scheduled for replacement at that time. This number is seen on an undated document titled “Replace PCB Transformer Post Wide-Main Section” which specifically identifies 46 PCB transformers on the Property that were scheduled for replacement (**Table 10**).

According to WRAMC personnel, all of the PCB-containing transformers on the Property have been removed and replaced with non-PCB transformers (Personal communication with Asbestos, Lead-Based Paint and Radon POC, WRAMC GEO, 2006; Hospital Energy Plant EA, 2004). WRAMC indicated this removal in a letter to the USEPA in 1995, which explained that all PCB containing materials had been removed from the Property, with the exception of fluorescent light ballasts (USEPA Letter, November 1995). However, the documents reviewed for the preparation of

this ECP produced documentation of the removal of 62 transformers; leaving four without replacement documentation. **Table 10** illustrates this point.

Table 10 – Summary of Removed PCB-Containing Transformers

Date	Number of Transformers Removed	Reference
30 September 1994	44	EPR Report WR0089S003
FY94	1	EPR Report WR0089S003
16 March 2000	17	EPR Report WR00925F051
TOTAL:	**62**	

Light Ballasts

Based upon the age of several buildings, light ballasts that contain PCBs may still be in use on the Property. As light fixtures are routinely changed, they are replaced with non-PCB containing ballasts. The old PCB ballasts are collected and disposed of in accordance with all applicable Federal, state, and Army regulations through the DRMO. The ECP team observed the proper handling and storage of these waste ballasts during the VSI visit in June 2006.

Elevator Hydraulic Fluid

Sixteen (16) hydraulic elevators are on the Property (15 hydraulic passenger elevators and one hydraulic freight elevator) (Personal communication, Stratus Elevator, 2006). Stratus Elevator Company currently maintains all of these elevators. The ECP Team inspected four hydraulic elevator rooms (those in Buildings 11, 32, and 91) in June 2006 and did not observe any environmental concerns. Furthermore, the ECP team did not find any records of known environmental concerns or leaks with any of the hydraulic elevators at the Property. Stratus uses Tellus 32 hydraulic oil for the elevators. According to the Material Safety Data Sheet, Tellus 32 hydraulic oil posses no known immediate health hazard, and no known physical hazard including PCBs. However, no documentation was discovered that verifies that the reservoirs have been fully emptied and/or cleaned in the past. Therefore, even though non-PCB hydraulic oils are used now, residual PCBs may remain in the reservoirs if PCB-containing oils had been used in the past.

PCB IMPACTED SITES AT THE PROPERTY:

Vault north of Building 40

There is an ongoing project at the Property that is aimed at removing PCB contaminated soil surrounding an underground electrical transformer vault north of Building 40, near the intersection of 14th Street and Dahlia (EBS for Building 40, 2003). This vault was installed in the 1950s and held PCB transformers that may have leaked. These PCB transformers were replaced with non-PCB transformers in the 1990s. After a rain event in 2003, rainwater that collected in the vaults had an

oily sheen and was therefore sampled for PCB contamination. Sample results revealed that the water in the vault contained PCBs and a follow-up investigation showed that the surface soils surrounding the vault also contained PCBs (Building 40 – Transformer Vault Soil and Groundwater Sampling Report, General Physics, 2004). This was the result of rainwater having been pumped from the vaults and discharged onto the surface soils adjacent to the vault. The study estimated that the area of impacted surface soil was limited to an area approximately 55 feet by 55 feet and 2-feet deep.

After receipt of the results, the WRAMC GEO submitted a work plan to the USEPA Regional Administrator and the D.C. Department of Health proposing a self-implemented plan to remove impacted soil via excavation. In September 2006, WRAMC awarded a contract for this excavation and they expect the work to begin in December 2006.

Building 40 – Old Machine Shop

During the decommissioning of building 40, sampling confirmed residual PCBs from machine shop activities. WRAMC initiated cleanup of the area and according to a 2004 EBS for Building 40, "the cleanup of the PCB oil on the old machine shop floor in the basement of Building 40 was completed." The EBS explains that everything in Room B003 was "remediated," with the exception of a small corner of the room, where PCBs were still present, but the concentrations were below 25 parts per million and therefore, the USEPA indicated that the Army "did not have to do any further cleanup as long as the room is used for 'low occupancy' activities (i.e., unprotected workers in the room less than 335 hours/year) and that this restriction on use of the room is recorded in [any] deed or comparable document" (EBS, WRAMC DPW, 2004).

Former Transformer near Rumbaugh Garage

A former PCB-impacted site at the Property is located approximately 70 feet north of the Rumbaugh Parking Garage along the northern boundary of the installation near the intersection of Fern Street and 13th Place. This site is identified in the IRP program as WRAMC-06 (see **Section 5.2.1** for more information on the IRP program). At this location, a below-grade PCB-containing transformer vault had been in place since 1961 and was removed in 1992 during construction of the parking garage. At the time of removal, soil samples were collected from the excavation site and analyzed for PCBs. Analysis confirmed the presence of PCBs in the soil. PCB-contaminated soil was excavated and removed. Soil removal was halted in October 1992 due to funding constraints and resumed in the spring of 1993. Additional soil was excavated to 23 feet below grade in the drainage area of the vault and further sampling was conducted. Although PCBs were detected at the bottom of the excavation, WRAMC petitioned the USEPA to allow backfilling of the excavation because the open excavation presented a safety hazard. A letter dated 19 November 1993 from USEPA Region 3 concurred with the decision to backfill the excavation.

As a result of provisions in the USEPA concurrence letter, WRAMC began an investigation in 1996 to determine the presence of PCB contamination in the groundwater by installing groundwater monitoring wells. No PCBs were detected in the groundwater in 1996 or 1997. However, in September 2000 and again in February 2001, PCBs were detected in two monitoring wells located downgradient of the former vault location. For the purpose of screening, concentrations were compared to the USEPA established Risk-Based Concentration (RBC) for drinking water and were found to be above the 0.033 µg/L RBC. Therefore, two additional monitoring wells (RUM-5 and RUM-6) were installed further downgradient in June 2001 to more accurately characterize the direction of groundwater flow and the extent of the contamination.

The groundwater monitoring wells were sampled quarterly from September 2000 through September 2004. During these sampling events, PCB contamination was detected on several occasions in monitoring wells located downgradient of the former vault at concentrations above the USEPA established RBC of 0.033 µg/L. However, PCB contamination does not appear to have migrated from the site area, because the groundwater sampling results do not indicate the presence of PCB contamination in the most hydraulically and topographically downgradient monitoring well. The Army concluded, based upon a conceptual site model report that because the contamination is confined to the general site area and does not appear to be migrating and the fact that the groundwater is not used as a drinking water source, there is no risk for human exposure.

The subsurface transformer was replaced with a pad-mounted transformer and the site is currently used as open space. According to the WRAMC Master Plan (Woolpert LLP, 2002 and 2005), there is no indication that the land area will be used as anything but open space.

WRAMC submitted a DD to USEPA Region 3 recommending NFA in August 2005. Correspondence dated 10 August 2006 from the USEPA concurred that an NFA decision was appropriate for this site. Closure of the monitoring wells is pending.

Building 54 – Basement

According to an undated internal WRAMC memo (circa November 1992), post wipe samples from the concrete basement floor of Building 54 were taken and analyzed for PCBs. The highest concentration was 73.7µg/100 sq cm and a recommendation was made to encapsulate the floor with epoxy paint. Current WRAMC personnel have no information about whether this recommendation was completed.

Manhole #29 near Building 1

According to an internal WRMAC memo dated 25 November 1992, PCB transformer #104845 exploded on 23 November 1992 in outdoor underground vault/manhole #29 adjacent to Building 1. The transformer had contained about 290 gallons of ASKAREL, which is 100% PCB Oil. Recommendation was made to clean up all visible oil and remove an area of soil adjacent to the manhole approximately 5 feet wide by 10 or 12 inches deep and to conduct sampling. No details have been found

regarding any testing or cleanup activities. No other details have been found on this issue.

Building 14 Transformer Explosion

Project Number WR0092F080 documents cleanup of PCBs and the replacement of exploded transformers at Building 14. This activity was completed as of 30 September 1992. No further documents were discovered during research done in an effort to complete this ECP Report. WRAMC GEO has additional files on PCBs at the Property and further information may be available there.

DPW Maintenance Shop

A Notice of Noncompliance (TSCA-III-99-0171) was issued to WRAMC on 5 October 1999 for "fail[ing] to prepare and provide a waste manifest to accompany a shipment of PCB wastes" due to the waste disposal of a drum through the DRMO that was presumed to have originated from the DPW maintenance shop (Letter from Army to USEPA, 4 November 1999). Per the USEPA's direction, WRAMC provided USEPA with a copy of PCB disposal SOPs, correct manifests, and certificate of disposal, which WRAMC completed and the notice was resolved in November 1999 (WRAMC Environmental Quality Report [EQR], U.S. Army, 2005).

RECENT PCB SAMPLING AT THE PROPERTY

Sampling of In-Ground Transformer Vaults and Transformer Pads

Due to the PCB findings at the Building 40 transformer vault (described above), WRAMC contracted EA Engineering, Science and Technology, Inc. (EA) to sample the in-ground transformer vaults and the above ground transformer pads for PCBs on 20 December 2005 through 10 January 2006. This effort is documented in a report dated April 2006 (PCB Sampling of In-Ground Transformer Vaults and Transformer Pads, EA, 2006). The sampling consisted of 57 surface wipe samples from eight of the in-ground transformer vaults and three above ground transformer pads. Sixteen water samples were taken from eight transformer vaults that were flooded at the time of the testing. The wipe sampling indicated that eight of the sampled vaults/pads had PCB levels that would require either removal to comply with the levels specified in 40 CFR 761.61(a)(5)(i) or, alternately, the porous surface could be used for the remainder of its useful life, provided the conditions in CFR 76.30(p) are complied with. When the concrete surface's useful life has ended, it can be disposed of as PCB waste. The water sampling indicated that seven vaults had detectable PCBs in the water, but at levels less than the regulatory requirement of 200 µg/L for PCB containing waste for non-contact use in a closed system. As these vaults are in low contact areas, the PCB containing water can remain in place provided that it is not disturbed. Should the water be disturbed, it would need to be disposed of as PCB waste (PCB Sampling of In-ground Transformer Vaults and Transformer Pads, EA, 2006).

5.6 Asbestos-Containing Materials

A list of known asbestos surveys provided by WRAMC is included in **Table 11**. The table provides asbestos survey information for 35 sites at WRAMC, 34 buildings and one steam tunnel network.

Table 11 – ACM Surveys
WRAMC Main Post, Washington, D.C.

Building Number	Survey by	Date	Asbestos		O&M Plan
			Friable	Non-friable	
1	(1) Kemron Environmental	December 1994	Y	Y	Y
	(2) The Lukmire Partnership	July 1998			
	(3) General Physics Corporation	July 2002			
2	(1) EA Engineering	December 1999	N	Y	N
4 (garage)	(1) General Physics Corporation	2000	N	N	N
7	(1) Dynamac Corporation	January 1995	Y	N	Y
	(2) General Physics Corporation	January 2002			
8	(1) EA Engineering (database**)	January 1997	Y	Y	N
9	(1) EA Engineering (database**)	January 1997	Y	Y	N
11	(1) EA Engineering (database**)	January 1997	Y	N	Y
	(2) General Physics Corporation	January 2002			
12	(1) EA Engineering (database**)	January 1997	N	Y	Y
	(2) General Physics Corporation	January 2002			
14	(1) EA Engineering (database**)	January 1997	Y	Y	Y
	(2) General Physics Corporation	January 2002			

Building Number	Survey by	Date	Asbestos		O&M Plan
			Friable	Non-friable	
15	(1) Dynamac Corporation	January 1995	Y	Y	Y
	(2) General Physics Corporation	January 2003			
	(3) General Physics Corporation	January 2005			
17	(1) Dynamac Corporation	January 1995	Y	Y	Y
	(2) General Physics Corporation	December 2002			
18	(1) Dynamac Corporation	January 1995	Y	Y	Y
	(2) General Physics Corporation	January 2002			
19	(1) EA Engineering (database**)	January 1997	Y	Y	N
21	(1) EA Engineering (database**)	January 1997	Y	Y	N
22	(1) EA Engineering (database**)	January 1997	Y	Y	N
25	(1) EA Engineering (database**)	January 1997	Y	Y	N
26	(1) EA Engineering (database**)	January 1997	Y	Y	N
29	(1) EA Engineering (database**)	January 1997	Y	Y	N
30	(1) EA Engineering (database**)	January 1997	Y	Y	N
35	(1) EA Engineering (database**)	January 1997	Y	Y	N
38	(1) EA Engineering (database**)	January 1997	Y	Y	Y
	(2) Aero Environmental Health & Safety	October 2000			
	(3) General Physics Corporation	January 2002			
40	(1) Kemron Environmental	July 1992	Y	Y	Y
	(2) General Physics Corporation	January 2002			
48	(1) Dynamac Corporation	January 1995	Y	Y	Y
	(2) General Physics Corporation	January 2003			
	(3) General Physics Corporation	April 2005			

Building Number	Survey by	Date	Asbestos		O&M Plan
			Friable	Non-friable	
52	(1) Dynamac Corporation	January 1995	Y	Y	Y
	(2) General Physics Corporation	January 2002			
53	(1) Dynamac Corporation	January 1995	Y	Y	Y
	(2) General Physics Corporation	January 2002			
54	(1) EA Engineering (database**)	January 1997	Y	Y	Y
	(2) AMI Environmental	February 2000			
	(3) General Physics Corporation	January 2002			
57	(1) Dynamac Corporation	January 1995	Y	Y	Y
	(2) General Physics Corporation	August 2004			
82	(1) Dynamac Corporation	January 1995	N	Y	Y
	(2) General Physics Corporation	June 2002			
83	(1) Dynamac Corporation	January 1995	N	N	N
	(2) General Physics Corporation	August 2004			
88	(1) Dynamac Corporation	January 1995	N	Y (assumed)	N
	(2) General Physics Corporation	June 2002			
90	(1) EA Engineering (database**)	January 1997	Y	N	Y
	(2) General Physics Corporation	June 2002			
91	(1) EA Engineering (database**)	January 1997	N	N	Y
	(2) General Physics Corporation	January 2002			
	(3) General Physics Corporation	August 2004			
T-2	(1) Dynamac Corporation	January 1995	N	Y	Y
	(2) General Physics Corporation	July 2002			
	(3) General Physics Corporation	April 2005			

Building Number	Survey by	Date	Asbestos		O&M Plan
			Friable	Non-friable	
T-20	(1) Dynamac Corporation	January 1995	Y	Y	Y
	(2) General Physics Corporation	December 2002			
	(3) General Physics Corporation	April 2005			
Steam Tunnels	(1) Dynamac Corporation	January 1995	Y	Y	Y
	(2) General Physics Corporation	September 2002			

**EA, 1997

Buildings 3, 5, 6, 16, 20, 31, 32, 45, 49, 55, 56, 84, and 95 were not surveyed for ACM as they are either new construction, already renovated, under renovation, scheduled for demolition, or used as equipment storage spaces.

Building 41, the former Old Red Cross Building and current multiple purpose building, has undergone partial renovations but does not have an ACM survey.

Summary of Asbestos Surveys & Abatement Activities

The first base wide ACM survey was completed 1997 (Final Asbestos Survey Report for Walter Reed Army Medical Center – Main Hospital and Final Asbestos Survey Report for Walter Reed Army Medical Center – Main Post, EA Engineering, 1997). Beginning in 2002, reinspections and condition assessments were conducted for all Property buildings except for Building 41, the single family housing quarters and storage sheds (Asbestos Reinspection and Condition Assessment Reports, Walter Reed Army Medical Center, General Physics Corporation, 2002a-o, 2002/2005a-c, 2003/2005a,b, 2004). Many initial surveys and re-inspection ACM surveys have been conducted over the years to assess the status of a number of buildings and specific areas inside buildings at WRAMC; however, not every building was surveyed comprehensively (EBS Enhanced Use Lease Project, Buildings 40 & 18, WRAMC DPW, 2004). The reinspection surveys and condition assessments were based on the *Asbestos Management Database* prepared by EA, dated January 1998. The *Asbestos Management Database* is a compilation of previous asbestos activities conducted on the Property by several contractors (Dames & Moore (September 1990), SCS Engineers (June 1992), KEMRON Environmental Services (July 1992, December 1994), and Dynamac Corporation (November 1993, January 1995)). Additional site-specific reports (i.e., surveys for renovation/demolition) were also used.

The ACM surveys listed in **Table 11** were performed on specific buildings and the steam tunnels subsequent to the prior base-wide survey.

Current records indicate there have been limited installation-wide remediation or abatement projects. Spot surveys have been conducted to identify hazardous materials in place. Some site-specific abatement projects have occurred on an as-needed basis. Documentation of renovations and abatement activities is either incomplete or not

maintained on file or annotated on drawings. Thus, the current quantity of ACM contained within a facility may be less than that identified in building records and reports (EBS Enhanced Use Lease Project, Buildings 40 & 18, WRAMC DPW, 2004).

There are currently 35 structures with documented asbestos surveys including the steam tunnels. Many structures have had multiple surveys. Of the 35 structures surveyed, 27 were found to have friable asbestos and non-friable asbestos materials. Two buildings are reported to contain non-friable asbestos materials, only. Eight buildings contain no asbestos materials. Per WRAMC GEO staff, of the 27 structures with friable asbestos, 17 have an asbestos O&M Plan in place. Of the 35 structures surveyed, 29 were found to have non-friable asbestos. Of the 29 structures with non-friable asbestos, 17 have an asbestos O&M Plan. All of the buildings that contain ACMs have an O&M Plan in place, with the exception of the housing quarters, which are covered under the Base-wide Asbestos Management Plan. Building 91 has an O&M Plan in place; however, all ACM has been removed in a recent renovation. There are 48 buildings on the Property. Currently, only Building 41 lacks documentation of an asbestos survey. The WRAMC has a Base-wide Asbestos Management Plan that was revised in 2005.

5.7 Lead and Lead-Based Paint

Lead-Based Paint

WRAMC has not conducted a fence-to-fence survey to determine the location of all LBP on Post. Consistent with AR 420-70, Buildings and Structures (10 October 97), WRAMC's policy is for personnel to assume that paint in buildings that were constructed prior to 1978 is LBP. Thus, testing is not required for every building.

The DoD Guidelines for LBP in Military Housing (1999) specifies that LBP surveys and risk assessments are required for residential housing units. Currently, there is not a comprehensive or programmatic report for the residential housing units on the Property. All housing quarters have been surveyed for the presence of LBP and the results are detailed in individual reports for each unit. Many of the buildings at the Property 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 buildings constructed or renovated immediately after the ban may also contain LBP, because inventories of such paints were in the supply network and were likely to have been used. Therefore, the practice on the Property is to test for LBP in areas prior to building renovations or demolition (Personal communication with Asbestos, Lead-Based Paint and Radon POC, WRAMC GEO, 2006).

Table 12 presents a summary of the known LBP surveys on the Property and a summary of the findings.

Table 12 – Lead and Lead-Based Paint Surveys

Building Number	Built	Survey by	Survey Date	Number of Building Components* Sampled	LBP Positive** Components
Building 1	1908-1953 (Various phases)	Custer Environmental	June 1993	Report not located	N/A
Building 4 (Hospital Garage)	1977	General Physics Corporation	August 1999	52	6
Building 8 (Quarters 1)	1910 & 1939	Aerosol Monitoring & Analysis	July 1994	45	31
Building 9 (Quarters 2)	1910 & 1939	Aerosol Monitoring & Analysis	July 1994	56	35
Building 11	1929, 1931, 1933	Jenkins Professionals Inc.	July 1994	Report not located	
Building 12	1911, 1934	SCS Engineers	July 1992	Report not located	
Building 19 (Quarters 5)	c. 1915, moved 1954	Aerosol Monitoring & Analysis	July 1994	45	20
Building 21 (Quarters 7)	c. 1915,	Aerosol Monitoring & Analysis	July 1994	38	7
Building 22 (Quarters 8)	c. 1915, moved 1954	Aerosol Monitoring & Analysis	July 1994	42	18
Building 26 (Quarters 12)	c. 1918, moved 1954	Aerosol Monitoring & Analysis	July 1994	44	24
Building 30 (Quarters 17)	c. 1915, moved 1954& currently condemned	Aerosol Monitoring & Analysis	July 1994	40	8
Building 35 (Quarters 19)	c. 1915, moved 1954 & currently condemned	Aerosol Monitoring & Analysis	July 1994	34	12

*Components = doors, window frames/sills, walls, cabinet, painted piping, baseboards, etc.
**Positive = 0.5% lead by weight or greater or 0.7 mg cm^2 by XRF.

For the residential buildings (Quarters), the sampling contractors recommended that the component types that tested positive for lead be abated in accordance with HUD Guidelines, 29 CFR 1910.1025 and 29 CFR 1926.62. Four general strategies for LBP abatement are replacement, enclosure, encapsulation and paint removal.

Renovations or abatement activities have been performed on some of the structures where LBP positive components have been identified. However, documentation of renovations or abatement activities are not always maintained on file or annotated on drawings. Thus, the number of buildings and building components containing LBP may be less than identified (EBS Enhanced Use Lease Project, Buildings 40 & 18, WRAMC DPW, 2004).

Lead in Water

WRAMC voluntarily conducts potable water sampling to determine whether water in the distribution pipes exceed regulatory limits for lead and copper. The Hospital (Building 2) has been extensively sampled with results showing isolated pipes and drinking fountains within the building that have recurring lead levels above the 15 ppb action level established by the National Primary Drinking Water Regulations. Samples collected between 1992 and 1999 showed isolated exceedances of lead action levels at 1 of 12 locations sampled (EBS Enhanced Use Lease Project, Buildings 40 & 18, WRAMC DPW, 2004). When lead levels are exceed at drinking fountains, lead filters are installed on the fountains. Recently, lead levels have not exceeded USEPA drinking water action levels (Personal communication with Air, Wastewater and Stormwater POC, WRAMC GEO, 2006c).

5.8 Radioactive Material

The use of RAM at WRAMC has historically been, and is currently conducted, in accordance with a number of NRC licenses and ARAs. Specific uses of RAM can be summarized as follows:

- Medical treatment using sealed sources in mCi quantities (e.g., brachytherapy and oncology seeds).

- Health physics support using sealed sources in microCurie (µCi) quantities (e.g., calibration sources).

- Clinical and biomedical research using unsealed µCi and mCi quantities. Of the various unsealed isotopes used in research, only long-lived radioisotopes, i.e., half-lives greater than 1 year to present, any potential for residual contamination.

Several buildings on the Property have had radiological investigations performed previously to achieve release for unrestricted use from the US NRC. These included:

- Building 40 – Building 40 is the former headquarters for the WRAIR. Building 40 housed a research reactor in the basement that was operated under a separate AEC license Number AEC Sub 603 and AEC SNM 472. The Building 40 Research Reactor was de-fueled in 1971 and partially decontaminated in 1972. The AEC license was terminated at this time. Complete decommissioning of the sub-basement and basement levels of Building 40 was completed in 2001.

  Decommissioning activities on the research levels was completed in 2004. Minor surface decontamination was performed within the research labs prior to final status survey.

- Building T-2 – Building T-2 was a temporary research building that housed the Department of Clinical Investigation for WRAMC. Decommissioning activities included minor surface decontamination of research laboratories as well as removal of a fume hood that contained residual uranyl acetate contamination

from staining electron microscopy slides. Final status surveys were performed in all labs after successful decontamination.

Of the remaining facilities on the Property, seven buildings were found to be impacted from historical use of RAM. The buildings classified as Impacted include Nos. 1, 2, 7, 41, 54, 91, and 92. One hundred and two rooms or laboratories within these seven buildings have been classified as "Impacted." No radiologically impacted outdoor areas or release points were identified during the records search for the Property.

Addendum 1 is the Historical Site Assessment that provides details on the areas at the Property that had operations involving radioactive materials.

5.9 Historical Landfills/Dumps

There are no known landfills or dumps on the Property. Significant earth moving activities have occurred over the majority of the land surface and no indications of historical landfilling or dumping have been discovered.

5.10 Explosive Contaminated Structures

The WRAMC mission did not include processing or handling of explosives or munitions. No structures are known or expected to be contaminated with explosives.

5.11 Radon

According to the USEPA's categorization of radon zones, Washington, D.C. is qualified as radon zone three, meaning that it has a predicted average indoor radon screening level less than 2.0 pCi/L. The USEPA's action level for radon is 4.0 pCi/L (EBS Enhanced Use Lease Project, Buildings 40 & 18, WRAMC DPW, 2004).

The Property has a Radon Management Plan (U.S. Army Center for Public Works, 1999) that lists the Army's policies for identifying, assessing and mitigating indoor levels of radon at U.S. Army facilities. A radon survey was conducted for the Property in August 1991 and follow-up surveys were conducted in 1998 and 2001 for buildings where radon levels exceeded the 4.0-pCi/L action level and buildings that have been newly constructed or renovated. Buildings 2, 6, 7, 17, 20, and 54 were sampled and all detections for radon were below the 4 pCi/L (Radon Monitoring Report for Six Buildings, WRAMC, General Physics, 2001).

5.12 Pesticides

Per the 2004 Pest Management Plan, all current pesticide mixing/storage has been moved off of the Property and is at the Forest Glen Annex. Maintenance activities and materials related to pesticides are managed under the Integrated Pest Management Plan 2004.

The Property historically had three known areas of pesticide mixing and storing prior to 1975; Building 50, Building 51, and Building 16 (Installation Assessment, USATHAMA, 1984). As shown on **Figure 3-3**, Buildings 50, 51 and 16 were near the southern end of

the Property. Buildings 50 and 51 were greenhouses that have since been deconstructed, most likely around 1998. Building 16 is currently a DPW storehouse. Documentation indicated that pesticide disposal possibly occurred under benches in the greenhouse Buildings 50 and 51, and in the sanitary sewer during this time (Installation Assessment, USATHAMA, 1984). A listing of the pesticide inventory and usage in 1975 is presented in **Appendix J**.

To facilitate disposal, the greenhouse soil was sampled in 1997; a copy of the results is presented in **Appendix J**. Buildings 50 and 51 each had one soil sample analyzed for pesticides and other parameters. Both soil samples reported detectable levels of pesticides; however, these levels were below corresponding levels of concern.

Also, a 1945 historic site map indicates that an apple orchard was located between Elder and Dogwood Streets at the intersection of 14th Street, near the far northwestern extent of the Property. The AFIP Building (54) was constructed in this area.

Historically, there were two areas where residual pesticides were discharged to the ground; however, the specific locations were not documented. Per the February 1976 Environmental Impact Assessment, conducted by the USAEHA, pest control operations were divided into two sections, one section working on household and structural pests (under the supervision of Buildings and Structures) and a second section working on ornamentals and greenhouse pests (under supervision of Roads and Grounds). The report stated that pesticide wastes from the Building and Structures department were being disposed of via a soaking pit, and the pesticide wastes from the Roads and Grounds department were being disposed via a gravel driveway. Efforts were being made to improve the operations at that time. There was no description where these disposal areas were located; therefore, it is not known if this occurred at the Property (Main Post) or at another WRAMC facility such as Forest Glen Annex.

5.13 Other Identified Concerns

Mercury or mercury vapor is present on post in the form of mercury thermometers, switches, blood pressure gauges, and in fluorescent light bulbs. In addition, mercury is contained in some of the chemicals used in laboratories and other operations throughout the Property. Wastewater discharges at the Property are monitored for mercury levels. There have been levels exceeding the permit limits at the Property that were addressed through a Consent Agreement between WRAMC and the D.C. WASA. This issue has been closed per Air, Wastewater and Stormwater POC, WRAMC GEO.

WRAMC previously operated incinerators at Building 54 (pathological waste) and Building 16 at the Property. Details on the waste streams for these incinerators are not readily available.

5.14 Identification of Uncontaminated Property

ECP Category 1 – 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 visual inspection indicates that both the buildings and the land are uncontaminated.

The ECP Category 1 Uncontaminated Property consists of two parcels, Parcel 1 and Parcel 2. The parcels are shown on **Figure 8**, Environmental Condition of Property Categories, and are described below (refer to **Table 13**). **Figure 9** depicts the remaining identified parcels on the Property.

Parcel 1 – This section is located on the west perimeter of the property. Parcel 1 is considered ECP Category 1 because 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. Parcel 1 consists generally of open areas, with officer residences, a chapel and two extended stay accommodations, the two Fisher Houses. Parcel 1 consists of approximately 16.6 acres or 14.6 percent of the property.

Parcel 2 – This is the remainder of the Property not receiving ECP Categories 2 through 7. This parcel consists of commercial, medical and industrial facilities as shown on the parcel map excluding the specific buildings and areas that are ECP Categories 2 through 7.

Parcel 2 has was ranked as ECP Category 1 property because 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. Parcel 2 consists of approximately 93.5 acres or 83 percent of the property.

Table 13 – Uncontaminated ECP Parcel Identification

Parcel Identifier	Description	Acreage
1	Parcel 1 is located on the west perimeter of the Property- At the western boundary between 16th Street and 14th Street and north of Main Drive to Alaska Avenue. It consists of open areas, officer residences, a chapel and light commercial operations (extended stay accommodations-the two Fisher Houses).	16.6
2	Parcel 2 consists of the main portion of the Property and consists of commercial, medical and industrial facilities.	93.5
	Totals	110.1

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 insufficient documentation to

make a determination and are required to be noticed with the appropriate Local Redevelopment Authority (LRA).

The ECP real property classification descriptions for Categories 2 through 7 are as follows:

ECP Classification System

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

Category 3 – Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial response.

Category 4 – Areas where release, disposal and/or migration of hazardous substances has occurred, and all removal or remedial actions to protect human health and the environmental have been taken.

Category 5 – Areas where release, disposal and/or migration of hazardous substances has occurred, and removal or remedial actions are underway, but all required remedial actions have not yet been taken.

Category 6 – Areas where release, disposal and/or migration of hazardous substances has occurred, but required actions have not yet been implemented.

Category 7 – Areas that are not evaluated or require additional evaluation.

The ECP Categories 2 through 7 Property consists of 16 parcels. These parcels are shown on **Figure 8**, Environmental Condition of Property Categories, and are summarized below. Based on data collected during the ECP process, the following category classifications, including ECP Category 1, have been assigned:

Eleven parcels were assigned ECP Category 2. These areas include 2.6 acres the majority of with is in the area of Buildings 15 and 82 where multiple USTs have been removed and potentially leaked.

No parcels were assigned ECP Category 3.

Two parcels were assigned ECP Category 4. These parcels consist of IRP sites for which the remedial response has been completed.

One parcel was assigned ECP Category 5. This parcel consists of the area of the former transformer vault adjacent to Building 40. This area has a confirmed release of PCBs to soil. However, the Army has planned a response and will address this contamination.

No parcels were assigned ECP Category 6.

Two parcels were assigned ECP Category 7. These two areas consist of locations of transformer explosions that were documented to release transformer dielectric fluid to the surrounding soil. The WRAMC GEO staff indicated that these releases were likely cleaned up; however, no documentation of the clean ups were located as part of the document search performed for this ECP.

ECP Categorization

Parcel No. & Label	Approx Size	Area	ECP Category	Basis	Source of Evidence	Remediation / Mitigation
1(1)	16.6 acres	Residential Area	1	This parcel is associated with the residential area in the western portion of the Property. These are areas where there has been no documented release, disposal, or known migration from adjacent properties of hazardous substances or petroleum products.	No documented release of hazardous substances or petroleum products.	NA
2(1)	93.5 acres	Remaining Land	1	This parcel encompasses all of the land area between smaller parcels on the Property.	No documented release of hazardous substances or petroleum products.	NA
3(2)PS/PR	2.6 acres	Petroleum Issues in the area of Building 15 and former Tank Farm	2	Multiple USTs removed from the area. No documentation was located for the closure of USTs MP-3, MP-11, MP-12, MP-14, MP-15, MP-16*, MP-16, MP-17, MP-18, MP-19, MP-20, MP-21, MP-22, and MP-23. Petroleum product (oil) observed in excavation for new construction.	WRAMC UST Registration documents Visual Site Inspection	Ongoing in one area east of Building 15. Unknown in other areas.
4(4)HS/HR	4,342 square feet	WRAMC-06	4	PCB release from a transformer. PCBs were detected in soil and groundwater. The soil was remediated under the Installation Restoration Program. WRAMC GEO received an NFA letter from USEPA Region 3 in August 2006.	FY 2006 IAP report and WRAMC GEO	Soils were removed from the site. Groundwater monitoring was conducted.
5(4)HS/HR	3,403 square feet	WRAMC-01	4	Detection of cadmium contamination during installation restoration sampling.	FY 2006 IAP report	The storage building was cleaned in 1992, which resolved the cadmium issue.

Parcel No. & Label	Approx Size	Area	ECP Category	Basis	Source of Evidence	Remediation / Mitigation
6(5)HS/HR	2,184 square feet	Transformer Vault Adjacent to Building 40	5	Discharge of PCB contaminated rainwater from an underground electrical transformer vault.	EBS for Building 40	WRAM GEO awarded a contract to excavate and dispose of the contaminated soil.
7(7)HS/HR	4,347 square feet	Area surrounding Manhole 29 adjacent to Building 1	7	Explosion of PCB transformer in manhole 29. Surrounding soil was reportedly removed however no documentation of post excavation samples was located.	Internal WRAMC memo dated 25 November 1992	Soil was recommended to have been removed after explosion. Documentation of remediation not located.
8(7)HS/HR	3,972 square feet	PCB transformers exploded in the area of Building 14	7	Explosion of PCB transformers in the area of Building 14. Documentation exists regarding the PCB cleanup and replacement of the transformers. No documentation was found regarding the collection of post excavation soils.	EPR System Report Project Number WR0092F080	Cleanup was conducted after explosion.
9(2)PS/PR(P)	Not defined	MP-1 Building 1	2	500-gallon UST that has been removed. No documentation was available regarding the condition of the tank at closure.	WRAMC UST Registration documents	None apparent
10(2)PS/PR(P)	Not defined	MP-2 Building 4	2	3,000-gallon UST that has been removed. No documentation was available regarding the condition of the tank at closure.	WRAMC UST Registration documents	None apparent
11(2)PS/PR(P)	Not defined	MP-4 Building T-2	2	2,000-gallon UST that has been removed. No documentation was available regarding the condition of the tank at closure.	WRAMC UST Registration documents	None apparent
12(2)PS/PR(P)	Not defined	MP-5 Building 2	2	10,000-gallon UST that has been removed. No documentation was available regarding the condition of the tank at closure.	WRAMC UST Registration documents	None apparent
13(2)PS/PR(P)	Not defined	MP-6 Building 2	2	10,000-gallon UST that has been removed. No documentation was available regarding the condition of the tank at closure.	WRAMC UST Registration documents	None apparent
14(2)PS/PR(P)	Not defined	MP-7 Building 54-E	2	2,000-gallon UST that has been removed. No documentation was available regarding the condition of the tank at closure.	WRAMC UST Registration documents	None apparent

Parcel No. & Label	Approx Size	Area	ECP Category	Basis	Source of Evidence	Remediation / Mitigation
15(2)PS/PR(P)	Not defined.	MP-8 Building 54-W	2	6,000-gallon UST that has been removed. No documentation was available regarding the condition of the tank at closure.	WRAMC UST Registration documents	None apparent
16(2)PS/PR(P)	Not defined.	MP-9 Building 41	2	3,000-gallon UST that has been removed. No documentation was available regarding the condition of the tank at closure.	WRAMC UST Registration documents	None apparent
17(2)PS/PR(P)	Not defined	MP-13 Building 54	2	1,500-gallon UST that has been removed. No documentation was available regarding the condition of the tank at closure.	WRAMC UST Registration documents	None apparent
18(2)PS/PR	Not defined	Building 18	2	Leaking UST identified in UST Database.	EDR, 2006	Site listed as closed.
Other Issues						
1Q/A/L/RD	NA*	Building 1 (includes appended Building 5 and 92)	1	Asbestos Surveys identified friable and non-friable asbestos.	Kemron, 1994 Lukmire Partnership, 1998 GP, 2002a	O&M Plan
				Lead-Based Paint based on the age of the building (1908-1953) and Former Paint shop in appended Building 5.	NA	None apparent
				Classified as impacted by RAM.	Cabrera, 2006	None apparent
2Q/A/L/RD	NA*	Building 2	1	Asbestos Survey identified non-friable asbestos.	EA, 1999	O&M Plan
				Lead-Based Paint based on the age of the Building (1977).	NA	None apparent
				Classified as impacted by RAM.	Cabrera, 2006	None apparent
4Q/L	NA*	Building 4	1	Lead-Based Paint Survey identified LBP positive components.	GP, 1999	None apparent
7Q/A/L/RD	NA*	Building 7	1	Asbestos Surveys identified friable asbestos.	Dynamac, 1995 GP, 2002b	O&M Plan
				Lead Based Paint based on the age of the building (1910).	NA	None apparent
				Classified as impacted by RAM.	Cabrera, 2006	None apparent

Parcel No. & Label	Approx Size	Area	ECP Category	Basis	Source of Evidence	Remediation / Mitigation
8Q/A/L	NA*	Building 8	1	Asbestos Survey identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan
				Lead-Based Paint Survey identified positive components.	Aerosol Monitoring, 1994	None apparent
9Q/A/L	NA*	Building 9	1	Asbestos Survey identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan
				Lead-Based Paint Survey identified positive components.	Aerosol Monitoring, 1994	None apparent
11Q/A/L	NA*	Building 11	1	Asbestos Surveys identified friable asbestos.	GP, 2002c EA, 1997	O&M Plan
				Lead-Based Paint base on age of building (1929, 1931, 1933).	NA	None apparent
12Q/A/L	NA*	Building 12	1	Asbestos Surveys identified non-friable asbestos.	GP, 2002d EA, 1997	O&M Plan
				Lead-Based Paint base on age of building (1911, 1934).	NA	None apparent
14Q/A/L	NA*	Building 14	1	Asbestos Surveys identified friable and non-friable asbestos.	GP, 2002e EA, 1997	O&M Plan
				Lead-Based Paint based on age of building (1976).	NA	None apparent
15Q/A/L	NA*	Building 15	1	Asbestos Surveys identified friable and non-friable asbestos.	GP, 2003/2005a Dynamac, 1995	O&M Plan
				Lead-Based Paint based on age of building (1918).	NA	None apparent
16Q/L	NA*	Building 16	1	Lead-Based Paint based on age of building (1920).	NA	None apparent
17Q/A/L	NA*	Building 17	1	Asbestos Surveys identified friable and non-friable asbestos.	GP, 2002f Dynamac, 1995	O&M Plan
				Lead-Based Paint based on age of building (1920, 1944).	NA	None apparent
18Q/A/L	NA*	Building 18	1	Asbestos Surveys identified friable and non-friable asbestos.	GP, 2002g Dynamac, 1995	O&M Plan
				Lead-Based Paint based on age of building (1967).	NA	None apparent
19Q/A/L	NA*	Building 19	1	Asbestos Surveys identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan
				Lead-Based Paint Survey identified positive components.	Aerosol Monitoring, 1994	None apparent
21Q/A/L	NA*	Building 21	1	Asbestos Surveys identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan

Parcel No. & Label	Approx Size	Area	ECP Category	Basis	Source of Evidence	Remediation / Mitigation
				Lead-Based Paint Survey identified positive components.	Aerosol Monitoring, 1994	None apparent
22Q/A/L	NA*	Building 22	1	Asbestos Surveys identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan
				Lead-Based Paint Survey identified positive components.	Aerosol Monitoring, 1994	None apparent
25Q/A/L	NA*	Building 25	1	Asbestos Surveys identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan
				Lead-Based Paint based on age of building (1919).	NA	None apparent
26Q/A/L	NA*	Building 26	1	Asbestos Surveys identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan
				Lead-Based Paint Survey identified positive components.	Aerosol Monitoring, 1994	None apparent
29Q/A/L	NA*	Building 29	1	Asbestos Surveys identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan
				Lead-Based Paint based on age of building (1915).	NA	None apparent
30Q/A/L	NA*	Building 30	1	Asbestos Surveys identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan
				Lead-Based Paint Survey identified positive components.	Aerosol Monitoring, 1994	None apparent
31Q/L	NA*	Building 31	1	Lead-Based paint based on age of building (1921).	NA	None apparent
35Q/A/L	NA*	Building 35	1	Asbestos Surveys identified friable and non-friable asbestos.	EA, 1997	Base-wide Asbestos Management Plan
				Lead-Based Paint Survey identified positive components.	Aerosol Monitoring, 1994	None apparent
40Q/A/L/P	NA*	Building 40	1	Asbestos Surveys identified friable and non-friable asbestos.	Kemron, 1992 GP, 2002h	O&M Plan
				Lead-Based Paint based on age of building (1924, 1932, 1962).	NA	None apparent
				Residual PCBs on floor of Room B003 following cleanup and building decommissioning.	WRAMC, EBS, 2004	Managed with low occupancy
41Q/L/RD	NA*	Building 41	1	Lead-Based Paint based on age of building (1927, 1944).	NA	None apparent
				Classified as impacted by RAM.	Cabrera, 2006	None apparent

Parcel No. & Label	Approx Size	Area	ECP Category	Basis	Source of Evidence	Remediation / Mitigation
48Q/A/L	NA*	Building 48	1	Asbestos Surveys identified friable and non-friable asbestos.	Dynamac, 1995 GP, 2003/2005b	O&M Plan
				Lead-Based Paint based on age of building (1961).	NA	None apparent
52Q/A/L	NA*	Building 52	1	Asbestos Surveys identified friable and non-friable asbestos.	Dynamac, 1995 GP, 2002i	O&M Plan
				Lead-Based Paint based on age of building (1930).	NA	None apparent
53Q/A/L	NA*	Building 53	1	Asbestos Surveys identified friable and non-friable asbestos.	Dynamac, 1995 GP, 2002j	O&M Plan
				Lead-Based Paint based on age of building (1954).	NA	None apparent
54Q/A/L/P/RD	NA*	Building 54	1	Asbestos Surveys identified friable and non-friable asbestos.	EA, 1997 AMI, 2000 GP, 2002k	O&M Plan
				Lead-Based Paint based on age of building (1954/1971).	NA	None apparent
				PCBs detected on the concrete floor of the basement.	WRAMC, Internal Memo, c. 1992	VSI performed as part of the ECP indicated the floor was painted; however, the exact location of the detection could not be located.
				Classified as impacted by RAM.	Cabrera, 2006	None apparent
57Q/A/L	NA*	Building 57	1	Asbestos Surveys identified friable and non-friable asbestos.	Dynamac, 1995 GP, 2004	O&M Plan
				Lead-Based Paint based on age of building (1931).	NA	None apparent
82Q/A/L	NA*	Building 82	1	Asbestos Surveys identified non-friable asbestos.	Dynamac, 1995 GP, 2002l	O&M Plan
				Lead-Based Paint based on age of building (1942, 1958).	NA	None apparent
83Q/A/L	NA*	Building 83	1	Asbestos Based on the age of the building.	NA	None apparent
				Lead-Based Paint based on age of building (1942, 1944).	NA	None apparent
84Q/L	NA*	Building 84	1	Lead-Based Paint based on age of building (1942).	NA	None apparent
88Q/A/L	NA*	Building 88	1	Asbestos Surveys assumed non-friable asbestos.	Dynamac, 1995 GP, 2002m	Base-wide O&M Plan
				Lead-Based Paint based on age of building (1945).	NA	None apparent
90Q/A/L	NA*	Building 90	1	Asbestos Surveys identified friable asbestos.	EA, 1997 GP, 2002n	O&M Plan
				Lead-Based Paint based on age of building (1946).	NA	None apparent

Parcel No. & Label	Approx Size	Area	ECP Category	Basis	Source of Evidence	Remediation / Mitigation
91Q/A/L/RD	NA*	Building 91	1	Asbestos based on age of building (1956).	EA, 1997 GP, 2002/ 2005a	O&M Plan
				Lead-Based Paint based on age of building (1956).	NA	None apparent
				Classified as impacted by RAM.	Cabrera, 2006	None apparent
95Q/A/L	NA*	Building 95	1	Asbestos and lead paint based on age of building (1962).	NA	Base-wide Asbestos O&M Plan
				Lead-Based Paint based on the age of the building (1962).	NA	None apparent
T-2Q/A/L	NA*	Building T-2	1	Asbestos Surveys identified non-friable asbestos.	Dynamac, 1995 GP, 2002/ 2005b	O&M Plan
				Lead-Based Paint based on age of building (1972).	NA	None apparent
T-20Q/A/L	NA*	Building T-20	1	Asbestos Surveys identified friable and non-friable asbestos.	Dynamac, 1995 GP, 2002/ 2005c	O&M Plan
				Lead-Based Paint based on age of building (1972).	NA	None apparent
100Q/A	NA*	Steam Tunnels (multiple)	1	Asbestos Surveys identified friable and non-friable asbestos.	Dynamac, 1995 GP, 2002o	O&M Plan
100Q/P	NA*	Transformer Pads (multiple)	1	Eight sampled transformer vaults/pads/encroached water contained levels of PCBs that will require disposal as PCB waste after the use of the pad is complete.	EA, 2006	None

NA*-Not Applicable. Individual areas of ACM & LBP continue to be discovered and abated during renovations, therefore the size of any remaining areas of impact has not been defined.

5.16 Applicable Regulatory Compliance Issues

The Army currently tracks issues concerning compliance with environmental laws and regulations through the EQR and formerly used the Army Compliance Tracking System. Army installations are required to enter lawsuits, NOVs and warning letters into the system and to track response actions. **Table 14** lists pertinent compliance/ noncompliance data from inspections of the Property (EQR, U.S. Army, 2005). **Appendix L** presents a complete copy of the EQR.

Table 14 – Pertinent Compliance/Noncompliance Data

Date	Statute	Description	Status
01/01/1990	Hazardous Waste/RCRA-C	Small storage bunker at Building 40 was closed but water from clean up was still present which had to be tested and delayed the final closure of the bunker.	Administratively Resolved
11/08/1994	Wastewater/CWA	WRAMC listed as in significant violation of the D.C. pretreatment requirements in 1993.	Administratively Resolved
02/21/1997	UST/RCRA-I	Heating oil spill during refueling.	Resolved
06/30/1998	UST/RCRA-I	Temporarily closed USTs were not permanently closed within standards.	Administratively Resolved
08/19/1998	UST/RCRA-I	Failure to register and/or renew registration. Filling and dispensing from an unregistered tank.	Resolved
09/03/1998	Hazardous Waste/RCRA-C	1997 Hazardous Waste Biannual Report not completed by 1 March 1998. Labeling oversight in satellite accumulation area.	Resolved
09/30/1998	Hazardous Waste/RCRA-C	Hazardous waste being stored over 90 days without permit or interim permit status permit. Date/labeling/notification oversights.	Administratively Resolved
01/14/1999	Wastewater/CWA	Mercury in excess of permit levels at Manholes #7 and #27 on 3 June, 28 September, and 16 December 1998. D.C. required corrective action and further testing.	Resolved
03/31/1999	Solid Waste/RCRA-D	Three separate incidents of RMW being found in a solid waste disposal shipment from WRAMC at three different solid waste disposal facilities in Virginia. WRAMC Training program initiated & corrective actions taken.	Resolved
08/17/1999	Air Emissions/CAA	For boiler plant-Failure to obtain an air quality permit, monitor for emissions, and submit NOx data.	Resolved
09/28/1999	PCBs, Asbestos, LBP(FGS)/TSCA	Drum containing PCB waste shipped with incorrect manifest.	Resolved
11/17/1999	Wastewater/CWA	Mercury in excess of permit levels on 19 May 1999. WRAMC implemented quarterly and random wastewater testing 9 February 2000.	Resolved
01/5/2000	Wastewater/CWA	Exceeded permit level of mercury and no samples were taken from April-September 1999 and July to December 1999. Resolution was that mercury was not in the permit's limits.	Administratively Resolved
12/20/2000	Wastewater/CWA	Exceeded permit level of mercury on 16 November 2001.	Administratively Resolved

Date	Statute	Description	Status
12/29/2000	Wastewater/CWA	Exceeded permit level of mercury on 2 November 2001. Follow up sampling on 4, 5, and 6 December 2000 in noncompliance.	Administratively Resolved
03/21/2001	Wastewater/CWA	Exceeded permit level of mercury on 20 February 2001.	Administratively Resolved
04/30/2001	Wastewater/CWA	Exceeded permit level of mercury on 26 and 29 March 2001.	Administratively Resolved
08/3/2001	Wastewater/CWA	Exceeded permit level of Oil and Grease on 12 July 2001.	Resolved
04/01/02	Air Emissions/CAA	Failure to obtain an air permit. Permit was later obtained and is in compliance.	Resolved
07/01/05	Hazardous Waste/RCRA	USEPA inspection found multiple hazardous waste, universal waste violations at both WRAMC Main Post and Forest Glen Annex at point of generation. Installation Commander has approved an Environmental Compliance Campaign Action Plan to improve training and accountability.	Listed as Open, WRAMC GEO Staff confirms currently Resolved.

As indicated in **Table 14**, all entries into the EQR are listed as resolved except for the most recent listing. According to WRAMC GEO staff, this NOV has since been settled with the EPA.

In addition to the EQR entries summarized above, the IRP lists three AEDB-R sites for the Property: WRAMC-01, WRAMC-03, and WRAMC-06. These are sites on the Property where environmental compliance issues have been identified and are being addressed. The description of these areas is not identified in the EQR report discussed in this section; however, the summaries and updated status for these sites is summarized in **Section 5.2.1**.

5.17 Adjacent Properties

The Property is bound by Fern Street and Alaska (to the north and northwest), Aspen Street (to the south), Georgia Avenue (to the east), and 16th Street (to the west). Adjacent property use and condition were determined from a visual site investigation conducted on 23 June 2006, and a review of the EDR Report dated 31 August 2006.

The following presents a summary of the adjacent properties:

North: Located across Fern Street are single-family and multi-story stone and brick bungalow-style residences. No environmental hazards were observed or noted during the ECP VSI or EDR report review.

South: Located across Aspen Street are primarily single-family, single- and two-story brick residential houses. No environmental hazards were observed or noted during the ECP VSI or EDR report review.

East: Located across Georgia Avenue are primarily low-rise, commercially mixed buildings and multi-story residential apartments. A few two-story brick single residential houses and two multi-story brick hotels are also present across Georgia Avenue. One of the brick hotels is part of the Property (Building 18, formerly the Walter Reed Inn - See **Section 3.4.1** for information on the public database reporting for the Property). No environmental hazards were observed during the ECP VSI. However, the EDR report flagged the following adjacent properties as possible concerns to the east of the property:

LUST Sites:

- Willis Ltd. Partnership located at 7019 Georgia Avenue N.W. is located adjacent to the Property, and is listed as a DC LUST site. The LUST was a heating oil tank , which was closed in 1997.

Other Tanks:

- Dahlia Apartments located at 7019 Georgia Avenue N.W. is located adjacent to the Property, and is listed as a DC UST site.

- Normandie LP located at 6817 Georgia Avenue N.W. is located adjacent to the Property, and is listed as a DC AST site.

Other Listings:

- WRAMC Drycleaner located at 6800 Georgia Avenue N.W. is located adjacent to the Property, and is listed as a FINDS site. This site is not part of the Property, as the name may imply. This site is on the FINDS list because of an air permit.

- Longfellow Colorado Associates located at 6939 Georgia Avenue N.W. is located adjacent to the Property, and is listed as a FINDS site.

- Private Residence located at 6900 Georgia Avenue N.W. is located adjacent to the property, and is listed as an ERNS site. The site was on the ERNS listing because of a fuel oil day tank leak to the surface.

Based on the minor nature of these sites, there is little risk of impact to the Property.

West: Located across Alaska Avenue to the northwest are single-family residences and multi-story stone and brick bungalow-style residences. There are also two multi-story stone and brick churches. More recent residential redevelopment was noted, but the style was consistent with the existing architectural theme. Across 16th Street to the west of the Property is Rock Creek Park, an urban recreational area that is managed by the National Capital Parks and Recreation Department. No environmental hazards were observed or noted during the ECP VSI or EDR report review.

6 Conclusions

Based on a review of all available environmental related reports and documents, a VSI, research of available historical information, interviews with knowledgeable parties, and an environmental database search, the following conclusions are presented:

6.1 Areas of Concern

Wastewater:

- Although previous assessment reports have listed areas of use on the Property that have discharged to the sanitary and storm sewers (further detailed in previous **Sections 4.4.2** and **4.4.3**), these practices were discontinued in the 1970s. Based upon the age of the sewer systems and the documentation of past discharges, there may be environmental concerns related to past sewer system discharges; however, there is no assessment documentation to support this concern. Waste streams involving recalcitrant chemicals, such as chlorinated solvents, and mercury are of the greatest concern. WRAMC has received NOVs with regard to wastewater discharges at the Property in the past, primarily for mercury. The Property is currently in compliance and no RECs have been identified.

Permits:

- The Property has the following Federal and local permits. The Property is currently in compliance and no RECs have been identified with regard to the permits:
    - Title V CAA permit (#004) has been issued from the D.C. Department of Health to operate the boilers for Building 15 and generators throughout the Property.
    - UST permits have been issued by the D.C. Department of Health, UST Division for eight USTs. Eighteen ASTs are on the Property; however, there are no permitting requirements for ASTs. All of the known USTs on the Property are registered.
    - A wastewater discharge permit (#045-5) was issued by D.C. WASA and it covers general discharges to the sanitary sewer system. A Semi-Annual Self Monitoring program is conducted at the Property to measure and report compliance. As of the reporting period ending June 2006, the Property is in compliance.

NOVs:

- All listed NOVs have been resolved or administratively resolved. The most recent NOV was issued on 1 July 2005 under RCRA Hazardous Waste and was related to a USEPA inspection that found multiple hazardous waste and universal waste violations at the point of generation. To resolve this NOV, the Installation

Commander approved an Environmental Compliance Campaign Action Plan to improve training and accountability. Although this NOV is still listed as open, according to WRAMC GEO staff, it has since been resolved with the EPA. Prior resolved NOVs include those issued under the CAA (2), TSCA (1), RCRA Hazardous Waste (3), RCRA Solid Waste (1), RCRA UST (3), and the CWA (8). The majority of the CWA NOVs were due to exceedences of mercury in the wastewater, which has been an ongoing problem at the Property. As mentioned above, the Property is conducting a Semi-Annual Self Monitoring program to measure and report compliance and as of June 2006, the Property is in compliance.

Cleanups:

- All designated cleanups are complete. There are no MMRP sites or identified CC sites on the Property. The only reported programmatic cleanups on the Property were the three IRP sites (WRAMC-01, WRAMC-03, and WRAMC-06) and they are currently either designated as or considered "response complete," and are therefore not considered a current REC.

Hazardous Substances & Hazardous Waste:

- Substances designated as hazardous under Section 102 of CERCLA have been used and stored at the Property in quantities exceeding their corresponding CERCLA reportable quantities; however, there is no evidence that these chemicals were improperly handled, released, or disposed at the Property except for the NOVs listed above. Additionally, the Property is an LQG of hazardous waste; however, there is no evidence that these wastes were improperly handled, released, or disposed at the Property except for the NOVs listed above. Therefore, no RECs have been identified with regard to hazardous substances or hazardous waste.

Petroleum UST/AST Incidents:

- Three separate minor spills were reported in 1987, 1988, and 1994 during filling operations; however, none of these incidents were reported to have caused impairment or impact that required remediation.

- An environmental investigation is ongoing for an area adjacent to the Boiler Plant (Building 15). During the construction of a replacement electrical switching station (Building 95) in spring of 2006, an oily substance, determined to be DRO constituents, was encountered in the subsurface. The source was assumed to have been from past operations. Further investigation at this location is ongoing. This site constitutes a REC.

- A review of available records identified 24 former USTs that have been removed from the property. Closure documentation was not identified for 23 of these USTs. While it is likely that all of these USTs were removed from the Property, available documentation did not indicate the condition of the tanks at removal or provide any post-excavation sampling results. Therefore, these 23 USTs constitute a REC.

PCBs:

- According to recent interviews with WRAMC personnel and from a 1985 letter submitted to the USEPA, all of the PCB-containing transformers on the Property have been removed and replaced with non-PCB transformers. However, a data gap exists in reconciling the transformer removal documents, resulting in four units without documentation of replacement.

- There have been six areas of documented PCB impact on the Property:

    - An underground transformer vault north of Building 40 has documented PCB contamination in the soils surrounding the vault and remediation via excavation is planned for the near future. This site constitutes a REC.

    - The former machine shop in the basement of Building 40 had a limited area on the concrete basement floor that was cleaned and low levels of PCBs are remaining. An occupancy restriction is required to be listed on the buildings deed to address the residual PCB impact as an institutional control.

    - The former underground transformer vault near the Rumbaugh Garage (IRP site WRAMC-06) has had PCB contamination in the soil and low levels of PCBs in the groundwater. However, following remediation via excavation, a period of groundwater monitoring and submittal of a risk assessment, the USEPA issued an NFA in August 2006. A use restriction is required to be listed on the property deed to address the residual PCB impact as an institutional control.

    - PCBs were cleaned up from the concrete floor surrounding a transformer in the basement of Building 54. Residual levels of PCBs were documented. Recommendation was made to encapsulate the floor with epoxy paint; however, no further documentation was found to confirm if the area was encapsulated. Current WRAMC personnel have no further information on this incident. Although the basement floor was noted to have been painted during the VSI, it is unknown if this particular area was encapsulated. This site constitutes a REC, unless documentation supporting encapsulation can be found.

    - Following a transformer explosion in manhole #29 near Building 1 in November 1992, recommendation was made to clean up all visible oil and remove an area of soil adjacent to the manhole approximately 5 feet wide by 10- or 12-inches deep and to conduct sampling. No details have been found regarding any testing or cleanup activities. No other details have been found on this issue. This site constitutes a REC, unless further documentation supporting cleanup can be found.

    - A transformer was documented to have exploded Building 14 in 1992. The unit was replaced and PCBs were cleaned up at Building 14 used for enlisted barracks. No further documents were discovered during the ECP

research. This site constitutes a REC, unless further documentation supporting cleanup can be found.

- Due to the PCB findings at the Building 40 transformer vault (described above), a sampling program was conducted in late 2005 through early 2006 to evaluate existing in-ground transformer vaults and transformer pads across the Property. Sampling concluded that that eight of the sampled vaults/pads had PCB levels that would need to be disposed of as PCB waste when the units are removed from service and the water in seven vaults had PCBs, but at levels less than the regulatory requirement of 200 µg/L for PCB containing waste for non-contact use in a closed system. Since these vaults are in low contact areas, the PCB containing water can remain in place provided that it is not disturbed. Should the water be disturbed, it would need to be disposed of as PCB waste.

- Due to the age of many of the buildings on the property, it is known that some PCB containing light ballasts remain in older light fixtures. As these light fixtures are routinely changed, they are replaced with non-PCB containing ballasts and the old PCB ballasts are disposed of in accordance with all applicable Federal, state, and Army regulations through the DRMO.

ACMs:

- There are building specific asbestos O&M Plans and a Post-wide Asbestos Management Plan in place. There are 48 buildings on the property.

- ACM surveys have been performed at 34 buildings and the steam tunnel network based upon the age of their construction.

- ACM surveys were not required at 13 buildings (new construction, already renovated or under renovation, scheduled for demolition, or used for equipment storage).

- Twenty-seven of the 34 buildings surveyed for ACM were found to have friable & non-friable asbestos.

- The remaining building is the Red Cross Building (Building 41), which has been renovated; however, ACM abatement documentation could not be located.

Lead and LBP:

- Currently, there is not a comprehensive or programmatic report for the residential housing units on the Property. Many of the buildings at the Property 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. There are 48 buildings on the Property.

- LBP surveys have been performed at all housing quarters (Buildings 8, 9,19, 21, 22, 26, 30, and 35). For the residential buildings, the sampling contractors recommended that the component types that tested positive for lead be abated in accordance with HUD Guidelines, 29 CFR 1910.1025 and 29 CFR 1926.62.

- LBP surveys have also been performed at Buildings 1, 4, 11, and 12.

- Renovations or abatement activities have been performed on some of the structures where LBP positive components have been identified. However, documentation of renovations or abatement activities are not always maintained on file or annotated on drawings. Thus, the number of buildings and building components containing LBP may be less than identified.

Radioactive Material:

- Buildings 1, 2, 7, 41, 54, 91, and 92 (now considered part of Building 1) are classified as being "impacted" by RAM. Within these seven buildings, 102 rooms or laboratories are classified as "impacted." Based upon the found radiological impacts, these areas constitute a REC.

Radon:

- The Property has a Radon Management Plan (U.S. Army Center for Public Works, 1999) that lists the Army's policies for identifying, assessing, and mitigating indoor levels of radon at U.S. Army facilities.

- The radon surveys conducted in 1991 and follow-ups from 1998 and 2001 indicate that elevated radon is not an issue on the Property. Therefore, no RECs have been identified with regard to radon.

Pesticides:

- The Property has an Integrated Pest Management Plan (WRAMC-GEO, 2004), which outlines maintenance activities and materials related to pesticides. Currently, all pesticide mixing/storage has been moved off-Property to the Forest Glen Annex.

- The Property historically had three known areas of pesticide mixing and storage prior to 1975 - Building 50 and Building 51 (former greenhouses, now deconstructed) and Building 16 (DPW Storehouse). Documentation indicates that pesticide disposal possibly occurred under benches in the greenhouses, and in the sanitary sewer.

- Other documentation indicates that there were two areas where residual pesticides were discharged to the ground; however, there was no description where these disposal areas were located, and the possibility exists that this may have occurred off-Property at another WRAMC facility such as Forest Glen Annex.

- Also, per a historic site map, an apple orchard was near the far northwestern extent of the Property. Apple orchards were historically treated with arsenic containing pesticides that are resistant to degradation and persist in the environment; however, the AFIP Building (54) and the associated parking areas were constructed over the former orchard.

- With consideration that pesticide mixing and storage was discontinued on the Property in the mid-seventies, and the handling and use of these products were likely to have been seasonal and used as needed, wide-scale pesticide use and possible disposal is assumed to be unlikely. Therefore, no RECs have been identified with regard to pesticides.

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.

Randal L. Treiber	Roger H. Walton, P.E
Base Transition Coordinator	Environmental Engineer
Walter Reed Army Medical Center-Main Post	U.S. Army Environmental Center

8 References

Aerosol Monitoring. 1994. “Lead Paint Surveys for Quarters 1, 2, 5, 7, 12, 17 and 19”. 1994.

Air, Wastewater and Stormwater POC. WRAMC GEO. 2005. Personal Communication. 18 July 2005.

Air, Wastewater and Stormwater POC. WRAMC GEO. 2006a. Personal Communication. 4 August 2006 and 5 December 2006.

Air, Wastewater and Stormwater POC. WRAMC GEO. 2006b. Personal Communication. 7 August 2006.

Air, Wastewater and Stormwater POC. WRAMC GEO. 2006c. Personal Communication. 13 October 2006.

Air, Wastewater and Stormwater POC. WRAMC GEO. 2006d. Personal Communication. 5 December 2006.

Air, Wastewater and Stormwater POC. WRAMC GEO. 2006e. Personal Communication. 5 December 2006.

AMI. 2000. “Hazardous Materials Site Assessment Report”. 2000.

Army Garrison WRAMC. 1999. Letter response “Notice of Noncompliance” for TSCA-111-99-0171. 4 November 1999.

Army Environmental Database (AEDB). 2005. 31 March 2005.

Asbestos, Lead-Based Paint and Radon POC. WRAMC GEO. 2006. Personal Communication.

ASIP. 2005. “Army Stationing and Installation Plan”. 2005.

Astore Architects and Urban Designers, P.C. 1996. “Walter Reed Army Medical Center Master Plan Narrative Report, Final”. 1996.

Bailey, R.G. 1980. “Descriptions of the Ecoregions of the United States. U.S. Department of Agriculture, Miscellaneous Publications No. 1391.”

BEC. WRAMC GEO. 2006. Personal Communication.

Cabrera Services, Inc. 2006. “Historical Site Assessment and Addendum to Environmental Condition of Property, Walter Reed Army Medical Center, Washington, D.C.” August 2006.

Dynamac. 1995. “Asbestos Survey Report for Buildings 7, 15, 17, 18, 52, 53, 57, 82, 83, 88, T-2, T-20 and the Steam Tunnels”. 1995.

EA Engineering, Science, and Technology (EA). 1997. “Final Asbestos Survey Report for Walter Reed Army Medical Center – Main Hospital and Final Asbestos Survey Report for Walter Reed Army Medical Center – Main Post”. 1997.

EA Engineering, Science, and Technology (EA). 1999. “Asbestos Survey Report, WRAMC, Building 2.” December 1999.

EA Engineering, Science, and Technology (EA). 2003. Master Plan.

EA Engineering, Science, and Technology (EA). 2006. PCB Sampling of In-ground Transformer Vaults and Transformer Pads for WRAMC Main Post.

EDR® Environmental Data Resources, Inc. 2005a. “Sanborn® Map Report.” Walter Reed Army Medical Center. Prepared for Malcolm Pirnie, Inc. 3 October 2005.

EDR® Environmental Data Resources, Inc. 2005b. “Historical Topographic Map Report.” Walter Reed Army Medical Center. 11 October 2005.

EDR® Environmental Data Resources, Inc. 2006. “Data Map ™ Area Study.” #01738244.1r. Walter Reed Army Medical Center. 31 August 2006.

Environmental Research, Inc. (ERI). 2005. Aerial Photographic Analysis. Walter Reed Army Medical Center. September 2005.

General Physics Corporation. 1999. “Lead Paint Survey for Building 4”. 1999.

General Physics Corporation. 2001. “Radon Monitoring Report for Six Buildings.” 2001.

General Physics Corporation. 2002a. “Asbestos Reinspection and Condition Assessment Report for Building 1, Walter Reed Army Medical Center.” 15 January 2002.

General Physics Corporation. 2002b. “Asbestos Reinspection and Condition Assessment Report for Building 7, Walter Reed Army Medical Center.” 15 January 2002.

General Physics Corporation. 2002c. “Asbestos Reinspection and Condition Assessment Report for Building 11, Walter Reed Army Medical Center.” 15 January 2002.

General Physics Corporation. 2002d. “Asbestos Reinspection and Condition Assessment Report for Building 12, Walter Reed Army Medical Center.” 15 January 2002.

General Physics Corporation. 2002e. “Asbestos Reinspection and Condition Assessment Report for Building 14, Walter Reed Army Medical Center.” 15 January 2002.

General Physics Corporation. 2002f. “Asbestos Reinspection and Condition Assessment Report for Building 17, Walter Reed Army Medical Center.” 6 December 2002.

General Physics Corporation. 2002g. “Asbestos Reinspection and Condition Assessment Report for Building 18, Walter Reed Army Medical Center.” 15 January 2002.

General Physics Corporation. 2002h. “Asbestos Reinspection and Condition Assessment Report for Building 40, Walter Reed Army Medical Center.” 15 January 2002.

General Physics Corporation. 2002i. “Asbestos Reinspection and Condition Assessment Report for Building 52, Walter Reed Army Medical Center.” 15 January 2002.

General Physics Corporation. 2002j. “Asbestos Reinspection and Condition Assessment Report for Building 53, Walter Reed Army Medical Center.” 15 January 2002.

General Physics Corporation. 2002k. “Asbestos Reinspection and Condition Assessment Report for Building 54, Walter Reed Army Medical Center.” 22 January 2002.

General Physics Corporation. 2002l. “Asbestos Reinspection and Condition Assessment Report for Building 82, Walter Reed Army Medical Center.” 17 June 2002.

General Physics Corporation. 2002m. “Asbestos Reinspection and Condition Assessment Report for Building 88, Walter Reed Army Medical Center.” 17 June 2002.

General Physics Corporation. 2002n. “Asbestos Reinspection and Condition Assessment Report for Building 90, Walter Reed Army Medical Center.” 15 January 2002.

General Physics Corporation. 2002o. “Asbestos Reinspection and Condition Assessment Report for East and West Steam Tunnels, Walter Reed Army Medical Center.” 9 September 2002.

General Physics Corporation. 2002/2005a. “Asbestos Reinspection and Condition Assessment Report for Building 91, Walter Reed Army Medical Center.” 15 January 2002.

General Physics Corporation. 2002/2005b. “Asbestos Reinspection and Condition Assessment Report for Building T-2, Walter Reed Army Medical Center.” 10 March 2005.

General Physics Corporation. 2002/2005c. “Asbestos Reinspection and Condition Assessment Report for Building T-20, Walter Reed Army Medical Center.” 10 March 2005.

General Physics Corporation. 2003/2005a. “Asbestos Reinspection and Condition Assessment Report for Building 15, Walter Reed Army Medical Center.” 6 January 2003.

General Physics Corporation. 2003/2005b. “Asbestos Reinspection and Condition Assessment Report for Building 48, Walter Reed Army Medical Center.” 6 January 2003.

General Physics Corporation. 2004. “Asbestos Reinspection and Condition Assessment Report for Building 57” and “Asbestos Reinspection and Condition Assessment Report for Building 91”. 2004.

General Physics Corporation. 2004. “Building 40 – Transformer Vault Soil and Groundwater Sampling Report”. May 2004.

General Physics Corporation. 2000. “Sampling and Analyses Report for the AFIP, Medical Waste Incinerator in Building 54, Room 4115A”. 2000.

Goodwin and Associates, 1999. “Integrated Cultural Resources Management Plan, 1999.

Kemron. 1992. “Asbestos Survey Report for Building 40”. 1992.

Kemron. 1994. “Asbestos Survey Report for Building 1”. 1994.

Kise Franks & Straw, Inc. 1994. “Main Section, Walter Reed Army Medical Center, Washington, D.C., Section 106 Report.”

Lukmire Partnership. 1998. “Feasibility Study for the Renovation of Building No. 1”. 1998.

Motor and Generator Institute. 2004. “Environmental Assessment, Construction of Hospital Energy Plant, Main Section”. 31 March 2004.

R. Christopher Goodwin and Associates, Inc. 1999. “Walter Reed Army Medical Center Integrated Cultural Resources Management Plan.” Final. Prepared for USACE, Baltimore District. 22 November 1999.

Rogers, Golden & Halpern, Inc. 1990. “ Environmental Assessment: Forest Glen Section, Walter Reed Army Medical Center.”

Roy F. Weston, Inc. (Weston). 1990. “Preliminary Assessment Report for Walter Reed Army Medical Center.” 30 September 1990.

RTKL Associates, Inc. 1976. “Master Plan - Analysis of Existing Facilities and Environmental Assessment.”

Stratus Elevator Company and WRAMC DPW. 2006. Interview. 22 June 2006.

U.S. Army. 2005. Environmental Quality Report (EQR).

U.S. Army Center for Public Works. 1999. “Lead Hazard Management Plan.” January 1999.

U.S. Army Center for Public Works. 1999. “Radon Management Plan.” June 1999.

U.S. Army Environmental Hygiene Agency (USAEHA). 1976. “Environmental Impact Assessment, Walter Reed Army Medical Center.” February 1976.

U.S. Army Corps of Engineers (USACE). 2001. “Walter Reed Army Medical Center Spill Prevention, Control, and Countermeasures (SPCC) Plan.” Final. October 2001.

U.S. Army Toxic and Hazardous Materials Agency (USATHAMA). 1984. “Installation Assessment of Headquarters, Walter Reed Army Medical Center, Washington, D.C., and Noncontiguous Sections Forest Glen, Silver Spring, MD, and Glen Haven, Wheaton, MD.” June 1984.

U.S. Environmental Protection Agency (USEPA). 1995. Letter. November 1995.

U.S. Environmental Protection Agency (USEPA). 2000. FFEO Report. December 2000.

U.S. Environmental Protection Agency (USEPA). 2002. Consent Agreement for Violations Related to USTs at WRAMC. April 2002.

U.S. Environmental Protection Agency (USEPA). 2004. Satisfactory Completion of SEP for WRAMC. 9 March 2004.

U.S. Environmental Protection Agency (USEPA) Region 3. 2006. Statistics for 8-Hour Ground-level Ozone Designations.

Walter Reed Army Medical Center (WRAMC). 2004 and 2005. EPCRA Tier II Reports.

Walter Reed Army Medical Center (WRAMC). 2004. “Walter Reed Army Medical Center Installation Action Plan.”

Walter Reed Army Medical Center (WRAMC). 2005. “FY2006 Walter Reed Army Medical Center Installation Action Plan.” July 2005.

Walter Reed Army Medical Center (WRAMC). 2006. “Walter Reed Army Medical Center Installation Action Plan.” Draft.

Walter Reed Army Medical Center Department of Public Works (WRAMC DPW). 2004. “Environmental Baseline Survey (EBS) Enhanced Use Lease Project, Buildings 40 & 18.” 7 July 2004.

WRAMC GEO. 2005. Base-wide Asbestos Management Plan. 2005.

WRAMC Industrial Hygiene Office. 2006. Personal Communication.

Walter Reed Army Medical Center Garrison Environmental Office (WRAMC GEO). 2004. “Integrated Pest Management Plan for Walter Reed Army Medical Center.” July 2004.

Woolpert LLP. 1999a. “Rare, Threatened, and Endangered Species Survey of Walter Reed Army Medical Center: Montgomery County and the District of Columbia, Maryland.”

Woolpert LLP. 1999b. “Walter Reed Army Medical Center, Integrated Natural Resources Management Plan (Main Section, Forest Glen, and Glen Haven).” Prepared for USACE, Baltimore District.

Woolpert LLP. 2002. “Environmental Assessment Master Plan Revision – Main Section, Walter Reed Army Medical Center.” Prepared for USACE, Baltimore District. October 2002.

Woolpert LLP. 2005. “Walter Reed Army Medical Center Main Section Master Plan Revision, Walter Reed Army Medical Center.” June 2005.