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**U.S. Army
Environmental
Center**

VERSION I

Base Realignment and Closure (BRAC) Cleanup Plan

Woodbridge Research Facility Woodbridge, Virginia

Prepared for:

**U.S. ARMY ENVIRONMENTAL CENTER
ABERDEEN PROVING GROUND, MARYLAND 21010**

Prepared by:

**THE EARTH TECHNOLOGY CORPORATION
1420 KING STREET, SUITE 600
ALEXANDRIA, VIRGINIA 22314**

Requests for this document must be referred to:
Commander, Woodbridge Research Facility
U.S. Army Research Laboratory
ATTN: AMSRL-DD
2800 Powder Mill Road
Adelphi, Maryland 20783-1145

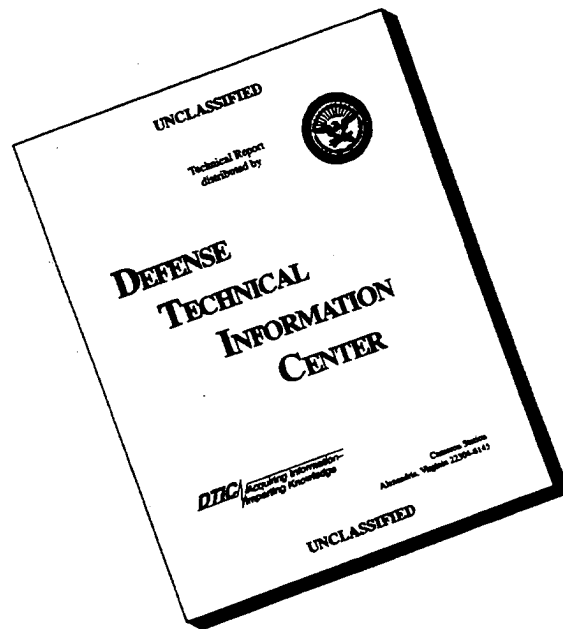
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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ACM	Asbestos-containing Material
ACSIM	Assistant Chief of Staff for Installation Management
AREE	Areas Requiring Environmental Evaluation
AST	Aboveground Storage Tank
BATES	Biological Assessment of Threatened and Endangered Species
BCP	BRAC Cleanup Plan
BCT	BRAC Cleanup Team
BEC	BRAC Environmental Coordinator
bgs	Below Ground Surface
BRAC	Base Realignment and Closure
CAMU	Corrective Action Management Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
CFR	Code of Federal Regulation
CONUS	Continental United States
DD	Decision Documents
DoD	Department of Defense
DOT	Department of Transportation
DPW	Directorate of Public Works
DSMOA	Department of Defense and State Memorandum of Agreement
EIS	Environmental Impact Statment
EMP	Electromagnetic Pulse
EnPA	Enhanced Preliminary Assessment
FY	Fiscal Year
HDL	Harry Diamond Laboratories
IRDMIS	Installation Restoration Data Management Information System
IRP	Installation Restoration Program
MOA	Memorandum of Agreement
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEPA	National Environmental Policy Act
NFRAP	No Further Response Action Planned
NHPA	National Historic Preservation Act of 1966
NPDES	National Pollution Discharge Elimination System
NPL	National Priority List
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PA	Preliminary Assessment
PCB	Polychlorinated Biphenyl
PIRP	Public Involvement and Response Plan

LIST OF ACRONYMS

Continued

POL	Petroleum, Oil, and Lubricant
RA	Remedial Action
RAB	Restoration Advisory Board
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RFA	RCRA Facility Assessment
RI	Remedial Investigation
RI/FS	Remedial Investigation/ Feasibility Study
RMA	Resource Management Area
RMIS	Restoration Management Information System
ROD	Records of Decision
RPA	Resource Protection Area
SARA	Superfund Amendments and Reauthorization Act
SAV	Submerged Aquatic Vegetation
SHPO	State Historic Preservation Office
SI	Site Inspection
SSI	Supplemental Site Inspection
SWMU	Solid Waste Management Unit
USACE	U.S. Army Corps of Engineers
USAEC	U.S. Army Environmental Center
USAMC	U.S. Army Materiel Command
USARL	U.S. Army Research Laboratory
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	Underground Storage Tank
UXO	Unexploded Ordnance
VDEQ	Virginia Department of Environmental Quality
WRF	Woodbridge Research Facility

EXECUTIVE SUMMARY

Introduction

This Base Realignment and Closure (BRAC) Cleanup Plan (BCP) describes the status, management and response strategy, and action items related to ongoing environmental restoration and associated compliance programs at the Woodbridge Research Facility (WRF). These programs support restoration of the installation, which is necessary to meet the requirements for property disposal and reuse activities associated with the closure of the installation. The scope of the BCP considers the following regulatory mechanisms: the BRAC; National Environmental Policy Act (NEPA); Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Community Environmental Response Facilitation Act (CERFA); Resource Conservation and Recovery Act (RCRA); and other applicable laws.

The BCP is a planning document, and the information and assumptions presented may not necessarily have complete approval from the U.S. Army and/or federal and state regulatory agencies. The BCP is a dynamic document that will be updated regularly to reflect the current status and strategies of remedial actions. This document is the first in a series of updates/modifications and represents conditions and strategies as of 24 February 1994.

Status of Disposal, Reuse, and Interim Lease Process

The WRF is located on approximately 579 acres of land in the easternmost portion of Prince William County, Virginia, within the town of Woodbridge. The primary mission of the facility, until its closure in September 1994, is to support the U.S. Army Research Laboratory in a variety of programs involving nuclear weapons effects and U.S. Army systems survivability. For the closure of the WRF, emphasis is given to ecological aspects at the installation due to the presence of numerous sensitive natural resource habitats. Approximately 82% of the WRF is categorized as being "environmentally-sensitive" with 49% of the WRF classifiable as jurisdictional wetlands. The great diversity of habitat types include upland forests, tidal marsh, wooded swamp. In addition, habitat for many endangered and threatened species including the bald eagle is present on the facility.

The WRF officially closes by the end of September 1994. The disposal of the WRF involves three interrelated activities: the NEPA Environmental Impact Statement (EIS) process, development of a disposal plan, and development of a community reuse plan. The first two items are the responsibility of the U.S. Army. The third is the responsibility of the "Woodbridge Reuse Committee," an ad hoc committee of citizens officially sanctioned by the Prince William County Board of Supervisors in February 1994 for the purpose of developing a plan for reuse and redevelopment of the installation. These three activities have not been completed at the WRF. The U.S. Army's current disposal alternatives are outlined in the preliminary draft EIS for the WRF Disposal/Reuse dated June 1993. The Woodbridge Reuse Committee has not

selected a preferred reuse alternative nor prepared a redevelopment plan that involves development of the WRF. After these plans are completed they will be considered in the development of the U.S. Army's disposal decisions.

No property has been disposed at the WRF as of 24 February 1994. Pending final reuse decisions, the BCT has developed a likely reuse scenario to assist in the development of the BCP. The scenario assumes the transfer of approximately 70 non-environmentally-sensitive acres to the private sector by deed, with the balance (approximately 509 acres) to be transferred to another Federal agency as an addition to the Marumsc National Wildlife Refuge. This hypothetical scenario was selected to serve as a basis for the development of this Plan. This BCP will be modified appropriately when the Congress and the Woodbridge Reuse Committee have announced decisions that will affect the actual reuse of the WRF.

Status of Environmental Restoration Program

A Department of Defense and State Memorandum of Agreement (DSMOA) was signed in 1990. This agreement should be helpful in expediting cleanup needs at the WRF. The Installation Restoration Program (IRP) effort at the WRF was initiated in 1991. As part of the IRP process, an Enhanced Preliminary Assessment (EnPA) was performed in September 1991 and documented past activities and current conditions at the WRF in a report dated March 1992. A CERFA PA was also performed during August and September 1993 which identified clean portions of the WRF for rapid transfer to the private sector for economic redevelopment in a draft report dated 8 October 1993. The last IRP activity that has occurred to date was the beginning of the Site Inspection (SI) and Remedial Investigation (RI) to further characterize the environmental restoration areas of concern. The SI and RI are currently ongoing and are scheduled for completion by the end of December 1994. Avenues to be used to address compliance activities have also been identified. A brief summary of the current status of the environmental restoration process and ongoing compliance activities at the WRF is provided below.

Thirty-five areas requiring environmental evaluation (AREEs) have been identified at the WRF. Twenty-nine of the 35 AREEs were identified in the Enhanced PA with 21 of these falling under environmental restoration projects, six regarding compliance activities, and two specified as no further remedial action planned (NFRAP). The CERFA report identified two additional AREEs, one of which will be handled under environmental restoration and the other will be handled as a compliance activity. The final four AREEs were identified during the BCP "Bottom Up Program Review" with one falling under environmental restoration projects, two regarding compliance activities and one specified as NFRAP. From this, a total of 23 AREEs will be addressed as environmental restoration projects, nine AREEs will be addressed as compliance activities and three AREEs discussed as NFRAP.

Key Restoration and Transferability Strategies and Schedules

The WRF has shifted its focus from the activities of an active installation to compliance and restoration for disposal and reuse of the property. The BCP strategies are currently being implemented to focus restoration activities on final transfer of installation property. Strategies for determining the most effective response for contaminant sources and contaminated areas during the early stages of the restoration process at the installation have been performed on a

case-by-case basis by the Project Team. A comprehensive strategy to identify appropriate regulatory programs applicable to the areas of contamination discovered during the restoration program has been developed.

Summary of Current BCP Action Items

Table ES-1 provides a listing of recommendations and issues associated with environmental restoration, compliance, and technical/management action items that require further evaluation and implementation by the BRAC Cleanup Team (BCT)/Project Team.

TABLE ES-1. BCT/PROJECT TEAM ACTION ITEMS

Action Item	Status		
	Program Review Item	In Progress	To Be Performed
COMPLIANCE ACTIVITIES			
Storage Tanks			
- Investigate former UST locations	13, 16		×
- Investigate existing UST locations	13, 16		×
- Investigate hydraulic oil and fuel oil spill locations	13, 16		×
Asbestos			
- Conduct asbestos survey	16		×
Lead-based Paint			
- Conduct lead-based paint survey	16		×
NEPA			
- Complete EIS	27		×
CERCLA 120(H)(3) CONSIDERATIONS			
Environmental Condition of Property			
- Perform further studies to evaluate	9, 13, 22	×	
Suitability for Property Transfer			
- Support McKinney Act Screening	28		×
- Determine required and acceptable deed restriction or controls	28, 32		×
- Integrate disposal and reuse priorities into restoration and compliance scheduling	3, 17, 18	×	
- Develop base reuse parcel map	28		×
- Refine identification of property suitable for transfer	28		×
COMMUNITY RELATIONS			
- Develop community relations plan	14		×
- Establish restoration advisory board	14		×
MANAGEMENT AND ADMINISTRATIVE SUPPORT ACTIVITIES			
- Maintain database for information management	21	×	
- Establish background concentration levels for use in risk assessments	23		×
- Establish data quality objectives	20	×	
- Support update of BCP periodically	27, 33		×

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CHAPTER 1

► INTRODUCTION AND SUMMARY ◀

The purpose of this BRAC Cleanup Plan (BCP) is to summarize the current status of the Woodbridge Research Facility (WRF) environmental restoration and associated environmental compliance programs and present a comprehensive strategy for implementing response actions necessary to protect human health and the environment. This strategy integrates activities being performed under both the Installation Restoration Program (IRP) and the associated environmental compliance programs to support full restoration of the installation. The BCP is a dynamic document that will be updated regularly to incorporate newly-obtained information and will reflect the completion or change in status of any remedial actions (RAs). This iteration of the BCP was prepared with information available as of 24 February 1994.

This BCP is a planning document. Information, schedules, and any RAs presented in this BCP do not necessarily represent those that have been or will be approved by the U.S. Army or federal and state regulatory agencies. It was necessary to make certain assumptions and interpretations to develop the schedules and cost estimates. As additional data become available, implementation programs and cost estimates could be dramatically altered. Such changes would then be reflected in future updates to the BCP.

Chapter 1 describes the objectives of the environmental restoration program, explains the purpose of the BCP, introduces the Project Team formed to review the program, and provides a brief history of the installation.

Chapter 2 summarizes the current status of the WRF property disposal planning process and describes the relationship of the disposal process with other environmental programs.

Chapter 3 summarizes the current status and past history of the WRF restoration and associated environmental compliance programs, community relations activities that have occurred to date, and the environmental condition of installation property.

Chapter 4 describes the installation-wide strategy for environmental restoration, including the strategies for dealing with each operable unit (OU) on installation. This chapter also includes plans for managing underground tanks via an underground storage tank (UST) program and summarizes plans for managing responses under other compliance programs.

Chapter 5 provides master schedules of planned and anticipated activities to be performed throughout the duration of the environmental restoration program, including associated compliance activities.

Chapter 6 describes specific technical and/or administrative issues to be resolved and presents a strategy for resolving these issues.

Chapter 7 provides a list of primary references utilized in the preparation of the BCP.

In addition to the main text, the following appendices are included in this document:

- ▶ Appendix A - summary tables of past, current, and projected costs for the environmental restoration program
- ▶ Appendix B - technical documents and data loading summary (Installation Restoration Data Management Information System (IRDMIS)), and listings of previous environmental restoration program deliverables by program and by site
- ▶ Appendix C - summaries of Decision Documents (DDs) for which an RA was selected
- ▶ Appendix D - summaries of each DD for each site or OU for which a no further response action planned (NFRAP) decision has been made
- ▶ Appendix E - working conceptual models for sites (areas requiring environmental evaluation (AREEs)), zones, or OUs
- ▶ Appendix F - other ancillary materials relevant to the BCP.

1.1 Environmental Response Objectives

The objectives of the base closure environmental restoration program at the WRF are as follows:

- ▶ Protect human health and the environment
- ▶ Strive to meet reuse goals established by the U.S. Army and the community, consistent with legislation relevant to the WRF closure
- ▶ Comply with existing Federal and State statutes and regulations
- ▶ Conduct all environmental restoration activities in a manner consistent with Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA)
- ▶ Continue efforts to identify all potentially-contaminated areas
- ▶ Establish priorities for environmental restoration and restoration-related compliance activities so that property disposal and reuse goals can be met
- ▶ Identify and map the environmental condition of installation property with the intent of identifying areas suitable for transfer by deed

- Complete the environmental restoration process as soon as practicable for each source area, zone, or OU, in an order of priority which takes into account both environmental concerns and redevelopment plans; consider future land use when characterizing risks associated with releases of hazardous substances, pollutants, contaminants, or hazardous wastes.

1.2 BCP Purpose, Updates, and Distribution

This BCP presents, in summary fashion, the status of the WRF's environmental restoration and compliance programs and the comprehensive strategy for environmental restoration and restoration-related compliance activities. It lays out the response action approach at the installation in support of base closure. In addition, it defines the status of efforts to resolve technical issues so that continued progress and implementation of scheduled activities can occur. The WRF BCP strategy and schedule herein is designed to streamline and expedite the necessary response actions to facilitate the earliest possible disposal and reuse activities. Risk assessment protocols will incorporate future land use in exposure scenarios.

The BRAC Cleanup Team (BCT) has decided that the BCP will be updated semi-annually, or more frequently if determined to be necessary. Updates of the BCP will be distributed to those individuals identified in Table 1-1 which includes each member of the WRF Project Team.

TABLE 1-1. BCP DISTRIBUTION LIST

Name	Title	Address
Robert Craig	BRAC Environmental Coordinator (BEC)	U.S. Army Research Laboratory (USARL) ATTN: AMSRL-OP-IN-RE 2800 Powder Mill Road Adelphi, MD 20783-1145
David Grimes	VDEQ BRAC Project Manager	VDEQ Water Division 4900 Cox Road Glen Allen, VA 23060
Jack Potosnak	U.S. Environmental Protection Agency (USEPA), Region III, Remedial Project Manager	USEPA, Region III 841 Chestnut Street (3HW71) Philadelphia, PA 19107
Todd Waltemyer	Base Transition Coordinator	WRF Dawson Beach Road Woodbridge, VA 22191
Clara Bennett	Real Property Specialist	USARL ATTN: AMSRL-OP-SD-PW 2800 Powder Mill Road Adelphi, MD 20783-1145
Dr. Alfred Pinckney	U.S. Fish and Wildlife Service (USFWS) Representative	USFWS Chesapeake Bay Field Office 1825 Virginia Street Annapolis, MD 21401
Scott Hill	U.S. Army Environmental Center (USAEC) Environmental Engineer, Base Closure Division	USAEC ATTN: SFIM-AEC-BCB Aberdeen Proving Ground, MD 21010-5401
Joyce Eagles	Chairperson, Reuse Committee	14122 Essex Drive Woodbridge, VA 22191

TABLE 1-1. BCP DISTRIBUTION LIST**Continued**

Name	Title	Address
James Waggener	Member, Reuse Committee	12823 Mill Brook Court Woodbridge, VA 22192
William von Till	VDEQ Geologist Supervisor	VDEQ Water Regional Office Northern Regional Office 1591 Davis Ford Road, Suite 14 Woodbridge, VA 22192
Khaled Masoud	U.S. Army Corps of Engineers (USACE) - Baltimore Project Manager	USACE Baltimore District ATTN: CENAB-EN-HM 10 South Howard Street Baltimore, MD 21201
Gerald Brese	USACE - Baltimore District	USACE Baltimore District ATTN: Real Estate Division P. O. Box 1715 Baltimore, MD 21203
Col. William Miller	Installation Commander	USARL ATTN: AMSRL-DD 2800 Powder Mill Road Adelphi, MD 20783-1145
Charles Denney, III	Operations Directorate Executive (Acting)	USARL ATTN: AMSRL-OP 2800 Powder Mill Road Adelphi, MD 20783-1145
Teresa Kines	Site Operations Director	USARL ATTN: AMSRL-OP-SD 2800 Powder Mill Road Adelphi, MD 20783-1145
Jeffrey Nelson	USARL Environmental Coordinator	USARL ATTN: AMSRL-OP-IN-RK 2800 Powder Mill Road Adelphi, MD 20783-1145
Ray Roudebush	Public Works Engineer	USARL ATTN: AMSRL-OP-SD-FE 2800 Powder Mill Road Adelphi, MD 20783-1145
Kathleen Christ	USARL Transition Coordinator	USARL ATTN: AMSRL-OP-TO 2800 Powder Mill Road Adelphi, MD 20783-1145
Kevin Mason	USARL Environmental Coordinator	USARL ATTN: AMSRL-OP-IN-RE 2800 Powder Mill Road Adelphi, MD 20783-1145
Donald Brower	USARL National Environmental Policy Act (NEPA) Coordinator	USARL ATTN: AMSRL-OP-IN-RE 2800 Powder Mill Road Adelphi, MD 20783-1145
Anne Barnett	Chief, Relocation Planning Branch	USARL ATTN: AMSRL-OP-IN-RP 2800 Powder Mill Road Adelphi, MD 20783-1145

TABLE 1-1. BCP DISTRIBUTION LIST**Continued**

Name	Title	Address
Pedro Cunanan	Project Manager	USARL ATTN: AMCEN-A 5001 Eisenhower Avenue Alexandria, VA 22333-0001
Jean Gillen	Project Manager	U.S. Army Materiel Command (USAMC) ATTN: AMSCO-TO 5001 Eisenhower Avenue Alexandria, VA 22333-0001
Marian Singleton	Public Affairs Officer	USARL ATTN: AMSRL-CD-S-PA 2800 Powder Mill Road Adelphi, MD 20783-1145

1.3 BCT/Project Team

The BCT is composed of three members, including Remedial Project Managers from both the USEPA, Region III and from the Virginia Department of Environmental Quality (VDEQ). The BCT is led by the BEC, who represents the Installation Commander.

The WRF Project Team consists of the BCT and additional individuals whom the BCT selects to assist in the environmental restoration process at the WRF. The Project Team is led by the BEC. Project Team meetings are the means of conducting periodic program reviews and reaching consensus on decisions with the USEPA and VDEQ. Table 1-2 lists the current WRF Project Team Members and specifies individual roles and responsibilities.

TABLE 1-2. CURRENT BCT/PROJECT TEAM MEMBERS

Name	Title	Phone	Role/Responsibility
BCT MEMBERS			
Robert Craig	BEC	V: (301) 394-4511 F: (301) 394-2660	Environmental Restoration Program Project Manager
David Grimes	VDEQ BRAC Project Manager	V: (804) 527-5095 F: (804) 527-5267	VDEQ BRAC Project Manager
Jack Potosnak	USEPA, Region III, Remedial Project Manager	V: (215) 597-2317 F: (215) 597-9890	USEPA, Region III Remedial Project Manager
OTHER KEY PARTICIPANTS			
Todd Waltemyer	Base Transition Coordinator	V: (703) 490-2511 F: (703) 490-2334	Liaison with Community and Department of Defense (DoD)
Clara Bennett	Real Property Specialist	V: (301) 394-2220 F: (301) 394-1386	Directorate of Public Works (DPW) Representative
Dr. Alfred Pinckney	USFWS Service Representative	V: (410) 269-5448 F: (410) 269-0832	USFWS Representative
Scott Hill	USAEC Environmental Engineer, Base Closure Division	V: (410) 671-1607 F: (410) 671-1635	Site Investigation (SI) Project Manager
Joyce Eagles*	Chairperson, Reuse Committee	V: (703) 491-6972	Chairperson, Woodbridge Reuse Committee
James Waggener*	Member, Reuse Committee	V: (703) 497-0506	Member, Woodbridge Reuse Committee

TABLE 1-2. CURRENT BCT/PROJECT TEAM MEMBERS

Continued

Name	Title	Phone	Role/Responsibility
William von Till	VDEQ Geologist Supervisor	V: (703) 490-8922 F: (703) 490-6773	VDEQ Technical Representative
Khaled Masoud	USACE - Baltimore Project Manager	V: (410) 962-4448 F: (410) 962-7736	Site Restoration Project Manager
Gerald Brese	USACE - Baltimore District Real Estate Division	V: (410) 962-5173 F: (410) 962-0866	Real Property Transfer

*Once the Restoration Advisory Board (RAB) is established, these individuals will be identified as RAB members rather than Project Team Members.

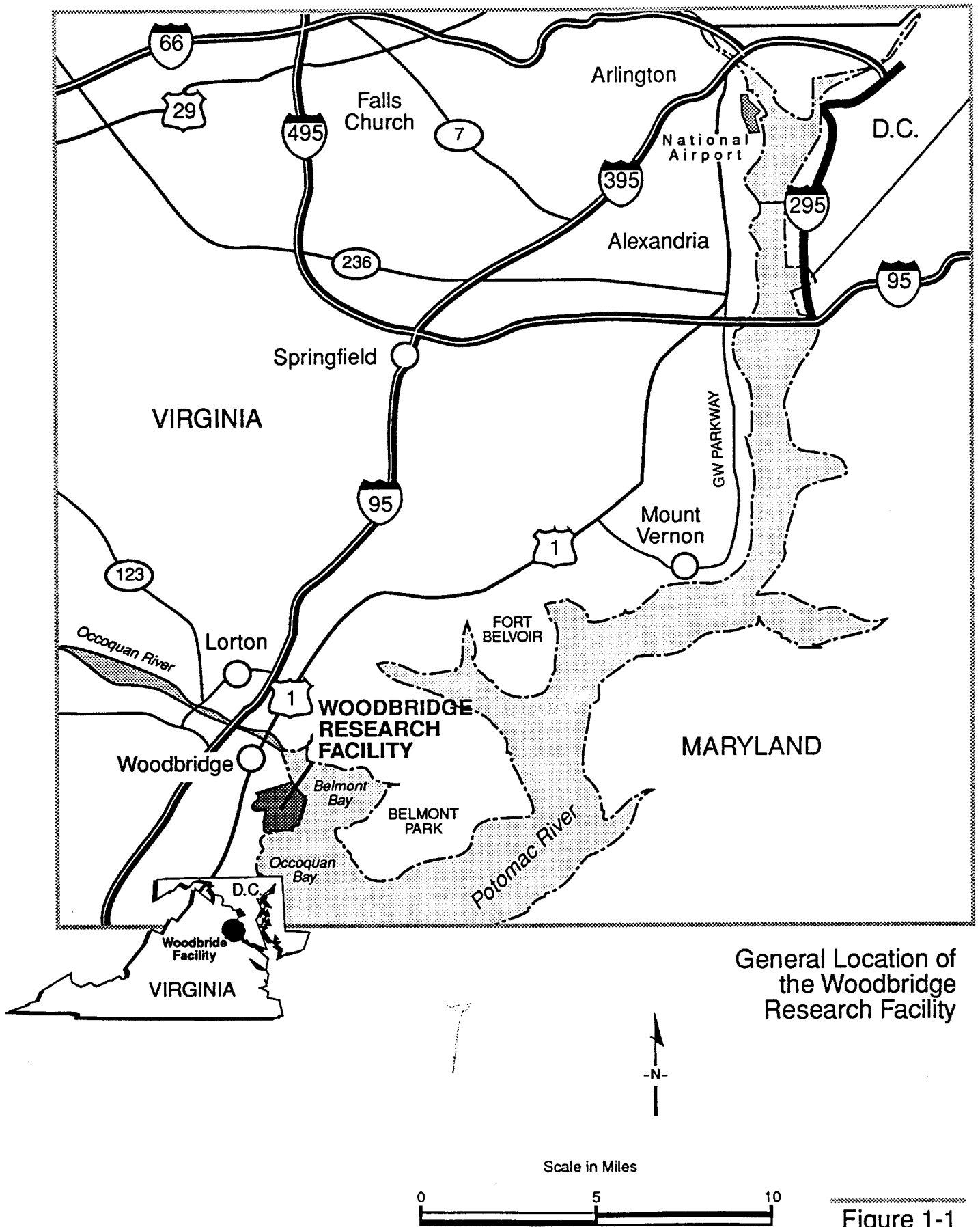
1.4 Installation Description and History

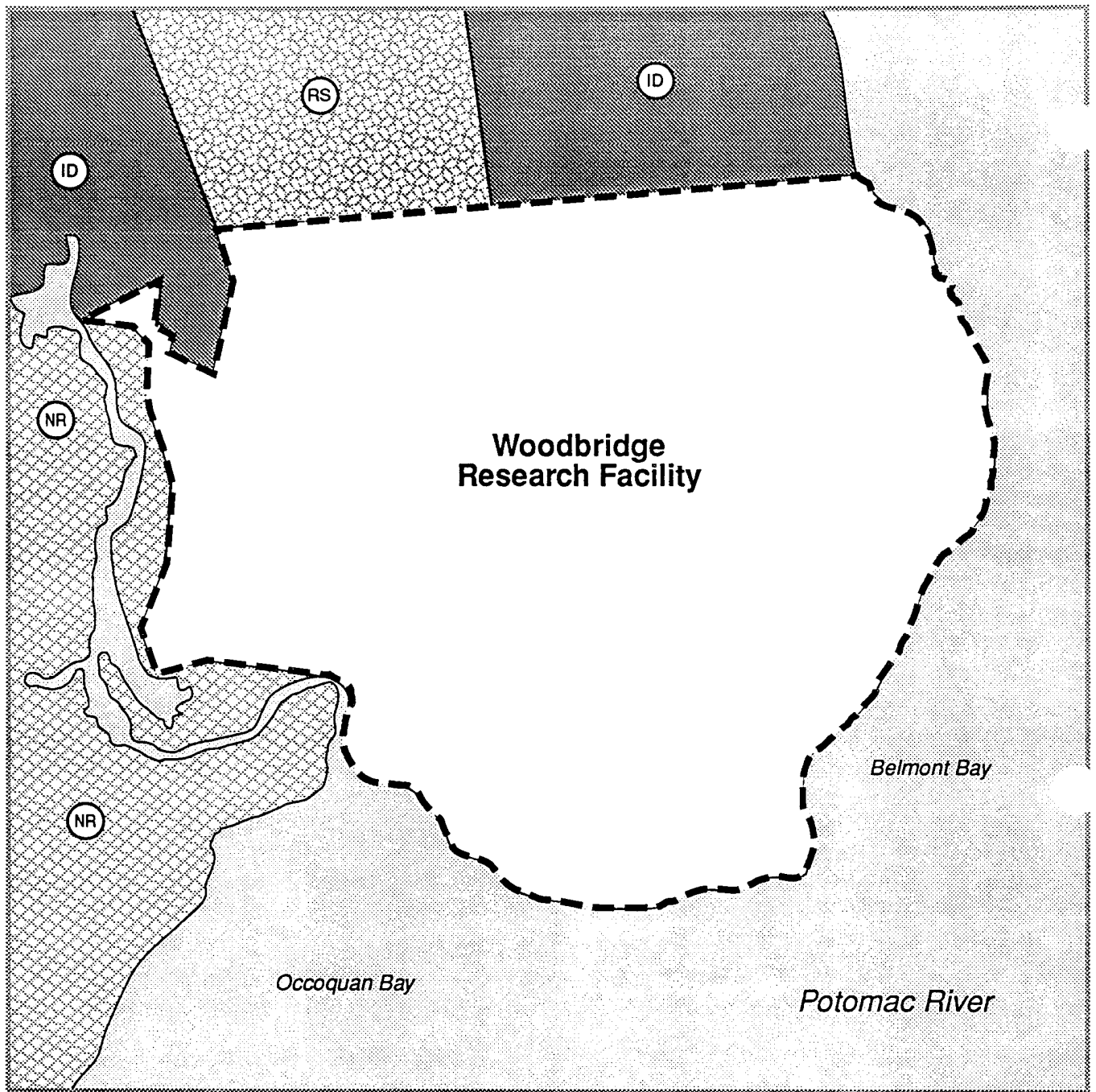
The WRF is located on approximately 579 acres of land in the easternmost portion of Prince William County, Virginia, within the town of Woodbridge. Occoquan and Belmont Bays border the WRF on the south and east, respectively. Marumsco Creek, which is part of Marumsco National Wildlife Refuge, bounds the facility on the west side. Residential, commercial, and industrial areas are located north of the WRF. The entrance to the WRF is located on Dawson Beach Road, which extends to the southeast from U.S. Route 1 in Woodbridge. A facility location map is provided as Figure 1-1. Figure 1-2 illustrates the surrounding off-base land use.

Historical records of the property which comprises the present-day WRF, date back to the late 17th century when Martin Scarlet purchased approximately 700 acres (including the entire WRF site) from Captain Edward Streater. The land (referred to as Deep Hole Point) was used primarily for tobacco farming for nearly a century. In 1765, the land was transferred to Colonel John Taylor, in whose name the property remained until the Civil War. During the Civil War, Confederate artillery batteries were constructed in the vicinity of the WRF. When the war ended, the WRF land returned to farming, and farm residences and outbuildings were present on the site. Fishing ports were located along the southern shoreline. In 1908, J. Lindsay Dawson purchased the farmland for raising cattle. Cattle raising and commercial fishing ended in 1950 and 1951 when the U.S Army acquired title to approximately 649 acres of land for use as a military radio station, which was then known as the Woodbridge Virginia Facility of the U.S. Army Strategic Communications Command. This property acquisition is shown in Table 1-3.

TABLE 1-3. PROPERTY ACQUISITION SUMMARY

Tract Number	Previous Land Owner	Acreage		
		Fee Land	Easement Land	Acquisition Date
Entire Installation	J. Lindsay Dawson	649	0	1951





EXPLANATION

- Public Open Space and Recreation
- Residential
- Commercial General
- Commercial Office
- Commercial Residential Mixed
- Industrial
- Installation Boundary

- Utilities and Services
- Agricultural
- Natural Resources Conservation
- Undeveloped
- Institutional

Surrounding
Off-Post
Land Use

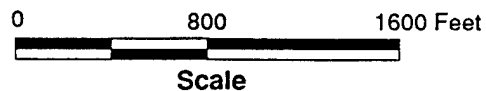
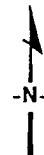


Figure 1-

Woodbridge Research Facility, Virginia

In 1952, the property was assigned to the U.S. Army Command and Administrative Communications Agency and designated the U.S. Army Transmitting Station. In 1962, the Station was reassigned to the U.S. Army Continental United States (CONUS) Regional Communications Command and redesignated the East Coast Radio Transmitting Station. In 1965, the Station was placed under the U.S. Army Strategic Communications Command, CONUS. The Station became inactive in July 1969. Two years later, in July 1971, the USAMC acquired approximately 642 acres of the site. The U.S. Army Mobility Equipment Research and Development Center administered the Station. During that same year, the approximately 7 acres reserved for housing were administratively transferred to the U.S. Army Engineering and Housing Support Center, located at Fort Belvoir, approximately 6 miles northeast of the Station.

In 1971, a consolidation of USAMC nuclear weapons effects research and test activities resulted in the administrative transfer of the 642-acre parcel to Harry Diamond Laboratories (HDL) located at Adelphi, Maryland. The site was re-designated as the WRF. In December 1972, approximately 63 unimproved acres of the installation in the vicinity of Marumsco Creek were transferred to the U.S. Department of the Interior for use as a park and wildlife refuge.

In 1991, the Defense Base Closure and Realignment Commission recommended realignment of the U.S. Army activities being conducted at the WRF. In October 1992, HDL was absorbed into the USARL. Most USARL activities at the WRF will be relocated to Adelphi, Maryland. Some activities are planned to relocate to White Sands, New Mexico. The WRF is required to close as an active U.S. Army facility by the end of September 1994.

The primary mission of the facility, until its closure in September 1994, is to support USARL, headquartered in Adelphi, Maryland. Scientists, engineers, and technical and administrative personnel are employed at the WRF in a variety of programs involving nuclear weapons effects and U.S. Army systems survivability. The facility has investigated and studied the effects of electromagnetic pulses generated by exo-atmospheric nuclear weapons detonation on communications and other military systems. Testing activities involve simulations utilizing on-site electromagnetic pulsers.

1.5 Environmental Setting

Geology and Hydrogeology. The WRF is comprised of coastal plain sediments that dip and thicken toward the east to form a wedge. Underlying the coastal plain sediments are undifferentiated Paleozoic meta-sedimentary and meta-igneous rocks. Well borings performed by the U.S. Geological Survey indicate that bedrock depth ranges from approximately 94 to 105 feet below ground surface (bgs) less than one-fourth mile to the northwest of the WRF. However, two wells drilled into the lower Potomac aquifer approximately one-half mile away in the central part of the WRF site indicated bedrock at a depth of approximately 150 feet bgs. The sediments overlying the bedrock are principally gravels, sand, and clay of the Cretaceous-age Potomac group. The upper sediments include terrace and alluvial deposits of Pleistocene and Holocene (recent) ages.

Groundwater contours have not been characterized at the WRF, other than at a few discrete locations. However, due to the relatively flat topography of the site and, as evidenced by the abundance of acreage classified as jurisdictional wetlands, the depth to groundwater at the WRF is presumed to be very shallow.

Ecology. A comprehensive jurisdictional wetlands delineation of the WRF was conducted during November and December 1991. Boundaries between "wetlands" and "uplands" were determined using the procedures outlined in the 1987 "Corps of Engineers Wetlands Delineation Manual". The delineation found that approximately 285 acres (approximately 49%) of the WRF is classifiable as jurisdictional wetlands. Most of this acreage (approximately 265 acres) is tidally-influenced. Consequently, an additional 100-foot wide Chesapeake Bay Resource Protection Area (RPA) buffer zone is added at the upland periphery of these tidally-influenced areas.

According to the July 1993 Preliminary Draft Environmental Impact Statement (EIS) entitled "Woodbridge Research Facility Disposal/Reuse," approximately 477 acres (approximately 82%) of the WRF are categorized as being "environmentally-sensitive." This acreage includes the jurisdictional wetlands and the associated 100-foot wide RPA buffer zone, plus any additional uplands acreage within the 100-year floodplain that does not fall within the RPA buffer.

The WRF contains a great diversity of habitat types and resultant edge habitats. Habitat types include floodplain and upland forests, tidal marsh, wooded swamp, shrubland, open water, and disturbed habitat (mowed fields). As previously mentioned, the WRF borders the Marumsco National Wildlife Refuge, a large palustrine marsh system managed by the USFWS.

Habitat for the endangered (Federal and State) bald eagle is present on the facility, although no nests have been documented. Bald eagles use the site as a resting and feeding area. The most commonly-used areas are from Marumsco Creek, along the river shore, to the picnic ground. Other portions of the site, including both the wetlands and the non-wetlands, provide habitat for a number of documented birds listed by Virginia as "Threatened" (Henslow's Sparrow and Loggerhead Shrike) or of "Special Concern" (Great Egret, Northern Harrier, Caspian and Forster's Terns, Brown Creeper, Golden-Crowned Kinglet, and Hermit Thrush).

1.6 Hazardous Substances and Waste Management Practices

During the years in which the WRF served as a radio transmitting station for the U.S. Army, the installation held a number of antennae fields which covered significant acreage. Typically, these fields were constructed of tall wooden poles, with wire conductors suspended from pole to pole in one of a variety of arrays. Associated with these arrays were grounding grids, the wires to which may have been sheathed in lead and protected by polychlorinated biphenyl (PCB) dielectric fluid. Additionally, there were numerous capacitors and transformers associated with these fields. When these antennae fields were dismantled in the early 1970's, some (if not all) of this contaminated electrical hardware was disposed in on-site landfills, which are described later within this Plan. PCBs and PCB items were known to have been stored at the site of present day Building 211.

Presently, there are six USTs and one aboveground storage tank (AST) at the WRF, all of which contain petroleum products. In the years since 1971, six USTs have been removed. Petroleum leaks and spills have occurred over the years at many of these 12 UST locations.

At some time prior to 1971, as part of a research and development effort to develop an intrusion detection system, an array of ethylene glycol-filled hoses were installed in the ground at a test site. Most of these hoses remain in the ground today, still filled with ethylene glycol.

In the years prior to 1971, solid waste was disposed on-site at the previously mentioned landfills. The solid waste was disposed in the form of ash, following volumetric-reduction in an on-site incineration unit. The incinerator has since been dismantled and disposed of on-site at one of the landfills, except for the chimney, which is reportedly constructed of asbestos-cement. This former chimney is reportedly in service today as a roadway culvert.

For a period of a few months in 1974, sewage sludge from local sewage treatment plants was injected into the soil at the WRF. The sludge injection program was implemented in an effort to improve the soil conditions at the WRF. This practice was halted due to complaints from the nearby community.

In addition to these past disposal practices, other incidents have occurred over the years that have resulted in chemical contamination at the WRF. These incidents are described later within this Plan.

Hazardous waste generated at the WRF is routinely less than 100 kilograms per month. If the WRF were to generate appreciable amounts of hazardous wastes, these generating activities would be summarized in Table 1-4. Table 1-4 has been included for informational purposes only. The WRF does not possess a permitted hazardous waste storage facility, since such a facility is unneeded. Rather, hazardous wastes at the WRF are collected at satellite accumulation points located as needed at various locations within the main compound buildings. Hazardous wastes have been and continue to be routinely disposed of through the Defense Reutilization and Marketing Office located at Fort Belvoir, Virginia.

TABLE 1-4. HAZARDOUS WASTE GENERATING ACTIVITIES

Facility	Unit	Activity	Name of Waste Material	Generation Rate	Disposition
	The WRF is considered a small quantity hazardous waste generator with no appreciable amounts of hazardous wastes generated at the WRF.				

Table 1-5 outlines the history of base operations at the WRF, including the historical hazardous substance activities. Figure 1-3 shows the general locations of past hazardous substance activities at the WRF identified in Table 1-5.

TABLE 1-5. HISTORY OF INSTALLATION OPERATIONS

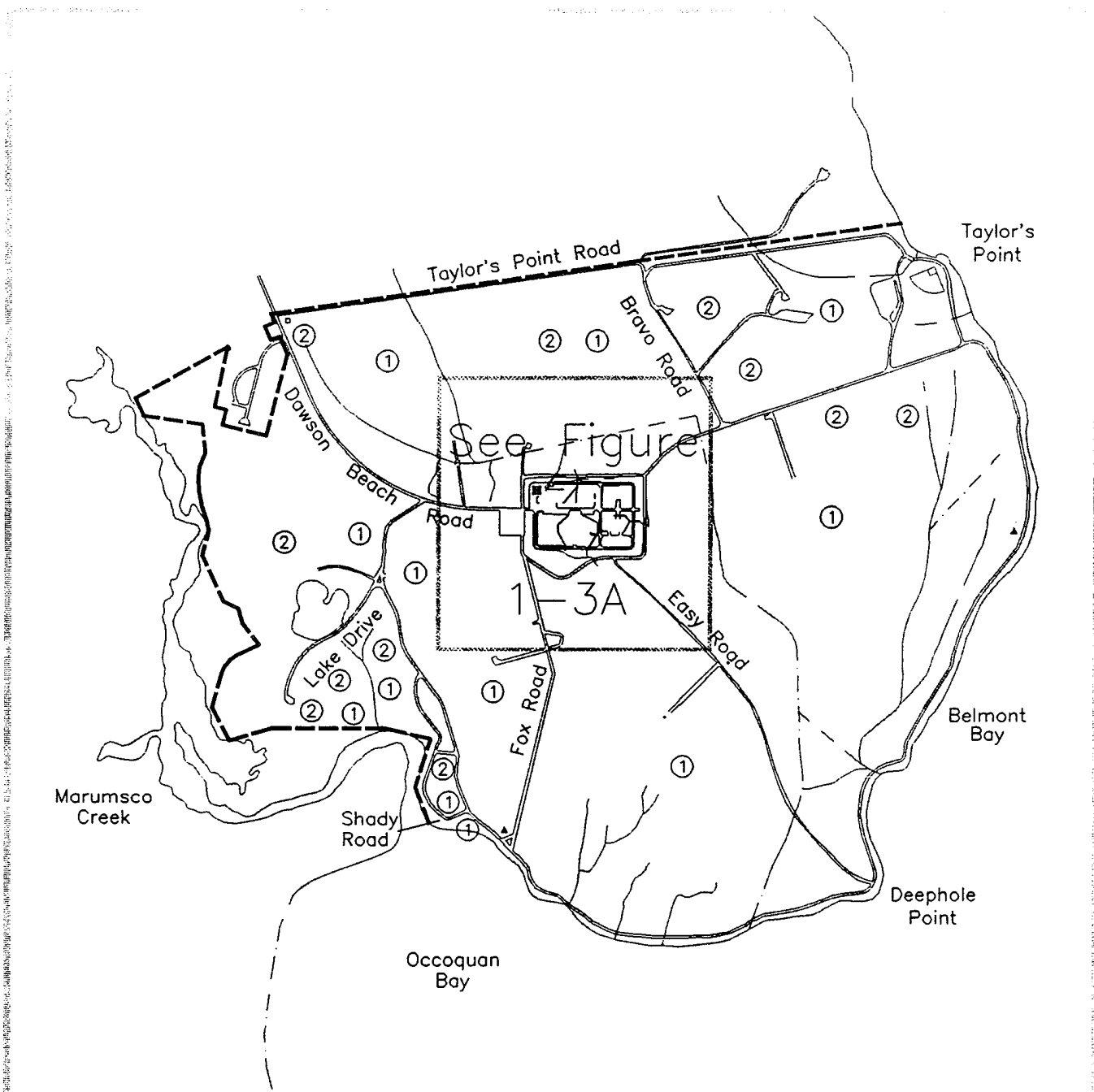
Period	Type of Operation	Hazardous Substance Activities	Map Reference (See Figure 1-3)
Pre-1951	Cattle raising; commercial fishing	Construction	--
1951-1971	Military radio station	Construction/demolition; fuel/oil storage; landfills; battery storage; classified document incineration; machine shop; buried wire	1
1971-Present	Nuclear weapons effects research and test activities	Construction/demolition; fuel/oil storage; landfills, firing ranges; battery shop; battery storage; sewage injection; machine shop; oil/water separators; buried ethylene glycol hoses	2

1.7 Off-Post Property/Tenants

Off-Post Properties. There are no off-post properties that are subordinate to the WRF, nor any that need to be considered as a part of the base closure process. If any off-post properties were to exist, they would be identified in Table 1-6 and illustrated in Figure 1-4. Table 1-6 and Figure 1-4 have been included for informational purposes only.

TABLE 1-6. OFF-POST PROPERTIES

Description	Acreage	Date of Acquisition	Environmental Status	Location	Remarks
	There are no off-post properties that are subordinate to the WRF, nor any that need to be considered as part of the base closure process.				



EXPLANATION

- ① Designation of Activity Location
- Installation Boundary

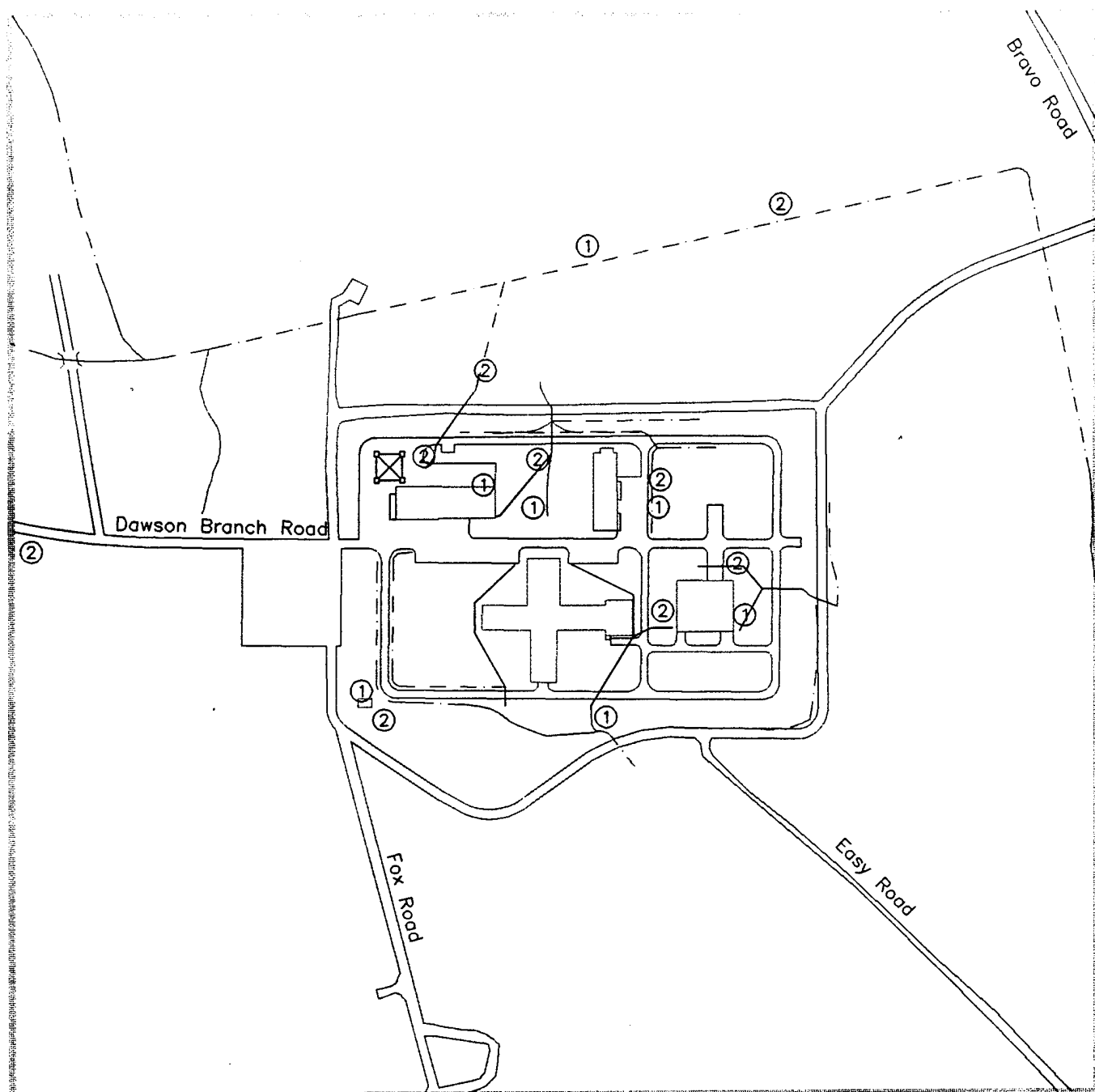
Location of Past
Hazardous
Substance
Activities



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Figure 1-3

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EXPLANATION

① Designation of Activity
Location (See Table 1-5)

--- Installation Boundary

Location of Past
Hazardous
Substance
Activities



0 150 300
FEET

Figure 1-3A

Woodbridge Research Facility, Virginia

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**There are currently no Off-Post Parcels
associated with Woodbridge Research Facility.
Future changes will be reflected here.**

EXPLANATION

Off-Post Properties

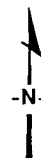


Figure 1-4

Tenant Units. Table 1-7 lists the significant non-component organizations on the installation that were identified from installation real property records. As of 24 February 1994, there were approximately 90 civilian and military employees located at the WRF. Twenty-five of these employees are located on-site in Building 201 as a tenant, working for an administrative organization named "Project Manager, Soldier," that is not a part of USARL. All remaining on-site employees are members of the USARL organization.

TABLE 1-7. ON-POST TENANT UNITS

Tenant	Building
Project Manager, Soldier	201

CHAPTER 2

► PROPERTY DISPOSAL AND REUSE PLAN ◀

This chapter presents the status and strategy for real property disposal. Discussion is included concerning the relationship between environmental cleanup efforts and disposal efforts. The three major components of disposal planning are development of the NEPA EIS, the community reuse plan, and the disposal plan. This section identifies the reuse parcel configuration and the proposed reuse activity for each parcel, which is currently under development for the WRF.

2.1 Status of Disposal Planning Process

The disposal of the WRF involves three interrelated activities: the NEPA EIS process, development of a disposal plan, and development of a community reuse plan. None of these processes and plans are complete as of 24 February 1994. The NEPA EIS process is underway, but is presently in an "on hold" status pending the establishment of a community reuse plan and the resolution of certain technical concerns. Work has not yet begun on the development of a disposal plan. An ad hoc committee of citizens was officially sanctioned by the Prince William County Board of Supervisors in February 1994. The committee is known collectively as the "Woodbridge Reuse Committee." As of 28 February 1994, the reuse committee was actively engaged in the process of obtaining BRAC funding and selecting a consultant to assist in the development of a comprehensive community reuse plan.

As of 24 February 1994, no final decisions have been made concerning the reuse of the WRF following closure in September 1994.

Draft legislation was introduced in Congress in 1993 which, if enacted, would have required the transfer of the entire facility to the USFWS. However, this draft legislation was not finalized, and accordingly was not enacted into law.

The Woodbridge Reuse Committee has yet to select a preferred reuse alternative. As mentioned in Chapter 1, approximately 477 acres of the WRF are categorized as "environmentally-sensitive." The balance of the installation, approximately 102 acres, is available for economic redevelopment. The Reuse Committee may select a preferred reuse option which calls for the private sale and development of some or all of this acreage. Alternatively, the Reuse Committee may decide that the preferred use of the installation is as a wildlife sanctuary, either with or without intensive public access. Regardless of the number of acres that are ultimately selected for wildlife sanctuary purposes, the possibility exists that the Commonwealth of Virginia Fish and Game Commission rather than the USFWS could administer the environmentally-sensitive portion of the WRF.

Regardless of the outcome of the reuse decision-making processes that are underway, the real property transfer process will be administered by the USACE, Baltimore District.

Pending final reuse decisions, the BCT has developed a likely reuse scenario to assist in the development of the BCP. The scenario assumes the transfer of approximately 70 non-environmentally-sensitive acres to the private sector by deed, with the balance (approximately 509 acres) to be transferred to another Federal agency for addition to the Marumsco National Wildlife Refuge. The 70 acres to be transferred to the private sector are divided into two redevelopment parcels as illustrated in Figure 2-1. This hypothetical scenario was selected to serve as a basis for the development of this Plan. This BCP will be modified appropriately when the Congress and the Woodbridge Reuse Committee have announced decisions that will affect the actual reuse of the WRF.

2.2 Relationship to Environmental Programs

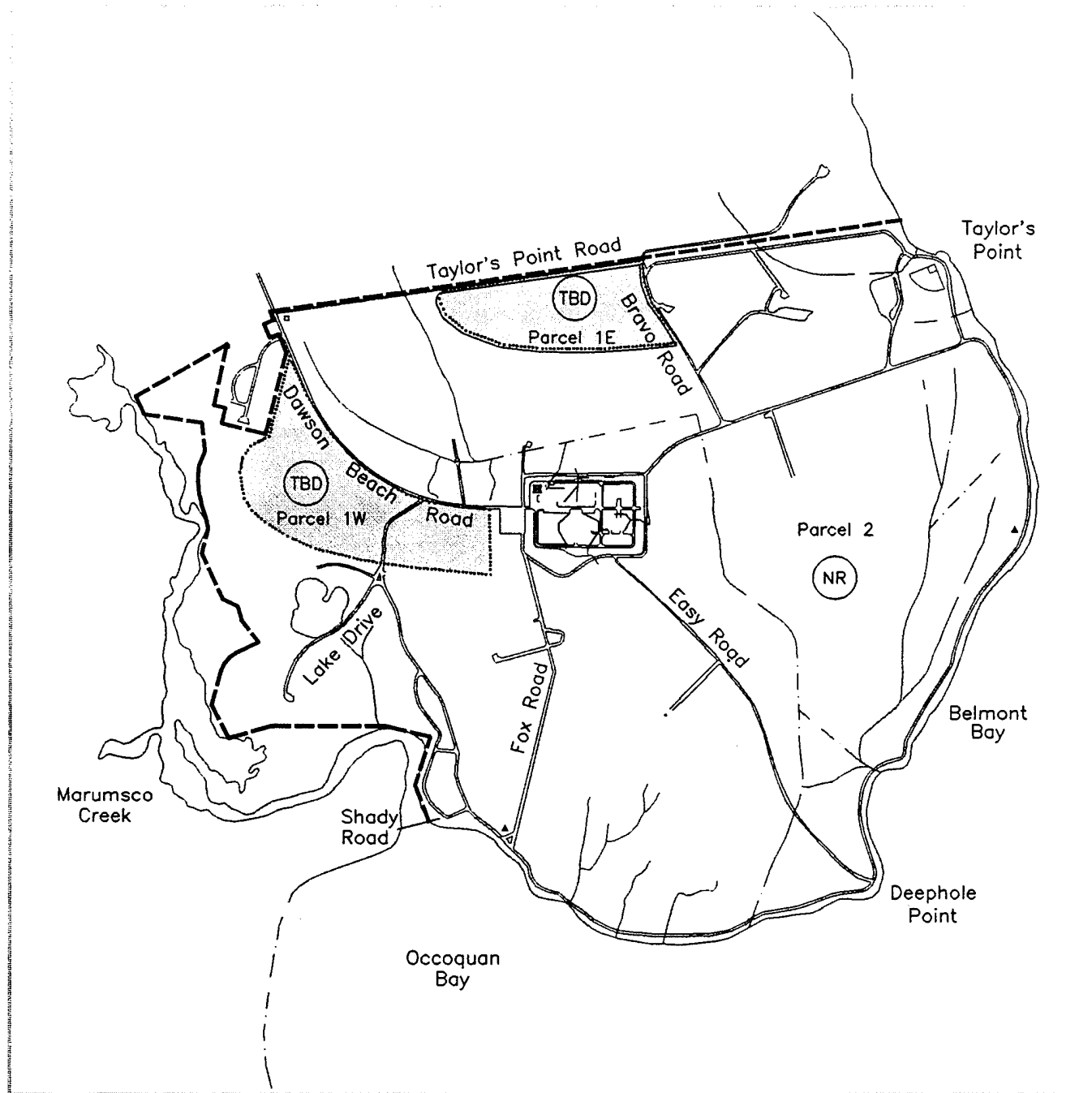
Disposal and reuse activities at the WRF are intimately linked to environmental investigations, restoration, and compliance activities for two basic reasons:

- ▶ Federal property transfers to nonfederal parties are governed by CERCLA Section 120(h)(3)(B)(i).
- ▶ Residual contamination may remain on certain properties after RAs have been completed or put into place, thereby restricting the future use of those properties.

CERCLA Section 120(h)(3)(B)(i) requires deeds for federal transfer of previously-contaminated property to contain a covenant that all RAs necessary to protect human health and the environment have been taken. All RA has been taken if the construction and installation of an approved remedial design has been completed, and the remedy has been demonstrated to the Administrator to be operating properly and successfully. It further states that the completion of long-term pumping and treating, or operation and maintenance, after the remedy has been demonstrated to the State Regulatory Agency or USEPA to be operating properly and successfully does not preclude the transfer of the property. Thus, any required remedial and/or removal response actions must be selected and implemented for such contaminated properties before transfer to private parties can occur. CERCLA also requires that deeds for property on which a hazardous substance was stored for more than one year, released or disposed, include information on the type, quantity, and the time at which the storage or release occurred.

The requirement for complying with CERCLA Section 120(h) and the possibility of residual contamination are factored into the property disposal and reuse process at the WRF. Table 2-1 takes these two factors into consideration, presents summary information on Parcels 1E, 1W, and 2, and provides an approximate timetable for transfer by deed of each parcel at the WRF.

The strategy and schedule developed by the WRF BCT herein is designed to streamline and expedite the necessary response actions associated with Parcels 1E, 1W, and 2 in order to facilitate the earliest possible disposal and reuse activities. Because of the need to delineate between areas suitable for transfer and those which are not, the BCT has developed an environmental-condition-of-property map for the WRF (see text and figures in Chapter 3.4) using data from the Community Environmental Response Facility Act (CERFA) investigation of the installation. This environmental-condition-of-property map allows the visualization of potentially contaminated areas and areas of no suspected contamination, and the relationship of these areas to disposal and reuse parcels.



EXPLANATION

- TBD To Be Determined
- NR Natural Resources Conservation
- Installation Boundary

**Disposal
and
Reuse
Parcels**



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FEET

Figure 2-1

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TABLE 2-1. REUSE PARCEL DATA SUMMARY

Reuse Parcel	Acres	Priority	Description and Proposed Reuse	Known Sites	Projected Transfer Date	Transfer Mechanism	Recipient
1E	20	High	TBD	AREE 25	TBD	TBD	TBD
1W	50	High	TBD	AREEs 25, 30	TBD	TBD	TBD
2	509	Medium	Wildlife Refuge	AREEs 1, 2, 3, 4, 5, 6A, 6B, 7, 8, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 30, 32	TBD	Federal Property Transfer	Other Federal Agency

Key: AREE - Areas Requiring Environmental Evaluation
 TBD - To Be Determined

CERFA established stringent requirements to designate a parcel as a CERFA "clean" parcel. At most installations a substantial number of acres while not classified as CERFA "clean" present no threat to human health and the environment and will be available for transfer.

2.3 Property Transfer Methods

Various mechanisms are available for disposal of DoD property. Each of the options below will be considered when developing the community reuse plan. The NEPA EIS will evaluate reuses consistent with the requirements of the potential transfer methods for the WRF. The CERFA investigation results and reuse parcel designation are also major components for determining the selected disposal mechanism.

As identified in Section 2.1, the reuse scenario developed assumes the transfer of approximately 70 acres to the private sector by deed with the remaining 509 acres transferred to another Federal agency. If 70 acres are, in fact, to be transferred by deed to the private sector, the mechanism of sale may occur as a no-cost public benefit conveyance, negotiated sale, or competitive public sale. Similar to the inter-agency transfer process, the real property transfer-by-deed process will be handled by the USACE, Baltimore District.

2.3.1 Federal Transfer of Property

As mentioned previously, 509 acres are proposed to be transferred to another Federal Agency as an addition to the Marumsc National Wildlife Refuge. The process of and requirements for transfer of property from one federal agency to another differ substantially from a transfer of property by deed to the private sector. Most significantly, there is no requirement that all RA be taken prior to an inter-agency transfer of ownership.

The inter-agency transfer process involves an inter-agency agreement (IAG) between the disposing and receiving agencies. Some of the terms in the IAG that must be agreed to are the date of the transfer and the environmental condition of the property as of that date, the scope of the environmental remediation that is yet to be performed, and a schedule for the actual remediation activities. It may also be necessary to negotiate access agreements so that the disposing agency (i.e., USARL) can continue remediation activities following actual transfer of

ownership. Additionally, the terms of the IAG must include language to facilitate the continuing access of the USEPA and State regulators following transfer of ownership.

As previously mentioned, the real estate transfer process, including the negotiation of the terms of the IAG, will be coordinated by the USACE, Baltimore District. Presuming that the two agencies come to an agreement in terms, U.S. Army approval of the inter-agency transfer will come from the office of the Assistant Deputy Secretary of the U.S. Army for Installations, Logistics, and Environment, presently headed by Mr. Paul Johnson.

2.3.2 No-Cost Public Benefit Conveyance

There is no indication at this time that a no-cost public benefit conveyance would take place at the WRF.

2.3.3 Negotiated Sale

There is no indication at this time that a negotiated sale would take place at the WRF.

2.3.4 Competitive Public Sale

There is no indication at this time that a competitive public sale would take place at the WRF.

2.3.5 Widening of Public Highways [Easements]

There is no indication at this time that any property will be transferred for the widening of public highways.

2.3.6 Donated Property

There is no indication at this time that any property will be donated.

2.3.7 Interim Leases

There are no leaseholdings at the WRF. Consequently, there are no leases that will have to be modified or terminated as a result of the impending closure. If any legal agreements or interim leases were to exist, they would be identified in Table 2-2. Table 2-2 has been included for informational purposes only.

TABLE 2-2. EXISTING LEGAL AGREEMENTS/INTERIM LEASES

Title Interim Lease/Legal Agreement	Building No./Areas	Date of Agreement	Reuse Parcel
	There are no legal agreements/interim leases at the WRF.		

2.3.8 Other Property Transfer Methods

There are no other property transfer methods identified at this time.

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CHAPTER 3

► BASE-WIDE ENVIRONMENTAL PROGRAM STATUS ◀

This chapter provides a summary of the current status of environmental restoration projects and ongoing compliance activities at the WRF. It also summarizes the status of cultural and natural resources programs at the installation, the environmental condition and suitability for transfer of the installation property, and community involvement to date.

Table 3-1 lists 35 AREEs that were identified in the March 1992 Enhanced Preliminary Assessment (EnPA), the 8 October 1993 CERFA report, and during the BCP "Bottom Up Program Review" subsequent to the CERFA report. Twenty-nine of the 35 AREEs were identified in the EnPA with 21 of these considered environmental restoration projects, six considered compliance activities, and two considered as NFRAP. The CERFA report identified two additional AREEs, one of which will be handled under environmental restoration and the other will be handled as a compliance activity. The final four AREEs were identified during the BCP "Bottom Up Program Review" with one considered an environmental restoration project, two considered compliance activities and one considered as NFRAP. In total, 23 AREEs will be addressed as environmental restoration projects, nine AREEs will be addressed as compliance activities and three AREEs discussed as NFRAP.

3.1 Environmental Program Status

Table 3-2 lists the 23 restoration sites currently being investigated. Table 3-2 also lists the study area (consisting of zone/parcel location designation for each AREE) and may be cross-referenced to the reuse map presented in Figure 2-1. The following sections include a brief history of the IRP as it applies to the installation, the current status of restoration projects, and the installation-wide source discovery and assessment status.

Table 3-2 also provides the Army Restoration Management Information System (RMIS) site identifier for each of the restoration sites. The current database information was reviewed as of March 1994. The newly discovered AREEs for the WRF require review by the BCT to determine which, if any, additional sites should be included. Currently the RMIS database contains 28 sites for the WRF. These sites include all AREEs identified in the EnPA except radon (AREE 28) with all sites listed as non-National Priority List (NPL), IRP sites. Updating the RMIS database is identified as an action item for the BCT and is discussed further in Section 6.2 of this BCP.

3.1.1 Restoration Sites

The IRP effort at the WRF was initiated in 1991 and has continued to the present. Investigations at some sites date back to the early 1980s. Table 3-2 includes the 23 restoration sites that are

TABLE 3-1. PRELIMINARY LOCATION SUMMARY

AREE Number	Description	Environmental Investigation Report Results/Findings			Final Determination
		PA	SI	Findings	
1	Landfill No. 1	✓	✓	PA recommended SI; SI recommended RI.	RI to be completed.
2	Landfill No. 2	✓	✓	PA recommended SI; SI recommended RI.	RI to be completed.
3	Landfill No. 3	✓	✓	PA recommended SI; SI recommended RI.	RI to be completed.
4	Landfill No. 4	✓	✓	PA recommended SI; SI recommended RI.	RI to be completed.
5	Landfill No. 5	✓	✓	PA recommended SI; SI recommended RI.	RI to be completed.
6A	Landfill No. 6A	✓	✓	PA recommended SI; SI recommended RI.	RI to be completed.
6B	Potential Landfill No. 6B	✓	✓	PA recommended SI; SI recommended NFRAP.	NFRAP
7	Pistol Range	✓	✓	PA recommended SI; SI recommended SSI.	SSI to be completed.
8	UST Leaks/Spills	✓	✓	PA recommended SI; SI recommended VDEQ response action.	VDEQ response action to be completed.
9	Salt Contamination at Test Area	✓		PA recommended NFRAP.	NFRAP
10	Maintenance Shop (Building 202)	✓		PA recommended NFRAP.	NFRAP
11	Oil/Water Separator (Building 202)	✓	✓	PA recommended SI; SI recommended RI.	RI to be completed.
12	Drum Storage Area (Building 202)	✓	✓	PA recommended SI; SI recommended SSI.	SSI to be completed.
13	Acid Neutralization Tank (Building 211)	✓	✓	PA recommended SI; SI recommended SSI.	SSI to be completed.
14	Oil/Water Separator (Building 211)	✓	✓	PA recommended SI; SI recommended RI.	RI to be completed.
15	PCB Transformer	✓		PA recommended non-CERCLA response by USARL; transformer was removed and replaced in December 1992 along with all associated contaminated concrete and soil.	NFRAP

TABLE 3-1. PRELIMINARY LOCATION SUMMARY

Continued

AREE Number	Description	Environmental Investigation Report Results/Findings			Final Determination
		PA	SI	Findings	
16	Asbestos	✓		PA recommended non-CERCLA response by USARL.	USAEC asbestos location survey to be completed.
17	Petroleum Spill Area	✓	✓	PA recommended NFRAP; SI performed for AREE No. 11 included this AREE.	RI to be completed.
18	Flammable/Battery Storage (Building 204)	✓	✓	PA recommended SI; SI recommended NFRAP.	NFRAP
19	Thermal Battery Storage	✓	✓	PA recommended SI; SI recommended NFRAP.	NFRAP
20	Former Incinerator	✓	✓	PA recommended SI; SI recommended SSI.	SSI to be completed.
21	Former Storage Area (Building 211)	✓	✓	PA recommended SI; SI recommended SSI.	SSI to be completed.
22	Drainage Ditch	✓	✓	PA recommended SI; SI recommended RI.	RI to be completed.
23	Former USTs	✓	✓	PA recommended SI; SI recommended VDEQ response action.	VDEQ response action to be completed.
24	Existing USTs	✓		PA recommended non-CERCLA response by USARL.	VDEQ response action to be completed.
25	Sewage Injection Areas	✓	✓	PA recommended SI; SI recommended SSI.	SSI to be completed.
26	Ethylene Glycol Area	✓	✓	PA recommended SI; SI recommended SSI.	SSI to be completed.
27	Buried Wire	✓	✓	PA recommended SI; SI recommendation NFRAP.	NFRAP
28	Radon	✓		PA recommended non-CERCLA response by USARL; radon survey completed in 1993.	NFRAP
30	Hydraulic Oil Spill			AREE identified in 8 October 1993 CERFA report.	VDEQ response action to be completed.
31	Low-Level Radioactive Material			AREE identified after 8 October 1993 CERFA report.	NFRAP

TABLE 3-1. PRELIMINARY LOCATION SUMMARY

Continued

AREE Number	Description	Environmental Investigation Report Results/Findings			Final Determination
		PA	SI	Findings	
32	Lead Paint			AREE identified after 8 October 1993 CERFA report.	USAEC lead-based paint survey to be completed.
33	Bulldozer Fuel Spills	✓		PA recommended NFRAP.	VDEQ response action to be completed.
34	Hunter Qualification Target Range			AREE identified after 8 October 1993 CERFA report.	SSI to be completed.

Key:

- PA = Preliminary Assessment
- SI = Site Inspection
- SSI = Supplemental Site Inspection
- RI = Remedial Investigation
- VDEQ = Virginia Department of Environmental Quality
- NFRAP = No Further Remedial Action Planned
- CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
- USARL = U.S. Army Research Laboratory
- CERFA = Community Environmental Response Facilitation Act
- AREE = Area Requiring Environmental Evaluation
- USAEC = U.S. Army Environmental Center

TABLE 3-2. ENVIRONMENTAL RESTORATION SITE/STUDY AREA SUMMARY

Study Area OU (Zone/Reuse Parcel)	Site	RMIS No.	Site Class	Description	Material Disposed Of	Date of Operation	Status	Risk to Human Health and the Environment*	Regulatory Mechanism	NFRAP
OU 1 (Parcel 2)	AREE 1	WBRF-01	TBD	Landfill No. 1	Metal, wire, concrete, wood, rubber tires, possible electrical capacitors	1950s-1973	RI	TBD	Non-FFA CERCLA	
OU 1 (Parcel 2)	AREE 2	WBRF-02	TBD	Landfill No. 2	Metal debris, wire, wood, misc. refuse, capacitors and transformers containing PCBs	1970-1973	RI	TBD	Non-FFA CERCLA	
OU 1 (Parcel 2)	AREE 3	WBRF-03	TBD	Landfill No. 3	Lead-containing wire, paper, plastic, wood	1960s-1973	RI	TBD	Non-FFA CERCLA	
OU 1 (Parcel 2)	AREE 4	WBRF-04	TBD	Landfill No. 4	Wire, trash, empty oil drums	1950s-1973	RI	TBD	Non-FFA CERCLA	
OU 1 (Parcel 2)	AREE 5	WBRF-05	TBD	Landfill No. 5	Metal debris	1950s-1960s	RI	TBD	Non-FFA CERCLA	
OU 1 (Parcel 2)	AREE 6A	WBRF-06	TBD	Landfill No. 6A	Metal debris	1960s-1970s	RI	TBD	Non-FFA CERCLA	
(Parcel 2)	AREE 6B	WBRF-07	TBD	Potential Landfill No. 6B	Metal debris	1960s-1970s	NFRAP	N/A	Non-FFA CERCLA	x
(Parcel 2)	AREE 7	WBRF-08	TBD	Pistol Range	Spent rounds	1970s-1982	SSI	TBD	Non-FFA CERCLA	
OU 2 (Parcel 2)	AREE 11	WBRF-12	TBD	Oil/Water Separator (Building 202)	Waste oil, paints, cleaning solvents, antifreeze, brake fluid, and possible transformers and capacitors.	mid-1970s-1990	RI	TBD	Non-FFA CERCLA	
(Parcel 2)	AREE 12	WBRF-13	TBD	Drum Storage Area (Building 202)	Waste oil, paints, cleaning solvents, antifreeze, brake fluid, and possible transformers and capacitors.	1950s-present	SSI	TBD	Non-FFA CERCLA	
(Parcel 2)	AREE 13	WBRF-14	TBD	Acid Neutralization Tank	Battery acid	1979-present	SSI	TBD	Non-FFA CERCLA	
OU 3 (Parcel 2)	AREE 14	WBRF-15	TBD	Oil/Water Separator (Building 211)	Waste oil, paints, cleaning solvents, antifreeze, brake fluid, and possible transformers and capacitors.	1979-present	RI	TBD	Non-FFA CERCLA	

TABLE 3-2. ENVIRONMENTAL RESTORATION SITE/STUDY AREA SUMMARY

Continued

Study Area OU (Zone/Reuse Parcel)	Site	RMIS No.	Site Class	Description	Material Disposed Of	Date of Operation	Status	Risk to Human Health and the Environment*	Regulatory Mechanism	NFRAP
OU 2 (Parcel 2)	AREE 17	WBRF-18	TBD	Petroleum Spill Areas	Petroleum products	1989	RI	TBD	Non-FFA CERCLA	
(Parcel 2)	AREE 18	WBRF-19	TBD	Flammable/ Battery Storage Building	Flammable materials, battery acid	mid-1960s-1993	NFRAP	N/A	Non-FFA CERCLA	X
(Parcel 2)	AREE 19	WBRF-20	TBD	Thermal Battery Storage	Thermal Battery Components	mid-1960s-1993	NFRAP	N/A	Non-FFA CERCLA	X
(Parcel 2)	AREE 20	WBRF-21	TBD	Former Incinerator	Paper	1950s-1972	SSI	TBD	Non-FFA CERCLA	
(Parcel 2)	AREE 21	WBRF-22	TBD	Former Storage Area (Building 211)	Waste oil, paints, cleaning solvents, antifreeze, brake fluid, and possible transformers and capacitors.	1962-1975	SSI	TBD	Non-FFA CERCLA	
OU 2 (Parcel 2)	AREE 22	WBRF-23	TBD	Drainage Ditch	Petroleum Products	1960s	RI	TBD	Non-FFA CERCLA	
(Parcels 1E, 1W, 2)	AREE 25	WBRF-26	TBD	Sewage Injection Areas	Metals	1974	SSI	TBD	Non-FFA CERCLA	
(Parcel 2)	AREE 26	WBRF-27	TBD	Ethylene Glycol Area	Ethylene Glycol	Unknown	SSI	TBD	Non-FFA CERCLA	
(Parcel 2)	AREE 27	WBRF-28	TBD	Buried Wire	Wire	1950s-1970	NFRAP	N/A	Non-FFA CERCLA	X
(Parcel 2)	AREE 29	TBD	TBD	VEPCO Transformer Spill	PCBs	1984	SSI	TBD	Non-FFA CERCLA	
(Parcel 2)	AREE 34	TBD	TBD	Hunter Qualification Target Range	Spent rounds	1992-present	SSI	TBD	Non-FFA CERCLA	

Key: OU = Operable Unit
TBD = To Be Determined
RI = Remedial Investigation
SSI = Supplemental Site Inspection
Non-FFA = Non-Federal Facility Agreement
RMIS = Army Restoration Management Information System
AREE = Area Requiring Environmental Evaluation
NFRAP = No Further Response Action Planned
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act

being investigated under the IRP. All of the 23 restoration sites are located on the WRF. As of 24 February 1994, no restoration sites have been fully remediated and no DDs or Records of Decisions (RODs) for which an RA was selected have been prepared.

An EnPA was prepared by a contractor, under contract to the U.S. Army Toxic and Hazardous Materials Agency. The contractor observed the environmental conditions at the WRF during the period 18 through 20 September 1991. Past site conditions and management practices were evaluated, based on readily-available records and the recollections of employees interviewed. No environmental sampling was conducted. Weston generated a report dated March 1992, entitled "Enhanced Preliminary Assessment, Woodbridge Research Facility, Virginia".

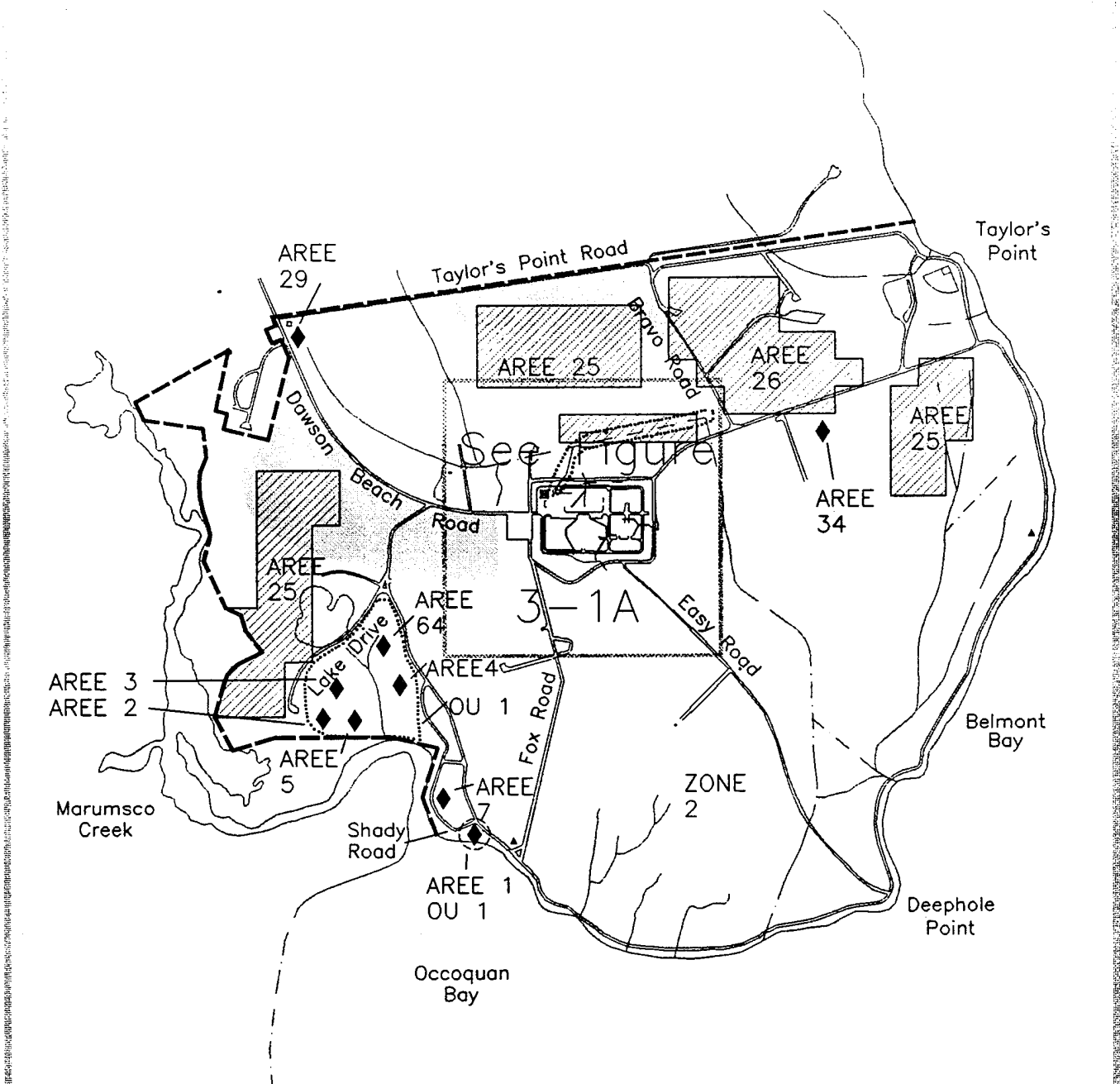
The EnPA report identified 29 AREEs and made recommendations for followup investigations (including sampling) at 22 of the 29 AREEs. One of the 22 sites included investigations at former USTs which are not considered part of the IRP but is discussed under compliance programs. The CERFA report identified two additional AREEs, one of which (AREE 29) is being investigated under the IRP. Four additional AREEs were also created by the BCT, one of which (AREE 34) is being investigated under the IRP. Table 3-2 presents the 23 restoration sites, with a brief description of suspected materials associated with each site plus an indication of site status. Figure 3-1 presents a map of the WRF, which illustrates the location of each site currently under investigation. A synopsis descriptive history of each site is provided as part of Appendix E.

During September and October 1993, a contractor to the USAEC, conducted a physical sampling exercise at the 21 restoration sites identified in the EnPA. This phase of the CERCLA restoration process is known as the Site Inspection, or SI. The purpose of a SI is to determine whether or not a site is contaminated. Definition of the extent of contamination, if warranted, is performed during the next phase of the CERCLA restoration process, the RI.

During the SI, contamination was found at 17 of the 21 sites investigated, although not necessarily at levels that warrant further action. Findings of the SI are presented in Table 3-1, along with final determinations for these sites. A more exhaustive discussion of the findings at each site is presented as part of Appendix E.

A major element in the WRF environmental restoration process is the execution of early actions including the implementation of immediate removal actions to eliminate "hot spots" while investigations continue. These early actions provide the means of removing contamination sources and reducing risks posed by releases while at the same time providing critical data for the development of comprehensive conceptual models of sources, migration pathways, and receptors. Early actions can also accelerate the availability of property for economic development. Restoration site early actions at the WRF include activities at AREE 1 and AREE 2 and are summarized in Table 3-3.

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Note: Entire Installation is designated Zone 2

EXPLANATION

-  Zone
-  Non Site Specific AREE
-  Site Specific AREE
-  OUs
-  OU & Site (AREE)
-  Installation Boundary

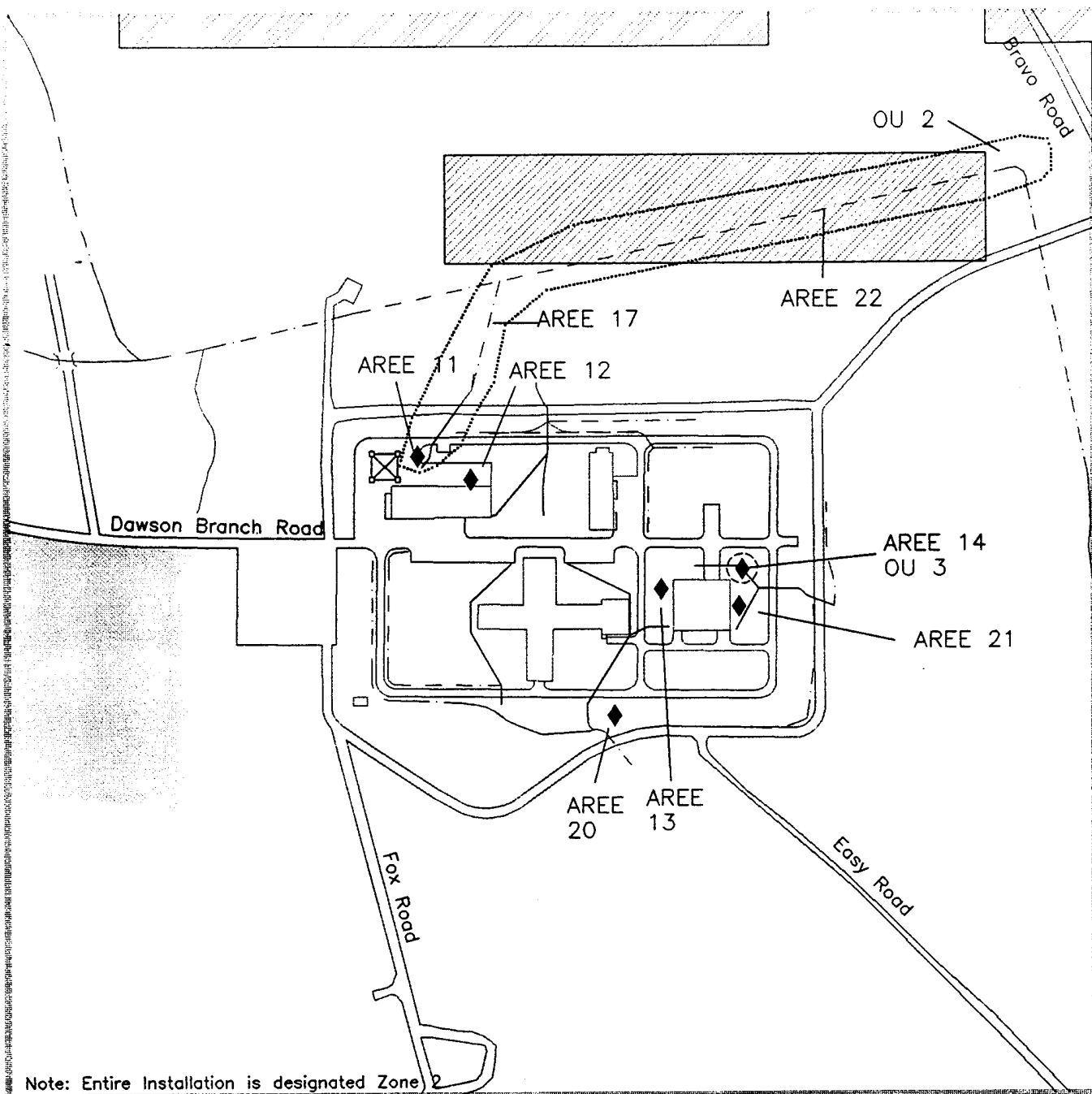
**Sites, Zones
and OUs
Currently Under
Investigation**



0 600 1200
FEET

Figure 3-1

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EXPLANATION

-  Zone
-  Non Site Specific AREE
-  Site Specific AREE
-  OUs
-  OU & Site (AREE)
-  Installation Boundary

**Sites, Zones
and OUs
Currently Under
Investigation**

0 150 300
FEET

Figure 3-1A

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TABLE 3-3. ENVIRONMENTAL RESTORATION EARLY ACTION STATUS

Site	Action	Purpose	Status
AREE 1	RI and 4 year groundwater sampling program	Determine the presence of any PCB contamination.	RI
AREE 2	Remedial Investigation/ Feasibility Study (RI/FS), removal action, and 5 year groundwater sampling program	Removal and offsite disposal of electrical equipment and PCB-contaminated soil.	RI

At AREE 1, a RI was completed for the landfill between January and May of 1984. The study showed that PCBs were detected at low concentrations in sediment samples taken from the landfill but not detected in surface water samples. In addition, bis(2-ethylhexyl)phthalate and di-n-octyl phthalate were detected in a surface water sample collected at the site. As a result of the RI, six monitoring wells were installed at the site between January and February of 1985. A groundwater sampling program to monitor for PCB contamination was implemented at AREE 1; samples were collected over a 4-year period between 1987 and 1990. As part of the EnPA, a review of the analytical data from the groundwater sampling program was conducted, and no detectable concentrations of PCBs were found in any of the groundwater samples collected. Also during the EnPA site reconnaissance, additional materials were identified at the landfill including potential asbestos-containing material. The Virginia Water Control Board also collected surface runoff samples at this landfill in March 1993 with PCBs detected at a level of 15 parts per billion. An additional RI is currently underway to further assess all contamination at this site.

A RI/FS was also completed for the landfill associated with AREE 2 between January and May 1984. Six groundwater monitoring wells were installed as part of the RI. The investigation identified PCB contamination within the landfill site; however, no PCBs were detected outside the landfill area. The RI concluded that PCBs had not migrated from within the disposal area and the FS recommended removal and offsite disposal of contaminated material. The removal and offsite disposal of contaminated material was completed in 1985. Six transformers and 85 capacitors were recovered, and PCB-contaminated soil was excavated until the soil remaining in the excavation tested as clean of PCBs. The transformers, other debris, and soil were disposed at a hazardous materials landfill in New York. The groundwater samples collected for the RI completed in 1984 did not contain detectable concentrations of PCBs. A five year groundwater sampling program was implemented from 1985 to 1990 to monitor for PCB contamination. The PCB concentrations have been increasing annually with concentrations up to 7 micrograms per liter detected in samples from two monitoring wells in 1990. An additional RI is currently underway to further assess the contamination at this site.

3.1.2 Base-Wide Source Discovery and Assessment Status

During August and September 1993, a contractor to the USAEC, conducted on-site visits, personal interviews, and an extensive search of historical records at the WRF. This task was performed pursuant to CERFA with the results of the investigation described below.

The purpose of CERFA is to identify clean portions of closing military installations for speedy transfer to the private sector for economic redevelopment. The draft report dated 8 October 1993, entitled "Supplementary Preliminary Assessment, Community Environmental Response Facilitation Act (CERFA PA)" has been reviewed by USEPA Region III and by the VDEQ. USEPA, Region III had no comments on the draft report; however, VDEQ did have comments and the U.S. Army is in the process of satisfying VDEQ's comments.

In addition to the 29 AREEs identified by the EnPA, the CERFA report identified two new AREEs that will also be evaluated. These new areas have been identified as AREE 29 and AREE 30, respectively, and are shown in Table 3-1. AREE 29 consists of a spill from what is thought to be a PCB-contaminated power distribution transformer. The VDEQ member of the BCT suggested that confirmation sampling be conducted to confirm that the area has been adequately remediated. The BCT has determined to include this AREE in the IRP process with further characterization to be completed during the SSI. AREE 30 consists of a hydraulic oil spill. Investigation of AREE 30 has been grouped together with the other AREEs requiring VDEQ response action. More details of these AREEs are provided as part of Appendix E.

In addition to the already identified AREEs, four new AREEs were identified by the BCT subsequent to the CERFA report. The first was identified in October 1993 when the BEC for the WRF was made aware of another area of potential concern. It was learned that low-level sealed radioactive source material has been utilized for research and development purposes at the WRF since the 1980's, and that some of these remain in active use at the present time. There is no evidence that any of these sealed sources were ever damaged or ruptured. This concern was first discussed at the on-site meeting of the BCT that occurred on 10 November 1993. The installation identified the nature and number of radioactive sources that remain at the WRF, as well as the fate of the radioactive sources that were removed from the WRF in 1992. NFRAP is planned; however, for tracking purposes only, this matter will be identified as AREE 31. This AREE is shown in Table 3-1 with a description provided as part of Appendix E.

Three additional AREEs were created for administrative purposes in January 1994, as discussed below.

AREE 32, Lead-based Paint. Lead-based paint contamination is neither a CERCLA nor an IRP concern, although it remains a concern to those involved in the property transfer process. Once a lead-based paint survey has been performed at the WRF, an appropriate response will be selected by the BCT.

AREE 33, Bulldozer Fuel Spills. AREE 17, Petroleum Spill Areas, originally encompassed two spill areas at different locations at the facility. One of these areas is the contaminated ditch located down-gradient of the oil/water separator on the north side of Building 202, which remains the sole component of AREE 17, and which will be studied during the CERCLA RI in conjunction with AREEs 11 and 22. The second portion of AREE 17 was the location of two bulldozer fuel spills that occurred in January 1990. For administrative purposes only, this concern has been re-identified as AREE 33.

AREE 34, Hunter Qualification Target Range. During a site visit that occurred at the WRF on 10 November 1993, the VDEQ member of the BCT suggested that the hunter qualification target range be identified as an AREE due to possible contamination from spent rounds. The BCT has determined to include AREE 34 in the IRP process. The AREE will be further characterized during the SSI.

These three additional AREEs are also provided in Table 3-1. Brief descriptions of these AREEs are provided as part of Appendix E.

3.2 Compliance Program Status

Compliance activities at the WRF are being conducted in coordination with environmental restoration activities under the IRP. Compliance activities address storage tanks, hazardous materials management, asbestos, radon, PCBs, water discharges, and lead-based paint.

Compliance actions at the installation can be broken into two separate categories, current mission and operational-related compliance projects and closure-related compliance projects. Mission and operational-related projects are those which have been or would be conducted for the normal operation of the installation and are unrelated to activities necessitated by installation closure under BRAC. Conversely, closure-related compliance projects are those conducted specifically as a result of environmental compliance and restoration activities related to BRAC closure and property disposal. The various environmental projects at the WRF are identified by category in Tables 3-4 and 3-5.

TABLE 3-4. MISSION/OPERATIONAL-RELATED COMPLIANCE PROJECTS

Project	Status	Regulatory Program
UST Tightness Testing	Four existing USTs will require tightness testing	Virginia UST Regulations

A number of early actions have been conducted as part of the WRF compliance program to remove contamination sources and reduce risk posed by releases or potential releases at the installation. These early actions are identified in Table 3-6.

TABLE 3-5. CLOSURE-RELATED COMPLIANCE PROJECTS

Project	Status	Regulatory Program
Storage Tanks	UST leaks/spills associated with AREE 8 to be investigated via a VDEQ response action. 6 former USTs associated with AREE 23 to be investigated via a VDEQ response action. 6 existing USTs associated with AREE 24 to be investigated via a VDEQ response action. 1 AST in service (NFRAP). Hydraulic oil spill associated with AREE 30 to be investigated via a VDEQ response action. Bulldozer fuel spill associated with AREE 33 to be investigated via a VDEQ response action.	Virginia UST regulations
Hazardous Materials/Waste Management	WRF is considered a small quantity generator. Does not possess a permitted hazardous waste storage facility. Hazardous wastes collected at satellite accumulation points. Hazardous wastes disposed of through Fort Belvoir DRMO.	RCRA, Virginia Hazardous Waste Management Regulations, and U.S. Army Regulations
Solid Waste	Solid waste generated is transported offsite for disposal at a local landfill.	RCRA, Virginia Solid Waste Management Regulations, and U.S. Army Regulations
PCBs	Only one PCB transformer at WRF since 1970s was removed and replaced in December 1992 along with all contaminated concrete and soil. Identified as AREE 15 (NFRAP). Action at the VEPCO transformer spill associated with AREE 29 is to be investigated under the IRP process.	TSCA, USEPA policy
Asbestos	Management of asbestos as identified under AREE 16 to be addressed via an USAEC asbestos survey.	DOA Regulation 200-1 and U.S. Army Policy Memorandum "Lead-Based Paint and Asbestos in U.S. Army Properties Affected by Base Closure and Realignment," 15 November 1993
Radon	Radon survey completed in 1993. All results below USEPA action level of 4 picocuries/liters (NFRAP).	DOA Regulation 200-1
SWMUs	No SWMUs identified at WRF.	N/A
NPDES Permits	No NPDES permits in effect at WRF.	N/A
Oil/Water Separators	Both oil/water separators to be investigated under the IRP process.	CERCLA
NRC Licensing	No NRC licensing in effect at WRF.	N/A

TABLE 3-5. CLOSURE-RELATED COMPLIANCE PROJECTS**Continued**

Project	Status	Regulatory Program
Pollution Prevention	No pollution prevention measures in effect at WRF.	N/A
Mixed Waste	No known mixed wastes at WRF.	N/A
Radiation	The low-level sealed radioactive source material identified under AREE 31 has been removed (NFRAP).	N/A
Lead-based Paint	Management of lead-based paint as identified under AREE 32 to be addressed via an USAEC lead-based paint survey.	U.S. Army Policy Memorandum "Lead-Based Paint and Asbestos in U.S. Army Properties Affected by Base Closure and Realignment," 15 November 1993

TABLE 3-6. COMPLIANCE EARLY ACTION STATUS

Site No.	Site Type	Action	Purpose	Status
AREE 23	UST U-101-1	UST Removed	Remove potential contaminant source (tank failed tightness test on 7 January 1991)	To be investigated via a VDEQ response action.
AREE 8	UST U-202-1	UST Removed	Remove potential contaminant source (tank failed tightness test on 17 November 1989)	To be investigated via a VDEQ response action.
AREE 8	UST U-202-2	UST Removed	Remove potential contaminant source (tank failed tightness test on 17 November 1989)	To be investigated via a VDEQ response action.
AREE 8	UST U-202-3	UST Removed	Remove potential contaminant source (tank not tightness tested)	To be investigated via a VDEQ response action.
AREE 23	UST U-202-4	UST Removed	UST upgrade	To be investigated via a VDEQ response action.
AREE 23	UST U-203-1	UST Removed	Unknown	To be investigated via a VDEQ response action.
AREE 24	UST U-202-5	Tightness Testing	Release Detection	UST passed tightness test in December 1993 and will require annual tightness testing for the tank.
AREE 24	UST U-202-6	Tightness Testing	Release Detection	UST passed tightness test in December 1993 and will require tightness testing for the tank every 5 years.
AREE 24	UST U-203-2	Tightness Testing	Release Detection	UST passed tightness test in December 1993 and will require annual tightness testing for the tank.
AREE 24	UST U-211-1	Tightness Testing	Release Detection	UST passed tightness test in December 1993.
AREE 24	UST U-306-1	Tightness Testing	Release Detection	UST passed tightness test in December 1993.
AREE 24	UST U-306-2	Tightness Testing	Release Detection	UST passed tightness test in December 1993 and will require annual tightness testing for the tank.
AREE 15	PCB Transformer	PCB transformer removed and replaced in December 1992 along with all contaminated concrete and soil.	Remove contaminant source	NFRAP.
AREE 28	Radon	Radon survey completed in 1993. All results below USEPA action level of 4 picocuries/liter.	Verify that radon is not an environmental concern at the WRF	NFRAP.

3.2.1 Storage Tanks

AST compliance programs at the WRF are conducted under DOA Regulation 200-1 and the federal and state requirements including 40 Code of Federal Regulation (CFR) Parts 110, 112, and 116 and the Commonwealth of Virginia State Water Control Law.

There is one in-service AST at the WRF. This tank is located on the east side of Building 101, and was placed in service as a replacement for a 1,000 gallon #2 fuel oil UST that was removed in 1991. This AST is described in Table 3-7. No other ASTs exist at the WRF other than small portable tanks that were used in support of field testing activities.

TABLE 3-7. AST INVENTORY

Location	Size/Contents	Status
Building 101	150-gallon/#2 fuel oil	Active

The USEPA has delegated the management of the UST program to the Commonwealth of Virginia. The Commonwealth of Virginia has primary enforcement responsibility and USEPA's approval effectively suspends the applicability of certain federal regulations in favor of the state program, thereby eliminating duplicative requirements. Therefore, UST closure and investigation activities at the WRF are being conducted under the Virginia UST program.

Available records indicate that there have been a total of 12 USTs installed on the property. Six of these have since been removed, and six UST's remain in service as of 7 February 1994. These USTs are described in Table 3-8. Note that some of these in-service USTs were installed as replacements for some of the now-removed tanks.

3.2.2 Hazardous Materials/Waste Management

Hazardous materials and waste compliance programs at the WRF are conducted under DOA Regulation 200-1, federal requirements found in 40 Code of Federal Regulation (CFR) 260 through 269, 40 CFR 117. 49 CFR 171 et seq., Department of Transportation (DOT) regulations, and Virginia Hazardous Waste Management Regulations (VR 672-10-1).

Hazardous waste generated at the WRF is routinely less than 100 kilograms per month. The WRF does not possess a permitted hazardous waste storage facility, since such a facility is unneeded. Rather, hazardous wastes at the WRF are collected at satellite accumulation points located as needed at various locations within the main compound buildings. Hazardous wastes have been and continue to be routinely disposed of through the Defense Reutilization and Marketing Office located at Fort Belvoir, Virginia.

TABLE 3-8. UST INVENTORY

Tank No.	Site No. Parcel	Location	Year Installed	Capacity (Gallon) Tank Material	Substance Stored	Status	Comments	Future Actions
U-101-1	AREE 23 Parcel 2	Building 101	1966	1,000-steel	#2 Fuel Oil	Removed	Year Removed 1991	To be investigated via a VDEQ response action.
U-202-1	AREE 8 Parcel 2	Building 202	1966	10,000-steel	#2 Fuel Oil	Removed	Year Removed 1990	To be investigated via a VDEQ response action.
U-202-2	AREE 8 Parcel 2	Building 202	1966	10,000-steel	#2 Fuel Oil	Removed	Year Removed 1990	To be investigated via a VDEQ response action.
U-202-3	AREE 8 Parcel 2	Building 202	Unknown	10,000-steel	Diesel Fuel	Removed	Year Removed 1981	To be investigated via a VDEQ response action.
U-202-4	AREE 23 Parcel 2	Building 202	Unknown	1,000-steel	Gasoline	Removed	Year Removed 1990	To be investigated via a VDEQ response action.
U-203-1	AREE 23 Parcel 2	Building 203	1966	2,000-steel	#2 Fuel Oil	Removed	Year Removed 1986 or 1987	To be investigated via a VDEQ response action.
U-202-5	AREE 24 Parcel 2	Building 202	1981	2,000-fiberglass	Diesel	Active	Passed tightness test December 1993	To be investigated via a VDEQ response action.
U-202-6	AREE 24 Parcel 2	Building 202	1990	1,000-fiberglass	Gasoline	Active	Passed tightness test December 1993	To be investigated via a VDEQ response action.
U-203-2	AREE 24 Parcel 2	Building 203	1966	10,000-steel	#2 Fuel Oil	Active	Passed tightness test December 1993	To be investigated via a VDEQ response action.
U-211-1	AREE 24 Parcel 2	Building 211	1976	1,500-steel	#2 Fuel Oil	Active	Passed tightness test December 1993	To be investigated via a VDEQ response action.
U-306-1	AREE 24 Parcel 2	Building 306	1976	300-steel	#2 Fuel Oil	Active	Passed tightness test December 1993	To be investigated via a VDEQ response action.
U-306-2	AREE 24 Parcel 2	Building 306	1976	300-steel	Diesel	Active	Passed tightness test December 1993	To be investigated via a VDEQ response action.

3.2.3 Solid Waste Management

Solid waste management compliance programs at the WRF are conducted under DOA Regulations 200-1 and 420-47, federal requirements found in 40 CFR 240-246 and 40 CFR 257-258, DOT regulations and Virginia Solid Waste Management Regulations (VR 672-20-10).

Solid waste generated at the WRF is currently transported off installation for disposal at a local landfill. All existing landfills at the WRF are currently closed, and are being addressed under the IRP process.

3.2.4 Polychlorinated Biphenyls (PCBs)

PCB management compliance programs at the WRF are conducted under DOA Regulation 200-1 and the federal requirements found in 40 CFR 761 and DOT regulations.

All available evidence indicates that there has been only one U.S. Army owned PCB power distribution transformer in service at the WRF since the early 1970s. This transformer was located at the northeast corner of Building 201. It was removed and replaced in December 1992, along with all associated contaminated concrete and soil. This site is identified as AREE 15.

The CERFA Preliminary Assessment (PA) documented a spill from what is thought to be a PCB-contaminated power distribution transformer owned by the local electric utility (VEPCO) that occurred in 1984. It has been documented that the transformer contained mineral oil contaminated with PCBs at a level of 87 parts per million. VEPCO responded to the incident in 1984, and reportedly removed all on-site VEPCO-owned transformers and contaminated soil from the facility. Replacement transformers were installed a short distance north on Dawson Beach Road, beyond the limits of the installation. The VDEQ member of the BCT suggested that confirmation sampling be conducted to confirm that the area has been adequately remediated. This spill site is identified as AREE 29 and will be further characterized under the IRP process.

PCB contamination has also been documented at several other AREES. This contamination is attributable to historical use of PCB electrical equipment while the WRF was in active use as a radio transmitting station. Residual contamination from this source of PCB contamination is being handled as a part of the IRP process.

At present, the only known continuing utilization of PCBs is within fluorescent lighting ballasts manufactured prior to 1984. The continuing usage and disposal of these ballasts is unregulated.

3.2.5 Asbestos

Asbestos-containing material (ACM) is regulated by USEPA, the Occupational Safety and Health Administration (OSHA), and the Commonwealth of Virginia.

Management of asbestos and asbestos-containing materials (ACM) at the WRF is managed in accordance with DOA Regulation 200-1 and U.S. Army policy promulgated by Assistant Chief of Staff for Installation Management (ACSIM) Memorandum dated 15 November 1993, titled "Lead-Based Paint and Asbestos in U.S. Army Properties Affected by Base Closure and Realignment." USARL's policy with regard to ACM has been to remove asbestos when it has been found to be in a damaged, friable, and accessible state. In addition, ACM has been removed and properly disposed by licensed contractors when ACM has been encountered during the course of routine mechanical equipment upgrades and repairs.

At this time, no installation-wide asbestos survey has been performed. The USAEC has been requested to procure such a survey for the WRF. For tracking purposes, asbestos-related concerns are identified as AREE 16.

3.2.6 Radon

The radon reduction program at the WRF is conducted under DOA Regulation 200-1, Chapter 11, U.S. Army Radon Reduction Program. It is the policy of the U.S. Army to remediate radon in housing areas when it is found to be in excess of 4 picocuries per liter. Although a housing area is located on U.S. Army property located at the main entrance to the WRF, this area is administratively controlled by Fort Belvoir, and not by the USARL. There are no housing areas on the portion of the WRF that is the subject of this BCP.

An installation-wide radon survey was performed under the direction of the USARL's Industrial Hygienist during 1993. Canisters were reportedly left in place at strategic locations within occupied buildings around the facility for a six-month duration that ended on or about 27 October 1993. Results from the radon survey were published in a "Radon Monitoring Report" dated 10 November 1993. The highest level of radon detected in field samples was 0.6 picocuries per liter, well below the USEPA's recommended 4.0 picocuries per liter threshold level for corrective action. No further action is planned for AREE 28.

3.2.7 RCRA Facilities (SWMUs)

RCRA facilities and Solid Waste Management Units (SWMUs) at the WRF are managed under the installation hazardous waste management program in accordance with the DOA Regulation 200-1, Chapter 6; DoD directives, RCRA Subtitle C; and the Commonwealth of Virginia regulations.

The WRF does not have a RCRA Part B permit; therefore, a RCRA Facility Assessment (RFA) has never been performed at the WRF. Consequently, no SWMUs have been identified. In the event that a RFA occurs at the WRF, this section of the BCP will be modified accordingly.

3.2.8 NPDES Permits

There are no National Pollution Discharge Elimination System (NPDES) permits in effect at the WRF.

3.2.9 Oil/Water Separators

There are two oil/water separators located at the WRF. These are fully described in the portions of this BCP that describe AREEs 11 and 14. Both of these oil/water separators will be further characterized in the IRP process.

3.2.10 NRC Licensing

There are no NRC licensing agreements in effect at the WRF.

3.2.11 Pollution Prevention

At the present time, the WRF is preparing for entry into caretaker status and is staffed by a minimal number of people with a minimal level of activity. Concomitantly, pollution prevention efforts are also at a low level.

3.2.12 Mixed Waste

There are no known mixed wastes at the WRF.

3.2.13 Radiation

During October 1993, the BEC for the WRF was made aware that low-level sealed radioactive source material has been utilized for research and development purposes at the WRF since the 1980s, and that some of these remain in active use at the present time. There is no evidence that any of these sealed sources were ever damaged or ruptured.

This concern was first discussed at the on-site meeting of the BCT that occurred on 10 November 1993. The installation identified the nature and number of radioactive sources that remain at the WRF, as well as the fate of the radioactive sources that were removed from the WRF in 1992. No further action is planned for AREE 31.

3.2.14 Lead-based Paint

Management of lead-based paint at the WRF is in accordance with U.S. Army policy promulgated by ACSIM memorandum dated 15 November 1993, title "Lead-Based Paint and Asbestos in U.S. Army Properties Affected by Base Closure and Realignment."

At this time, no installation-wide lead-based paint location survey has been performed. The USAEC has been requested to procure such a survey for the WRF. For tracking purposes, lead-based paint related concerns are identified as AREE 32.

3.2.15 Unexploded Ordnance (UXO)

There is no known UXO at the WRF.

3.2.16 Medical Waste

There is no medical waste at the WRF.

3.2.17 NEPA

The NEPA EIS process is underway, but is presently in an "on hold" status pending the establishment of a community reuse plan and the resolution of certain technical concerns. A Preliminary Draft EIS report for the WRF Disposal/Reuse has been prepared and is dated June 1993.

3.2.18 Other Compliance Programs

There are no other known compliance concerns at the WRF.

3.3 Status of Natural and Cultural Resources Programs

Presently, a cultural and archeological resources study is underway, in support of the ongoing WRF Disposal/Reuse EIS efforts. The results of the study will be considered in the selection of the final reuse alternative for the WRF. No cultural resource programs are planned once the current study has been concluded. The information provided in this section has been taken from the Preliminary Draft EIS report for the WRF Disposal/Reuse.

3.3.1 Vegetation

Several different habitats exist within the WRF. Because construction has been limited to the main compound area, disruptions of these habitats has occurred primarily through the construction of access roads and mowing. Mowing on the WRF occurs regularly from April to October within a 75-foot zone along Dawson Beach Road. Test areas are mowed as required. All of the open areas are mowed in the fall.

Transitions between vegetative communities on the installation is largely the result of differing hydrologic regimes. Tidal influences are significant because most of the WRF lies below the 100-year floodplain elevation. Areas receiving the greatest tidal influences are typically characterized by floating, emergent, or scrub/shrub vegetation, whereas higher elevations support open grasslands and trees.

Information collected during the Biological Assessment of Threatened and Endangered Species (BATES) survey, wetland delineation, and from color aerial photographs was used to designate 19 vegetative communities. These communities are differentiated by their vegetative composition. The largest community covers approximately 164 acres of the south and east sections of the WRF and is subject to strong tidal influences. Two other large communities are maintained primarily by annual mowing and cover a combined area of approximately 237 acres. Steeply sloping upland wooded areas are found along Marumsco Creek and encompass approximately 16 acres. The remaining communities consist of intermittent channels and swales, open areas, forested areas, the Picnic and Recreation Area near Taylor's Point, a transitional

area between the tidal communities and open field community/main compound, the main compound area, a 2-acre pond, an upland ridge along Marumsco Creek, and a low area adjacent to Marumsco Creek.

A survey of Submerged Aquatic Vegetation (SAV) along the Potomac River and adjoining embayments was conducted by the Metropolitan Washington Council of Governments during the summer of 1991. No significant SAV colonies were identified in either Belmont or Occoquan Bays.

3.3.2 Wildlife

A wide variety of birds use the WRF. A list of those species that are likely to occur on the WRF was obtained from the Biota of Virginia (BOVA) program. During the BATES survey, conducted between October 1991 and May 1992, commonly observed species included the American crow, Red-tailed hawk, killdeer, tufted titmouse, and acadian flycatcher. In and around aquatic habitats, species encountered included the belted kingfisher, double-crested cormorant, great blue heron, Canada goose, and wood duck. The USFWS, through its volunteer program, has been conducting a biweekly bird survey of the WRF. The volunteers have been able to confirm the presence of most of the species on the BOVA list.

The various hydrologic regimes found on the WRF offer a variety of habitats for reptiles and amphibians. Those species that could inhabit the installation, as indicated by the BOVA program were determined. During the BATES survey, commonly encountered species included the spotted salamander, slimy salamander, four-toed salamander, green frog, pickerel frog, eastern box turtle, eastern painted turtle, northern water snake, and eastern worm snake.

Mammals that could inhabit the WRF as indicated by BOVA were determined. Species encountered during the BATES survey included raccoon, river otter, woodchuck, beaver, eastern cottontail, and white-tailed deer.

Hunting and fishing are permitted on the WRF by authority of the HDL Memorandum 420-74, and authorized by the Cooperative Plan Agreement for the Conservation and Development of Fish and Wildlife Resources. In the past, duck and dove hunting were allowed on the WRF. White-tailed deer, however, is the only game species currently hunted on the facility. The facility population averages 175 animals in September of each year. The staff at the WRF works closely with the Virginia Department of Game and Inland Fisheries to set annual harvest limits. Hunting removes between one-third and one-half of the deer population annually. About half of the animals harvested are does.

Fishing within the installation is only allowed at the pond. A Fisheries Management Plan, developed by the USFWS, was adopted in 1977. The plan calls for management of game species for fishing. Fish surveys from the pond have been infrequent. Periodic surveys since 1963 have found bluegill, largemouth bass, channel catfish, and crappie. USFWS personnel periodically have stocked the pond with bass and catfish.

An inventory of common fish species in the WRF vicinity was derived from a study conducted in Gunston Cove in 1987. Gunston Cove is on the western shore of the Potomac River, approximately 4.5 miles upstream from the WRF and is the nearest embayment that has been sampled for finfish diversity and abundance. The most abundant species identified by the survey was the white perch. Other species identified included blueback herring, bay anchovy, inland silverside, spottail shiner, and pumpkinseed.

3.3.3 Wetlands

A comprehensive jurisdictional wetlands delineation of the WRF was conducted during November and December 1991. Boundaries between wetlands and uplands were determined using the procedure outlined in the 1987 *Corps of Engineers Wetlands Delineation Manual*. The results of the delineation are summarized below.

The delineation found that approximately 285 acres of the WRF was jurisdictional wetlands. Predominantly, the wetlands were tidally influenced and contained scrub/shrub and emergent vegetation. In addition, areas of nontidal emergent, scrub/shrub, and forested wetlands were observed. However, less than 5 acres of the identified wetlands were not connected hydrologically to either Belmont Bay or Occoquan Bay. Subsequently, most of the identified wetlands receive an additional 100-foot Chesapeake Bay RPA buffer along their upland edges.

A single, large wetland complex, extending southeasterly from the main entrance to the shoreline, accounted for 265 acres of the total. In its upper reaches, this complex is nontidal and flanks an unnamed stream. Just north of the main compound, tidal influences begin to dominate the hydrology of the complex. South of the main compound, the complex broadens and covers much of the shoreline from the mouth of Marumsco Creek up to the intersection of Charlie Road and Deephole Point Road. The hydrology in this section of the complex is controlled by tidal fluxes.

A 15-acre wetland, associated with drainage to Marumsco Creek, was identified along the western boundary of the WRF. This complex includes a large swale extending from a point northeast of the installation pond southward to Marumsco Creek. The hydrology of the swale is nontidal.

3.3.4 Designated Preservation Areas

The Commonwealth of Virginia enacted the Chesapeake Bay Preservation Act in 1989. This act mandates that 27 counties in Virginia, including Prince William County, implement, at a minimum, the specific regulations directed at protection of RPAs. Prince William County has adopted an ordinance that requires a 100-foot vegetated buffer between construction disturbance and components designated as RPAs. The limits of the RPA are defined by the following natural features:

- ▶ Tidal wetlands

- ▶ Nontidal wetlands connected by surface flow and contiguous to tidal wetlands or tributary streams
- ▶ Tidal shores
- ▶ Other lands, which under the provisions of the Virginia Code of Regulations, Section 3.2, Subsection A, are necessary to protect the quality of state waters.

Development of the RPA is specifically restricted to water-dependent facilities, passive recreation (paths, boardwalks, etc.), water wells, and historic preservation and archaeological activities.

In addition to the RPA requirements, the Act also requires that a Resource Management Area (RMA) be contiguous to the entire landward boundary of the RPA, which can include the following natural features:

- ▶ Floodplains
- ▶ Highly erodible soils, including steep slopes
- ▶ Highly permeable soils
- ▶ Nontidal wetlands not included in the RPA
- ▶ Other lands that are necessary to protect the quality of state waters

Development in the RMA requires the use of best management practices to control stormwater runoff and downstream sedimentation. In Prince William County, all land that is not wetland or RPA has been classified as RMA.

The DoD has agreed to comply with these regulations with the issuance of the 1987 Chesapeake Bay Agreement, the *Federal Facilities Strategy*; *Federal Workplan*, issued in July 1988; and an April 1990 Memorandum of Agreement (MOA) with USEPA to restore the Chesapeake Bay. The MOA includes a list of DoD facilities in the Chesapeake Bay region that have a significant potential to affect the bay's water quality. The WRF is included on this list.

3.3.5 Rare, Threatened and Endangered Species

A BATES survey was conducted at the WRF between October 1991 and May 1992. The BATES survey confirmed the presence of one endangered species as well as numerous extremely rare, very rare, and rare to uncommon species.

The American bald eagle was sited perched in the trees on Conrad Island and on the installation in trees along Deephole Point Road. Data provided by USFWS volunteers indicate that these areas are used by juveniles and subadults on a weekly basis throughout the year. No nests were observed. Sitings are common in the Mason Neck Wildlife Refuge, located across Occoquan Bay from the WRF. The bald eagle is listed as endangered on both the Virginia and Federal Lists of Threatened and Endangered Species. The Cooper's hawk, hooded merganser, loggerhead shrike, double-crested cormorant, blue-winged teal, northern pintail, swamp sparrow,

great egret, and golden-crowned kinglet are species listed in the rare categories as defined by the Commonwealth of Virginia.

3.3.6 Cultural Resources

Historic properties include prehistoric or historic archaeological sites, buildings, structures, districts, or objects (such as monuments), that are listed on or eligible for the National Register of Historic Places (NRHP). The National Historic Preservation Act of 1966 (NHPA, Public Law 89-665), as amended, makes federal agencies responsible for the preservation and management of historic properties that are located on federally owned land. Section 106 of the NHPA directs agencies to obtain comments on such undertakings from the State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (ACHP), and other interested parties. Cultural resource management by the U.S. Army is further prescribed by DOA Regulation 420-40 (Historic Preservation), dated 15 May 1984.

On 13 July 1992, the U.S. Army signed an amended Programmatic Agreement with the ACHP and the National Conference of SHPOs. The amended Programmatic Agreement, which supersedes a previous Programmatic Agreement signed on 5 February 1990, stipulates how the U.S. Army will meet its responsibilities under the NHPA and coordinate NHPA compliance with the NEPA process, while implementing the BRAC program as directed.

Whenever possible, the U.S. Army will complete its NHPA activities as described in the Programmatic Agreement before filing the ROD that follows a final EIS (or the equivalent document for an environmental assessment) for a BRAC action. When that is not possible, the U.S. Army will specify in the ROD what aspects of NHPA compliance (as stipulated by the Programmatic Agreement) still remain to be completed and will not undertake any land disposal or other BRAC activities that could affect historic properties until compliance is complete.

The WRF is located in the Lower Potomac Valley, an area that has seen much interest in archaeological research. The Smithsonian Institution has artifacts from the Lower Potomac Valley, which were collected by amateur archaeologists during the mid-19th century. Investigations in the region by Virginia State Archaeologist Howard MacCord during the late 1950s included the discovery of one site on the WRF property. During the 1960s, amateur archaeologists affiliated with the Virginia Archaeological Society recovered artifacts from a colonial trash pit at WRF.

A resource management plan for WRF, prepared in 1985 by Thunderbird Archaeological Associates, presented an overview of known sites and areas of high resource potential on the property. No fieldwork was associated with this document.

The preliminary draft of the *Harry Diamond Laboratories Cultural Resource Management Plan*, dated 16 September 1991, provides an inventory and assessment of cultural resources and a detailed management plan to help the U.S. Army meet its cultural resource responsibilities at three facilities including the WRF.

In October 1991, a preliminary field survey was conducted at the WRF to evaluate the significance of the known resource sites and to survey those sensitive areas considered most likely to contain additional archaeological sites. Details of the methods and results of the survey are included in the revised *Cultural Resource Survey of the Woodbridge Research Facility*, dated 17 January 1992. A full Phase 1 survey is currently in progress at the facility.

Four potential prehistoric archaeological sites were identified in the Management Plan and Cultural Resource Survey report. The cultural resource survey evaluated these four sites for National Register eligibility. The survey results indicated that none of the sites were eligible for inclusion in the National Register.

Five known or potential historic sites have been identified at the WRF, which are referred to as Loci 1 through 5 in the Management Plan and Cultural Resource Survey report; Locus 5 also has prehistoric components. The survey found evidence of extensive past disturbance at all five sites. None of these sites are considered eligible for the NRHP, and no further investigation was recommended by the archaeological survey team.

Facilities and structures considered for listing under the cold-war status are those which were constructed or developed for the primary purpose of supporting Cold War research and defense. Because the primary mission of the WRF is to test the effects of electromagnetic pulse on communications equipment and equipment electronics through the use of simulators, the facilities and structures were considered suitable for evaluation and inclusion on the NRHP. The SHPO and the ACHP determined that the simulators and antenna arrays were eligible for listing on the NRHP. The U.S. Army, however, will be allowed to relocate these structures after mitigation has been completed. The SHPO determined that appropriate mitigation would be photographic and written records of the simulators. After the simulators are relocated, they will not be considered eligible for the NRHP because they will be out of context. The SHPO, ACHP, and the U.S. Army evaluated the status of the buildings and laboratories at the WRF for inclusion on the NRHP. This evaluation was scheduled to be completed in July 1993.

3.3.7 Other Environmental Resources

Also noted in the EIS as an environmental resource at the WRF are visual resources. The WRF property consists mostly of open, mowed fields with a large marshy area along the southeastern section and a few forested areas. The developed area lies mostly in the center of the property. Because of the woods abutting the northern and western sides and the slopes above Marumsc Creek to the west of the property, only some of the antennas and none of the buildings are visible from outside the property.

Attractive views from the WRF include vistas east across the waters of Belmont Bay to the pristine Mason Neck State Park and Wildlife Refuge; north to wooded areas separating the facility from its nearest neighbors; south and west across Marumsc Creek to the Marumsc National Wildlife Refuge, Bayside Park, and Veterans Memorial Park; and south to the Occoquan Bay.

3.4 Environmental Condition of Property

In October 1992, Public Law 102-426, CERFA amended Section 120(h) of CERCLA and established new requirements with respect to contamination assessment, cleanup, and regulatory agency notification/concurrence for federal facility closures. CERFA requires the federal government to identify property where no hazardous substances were stored, released, or disposed, before termination of federal activities on real property owned. These requirements retroactively affect the U.S. Army BRAC I and BRAC 91 environmental restoration activities, and are being implemented at BRAC 93 sites concurrently with their EnPAs. The primary CERFA objective is for federal agencies to expeditiously identify real property offering the greatest opportunity for immediate reuse and redevelopment. Although CERFA does not mandate the U.S. Army to transfer real property so identified, the first step in satisfying the objective is the requirement to identify real property where no CERCLA-regulated hazardous substances or petroleum products were stored, released, or disposed.

An investigation to identify the environmental condition of property to respond to the requirements of CERFA is ongoing at the WRF. CERFA investigations include the following assessment procedures:

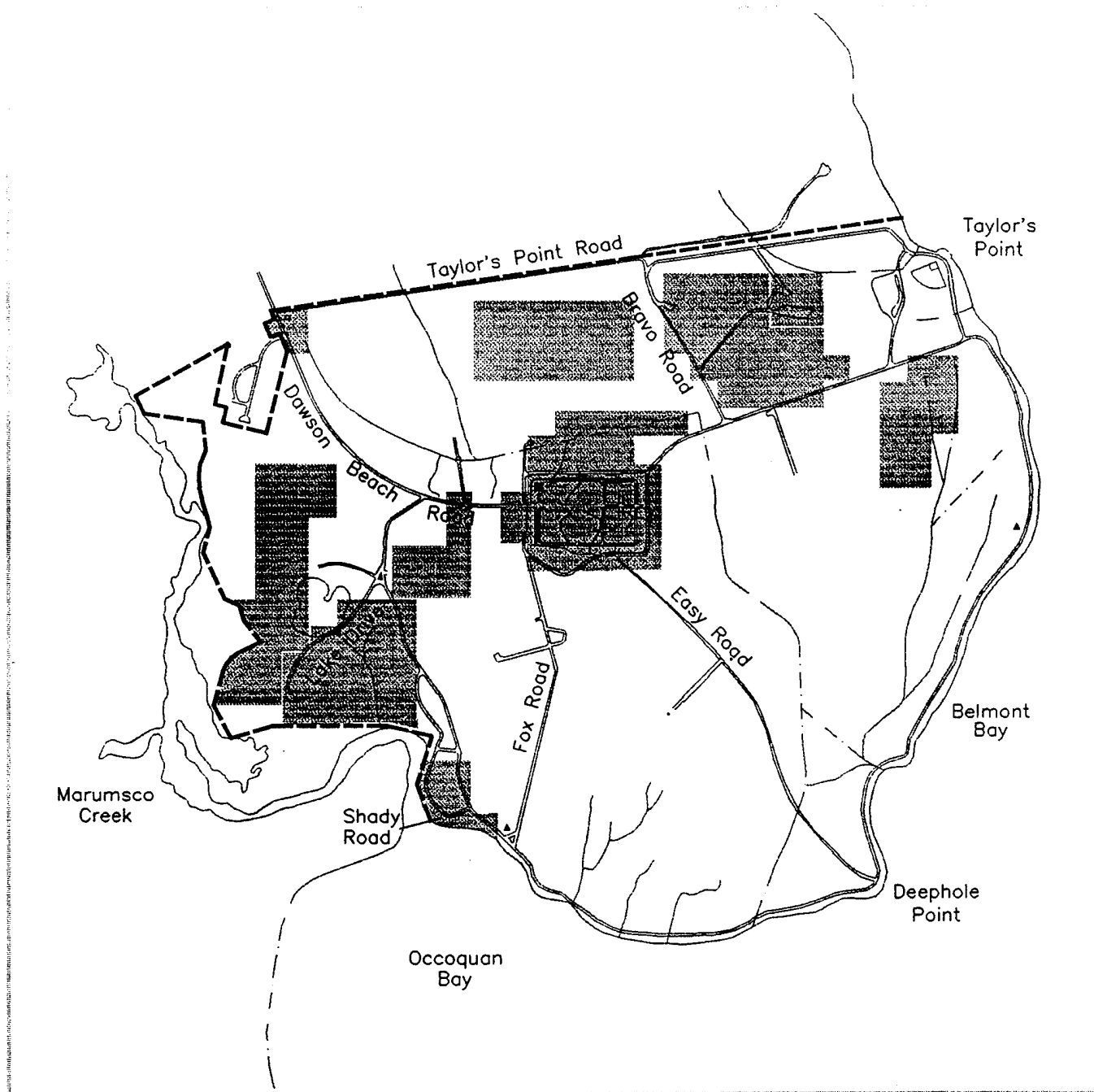
- ▶ Review of historical installation records, environmental documents, aerial photographs and property documents to identify current and past activities applicable to CERFA
- ▶ Interviews with current and past installation employees
- ▶ Visual site inspections of the installation.

During the CERFA investigation, evidence was gathered that screened installation property into four parcel types. These parcels are CERFA parcel, CERFA parcel with qualifiers, CERFA disqualified parcels, and CERFA excluded parcels as defined below.

An environmental condition of property map provided as Figure 3-2 identifies property at the installation based on these four parcel categories. The parcels are delineated using a 1-acre square grid for boundary definition. Where CERFA disqualified parcels and CERFA parcels with qualifiers have coincided, the overlapped area has been designated CERFA disqualified.

3.4.1 CERFA Parcels

CERFA parcels are those portions of the installation real property for which investigation reveals no evidence of storage for one year or more, release, or disposal of CERCLA hazardous substances, petroleum, or petroleum derivatives and no evidence of being threatened by migration of such substances. CERFA Parcels also include portions of the installation which once contained non-CERCLA hazards, including asbestos, unexploded ordnance (UXO), lead-based paint, radionuclides, radon, or stored (not in use) PCB containing equipment, but has been fully remediated.



EXPLANATION

- Installation Boundary
- CERFA Parcel
- CERFA Parcel with Qualifier(s)
- CERFA Disqualified Parcel
- CERFA Excluded Parcel



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FEET

Environmental
Condition
of Property

Figure 3-2

Woodbridge Research Facility, Virginia

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3.4.2 CERFA Parcels with Qualifiers

CERFA parcels with qualifiers are those portions of the installation real property for which investigation reveals no evidence of storage for one year or more, release, or disposal of CERCLA hazardous substances, petroleum, or petroleum derivatives and no evidence of being threatened by migration of such substances. The parcel does however contain non-CERCLA related hazards including the presence of asbestos, unexploded ordnance (UXO), lead-based paint, radionuclides, radon, or stored (not in use) PCB containing equipment.

CERFA established stringent requirements to designate a parcel as a CERFA "clean" parcel. At most installations a substantial number of acres, while not classified as CERFA "clean", present no threat to human health and the environment and will be available for transfer.

3.4.3 CERFA Disqualified Parcel

CERFA disqualified parcels are those portions of the installation real property for which there is evidence of CERCLA hazardous substance, petroleum, or petroleum derivative storage for one year, release or disposal, or parcels threatened by such release or disposal. CERFA disqualified parcels also include any portion of the installation containing a PCB release or disposal, any explosive ordnance disposal locations, any storage sites of chemical ordnance, and any areas in which CERCLA hazardous substances or petroleum products have been released or disposed and subsequently fully remediated.

3.4.4 CERFA Excluded Parcel

CERFA excluded parcels are those portions of the installation real property to be retained by the DoD, and therefore not explicitly investigated for CERFA. CERFA Excluded Parcels also include any portion of the installation which have already been transferred by deed to a party outside the federal government, or by transfer assembly to another federal agency.

3.4.5 Suitability of Base Property for Transfer by Deed

SARA Title I, Section 120 to CERCLA establishes deed requirements for federal property being transferred on which any hazardous substance was stored for one year or more, or known to have been released or disposed. To the extent such information is available on the basis of a complete search of agency files, deeds must contain the following information:

- ▶ A notice of the type and quantity of such hazardous substances,
- ▶ Notice of the time at which such storage, release, or disposal took place,
- ▶ A description of the RA taken, if any, and
- ▶ A covenant warranting that all RA necessary to protect human health and the environment with respect to any such substance remaining on the property has been taken before the date of such transfer, and any additional RA found to be necessary after the date of such transfer shall be conducted by the United States.

The U.S. Army has begun the identification of property suitable for transfer under CERCLA through the CERFA identification process. The CERFA process is an effective screening mechanism to expeditiously identify those properties immediately transferable. These properties, designated CERFA parcels and CERFA parcels with qualifiers, have had no activities which could potentially preclude them from transfer under CERCLA.

CERFA disqualified properties consist of those which have experienced CERCLA hazardous substance storage, petroleum, oil, and lubricant (POL) storage, hazardous substance releases or POL releases. Under SARA Title I, Section 120 to CERCLA only those properties which have experienced a hazardous substance release which has not been remediated and for which there is no "remedy in place" are currently unsuitable for transfer to a non-federal entity. These properties typically represent a small portion of the CERFA disqualified property.

Figure 3-3 identifies CERFA parcels and CERFA parcels with qualifiers which are immediately transferable under CERCLA as well as CERFA disqualified parcels. The U.S. Army is continuing the suitable property for transfer identification process including the refinement of CERFA disqualified parcels into those suitable and unsuitable for transfer under CERCLA.

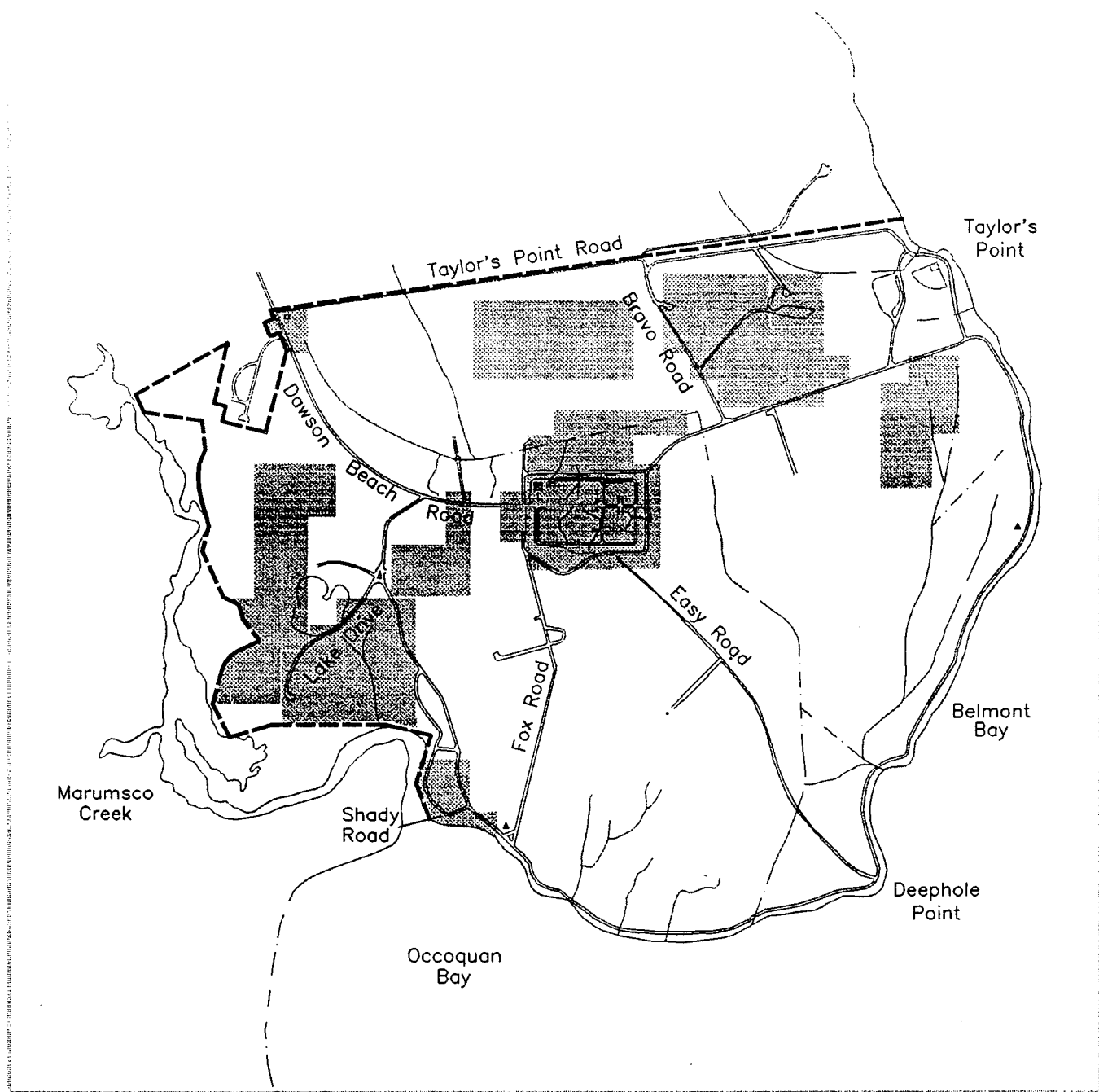
3.5 Status of Community Involvement

Community involvement with the installation dates from the early 1970s. During 1974, the facility injected sewage sludge into soils at the facility. At least one nearby resident objected to the odors generated and the potential for groundwater pollution. The installation stopped this practice shortly thereafter.

During the period from 1984 through 1986, the U.S. Army was actively involved with the community in communicating the progress of a PCB cleanup at a burial site for PCB transformers and capacitors (Landfill No. 2) at the WRF.

In March 1984, the Citizen's Clearinghouse for Hazardous Waste, Inc. wrote to the installation at the request of several citizens and requested information about the soil investigation at the WRF. In early April 1984 the installation responded with a brief explanation of activities and promised a public meeting in the near future. The installation held the promised public meeting on May 9, 1984, to announce the results of the PCB sampling survey. The U.S. Army tried to reassure the community by emphasizing that soil contamination was localized at two locations, and that contamination of groundwater had not been detected.

At the request of concerned citizens, the Citizen's Clearinghouse for Hazardous Waste, Inc. prepared a lengthy list of comments regarding the U.S. Army's sampling and analysis program for the WRF. Many comments concerned technical aspects of the sampling program, but the letter also asked for several documents not yet made public and for greater community participation in decision-making at the WRF. The U.S. Army replied in detail to these questions, and assured the requestors that ample opportunity would be provided for public input at time of the publication of the draft final report, and promised another public meeting at that time.



EXPLANATION

--- Installation Boundary

□ CERFA Parcel and CERFA Parcel with Qualifier(s) *

▨ CERFA Disqualified Parcel **

■ CERFA Excluded Parcel

* CERFA Parcels and CERFA Parcels with Qualifier(s) are areas suitable for current transfer under SARA Title I, Section 120 of CERCLA.

** CERFA Disqualified Parcels are areas with current or historic POL/Hazardous Substance Storage and/or releases. Only unremediated hazardous substance release sites or those without a remedy in place are unsuitable for transfer to a non-federal entity under SARA Title I, Section 120.

0 600 1200
FEET

Suitability of
Property for
Transfer

Figure 3-3

Woodbridge Research Facility, Virginia

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The U.S. Army held a second public meeting on July 25, 1984, to present the results of the environmental contamination assessment at the WRF. Specific topics discussed included a summary of the technical work performed at the site, the results of the chemical analyses, a description of the RA alternatives assessment, and presentation of the preferred RAs. Several residents continued to express concerns about PCB cleanup criteria and possible migration of contaminants from the site. Also, an editorial appeared in the local newspaper stating that PCBs would still remain in the ground, and that migration of these contaminants could still occur. The U.S. Army responded to these comments, again assuring residents that PCBs would be cleaned up to safe levels. The U.S. Army continued to communicate with community through press releases and questions and answers sheets during late 1984 and early 1985, when cleanup and removal of PCB soils was completed.

During 1988, a controversy arose over the possible detrimental effects of electromagnetic pulse (EMP) experiments at the WRF. The controversy was precipitated when two facility employees alleged that the U.S. Army was withholding evidence of potential harmful effects of EMP experiments. Although no adverse health impacts were ever substantiated, a contractor study conducted for the U.S. Army claimed that there was a small risk that EMP could interfere with airplane navigation systems (the area is within the landing pattern for Washington National Airport). A considerable amount of negative publicity occurred, and the U.S. Army stopped EMP testing in May 1988 under a court ordered agreement until safety concerns were addressed. Since that time, only small-scale experiments within the central compounds have taken place.

Another period of interaction between the U.S. Army and the public occurred from 1991-1993 during the preparation of the Environmental Assessments and an EIS prepared for closure of the installation, realignment of activities, and plans for disposal and future reuse. Comments expressed during public meetings and review periods overwhelmingly endorsed conversion of the WRF into a wildlife refuge or a park because of the perceived ecological value of the area. In particular, conservationists noted that bald eagles used the area for feeding and roosting, although no nests had been observed on the installation.

During July 1993, the Prince William County Board of Supervisors announced that it had approved a 350 acre mixed use development located adjacent to the northern border of the installation. This plan drew sharp criticism from some residents and officials of neighboring Fairfax County, who had been largely successful in limiting development on the opposite shore of Belmont Bay. Environmentalists announced that they would try to stop the planned development. This action will likely enhance the visibility of the U.S. Army's hazardous waste investigation at the WRF among residents of both Prince William and Fairfax Counties.

During the summer of 1993, a proposal to establish a 12,000 square foot warehouse at the WRF for the Library of Congress also encountered vigorous opposition from community residents and the local Congressional delegation. Both Virginia Senators Chuck Robb and John Warner have sponsored legislation that would turn the WRF over to the USFWS.

Specific community relations activities that have taken place concerning the disposal of the WRF include the following:

- ▶ **EIS Process.** Environmental issues relevant to the disposal and reuse of the WRF were solicited from the public and from government agencies and their representatives in February and March 1993. The scoping process began with the transmittal of a Notice of Intent to prepare an EIS, published in the *Federal Register* on December 31, 1992. Public notices describing the proposed action and announcing a public scoping meeting were published in the *Potomac News* on February 19 and 27, 1993, and in the *Washington Post* on February 19 and 21, 1993. Copies of the notice were also mailed to the USEPA, Region III (NEPA Compliance Section and the Regional Administrator), the USFWS (Regional Director), the U.S. Soil Conservation Service, the National Marine Fisheries Service, the Commonwealth of Virginia, Prince William County, other local county officials, and to various public and civic organizations and individuals. A public scoping meeting was held at Belmont Elementary School on March 2, 1993, in Woodbridge, Virginia. Public comments were recorded through the preparation of meeting transcripts. Additional comments were subsequently received in the form of letters. During the scoping process for this EIS, it was explained that both the draft and final versions of the EIS document would be published, in accordance with Council on Environmental Quality regulations for implementing NEPA, for review and comment by federal, state, and local agencies and by the general public. A notice of availability will be published when the draft EIS has been completed. The final EIS will be comprised of the draft EIS, public and agency comments on the EIS, the U.S. Army's response to comments, and any amendments to the EIS that are warranted.
- ▶ **Information Repositories.** Two public repositories for information have been identified in two libraries near the WRF. The locations include the Chinn Park Regional Library and the Potomac Branch of the Prince William County Library. They will contain information relative to environmental activities at the WRF.
- ▶ **Community Relations Plan.** The USAEC'S Public Affairs Office is currently preparing a community relations plan entitled "Public Involvement and Response Plan" (PIRP) which will provide guidelines for future community involvement actions.
- ▶ **Mailing List.** A mailing list of all interested parties in the community is maintained by the installation and updated regularly.

Currently, two members of the Woodbridge Reuse Committee, including its chairperson, are actively participating in the monthly meetings of the BCT. The BCT is currently in the process of soliciting nominations for community participants in the soon-to-be established RAB.

CHAPTER 4

► INSTALLATION-WIDE STRATEGY FOR ENVIRONMENTAL RESTORATION ◀

This chapter describes and summarizes the installation-wide environmental restoration and compliance strategy for the WRF. Prior to July 1991, IRP projects were underway to identify, characterize, and remediate environmental contamination at the WRF. With the closure announcement, the installation's strategy shifted from supporting an active U.S. Army mission to responding to disposal and reuse considerations.

The strategy for determining the most effective response mechanism for contaminant sources and contaminated areas during the early stages of the restoration process at the installation has been performed on a case-by-case basis by the BCT. The BCT has developed a comprehensive strategy to identify the appropriate regulatory programs applicable to the areas of contamination discovered during the restoration program.

4.1 Zone/OU Designation and Strategy

Zones define an installation's investigative strategy. Zones are geographically contiguous areas amenable to management as a single investigative unit. They are useful tools for organizing and defining areas of investigation. Zones can be used to group multiple sites and environmental data collected during one or more investigations into related geographic areas for detailed mapping, and facilitate the development of conceptual models of sources, migration pathways, and receptors. Zones are distinct from OU response actions.

OUs define an installation's remedial strategy. They are derived from an evaluation of hydrogeologic and chemical analytical data within an investigative zone, or by comparing data between zones. OU types may be based on geographic area, common media (soil, groundwater, surface water, other), common treatment technology, priorities, or schedules. Properly defined, OUs establish a logical sequence of actions that address contamination releases in a comprehensive fashion.

As first mentioned within Section 2.3 of this BCP, the strategies described herein are written as if a decision has been made to transfer approximately 70 non-environmentally-sensitive acres to the private sector by deed, with the balance (approximately 509 acres) to be transferred to another Federal agency as an addition to the Marumsco National Wildlife Refuge. This hypothetical scenario was selected to serve as a basis for the development of this Plan. This BCP will be modified appropriately when the Congress and the Woodbridge Reuse Committee have announced decisions that will affect the actual reuse of the WRF.

4.1.1 Zone Designations

In response to the U.S. Army base closure environmental restoration goals, all restoration sites requiring further action at the WRF have been grouped into two zones. Table 4-1 depicts the relationship between restoration sites, zones and reuse parcels. Installation zones and restoration sites are shown in Figure 3-1. The composition of each of the installation zones is summarized below.

Zone 1 is equivalent to Parcel 1 described in Chapter 2. Two areas comprise Zone 1 that are geographically separated; therefore, they are identified uniquely as Zone 1W (with the "W" denoting "West") and Zone 1E (with the "E" denoting "East"). Discussions that follows that pertains to both Zone 1W and Zone 1E will make reference to Zone 1. Discussions that pertain to only one of the two parcels will make reference to the "E" or "W" suffix. These two areas were selected for the following reasons:

- ▶ They are located on the northern perimeter of the WRF, and are contiguous with existing privately-held properties. These two areas could be incorporated into a "Regional Employment Center" that is actively being discussed by the Prince William County Board of Supervisors.
- ▶ They are primarily located on "uplands". Only a few small fingers of environmentally-sensitive acreage intrude into the heart of these two parcels.
- ▶ They are relatively "clean" portions of the WRF, with only a portion of AREE 25 located within both areas and AREE 30 located within Zone 1W.

The balance of the WRF, comprising approximately 509 acres, has been identified as Zone 2. All 23 restoration sites (including portions of AREE 25) are located within Zone 2.

4.1.2 OU Designations

The zones described in Section 4.1.1 of this BCP are not necessarily equivalent to OUs. OUs are defined as discrete response actions or steps toward comprehensive environmental restoration. These zones may be further subdivided or integrated where conceptual models of sources, contaminant migration, and receptors indicate the need for delineation of source-control and groundwater response actions within a zone or across several zones. Given this flexibility, and the findings to date, the following approach to defining OUs has been proposed by the WRF Project Team. The relationship between restoration sites, OUs, zones, and reuse parcels is depicted in Table 4-1. Installation OUs are shown in Figure 3-1.

All restoration sites (AREEs) will be studied under the current SI/RI contract. The on-site portion of the RI is expected to occur during the third quarter of FY94. Ten of these AREEs have been subdivided into three OUs for administrative ease.

**TABLE 4-1. RELATIONSHIP BETWEEN RESTORATION
SITES, OUS, AND PARCELS**

Reuse Parcel	Zone	OU	Site
1E	1E		AREE 25
1W	1W		AREE 25
2	2		AREEs 6B, 7, 12, 13, 18, 19, 20, 21, 25, 26, and 27
2	2	1	AREEs 1, 2, 3, 4, 5, and 6A
2	2	2	AREEs 11, 17, and 22
2	2	3	AREE 14

Key: OU = Operable Unit
AREE = Area Requiring Environmental Evaluation

- ▶ **OU1 (Landfills):** The SI confirmed the existence of former dumping sites at AREEs 1, 2, 3, 4, 5, and 6A. The RI will characterize these six AREEs following guidance promulgated by CERCLA, as well as by the Commonwealth of Virginia for landfill closures.
- ▶ **OU2 (Building 202 Oil/Water Separator):** The SI confirmed the presence of contamination at the Building 202 oil/water separator, AREE 11, plus the two down-gradient drainage swales, AREEs 17 and 22. The RI will characterize these three AREEs as an entity following guidance promulgated by CERCLA.
- ▶ **OU3 (Building 211 Oil/Water Separator):** The SI confirmed the presence of contamination at the Building 211 oil/water separator, AREE 14. The RI will characterize this AREE following guidance promulgated by CERCLA. (Note: This OU may be deleted from the RI if it is found that the phthalate compound contamination is attributable to contamination in the laboratory and not in the soil.)

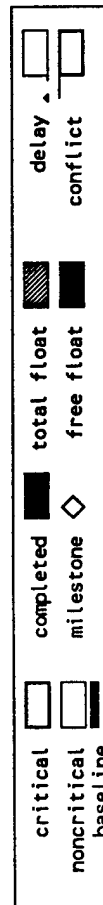
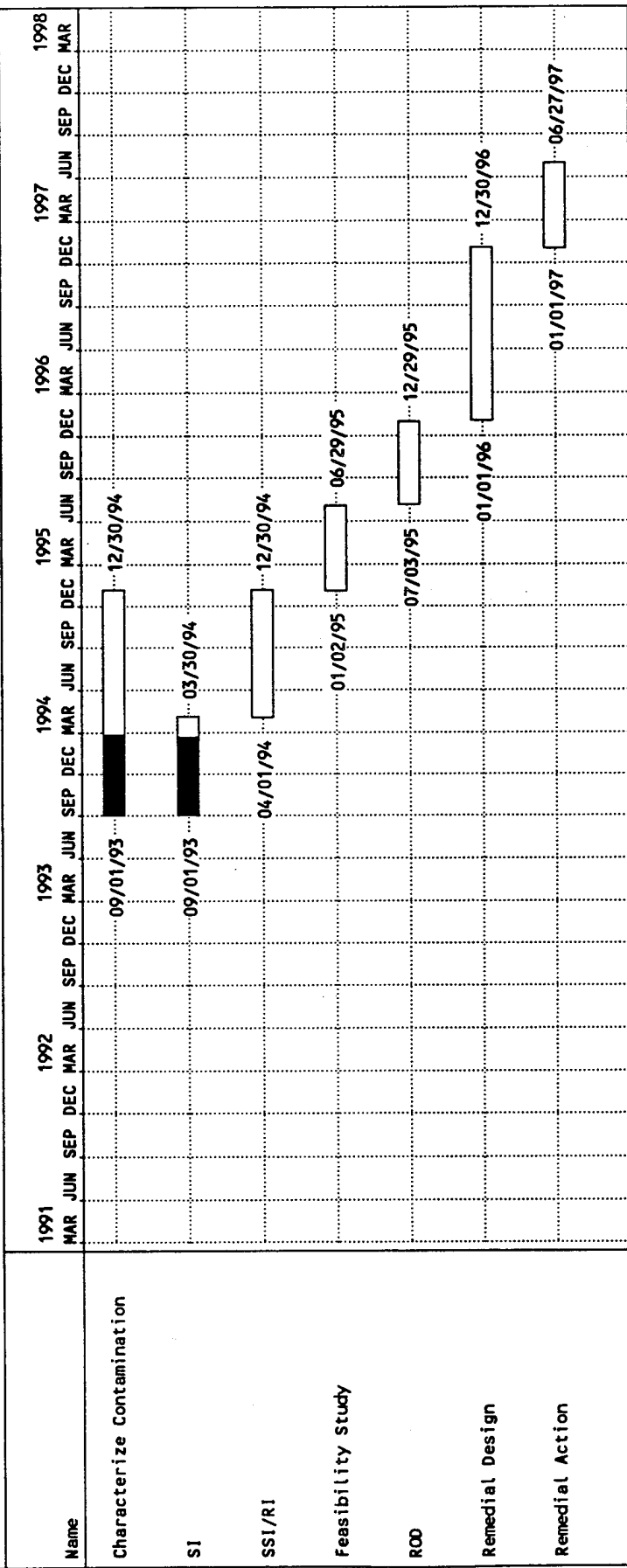
4.1.3 Sequence of OUs

A comprehensive strategy has been developed by the WRF BCT and is summarized in Table 4-2 and illustrated in Figure 4-1. This strategy consolidates restoration sites into zones for investigation, and then defines a logical sequence of OUs addressing all past releases associated with these sites.

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PROJECT: Woodbridge Fig 4-1
 MANAGER: Robert Craig
 CURRENT DATE: 03/01/94
 AS OF DATE: 02/23/94

Figure 4-1



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TABLE 4-2. CLEANUP SEQUENCE

Reuse Parcel	Zone	OU	Environmental Risk	Reuse Priority	Cleanup Sequence	Reconcile Comments
1E	1E		TBD	High	*	
1W	1W		TBD	High	*	
2	2		TBD	Medium	*	
2	2	1	TBD	Medium	*	
2	2	2	TBD	Medium	*	
2	2	3	TBD	Medium	*	

*Environmental restoration at all sites to be conducted simultaneously.

Key: TBD - To Be Determined.

The BCT will, when appropriate, give priority attention to environmental actions regarding imminent threats to human health or the environment and those that are necessary in order to make Zone 1 available for speedy transfer (by deed) to the private sector, while recognizing that Zone 1 may ultimately remain in the public sector for the purpose of wildlife habitat conservancy. Zone 1 will be considered to be on the "fast track". The environmental restoration process for Zone 2, which will not be transferred to the private sector for economic redevelopment, will proceed at a more routine pace. In the event of manpower or fiscal resource limitations that require a prioritization of which projects are supported and which projects are postponed, projects that support the speedy transfer of Zone 1 will be assigned a higher priority than projects that support the transfer of Zone 2. However, as of 24 February 1994, there are no limitations and no compelling reasons to handle the two zones separately. Consequently, the text which follows describes the strategy for environmental restoration of the installation as a whole.

The schedules developed for the WRF BCP were developed using the software Project Scheduler 5 (PS 5). This includes the schedules throughout Chapter 4 as well as Chapter 5. Certain parameters must be identified prior to developing a schedule using PS5, such as determining the critical path, milestones, and any delays and/or conflicts. Below are definitions to the standard components of the PS5 schedule. These terms also appear in the legend of each schedule.

- ▶ **Critical.** Critical jobs are those in which any extension in their duration will cause an equivalent delay in the project. Often referred to as the critical path. Normally the cumulative time span from the start of the first critical job to the end of the last critical job is the duration of the project.

- ▶ **Noncritical.** Noncritical jobs are usually subtasks required to accomplish the critical job. The start and end dates may be varied within the project parameters. However, variations in the timeframe may result in an impact to the critical job of the project.
- ▶ **Baseline.** A set of "original" schedule dates that can be compared with the current schedule to determine if the project has slipped. Baseline dates can be saved on a job-by-job basis, or for the entire project.
- ▶ **Completed Duration.** A measure in time periods of the portion of a job that is completed. A corresponding value will be displayed in the percent complete field and remaining duration field after the completed duration value has been entered.
- ▶ **Milestone.** A project event that represents a checkpoint, a major accomplishment, or a deliverable result. There is no time duration associated with a milestone.
- ▶ **Total Float.** The total length of time that a noncritical job can be delayed before it causes the project or a critical job to slip or causes a job to not meet its target date.
- ▶ **Free Float.** The length of time a noncritical job can be delayed without affecting another job.
- ▶ **Delay.** A waiting period that prevents the job from starting at its earliest possible start time. Delay times can either be input by the user or assigned by the program to resolve resource conflicts.
- ▶ **Conflict.** The amount of time a job overruns its target date. This is also called "negative float".

4.1.4 Early Actions Strategy

There are no early actions identified for environmental restoration projects at the WRF at this time. In the future, Table 4-3 may be used to summarize any environmental restoration planned early actions. Table 4-3 has been included for informational purposes only.

**TABLE 4-3. ENVIRONMENTAL RESTORATION
PLANNED EARLY ACTIONS**

Site	UST No. (or other unit identifier)	Action	Objective	Time Frame
	No environmental restoration planned early actions have been identified at this time.			

4.1.5 Remedy Selection Approach

Remedies will be selected in accordance with statutory and National Oil and Hazardous Substances Pollution Contingency Plan (NCP) criteria. The WRF Project Team will involve all parties who have an impact on the remedies selected at the installation in the remedy selection process. Particular attention will be given to the following during the evaluation of alternatives:

- ▶ **Applicable or Relevant and Appropriate Requirements (ARARs).** Applicable requirements for anticipated remedial actions will be identified through the Project Team
- ▶ **Remedial Alternatives.** The effectiveness of alternatives in reducing concentrations of contaminants to chemical-specific ARARs will be evaluated. Waivers will be considered where treatment to standards is technically impractical
- ▶ **Land Use/Risk Assessment.** Risk assessment protocols will incorporate future land use in exposure scenarios
- ▶ **Basewide Treatment Facilities.** The use of basewide treatment facilities will be investigated as necessary.
- ▶ **Corrective Action Management Units (CAMUs) regulation.** CAMUs will be established as necessary.
- ▶ **POL Remedies.** Source-specific actions for POLs will be addressed under the Virginia UST program as POL releases at the WRF have occurred mostly as a result of leaking USTs. Large-scale groundwater remedial actions as a result of leaking USTs will be incorporated into the appropriate zone groundwater actions if practicable under the IRP.

- ▶ **Future Land Use.** Cleanup goals will be factored into future land use and/or deed restrictions.

The BEC will hold Project Team meetings to discuss conceptual remedies early in the FS process (initial screening of alternatives stage) to ensure that the FS focuses on the appropriate types of remedies for each site or OU.

4.2 Compliance Strategy

This section includes the mission/operational-related and closure-related compliance program strategies. Compliance activities address storage tanks, hazardous materials management, asbestos, radon, PCBs, water discharges and lead-based paint. In addition to the identification of future compliance action strategies, environmental compliance planned early actions are also presented.

4.2.1 Storage Tanks

It has been determined that five AREEs are contaminated or potentially contaminated with only petroleum hydrocarbons. These AREEs have now been removed from the CERCLA environmental restoration process and will be subjected to a response process promulgated by the VDEQ. These AREEs are:

- ▶ **AREE 8, UST Leaks and Spills (Three Former 10,000-Gallon USTs)**
- ▶ **AREE 23, UST Leaks and Spills (Three Former Small USTs)**
- ▶ **AREE 24, Six Existing USTs**
- ▶ **AREE 30, Hydraulic Oil Spill**
- ▶ **AREE 33, Bulldozer Fuel Spills**

As a result of coordination that occurred between USARL and USAEC representatives on 28 January 1994, necessary on-site sampling and a Site Characterization Report (SCR) will be completed for these AREEs. A VDEQ SCR not only characterizes the contamination at a spill site, but also includes a risk assessment, both of which the VDEQ regulators typically utilize to determine appropriate remedial actions (if any) for a site. It is expected that the on-site phase of this investigation will occur in the third quarter of FY94. Due to this timeframe, these tasks have been illustrated in Table 4-4 for environmental compliance planned early actions. Remedial design and remedial action for these five AREEs, if necessary, will be performed by the U.S. Army Corps of Engineers, Baltimore District. FY94 Remedial Action funds are currently available, in the event that a remedial design and remedial action are found to be required.

TABLE 4-4. ENVIRONMENTAL COMPLIANCE PLANNED EARLY ACTIONS

Site	UST No. (or other unit identifier)	Action	Objective	Time Frame
AREE 8	U-202-1 U-202-2 U-202-3	VDEQ SCR	Characterize contamination at site including risk assessment; determine any appropriate remedial actions.	Third quarter of FY94.
AREE 23	U-101-1 U-202-4 U-203-1	VDEQ SCR	Characterize contamination at site including risk assessment; determine any appropriate remedial actions.	Third quarter of FY94.
AREE 24	U-202-5 U-202-6 U-203-2 U-211-1 U-306-1 U-306-2	VDEQ SCR	Characterize contamination at site including risk assessment; determine any appropriate remedial actions.	Third quarter of FY94.
AREE 30	N/A	VDEQ SCR	Characterize contamination at site including risk assessment; determine any appropriate remedial actions.	Third quarter of FY94.
AREE 33	N/A	VDEQ SCR	Characterize contamination at site including risk assessment; determine any appropriate remedial actions.	Third quarter of FY94.

Key: VDEQ SCR = Virginia Department of Environmental Quality Site Characterization Report.

4.2.2 Hazardous Materials/Waste Management

Hazardous materials/wastes at the WRF will continue to be managed as they are at this time since the operations are in compliance with applicable regulations.

4.2.3 Solid Waste Management

Solid waste generated at the WRF will continue to be managed as they are at this time since the operations are in compliance with applicable regulations.

4.2.4 Polychlorinated Biphenyls

The transformer identified as AREE 15 was removed and replaced in December 1992, along with all associated contaminated concrete and soil. Therefore, no further remedial action will be necessary at this AREE.

The other PCB-related site at the WRF is identified as AREE 29 and includes a spill from what is thought to be a PCB-contaminated power distribution transformer owned by the local electric utility (VEPCO). This AREE will be further characterized in the IRP process.

4.2.5 Asbestos

The U.S. Army Environmental Center (USAEC) has been tasked to procure a contamination-location survey for the WRF to assess the nature and extent of asbestos contamination at the WRF. This information is needed to support property transfer documents, and if appropriate, to enable planning for future remedial actions. The asbestos contamination is identified as AREE 16.

4.2.6 Radon

An installation-wide radon survey was performed under the direction of the USARL's Industrial Hygienist during 1993. Canisters were left in place at strategic locations within occupied buildings around the facility for a six-month duration that ended on or about 27 October 1993. Results from the radon survey were published in a "Radon Monitoring Report" dated 10 November 1993. The highest level of radon detected in field samples was 0.6 picocuries per liter, well below the USEPA's recommended 4.0 picocuries per liter threshold level for corrective action. No further action is planned for radon.

4.2.7 RCRA Facilities (SWMUs)

The WRF does not have a RCRA Part B permit; therefore, a RFA has never been performed at the WRF. Consequently, no SWMUs have been identified at the WRF. In the event that SWMUs are identified in the future, this section will be modified accordingly.

4.2.8 NPDES Permits

There are no NPDES permits in effect at the WRF.

4.2.9 Oil/Water Separators

There are two oil/water separators located at the WRF. These are fully described in the portions of this BCP that describe AREES 11 and 14. Both of these oil/water separators will be further characterized in the IRP process.

4.2.10 NRC Licensing

There are no NRC licensing agreements in effect at the WRF.

4.2.11 Pollution Prevention

At the present time, the WRF is preparing for entry into caretaker status and is staffed by a minimal number of people with a minimal level of activity. Concomitantly, pollution prevention efforts are also at a low level.

4.2.12 Mixed Waste

There are no known mixed wastes at the WRF.

4.2.13 Radiation

Low-level sealed radioactive source material is identified as AREE 31. The BEC was made aware of this potential area of concern in October 1993 and subsequently discussed the matter at the BCT meeting held on 10 November 1993. The installation identified the nature and number of radioactive sources that remain at the WRF, as well as the fate of the sources removed from the WRF in 1992. No further action is planned for this AREE.

4.2.14 Lead-based Paint

The USAEC has been tasked to procure a contamination-location survey intended to assess the nature and extent of lead-based paint contamination at the WRF. This information is needed in order to support property transfer documents, and if appropriate, to enable planning for future remedial actions. Potential lead-based paint contamination is identified as AREE 32.

4.2.15 Unexploded Ordnance (UXO)

There is no known UXO at the WRF.

4.2.16 Medical Waste

There is no medical waste at the WRF.

4.2.17 NEPA

The NEPA EIS process is underway, but is presently in an "on hold" status pending the establishment of a community reuse plan and the resolution of certain technical concerns. A Preliminary Draft EIS report for the WRF Disposal/Reuse has been prepared and is dated June 1993.

4.2.18 Other Compliance Programs

There are no other known compliance concerns at the WRF.

4.3 Natural and Cultural Resources Strategy(ies)

It is expected that the WRF will enter into a caretaker status on or before 1 October 1994. Once this status is achieved, the level of support provided to the WRF by the U.S. Army's Division of Public Works (formerly the Facilities Engineering Division) will diminish significantly. The frequency of grass mowing within the inner compound and along the entrance road will be decreased; all other grass mowing will be eliminated. However, the annual deer hunting program and periodic public access for birdwatching tours will continue. No new natural resource programs are planned.

Presently, a cultural and archeological resources study is underway, in support of the ongoing WRF Disposal/Reuse EIS efforts. No cultural resource programs are planned once the current study has been concluded.

4.3.1 Vegetation

The identification of vegetative communities at the WRF is being completed in support of the ongoing EIS. The results of the study will be considered in the selection of the final reuse for the WRF. Currently, no other studies are planned once the current program has been completed.

4.3.2 Wildlife

The identification of those species likely to inhabit the WRF is being completed in support of the ongoing EIS. The results of the study will be considered in the selection of the final reuse for the WRF. Currently, no other studies are planned once the current program has been completed.

4.3.3 Wetlands

The identification of jurisdictional wetlands at the WRF is being completed in support of the ongoing EIS. The results of the study will be considered in the selection of the final reuse for the WRF. Currently, no other studies are planned once the current program has been completed.

4.3.4 Designated Preservation Areas

The identification of the limits of the RPA at the WRF is being completed in support of the ongoing EIS. The results of the study will be considered in the selection of the final reuse for the WRF. Currently, no other studies are planned once the current program has been completed.

4.3.5 Rare, Threatened, and Endangered Species

The identification of those species likely to inhabit the WRF is being completed in support of the ongoing EIS. The results of the study will be considered in the selection of the final reuse

for the WRF. Currently, no other studies are planned once the current program has been completed.

4.3.6 Cultural Resources

The identification of all cultural resources at the WRF is being completed in support of the ongoing EIS. The results of the study will be considered in the selection of the final reuse for the WRF. Currently, no other studies are planned once the current program has been completed.

4.3.7 Other Environmental Resources

The identification of other environmental resources, including visual resources, at the WRF is being completed in support of the ongoing EIS. The results of the study will be considered in the selection of the final reuse for the WRF. Currently, no other studies are planned once the current program has been completed.

4.4 Community Involvement/Strategy

Community involvement in the WRF closure process is in its earliest stages of development. The BCT is taking steps toward the establishment of a RAB. The USAEC is currently preparing a PIRP which will provide guidelines for future community involvement actions.

The PIRP will be implemented to facilitate communication among the U.S. Army; other federal, state, or local agencies; and interested groups and other community residents concerning IRP activities at the WRF. This communication will ensure that all parties involved or interested are provided accurate, consistent information in a timely manner concerning related cleanup activities, contaminants, and possible effects of any contamination. It will provide mechanisms for all parties to provide input into the decisionmaking process of the IRP. Community involvement strategies will be developed after the PIRP is completed.

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CHAPTER 5

► ENVIRONMENTAL PROGRAM MASTER SCHEDULES ◄

This chapter presents the WRF Master Schedule of anticipated activities in the installation's environmental programs. These schedules are simplified from detailed network and operational schedules developed to support site/zone-specific Work Plans and compliance agreements. Environmental restoration activities and compliance activities are addressed separately with compliance activities being further subdivided into mission/operational-related and closure-related programs. In addition to these activities, natural and cultural resources activities are also addressed as well as identifying meeting schedules.

5.1 Environmental Restoration Program

This section presents response schedules and outlines fiscal year (FY) requirements for the WRF's environmental restoration program.

5.1.1 *Response Schedules*

The installation's ability to meet the milestones shown on the schedule in Figure 5-1 hinges on (1) the development of conceptual models in zones/OU's under investigation, and (2) the preparation of draft RI reports and baseline risk assessments (i.e., not impeded by discovery of additional sources in the zones/OU's). The schedule detailed in Figure 5-1 is based upon the following general description:

- **1994:** The major emphasis during this calendar year will be characterization of contamination at the WRF. This will be accomplished by performing a Supplemental Site Inspection/Remedial Investigation.
- **1995:** The major emphasis during this calendar year will be the FS and the ROD.
- **1996:** The major emphasis during this calendar year will be upon Remedial Design (RD), if so guided by the ROD.
- **1997:** The major emphasis during this calendar year will be upon RA, if so guided by the ROD.

5.1.2 *Requirements by Fiscal Year*

The detailed requirements information by fiscal year is contained in the WRF BRAC Work Plan and is incorporated into this document by reference. The tables in Appendix A to this document are taken directly from the BRAC Work Plan and provide summary information on funding requirements.

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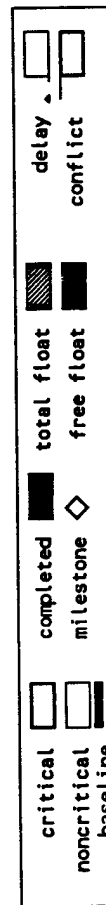
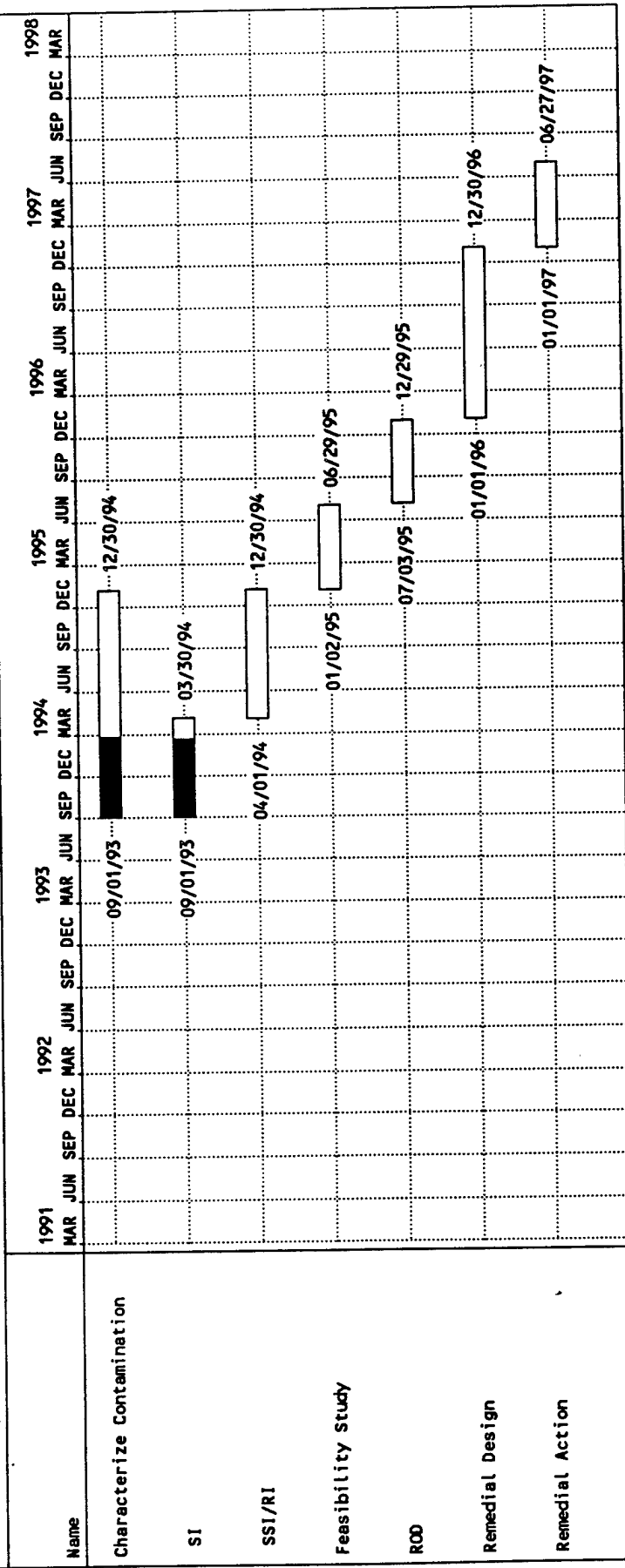
Figure 5-1

PROJECT: Woodbridge Fig 5-1

MANAGER: Robert Craig

CURRENT DATE: 03/01/94

AS OF DATE: 02/23/94



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5.2 Compliance Programs

This section presents master compliance schedules and outlines fiscal year requirements for the WRF environmental compliance programs.

5.2.1 Master Compliance Schedules

The projected master schedule for mission/operational-related compliance programs is illustrated in Figure 5-2. The only activity that falls under this category would be tightness testing of existing USTs. All existing USTs passed tightness tests in December 1993. It should be noted that the tightness testing schedule will vary from UST to UST depending upon the installation date of the tank. At the WRF, existing USTs U-202-5, U-203-2, and U-306-2 will require annual tightness testing to remain in compliance with regulations up to December 1998. At that time, the owner of these USTs must make a determination whether to upgrade or close the USTs, either of which will be required. Existing UST U-202-6 will require tightness testing every five years. Tightness testing is not required for the remaining two existing USTs (U-211-1 and U-306-1) due to their size and contents. For simplicity, Figure 5-2 illustrates the annual tightness testing required for existing USTs U-202-5, U-203-2, and U-306-2 through December 1998 but it should be noted that existing UST U-202-6 will also require tightness testing by December 1998.

The closure-related compliance schedule for the WRF is provided in Figure 5-3. The major emphasis will be characterization of contamination at the WRF during 1994. This will be accomplished by performing the VDEQ Site Characterization Study and Report for applicable USTs as well as the lead-based paint, and asbestos location surveys.

It appears likely that a response action will be required for petroleum contamination at AREEs 8, 23, 24, 30, and 33. If required, this action can be performed outside of the CERCLA restoration schedule. Presently, FY94 funding is available for a petroleum-contamination response which, if required, could occur as early as the 4th quarter of FY94. At this point in time, no other likely interim removal actions have been identified.

5.2.2 Requirements by Fiscal Year

The detailed requirements information by fiscal year is contained in the BRAC Work Plan and is incorporated into this document by reference. The tables in Appendix A to this document are taken directly from the BRAC Work Plan and provide summary information on funding requirements.

5.3 Natural and Cultural Resources

This section presents master natural and cultural resources activity schedules and outlines fiscal year requirements for the WRF natural and cultural resource programs. All natural and cultural resources activities are being completed as part of the ongoing EIS with no other activities planned for the WRF. If additional activities arise in the future, this section will be modified appropriately.

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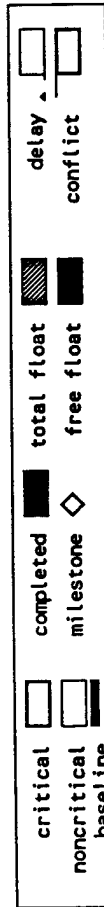
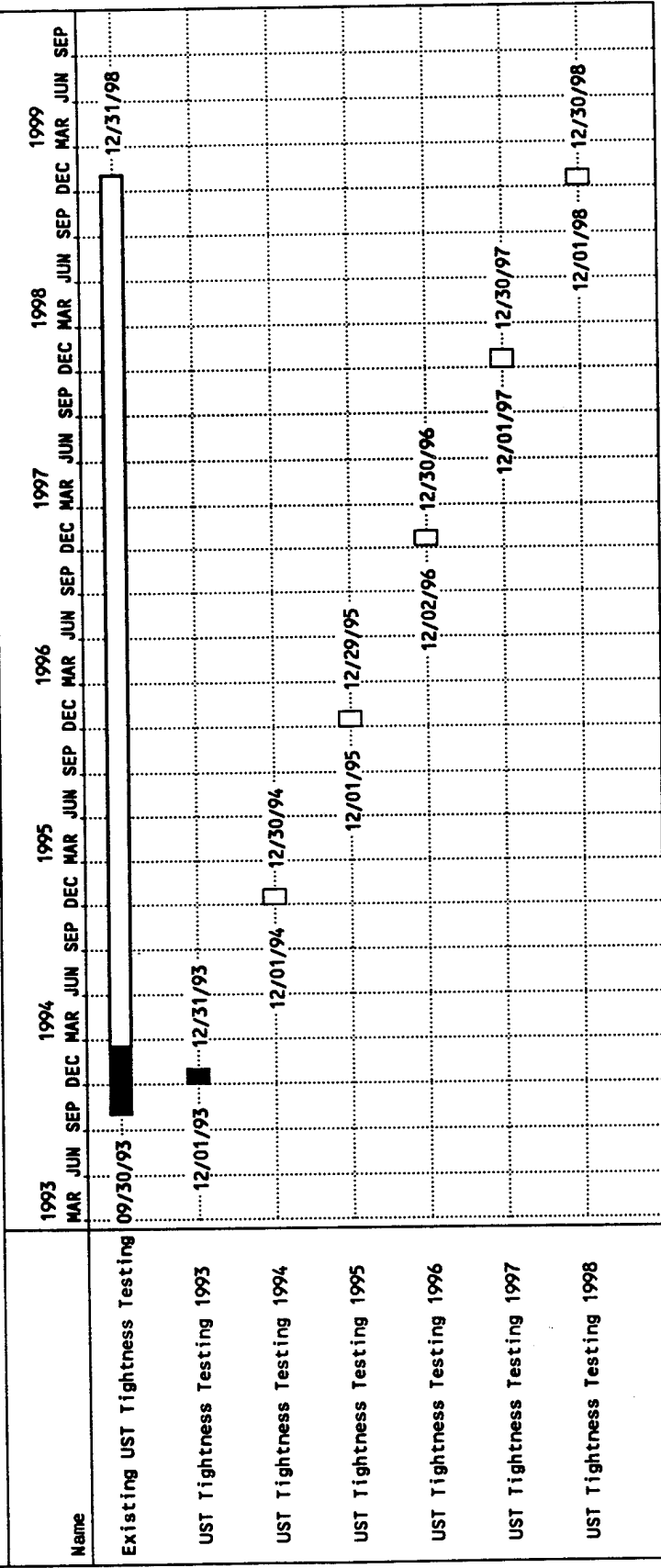
PROJECT: Woodbridge Fig 5-2

MANAGER: Robert Craig

CURRENT DATE: 03/01/94

AS OF DATE: 02/23/94

Figure 5-2



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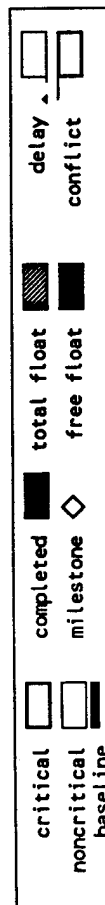
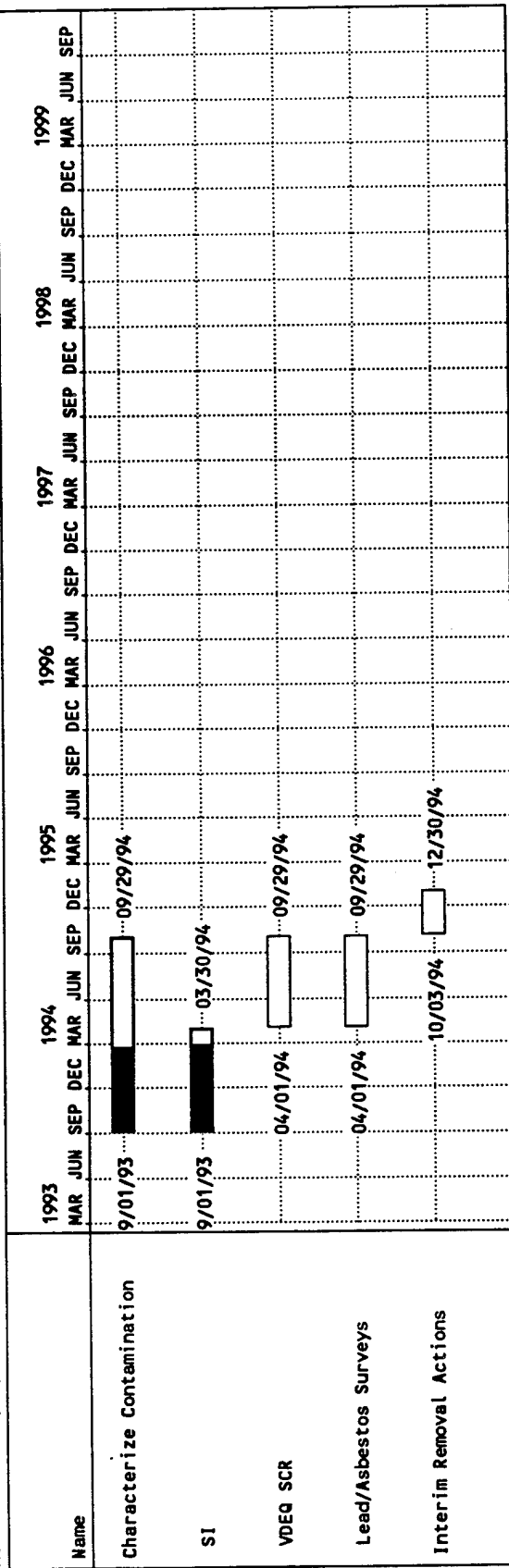
Figure 5-3

PROJECT: Woodbridge Fig 5-3

MANAGER: Robert Craig

CURRENT DATE: 03/01/94

AS OF DATE: 02/23/94



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5.3.1 Natural and Cultural Resources Schedule(s)

There is no natural and cultural resources schedule for the WRF due to the activities pertaining to these areas being completed as part of the ongoing EIS. If additional activities arise in the future, a schedule will be provided as Figure 5-4. Current Figure 5-4 has been provided for informational purposes only.

5.3.2 Requirements by Fiscal Year

No detailed requirements information by fiscal year is contained in the WRF BRAC Work Plan for natural and cultural resources activities due to the activities pertaining to these areas being completed as part of the ongoing EIS. If additional activities arise in the future, tables will be provided in Appendix A of this document that will be taken directly from the BRAC Work Plan and provide summary information on funding requirements.

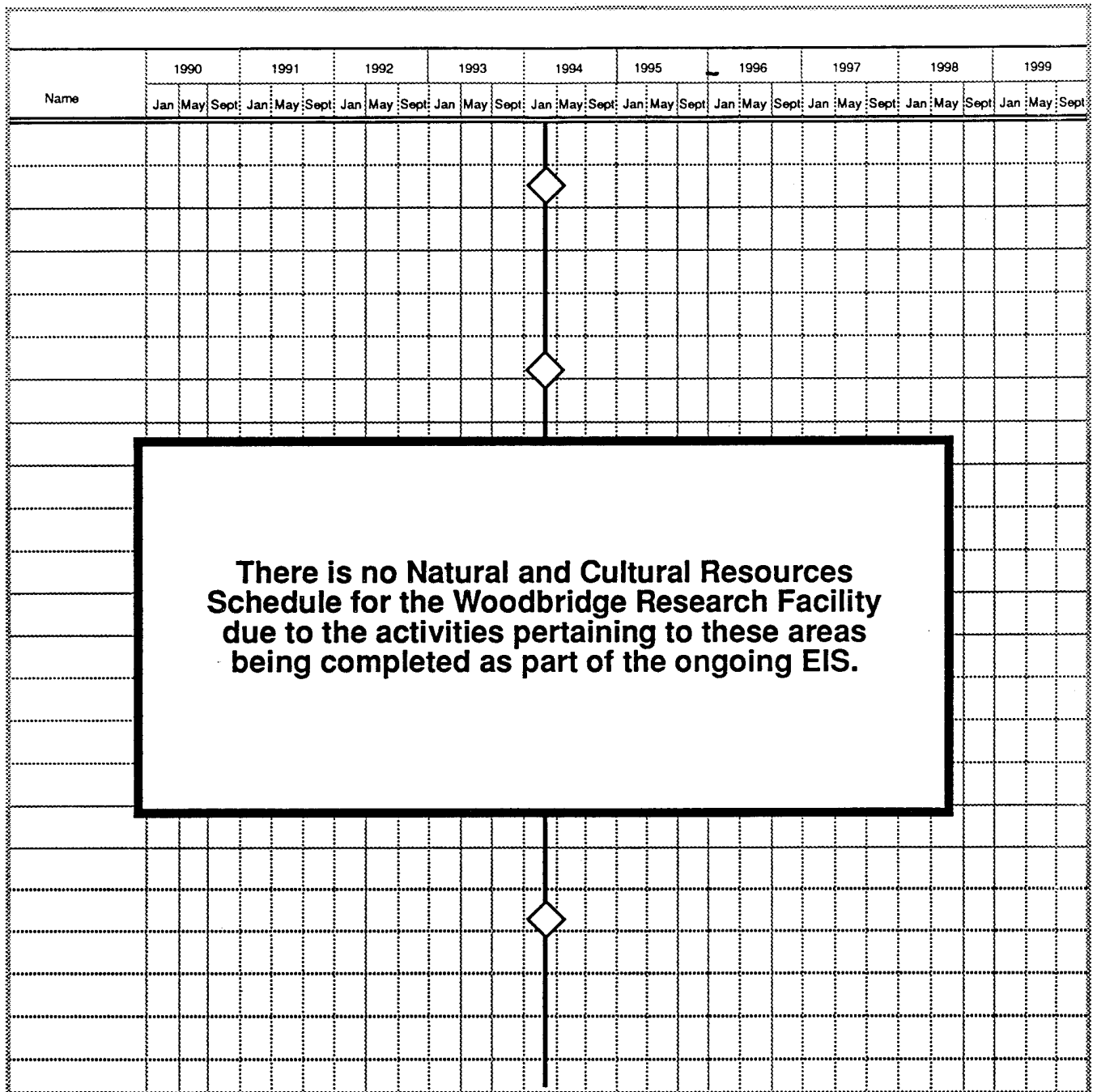
5.4 Meeting Schedule

There are three groups (the BCT, the Woodbridge Reuse Committee, and the RAB) that meet or will meet on a regular basis. Currently, the BCT meets regularly on a monthly basis with the first meeting being held on 10 November 1993. Subsequent meetings were held on 10 December 1993, 10 January 1994, and 24 February 1994. The next planned BCT meeting is scheduled for 24 March 1994 and identified in Table 5-1. Additional meetings are conducted on an as-needed basis. The Woodbridge Reuse Committee was officially sanctioned by the Prince William County Board of Supervisors in February 1994 and currently meets on a weekly basis. The RAB has not yet been established but will meet on a regular basis once the RAB is specified.

TABLE 5-1. BRAC CLEANUP TEAM MEETING SCHEDULE

Date	Topic
24 March 1994	TBD

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EXPLANATION

Natural and Cultural
Resources Schedule

Figure 5-4

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CHAPTER 6

► TECHNICAL AND OTHER ISSUES TO BE RESOLVED ◄

This chapter summarizes technical and other issues that are yet to be resolved. These issues include information management; usability of historical data; data gaps; natural (background) levels of elements and compounds in soil, groundwater, surface water, and sediments; risk assessment; state cleanup standards; and program initiatives to complete cleanup requirements as required to meet property transfer schedules.

6.1 Data Usability

This section identifies issues that need to be resolved with regard to managing information gathered and used in the installation environmental restoration and compliance programs.

6.1.1 BCT Action Items

No BCT action items have been identified at the WRF at this time. If necessary, action items may be identified in the future in order to manage data usability during the BRAC environmental restoration process.

6.1.2 Rationale

As the number of agencies and contractors associated with the WRF disposal and environmental restoration program grows, it is important that all parties involved be able to share data for decision making. The establishment and maintenance of an electronic data base of sampling and analysis data and spatial (e.g., real estate maps) data are the most efficient method of sharing data among parties.

6.1.3 Status/Strategy

A summary of the current status of data usability relative to BRAC cleanup activities at the WRF and strategies which have been developed to address data usability requirements is provided below:

- All historical data generated at the WRF has been loaded into the IRDMIS database
- Data collected in the future will be loaded into IRDMIS as it is generated, subject to inclusion of this requirement in contracts

6.2 Information Management

This section summarizes unresolved issues pertaining to the validity of using historical data sets in the installation environmental restoration program. This section also discusses a possible action item for determining the accuracy and completeness of the RMIS database for the WRF sites.

6.2.1 BCT Action Items

Action items may be identified in the future in order to provide improved information management during the BRAC environmental restoration process. An example could be to ensure the acceptability of data generated through compliance with USEPA and USAEC guidance on data validation and execution of fieldwork in accordance with procedures established in the approved Sampling and Analysis Plan.

The RMIS records should also be reviewed. New sites should be added as necessary with the progression of the SI and the RI. Inaccurate data should be corrected.

6.2.2 Rationale

Historical analytical data can contribute to the completion of site characterizations and risk assessments by filling data gaps. Current and future data from each data collection system (e.g., field laboratories, field screening techniques) are critical to the completion of site characterization efforts, comprehensive conceptual model development, risk assessments, and ultimately the selection of remedial actions to protect human health and the environment.

6.2.3 Status/Strategy

There are no BCT action items to change information management efforts currently ongoing at the WRF. At the present time, data from field investigations are entered into IRDMIS. This database will be used to generate reports and analyze data.

6.3 Data Gaps

This section summarizes unresolved issues pertaining to the determination and collection of data needed to complete the WRF environmental restoration program.

6.3.1 BCT Action Items

The currently proposed investigations (Supplemental SI, RI, VDEQ response actions, asbestos survey, lead-based paint survey) are considered actions identified to fill data gaps. As the investigations continue, additional action items may be outlined to address future data gaps and continue the BRAC environmental restoration process.

6.3.2 Rationale

Effective identification and filling of data gaps will permit the development of comprehensive conceptual zone or site models for site characterization and risk assessment. Analysis of data gaps will also facilitate the completion of RI efforts so that appropriate remedial actions can be identified and evaluated. This information will also facilitate the identification of clean areas at the WRF.

6.3.3 Status/Strategy

With the BCT action items that are in place to identify and fill data gaps, strategies to fill future data gaps will be developed as needed. An example of a strategy could include BCT meetings to resolve data gap issues prior to the execution of additional field work with the coordination process continuing as an integral part of the investigations leading to remedial actions.

6.4 Background Levels

This section summarizes unresolved issues pertaining to documenting background levels for the WRF environmental restoration program.

6.4.1 BCT Action Items

No BCT action items have been identified at the WRF relative to documenting background levels. The establishment of background concentrations of elements in the environment at the WRF for use in baseline risk assessment computations will be conducted during the RI portion of the IRP process.

6.4.2 Rationale

Background concentration values of elements in the soil, groundwater, surface water, and sediments need to be determined before risk assessments can be conducted. The values must be representative of naturally occurring elements and their concentrations. These values must be concurred with by USEPA and state regulators.

6.4.3 Status/Strategy

A summary of the current status of background level documentation at the WRF and strategies which have been developed to further identify background cleanup levels is provided below:

- ▶ During the SI, three background soil samples were collected at the WRF.
- ▶ RI activities will include a comprehensive sampling effort to establish background soil, sediment, groundwater and surface water conditions at the WRF.

6.5 Risk Assessments

This section summarizes unresolved issues pertaining to the completion of risk assessments required to complete the WRF environmental restoration and compliance programs.

6.5.1 BCT Action Items

No BCT action items have been identified at the WRF relative to the completion of environmental restoration and compliance program risk assessments. An example action item could include continuing evaluation of anticipated land use as a criterion in selecting assumptions in the exposure assessment.

6.5.2 Rationale

Due to the fact that no BCT action items have been developed relative to risk assessments, no rationale has been developed either. For the example given in Section 6.5.1, a rationale could be that anticipated or known land uses need to be considered in exposure assessment assumptions.

6.5.3 Status/Strategy

Risk assessment protocols to be employed at the WRF and strategies to improve these protocols have not been developed. Future land use scenarios for risk assessment and development of remedy selections at the WRF may be developed at a later date and summarized in Table 6-1. Table 6-1 has been included for informational purposes only.

6.6 Basewide Remedial Action Strategy

The BCT will develop a remedial action strategy based on the results of the ongoing environmental investigations at the WRF. Action items currently being addressed are discussed below.

6.6.1 BCT Action Items

The BCT plans to update the BCP semi-annually including revisions to the remediation schedule. A budget addressing current and projected funding needs has been developed and will be modified as necessary to reflect changes in the BCP.

6.6.2 Rationale

The basewide remedial action strategy will be structured to achieve investigation of potentially contaminated sites as quickly as possible and to expedite any necessary remedial actions while controlling costs.

TABLE 6-1. FUTURE LAND USE RISK ASSESSMENT FOR DEVELOPMENT OF REMEDY SELECTIONS

Site ID	Risks	Contaminants			Current Use	Adjacent Uses	Anticipated Uses
		Groundwater	Soil	Surface/Sediment			
	Risk assessment protocols to be employed and strategies to improve these protocols have not been developed.						

6.6.3 Status/Strategy

Environmental investigations are proceeding at the WRF. The results of these investigations will be used to develop a basewide remedial action strategy.

6.7 Interim Monitoring of Groundwater and Surface Water

Interim monitoring of groundwater and surface water was conducted at the WRF between 1985 and 1990 to monitor PCB concentrations. At the present time, there is no routine monitoring of groundwater or surface water.

6.7.1 BCT Action Items

At the present time, there is no routine monitoring of groundwater or surface water at the WRF. Baseline groundwater samples are being collected and analyzed as part of the ongoing environmental investigations at the WRF. The BCT will evaluate the need for routine monitoring based on the results of these investigations.

6.7.2 Rationale

If the results of the ongoing environmental investigations indicate the need for interim monitoring of groundwater and surface water, the BCT will develop a plan to execute these activities. Sampling and analysis efforts will target specific analytes, sampling locations, and sampling frequencies. Selection of these parameters will be based on the results of previous investigative efforts.

6.7.3 Status/Strategy

If necessary, the BCT will develop a plan for interim monitoring of groundwater and surface water at the WRF. The plan will be based on the results of ongoing environmental investigations.

6.8 Excavation of Contaminated Materials

No excavation of contaminated materials has been identified at the WRF. This activity will be addressed in the future as appropriate.

6.8.1 BCT Action Items

If ongoing environmental investigations at the WRF identify contaminated materials requiring excavation, the BCT will incorporate this activity into the WRF remedial action strategy.

6.8.2 Rationale

If ongoing environmental investigations at the WRF identify source areas that can be removed by excavation, or other contaminated materials requiring excavation, the BCT will address this need through the basewide remedial strategy.

6.8.3 Status/Strategy

At the present time, no contaminated materials requiring excavation have been identified at the WRF. The BCT will develop a strategy for excavation activities on an as-needed basis.

6.9 Protocols for Remedial Design Reviews

At the present time, environmental investigations are proceeding at the WRF. When these ongoing investigations are complete, it may be necessary to develop remedial designs.

6.9.1 BCT Action Items

If ongoing environmental investigations at the WRF identify a need to develop remedial designs, the BCT will adopt remedial design protocols as part of the basewide remedial strategy.

6.9.2 Rationale

If remedial designs are required, review of the designs is critical to ensure they will achieve cleanup goals and that they are technically and administratively feasible. The BCT will adopt remedial design review protocols, if necessary, as part of the basewide remedial strategy.

6.9.3 Status/Strategy

At the present time, environmental investigations are ongoing at the WRF. The results of the investigations will be used to determine if remedial designs are necessary. If designs are necessary, the BCT will adopt review protocols as part of the basewide remedial strategy.

6.10 Conceptual Models

The BCT will develop conceptual models as needed for sites at the WRF. The first item included in a conceptual site model is a description of the site and source characterization. Site characterization activities are currently underway at the WRF, therefore, only brief site descriptions are provided in Appendix E.

6.10.1 BCT Action Items

As the current environmental investigations at the WRF are completed, the BCT will develop conceptual models. The models will be updated by the BCT as new information becomes available.

6.10.2 Rationale

Conceptual site models will be developed based on the results of past and current investigations. The conceptual models will be used to identify data gaps, and during identification and evaluation of potential remedial alternatives, if necessary.

6.10.3 Status/Strategy

As the current environmental investigations at the WRF are completed, the investigation results will be reviewed, evaluated, and integrated with existing data to develop conceptual models. The models will focus on identification of source areas, the potential extent of contamination, potential contaminant migration pathways, and identification of potential receptors.

6.11 Cleanup Standards

If site remediation is required, it is necessary to establish cleanup standards. The standards are used to identify remedial alternatives capable of achieving cleanup goals, and the time at which remediation is complete.

6.11.1 BCT Action Items

If it is necessary to remediate sites at the WRF, the BCT will identify contaminants of concern and establish cleanup standards.

6.11.2 Rationale

If it is necessary to remediate sites at the WRF, cleanup standards will be established by the BCT. Cleanup standards may be based on ARARs or they may be based on estimates of risk. ARARs will be identified and risk will be estimated for potential contaminants of concern, if necessary. The cleanup standards will be selected after review and evaluation of ARARs, risk estimates, and review of potential future land use.

6.11.3 Status/Strategy

Both ARARs and risk-based cleanup goals will be evaluated prior to selection of final cleanup goals. Selection of final cleanup goals will take into consideration potential future land use (e.g., residential, agricultural, or industrial). Tables 6-2 and 6-3 are provided to illustrate two of the many possible areas (human health and surface water) where cleanup standards may be established.

TABLE 6-2. HUMAN HEALTH STANDARDS

Contaminant	Concentration Level (mg/L)
Once cleanup standards have been developed, a table similar to this can be provided.	

TABLE 6-3. SURFACE WATER STANDARDS

Constituent/Parameter	Concentration Limit/Criteria
Once cleanup standards have been developed, a table similar to this can be provided.	

6.12 Initiatives for Accelerating Cleanup

Implementation of initiatives for accelerated cleanup may be desirable at the WRF to facilitate property transfer efforts. A DSMOA for the WRF was instituted in 1990, which may help expedite the clean up process.

6.12.1 BCT Action Items

The BCT will make every effort to take the initiative in implementation of any necessary cleanup activities to facilitate transfer of the WRF. Potential initiatives for accelerated cleanup include concurrent document preparation; fast-track design, review, and construction of remedial systems; excavation or removal of hot spots or continuing sources; and use of presumptive remedies.

6.12.2 Rationale

It may be desirable to initiate accelerated cleanups at the WRF to facilitate the property transfer process.

6.12.3 Status/Strategy

At the present time, environmental investigations are ongoing at the WRF. If these investigations indicate the need for remediation, cleanup initiatives which are capable of meeting cleanup standards, and are technically and administratively feasible will be identified. The time required to achieve cleanup standards will be considered during selection of cleanup approaches. Cleanup initiatives will be expedited as much as possible and will be incorporated into the basewide remedial action strategy.

6.13 Remedial Actions

At the present time, environmental investigations are proceeding at the WRF. The results of these investigations will be used to determine if remedial actions are necessary.

6.13.1 BCT Action Items

If the results of ongoing environmental investigations at the WRF indicate remedial actions are required, the BCT will review all available data to select appropriate remedial alternatives.

6.13.2 Rationale

If remedial actions are necessary at the WRF, the BCT will select **alternatives** that are capable of achieving cleanup standards in a timely and cost-effective manner.

6.13.3 Status/Strategy

Remedial actions will be incorporated into the basewide remedial action strategy. Selection of remedial alternatives will be based on data from ongoing environmental investigations, evaluation of cleanup standards, and the technical and administrative feasibility of potential alternatives.

6.14 Review of Selected Technologies for Application of Expedited Solutions

Expedited implementation of remedial technologies may be desirable at the WRF to facilitate property transfer efforts. A DSMOA for the WRF was instituted in 1990, which may help expedite the clean up process.

6.14.1 BCT Action Items

The BCT will make every effort to expedite implementation of any necessary remedial technologies to facilitate transfer of the WRF. Potential methods for expediting implementation include concurrent document preparation; fast-track design, review, and construction of remedial systems; excavation or removal of hot spots or continuing sources; and use of presumptive remedies.

6.14.2 Rationale

It may be desirable to expedite implementation of remedial technologies at the WRF to facilitate the property transfer process.

6.14.3 Status/Strategy

At the present time, environmental investigations are ongoing at the WRF. If these investigations indicate the need for remediation, remedial technologies which are capable of meeting cleanup standards, and are technically and administratively feasible will be identified. The time required to achieve cleanup standards will be considered during selection of remedial technologies. Implementation of the selected technologies will be expedited as much as possible and will be incorporated into the basewide remedial action strategy.

6.15 Hot Spot Removals

At the present time, no hot spots have been identified at the WRF. If hot spots are identified, removal of these spots may be desirable to remove a continuing source of contamination.

6.15.1 BCT Action Items

If hot spots are identified at the WRF, the BCT will review the situation to determine if removal of the hot spots will expedite cleanup and property transfer efforts. If these efforts will be expedited by a hot spot removal, the BCT may elect to incorporate this approach into the basewide remedial action strategy.

6.15.2 Rationale

Hot spot removals may expedite any required cleanup efforts and facilitate property transfer. If appropriate, hot spot removals may be used to achieve these goals.

6.15.3 Status/Strategy

At the present time, no hot spots have been identified at the WRF. The BCT will develop a strategy for hot spot removals on an as-needed basis.

6.16 Identification of Clean Properties

Clean properties will be identified as early in the BRAC process as possible to facilitate property transfer.

6.16.1 BCT Action Items

As clean properties are identified or become available for property transfer, the BCT will update the BCP.

6.16.2 Rationale

It is necessary to identify clean properties as part of the property transfer effort.

6.16.3 Status/Strategy

Section 3.4.5 of this BCP describes the suitability of base property for transfer. The CERFA process is being used as a screening mechanism to expeditiously identify properties that are immediately transferable. The properties have been designated CERFA parcels and CERFA parcels with qualifiers. Figure 3-3 illustrates these parcels which are immediately transferable. The U.S. Army is continuing the suitable property for transfer identification process.

6.17 Overlapping Phases of the Cleanup Process

At the present time, ongoing environmental investigations at the WRF include a RI, SSI, and VDEQ response actions. These activities are concurrent.

6.17.1 BCT Action Items

The BCT has coordinated the ongoing environmental investigations at the WRF to avoid redundant efforts, and to ensure data comparability.

6.17.2 Rationale

Overlapping phases of the cleanup process can expedite remediation efforts, if necessary, and facilitate property transfer.

6.17.3 Status/Strategy

At the present time, RI, SSI, and VDEQ response activities are proceeding concurrently at the WRF. If additional investigations or remedial activities are necessary, it may be desirable to conduct them concurrently as part of the basewide remedial action strategy to expedite property transfer efforts.

6.18 Improved Contracting Procedures

At the present time, environmental contractors working at the WRF are under contract to USAEC on a time and materials basis.

6.18.1 BCT Action Items

No BCT action items regarding contracting have been identified.

6.18.2 Rationale

Any unresolved technical issues relative to improved contracting procedures will be addressed in future revisions to this BCP, as needed.

6.18.3 Status/Strategy

At the present time, there is one environmental contractor working at the WRF on a time and materials basis.

6.19 Interfacing with the Community Reuse Plan

Interface with the community reuse plan is desirable to expedite potential implementation of remedial actions, and early identification and transfer of parcels to the community. The community reuse plan has not been completed for the WRF as of 24 February 1994.

6.19.1 BCT Action Items

No BCT action items have been identified regarding the community reuse plan.

6.19.2 Rationale

Coordination with the community reuse plan helps ensure selection of appropriate cleanup standards, and smooth implementation of any necessary remedial alternatives, ultimately resulting in successful transfer of property.

6.19.3 Status/Strategy

Once the community reuse plan has been completed, the BCT will use the plan to expedite any remedial efforts to assist in property transfer to the community.

6.20 Bias for Cleanup Instead of Studies

Whenever possible, the BCT will select early cleanup rather than additional studies of potentially contaminated sites. This approach will expedite early achievement of cleanup goals and transfer of property.

6.20.1 BCT Action Items

The BCT will make every effort to implement any necessary remedial technologies as soon as possible to facilitate transfer of the WRF. Potential methods for expediting implementation include concurrent document preparation; fast-track design, review, and construction of remedial systems; excavation or removal of hot spots or continuing sources; and use of presumptive remedies.

6.20.2 Rationale

Early implementation of remedial alternatives will reduce the need for additional studies of potentially contaminated sites and will accelerate completion of cleanup activities. This in turn will facilitate property transfer efforts.

6.20.3 Status/Strategy

At the present time, environmental investigations are ongoing at the WRF. If these investigations indicate the need for remediation, remedial technologies which are capable of meeting cleanup standards, and are technically and administratively feasible will be identified as soon as possible. The time required to achieve cleanup standards will be considered during selection of remedial technologies. Implementation of the selected technologies will be expedited as much as possible and will be incorporated into the basewide remedial action strategy.

6.21 Expert Input on Contamination and Potential Remedial Actions

At the present time, the WRF is drawing on the expertise of USAEC and its contractors, as well as in-house experts on an as-needed basis to address potential contamination and potential remedial actions.

6.21.1 BCT Action Items

The BCT is currently utilizing USAEC and its contractors to execute ongoing field investigations at the WRF and to develop associated reports and documents.

6.21.2 Rationale

The environmental staff at the WRF is not large enough to conduct field work in addition to its other responsibilities. USAEC has been requested to provide contract services to complete this work in order to expedite the property transfer process.

6.21.3 Strategy/Status

At the present time, USAEC and its contractors are providing RI, SSI, and VDEQ response action support services.

6.22 Presumptive Remedies

The USEPA has issued guidance on presumptive remedies for a few specific contamination scenarios, e.g., one of the presumptive remedies for vadose zone volatile organic compound contamination is soil vapor extraction. Some of these presumptive remedies may be applicable to the WRF if ongoing environmental investigations identify sites with contamination scenarios similar to those in the presumptive remedy guidance.

6.22.1 BCT Action Items

At the present time, environmental investigations are ongoing at the WRF and contamination scenarios are under development. When the results of the current investigations become available, the BCT may wish to consider the use of presumptive remedies to avoid the need for a FS and to expedite implementation of the basewide remedial action strategy.

6.22.2 Rationale

The use of presumptive remedies may potentially expedite the cleanup process by eliminating the need for a FS and allowing early implementation of cleanup technologies.

6.22.3 Status/Strategy

If necessary, contamination scenarios for the WRF will be developed based on the results of current environmental investigations. If the WRF scenarios are similar to those in USEPA presumptive remedy guidance, the BCT may elect to move directly to remediation efforts without FS to expedite cleanup and property transfer activities.

6.23 Partnering (Using Innovative Management, Coordination, and Communication Techniques)

Partnering is the process of fostering cooperation and communication between key players in the BRAC process.

6.23.1 BCT Action Items

At the present time, the BCT is actively fostering partnerships with USAEC, the community, and regulatory agencies through scheduled meetings and the document review process.

6.23.2 Rationale

Close cooperation/coordination between the WRF, USAEC, the community, and regulators helps foster good working relationships, and can accelerate implementation of the basewide remedial action strategy by keeping "key players" informed of the status of environmental efforts, soliciting their input, and addressing potential concerns early in the process.

6.23.3 Status/Strategy

The BCT plans to continue its activities and to encourage information transfer between the WRF, USAEC, the community, and regulators.

6.24 Updating the CERFA Report and Natural/Cultural Resources Documentation

At the present time, the WRF natural and cultural resources are well documented. The CERFA report, including parcel classifications, will be updated as necessary based on the results of ongoing environmental investigations at the WRF.

6.24.1 BCT Action Items

The BCT will update the CERFA report, including parcel classifications, as necessary when the results of ongoing environmental investigations at the WRF become available.

6.24.2 Rationale

Updates of the CERA report are necessary to reflect changes in parcel classification based on the results of environmental investigations and potential remedial actions. It is anticipated that parcel reclassification will ultimately result in most, if not all, of the WRF becoming eligible for property transfer.

6.24.3 Status/Strategy

The BCT will periodically review the CERFA report in conjunction with new data from environmental investigations and potential remedial actions to determine if parcels can be reclassified to allow property transfer.

6.25 Implementing the Policy for On-Site Decision Making

If decisions leading to investigation, potential remediation, and transfer of the WRF can be made onsite, implementation of the basewide remedial action strategy will be expedited.

6.25.1 BCT Action Items

At the present time, the BCT is actively fostering partnerships with USAEC, the community, and regulatory agencies through scheduled meetings and the document review process. This will enhance the BCT's ability to make effective onsite decisions and will speed the BRAC process.

6.25.2 Rationale

Close cooperation/coordination between the WRF, USAEC, the community, and regulators helps foster good working relationships, and can accelerate implementation of the basewide remedial action strategy by keeping "key players" informed of the status of environmental efforts, soliciting their input, allowing effective onsite decision making, and addressing potential concerns early in the process.

6.25.3 Status/Strategy

The BCT plans to continue its activities and to encourage information transfer between the WRF, USAEC, the community, and regulators.

6.26 Structural and Infrastructure Constraints to Reuse

At the present time, no structural or infrastructure constraints to reuse of the WRF have been identified.

6.26.1 BCT Action Items

If structural and infrastructure constraints to reuse of the WRF are identified, the BCT will evaluate approaches for overcoming these constraints, or for alternative reuses, so the property can be transferred.

6.26.2 Rationale

Potential structural and infrastructure constraints must be overcome, or alternative reuses must be identified, to allow transfer of the WRF.

6.26.3 Status/Strategy

At the present time, no structural or infrastructure constraints to reuse of the WRF have been identified.

6.27 Other Technical Reuse Issues to be Resolved

At the present time, no other technical reuse issues have been identified.

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CHAPTER 7

► REFERENCES ◀

The following is a list of primary documents utilized in the development of this BCP.

Arthur D. Little, Inc. 1993. Draft Report, Supplementary Preliminary Assessment, Community Environmental Response Facilitation Act (CERFA PA), Woodbridge Research Facility, Woodbridge, Virginia. October 8, 1993.

Bionetics. 1991. Installation Assessment, U.S. Army Base Closure Program, Woodbridge Research Facility. September 1991.

Environmental Science & Engineering, Inc. 1981. Installation Assessment of ERADCOM Activities. July 1981.

Environmental Science & Engineering, Inc. 1984. Plan for the Assessment of Contamination at Woodbridge Research Facility. April 1984.

Environmental Science & Engineering, Inc. 1984. Remedial Action Plan for the Woodbridge Research Facility PCB Disposal Site. July 1984.

Environmental Science & Engineering, Inc. 1985. Remedial Investigation and Feasibility Study at Woodbridge Research Facility. April 1985.

Roy F. Weston, Inc. 1985. Woodbridge Research Facility Remediation of PCB Contamination, Technical Plan. February 1985.

Roy F. Weston, Inc. 1985. Closure Plan for Transformer/Capacitor Burial Trench Harry Diamond Laboratories Woodbridge Research Facility. March 1985.

Roy F. Weston, Inc. 1986. Final Report, Remediation of PCB Contamination at Woodbridge Research Facility. May 1986.

Roy F. Weston, Inc. 1992. Enhanced Preliminary Assessment, Woodbridge Research Facility. June 1992.

The Earth Technology Corporation. 1993. Draft Final Work Plan, Woodbridge Research Facility. September 1993.

The Earth Technology Corporation. 1993. Preliminary Draft Public Involvement and Response Plan (PIRP), Woodbridge Research Facility, Woodbridge, Virginia. November 1993.

Thunderbird Archeological Associates. 1985. An Archeological Overview and Management Plan for the Harry Diamond Laboratories - Woodbridge Research Facility. July 1985.

U.S. Army Corps of Engineers. 1992. Draft Environmental Assessment, Harry Diamond Laboratories Woodbridge, Virginia, Research Facility Base Closure. June 1992.

U.S. Army Laboratory Command. 1989. Environmental Assessment of the Woodbridge Research Facility Operations. July 1989.

USATHAMA. 1988. Remedial Action Decision Document, Landfills 1 and 2 Woodbridge Research Facility. January 1988.

U.S. Department of the Army. 1993. Preliminary Draft Environmental Impact Statement, Woodbridge Research Facility, Disposal/Reuse. June 1993.

APPENDIX A

► FISCAL YEAR FUNDING REQUIREMENTS/COSTS ◄

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TABLE A-1. TOTAL ENVIRONMENTAL PROGRAM SUMMARY

FUND REQUIREMENTS (\$000)						
Program	FY 1993	FY 1994	FY 1995	FY 1996	FY 1997	Total
IRP DERA	0	0	0	0	0	0
IRP BRAC	1170	538	1620	620	20	3968
EC-CR	0	55	70	0	0	125
EC-MR	0	0	0	0	0	0
NAT/CULT	0	0	0	0	0	0
Total	1170	593	1690	620	20	4093

**TABLE A-2. HISTORICAL ENVIRONMENTAL
PROGRAM EXPENDITURES SUMMARY**

FUND REQUIREMENTS (\$000)		
Program	FY 1993	Total
IRP DERA	0	0
IRP BRAC	912	912
EC-CR	0	0
EC-MR	0	0
NAT/CULT	0	0
Total	912	912

Figure A-1

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Name	1990			1991			1992			1993			1994			1995			1996			1997			1998			1999		
	JAN	MAY	SEP	JAN	MAY	SEP	JAN	MAY	SEP	JAN	MAY	SEP	JAN	MAY	SEP	JAN	MAY	SEP	JAN	MAY	SEP	JAN	MAY	SEP	JAN	MAY	SEP	JAN	MAY	SEP
ZONE 1W																														
SITE 25 PA																														

critical 

noncritical 

baseline 

completed 

milestone 

total float 

free float 

delay 

conflict 

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APPENDIX B

► INSTALLATION ENVIRONMENTAL RESTORATION DOCUMENTS SUMMARY TABLES ◀

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TABLE B-1. PROJECT DELIVERABLES

Year	Phase	Project Title	Report #	Sites Examined	Deliverable Date/By Whom
1991	PA	Visual inspection, records search, interviews	1	AREEs 1 through 28	Enhanced Preliminary Assessment Report 1992, Roy F. Weston, Inc.
1993	PA	Visual inspection, records search, interviews	2	AREEs 1 through 30	Supplemental Preliminary Assessment, Community Environmental Response Facilitation Act (CERFA PA) Draft Report 8 October 1993, Arthur D. Little, Inc.
Ongoing	SI	Confirm and quantify	3	AREEs 1 through 8, 11 through 14, 17 through 23, 25, 26, and 27	Ongoing, The Earth Technology Corporation

TABLE B-2. SITE DELIVERABLES

Site ID	PA/SI	RI/FS	RD/RA	Close Out	IRA	LTM	NFRAP
AREE 1	1, 2, 3						
AREE 2	1, 2, 3						
AREE 3	1, 2, 3						
AREE 4	1, 2, 3						
AREE 5	1, 2, 3						
AREE 6A	1, 2, 3						
AREE 6B	1, 2, 3						
AREE 7	1, 2, 3						
AREE 8	1, 2, 3						
AREE 9	1, 2						
AREE 10	1, 2						
AREE 11	1, 2, 3						
AREE 12	1, 2, 3						
AREE 13	1, 2, 3						
AREE 14	1, 2, 3						
AREE 15	1, 2						
AREE 16	1, 2						
AREE 17	1, 2, 3						
AREE 18	1, 2, 3						
AREE 19	1, 2, 3						
AREE 20	1, 2, 3						
AREE 21	1, 2, 3						
AREE 22	1, 2, 3						
AREE 23	1, 2, 3						
AREE 24	1, 2						
AREE 25	1, 2, 3						
AREE 26	1, 2, 3						
AREE 27	1, 2, 3						
AREE 28	1, 2						
AREE 29	2						
AREE 30	2						

**TABLE B-3. TECHNICAL DOCUMENTS/DATA
LOADING STATUS SUMMARY**

Date	Title	Site/OU	Contractor	Service Center	IRDMIS Status/Other
1993	Preliminary SI Data	AREEs 1 through 8, 11 through 14, 17 through 23, 25, 26, and 27	TETC/PRI	USAEC	Loading complete

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APPENDIX C

► DECISION DOCUMENT/ROD SUMMARIES ◀

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APPENDIX C

► DECISION DOCUMENT/ROD SUMMARIES ◄

As of 24 February 1994, the WRF has not prepared any Records of Decision (RODs) nor Decision Documents (DDs). Once RODs or DDs have been finalized a summary of the documents will be presented in this appendix.

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APPENDIX D

► NO FURTHER RESPONSE ACTION PLANNED (NFRAP) SUMMARIES ◄

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APPENDIX D

► NO FURTHER RESPONSE ACTION PLANNED (NFRAP) SUMMARIES ◄

As of 24 February 1994, the WRF has not prepared any Decision Documents (DDs) for any no further response action planned (NFRAP) activity. The final determination at several of the WRF sites is NFRAP and once DDs have been finalized summaries of the documents will be presented in this appendix.

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APPENDIX E

► CONCEPTUAL SITE MODEL DATA SUMMARIES ◀

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APPENDIX E

► CONCEPTUAL SITE MODEL DATA SUMMARIES ◀

As of 24 February 1994, there were 35 AREEs identified at the Woodbridge Research Facility (WRF). Most of these AREEs (29) were initially identified by the Enhanced Preliminary Assessment (EnPA) Report published in March 1992. The remaining six AREEs were identified subsequent to the date of that report.

In September and October 1993, a team of investigators conducted on-site sampling activities at 23 AREEs, pursuant to a contract with the U.S. Army Environmental Center (USAEC) to conduct a Site Inspection (SI). Analytical results from this sampling exercise became available in December 1993.

This Appendix provides a brief chronological history of each AREE.

AREE 1

Landfill No. 1

AREE 1 is an 0.4 acre landfill located at the intersection of Deephole Point Road and Shady Road. The landfill was reportedly used as a disposal site for construction debris including concrete and scrap metal. Some PCB-containing capacitors may also have been disposed at this site. There is no record of when disposal began at AREE 1, but all disposal reportedly ceased in 1973.

Also in 1973, it was reported that a trench approximately 60 feet long was excavated in order to bury wooden boxes along the slope of the adjacent shoreline. The reason for this activity was reportedly to provide shore erosion control.

A remedial investigation (RI) was completed for the landfill between January and May of 1984. The study showed that polychlorinated biphenyls (PCBs) were detected at low concentrations in sediment samples taken from the landfill. (PCBs were not detected in surface water samples at that time.) In addition, bis(2-ethylhexyl)phthalate and di-n-octyl phthalate were detected in a surface water sample. As a result of the RI, six monitoring wells were installed at the site between January and February of 1985. These six wells, and six additional wells located at AREE 2, were subjected to a five-year groundwater monitoring program that ended in June 1990. At AREE 1, the highest PCB levels detected in groundwater occurred in 1990, when PCB-1221, PCB-1232, PCB-1242, PCB-1248, and PCB-1254 were all detected at MW-10 at a level of 2.0 parts per billion (ppb). (These numbers were suspected of being inaccurate, but the program ended with no followup action on this question.)

The March 1992 EnPA Report suggested that asbestos-containing materials (ACM) and petroleum products may also have been disposed at this site.

In March 1993, surface water samples were collected by representatives of the Virginia Water Control Board. One sample contained PCB-1260 at a level of 15 parts per billion (ppb).

The late-1993 SI sampling program identified acetone in one groundwater sample at a level of 13 ppb. PCB-1260 was detected in soil samples taken from one trench at levels of 31 and 74 parts per million (ppm). PCB-1242 was detected in a soil sample taken from a second trench at a level of 244 ppb.

AREE 1 will be further studied as a part of the upcoming RI.

AREE 2

Landfill No. 2

The landfill associated with AREE 2 is located at the end of Lake Drive. This landfill was utilized as a disposal area for PCB-containing transformers and capacitors in the early 1970's. An RI/FS study was completed for the landfill between January and May 1984. Six groundwater monitoring wells were installed as part of the RI. The investigation identified PCB contamination within the landfill site. No PCBs were detected beyond the limits of the landfill. The RI concluded that PCBs had not migrated from within the disposal area. The FS recommended removal and offsite disposal of contaminated material.

Removal and offsite disposal of contaminated material was completed in 1985. Six transformers and 85 capacitors were recovered, and PCB-contaminated soil was excavated until the soil remaining in the excavation area tested clean (or essentially clean) for PCBs. The transformers, other debris, and soil were disposed at a hazardous waste landfill in New York. Subsequent to the restoration action, a five-year groundwater sampling program was initiated in 1985 to monitor for PCB contamination. PCBs were detected in these wells at ppb-levels in every year of the program. The highest recorded level occurred in 1990 at MW-2, when PCB-1221 was detected at a level of 7.0 ppb. Similar to the case at AREE 1, the data collected in the 1990 sampling exercise were suspected of being inaccurate, but the program ended with no followup action being taken.

The late-1993 SI sampling program identified PCB-1260 in three sediment samples, at levels of 140 ppb, 130 ppb, and 70 ppb, respectively. No other contamination was detected. AREE 2 will be further studied as a part of the upcoming RI.

AREE 3

Landfill No. 3

AREE 3 is a landfill located just to the north of AREE 2. Approximate dimensions of the landfill were reported in the EnPA as 100 feet by 25 feet by 10 feet deep. Reportedly, debris such as wood, wire coated with lead, paper, and plastic were disposed at this site as early as 1966, until 1973 when the landfill was covered with soil.

The late-1993 SI sampling program confirmed the presence of a landfill, and detected acetone in groundwater at a level of 18 ppb. No PCBs or pesticides were detected. AREE 3 will be further studied as a part of the upcoming RI.

AREE 4

Landfill No. 4

AREE 4 is a landfill located just south of Deephole Point Road and west of Shady Road. Reportedly, debris such as wire, wood, concrete, pipe insulation, and empty oil drums were disposed at this site from the late 1950s until 1973 when the landfill was covered with soil.

The late-1993 SI sampling program confirmed the presence of a landfill. Contamination was detected in one soil sample, which contained PCB-1260 at a level of 850 ppb, and total petroleum hydrocarbons (TPH) at a level of 221 ppm. AREE 4 will be further studied as a part of the upcoming RI.

AREE 5

Landfill No. 5

AREE 5 is a landfill located just to the east of Landfill 2. Reportedly, only metal debris was dumped at this site from the 1950s through the 1960s. This landfill was closed before 1970.

The late-1993 SI sampling program confirmed the presence of a landfill. PCB-1254 contamination was detected in an up-gradient groundwater sample at a level of 0.14 ppb. Two down-gradient groundwater samples contained acetone at levels of 17 ppb and 20 ppb, respectively. Three soil samples taken from the landfill contained TPH at levels of 35 ppm, 27 ppm, and 10 ppm, respectively. Various pesticides and PCBs were detected in these same soil samples at ppb levels. AREE 5 will be further studied as a part of the upcoming RI.

AREE 6A

Landfill No. 6A

AREE 6A was identified in the EnPA as a potential landfill, based on obvious ground scars and soil disturbance noted on aerial photographs taken of the facility and reviewed as a part of the PA process. AREE 6A is located west of Deephole Point Road and east of Lake Drive.

The late-1993 SI sampling program confirmed the presence of a landfill, but did not detect any contamination. AREE 6A will be further studied as a part of the upcoming RI.

AREE 6B

Potential Landfill No. 6B

AREE 6B was identified in the EnPA as a potential landfill, based on obvious ground scars and soil disturbance noted on aerial photographs taken of the facility and reviewed as a part of the PA process. AREE 6B is located at the intersection of Deephole Point Road and Shady Road.

The late-1993 SI sampling program failed to confirm the presence of a landfill. No contamination was detected with the result being the consideration for no further remedial action planned (NFRAP). The BCT has determined that NFRAP is appropriate for this AREE.

AREE 7

Former Pistol Range.

AREE 7 is a former pistol range site located on an open hillside between Deephole Point Road and Shady Road. Reportedly, the range was used for qualifications of small arms firing on a semi-annual basis during the 1970s. This activity occurred for an unknown number of years before the firing range was covered with backfill material and firing practice was stopped as a regular activity at WRF.

The late-1993 SI sampling program failed to locate any bullets. However, a variety of metals were detected at levels in excess of background, confirming the presence of a firing range impact area. AREE 7 will be further studied as a part of the upcoming supplemental SI.

AREE 8

UST Leaks and Spills (Three Former 10,000-Gallon USTs)

AREE 8 is located outside of the eastern wall of Building 202. At one time, there were three 10,000-gallon steel underground storage tanks (USTs) at this site. One of these tanks was removed in 1981, and replaced with a new 2,000- gallon fiberglass tank. Records do not indicate why this removal and replacement occurred, but tank failure is suspected. The remaining two tanks were removed in 1990 after one of them failed to pass a precision test.

In addition to evidence of tank integrity failure, there is anecdotal information concerning uncontrolled releases of petroleum products relating to overfilling or spills while filling these USTs.

There is also anecdotal information relating to oil seeping into a sump pit located in Building 202 following precipitation events. While this event is apparently historically accurate, the seepage into the sump is no longer occurring at concentrations that are visible or detectable by smell.

The late-1993 SI sampling program confirmed the presence of petroleum contamination at AREE 8. Soil samples collected from a deep excavation at the site of the former tanks detected TPH at levels of 209 and 302 ppm, respectively. TPH was also detected in water taken from the sump pit. (The figures are somewhat suspect; the sample detected TPH at a level of 2 ppm, while a duplicate sample detected TPH at a level of 84 ppm.) AREE 8 will not be further studied as a part of the upcoming RI. Rather, AREE 8 will be removed from the CERCLA environmental restoration process and be subjected to site characterization and risk assessment processes as required by the Virginia Department of Environmental Quality (VDEQ).

AREE 9

Salt in Soil Test Areas

Small amounts (50 to 100 pounds) of calcium chloride salt were routinely mixed in the soil during field testing in order to improve electrical grounding characteristics. This occurred at an undetermined number of locations around the facility. In most cases, it is believed that the salt was left in the soil after the testing was complete. Calcium chloride is not a RCRA-listed hazardous material. The EnPA recommended that no further action be taken at AREE 9. The BCT has concurred with this recommendation.

AREE 10

Maintenance Shop

The activities performed in the Maintenance Shop (Building 202) are vehicle maintenance, carpentry, and minor electrical repairs. Containers of fresh and waste oil, cleaning solvent, paint, thinner, and battery acid are stored in this building. There are no drains to the outside. As mentioned in the discussion on AREE 8, there is a sump pit located at the east end of Building 202 that reportedly filled with water and petroleum product after a precipitation event. The EnPA recommended that no further action be taken at AREE 10, other than water sampling from the sump pit. This sampling was accomplished as a part of the late-1993 SI sampling program. As discussed previously, TPH was detected at ppm levels. The BCT has determined that NFRAP is appropriate for this AREE with the sump pit being included as part of AREE 8.

AREE 11

Building 202 Oil/Water Separator

AREE 11 is located just north of the paved area north of Building 202. This structure formerly collected surface drainage from the paved areas north of Building 202. Several uncontrolled releases of petroleum product have occurred on this paved area, and there is evidence that some portion of these releases entered and passed through this separator and entered the open drainage swales located on the north side of Locust Road. All influent pipes to this structure were sealed with concrete in 1989.

In March 1993, a surface water sample was collected by representatives of the Virginia Water Control Board, at the outfall of the culvert that passes under Locust Road. The sample contained PCB-1260 at a level of 1.5 ppb. The state representatives also observed "globules"

of oil in the pool at the pipe outfall, and took a second water sample for TPH analysis. Results of this second water sample are not known at this time.

However, the observation of the "globules" prompted an investigation, resulting in a finding that the oil/water separator was full of a petroleum and water mixture. Most of the petroleum and water mixture was emptied from the structure on April 28, 1993. Accumulated bottom sediments and all remaining visible traces of petroleum contamination were removed from the structure on June 4, 1993. During the course of this process, it was learned that the sediments were contaminated with PCB-1260 at a level of 4.9 ppb.

The late-1993 SI sampling program identified petroleum contamination in the soil surrounding the oil/water separator, at levels approaching 5,000 ppm TPH. Additionally, these soil samples revealed other contaminants, to include fluorene, phenanthrene, bis(2-ethylhexyl)phthalate, 2-butanone, and ethylbenzene at ppb levels.

The sampling program also revealed high levels of contamination at the culvert outfall north of Locust Road, finding PCB-1260 at a level of 1,168 ppm. Other contaminants identified included acetone (150 ppb), 1,4-dichlorobenzene (39 ppm), 1,2-dichlorobenzene (9 ppm), 1,2,4-trichlorobenzene (260 ppm), and chlorobenzene (2 ppm).

AREE 11 will be further studied as a part of the upcoming RI.

AREE 12

Building 202 Drum Storage Area

AREE 12 is located on the paved area just north of Building 202. Building 202 houses the maintenance facilities as well as the vehicle repair facility for the WRF. A wide range of organic and inorganic compounds and products were stored in drums, unprotected from the weather, on the pavement of this area. There is no record of large uncontrolled releases of any of the products stored at this AREE, although visual inspection of the area indicates worn and discolored asphalt at the surface of this site. The paved area is relatively flat, and drains toward the vicinity of the AREE 11 oil/water separator. Prior to the structure being sealed with concrete in 1989, most (if not all) of the surface drainage from AREE 12 passed through this device prior to release through the culvert under Locust Road.

The late-1993 SI sampling program took soil samples from four locations under the asphalt pavement. Acetone was detected at 135 ppb, 2-butanone was detected at 20 ppb, and TPH was detected at 66 ppm. AREE 12 will be further studied as a part of the upcoming supplemental SI.

AREE 13

Building 211 Acid Neutralization Tank

AREE 13 is a 1,000-gallon concrete underground acid neutralization tank located just west of Building 211. This location is adjacent to a lead-acid battery storage and recharging room within the building. This tank was installed at the time of Building 211's construction in 1979. The purpose of the tank is to contain any spills that may originate in the battery room, which has a concrete floor and a safety shower. Spills and/or shower water drain to the tank via a floor drain and underfloor piping. The tank has an overflow to the sanitary sewer, but is large enough to contain expected spills. There have been no significant spills reported at the battery room, although there is evidence of concrete etching at some locations within the room from what appear to be minor spill events.

There is anecdotal evidence that twice a year, a contractor would flush the tank with water and add a neutralizing chemical to the tank. While this may be historically accurate, this maintenance activity is no longer being performed.

The late-1993 SI sampling program took soil samples from two locations adjacent to the tank, which were tested for pH. The soil was found to have a pH of 6.4 in the field, and 7.0 in the laboratory. AREE 13 will be further studied as a part of the upcoming supplemental SI.

AREE 14

Building 211 Oil/Water Separator

AREE 14 consists of the oil/water separator located on the north side of Building 211. The separator receives drainage from work areas inside of Building 211, and discharges to the local storm drainage system. The EnPA found no evidence of oil spills from the work areas inside of Building 211. Similarly, there is no evidence that significant quantities of hazardous materials have been stored or handled within this building.

The late-1993 SI sampling program found bis(2-ethylhexyl) phthalate at 1 ppm, and di-n-octyl phthalate at 30 ppb, in water samples taken from the outfall. Sediment samples collected at the outfall, and soil samples taken from a trench adjacent to the tank, found TPH in the range of 51 - 65 ppm. AREE 14 will be further studied as a part of the upcoming RI.

AREE 15

Building 201 PCB Transformer

All power distribution transformers at the WRF were tested for polychlorinated biphenyls (PCBs) in July and August 1990. Of the eight transformers tested, only one was found to contain PCBs at a concentration in excess of 9 ppm. The transformer located at the northeast corner of Building 201 contained PCB-1260 at a concentration of 565,800 ppm.

In December 1992, this transformer, plus associated PCB-contaminated concrete and PCB-contaminated soil, was removed and replaced with a PCB-free replacement transformer placed on a new PCB-free concrete pad. NFRAP is planned for AREE 15.

AREE 16

Asbestos Containing Materials (ACM)

ACM is known to be present at the WRF, although a comprehensive "Asbestos Location Survey" has never been performed. Historically, ACM has been removed when encountered during the course of routine heating system repairs and upgrades.

ACM is suspected to remain in floor and ceiling tiles throughout the facility, as well as on certain components of the heating system. The EnPA positively identified asbestos-containing pipe insulation as a constituent of the debris at Landfill 1, and suggested that ACM may be found at other landfills as well. Finally, the chimney from the former incinerator (AREE 20) is reportedly in service as a roadway culvert in the far northeastern corner of the WRF. This chimney may have been constructed of asbestos cement.

In October 1993, the Army Research Laboratory (ARL) formally requested the support of the USAEC in procuring a comprehensive "Asbestos Location Survey" for the WRF. Once this survey has been accomplished, a proper response will be selected by the BCT.

AREE 17

Petroleum Spill Areas

The EnPA identified several areas at the WRF where petroleum products were spilled on the surface. One of these areas was the site of the three former 10,000-gallon USTs at Building 202. For administrative ease, this concern has been incorporated as a part of AREE 8.

In January 1990, approximately 100 gallons of water-contaminated diesel fuel was drained from a bulldozer in an area to the west of the fenced compound. Approximately 100 tons of contaminated soil was excavated and disposed of in response to this incident. The October 1993 draft report entitled "Supplementary Preliminary Assessment, Community Environmental Response Facilitation Act (CERFA PA)" further clarified the EnPA, identifying that there were actually two separate diesel fuel releases occurring within the span of one week from this same bulldozer. The ultimate fate of this (or these) bulldozer spill sites remains to be determined by the BCT. For administrative ease, this concern has been redesignated as AREE 33.

AREE 17 is presently composed of only of a spill area relating to a 1989 release associated with a mobile crane.

In April 1989, when a check valve was left open on a mobile crane's hydraulic system, approximately 100 to 150 gallons of No. 20 hydraulic oil leaked onto the pavement north of Building 202. Due to the slope of the pavement, this spill did not enter the AREE 11 oil/water separator, but rather bypassed the separator, entered the storm drain system, then passed

through the same road culvert under Locust Road discussed in AREE 11. This contamination migrated downstream of the Locust Road culvert before the spill was detected and the petroleum recovered. Approximately 40 - 60 tons of petroleum- contaminated soil were excavated and disposed of in response to this incident. Residual contamination associated with this mobile crane spill, if any, will be further investigated in conjunction with the upcoming RI effort associated with the AREE 11 oil/water separator contamination.

AREE 18

Flammable/Battery Storage Building (Building 204)

Building 204 is a small two-room concrete-floored structure used to store flammable materials in one room and vehicle batteries in the other. The (western) flammable storage room has a concrete floor with no drain and no curb. The (eastern) battery storage room has a concrete floor with a now-disconnected safety shower and a floor drain in one corner. The room is uncurbed, and the floor was apparently never sloped to direct contaminated water to the floor drain. However, the floor drain is connected to sub-surface piping which would convey any water it receives to a dry-well located just east of the building.

Due to AREE 18's proximity to AREE 19, sampling for these two AREES were combined. See AREE 19 for further discussion on AREE 18.

AREE 19

Thermal Battery Storage

AREE 19 is a grassy area located immediately east of Building 204. Until March 1993, there were two metal storage transport containers (CONEXs) at this location, each approximately 8' x 8' x 10', that were used to store thermal batteries. These thermal batteries were intended for use in the activation of fuse components for missiles. The batteries were hermetically sealed in metal cans with no evidence of leakage. The batteries typically contained an electrolyte of lithium chloride and potassium chloride, a cathode of calcium chromate or potassium chromate, and an anode of solid calcium. The batteries also contained a pyrotechnic heat source consisting of powdered zirconium and an ignitor such as a heated wire or a percussion primer. In addition, the batteries contained asbestos as an insulating material. The thermal batteries were removed from the WRF in March 1993. The empty CONEXs were removed from the WRF at the end of 1993.

The late-1993 SI sampling program took soil samples from the location of the dry-well, the then-relocated CONEXs, and just outside of each door to Building 204. This sampling identified levels of metals in excess of background. In addition, one of the samples contained toluene at a level of 3.1 ppb. Both AREES 18 and 19 are being considered for NFRAP. The BCT has determined that NFRAP is appropriate for both AREES 18 and 19.

AREE 20

Former Incinerator

A small incinerator (approximately 8' x 5' x 6') was thought to be located in the south area of the fenced compound. The incinerator was reportedly used for burning classified documents from the 1950s until 1970, and was dismantled in 1972. The unit was reportedly mounted on a concrete base and consisted of an asbestos lining between inner and outer metal walls, a dust collector in the smoke stack to prevent release of ash out of the stack, and a 100-gallon aboveground tank for heating oil, which was used as a fire starter. The incinerator was reportedly used frequently, sometimes daily. The ash was shoveled into drums and was reportedly disposed of at one of the on-site landfills. When the incinerator was dismantled, part of it was reportedly disposed of in Landfill No. 1. The smoke stack, which is suspected to contain asbestos, was reportedly reutilized as a roadway culvert at a stream crossing in the extreme northwest corner of the WRF.

The late-1993 SI sampling program made an effort to obtain soil samples from the site of the former incinerator. Unfortunately, the investigators were unable to pinpoint the exact location of the former incinerator. Several shallow test pits were dug in an attempt to find discolored soil, which would provide evidence of soil contamination. Finding no evidence of contamination, no soil samples were taken for analysis. The BCT has determined that AREE 20 should be further studied as part of the upcoming supplemental SI.

AREE 21

Former Storage Area

AREE 21 is an area to the east of Building 211 which was used as a storage yard prior to Building 211's construction in 1979. (It appears that part of AREE 21 is now actually *under* Building 211.) Reportedly, transformers and capacitors containing PCBs were stored within this AREE prior to disposal.

The late-1993 SI sampling program collected four composite soil samples from within the limits of this AREE. No PCBs were detected. However, TPH was detected within each composite sample, at levels ranging from 30 to 55 ppm. AREE 21 will be further studied as a part of the upcoming supplemental SI.

AREE 22

Drainage Ditch

A drainage ditch that enters the WRF along the northern boundary and flows along the north and east sides of the inner fenced compound may have received contamination from the wash rack, the oil water separators, various oil spills, and run-on from off-site properties to the north of the installation. Aerial photographs revealed possible stains and wet soil in the vicinity of the ditch during the 1960s, and tires and other debris were observed during the EnPA. Contamination from the Building 202 oil/water separator (AREE 11) and from the drainage ditch

contaminated by the mobile crane hydraulic oil spill (AREE 17) would have naturally migrated into the AREE 22 drainage ditch.

The late-1993 SI sampling program collected four composite soil samples from within the limits of this AREE. TPH was detected within two of the four composite sample, at levels of 14 and 18 ppm, respectively. During the course of the 14 December 1993 BCT meeting, the BCT agreed that AREE 22 would be subjected to the upcoming RI, as a part of one operable unit (OU) that would also include AREEs 11 and 17.

AREE 23

UST Leaks and Spills (Three Former Small USTs)

A total of six USTs have been removed from the WRF. Three of these, each containing 10,000 gallons, were formerly located to the east of Building 202, and are described under AREE 8. The remaining three include:

Building 101: A 1000-gallon steel tank which contained #2 fuel oil was removed in 1991, along with approximately 10 cubic yards of petroleum-contaminated soil. This UST was replaced with a skid-mounted aboveground storage tank (AST).

Building 202: A 1,000-gallon steel tank which contained gasoline was removed in 1990, and replaced with a new 1,000-gallon fiberglass tank.

Building 203: A 2,000-gallon steel tank which contained #2 fuel oil was removed in 1986 or 1987. This tank was not replaced.

The late-1993 SI sampling program confirmed the presence of petroleum contamination at Building 203. Soil samples collected from a deep excavation at the site of the former tank detected TPH at a level of 30 ppm. Soil samples were not obtained from the Building 101 and Building 202 former USTs. AREE 23 will not be further studied as a part of the upcoming RI. Rather, AREE 23 (in conjunction with AREE 8) will be removed from the CERCLA environmental restoration process and be subjected to site characterization and risk assessment processes as required by the VDEQ.

AREE 24

Existing USTs

There are a total of six USTs that remain in service at the WRF. Although identified as an AREE by the EnPA, this AREE was not investigated as a part of the SI.

AREE 24 (in conjunction with AREEs 8 and 23) will be removed from the CERCLA environmental restoration process and be subjected to site characterization and risk assessment processes as required by VDEQ.

AREE 25

Sewage Sludge Injection Areas

In 1974, sanitary sewage sludge was injected into the ground at various sites on the WRF. The EnPA identified "the northern part of the facility". The CERFA PA identified three discrete sites, one each to the east, north, and west of the fenced inner compound. The sludge was reportedly obtained from the Occoquan Sanitary District near Woodbridge and from the Blue Plains sanitary treatment plant in Washington, D.C. Reportedly, approximately 20,000 gallons per day were injected to a depth of 18 inches over a 4-month period, when the practice was stopped due to complaints from neighbors. Analyses of the sludge were not obtained, but reportedly only municipal (i.e., non-industrial) sanitary sewage was processed at these plants.

The late-1993 SI sampling program collected six soil samples from within the limits of this AREE (two from each discrete site mentioned above), and found elevated levels of several metals. This AREE will be further studied as part of the upcoming supplemental SI.

AREE 26

Ethylene Glycol Area

Antifreeze in rubber hoses was buried in the ground south of Building 306 as a test of a personnel intrusion detection system. The antifreeze, which consists mainly of ethylene glycol, was put in neoprene rubber hoses which were cut to various lengths and then sealed. The tubes were then buried at a depth of 1 to 3 feet, and were placed from 6 to 20 feet apart in a random pattern over a square area approximately 2,000 feet on a side. The hoses varied in diameter from 3/4-inch to 2-inches. These hoses were left in place following the completion of the testing program, and are inadvertently encountered from time to time during routine excavations through the test area. When encountered, the hoses generally still contain the antifreeze, which is usually lost into the ground during the excavation process.

The late-1993 SI sampling plan included locating some of these buried hoses and obtaining soil and fluid samples for analysis. Unfortunately, the on-site team failed to locate any of these buried hoses. AREE 26 will be further studied as a part of a upcoming supplemental SI.

AREE 27

Buried Wire in Test Areas

In the early 1950s, electrical cable was buried throughout the facility as a part of an antenna system for a worldwide communication network. The antenna system was used until 1970. Subsequent to this initial utilization of the facility, the research and development testing programs at the site also relied on buried cable, although to a much lesser extent than did the original occupants at this facility. The buried cable typically consists of a copper conductor surrounded by a metal shield that may contain copper, aluminum, or stainless steel, all encased in a plastic outer coating. A limited amount of cable may have had a shield that contained lead and/or PCB-impregnated insulation material. Some of the cable has been dug up since 1970 during routine excavations, but most remains in the ground.

The late-1993 SI sampling program collected six soil samples from within the limits of this AREE, and found elevated levels of several metals but no PCBs. This AREE is being considered for NFRAP. The BCT has determined that NFRAP is appropriate for AREE 27.

AREE 28

Radon

The EnPA Report identified radon concerns at the WRF as AREE 28. However, since radon contamination is not a CERCLA or IRP concern, but rather a compliance issue, AREE 28 was not included within the TETC SI effort.

An installation-wide radon survey was performed under the direction of the ARL's Industrial Hygienist during 1993. Canisters were reportedly left in place at strategic locations within occupied buildings around the facility for a six-month duration that ended on or about 27 October 1993. Results from radon survey were published in a "Radon Monitoring Report" dated 10 November 1993. The highest level of radon detected in field samples was 0.6 picocuries per liter, well below the EPA's recommended 4.0 picocuries per liter threshold level for corrective action. No further action is planned for AREE 28.

AREE 29

VEPCO Transformer Spill

During August and September 1993, a contractor to the USAEC, conducted on-site visits, personal interviews, and an extensive search of historical records at the WRF. This task was performed pursuant to CERFA which amends CERCLA.

The draft CERFA report identified a new AREE that had not been identified by the EnPA. An electrical substation is located at the Dawson Beach Road entrance to the installation, immediately opposite from Building 101. Prior to January 1984, one (or more) PCB-contaminated pole-mounted transformers owned by the local electric utility, the Virginia Electric Power Company (VEPCO), was located within this substation. One of these transformers failed in January 1984, resulting in a leak of PCB-contaminated dielectric fluid within the general area of this substation.

According to a 21 December 1993 letter provided by VEPCO to the installation, 450 gallons of PCB-contaminated transformer oil was shipped from the WRF on 25 January 1984. The letter and shipping documents state that the level of contamination was "87 ppm PCB". In addition to the transformer oil, 15 drums of PCB-contaminated soil and one drum of PCB-contaminated rags and filters were removed on that date. The letter does not mention when the transformer carcass was removed from the site.

A VEPCO representative visited the site 5 November 1993, and took two soil samples for chemical analysis. The 21 December 1993 letter reports that the samples contained PCBs at levels of "0.01 and 0.02 ppm PCB", respectively.

The BCT has determined that this AREE should be included as part of the upcoming supplemental SI.

AREE 30

Hydraulic Oil Spill

In May 1993, the mobile crane that was involved in the April 1989 oil spill incident described as AREE 17 was involved in a similar incident in an equipment staging area located on the north side of Dawson Beach Road, near the intersection with Lake Drive. Reportedly, a hydraulic line failed while the crane was in the process of loading excess equipment onto a trailer for off-site disposal. Approximately 50 gallons of hydraulic oil was lost from the crane.

The installation's facilities engineering staff responded promptly with empty drums and absorbent pads. Approximately 15 tons of contaminated soil was collected and stockpiled, and disposed of off-site on 1 November 1993.

AREE 30 will not be further studied as a part of the upcoming RI (or supplemental SI). Rather, AREE 30 (in conjunction with AREEs 8, 23, and 24) will be removed from the CERCLA environmental restoration process and be subjected to site characterization and risk assessment processes as required by VDEQ.

AREE 31

Low-Level Radioactive Material Usage and Storage

During October 1993, the BRAC Environmental Coordinator for the WRF was made aware of another area of potential concern. It was learned that low-level sealed radioactive source materials had been (and are still being) utilized for research and development purposes since the 1980s. There is no evidence that any of these sealed sources were ever damaged or ruptured. Many of these sources were removed from the site in August 1992, but some remain at the WRF. The exact number and types of sources that remain at the installation is currently being determined by installation personnel.

This radioactive material concern was first discussed at the on-site meeting of the BCT that occurred on 10 November 1993. The BCT has determined that NFRAP is appropriate for this AREE.

AREE 32

Lead Paint

This AREE was created in January 1994 for administrative purposes only. Similar to asbestos and radon, lead paint is not an IRP or CERCLA concern, although it remains a concern to those involved in the property transfer process.

In October 1993, the ARL formally requested the support of the USAEC in procuring a comprehensive "Lead Paint Survey" for the WRF. Once this survey has been accomplished, a proper response will be selected by the BCT.

AREE 33

Bulldozer Fuel Spills

This AREE was created in January 1994 for administrative purposes only. The two bulldozer fuel spills that occurred in January 1990 were first identified in the EnPA as a part of AREE 17, along with petroleum product spills at several other locations around the installation. For tracking purposes, the final disposition of these two bulldozer fuel spills will be identified as AREE 33.

AREE 33 will not be further studied as a part of the upcoming RI (or supplemental SI). Rather, AREE 33 (in conjunction with AREEs 8, 23, 24, and 30) will be removed from the CERCLA environmental restoration process and be subjected to site characterization and risk assessment processes as required by VDEQ.

AREE 34

Hunter Qualification Target Range

This AREE was administratively created in January 1994. During a site visit that occurred at the WRF on 10 November 1993, the VDEQ member of the BCT suggested that the hunter qualification target range located on the south side of the ethylene glycol area (AREE 26) be identified as an AREE.

The BCT has determined that this AREE should be included as part of the upcoming supplemental SI.

TABLE E-1. CONCEPTUAL SITE MODEL DATA SUMMARY AND CHEMICAL STANDARDS SUMMARY

[illegible]

TABLE E-2. SUMMARY OF BACKGROUND CONCENTRATIONS, VICINITY OF THE WRF

Constituent	Soils			Sediment			Surface Water		
	Number Detects	Number Nondetects	Maximum	Number Detects	Number Nondetects	Maximum	Number Detects	Number Nondetects	Maximum
	This table will be completed once the data are published in their appropriate reports identifying the findings (i.e., SI report, RI report, etc.).								

TABLE E-3. TOTAL METAL RESULTS FOR BACKGROUND GROUNDWATER LOCATIONS

[illegible]

APPENDIX F

► OTHER ANCILLARY BCP MATERIALS ◄

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