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FORT RITCHIE
BASE REALIGNMENT AND CLOSURE
(BRAC) CLEANUP PLAN (BCP)

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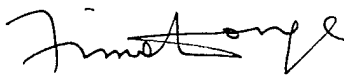
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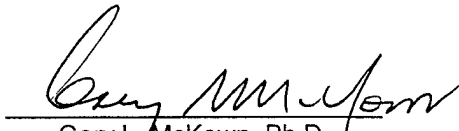
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FORT RITCHIE
BASE REALIGNMENT AND CLOSURE (BRAC) CLEANUP PLAN (BCP)
VERSION II

FINAL DOCUMENT



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LIST OF ACRONYMS AND ABBREVIATIONS

ACM	Asbestos-Containing Material
AJCC	Alternate Joint Communications Center
AR	Army Regulation
ARAR	Applicable or Relevant and Appropriate Requirement
AREE	Area Requiring Environmental Evaluation
AST	Above-ground Storage Tank
BCP	BRAC Cleanup Plan
BCT	BRAC Cleanup Team
BEC	BRAC Environmental Coordinator
BET	BRAC Environmental Team
Bldg	Building
BRAC	Base Realignment and Closure
CCR	Cumulative Cancer Risk
CEMML	Center for Ecological Management of Military Lands
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
CFR	Code of Federal Regulations
CHI	Cumulative Hazard Index
COPC	Chemical of Potential Concern
COR	Contracting Officer's Representative
CRP	Community Relations Plan
CWA	Clean Water Act
DD	Decision Document
DDT	Dichlorodiphenyltrichloroethane
DISA	Defense Information Systems Agency
DoD	Department of Defense
DOT	Department of Transportation
DPW	Department of Public Works
DQO	Data Quality Objective
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
EBS	Environmental Baseline Survey
EDC	Economic Development Conveyance
EE/CA	Engineering Evaluation/Cost Analysis
EIS	Environmental Impact Statement
EMD	Environmental Management Division
ERA	Ecological Risk Assessment
FFA	Federal Facility Agreement
FRP	Fiberglass Reinforced Plastic
FS	Feasibility Study
FY	Fiscal Year
gpm	gallons per minute
GSF	Gross Square Feet
HAZMAT	Hazardous Materials
HHRA	Human Health Risk Assessment
IMI	International Masonry Institute
IRA	Interim Remedial Action
IRDMIS	Installation Restoration Data Management Information System
IRP	Installation Restoration Program
ISA	Initial Screening of Alternatives
LBP	Lead-Based Paint
lbs	pounds
LRA	Local Redevelopment Authority

LTM.....	Long-Term Monitoring
MDE.....	Maryland Department of the Environment
MITC.....	Military Intelligence Training Center
msl.....	mean sea level
NA.....	Not Available
N/A.....	Not Applicable
NCO.....	Non-Commissioned Officer
NCP.....	National Oil and Hazardous Substance Pollution Contingency Plan
NEPA.....	National Environmental Policy Act
NFA.....	No Further Action
NFRAP.....	No Further Response Action Planned
NPDES.....	National Pollutant Discharge Elimination System
NPL.....	National Priorities List
NRC.....	Nuclear Regulatory Commission
O&M.....	Operations and Maintenance
OE.....	Ordnance and Explosives
OSHA.....	Occupational Safety and Health Administration
OU.....	Operable Unit
PA.....	Preliminary Assessment
PAH.....	Polycyclic Aromatic Hydrocarbon
PCB.....	Polychlorinated Biphenyl
PCE.....	Tetrachloroethene
PMDC.....	Pen Mar Development Corporation
PP.....	Proposed Plan
PX.....	Post Exchange
RA.....	Remedial Action
RAB.....	Restoration Advisory Board
RCRA.....	Resource Conservation and Recovery Act
RD.....	Remedial Design
RI.....	Remedial Investigation
ROD.....	Record of Decision
SARA.....	Superfund Amendments and Reauthorization Act
SB.....	Subsurface Soil
SD.....	Sediment
SI.....	Site Investigation
SS.....	Surface Soil
SVOC.....	Semivolatile Organic Compound
SW.....	Surface Water
TBD.....	To-Be-Determined
TCE.....	Trichloroethene
TRC.....	Technical Review Committee
TSCA.....	Toxic Substances Control Act
TSDF.....	Treatment, Storage, and Disposal Facility
U.S.....	United States
USACE.....	U.S. Army Corps of Engineers
USACHPPM.....	U.S. Army Center for Health Promotion and Preventative Medicine
USAEC.....	U.S. Army Environmental Center
USAEHA.....	U.S. Army Environmental Hygiene Agency
USAISEC-CONUS...	U.S. Army Information Systems Engineering Command - Continental United States
USEPA.....	U.S. Environmental Protection Agency
UST.....	Underground Storage Tank
UXO.....	Unexploded Ordnance
VOC.....	Volatile Organic Compound
WWII.....	World War II
XRF.....	X-Ray Fluorescence

1.0 INTRODUCTION AND SUMMARY

Fort Ritchie Army Garrison is a 631-acre active military communications center approved for closure under the Base Realignment and Closure (BRAC) Act of 1995. The official closure date for Fort Ritchie is October 1, 1998.

The purpose of this BRAC Cleanup Plan (BCP) is to: 1) summarize the current status of the Fort Ritchie Army Garrison environmental restoration and associated environmental compliance programs, 2) present the status of the Fort Ritchie disposal and reuse plan (redevelopment plan); and 3) present a comprehensive strategy for implementing response actions in support of installation closure, necessary to protect human health and the environment. The strategy integrates activities performed under both the environmental restoration program and the associated environmental compliance programs to support full restoration of the facility. The BCP is a dynamic document designed to be updated regularly to incorporate newly obtained information and to reflect the completion or change in status of any remedial actions (RAs). The Version I BCP for Fort Ritchie was prepared in September 1996; this Version II BCP was prepared with information available as of March 1998.

This BCP is a planning document. Information, schedules, and RAs presented in this BCP do not necessarily represent those that have been or will be approved by the United States (U.S.) Army or Federal and State regulatory agencies. It was necessary to make certain assumptions and interpretations to develop this document. As additional information becomes available, implementation programs and cost estimates could be dramatically altered.

1.1 BCP ORGANIZATION

The BCP is organized into seven sections:

- Section 1 - Introduction and Summary: describes the objectives of the environmental restoration program, explains the purpose of the BCP, introduces the Project Team formed to manage the program, and provides a brief history of the installation.
- Section 2 - Property Disposal and Reuse Plan: summarizes the current status of the Fort Ritchie property disposal planning process and describes the relationship of the disposal process with other environmental programs.
- Section 3 - Installation-Wide Environmental Program Status: summarizes the current status and past history of the Fort Ritchie environmental restoration program, associated environmental compliance programs, community relations activities, and the environmental condition of the installation property.
- Section 4 - Installation-Wide Strategy for Environmental Restoration: describes the installation-wide strategy for environmental restoration, including the strategies for dealing with each area requiring environmental evaluation (AREE) on the installation. This chapter also includes plans for managing underground tanks via the Underground Storage Tank (UST) program, and summarizes plans for managing responses under other compliance programs.
- Section 5 - Environmental Program Master Schedules: provides master schedules of planned and anticipated activities to be performed throughout the duration of the environmental restoration program, including associated compliance activities.
- Section 6 - Technical and Other Issues to be Resolved: describes specific technical and/or administrative issues to be resolved and presents a strategy for resolving these issues.
- Section 7 - References: provides a list of the references utilized in the preparation of the BCP.

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

- Appendix A – Fiscal Year Funding Requirements/Costs: Tables presenting projected funding requirements, as well as a summary table of past costs for the environmental restoration program;
- Appendix B – Installation Environmental Restoration Documents Summary Tables: Listing of previous environmental restoration program deliverables by program and by site, as well as technical documents and data loading summaries;
- Appendix C – Decision Documents/ROD Summaries: Summaries of decision documents (DDs) for which an RA was selected;
- Appendix D – NFRAP Summaries: Summaries of each DD for each AREE for which a no further response action planned (NFRAP) decision has been made;
- Appendix E – Conceptual Model Data: Working conceptual models for AREEs; and
- Appendix F – Ancillary BCP Materials: Other ancillary materials relevant to the BCP.

1.2 ENVIRONMENTAL RESPONSE OBJECTIVES

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

- Protect human health and the environment;
- Strive to meet reuse goals established by the U.S. Army and the community;
- Comply with existing statutes and regulations;
- Conduct all environmental restoration activities in a manner consistent with Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA);
- Meet Federal Facility Agreement (FFA) deadlines as detailed in Chapter 5 of this BCP;
- Conduct an Environmental Baseline Survey (EBS) and prepare a Community Environmental Response Facilitation Act (CERFA) Letter Report;
- Continue efforts to identify all potentially contaminated areas;
- Incorporate any new sites into the FFA as appropriate;
- Establish priorities for environmental restoration and restoration-related compliance activities (so that property disposal and reuse goals can be met);
- Initiate selected removal actions to control, eliminate, or reduce the risks to manageable levels;
- Identify and map the environmental condition of the installation property, concurrent with remedial investigation (RI) efforts; consider future land use when characterizing risks associated with releases of hazardous substances, pollutants, contaminants, or hazardous wastes;
- Identify and map areas suitable for transfer by deed and areas unsuitable for transfer by deed;
- Complete investigations as soon as practicable for each AREE in an order of priority which takes into account both environmental concerns and redevelopment plans;
- Develop, screen, and select RAs that reduce risks in a manner consistent with statutory requirements;
- Commence RAs for (1) environmental and (2) property disposal and reuse priority areas as soon as practicable;

- Advise the real estate arm of the U.S. Army Corps of Engineers (USACE) of properties that are deemed suitable for transfer and properties that are not suitable for transfer because they are either not properly evaluated or pose an unacceptable human health or environmental risk;
- Conduct long-term RAs for groundwater and any necessary 5-year reviews for wastes left on site; and
- Establish interim and long-term monitoring (LTM) plans for RAs as appropriate.

1.3 BCP PURPOSE, UPDATES, AND DISTRIBUTION

This BCP presents, in summary fashion, the status of Fort Ritchie'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 installation 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 Fort Ritchie BCP Strategy and Schedule section is designed to streamline the necessary response actions associated with the properties within Fort Ritchie in order to facilitate the earliest possible disposal and reuse of the properties. Risk assessment protocols incorporate future land use in exposure scenarios. The official closure date for Fort Ritchie is October 1, 1998.

The Final Version I BCP was submitted in September 1996. This Version II BCP and all future updates of the BCP will be distributed to each member of the Fort Ritchie BRAC Project Team and to additional individuals identified in Table 1-1. The BCP will also be available at the BRAC Information Repositories listed in Table 1-1.

1.4 BRAC CLEANUP TEAM/PROJECT TEAM

The Fort Ritchie BRAC Cleanup Team (BCT) is comprised of three members: the BRAC Environmental Coordinator (BEC), a representative from the U.S. Environmental Protection Agency (USEPA) Region III, and a representative from the Maryland Department of the Environment (MDE). The BCT is led by the BEC. The BCT is responsible for the management of the BCP process and the preparation of this BCP. Additionally, the BCT members will serve as the decision makers for the efforts of the Project Team.

The Project Team consists of the BCT and additional individuals whom the BCT selects to assist in the environmental restoration process at Fort Ritchie. The Project Team is also led by the BEC. Project Team meetings are the means of conducting periodic program reviews and reaching consensus on decisions with Federal and State regulators. The BCT members and their roles regarding this project are presented in Table 1-2.

1.5 INSTALLATION DESCRIPTION AND HISTORY

Fort Ritchie is a U.S. Army Garrison under the control of the U.S. Military District of Washington. Fort Ritchie provides and maintains operational support for the Defense Information Systems Agency (DISA) - Western Hemisphere; the Alternate Joint Communications Center/Site R (AJCC); Headquarters, U.S. Army Information Systems Engineering Command - Continental United States (USAISEC-CONUS); and the 1108th U.S. Army Signal Brigade. It provides specified administrative, logistical, information systems, and physical security support to attached or satellite activities in accordance with directions from higher authorities. The installation also maintains morale, welfare, and recreation programs. In 1996, Fort Ritchie had a combined military and civilian work force of approximately 2,300 personnel. In 1997, approximately 1,000 personnel were employed at Fort Ritchie and 281 personnel were living on post.

1.5.1 General Property Description

Fort Ritchie is located approximately one mile south of the Maryland/Pennsylvania border in Washington County, Maryland. It is situated near the upper end of a small valley at the foot of Quirauk Mountain, in the Catoctin Range of the Blue Ridge Mountains. The installation consists of approximately 631 acres. Slightly more than half of the property is developed. Administrative buildings, maintenance facilities, community

facilities, and housing areas are concentrated in the central and northeastern portions of the installation around Lake Royer and Lake Wastler. Undeveloped areas are heavily wooded, with freshwater streams and wetlands, and are concentrated in the southern and western portions of the installation. Figure 1-1 shows the general location of Fort Ritchie Army Garrison.

Table 1-1. Fort Ritchie BCP Distribution List.

Name	Title	Address
Bill Hofmann	BRAC Environmental Coordinator	U.S. Army Garrison Fort Ritchie ANRT-BRAC 152 Barrick Avenue Fort Ritchie, MD 21719
Harry Harbold	Project Manager	USEPA (3HW50) 841 Chestnut Building Philadelphia, PA 19107
Wendy Noe	Project Manager	MDE 2500 Broening Highway Baltimore, MD 21224
Alan Freed	Project Manager	USAEC (SFIM-AEC-RPO) Building E4480, Edgewood Area Aberdeen Proving Ground, MD 21010
Kelly Koontz	Project Manager	U.S. Army Corps of Engineers, Baltimore District ATTN: CEMAB-PP-E P.O. Box 1715 Baltimore, MD 21203-1715
Charlotte Rodriguez	Project Manager	U.S. Military District of Washington Fort Lesley J. McNair ATTN: ANEN-ES Building 42 Washington, D.C. 20319-5050
Theresa Persick	Project Manager	HQDA, DAIM-FDP-B ASCIM, 600 Army Pentagon Washington, D.C. 20310-0600
Summit Plaza Free Library	BRAC Information Repository	Blue Ridge Summit, PA
Washington County Free Library	BRAC Information Repository	100 S. Potomac Street Hagerstown, MD

Table 1-2. Current BCT and Project Team Members

Name	Title	Organization	Phone	Role/ Responsibility
Bill Hofmann	BRAC Environmental Coordinator	Fort Ritchie Army Garrison	(717) 878-5234	Project Management and Oversight
Harry Harbold	Project Manager	USEPA	(215) 566-3203	Project Oversight
Wendy Noe	Project Manager	MDE	(410) 631-3440	Project Oversight
Other Key Participants				
Alan Freed	Project Manager	USAEC	(410) 671-1626	Contract Management and Oversight
Kelly Koontz	Project Manager	USACE	(410) 962-6804	Contract Management and Oversight
Sanjib Chaki	Contracting Officer's Representative (COR)	USACE	(410) 962-2252	Contract Management and Oversight - Site Investigation
Contractor				
Tim Longe	Project Manager	ICF Kaiser Engineers	(410) 612-6368; Fax: 612-6351	Technical Support EBS and BCP
Mike Ervine	Project Manager	ICF Kaiser Engineers	(410) 612-6332; Fax: 612-6351	Technical Support Site Investigation

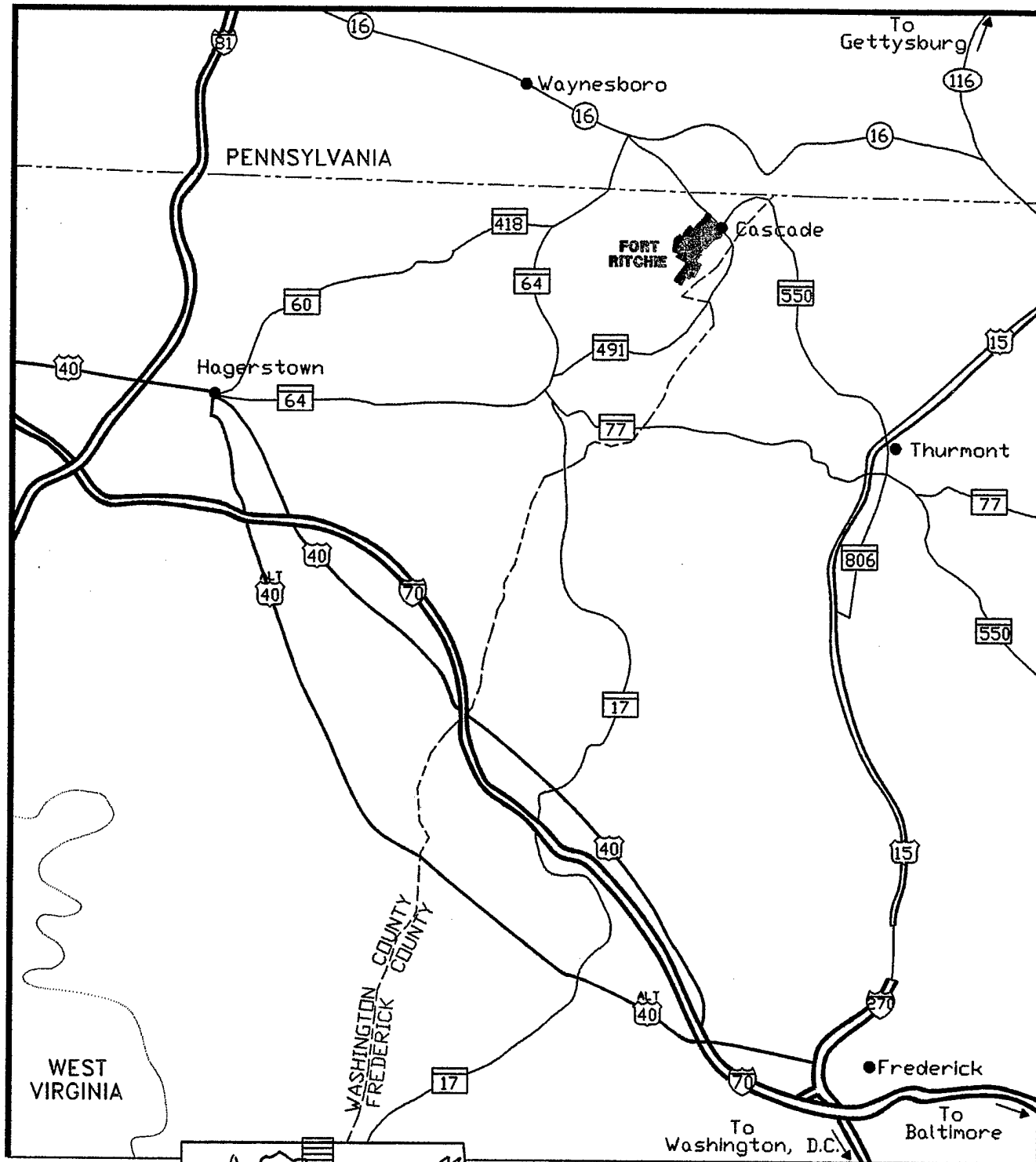
1.5.2 History of Installation

The present site of Fort Ritchie was first developed as a resort community in the late 1800s. Lower Lake Royer was constructed by the Buena Vista Ice Company to provide a summer recreational area and to produce ice during the winter. Residential buildings and ice storage facilities were also constructed during this time but have since been demolished.

Five hundred eighty (580) acres of the site were purchased by the State of Maryland in 1926. Camp Ritchie was established on the property and was utilized as a brigade training area for the Maryland Army National Guard. The first permanent buildings were constructed on the installation during this time. These buildings were mainly constructed of stone and timber resources acquired from surrounding locales, and most remain standing at this time.

During World War II (WWII), Camp Ritchie was leased by the U.S. Army and utilized as the War Department Military Intelligence Training Center (MITC). The Army constructed 165 buildings on the installation during the WWII era to provide housing and training areas; most of these WWII era buildings are still standing. A total of 20,000 intelligence troops were housed and trained at Camp Ritchie between 1942 and 1945. Some of the training activities included firing of ordnance into the hillsides in the western section of the installation. Thus, much of the wooded portions of the post are impact areas, potentially containing unexploded ordnance (UXO). Acquisition of additional adjacent acreage increased the installation size from 580 to 637.57 acres by 1988. A property acquisition summary is provided in Table 1-3 (USACE, 1993b). On August 18, 1993, 6.36 acres were transferred to the Washington County Sanitary District.

In 1945, the MITC was deactivated, and the State of Maryland re-instituted Camp Ritchie as a National Guard Training Station. In 1948, the Army again acquired control of Fort Ritchie for the purpose of providing



SOURCE: 1993 MARYLAND STATE HIGHWAY ADMINISTRATION MAP

US ARMY ENVIRONMENTAL CENTER

CONTRACT NO. DACA31-94-D-0064

FIGURE 1-1
FORT RITCHIE

**ICF KAISER
ENGINEERS**

2113 EMMORTON PARK RD.
EDGEWOOD, MD. 21040
(410) 612-8350

PREPARED JNW

TASK NO. 66225

CHECKED JH

ICF DWG NO:

DATE 7-18-97

FR1-1

**GENERAL
LOCATION OF
FORT RITCHIE**

Table 1-3. Property Acquisition Summary

Tract Number	Previous Land Owner	Acreage		Acquisition Date
		Fee Land	Easement Land	
A	Camp Ritchie	N/A	0.31, Easement for 6" Water Line, Right-of-Way, and Well Sites	9/25/50
A-100-1	State of Maryland	631.52	N/A	9/13/51
A-100-2	State of Maryland	2.74	N/A	9/13/51
A-100-E-3	State of Maryland	N/A	0.57, Perpetual Easement for Water Line and Road Right-of-Way	9/13/51
A-101 L	Washington County	N/A	No Area, License for 6" Water Line	3/11/52
A-102 L	The Potomac Edison Company	N/A	No Area, License for 6" Water Line	2/14/52
A-103-1	Western Maryland Railway Company	N/A	No Area, Lease for Artesian Well Site	4/1/52
A-103-2	Western Maryland Railway Company	N/A	No Area, Lease for 12" Water Line and 12" Sewer Line	4/1/52
A-103-3	Western Maryland Railway Company	N/A	No Area, Lease for 6" Water Line, 4" Conduit, and 10" Outfall Sewer	4/1/52
104	The Aaron Straus & Lillie Straus Foundation, Inc.	0.95	N/A	5/18/65
105	The Aaron Straus & Lillie Straus Foundation, Inc.	0.44	N/A	5/18/65
106 E	Great Rock Forest Corporation	N/A	0.33, Perpetual Easement for Roads and Utilities Right-of-Way	6/15/66
107 E	Calvin G. Pryor, Sr.	N/A	0.12, Perpetual Easement for Roads and Utilities Right-of-Way	6/13/66
108 E	G. M. McAfee et ux	N/A	0.13, Perpetual Easement for Roads and Utilities Right-of-Way	6/14/66
140 E	The Potomac Edison Company	N/A	0.46, Perpetual Easement for Water Line	7/21/88

N/A = Not Applicable

Source: USACE, 1993b

support for the AJCC located at Site R (USACE, 1993a). Support of the AJCC has been the primary mission of Fort Ritchie since the mid-1950s. Additionally, Fort Ritchie provides housing and morale support to Camp David and to the Naval Support Facility in Thurmont, Maryland. Finance and accounting services for the White House Communications Agency, Military Traffic Management Command, and other designated subordinate activities are conducted on the installation. Fort Ritchie is also the lead Federal agency supporting the City of Hagerstown, Maryland, Cooperative Administrative Support Unit initiative.

1.5.3 Tenants

Currently, three tenant agencies operate at Fort Ritchie at a significant level. In general, all of the activities of these tenants are administrative or communications related, and there are no major activities that involve hazardous materials. These agencies and their primary missions are listed in Table 1-4.

Table 1-4. Current Significant On-Post Tenants at Fort Ritchie

Tenant	Mission/Operation
1108 th U.S. Army Signal Brigade, Headquarters	Evaluate information systems; develop and conduct testing strategies and methodologies for information systems for the Army's long-range communications plans
U.S. Army Information Systems Engineering Command - Continental United States (USAISEC-CONUS), Headquarters	Engineer, install, and test information systems equipment and facilities within the continental United States, Alaska, Puerto Rico, and Panama
Defense Information Systems Agency (DISA)	Provide information products and services to the Department of Defense (DoD)

1.5.4 Environmental Setting

This section provides a brief description of the environmental setting at Fort Ritchie including topography, geology, hydrogeology, and surface water hydrology.

1.5.4.1 Topography

Fort Ritchie lies within the Blue Ridge District of the Appalachian physiographic province. This district is approximately 3 miles wide and consists of Catoclin and South Mountains and their intervening valleys. Elevations within the Blue Ridge District reach a maximum of 2,145 feet at the peak of Quirauk Mountain.

The terrain is steep and stony on the western (undeveloped) portion of Fort Ritchie and relatively level on the eastern (developed) portion of the installation. Elevations range from 2,050 feet above mean sea level (msl) along the western border of the property to approximately 1,320 feet above msl near the facility's two lakes. The western and southern areas of the installation are rocky, woodland areas (USACE, 1993a).

1.5.4.2 Geology

The soils in the Fort Ritchie area are mainly upland soils, which developed in place from materials weathered from the underlying rock. The Dekalb-Leetonia-Edgemont-Laidig soil association dominates the Fort Ritchie area. This is a shallow soil which extends to bedrock and consists of very stony, moderately coarse-textured to medium-textured soils. Parent materials for these soils are mainly sandstones and quartzites. These soils are strongly to very strongly acidic and are generally nonproductive for agricultural purposes (Slaughter, 1962).

The Catoclin rock formation was formed during the late Precambrian era through volcanic activity that occurred in northern and central Virginia, Pennsylvania, Maryland, and eastern West Virginia. The Catoclin

Metabasalt is composed of metamorphosed volcanic greenstone, purple slate, and tufaceous rock. This formation is underlain by highly metamorphosed Precambrian granite gneiss and metabasalt, and metamorphosed Cambrian shale and sandstone.

Outcrops of the Catoctin Metabasalt are found within the Fort Ritchie installation. Quartzite outcrops can also be observed on the installation, primarily in the undeveloped western portions of the post. The thickness of the Catoctin Metabasalt and the Precambrian basement rocks ranges over 1,000 feet in Washington County (Slaughter, 1962). The geology in the Fort Ritchie vicinity is characterized by asymmetrical folds and fractures. Rock deformation is greatest along the west flank of South Mountain, where complex fracture systems now exist. Rock cleavage patterns in the immediate area are often at angles to the bedding planes. There are no known or inferred geologic faults in the vicinity of Fort Ritchie. There is no evidence of subsidence, though solution cavities are known to exist.

1.5.4.3 Hydrogeology

The extent and distribution of the fracture within the Catoctin formation, as well as the rock cleavage patterns, strongly influence groundwater movement. The Precambrian metabasalt, which underlies the Catoctin formation, is characterized by a low water storage capacity. In general, productive wells in this water province yield 40 to 50 gallons per minute (gpm). The most productive wells in the Catoctin formation, as well as the rock cleavage patterns, strongly influence groundwater movement (Slaughter, 1962). The surficial aquifer at Fort Ritchie is less than 5 feet below the ground surface in some areas. Springs are commonly found on the installation, emerging at points between weathered and fresh strata.

1.5.4.4 Surface Water Hydrology

Fort Ritchie is located within the Potomac River watershed, which constitutes a major tributary to the Chesapeake Bay. Small springs and groundwater seeps are common along the slopes and at the bases of the mountains which surround the installation. The surface water runoff from the post and surrounding area flows into channels, ditches, and culverts at the installation, and collects in Lake Royer and Lake Wastler. These lakes have a combined holding capacity of 79 million gallons of water. Lake Wastler is at a higher elevation and discharges into Lake Royer. Lake Royer discharges into the South Fork of Falls Creek, which flows northwest into Pennsylvania (USACE, 1993a).

Falls Creek empties into the east branch of Antietam Creek, which turns south and reenters Maryland. Antietam Creek is the largest freshwater stream in the Fort Ritchie area, with a watershed of approximately 187 square miles. Monthly discharge records for Antietam over a three-year period, collected near Waynesboro, Pennsylvania, indicated an average flow of 1.14 to 1.59 cubic feet per second per square mile (USACE, 1993a).

There is one major complex of wetlands on the installation. This wetland complex consists of the areas immediately adjacent to the freshwater stream which drains into and feeds Lake Royer. Other isolated palustrine wetlands occur throughout the wooded portions of the installation downgradient of numerous unmapped springs.

1.5.4.5 Hazardous Substances and Waste Management Practices

Fort Ritchie is classified as a small quantity hazardous waste generator, USEPA identification number MD8210020758 (USACE, 1993a). Permitted activities at Fort Ritchie that are regulated under the provisions of the Resource Conservation and Recovery Act (RCRA) include storage and use of hazardous substances, and generation, storage, and disposal of hazardous wastes.

Hazardous substances used at Fort Ritchie include solvents, petroleum products, flammable liquids, herbicides, pesticides, and fungicides. Hazardous substances are stored and/or used in approximately 26 buildings throughout the installation. As a small quantity generator, Fort Ritchie is not permitted to store hazardous wastes for long-term periods. Management of hazardous substances at Fort Ritchie has historically focused on utilizing as much of the hazardous item as possible, then transporting unusable or unwanted portions to an off-site treatment, storage, and disposal facility (TSDF). Table 1-5 outlines the current hazardous waste generating activities at Fort Ritchie.

Table 1-6 identifies the historical hazardous substance activities conducted at Fort Ritchie by type of operation. Figure 1-2 identifies the current location of USTs and above-ground storage tanks (ASTs) at Fort Ritchie. Figure 1-3 identifies the various locations where historical hazardous substance activities have occurred.

1.6 OFF-POST PROPERTIES

There are currently no off-post properties owned by Fort Ritchie. Although Fort Ritchie does not own any off-post property, Fort Ritchie provides support to three off-post properties that are operated by the AJCC (Site R, Site C, and Site D). Site R and Site D are owned by AJCC and Site C is leased land. Site R is an underground communication facility in southern Adams County, Pennsylvania. Site C is a microwave terminal and relay station adjacent to Fort Ritchie on Quirank Mountain, and Site D is a microwave relay station in Damascus, Maryland. These properties are not part of the Fort Ritchie property to be closed under the BRAC program and will only be discussed further in this document in terms of tenant operations.

1.7 ADJACENT PROPERTIES

Fort Ritchie is located in a mountainous area within a rural-residential setting in the southwest corner of the town of Cascade in Washington County. Three other small townships, Highfield, Pennersville, and Blue Ridge Summit, are located within 1 mile northeast of the installation. Cascade is an older retirement resort area with no industrial activities and limited commercial activities. Single-family homes are situated along Ritchie Road on the southwestern border of the installation. Several parks and natural areas are in close proximity to the installation, including South Mountain State Park, Catoclin Mountain National Park, Cunningham Falls State Park, and Michaux State Park in Pennsylvania. Figure 1-4 shows the surrounding land use for Fort Ritchie.

Washington County contains nine municipalities and had a total population of 85,948 in 1995. The total population of the county is expected to approach 100,000 by the year 2020 (Economic Development Commission, 1995). The largest population center in Washington County, approximately 20 miles southwest of Fort Ritchie, is the city of Hagerstown with a population of 35,445 residents in 1995.

Table 1-5. Hazardous Waste Generating Activities at Fort Ritchie

Year	Location	Facility/ Operation	Activity	Name of Waste Material	Generation Rate (Pounds/yr)	Disposition
1992	Fort Ritchie	Information is not available on the generation of hazardous waste by facility or operation.	Information is not available on the individual generation or storage locations of hazardous waste.	Corrosive liquids, waste petroleum naphtha, hazardous liquid containing PCBs, adhesive flammable liquids, lead filters, flammable liquids, silver film (solid hazardous waste)	68,369	DRMO and Others
1993	Fort Ritchie			Photographic chemical kits, photocolor chrome kits, silver cartridges, sodium hypochlorite, lead acid batteries, lithium batteries, photographic cleaner/fixer trays, decontaminating agents, nicad batteries, toner	3,189	DRMO and Others
1994	Fort Ritchie			Nicad batteries, lithium batteries, ink, lead acid batteries, enamel spray paint, toner, lindane, methyl alcohol, acetic acid, cleaning solvents, No. 1 Fuel Oil - kerosene, dimethyl sulfate, denatured alcohol, decontaminating agents, diesel fuel, sodium hypochlorite, ammonium hydroxide, lacquer, photographic fixer bath, industrial cleaners, lead paint, alkaline liquids. Remediation of the skeet range also produced 730,000 pounds of soil contaminated with lead shot.	735,015	DRMO and Others
1995	Fort Ritchie			Lead contaminated debris, toner, filter element sets, flammable liquid glass cleaner, adhesive aerosols, aerosol liquid cleaners, photographic developer/toner kits, waste flammable liquids, lead acid batteries, sodium hypochlorite solution, cleaning solvents, photographic activator concentrate	6,383	DRMO and Others
1996	Fort Ritchie			Cleaning solvent and batteries	209	DRMO and Others

DRMO = Defense Reutilization and Marketing Office
PCB = Polychlorinated Biphenyl

Table 1-6. History of Installation Operations at Fort Ritchie

Period	Type of Operation	Hazardous Substance Activities	Map Reference
1800s-1926	Buena Vista Ice Company ice generation	Unknown	None
1926-1942	Maryland National Guard brigade training	Fuel storage and dispensing, ordnance/weapons training and disposal, waste disposal, incineration, construction	Installation-wide
1942-1945	War Department Military Intelligence Training Center (MITC)	Ordnance/weapons training, fuel storage/dispensing, waste disposal, incineration, construction	Installation-wide
1945-1948	National Guard Training Center	Ordnance/weapons training and disposal, fuel storage and dispensing, waste disposal, incineration, construction	Installation-wide
1948-present	Administrative, logistical, information systems, housekeeping, physical security, and engineering support for tenant activities	Maintenance operations, incineration, hazardous material/hazardous waste use and storage, waste disposal, fuel storage and dispensing, wastewater treatment, construction	Installation-wide

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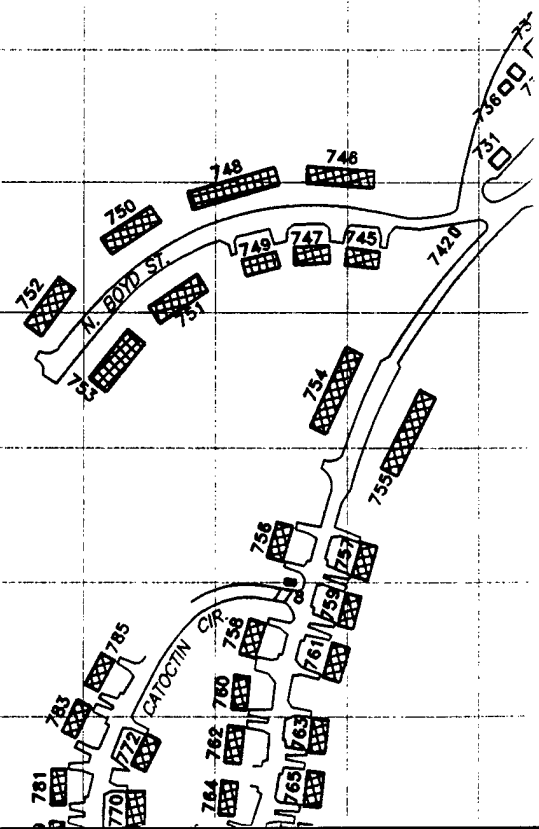
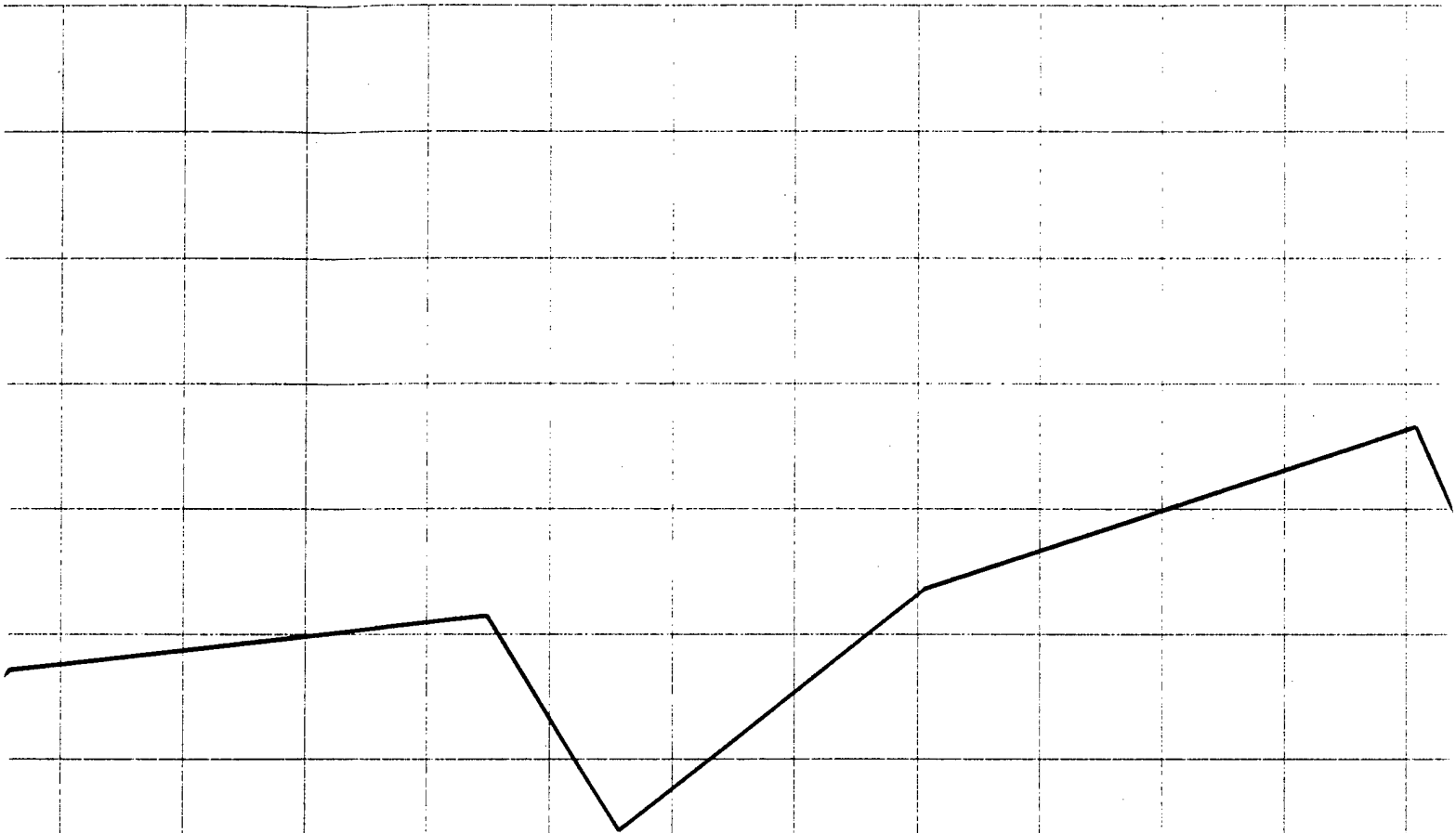
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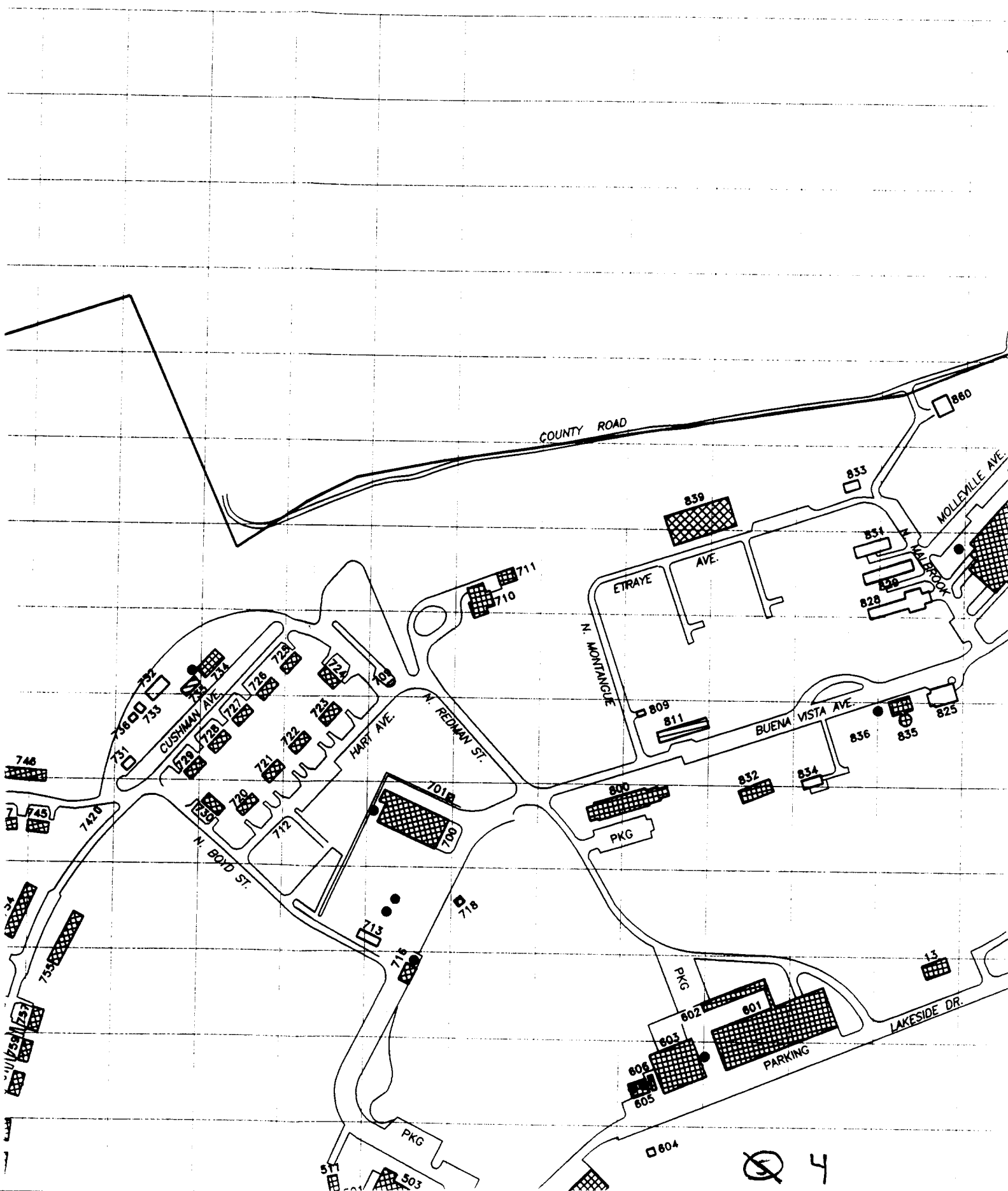
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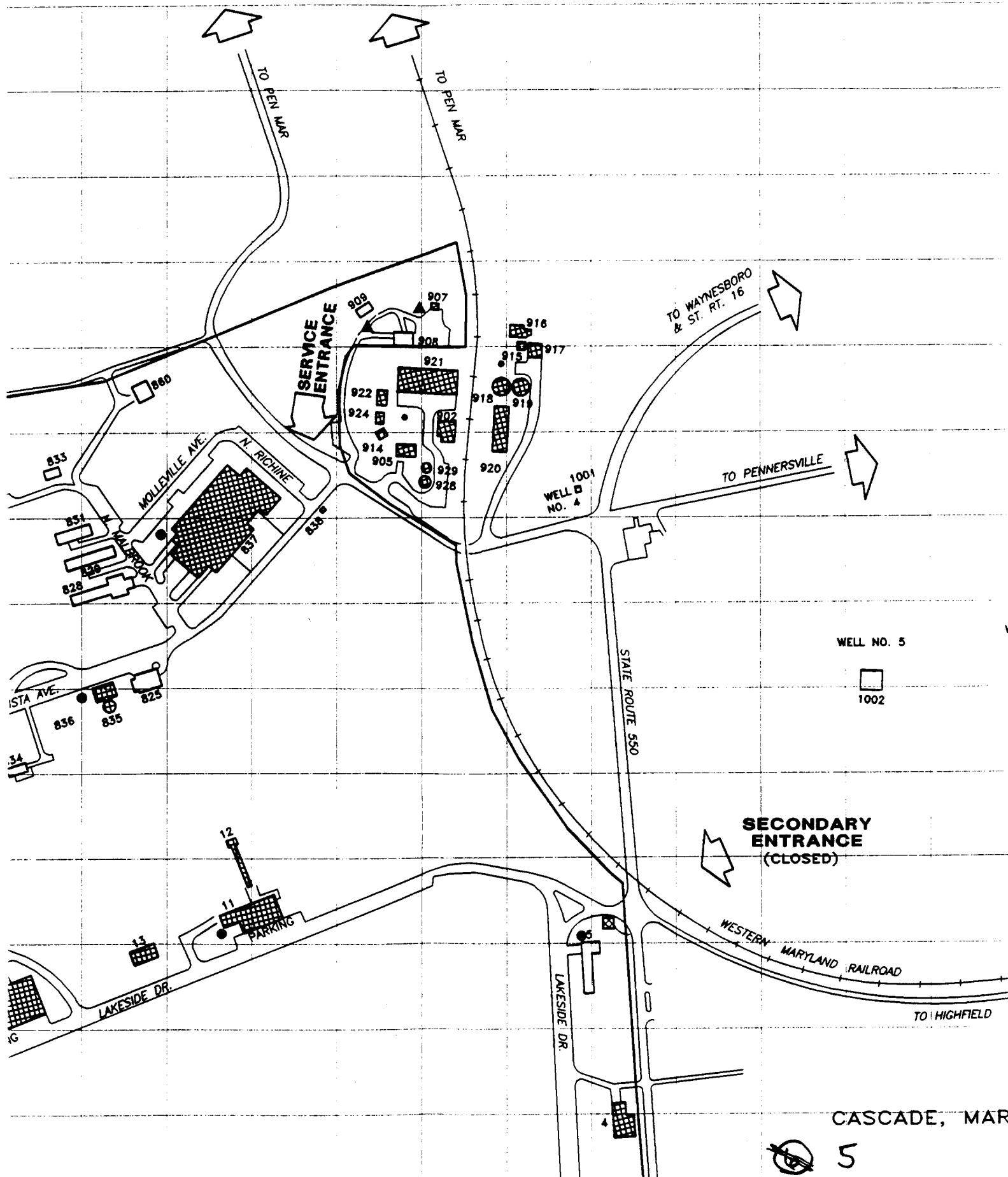


One Acre Grid Square
Coordinate Location: (3,35)

quare
on: (3,35)







CASCADE, MAR

WELL NO. 8



WELL NO. 5



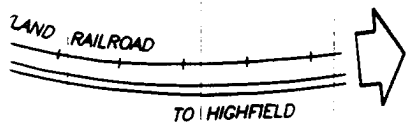
WELL NO. 6



WELL NO. 7



BOUNDARY
ANCE
(ED)



CASCADE, MARYLAND

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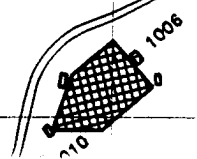
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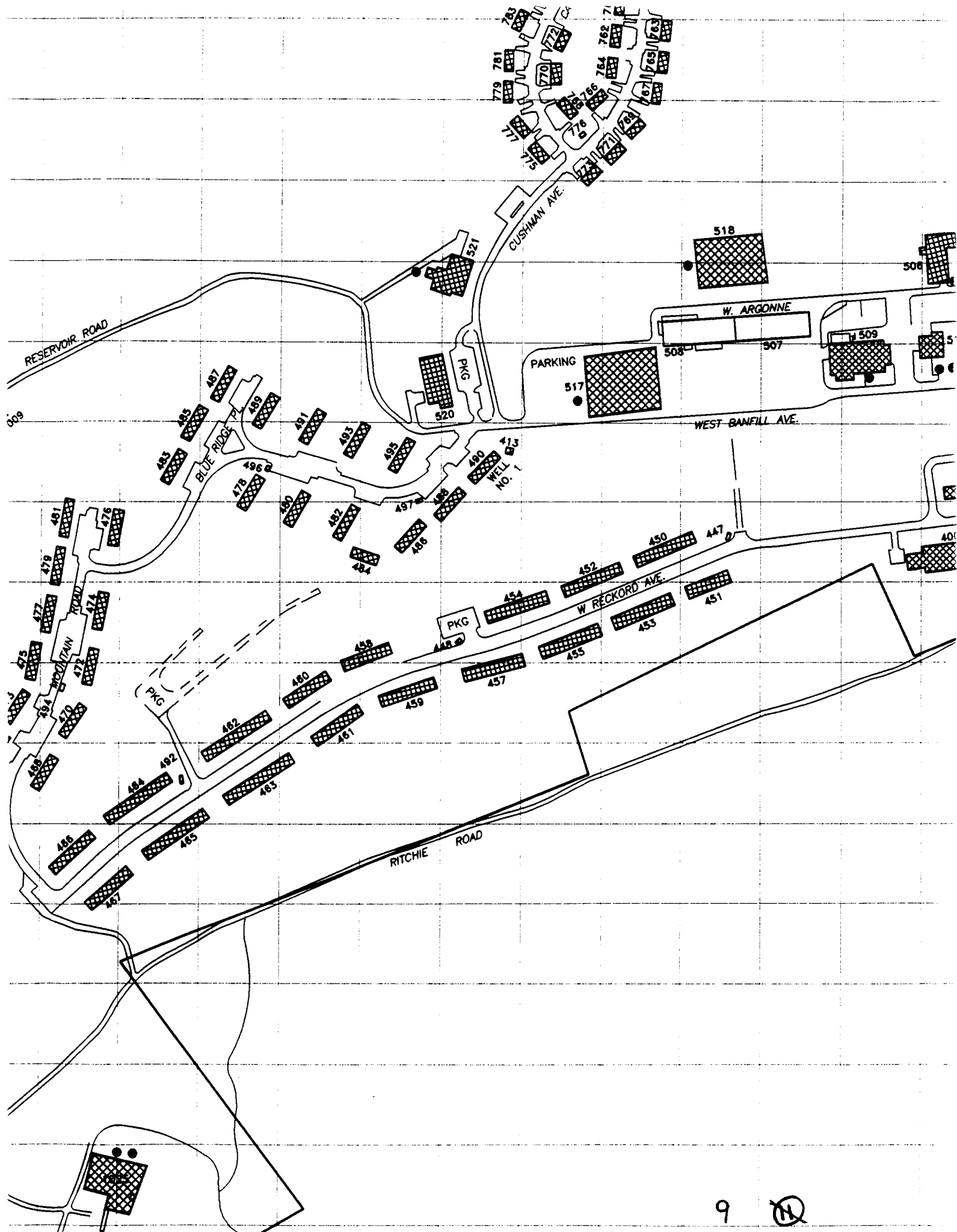
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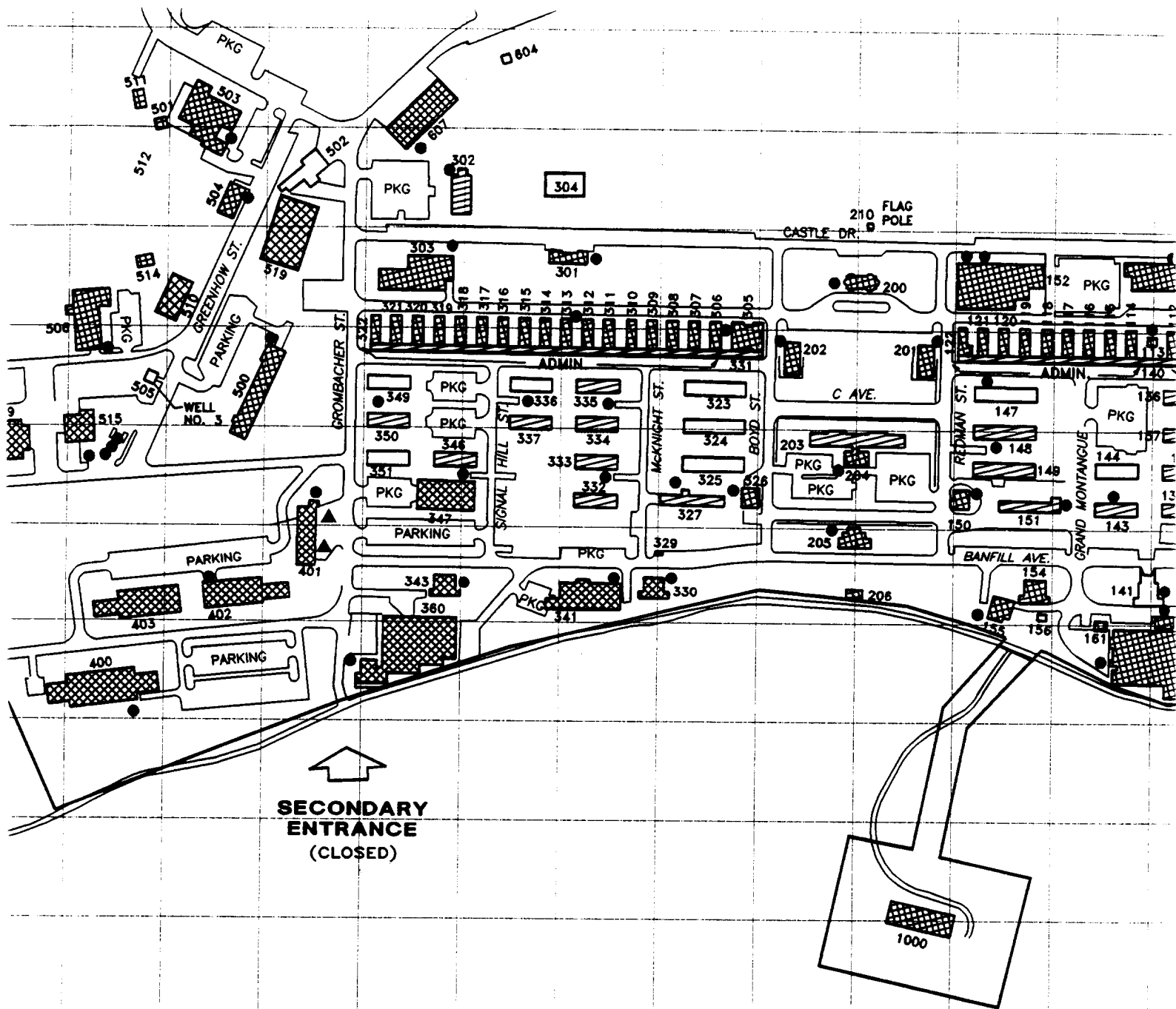
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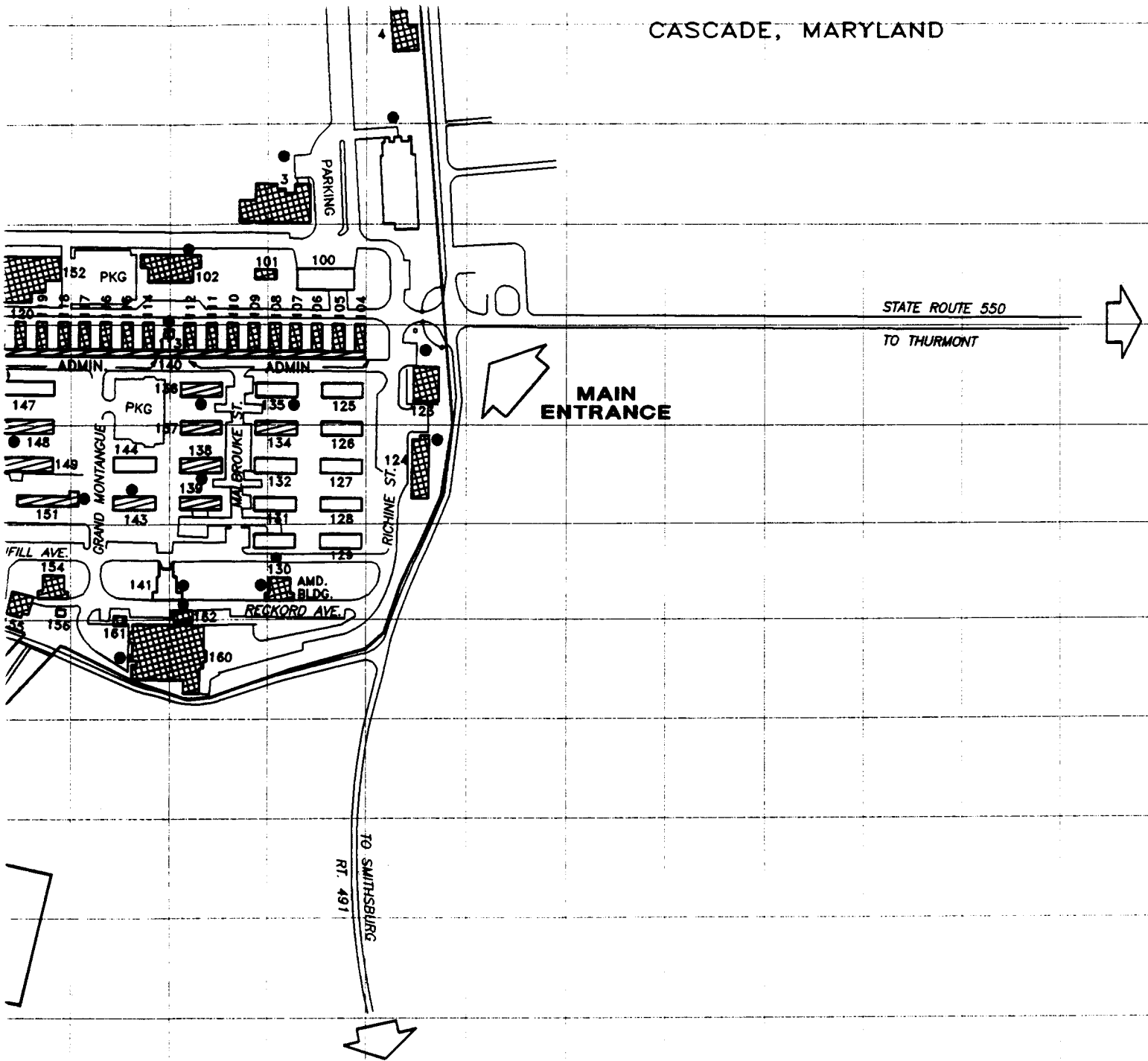








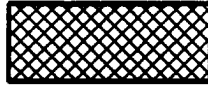
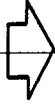
CASCADE, MARYLAND



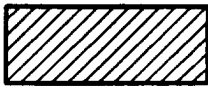
LAND

LEGEND:

STATE ROUTE 550
TO THURMONT



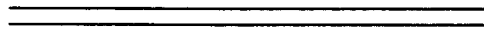
PERMANENT BUILDING



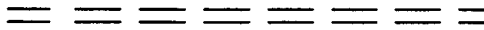
SEMI-PERMANENT BUILDING



TEMPORARY/DEMOLISHED BUILDING



ROADS, PARKING, ETC, PAVED



EARTH OR GRAVEL ROAD, TEMPORARY



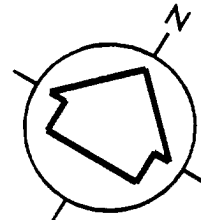
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USTs



ASTs



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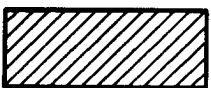
600

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LEGEND:



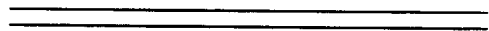
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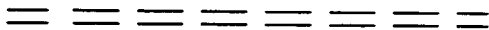
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EARTH OR GRAVEL ROAD, TRAIL, ETC.



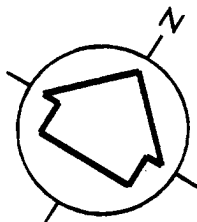
BRAC PROPERTY BOUNDARY

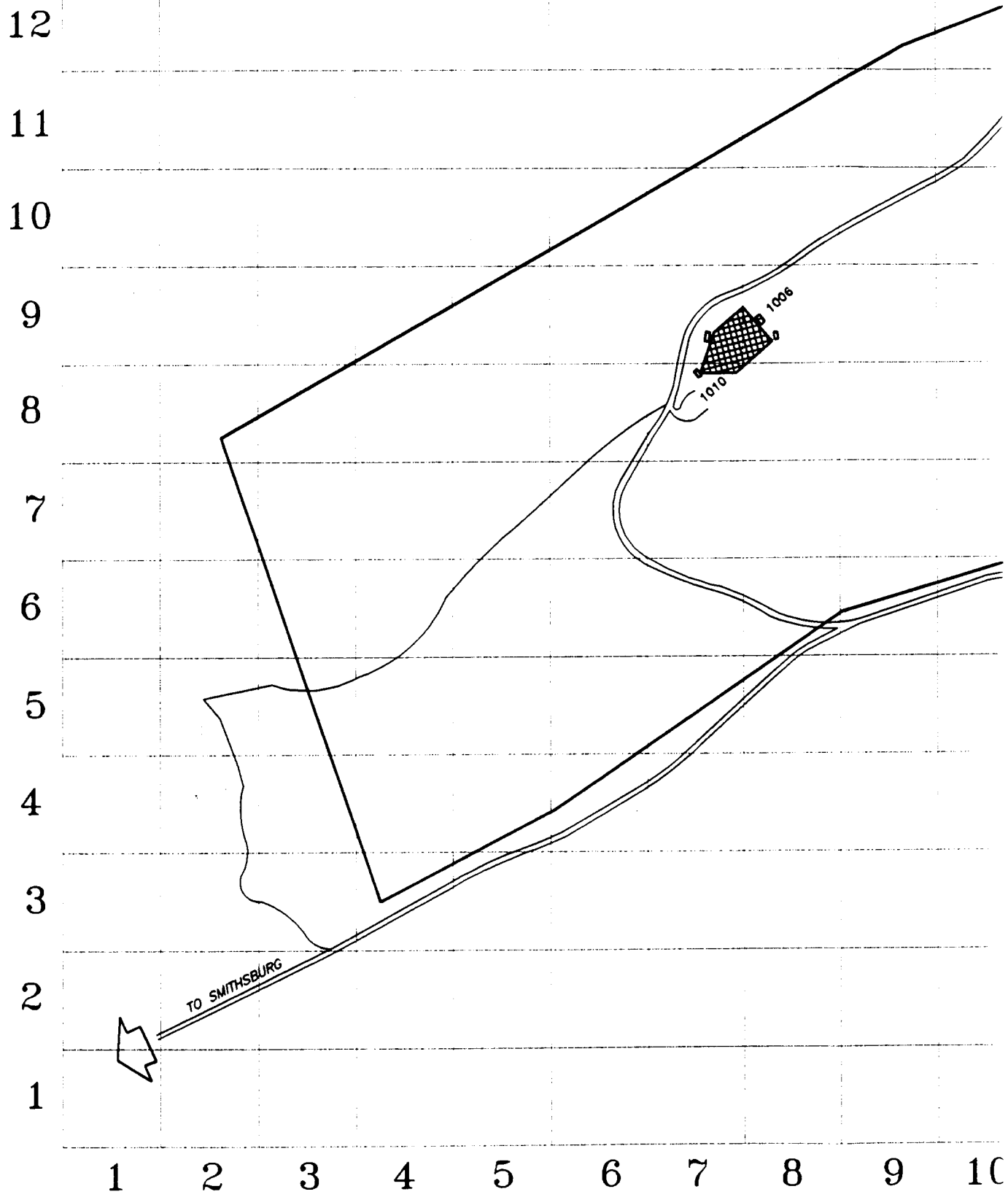


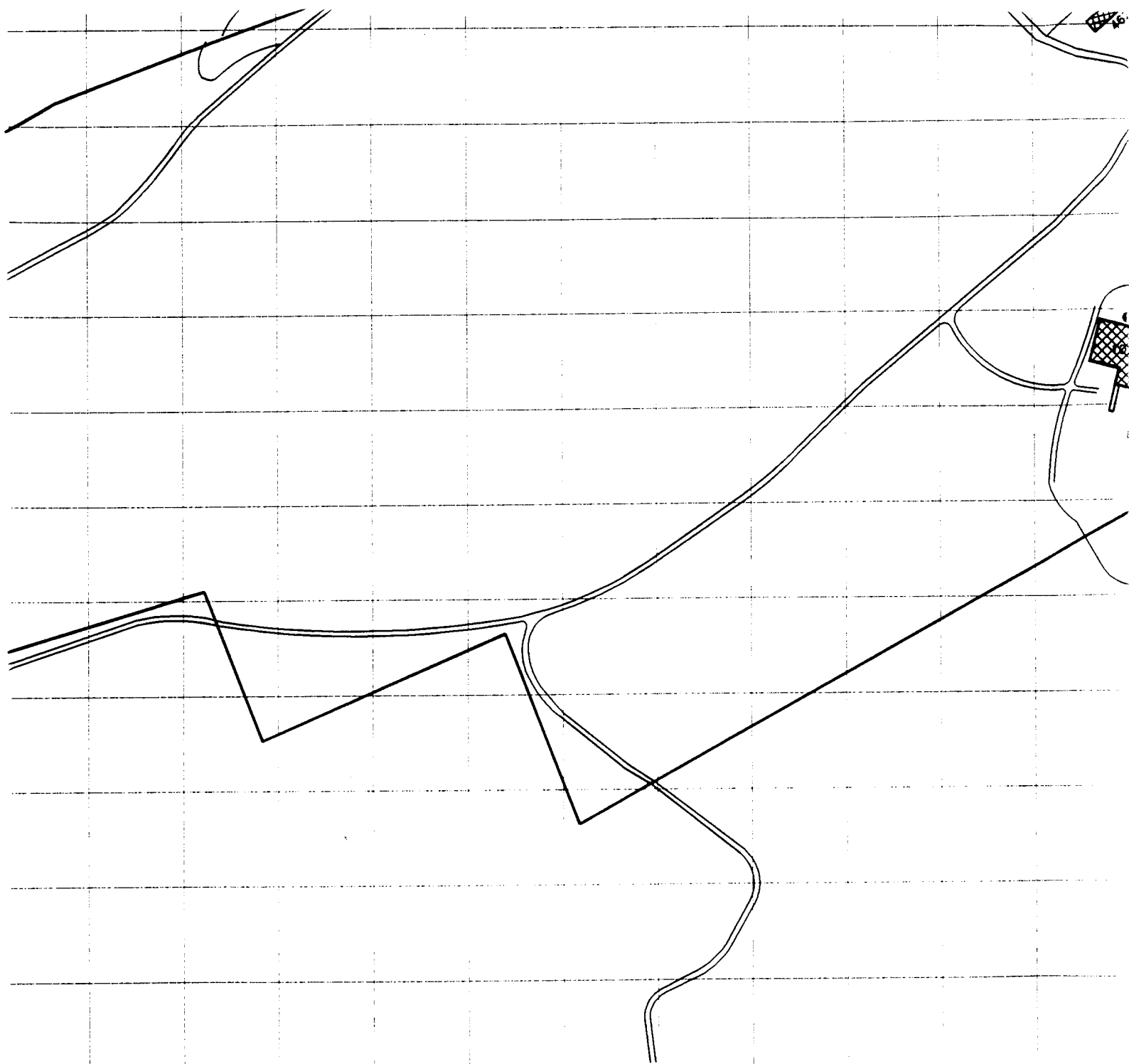
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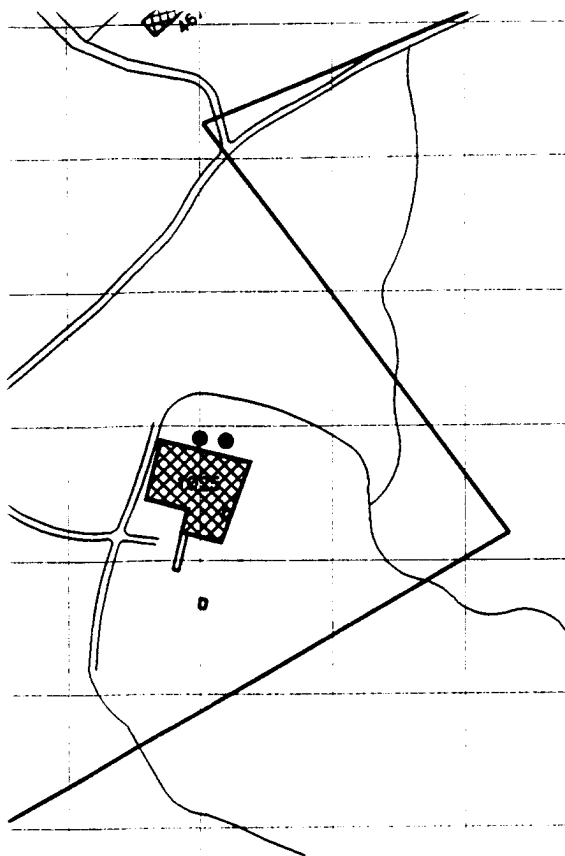




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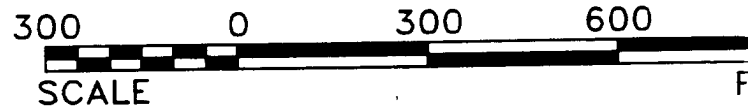
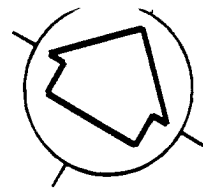
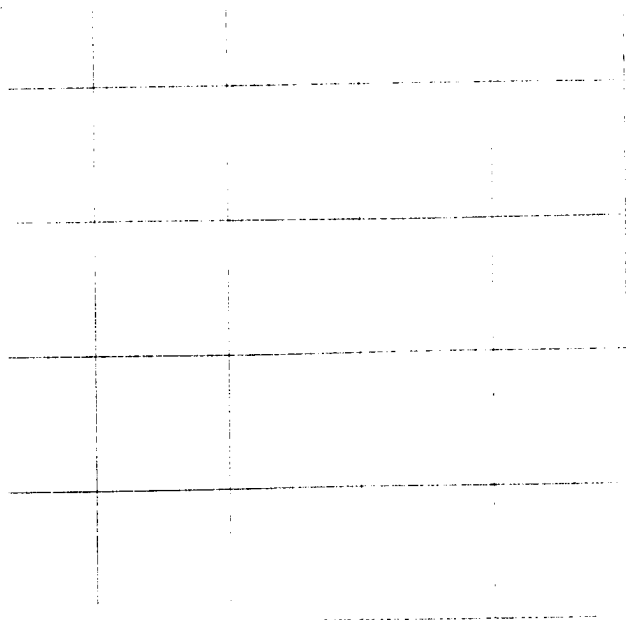
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PREPARED KDM

CHECKED TL

DATE 03-24-98

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US ARMY ENVIRONMENTAL CENTER

ACT NO. DACA31-94-D-0064

FIGURE 1-

FORT RITCHIE

OF KAISER

2113 EMMORTON PARK RD.
EDGEWOOD, MD. 21040
(410) 612-6350

LOCATION
FUEL STORAGE
DISPENS
ACTIVITY
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ID KDM

TASK NO: 66225

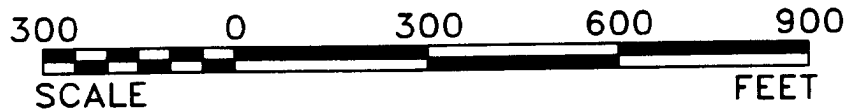
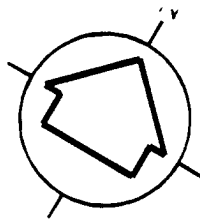
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FRBCP1-2





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US ARMY ONMENTAL CENTER

-94-D-0064

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SEWOOD, MD. 21040
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NO: 66225

DWG NO:

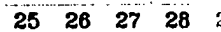
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FIGURE 1-2

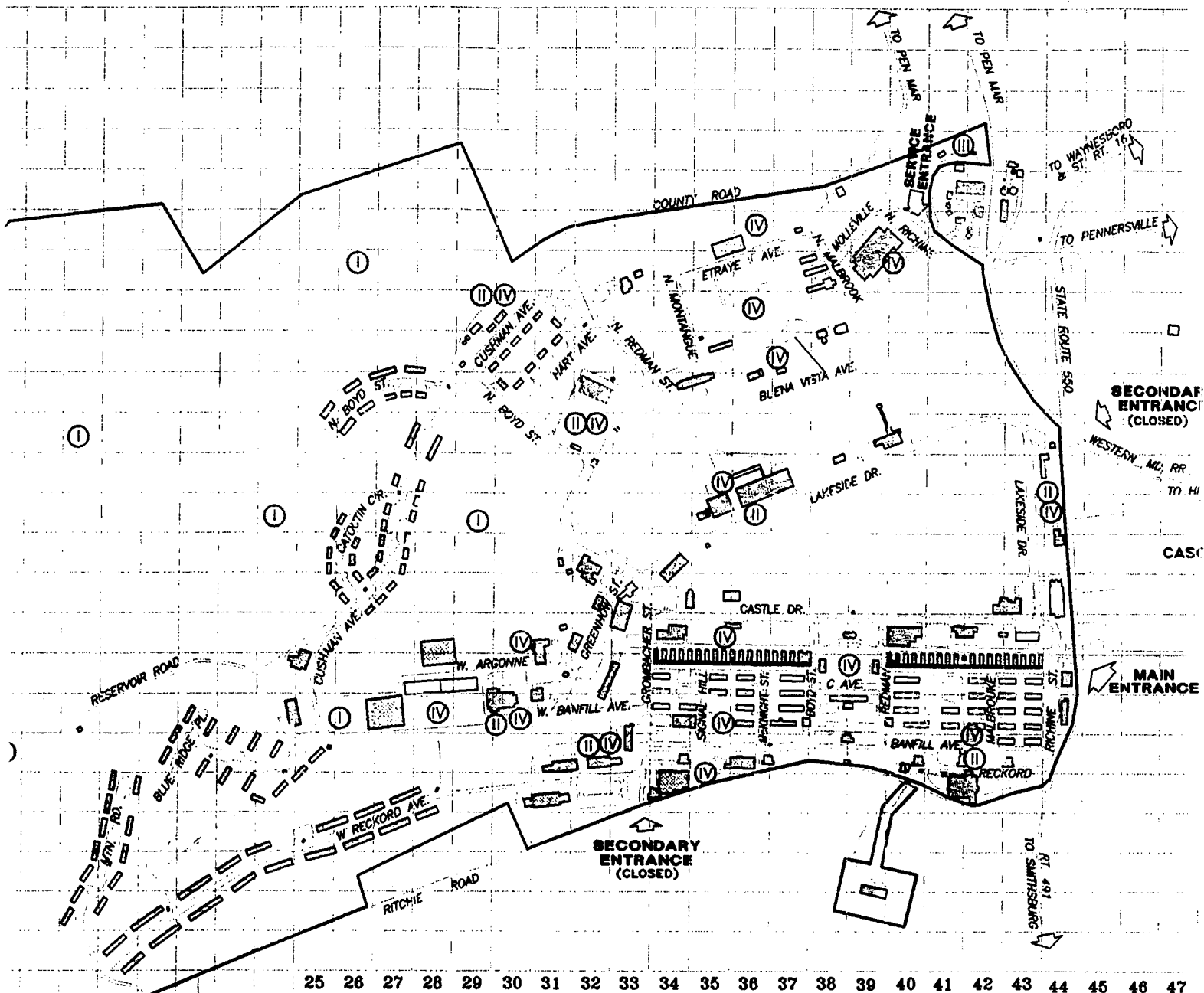
FORT RITCHIE

LOCATION OF
FUEL STORAGE AND
DISPENSING
ACTIVITIES
(USTs AND ASTs)

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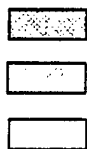


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LEGEND:



PERMANENT BUILDING

SEMI-PERMANENT BUILDING

DEMOLISHED BUILDING

ROADS, PARKING, ETC., PAVED

EARTH OR GRAVEL ROAD, TRAIL, ETC.

BRAC PROPERTY BOUNDARY

I

ORDNANCE/WEAPONS, TRAINING, AND DISPOSAL

II

MAINTENANCE OPERATIONS

III

INCINERATION

IV

HAZARDOUS MATERIAL/HAZARDOUS WASTE USE AND STORAGE

V

WASTE DISPOSAL AREAS



SOURCE: 1993 U.S. ARMY.

ENVIRC

CONTRACT NO. DACA3

ICF KAISER

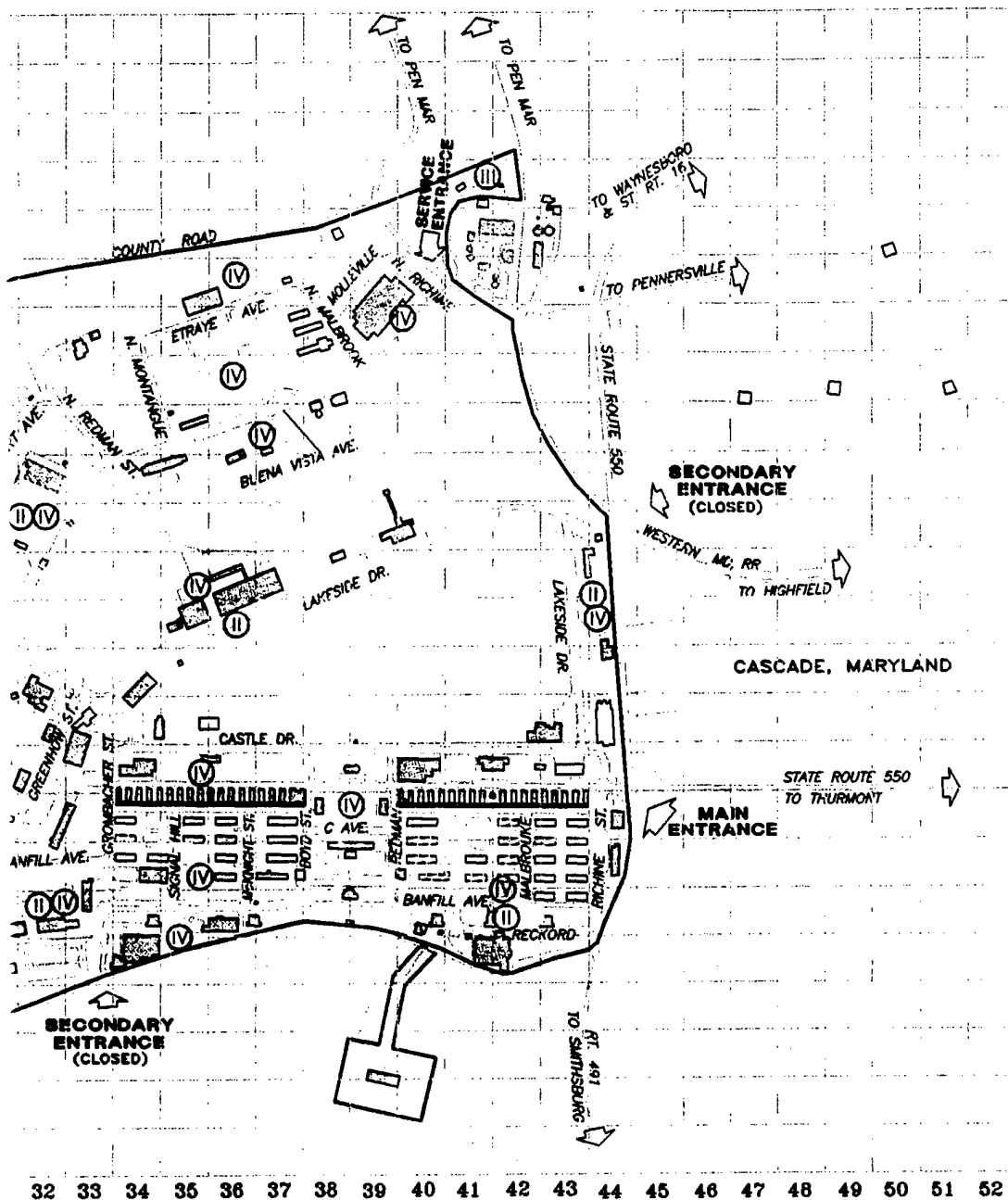
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PERTY BOUNDARY

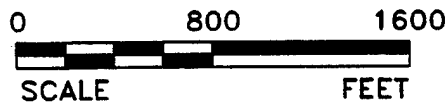
E/WEAPONS, TRAINING, AND DISPOSAL

CE OPERATIONS

ON

S MATERIAL/HAZARDOUS WASTE USE AND STORAGE

POSAL AREAS



SOURCE: 1993 U.S. ARMY, ENVIRONMENTAL OVERLAY MAP (EXISTING CONDITIONS)

US ARMY ENVIRONMENTAL CENTER

CONTRACT NO. DACA31-94-D-0064

◆ ICF KAISER

2113 EMMORTON PARK RD.
EDGEWOOD, MD. 21040
(410) 612-6350

PREPARED JNW

TASK NO: 66225

CHECKED JHH

ICF DWG NO:

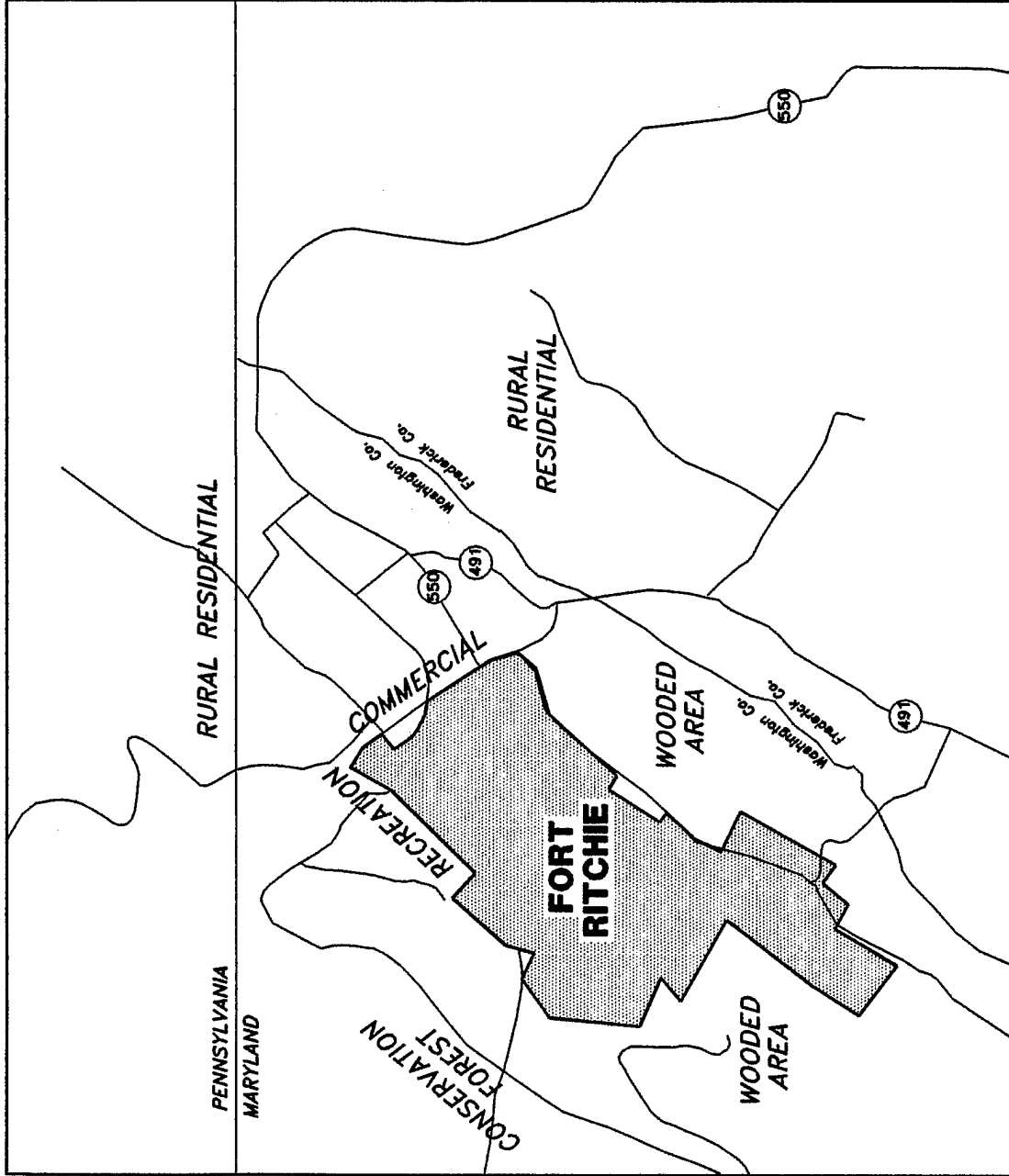
DATE 1-22-98

FRBCP1-3

FIGURE 1-3
FORT RITCHIE

LOCATION OF PAST
HAZARDOUS SUBSTANCE
ACTIVITIES

③



SCALE 1" = 3,000'



US ARMY ENVIRONMENTAL CENTER

CONTRACT NO. DACA31-94-D-0064		FIGURE 1-4 FORT RITCHIE	
ICP KAUFER ENVIRONMENTAL		VICINITY MAP AND COMMUNITY LAND USE FORT RITCHIE	
2113 EDMONTON PARK RD. EDGEWOOD, MD. 21040 (410) 812-8350		TASK NO. 66225 ICF DWG NO.	
PREPARED JMW	CHECKED JILH	DATE 7-12-97	
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SOURCE: 1993 FORT RITCHIE MASTER PLAN

2.0 PROPERTY DISPOSAL AND REUSE PLAN

This chapter describes the status of the disposal planning process (redevelopment plan) for Fort Ritchie and the relationship between the disposal process and environmental programs at the installation. It also identifies property transfer methods being utilized or considered in the disposal process.

2.1 STATUS OF DISPOSAL AND REUSE (REDEVELOPMENT) PLAN

The Fort Ritchie Local Redevelopment Authority (LRA) Executive Council, created by the Washington County Commissioners, has been tasked with the responsibility of developing a reuse plan that will provide an orderly transition of the installation personal property and facilities to uses that support local goals for economic and community development. The LRA Executive Council consists of local businesses and community leaders which ensure community involvement.

In 1996, the LRA established a conceptual redevelopment plan as a vehicle to provide overall guidance toward achieving the following goals:

1. Replacing job losses caused by installation closure;
2. Providing the first step toward long-term economic stability for the area; and
3. Focusing on broadening the tax base in Washington County.

The objective of this plan is to focus on broad generic areas of reuse that will be refined and reviewed in detail throughout the redevelopment process. The conceptual redevelopment plan is shown in Figure 2-1. This plan has allowed the LRA to move forward on the long range strategic plan while ensuring that near term tactical opportunities that fit within overall broad based long-term objectives, have not been lost.

The LRA recently (1997) prepared a Comprehensive Redevelopment Plan for Fort Ritchie. As part of this process, an analysis of the physical assets of the existing facility and market opportunities, has been conducted. Based upon this analysis, the property has been divided into four districts: the Original Core, Central Flats, North Slope, and Valley Edge. These four districts have been further divided into 17 parcels as represented in Figure 2-2 and Table 2-1. Five potential land uses were considered: industrial, office, conference and training, retail, and residential (LRA, 1997).

Alternatives were developed and further evaluated based on the following criteria:

1. Economic benefit to the community in terms of new jobs and property taxes;
2. Amount of capital investment required to prepare the site and buildings; and
3. Net revenues that would accrue.

As a result of this evaluation, the preferred plan proposes the development of a high technology office/R&D, corporate conference and training campus to be called the Lakeside Corporate Center at Pen Mar. The 20 year and long-term plans are presented as Figures 2-3 and 2-4. Further detail is available in the LRA's Comprehensive Redevelopment Plan (LRA, 1997). The Strategic Planning Committee will continue the process of reviewing community input, the needs of the homeless, and the greater needs of economic development to offset the impact of Fort Ritchie closure.

2.2 RELATIONSHIP TO ENVIRONMENTAL PROGRAMS

Disposal and reuse activities at Fort Ritchie 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); and
- Residual contamination may remain on certain properties after RAs have been completed or put into place, thereby restricting the future use of those properties.

FORT RITCHIE CONCEPTUAL REDEVELOPMENT PLAN

LEGEND
ROADS



FORT RITCHIE BOUNDARY



COUNTY BOUNDARY LINE



RAILROAD LINE



LAKES



TECHNOLOGY AND SERVICES PARK



RESIDENTIAL



RECREATION



PLANNED INDUSTRIAL



EDUCATION AND TRAINING



MULTI-USE EDUCATION / RECREATION



NATIONAL GUARD ENCLAVE



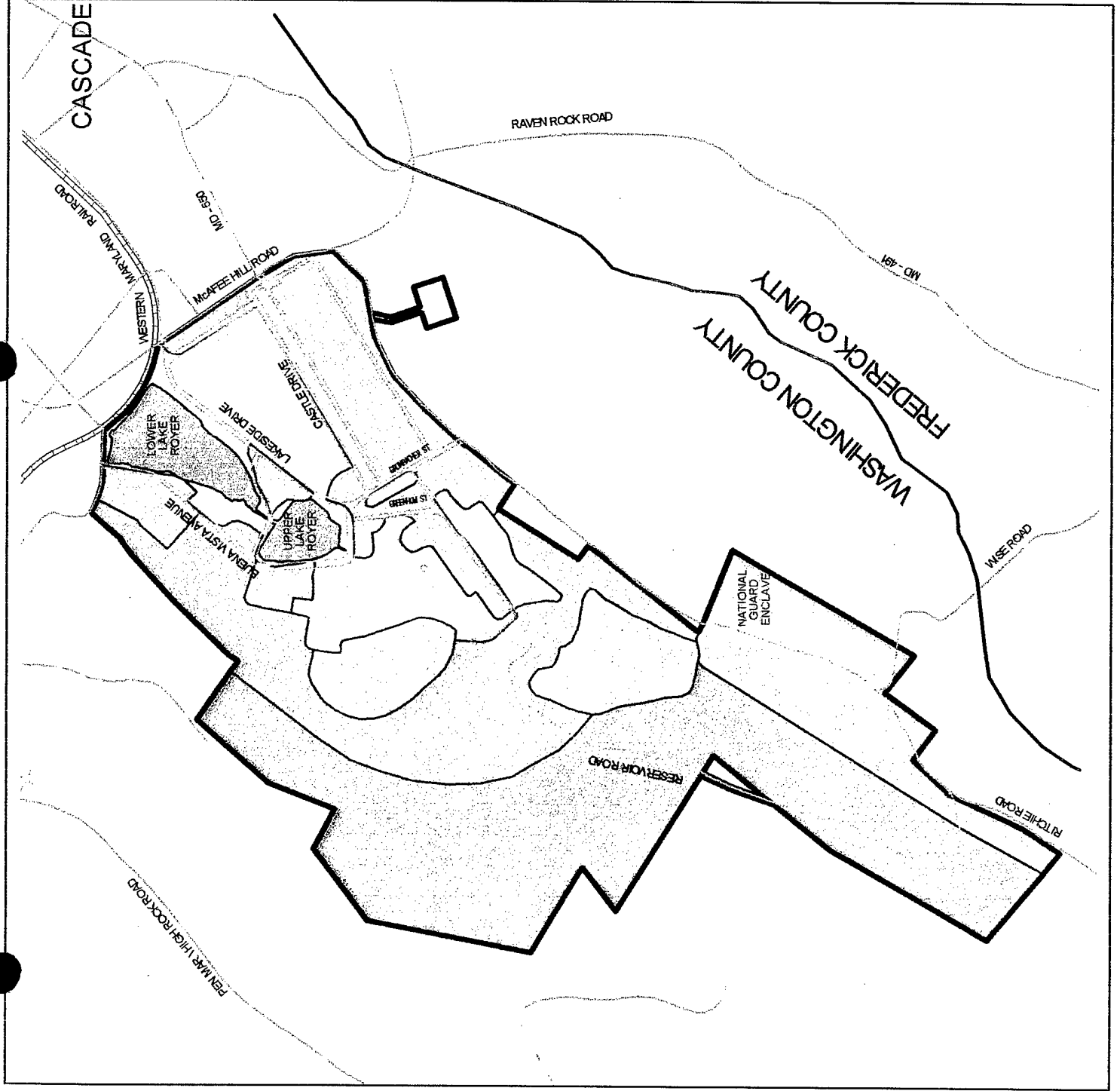
FIGURE 2-1
FORT RITCHIE

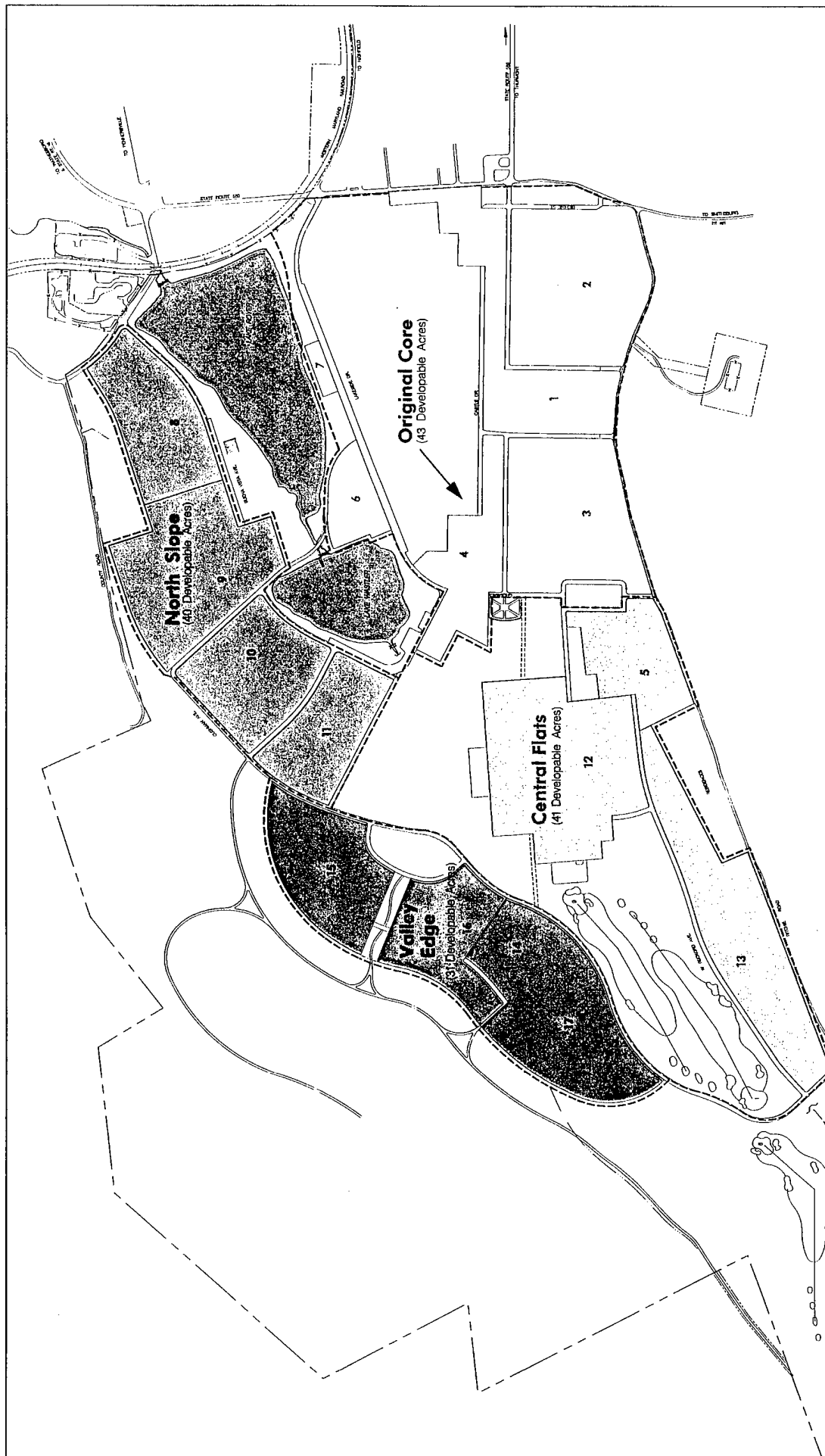


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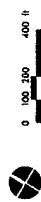
PREPARED BY THE WASHINGTON
COUNTY PLANNING DEPARTMENT GIS

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**Fort Ritchie Local
Redevelopment Authority**



Sasaki Associates, Inc.
Hamilton, Robinovitz & Alschuler, Inc.
URS /Greiner, Inc.

DeLone & Touch LLP - Fortus
D. W. Whitford & P. A. Preston LLP
Whitford, Taylor & Preston LLP

**Comprehensive
Reuse Plan for
Fort Ritchie**

Washington County, MD

**Lakeside Corporate Center
at PenMar
Development Districts
and Parcelization Plan**

FIGURE 2-2

May 9, 1997

Table 2-1. Reuse Parcel Data Summary

District	PARC EL ^a	Acres ^b	Priority	Description And Proposed Reuse	Known Sites ^c	Projected Transfer Date	Transfer Mechanism	Recipient
Original Core (43 acres)	1	total of 39	TBD	Camp Ritchie Historic District – Potential for combination office/training/education facilities	IV	1 Oct 98	EDC	PMDC
	2				II, IV	1 Oct 98	EDC	PMDC
	3				IV	1 Oct 98	EDC	PMDC
	4				IV	1 Oct 98	EDC	PMDC
	6				II, IV	1 Oct 98	EDC	PMDC
		3.73	TBD	Existing Buildings – No additional development opportunity.				
	7				None	1 Oct 98	EDC	PMDC
Central Flats (44 acres)	5	10.65	TBD	Dormitory Space (104,000 GSF) – Potential housing and/or office space.	II, IV	1 Oct 98	EDC	PMDC
	12	16.30	TBD	PX, Commissary, and other community facilities – Potential for conversion to office or conference/educational uses.	II, IV	1 Oct 98	EDC	PMDC
	13	14.0	TBD	Existing Homes – Upon demolition of existing structures, unconstrained development opportunities.	I, V	1 Oct 98	EDC	PMDC

EDC Economic Development Conveyance
GSF Gross Square Feet
PMDC Pen Mar Development Corporation
PX Post Exchange
TBD To-Be-Determined

^a The reuse parcel boundaries are subject to change.

^b Acreages listed in the Fort Ritchie LRA's Comprehensive
Redevelopment Plan, Executive Summary (LRA, 1997).

^c **Known Sites:** (shown on Figure 1-3)

- I = Ordnance/weapons training and disposal
- II = Maintenance operations
- IV = Hazardous material/hazardous waste use and storage

Table 2-1. Reuse Parcel Data Summary (Continued)

District	PARC EL ^a	Acres ^b	Priority	Description And Proposed Reuse	Known Sites ^c	Projected Transfer Date	Transfer Mechanism	Recipient
North Slope (36 acres)	8	9.0	TBD	Existing 46,000 GSF building – Renovation of existing building and an additional 57,000 GSF for development.	IV	1 Oct 98	EDC	PMDC
	9	13.0	TBD	Existing 20,300 GSF building – Ideal location for new facilities (can accommodate 160,000 GSF of additional space).	IV	1 Oct 98	EDC	PMDC
	10	8.39	TBD	Existing 12,300 GSF building – Suitable for subdivision and/or development of a complex of new buildings (can accommodate 171,000 GSF).	II, IV	1 Oct 98	EDC	PMDC
	11	7.54	TBD	Vacant parcel – Parcel can be subdivided or developed as a cluster of buildings (can accommodate 132,000 GSF of new space).	I	1 Oct 98	EDC	PMDC
Valley Edge (31 acres)	14 to 17	total of 31	TBD	Housing and open woods – Potential for redevelopment as 52 housing lots and a golf clubhouse.	I	1 Oct 98	EDC	PMDC

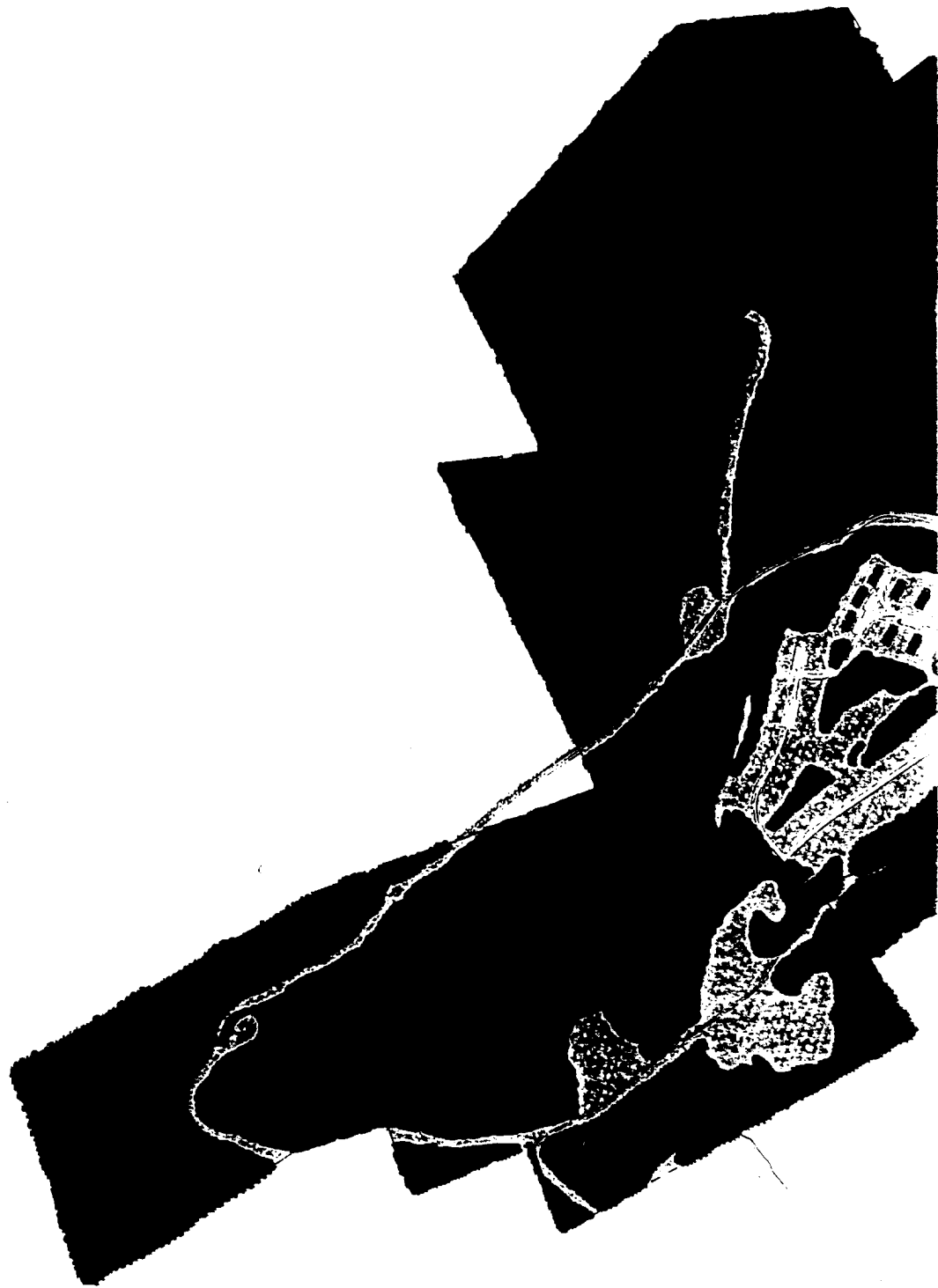
EDC Economic Development Conveyance
GSF Gross Square Feet
PMDC Pen Mar Development Corporation
TBD To-Be-Determined

^a The reuse parcel boundaries are subject to change.

^b Acreages listed in the Fort Ritchie LRA's Comprehensive Redevelopment Plan, Executive Summary (LRA, 1997).

^c **Known Sites:** (shown on Figure 1-3)

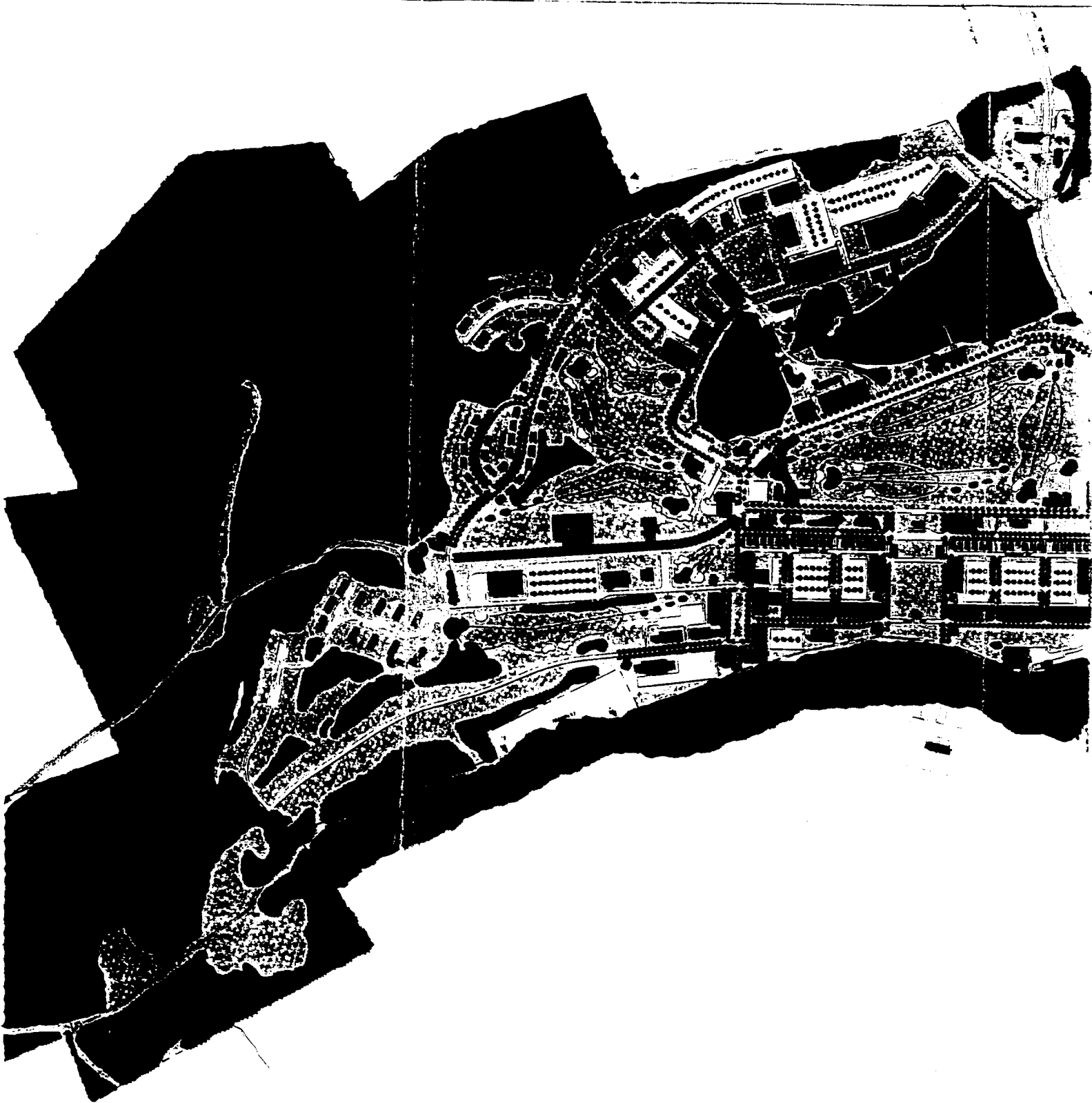
- I = Ordnance/weapons training and disposal
- II = Maintenance operations
- IV = Hazardous material/hazardous waste use and storage



**Fort Ritchie Local
Redevelopment Authority**



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Sasaki Associates, Inc.

Hamilton, Rabinovitch & Aischuler, Inc.

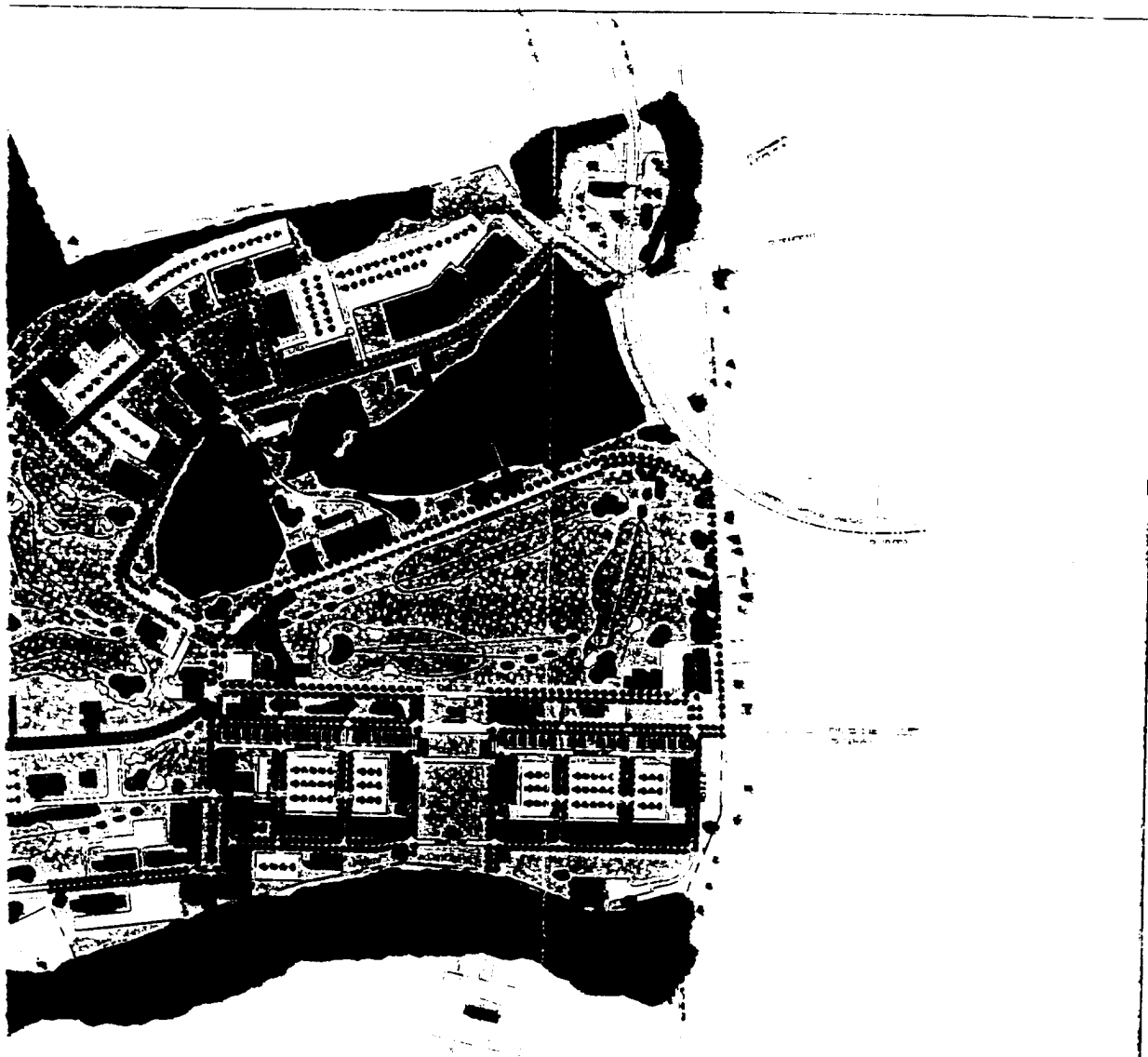
URS Greiner, Inc.

Deloria & Beach LLP - Partner
The Chesapeake Group
Hawthorn, Taylor & Weston LLP

Comprehensive
Reuse Plan for
Fort Ritchie

2

Washington County, MD



Legend

- Reused Existing Buildings
- Potential New Buildings

Comprehensive
Reuse Plan for
Fort Riche

Washington County, MD

Pen Mar Technology &
Conference Center
20 Year Illustrative Plan

FIGURE 2-3

February 20, 1997

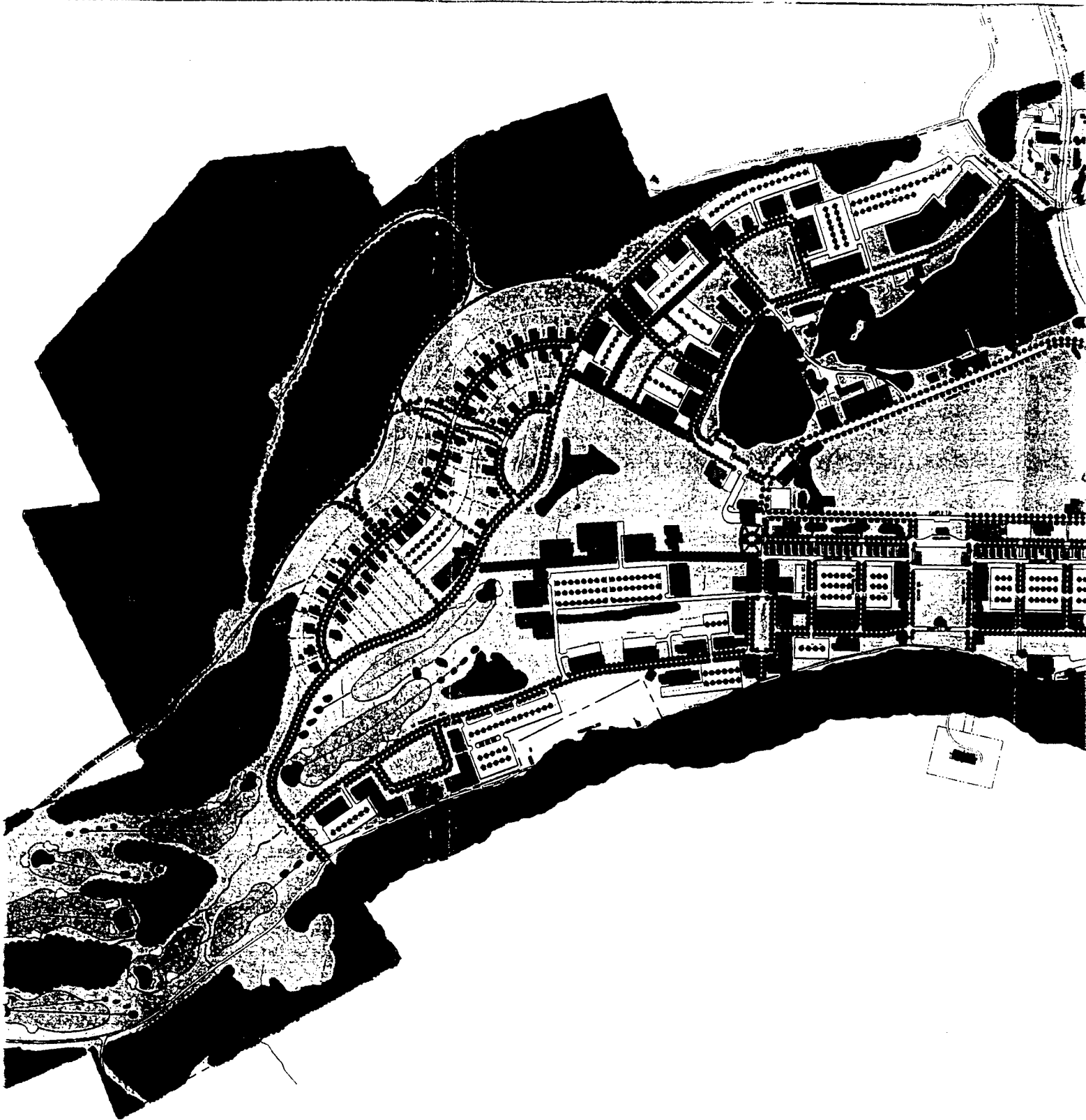
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**Fort Ritchie Local
Redevelopment Authority**



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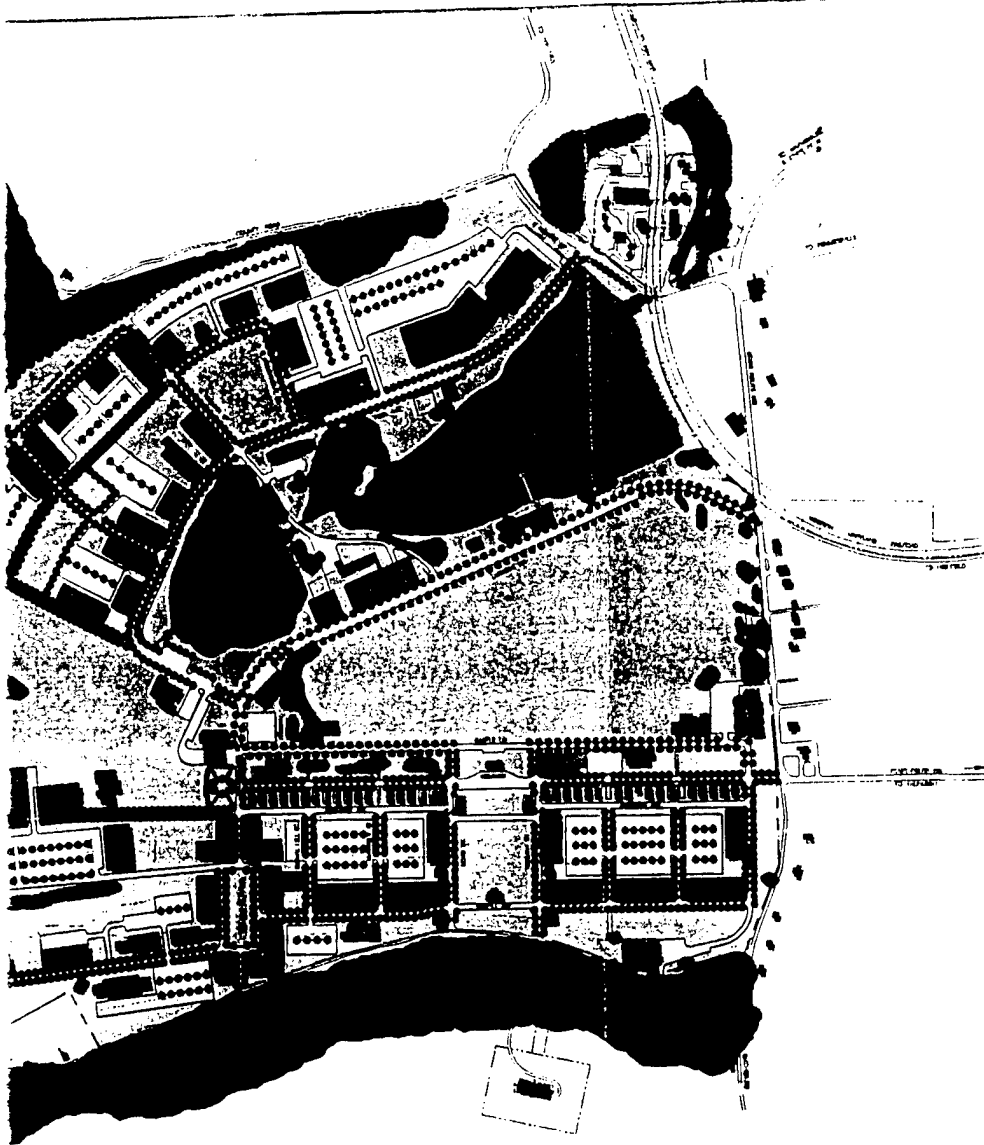
Sasaki Associates, Inc.
- Hamilton, Rabinovitz & Alschuler, Inc.
URS /Greiner, Inc.

Deloitte & Touch LLP - Fantus
The Chesapeake Group
Whiteford, Taylor & Preston LLP

②

**Comprehensive
Reuse Plan for
Fort Ritchie**

Washington County, MD



Legend

- Reused Existing Buildings
- Potential New Buildings

v, Inc.
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Comprehensive Reuse Plan for Fort Ritchie

Washington County, MD

Pen Mar Technology & Conference Center Long Term Illustrative Plan

FIGURE 2-4

February 21, 1997



A 1992 CERFA amendment to CERCLA Section 120(h)(3)(B)(i) defines when "all RA has been taken" based on two conditions. First, the construction and installation of an approved remedial design must be complete. Second, the remedy must be demonstrated to the Administrator to be operating properly and successfully. The amendment further states that implementation of long-term pumping and treating, or operation and maintenance, after the remedy has been demonstrated to the regulatory agencies [MDE/USEPA] to be operating properly and successfully, does not preclude the transfer of the property. This deed requirement applies only to property on which a hazardous substance was stored for one year or more, or is known to have been disposed of or released. Thus, any required remedial and/or removal response actions must be selected and implemented for such contaminated properties before transfers to private parties can occur.

At Fort Ritchie, a non-National Priorities List (NPL) facility, the State is the lead regulatory authority and will be responsible for regulatory approval of the remedial design. The requirement for complying with CERCLA 120(h) and the possibility of residual contamination will be factored into the property disposal and reuse process at Fort Ritchie.

2.3 PROPERTY TRANSFER METHODS

The various property transfer methods being utilized or considered in the disposal process at Fort Ritchie are described in this section. Transfer methods which may not be currently applicable but which may be considered in future disposal planning actions at the installation have also been identified.

2.3.1 Federal Transfer of Property

Transfer actions between Federal agencies are not applicable at Fort Ritchie.

2.3.2 Economic Development Conveyance

The Fort Ritchie property will be transferred to the Pen Mar Development Corporation (PMDC) as an Economic Development Conveyance (EDC). This is a method of transferring real property to a LRA to help spur local economic development and job creation. An EDC may be with or without initial payment at the time of transfer, and may be at or below the estimated fair market value of the property.

2.3.3 Negotiated Sale

After transfer to the PMDC, a negotiated sale could take place at Fort Ritchie.

2.3.4 Competitive Public Sale

After transfer to the PMDC, competitive public sales could take place at Fort Ritchie.

2.3.5 Widening of Public Highways

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

2.3.6 Donated Property

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

2.3.7 Interim Leases

Currently, the only interim lease at Fort Ritchie includes five buildings leased by the PMDC. The PMDC is responsible for subletting these buildings, including the space intended for the International Masonry Institute (IMI). After transfer of the Fort Ritchie property to the PMDC, all lease agreements and land negotiations will be conducted by the PMDC. Table 2-2 identifies the grantee, property/facility, effective date, and termination date of each current interim lease agreement.

2.3.8 Other Property Transfer Methods

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

Table 2-2. Existing Legal Agreements/Interim Leases

Title of Interim Lease/Legal Agreement	Building Number/Areas	Date of Agreement	Reuse Parcels
PMDC	320, 321, & 322	June 9, 1997 for a period of 5 years	4
PMDC	4, 500, & 601	October 1, 1997 for a period of 5 years	1, 12, & 6

PMDC Pen Mar Development Corporation

3.0 INSTALLATION-WIDE ENVIRONMENTAL PROGRAM STATUS

This section provides a summary of the current status of environmental restoration projects, installation-wide assessment activities, ongoing compliance activities, cultural and natural resources programs, and community involvement at Fort Ritchie. This section also describes the environmental condition and suitability for transfer of the property.

3.1 ENVIRONMENTAL PROGRAM STATUS

The Environmental Management Division (EMD) of Fort Ritchie manages and coordinates all environmental programs on the installation. The goal of these environmental programs is to protect human health and the environment.

3.1.1 Restoration Sites

Limited restoration activities have occurred at Fort Ritchie. To date, restoration activities include removal of contaminated soil at the Former Skeet Shooting Range and the Post Exchange (PX) Auto Service Station. The status of early actions that have been taken at these sites are summarized in Table 3-1. The location of these sites are identified in Figure 3-1.

3.1.2 Installation-Wide Source Discovery and Assessment Status

An EBS of Fort Ritchie was conducted in 1995. The results of the survey are summarized in the EBS Report and the CERFA Letter Report (an appendix of the EBS Report). The final versions were issued in June 1996. The EBS Report summarizes the status of Fort Ritchie's environmental programs, and the CERFA Letter Report summarizes the areas that were identified in the EBS Report as requiring environmental evaluation. Additional information regarding the CERFA parcels is presented in Section 3.4. Table 3-2 lists the AREEs identified in the EBS as having potential sources of contamination.

In support of the BRAC environmental restoration program, an environmental Site Investigation (SI) was initiated in late 1996, to determine whether there have been releases of hazardous substances, pollutants, or contaminants to the AREEs identified in the EBS. The results of the investigation will be used by the Army, in consultation with the regulators, to decide which areas or operable units (OUs) will proceed to cleanup action or will be removed from further investigation to allow for transfer and reuse. Figure 3-2 illustrates the 16 OUs identified for environmental investigation:

- OU1 - Golf Course Maintenance Shop;
- OU2 - Former Incinerator Area;
- OU3 - Lake Royer and Lake Wastler;
- OU4 - Motor Pool;
- OU5 - Department of Public Works (DPW) Maintenance Equipment Area;
- OU6 - Autocraft Shop;
- OU7 - Abandoned Firing Ranges;
- OU8 - PX Auto Service Station;
- OU9 - Administration Building Area;
- OU10 - Wise Road Disposal Area;
- OU11 - Wetland Area;
- OU12 - Former Hospital Area;
- OU13 - Ordnance and Explosives/Unexploded Ordnance (OE/UXO) Impact Areas;
- OU14 - Former Burn Area;
- OU15 - Reservoir Road Disposal Area; and
- OU16 - Electrical Substation.

Table 3-1. Environmental Restoration Early Action Status

Site	Action	Purpose	Status
Former Skeet Shooting Range	Soil sampling of Armory site and adjacent property was conducted in 1992.	Determine presence of lead contamination	The approximate off-property horizontal extent of lead contamination has been determined. Additional sampling up to a radius of 950 feet from the range has been completed (USACHPPM, 1995).
	Environmental Assessment (EA) for Armory construction was conducted in 1993.	Assess environmental impact of Armory construction	
	Soil sampling was conducted in 1995.	Determine extent of off-property lead contamination	
PX Auto Service Station, Bldg 515	18-25 gallons of gasoline on soil surface was cleaned up with sorbents and leak was repaired in 1984.	Source removal	Contaminated soil was removed in conjunction with UST replacement activities.
	Hydrologic study was conducted in 1991.	Determine extent of soil and groundwater contamination	
	Contaminated soil was removed during UST replacement activities in 1992.	Remove residual contamination	

Bldg Building
 EA Environmental Assessment
 PX Post Exchange
 UST Underground Storage Tank

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One Acre Grid Square
Coordinate Location: (3,35)

TO SMITHSBURG

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FORMER SKEET RANGE

RESERVOIR ROAD

BLUE RIDGE

N. BOND ST.

COLUMBIA CR.

CUSHMAN AVE.

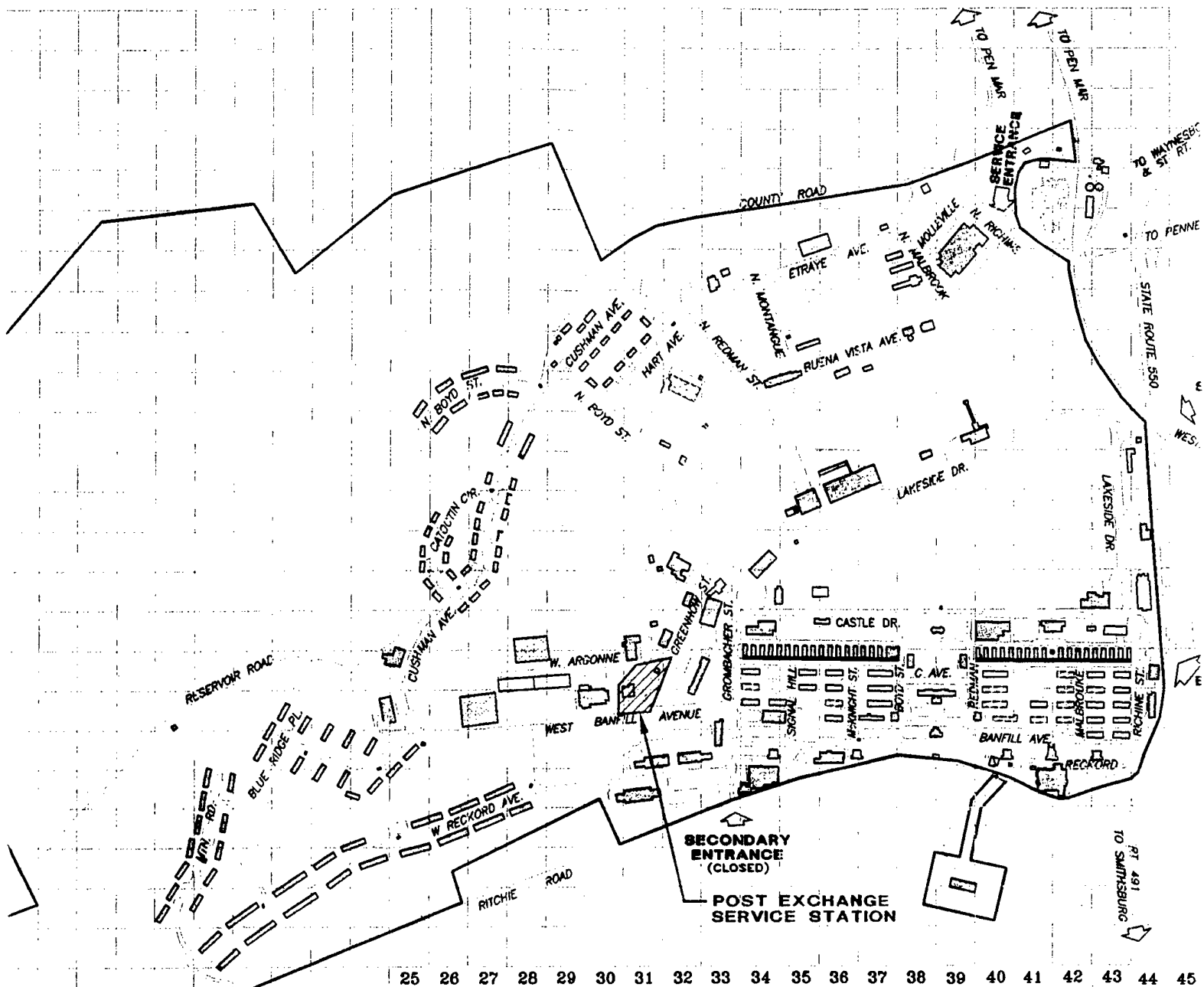
W. RECKORD AVE.

RITCHIE

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LEG

①



25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45

SKEET RANGE

LEGEND:



PERMANENT BUILDING



SEMI-PERMANENT BUILDING



DEMOLISHED BUILDING

ROADS, PARKING, ETC., PAVED

EARTH OR GRAVEL ROAD, TRAIL, ETC.

BRAC PROPERTY BOUNDARY



ENVIRONMENTAL RESTORATION EARLY ACTION

SOURCE: 1993

CONTRACT 1

ICF KA

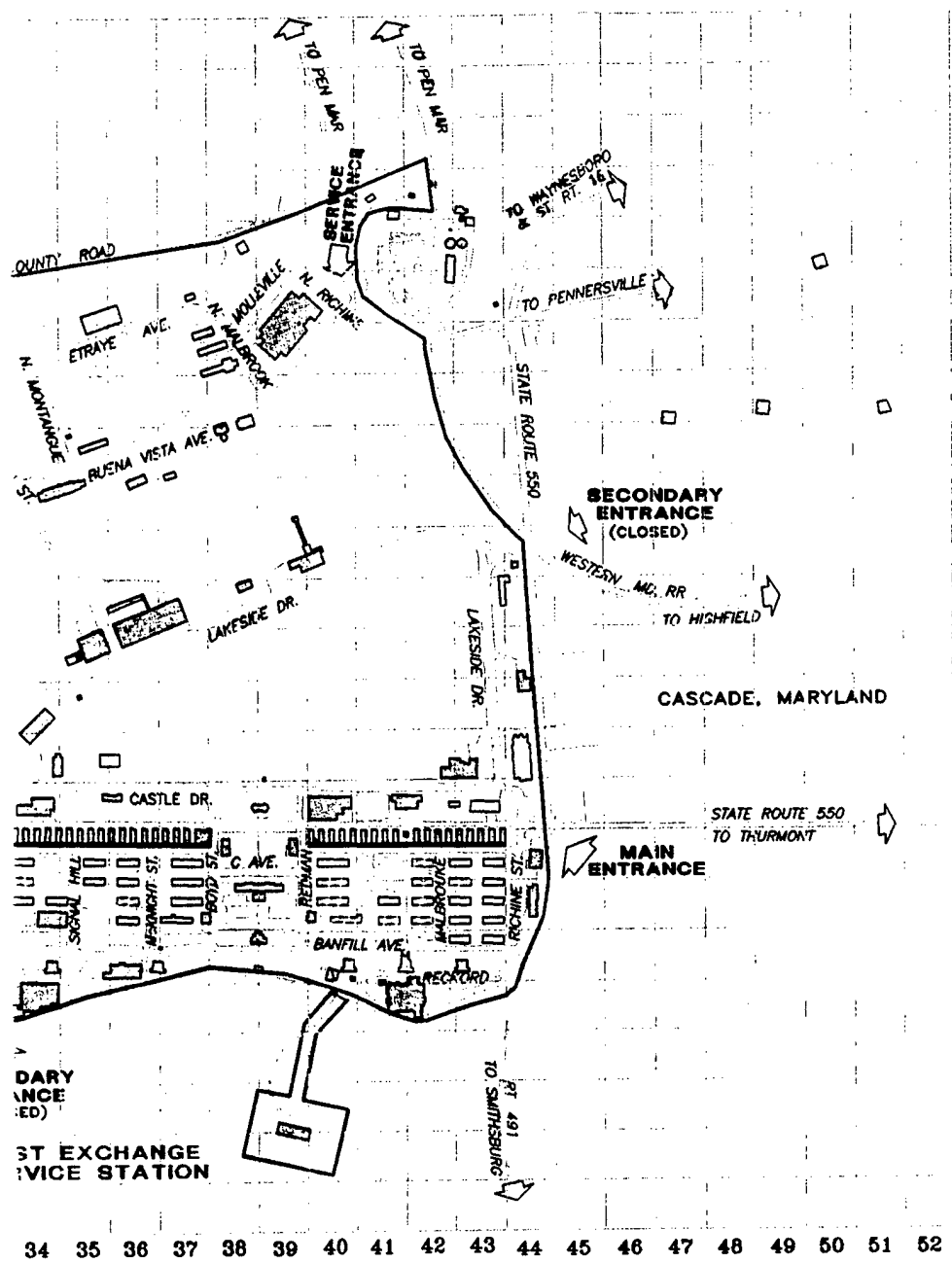
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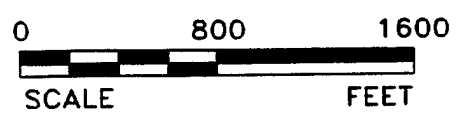
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- BUILDING
- VENT BUILDING
- BUILDING
- ING, ETC, PAVED
- RAVEL ROAD, TRAIL, ETC.
- RTY BOUNDARY
- L RESTORATION EARLY ACTION



SOURCE: 1993 U.S. ARMY, ENVIRONMENTAL OVERLAY MAP (EXISTING CONDITIONS)

US ARMY ENVIRONMENTAL CENTER			
CONTRACT NO. DACA31-94-D-0064		FIGURE: 3-1 FORT RITCHIE	
◆ ICF KAISER		2113 EMMORTON PARK RD. EDGEWOOD, MD. 21040 (410) 612-6350 ENVIRONMENTAL RESTORATION EARLY ACTION SITES	
PREPARED JNW	TASK NO: 66225		
CHECKED JHH	ICF DWG NO:		
DATE 1-22-98	FRBCP3-1		

Table 3-2. Preliminary Location Summary of AREEs

AREE Description	Environmental Investigation Report Results/Findings		Preliminary Recommendations*
	EBS	Findings	
900 Area Bldgs 907-908	X	Storage and potential release of hazardous substances and petroleum products	Conduct SI OU2
Abandoned Rifle Ranges	X	Potential release of inorganics associated with rifle range activities	Conduct SI OU7
Auto Craft Shop Bldg 401	X	Storage and release of hazardous substances and petroleum products; pesticide storage; spilled materials contained and removed; UST replaced; monitoring wells installed	Conduct SI OU6
DPW Maintenance Equipment Area - Bldgs 731-736	X	Storage of hazardous substances and waste oil; potential release of hazardous substances and petroleum products	Conduct SI OU5
Former Skeet Range	X	Release of lead, other inorganics, and PAHs associated with skeet range activities; lead-contaminated soil removed; additional investigation planned	Conduct SI OU11
Golf Maintenance Shop - Bldg 5	X	Storage and potential release of hazardous substances; storage and release of No. 2 Fuel Oil; spilled material removed; UST replaced and monitoring wells installed	Conduct SI OU1
Lake Royer (Lower Lake)	X	Release of hazardous substances and petroleum products; spilled materials removed; sediment dredged in 1981	Conduct SI OU3
Lake Wastler (Upper Lake)	X	Release of hazardous substances and petroleum products; spilled materials removed; sediment dredged in 1993	Conduct SI OU3
Motor pool - Bldg 700	X	Storage and potential release of hazardous substances; storage and release of gasoline, diesel, and fuel oil; spilled materials contained and removed	Conduct SI OU4

* The SI for these AREEs has been initiated.

AREE	Area Requiring Environmental Evaluation	PAH	Polycyclic Aromatic Hydrocarbon
DPW	Department of Public Works	SI	Site Investigation
EBS	Environmental Baseline Survey	UST	Underground Storage Tank
OU	Operable Unit (OUs are shown in Figure 3-2.)		

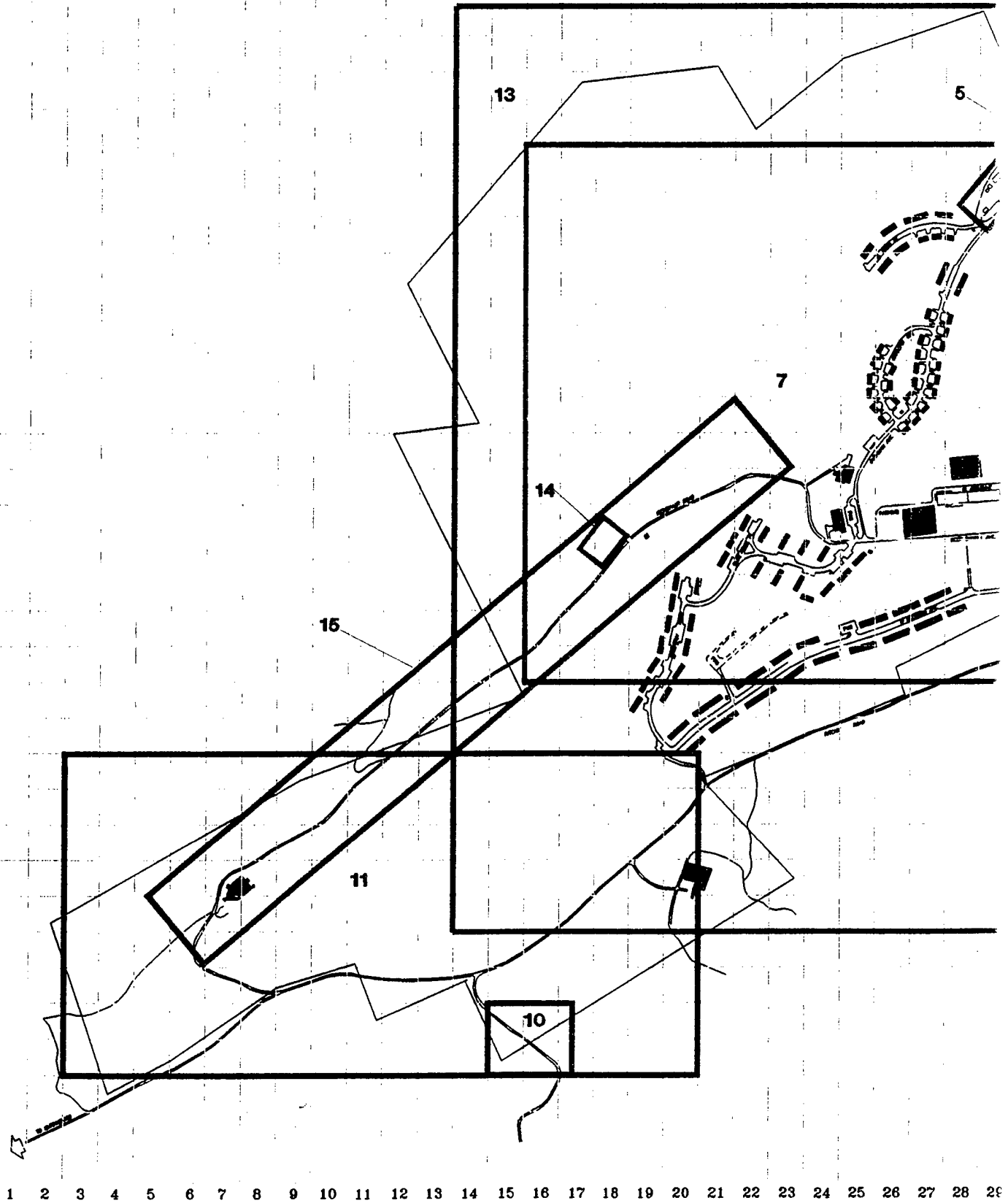
Table 3-2. Preliminary Location Summary of AREEs (Continued)

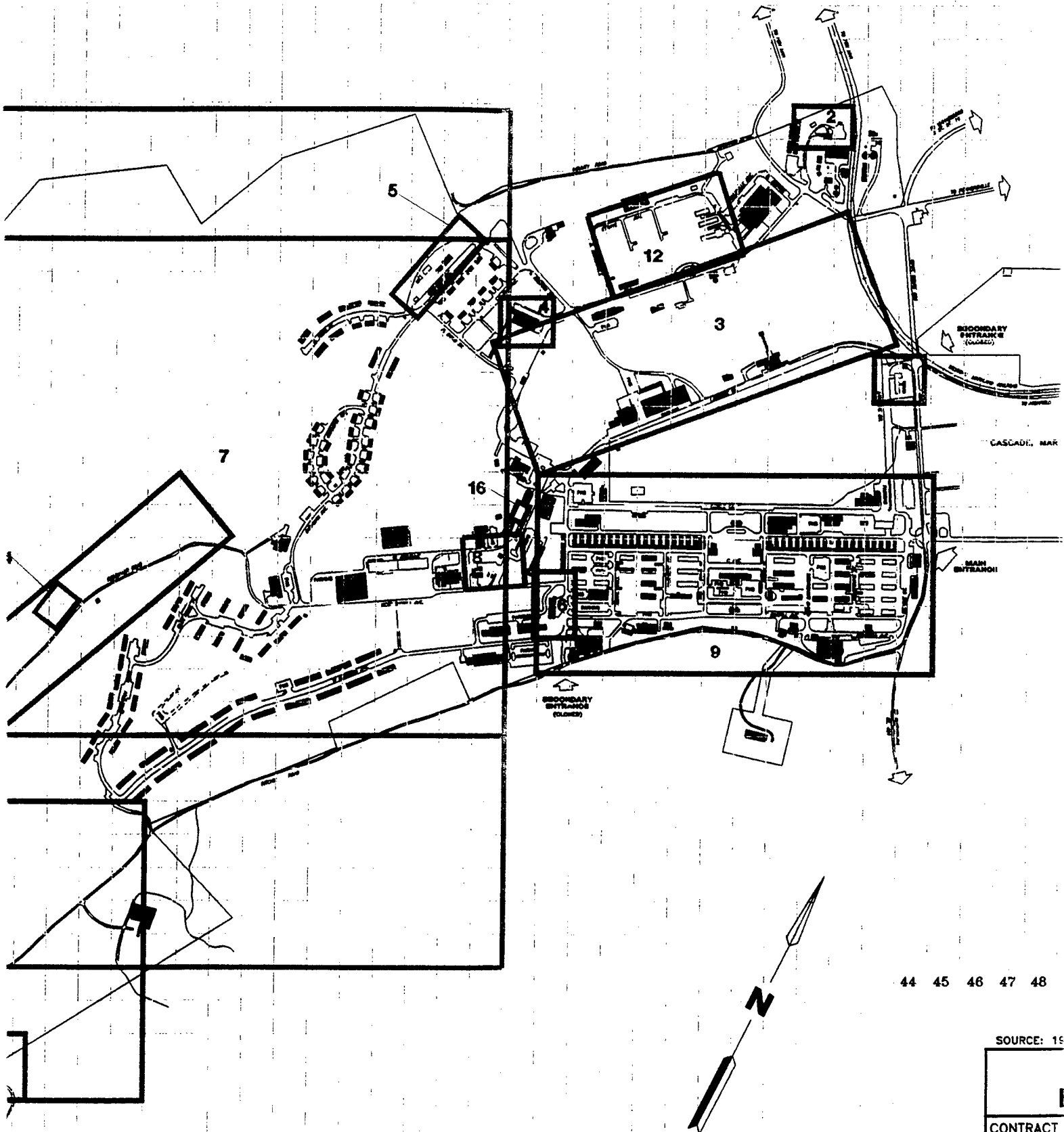
AREE Description	Environmental Investigation Report Results/Findings		Preliminary Recommendations*
	EBS	Findings	
PX Auto Service Station - Bldg 515	X	Release of petroleum products. Some remediation work occurred in 1992. Additional groundwater investigation required	Conduct SI OU8
Reservoir Road Disposal Area	X	Reported dumping of miscellaneous waste material which may include hazardous substances and petroleum products; stressed vegetation	Conduct SI OU15, OU11
Ritchie Road Disposal Area	X	Reported dumping of miscellaneous waste material which may include incinerator ash, hazardous substances, and petroleum products	Conduct SI OU11
Uncharacterized Groundwater	X	Suspected release of petroleum products into groundwater in Wise Road and Reservoir Road disposal areas, NCO family housing area, administrative buildings area and former hospital area	Conduct SI OU9, OU10, OU12, and OU15
Unexploded Ordnance Impact Area	X	UXO may be present	Conduct OE/UXO Study OU13
Wetland Area	X	Potential migration of hazardous substances or petroleum products from adjacent waste disposal sites and Former Skeet Range	Conduct SI OU11
Wise Road Disposal Area	X	Reported dumping of miscellaneous waste material which may include incinerator ash, hazardous substances, and petroleum products	Conduct SI OU10

* The SI for these AREEs has been initiated.

AREE	Area Requiring Environmental Evaluation	OU	Operable Unit
EBS	Environmental Baseline Survey	PX	Post Exchange
N/A	Not Applicable	SI	Site Investigation
NCO	Non-Commissioned Officer		
UXO	Unexploded Ordnance		

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CONTRACT

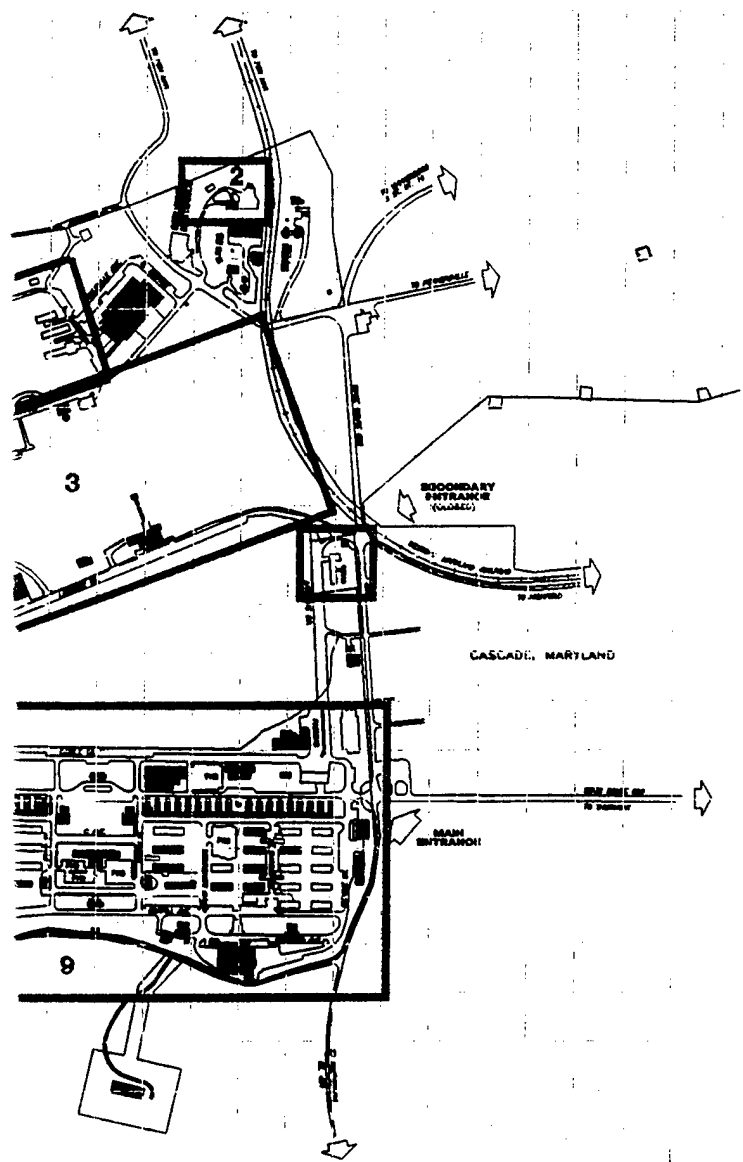
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DATE 1-22

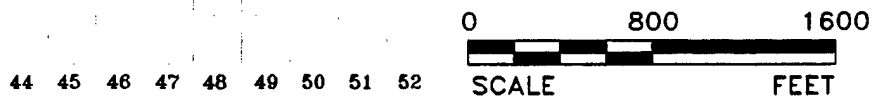
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LEGEND:

- 1 GOLF COURSE MAINTENANCE SHOP
- 2 INCINERATOR AREA
- 3 LAKE ROYER AND LAKE WASTLER
- 4 MOTOR POOL
- 5 DPW MAINTENANCE EQUIPMENT AREA
- 6 AUTOCRAFT SHOP
- 7 ABANDONED RIFLE RANGES
- 8 BUILDING 515 PX SERVICE STATION
- 9 ADMINISTRATION BUILDING AREA
- 10 WISE ROAD DISPOSAL AREA
- 11 WETLAND AREA
- 12 FORMER HOSPITAL AREA
- 13 OE/UXO IMPACT AREA
- 14 FORMER BURN AREA
- 15 RESERVOIR ROAD WASTE DISPOSAL AREA
- 16 ELECTRICAL SUBSTATION

- PERMANENT BUILDING
- SEMI-PERMANENT BUILDING
- DEMOLISHED BUILDING
- ROADS, PARKING, ETC., PAVED
- EARTH OR GRAVEL ROAD, TRAIL, ETC.
- BRAC PROPERTY BOUNDARY
- GENERAL LOCATION OF OPERABLE UNIT



SOURCE: 1993 U.S. ARMY, ENVIRONMENTAL OVERLAY MAP (EXISTING CONDITIONS)

US ARMY ENVIRONMENTAL CENTER

CONTRACT NO. DACA31-94-D-0064

FIGURE 3-2

FORT RITCHIE

◆ ICF KAISER

2113 EMMORTON PARK RD.
EDGEWOOD, MD. 21040
(410) 612-6350

PREPARED JNW
CHECKED JHH
DATE 1-22-98

TASK NO: 66225
ICF DWG NO:
FRBCP3-2

FORT RITCHIE
OPERABLE UNITS

③

All of the OUs were identified for chemical sampling and analysis except for OU13, where an Engineering Evaluation/Cost Analysis (EE/CA) sampling program has been initiated. Due to the nature of the investigation work, OU13 is being addressed as a separate investigation.

Initial field activities were conducted at OUs 1 through 12 between October 1996 and January 1997. A baseline risk assessment was performed, based on the initial sampling data, to characterize the toxicity and potential effects on human health and ecological receptors associated with any hazardous substances present at Fort Ritchie. Based on the results of the risk assessment and planned future land use, recommendations were made for each OU. A summary of the SI findings to date and preliminary recommendations are presented in Table 3-3. Additional investigation at OU1, OU4, OU5, OU13, OU14, OU15, and OU16 is planned for Spring 1998 (ICF KE, 1998).

3.2 COMPLIANCE PROGRAM STATUS

The Fort Ritchie EMD maintains several environmental compliance programs for the installation. Currently, only mission- and operational-related compliance projects are being conducted at Fort Ritchie. Mission- and operational-related projects are those which have been or would be conducted for the normal operation of the installation. These projects are unrelated to activities necessitated by the installation closure under BRAC. General compliance activities address the management of USTs, ASTs, hazardous materials and waste, solid waste, polychlorinated biphenyls (PCBs), asbestos, radon, water discharges, oil/water separators, Nuclear Regulatory Commission (NRC) licensing, pollution prevention, mixed waste, radiation, lead-based paint (LBP), UXO, and medical waste. These compliance programs are identified in Table 3-4 and detailed in the following sections.

Closure-related compliance projects are those conducted specifically as a result of environmental compliance and restoration activities related to BRAC closure and property disposal. Closure-related compliance projects for Fort Ritchie are listed in Table 3-5.

A number of compliance-related activities at Fort Ritchie have been completed as part of the installation's compliance program to remove contamination sources and reduce risk posed by releases or potential releases. These actions include asbestos abatement, PCB removal, and UST removal and replacement. These early actions are identified in Table 3-6.

3.2.1 Storage Tanks

USTs and ASTs have historically been and are currently utilized for the storage of petroleum products and waste at Fort Ritchie. Compliance activities and environmental restoration activities related to these storage tanks are described in the following subsections.

3.2.1.1 Underground Storage Tanks

The USEPA has delegated the management of the UST program to the State of Maryland. MDE has primary enforcement responsibility, and USEPA's approval effectively suspends the applicability of certain Federal regulations in favor of MDE's program, thereby eliminating duplicative requirements. Therefore, UST closure and investigation activities at Fort Ritchie have been conducted under the Maryland UST program.

Approximately 300 USTs, primarily containing No. 2 Fuel Oil, have been documented to exist at one time or another on the Fort Ritchie property according to UST Action Plan summaries. Numerous tanks have been replaced, removed, and/or abandoned throughout the history of the site. As of March 1998, 73 USTs are currently in use at the installation. All existing tanks are registered with the State of Maryland. The original single-walled, steel tanks were replaced by double-walled, fiberglass tanks. All UST removal and RAs implemented at Fort Ritchie since the 1980s were supervised and approved by MDE. Table 3-7 provides an inventory of USTs currently existing at Fort Ritchie.

Table 3-3. Environmental Restoration Site Study Area Summary

OU ^a	Reuse Parcel ^b	CERFA Parcel ^c	Description	Materials Stored or Released	Date of Operation	Chemicals of Potential Concern ^d	Risk to Human Health and the Environment ^e	Recommendations ^f
1	N/A	12(7)HR	Golf Course Maintenance Shop (Building 5)	Pesticides, fungicides, insecticides, herbicides, fertilizers, paints, solvents, thinners, fuel oil	1943 to Present	Benzo(a)pyrene, aluminum, arsenic, chromium, and iron in surface soils; Iron in subsurface soils; PCE in groundwater	Current/Future HH: CCR = 9×10^{-5} and CHI = 1 (site worker) ECO: Very limited potential impact.	Further investigation is recommended to confirm PCE in shallow groundwater and assess the source and extent.
2	N/A	10(7)HR	Former Incinerator Area (Buildings 907, 908, 909)	PCB-containing transformers, ASTs, batteries (on trays), paint cans, incinerator waste	Building 907 (old incinerator) – 1930s to 1940s Building 908 (newer incinerator) - 1952 to 1975 Building 909 (storage area) – 1943 to Present	Aroclor 1260, SVOCs, OCDD, antimony, arsenic, copper, and thallium in surface soil and residual ash; Iron in subsurface soils	Current/Future HH: CCR = 2×10^{-5} and CHI = 6×10^{-1} (site worker) ECO: Elevated risk to terrestrial plants, invertebrates, vermivorous birds, and omnivorous animals.	Further action is recommended to limit ecological risk in localized areas by "hot spot" soil/ash removal.
3	N/A	9(7)HR/PR	Lake Royer and Lake Wastler	Hazardous substances released into stormwater drains (household or automotive chemicals released by residents)	Lake Royer - late 1800s to Present; dredged in 1981 Lake Wastler – prior to 1926 to Present; dredged in 1993	Pesticides and TCE in surface water and sediment; metals and SVOCs in sediment	Current/Future HH: CCR = 6×10^{-5} and CHI = 1 (recreational visitor) ECO: Potential impacts to piscivorous birds and benthic organisms	Further investigation is recommended to confirm the potential impact on ecological receptors. This includes fish tissue sampling and limited sediment bioassays and chemical analyses.

^a OUs are shown in Figure 3-2.

^b Reuse Parcels are shown in Figure 2-2.

^c CERFA Parcels are shown in Figure 3-4.

^d Chemicals of Potential Concern (COPCs) are for surface soil, subsurface soil, surface water, sediment, and groundwater sampled during the Site Investigation at Fort Ritchie.

AST Above-ground Storage Tank
CCR Cumulative Cancer Risk
CERFA Community Environmental Response Facilitation Act
CHI Cumulative Hazard Index (Non-Cancer Risk)
ECO Ecological

HH Human Health
N/A Not Applicable
OCDD Octachlorodibenzo-p-dioxin
OU Operable Unit
PCB Polychlorinated Biphenyl

PCE Tetrachloroethene
SVOC Semivolatile Organic Compound
TCE Trichloroethene

^e Current/Future HH risk was evaluated for exposure as indicated in parentheses. Exposure scenarios with the highest cumulative risk values are shown. Please refer to Volume I of the Site Investigation Report (ICF KE, 1998b) for further details.

^f Recommendations as of February 1998.

Table 3-3. Environmental Restoration Site Study Area Summary (Continued)

OU ^a	Reuse Parcel ^b	CERFA Parcel ^c	Description	Materials Stored or Released	Date of Operation	Chemicals of Potential Concern ^d	Risk to Human Health and the Environment ^e	Preliminary Recommendations ^f
4	10	9(7)HR/PR	Motor Pool (Building 700) Maintenance Shop and Refueling Station	Motor oil, batteries, diesel oil; two reported spills in 1994 and 1995; temporary storage of chemicals and hazardous wastes	1952 to Present (HAZMAT sheds moved in 1995)	Iron in subsurface soils; Chlorinated solvents, PCE, and TCE in groundwater	<u>Current/Future HH:</u> No human exposure pathways (site worker) <u>ECO:</u> No ecological concerns	Further investigation is recommended to confirm and assess the source and extent of PCE and TCE in shallow groundwater
5	N/A	7(7)HR	DPW maintenance Equipment Area (Buildings 731 to 736)	Waste oil, antifreeze, pesticides, herbicides, diesel fuel, wastewater from oil/water separator	Building 734 (Maintenance Building) – 1974 to Present Other buildings 1960s to 1975	Arsenic, benzo(a)pyrene, metals and pesticides in surface soil; lead and heptachlor in groundwater	<u>Current/Future HH:</u> CCR = 1×10^{-4} and CHI = 2 (site worker) <u>ECO:</u> Very limited potential impact	Further investigation is recommended to confirm and collect additional data on lead and herbicides in shallow groundwater.
6	5	17(3)HR	Autocraft Shop (Building 401)	Waste oil, waste antifreeze, pesticides, petroleum naphtha solvent	1934 to Present	Arsenic, benzo(a)pyrene, metals, and pesticides in surface soil	<u>Current/Future HH:</u> CCR = 1×10^{-4} and CHI = 2 (site worker) <u>ECO:</u> No ecological concerns	NFA

^a OUs are shown in Figure 3-2.

^b Reuse Parcels are shown in Figure 2-2.

^c CERFA Parcels are shown in Figure 3-4.

^d Chemicals of Potential Concern (COPCs) are for surface soil, subsurface soil, surface water, sediment, and groundwater sampled during the Site Investigation at Fort Ritchie.

CCR Cumulative Cancer Risk
CERFA Community Environmental Response Facilitation Act
CHI Cumulative Hazard Index
DPW Department of Public Works
ECO Ecological
HH Human Health
HAZMAT Hazardous Materials
N/A Not Applicable
NFA No Further Action

^e Current/Future HH risk was evaluated for exposure as indicated in parentheses. Exposure scenarios with the highest cumulative risk values are shown. Please refer to Volume I of the Site Investigation Report (ICF KE, 1998b) for further details.

^f Recommendations as of February 1998.

OU Operable Unit
PCE Tetrachlorethene
TCE Trichloroethene

Table 3-3. Environmental Restoration Site Study Area Summary (Continued)

OU ^a	Reuse Parcel ^b	CERFA Parcel ^c	Description	Materials Stored or Released	Date of Operation	Chemicals of Potential Concern ^d	Risk to Human Health and the Environment ^e	Preliminary Recommendations ^f
7	14 to 17	4(3)HR 6(3)HR 8(3)HR 20(1)	Abandoned Firing Ranges	Lead and inorganics associated with rifle range activities	1951 to Present	Arsenic, lead, and thallium in surface soil	Current/Future HH: CCR = 4 x 10 ⁻⁶ and CHI = 1 x 10 ⁻¹ (site worker) CCR = 3 x 10 ⁻⁵ and CHI = 1 (recreational visitor) CCR = 1 x 10 ⁻⁵ and CHI = 4 x 10 ⁻¹ (adult resident) CCR = 9 x 10 ⁻⁵ and CHI = 1 x 10 ⁻¹ (child resident) ECO: No ecological concerns.	NFA
8	12	18(2)PR	Post Exchange Service Station (Building 515)	Gasoline, heating oil, ethylene glycol, lead acid batteries, waste motor oil; leak of 1,570 gallons of unleaded gasoline fuel in 1984 (contaminated soil and tank replacement in 1992)	1973 to Present	No chemicals of potential concern identified	Current/Future HH: No human exposure pathways ECO: No ecological concerns.	NFA
9	1 to 4	14(4)HR 15(4)HR 17(3)HR 18(2)PR	Administrative Building Area (100-, 200-, and 300-series buildings)	No. 2 fuel oil; diesel fuel; hazardous substances related to the health clinic, dental clinic, telecommunications facility, and photographic laboratory	1930s to Present	Arsenic, benzo(a)pyrene, metals, and pesticides in surface soil	Current/Future HH: CCR = 1 x 10 ⁻⁴ and CHI = 2 (site worker) ECO: No ecological concerns.	NFA

^a OUs are shown in Figure 3-2.

^b Reuse Parcels are shown in Figure 2-2.

^c CERFA Parcels are shown in Figure 3-4.

^d Chemicals of Potential Concern (COPCs) are for surface soil, subsurface soil, surface water, sediment, and groundwater sampled during the Site Investigation at Fort Ritchie.

CCR Cumulative Cancer Risk
CERFA Community Environmental Response Facilitation Act

CHI
ECO
HH
Cumulative Hazard Index
Ecological
Human Health

NFA
OU
No Further Action
Operable Unit

^e Current/Future HH risk was evaluated for exposure as indicated in parentheses. Exposure scenarios with the highest cumulative risk values are shown. Please refer to Volume I of the Site Investigation Report (ICF KE, 1998b) for further details.
^f Recommendations as of February 1998.

Table 3-3. Environmental Restoration Site Study Area Summary (Continued)

OU ^a	Reuse Parcel ^b	CERFA Parcel ^c	Description	Materials Stored or Released	Date of Operation	Chemicals of Potential Concern ^d	Risk to Human Health and the Environment ^e	Preliminary Recommendations ^f
10	N/A	22(7)HR	Wise Road Disposal Area	Household waste, miscellaneous debris, and incinerator ash	1930s to 1970s	Arsenic, beryllium, iron, and lead, in subsurface soils	<u>Current HH:</u> No complete pathways <u>Future HH:</u> CCR = 7×10^{-6} and CHI = 1 (excavation worker) <u>ECO:</u> Ecological risk was not evaluated	Further action is recommended to remediate OU10 in accordance with Maryland solid waste regulations.
11	N/A	2(3)HR	Wetland Area	Household appliances and concrete slabs; migration of contaminants from the skeet range (lead shot) and dump sites	Skeet range – 1970s to 1992	Pesticides and metals in surface water and sediment	<u>Current/Future HH:</u> CCR = 2×10^{-5} and CHI = 6×10^{-1} (recreational visitor) <u>ECO:</u> Very limited potential impact	NFA
12	8 to 9	5(1)	Former Hospital Area	Possible herbicide storage and hazardous materials related to activities at the World War II hospital	Building 811 (officers' quarters) 1943 to Present Buildings 828, 829, 831, and 833 – built in 1943 and demolished in 1992 Building 837 (warehouse) – 1975 to Present	No chemicals of potential concern were identified	<u>Current & Future HH:</u> Incomplete pathway <u>ECO:</u> No ecological concerns	NFA

^a OUs are shown in Figure 3-2.

^b Reuse Parcels are shown in Figure 2-2.

^c CERFA Parcels are shown in Figure 3-4.

^d Chemicals of Potential Concern (COPCs) are for surface soil, subsurface soil, surface water, sediment, and groundwater sampled during the Site Investigation at Fort Ritchie.

CCR Cumulative Cancer Risk
CERFA Community Environmental Response Facilitation Act

CHI Cumulative Hazard Index
ECO Ecological
HH Human Health

N/A Not Applicable
NFA No Further Action
OU Operable Unit

^e Current/Future HH risk was evaluated for exposure as indicated in parentheses. Exposure scenarios with the highest cumulative risk values are shown. Please refer to Volume I of the Site Investigation Report (ICF KE, 1998b) for further details.

^f Recommendations as of February 1998.

Table 3-3. Environmental Restoration Site Study Area Summary (Continued)

OU ^a	Reuse Parcel ^b	CERFA Parcel ^c	Description	Materials Stored or Released	Date of Operation	Chemicals of Potential Concern ^d	Risk to Human Health and the Environment ^e	Preliminary Recommendations ^f
13	14 to 17	5(1) 20(1) 21(4)HR	OE/UXO Impact Areas	Ordnance and explosives	Unknown	Evaluated under a separate OE/UXO study	Not evaluated as part of risk assessment	EE/CA; sampling for explosives
14	14	3(7)HR	Former Burn Area	Household waste, miscellaneous debris, & incinerator ash	Unknown	Evaluation Pending	Evaluation Pending	Collect subsurface soil samples
15	14 & 17	3(7)HR	Reservoir Road Disposal Area	Household waste, miscellaneous debris, & incinerator ash	Approximately 1952 to 1984	Evaluation Pending	Evaluation Pending	Conduct visual search to delineate boundaries of waste material; land survey
16	4	19(7)HR	Electrical Substation	PCBs	Approximately 1953 to Present	Evaluation Pending	Evaluation Pending	Collect and analyze soil samples for PCBs

^a OUs are shown in Figure 3-2.

^b Reuse Parcels are shown in Figure 2-2.

^c CERFA Parcels are shown in Figure 3-4.

^d Chemicals of Potential Concern (COPCs) are for surface soil, subsurface soil, surface water, sediment, and groundwater sampled during the Site Investigation at Fort Ritchie.

CERFA Community Environmental Response Facilitation Act
EE/CA Engineering Evaluation/ Cost Analysis
OU Operable Unit
OE/UXO Ordnance and Explosives/ Unexploded Ordnance
PCB Polychlorinated Biphenyl

^e Current/Future HH risk was evaluated for exposure as indicated in parentheses. Exposure scenarios with the highest cumulative risk values are shown. Please refer to Volume I of the Site Investigation Report (ICF KE, 1998b) for further details.
^f Recommendations as of February 1998.

Table 3-4. Mission/Operational-Related Compliance Projects

Project	Status	Regulatory Program
USTs	All existing USTs meet all applicable requirements	MDE, RCRA - Subtitle I
Hazardous Waste Management	Storage and disposal as required	RCRA - Subtitle C
PCBs	PCB testing efforts complete - transformers found to contain PCBs have been removed	TSCA
Asbestos	Abatement through properly managed O&M activities	MDE, OSHA
NPDES	Monitoring of outfalls as required	MDE, CWA
LBP	Three testing efforts completed; additional analysis recommended	MDE, OSHA
NRC Licensing	Maintenance of equipment containing radionuclides	NRC

CWA	Clean Water Act	OSHA	Occupational Safety and Health Administration
LBP	Lead-Based Paint	PCB	Polychlorinated Biphenyl
MDE	Maryland Department of the Environment	RCRA	Resource Conservation and Recovery Act
NPDES	National Pollution Discharge Elimination System	TSCA	Toxic Substances Control Act
NRC	Nuclear Regulatory Commission	UST	Underground Storage Tank
O&M	Operations and Maintenance		

Table 3-5. Closure-Related Compliance Projects

Project	Status	Regulatory Program
BRAC Cleanup Plan	Version I - Final Version II - Final	BRAC
Environmental Baseline Survey	Final	BRAC
Environmental Impact Statement	Draft	BRAC
Ordnance, Ammunition and Explosives - Archive Search Report	Complete	BRAC
Programmatic Agreement for the Closure and Disposal of Fort Ritchie	Complete	BRAC
Site Investigation	Ongoing	BRAC

Table 3-6. Compliance Early Action Status

Site Number	Action	Purpose	Status
Post-wide UST removals/replacements	All older USTs have been removed and/or replaced.	Comply with State and U.S. Army regulations	All existing USTs comply with applicable regulations and requirements.
Post-wide PCB removal	All known PCB-containing transformers have been removed and destroyed in accordance with TSCA.	Comply with PCB mitigation laws	All transformers have been tested for PCBs and those found to contain PCBs have been removed. All capacitors, hydraulic equipment, heat transfer equipment, and electromagnets have been tested and found to be free of PCBs.
Post-wide asbestos abatement of high risk or unsafe ACMs	Project is ongoing. Friable and damaged ACMs are removed and disposed of as they are discovered.	Comply with State, Federal, and U.S. Army regulations	On-going program

ACM Asbestos-containing material
 PCB Polychlorinated Biphenyl
 TSCA Toxic Substances Control Act
 UST Underground Storage Tank

Between 1989 and 1990, a complete regulation assessment of USTs at the installation was conducted. Based on this assessment, an installation-wide removal/replacement action was implemented. From 1991 to 1992, 59 USTs containing No. 2 Fuel Oil were removed from the 400 housing area. Overall, a total of 186 housing USTs were removed from the post between 1991 and 1995.

During the implementation of the installation-wide removal/replacement action, approximately 12% of all regulated, unregulated, and position quarters housing area tanks required RAs. Spill events were recorded from two tanks at housing unit 486 and from the tank at unit 724. Both incidents were leaks, and sorbents were used to clean up the spilled material. In addition, RAs included soil sampling and the installation of monitoring wells.

Between 1991 and 1995, 85 USTs were excavated and two USTs (in Bldgs 327 and 360) were abandoned in place in the administrative area of Fort Ritchie. Of these tanks, 70 were replaced with new tanks, and four of these replaced tanks were later removed. Two-thirds of all USTs identified as administration tanks indicated a release of petroleum product and required remediation. Spills occurred and were remediated at the Golf Course Maintenance Shop (Building 5), the Service Station (Building 515), and the Motor Pool (Building 700).

3.2.1.2 Above-ground Storage Tanks

AST compliance programs at Fort Ritchie are conducted under U.S. Army Regulation (AR) 200-1 and the Federal requirements including Title 40 of the Code of Federal Regulations (CFR) Parts 110, 112, and 116. A total of seven ASTs are known to have been on the installation at one time or another. Three ASTs have since been removed. One AST was removed in 1986 from Building 502, the old Fire Station, and one AST was removed in 1993 from Building 101. One AST was also removed from Building 605, the old service station; the time of removal is not known. There are currently four remaining ASTs. Two ASTs at the Auto Craft Shop (Building 401) contain waste oil and waste antifreeze, and two ASTs in the DPW maintenance

Table 3-7. Underground Storage Tank Inventory

Tank No.	Site No. /Parcel	Location	Year Installed	Capacity (gallons)/ Tank Material	Substance Stored	Status	Comments	Future Actions
048	N/A	Bldg 2	1993	6,000	Diesel	In Use	None	None
001	N/A	Bldg 3	1991	6,000/FRP	No. 2 Fuel Oil	In Use	None	None
002	N/A	Bldg 5	1991	1,000/FRP	No. 2 Fuel Oil	In Use	None	None
062	N/A	Bldg 11	1994	6,000	No. 2 Fuel Oil	In Use	None	None
068	N/A	Bldg 102	1993	6,000	No. 2 Fuel Oil	In Use	None	None
069	N/A	Bldg 113	1993	8,000/Steel	No. 2 Fuel Oil	In Use	None	None
070	N/A	Bldg 123	1993	2,500	No. 2 Fuel Oil	In Use	None	None
004	N/A	Bldg 124	1991	2,500/FRP	No. 2 Fuel Oil	In Use	None	None
044	N/A	Bldg 130	1993	1,000/FRP	Diesel	In Use	None	None
055	N/A	Bldg 134	1980	1,000/Steel	No. 2 Fuel Oil	In Use	None	None
049	N/A	Bldgs 136-137	1993	2,500	No. 2 Fuel Oil	In Use	None	None
006	N/A	Bldgs 138-139	1991	2,500/FRP	No. 2 Fuel Oil	In Use	None	None
007	N/A	Bldg 141	1991	1,000/FRP	No. 2 Fuel Oil	In Use	None	None
063	N/A	Bldg 143	1981	2,000	No. 2 Fuel Oil	In Use	None	None
009	N/A	Bldgs 148-149	1991	2,500/FRP	No. 2 Fuel Oil	In Use	None	None
010	N/A	Bldg 150	1991	1,000/FRP	No. 2 Fuel Oil	In Use	None	None
050	N/A	Bldg 151	1993	1,000	Diesel	In Use	None	None
083	N/A	Bldg 152	1993	4,000/FRP	No. 2 Fuel Oil	In Use	None	None
084	N/A	Bldg 152-D	1993	550/FRP	No. 2 Fuel Oil	In Use	None	None
011	N/A	Bldg 160	1991	6,000/FRP	No. 2 Fuel Oil	In Use	None	None
081	N/A	Bldg 162-D	1994	2,500	Diesel	In Use	None	None
082	N/A	Bldg 200	1994	2,500	No. 2 Fuel Oil	In Use	None	None
102	N/A	Bldg 201	1991	1,000/FRP	No. 2 Fuel Oil	In Use	None	None
051	N/A	Bldg 202	1993	1,000	No. 2 Fuel Oil	In Use	None	None

Bldg Building
FRP Fiber Reinforced Plastic
N/A Not Applicable
NA Not Available

Table 3-7. Underground Storage Tank Inventory (Continued)

Tank No.	Site No. /Parcel	Location	Year Installed	Capacity (gallons)/ Tank Material	Substance Stored	Status	Comments	Future Actions
070	N/A	Bldgs 203-204	1993	2,500	No. 2 Fuel Oil	In Use	None	None
013	N/A	Bldg 205	1991	1,000/FRP	No. 2 Fuel Oil	In Use	None	None
056	N/A	Bldg 301	1993	1,000	No. 2 Fuel Oil	In Use	None	None
052	N/A	Bldg 302	1993	1,000	Diesel	In Use	None	None
014	N/A	Bldg 303	1991	2,500/FRP	Diesel	In Use	None	None
064	N/A	Bldg 305	1993	1,000	No. 2 Fuel Oil	In Use	None	None
072	N/A	Bldg 313	1993	8,000/FRP	No. 2 Fuel Oil	In Use	None	None
016	N/A	Bldg 326	1991	1,000/FRP	No. 2 Fuel Oil	In Use	None	None
017	N/A	Bldg 327	Pre-1965	1,000	No. 2 Fuel Oil	Abandoned in Place in 1991	None	None
045	N/A	Bldg 330	1993	1,000	Diesel	In Use	None	None
018	N/A	Bldgs 332-333	1991	1,000/FRP	No. 2 Fuel Oil	In Use	None	None
019	N/A	Bldgs 334-335	1991	1,000/FRP	No. 2 Fuel Oil	In Use	None	None
086	N/A	Bldgs 336-337	1989	2,000	No. 2 Fuel Oil	In Use	None	None
020	N/A	Bldg 341	1991	2,500/FRP	No. 2 Fuel Oil	In Use	None	None
073	N/A	Bldg 343	1993	1,000	No. 2 Fuel Oil	In Use	None	None
021	N/A	Bldg 346	1991	1,000/FRP	No. 2 Fuel Oil	In Use	None	None
022	N/A	Bldg 349-350	1991	2,500/FRP	No. 2 Fuel Oil	In Use	None	None
074	N/A	Bldg 360	1993	10,000	No. 2 Fuel Oil	In Use	Abandoned & Replaced	None
024	N/A	Bldg 400	1991	10,000/FRP	No. 2 Fuel Oil	In Use	None	None
025	N/A	Bldg 401	1991	2,500/FRP	No. 2 Fuel Oil	In Use	None	None
026	N/A	Bldgs 402-403	1991	10,000/FRP	No. 2 Fuel Oil	In Use	None	None
027	N/A	Bldg 500	1991	6,000/FRP	No. 2 Fuel Oil	In Use	None	None
029	N/A	Bldg 503	1991	4,000/FRP	No. 2 Fuel Oil	In Use	None	None
058	N/A	Bldg 504	1993	1,000	No. 2 Fuel Oil	In Use	None	None
076	N/A	Bldg 506	1993	6,000	No. 2 Fuel Oil	In Use	None	None

Bldg Building
FRP Fiber Reinforced Plastic
N/A Not Applicable
TBD To-Be-Determined

Table 3-7. Underground Storage Tank Inventory (Continued)

Tank No.	Site No. /Parcel	Location	Year Installed	Capacity (gallons)/ Tank Material	Substance Stored	Status	Comments	Future Actions
077	N/A	Bldg 509	1993	4,000	No. 2 Fuel Oil	In Use	None	None
040	N/A	Bldg 515	1992	2,500/FRP	No. 2 Fuel Oil	In Use	None	None
041	N/A	Bldg 515-R	1992	10,000/FRP	Gasoline (Regular)	In Use	None	None
042	N/A	Bldg 515-P	1992	10,000/FRP	Gasoline (Premium)	In Use	None	None
043	N/A	Bldg 515-S	1992	10,000/FRP	Gasoline (Super)	In Use	None	None
093	N/A	Bldg 517	1992	4,000/FRP	No. 2 Fuel Oil	In Use	None	None
097	N/A	Bldg 518	1994	4,000	No. 2 Fuel Oil	In Use	None	None
078	N/A	Bldg 521	1993	4,000	No. 2 Fuel Oil	In Use	None	None
059	N/A	Bldg 603	1994	10,000	No. 2 Fuel Oil	In Use	None	None
094	N/A	Bldg 605-A	Pre-1965	Unknown	Gasoline	Abandoned in Place in 1950	None	None
095	N/A	Bldg 605-B	Pre-1965	Unknown	Gasoline	Abandoned in Place in 1950	None	None
092	N/A	Bldg 607	NA	2,000/Steel	No. 2 Fuel Oil	In Use	None	None
031	N/A	Bldg 700-A	1991	6,000/FRP	No. 2 Fuel Oil	In Use	None	None
037	N/A	Bldg 700-B	1991	10,000/FRP	Gasoline	In Use	None	None
038	N/A	Bldg 700-C	1991	6,000/FRP	Diesel	In Use	None	None
061	N/A	Bldg 716	1993	600	No. 2 Fuel Oil	In Use	None	None
066	N/A	Bldg (734) 735-U	1993	600	Waste Oil	In Use	None	None
047	N/A	Bldg 835-836	1993	2,500	Diesel	In Use	None	None
035	N/A	Bldg 837	1991	6,000/FRP	No. 2 Fuel Oil	In Use	None	None
001	N/A	Bldg MNGA-H	1994	4,000/Steel	No. 2 Fuel Oil	In Use	None	None
002	N/A	Bldg MNGA-D	1995	1,500/Steel	Diesel	In Use	None	None

Bldg Building
FRP Fiber Reinforced Plastic
N/A Not Applicable
NA Not Available

yard in the Building 900 Area contain diesel fuel and gasoline. One of these tanks was originally associated with the newer incinerator. No record of spills occurred at any of these tanks. Table 3-8 provides a current inventory of ASTs at Fort Ritchie.

Table 3-8. Above-ground Storage Tank Inventory

Tank No.	Location	Year Installed	Capacity (gallons)	Contents	Status
N/A	Auto Craft Shop, Bldg 401	1993	550	Waste Oil	In Use
N/A	Auto Craft Shop, Bldg 401	1993	275	Waste Antifreeze	In Use
N/A	DPW Maintenance, Bldg 900	1985	500	Diesel	In Use
N/A	DPW Maintenance, Bldg 900	1985	500	Gasoline	In Use

Bldg Building

DPW Department of Public Works

N/A Not Applicable, tank numbers have not been assigned to these tanks.

3.2.2 Hazardous Materials/Waste Management

Hazardous waste compliance programs at Fort Ritchie are conducted under AR 200-1; the Federal requirements found in 40 CFR 260 through 269, 40 CFR 117, and 40 CFR 171 et seq.; Department of Transportation (DOT) regulations; and the Maryland hazardous waste management regulations. Hazardous wastes currently generated on site are managed in accordance with all applicable State and Federal regulations.

Fort Ritchie is classified as a small-quantity hazardous waste generator, USEPA identification number MD8210020758 (USACE, 1993a). Activities at Fort Ritchie that are regulated under the provisions of RCRA include storage and use of hazardous substances, and generation, storage, and disposal of hazardous wastes. Hazardous substances used at Fort Ritchie include solvents, petroleum products, flammable liquids, herbicides, pesticides, and fungicides.

A total of 13 hazardous substance spills occurred from April 1993 through March 1998. Types of substances spilled include No. 2 Fuel Oil, waste oil, diesel fuel, and hydraulic fluid. In each case, the quantities that were released were relatively small (0.5 to 310 gallons), and actions were taken in accordance with the Fort Ritchie *Installation Spill Contingency Plan* to minimize the extent of environmental release of the spilled substance. Several spills also occurred before 1993.

3.2.2.1 Hazardous Material Management

Hazardous substances are stored and/or used in approximately 26 buildings throughout the installation. As a small-quantity generator, Fort Ritchie is not permitted to store hazardous wastes for long-term periods. Management of hazardous substances at Fort Ritchie has historically focused on utilizing as much of the hazardous item as possible, then transporting unusable or unwanted portions to an off-site TSDF.

3.2.2.2 Hazardous Waste Management

Disposal of the majority of hazardous wastes generated at Fort Ritchie is handled under a shipping contract administered by the Defense Reutilization and Marketing Office (DRMO). Limited quantities of non-hazardous chemical solutions used in photographic processing are disposed of in the sanitary sewer system. Hazardous wastes generated at Fort Ritchie are collected and temporarily stored at two hazardous waste sheds at Building 837. This location serves as a redistribution center and as the pick-up location for hazardous items that become classified as waste. Prior to 1989, hazardous substances were collected for shipment on pallets in Building 700. Containerized wastes are shipped to various TSDFs.

3.2.3 Solid Waste Management

Solid waste management compliance programs at Fort Ritchie are conducted under AR 200-1 and 420-47; Federal requirements found in 40 CFR 240 through 246 and 40 CFR 257 through 258; DOT regulations; and Maryland solid waste management regulations. Solid wastes currently being generated at Fort Ritchie are managed in accordance with all applicable State and Federal regulations.

Fort Ritchie does not have a permitted landfill on site. Non-recycled, non-hazardous solid waste is hauled off the site to the Washington Township, Pennsylvania, transfer station. The transfer station is operated by a private contractor who then transports wastes to a State-sanctioned landfill in Chambersburg, Pennsylvania. In 1996, 19,082 cubic yards of solid waste were generated. The installation estimates that it currently generates about 100 tons of refuse per month in regular household waste (i.e., paper, plastics, glass, metal, food, office supplies, yard and grounds waste).

In the past, on-site incinerators were used to dispose of solid waste. The original stone incinerator, Building 907, was constructed in the 1930s and operated into the 1940s. Typical solid wastes, including small quantities of miscellaneous chemicals, were placed directly into the incinerator and burned. Ash was deposited in two areas, one along Wise Road and the other near the former Skeet Range. A new replacement incinerator, Building 908, was constructed in the 1950s and had a capacity of 3,500 pounds (lbs)/hr. No. 2 Fuel Oil stored in a 275-gallon AST was used as startup fuel for this incinerator. During operation, approximately 2,000 gallons of No. 2 Fuel Oil were used monthly. In 1973, the incinerator was retrofitted with an air pollution control device which had maintenance problems. As a result, the burner was shut down shortly thereafter.

Fort Ritchie owned and operated a wastewater treatment facility until August 31, 1993, when ownership and operations were transferred to Washington County. Digested sewage sludge from this facility was disposed of under an MDE permit in the Washington County Sanitary Landfill.

3.2.4 Polychlorinated Biphenyls

PCB management compliance programs at Fort Ritchie are conducted under AR 200-1; Federal requirements found in 40 CFR 761; and DOT regulations. Disposal of PCB-containing material associated with Fort Ritchie activities is managed through the DRMO.

A site inspection was conducted by MDE in 1989 to document PCB-containing equipment. Seven known nameplate PCB-containing transformers were identified during this investigation and subsequently removed and disposed. Capacitors, hydraulic equipment, heat transfer equipment, and electromagnets were checked for PCB-containing materials; however, PCBs were not found in any of these items.

All 242 transformers at Fort Ritchie have been tested for the presence of PCBs. Eleven transformers were found to contain PCBs and have been disposed of according to TSCA requirements.

3.2.5 Asbestos

Asbestos-containing material (ACM) is regulated by USEPA, OSHA, and MDE. Asbestos at Fort Ritchie is managed in compliance with the U.S. Army guidance *Lead-Based Paint and Asbestos in U.S. Army Properties Affected by Base Realignment and Closure*.

A post-wide asbestos survey of Fort Ritchie was conducted by Dewberry & Davis to identify the presence of ACMs and to recommend appropriate abatement actions. An *Asbestos Users Guide and Management Plan* was developed in September 1993, based on the findings of the survey. ACMs were identified, located, and quantified. All buildings at Fort Ritchie that were built after 1980 were assumed to be asbestos-free.

Remedial actions have been implemented in conjunction with building demolition and in several other instances to mitigate exposure to asbestos. In 1992, asbestos was removed from two buildings. In 1993, ACMs were removed and disposed of in conjunction with the demolition of seven WWII-era buildings. The mechanical rooms of all housing units were insulated with non-ACMs when new furnaces were installed. There are no plans at this time to remove ACMs from other buildings since the ACMs are non-friable or in

good condition. ACMs will continue to be maintained in good condition through Fort Ritchie's operations and maintenance (O&M) program.

3.2.6 Radon

The radon reduction program at Fort Ritchie is conducted under AR 200-1, Chapter 11, U.S. Army Radon Reduction Program. Radon testing of Fort Ritchie was conducted in Fall 1989, and radon was not found to exceed acceptable levels in any test location on the installation.

3.2.7 RCRA Facilities (Solid Waste Management Units)

Fort Ritchie does not have any RCRA facilities.

3.2.8 National Pollutant Discharge Elimination System Permits

Point source wastewater discharges generated at Fort Ritchie are regulated under AR 200-1; the Federal Water Pollution Control Act; the Clean Water Act (CWA); the National Pollutant Discharge Elimination System (NPDES) Permit Program (40 CFR 122, 125, and 136); National Pretreatment Standards (40 CFR 403); and Maryland regulations.

Fort Ritchie currently has two permitted surface water discharge points. One is located at the Water Treatment Plant (Building 835), and the other point is the oil/water separator at the Motor Pool (Building 700). These outfalls are permitted to discharge into Lake Royer and Lake Wastler under NPDES permit MD-0003221 and State of Maryland discharge permit 91-DP-2516.

Through the Department of the Army application process, Fort Ritchie has submitted an application to acquire an installation-wide stormwater permit. All applicable contracts at the installation include appropriate erosion and sediment control plans (USACE, 1993a).

3.2.9 Oil/Water Separators

Oil/water separators at Fort Ritchie are managed under the Installation Spill Contingency Plan and in accordance with applicable Federal regulations including the CWA 313(a); 40 CFR 110, 112, and 122; DoD directives; and AR 200-1.

Five oil-water separator units currently exist at the installation. Four of the units, located at the Auto Craft Shop (Building 401), the Vehicle Wash Rack (Building 731), the PX Gas Station (Building 515), and the Fire Station (Building 519), discharge into the sanitary sewer system. Effluents are treated prior to release to a surface water body; thus, no NPDES permits are required for these units. One oil/water separator located at the Motor Pool (Building 700) discharges to the lake, and an NPDES permit exists for this outfall.

3.2.10 Lead-Based Paint

Three reports document the main testing efforts for LBP at Fort Ritchie. A test conducted in 1991 involved 30 representative housing units, some random playground equipment, and a few shed doors behind the housing units. Another effort in 1994 tested 22 miscellaneous administration buildings. A detailed X-ray fluorescence (XRF) testing of all child care facilities was performed in 1995 due to the greater potential risk posed to young children. Some positive results were found in all three investigations. All three testing efforts recommended further analysis in order to determine which building components should be focused on for an effective LBP abatement effort if an abatement effort was undertaken. All structures constructed before 1978 are presumed to contain LBP. LBP removal and encapsulation for 11 buildings were initiated in July 1995. LBP management and education are currently part of Fort Ritchie's LBP mitigation efforts.

3.2.11 Unexploded Ordnance

The presence of UXO in an area of the installation designated as the impact area and the area of the new PX and Commissary, has been verified by installation personnel, records (i.e., USACE, 1997), construction and demolition activities, and visual inspections. The impact area was the site of WWII outdoor readiness training

activities. An EE/CA investigation is currently being conducted to determine the extent of UXO in this area (OU13).

3.2.12 Nuclear Regulatory Commission Licensing

Fort Ritchie has four NRC licenses for various equipment and devices that contain radionuclides and are used by the 572nd Military Police Company. These equipment and devices will continue to be managed appropriately until closure when they will be removed properly.

3.2.13 Pollution Prevention

Pollution prevention at Fort Ritchie is managed in accordance with Chapter 6 of AR 200-1 and applicable Federal and State regulatory requirements. Pollution prevention activities at Fort Ritchie include waste minimization and recycling. Pollution prevention activities will continue to be implemented as appropriate until closure.

3.2.14 Mixed Waste

No mixed waste is generated at Fort Ritchie.

3.2.15 Radiation

In 1990, the U.S. Army Environmental Hygiene Agency (USAEHA), now the U.S. Army Center for Health Promotion and Preventative Medicine (USACHPPM), reviewed Fort Ritchie's environmental radiation protection program. USAEHA also conducted an industrial radiation survey in 1991. Safety and protection policies and procedures concerning operational and personnel movement limitations to limit exposure, were developed from inspection reports and will continue to be followed until closure.

3.2.16 National Environmental Policy Act

Environmental program status of the property has not been determined pursuant to NEPA at this time.

3.2.17 Medical Waste

Medical waste is generated from the Health Clinic (Building 341) and the Dental Clinic (Building 332). Medical waste is collected separately and stored in a special dumpster outside Building 341. The waste is periodically removed from Fort Ritchie by a specialty contractor.

3.2.18 Air Permits

Fort Ritchie does not have an air permit because there are no major air emission sources at Fort Ritchie.

3.3 STATUS OF NATURAL AND CULTURAL RESOURCES PROGRAMS

This section presents the current status of the natural and cultural resources programs at Fort Ritchie. These programs include the identification and management of sensitive environments; vegetation, wildlife, and wetlands; rare, threatened, and endangered species; and cultural resources. Natural and cultural resources at Fort Ritchie are managed in accordance with AR 420-74 and 420-40; DoD Directive 4700.4 and 4710.1; and applicable Federal and State regulations and statutes.

3.3.1 Sensitive Environments

Fort Ritchie is surrounded by wooded and residential areas with limited commercial activity. Thus, woodlands and agricultural environments are predominant in the Fort Ritchie area. The woodlands are dominated by deciduous tree species, including oak (*Quercus* spp.), hickory (*Carya* spp.), maple (*Acer* spp.), tulip poplar (*Liriodendron* spp.), and black gum (*Nyssa* spp.). Due to the history of agricultural land use in the Fort Ritchie vicinity, no old-growth forest habitat is likely to occur.

Surveys of natural and cultural resources on the Fort Ritchie installation have recently been conducted. These survey efforts include an inventory of vascular plants and vertebrates, a jurisdictional wetland

delineation, and a comprehensive investigation of historic and archaeological sites that are located on the installation. Preliminary findings from these investigations indicate that there are several sensitive environments on the installation.

3.3.2 Vegetation

Staff from the Center for Ecological Management of Military Lands (CEMML) of Colorado State University conducted an installation-wide survey of vascular plants. Initial data collection for this survey began in 1993, and field efforts were completed in 1995. The report of findings for this field effort included descriptions of methodologies and findings. Data collected during field efforts included the identification of species, relative abundance of species, habitat descriptions, and determination of species status. Forest stand delineations were also conducted at Fort Ritchie. These delineations intended to identify sections of wooded areas that were suitable for forest management, based on species composition, age, and size classes. Results of the vascular plant survey, forest stand delineations, and recent aerial photos were used to create a vegetation map of the installation.

3.3.3 Wildlife

There are several protected wildlife areas in close proximity to Fort Ritchie, including South Mountain State Park, Catoclin Mountain National Park, Cunningham Falls State Park, and Michaux State Park. These areas support a variety of wildlife, including black bear (*Ursus americanus*), white-tailed deer (*Odocoileus virginianus*), red squirrels (*Tamiasciurus hudsonicus*), red fox (*Vulpes*), Eastern cottontail (*Sylvilagus floridanus*), and others. The Fort Ritchie area is located along the western periphery of the Atlantic flyway used by migrating waterfowl, waterbirds, and neotropical migrants.

Baseline surveys of terrestrial invertebrates/vertebrates, including birds, mammals, reptiles, and amphibians, dwelling at the Fort Ritchie installation, were conducted by Shippensburg University from May through October 1994 (Shippensburg, 1995). The species of birds utilizing Fort Ritchie habitats were determined through observations made along 24 transects which were established in four major habitat types found on the installation. Mammals were surveyed using traplines that were set up at 33 sampling stations. Four days of surveying were devoted to searching for amphibians and reptiles under rocks and fallen logs. Results of the survey efforts included a list of species, determination of species status, and limited wildlife resource management recommendations.

3.3.4 Wetlands and Flood Plains

An installation-wide survey and delineation of jurisdictional wetlands was conducted in April 1992. Jurisdictional wetlands were determined through methodologies outlined in the 1987 version of the U.S. Army Corps of Engineers Wetland Delineation Manual. A final report of findings from the wetland delineation field efforts was prepared and submitted in July 1992. Results of the delineation efforts indicated that there is one major complex of wetlands on the installation. This wetland complex consists of the areas immediately adjacent to a freshwater stream which drains into Lake Royer. Other isolated palustrine wetlands probably occur throughout the wooded portions of the installation downgradient of numerous unmapped springs. The locations of wetlands at Fort Ritchie are shown in Figure 3-3.

3.3.5 Rare, Threatened, and Endangered Species

Identification of rare, threatened, and endangered species at Fort Ritchie was accomplished through the use of both wildlife and vascular plants surveys, described above. The results of these surveys indicated that no Federally-listed endangered species were confirmed on the installation. However, four plant species that are Federally-listed as Category 2 species of concern were confirmed on the installation, and one mammal that is State of Maryland-listed as a species of special concern was confirmed on the site. Additionally, it was determined that the forested stream areas of the installation constitute excellent potential habitat for one Federally-listed candidate mammal species, the smoky shrew (*Sorex fumeus*). There are no resident endangered species in the area, although bald eagles (*Haliaeetus leucocephalus*), listed as Federally threatened, have been sighted in the area.

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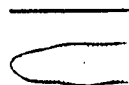
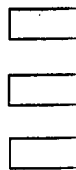
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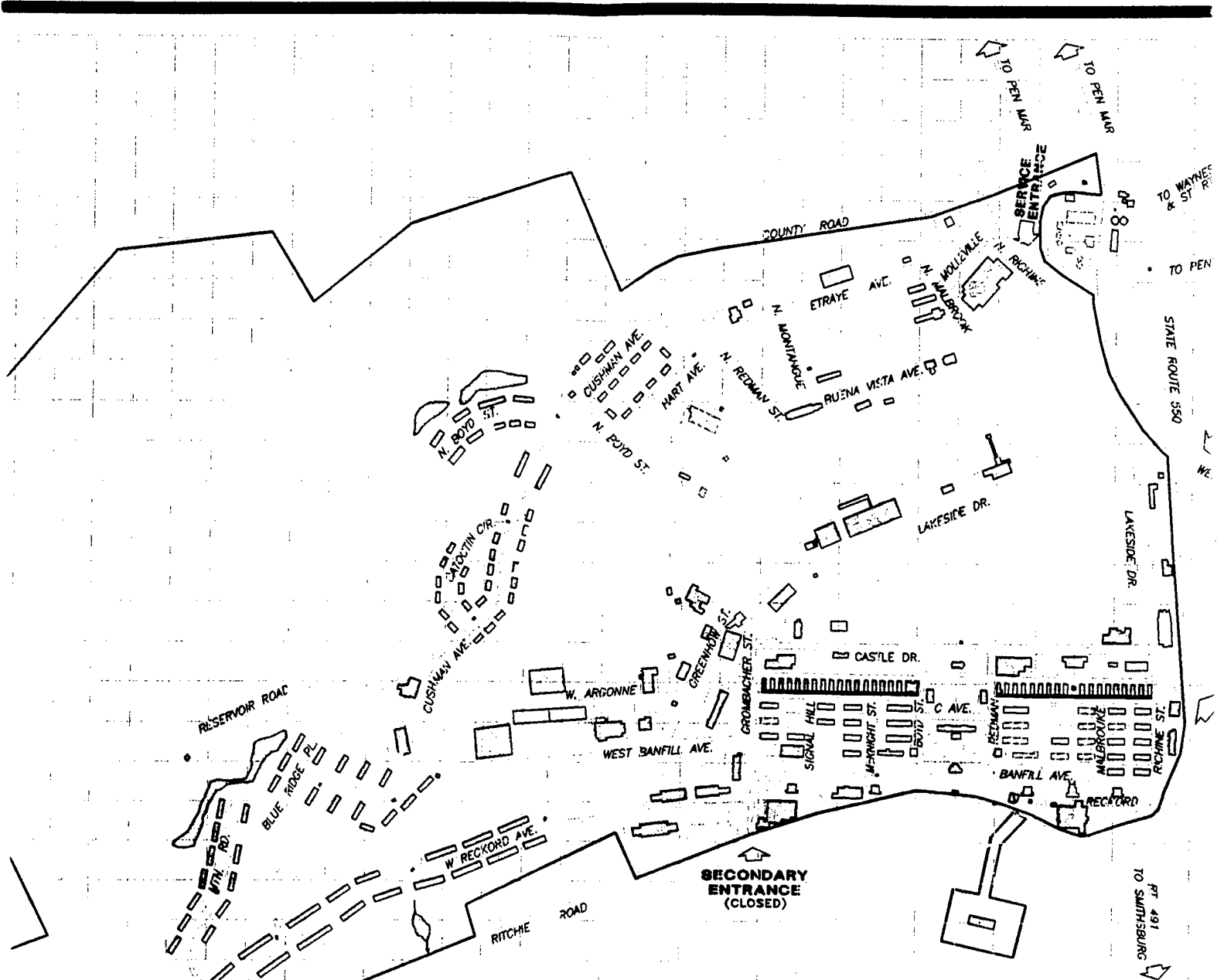
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LEGEND:

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-  SEMI-PERMANENT BUILDING
-  DEMOLISHED BUILDING
-  ROADS, PARKING, ETC, PAVED
-  EARTH OR GRAVEL ROAD, TRAIL, ETC.
-  BRAC PROPERTY BOUNDARY
-  WETLAND AREA

NOTE:

THE WETLAND BOUNDARIES SHOWN ARE APPROXIMATE AND SHOULD BE USED FOR GENERAL PLANNING PURPOSES ONLY.

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SOURCE: 1993

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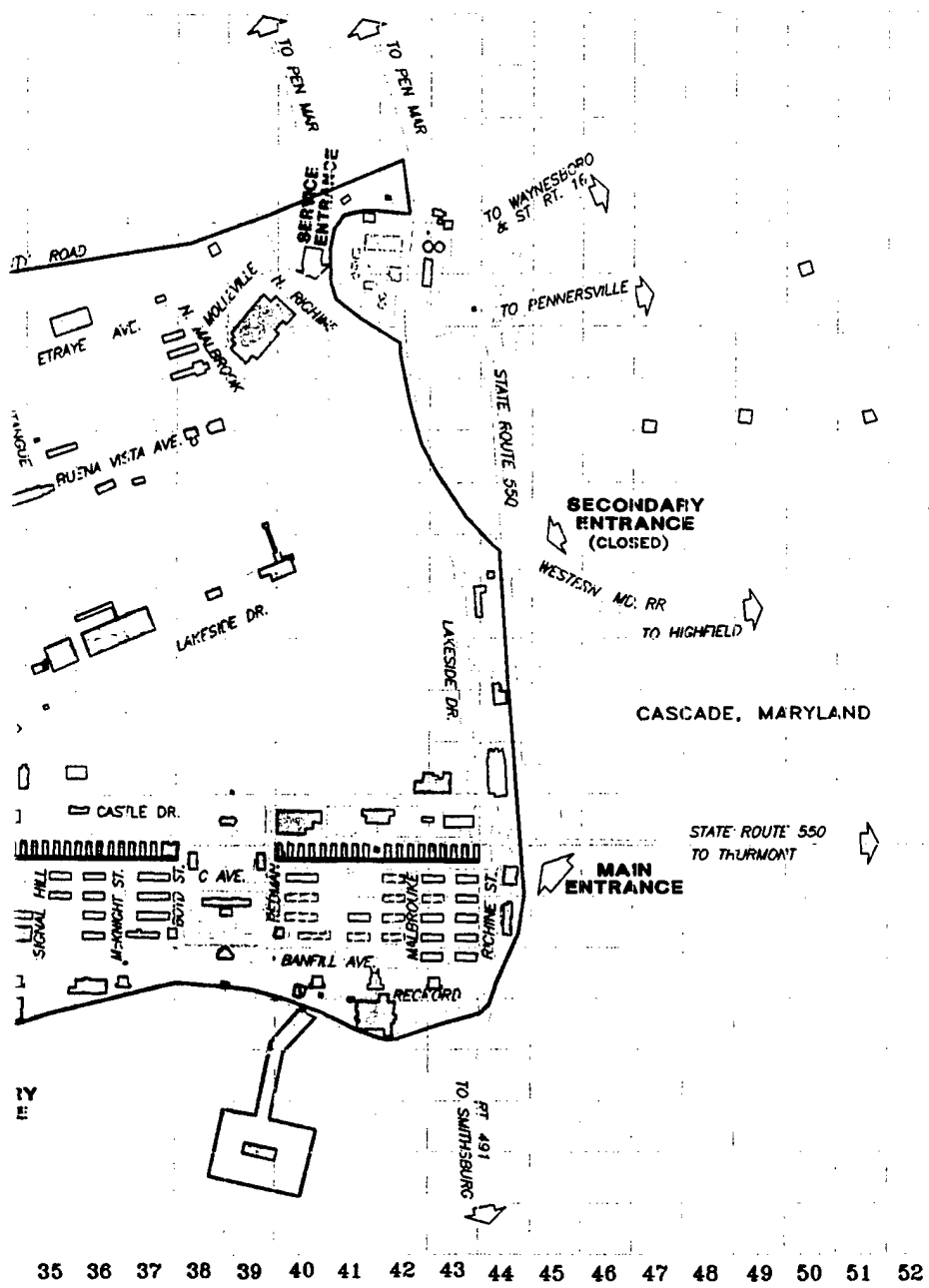
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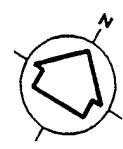
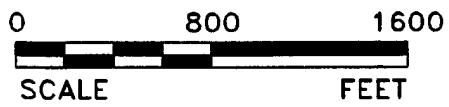
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SOURCE: 1993 U.S. ARMY, ENVIRONMENTAL OVERLAY MAP (EXISTING CONDITIONS)

US ARMY ENVIRONMENTAL CENTER		
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3.3.6 Cultural Resources

A final report on the review of all pertinent historical documentation and field surveys for cultural and historical resources was submitted by Dames & Moore in August 1995. An archeological resource sensitivity model was developed for Fort Ritchie during this investigation to assist in predicting the locations of unrecorded archeological sites. The findings from this investigation along with the application of the sensitivity model indicated that there are two archeological sites at the southwest end of Lake Royer. These sites have been determined to be of no archeological significance. It is not anticipated that additional sites will be found on the installation due to the high degree of disturbance that has occurred in the portions of the installation that are most likely to contain archeological sites.

A historic district has been designated at Fort Ritchie. This district was designed to account for all of the structures and sites associated with the development of Fort Ritchie from 1926 to 1945. Recommendations from cultural resources studies include application for inclusion of the Fort Ritchie Historic District in the National Historic Register.

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, prior to termination of Federal activities of real property, to identify property where no hazardous substances were stored, released, or disposed. The primary objective of CERFA 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.

The environmental condition of the Fort Ritchie property is provided in Figure 3-4. This map is based on the CERFA Letter Report (ICF KE, 1996b), but has been updated to include information collected during the SI (ICF KE, 1997b). Parcel descriptions are included in Table 3-9 and column 3 of Table 3-3 refers to CERFA parcels presented in Figure 3-4. Fort Ritchie was parcelized based on seven categories of environmental conditions. The following subsections describe each category of environmental condition and list the areas of Fort Ritchie which fall under each category. The eighth subsection lists parcels which are suitable for transfer. The definitions of the parcel categories have been revised based on updated BRAC guidance (DoD, 1996).

3.4.1 Category 1: Areas Where No Release or Disposal (Including Migration) of Hazardous Substances or Petroleum Products has Occurred

This area type is defined as a geographically contiguous and mappable area where the results of investigations show that no hazardous substances or petroleum products were released into the environment or site structures, or disposed of on site property (including no migration of these substances from adjacent areas). This area type is color-coded white in Figure 3-4. A determination of this area type cannot be made, however, unless a minimum level of information gathering and assessment has been completed. In accordance with Section 120(h)(4) of CERCLA as amended by CERFA, all such determinations (i.e., "uncontaminated") of this area type must be made on the basis of: a records search of the area in question and adjacent property; a review of the chain of title documents for the area; a review of aerial photographs of the area; a visual inspection of the area and adjacent property; and interviews with current and former employees regarding their knowledge of past and current activities on the property. These efforts can be functionally accomplished via an EBS or properly scoped Preliminary Assessment of the property in question. If information gathered from these efforts indicates that hazardous substances or petroleum products have been released, disposed of, or stored in the area, the geographic location becomes one of the other area types.

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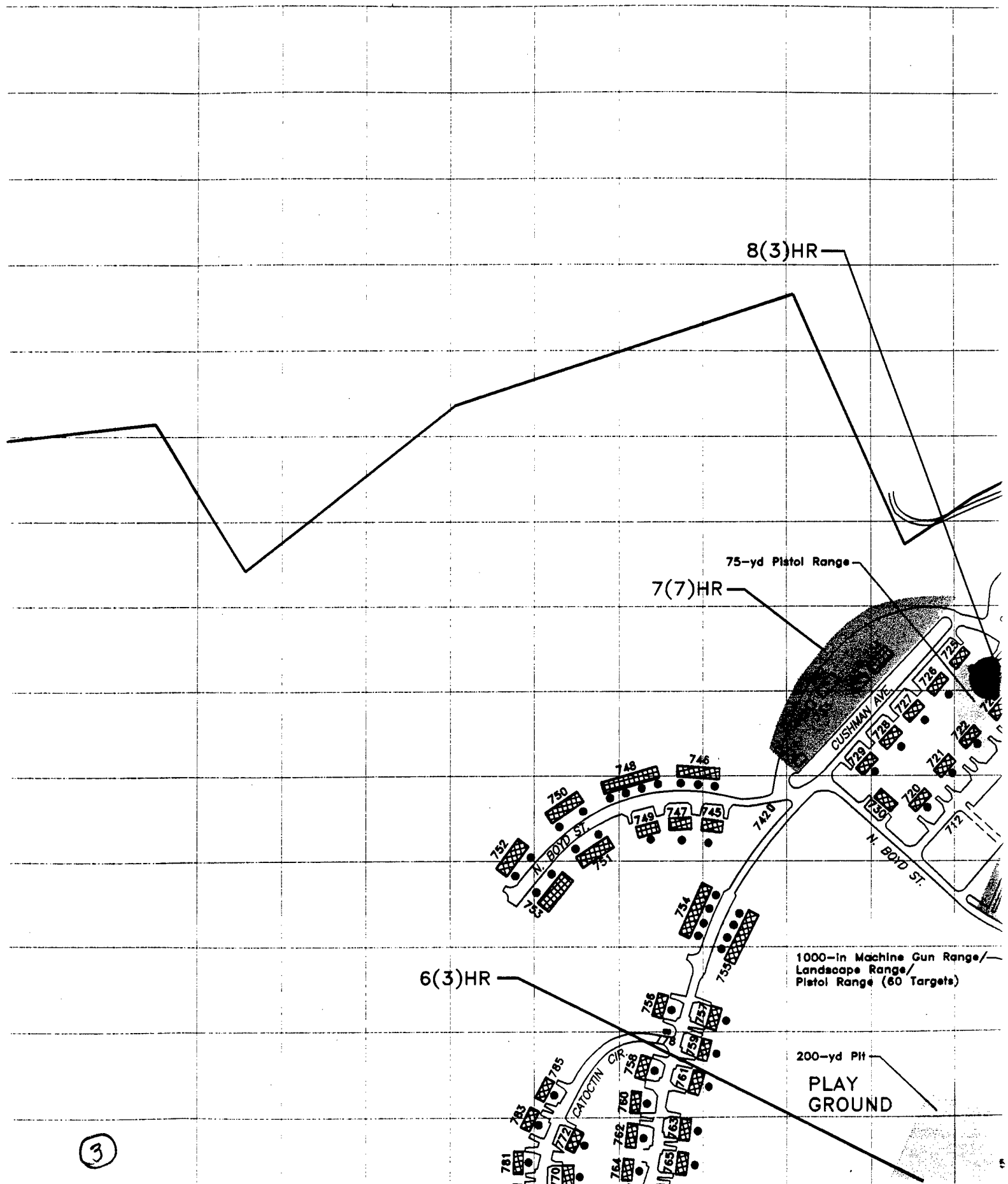


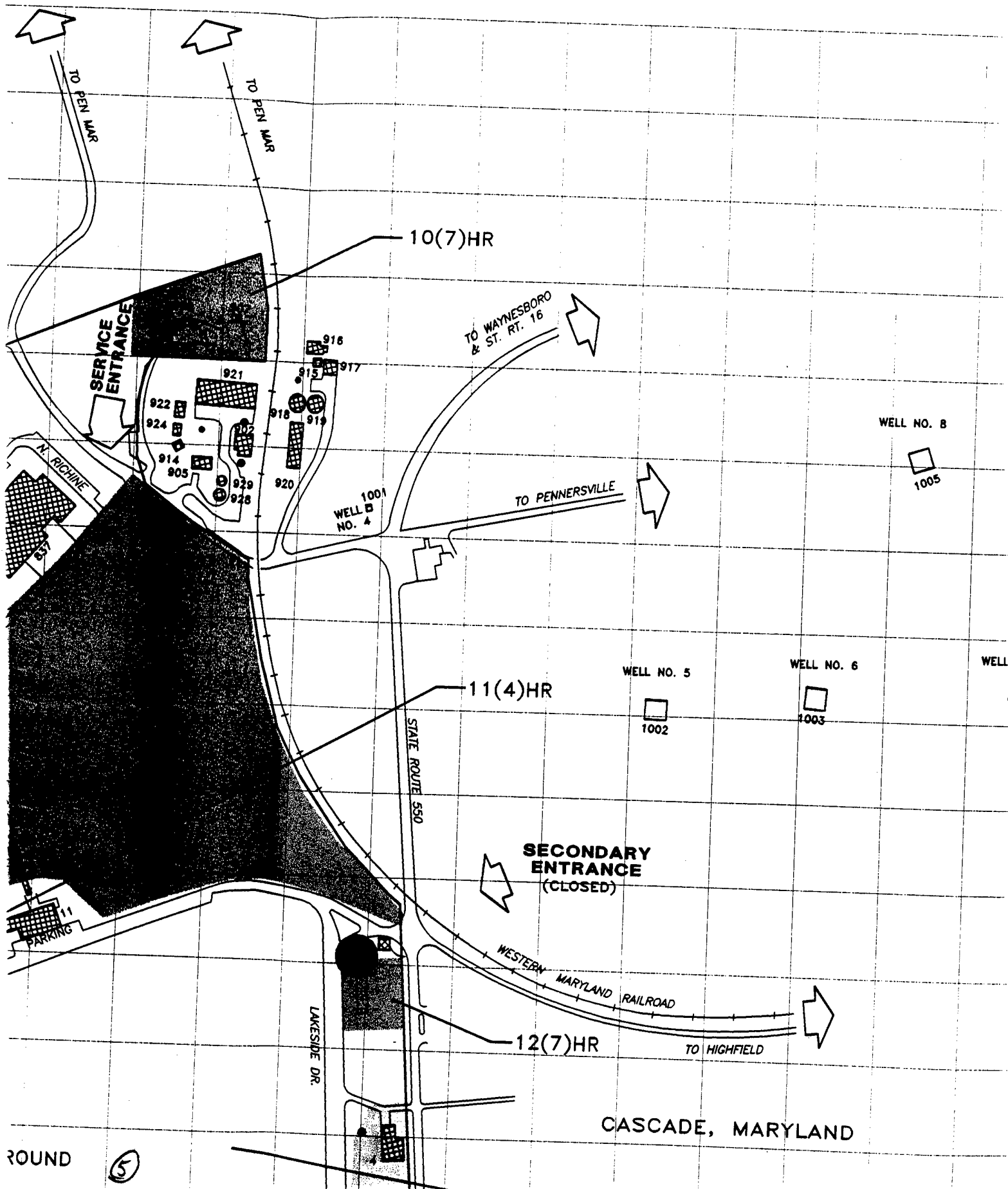
One Acre Grid Square
Coordinate Location: (X3,Y35)

3,Y35)

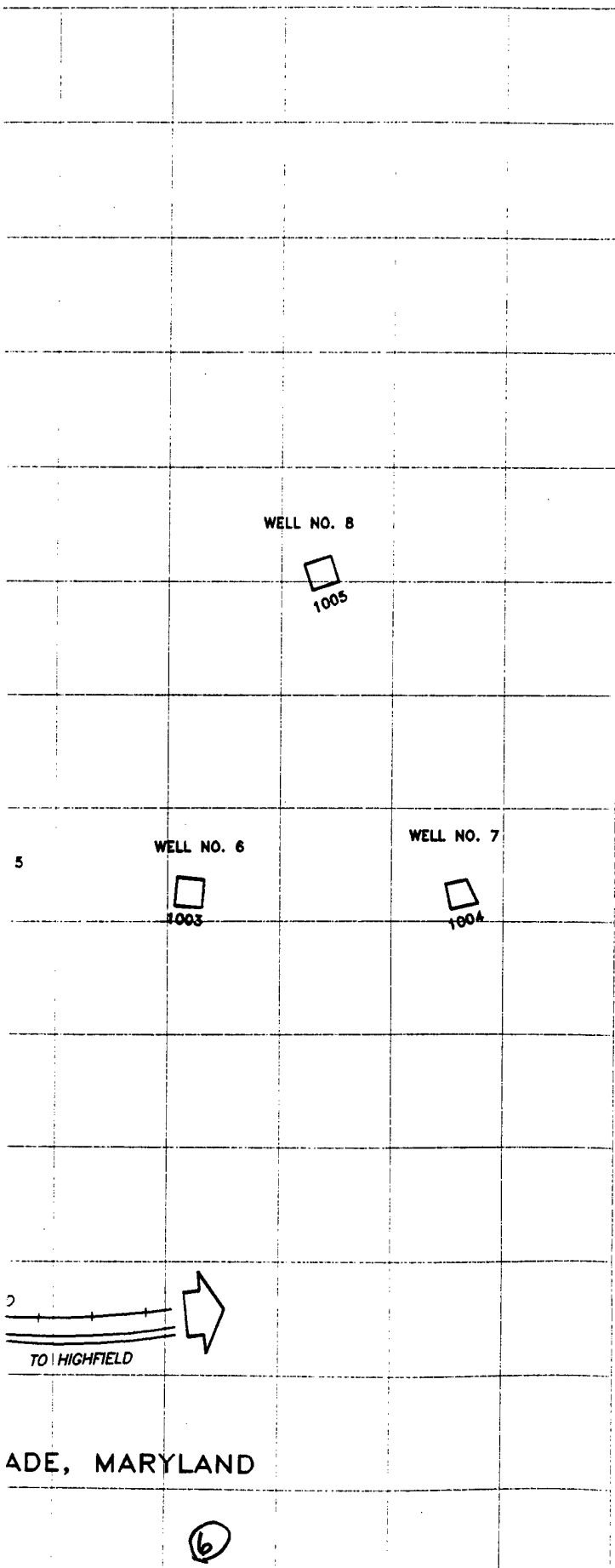
5(1)

UNEXPLODED ORDNANCE
IMPACT AREA





ROUND (5)



PARCEL CATEGORIES

<u>CATEGORY</u>	<u>COLOR</u>	<u>DEFINITION</u>
1	White	Areas where no release of hazardous substances or petroleum products has occurred.
2**	Blue	Areas where only release of petroleum products has occurred.
3	Lt. Green	Areas where release of hazardous substances has occurred, but at a level that does not require a remedial action.
4	Dk. Green	Areas where release of hazardous substances has occurred, and all remedial actions necessary to protect the environment have been taken.
5	Yellow	Areas where release of hazardous substances has occurred, and remedial actions are under way or remedial actions have been taken.
6	Red	Areas where release of hazardous substances has occurred, but remedial actions have not yet been implemented.
7	Gray	Areas that are not eligible for additional evaluation.

* CERFA Parcel Categories reflect the Addendum to the Fall 1995 BRAC G

** Release from a UST is indicated by a diamond symbol around the UST.

PARCEL LABEL DEFINITION

18	(7)	HR/	PR	
				Petroleum Release

ADE, MARYLAND

PARCEL CATEGORIES *

<u>CATEGORY</u>	<u>COLOR</u>	<u>DEFINITION</u>
1	White	Areas where no release or disposal of hazardous substances or petroleum products has occurred.
2**	Blue	Areas where only release or disposal of petroleum products has occurred.
3	Lt. Green	Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
4	Dk. Green	Areas where release, disposal, and/or migration of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
5	Yellow	Areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions are under way, but all required remedial actions have not yet been taken.
6	Red	Areas where release, disposal, and/or migration of hazardous substances has occurred, but required actions have not yet been implemented.
7	Gray	Areas that are not evaluated or require additional evaluation.

*** CERFA Parcel Categories reflect the September 1996 Addendum to the Fall 1995 BRAC Guidance.**

****Release from a UST is indicated by a 0.25-acre diameter circle around the UST.**

PARCEL LABEL DEFINITIONS:

<u>18</u>	<u>(7)</u>	<u>HR/</u>	<u>PR</u>	
			└──	Petroleum Release

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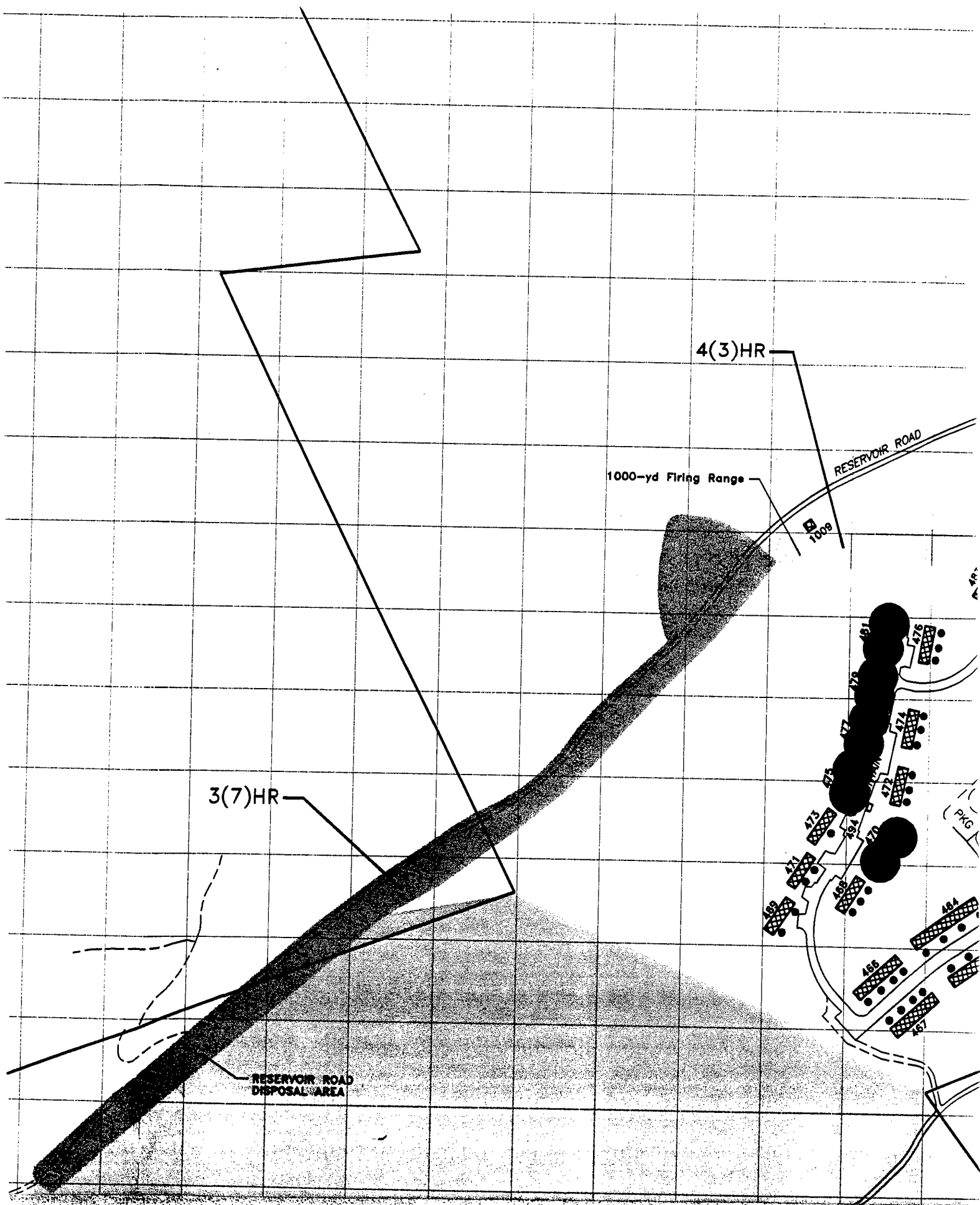
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2(3)HR

⑧



Scout Range/
Pistol Range (60 Targets)

200-yd Pit
PLAY GROUND

300-yd Firing Range

500-yd Firing Range

Substation

600-yd Firing Range

CUSHMAN AVE.

RESERVOIR ROAD

PARKING

WEST-BANFILL AVE.

1000-Inch Machine
Gun Range

PKG

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TO HIGHFIELD

DE GROUND

- 14(4)HR

STATE ROUTE 550

TO THURMONT

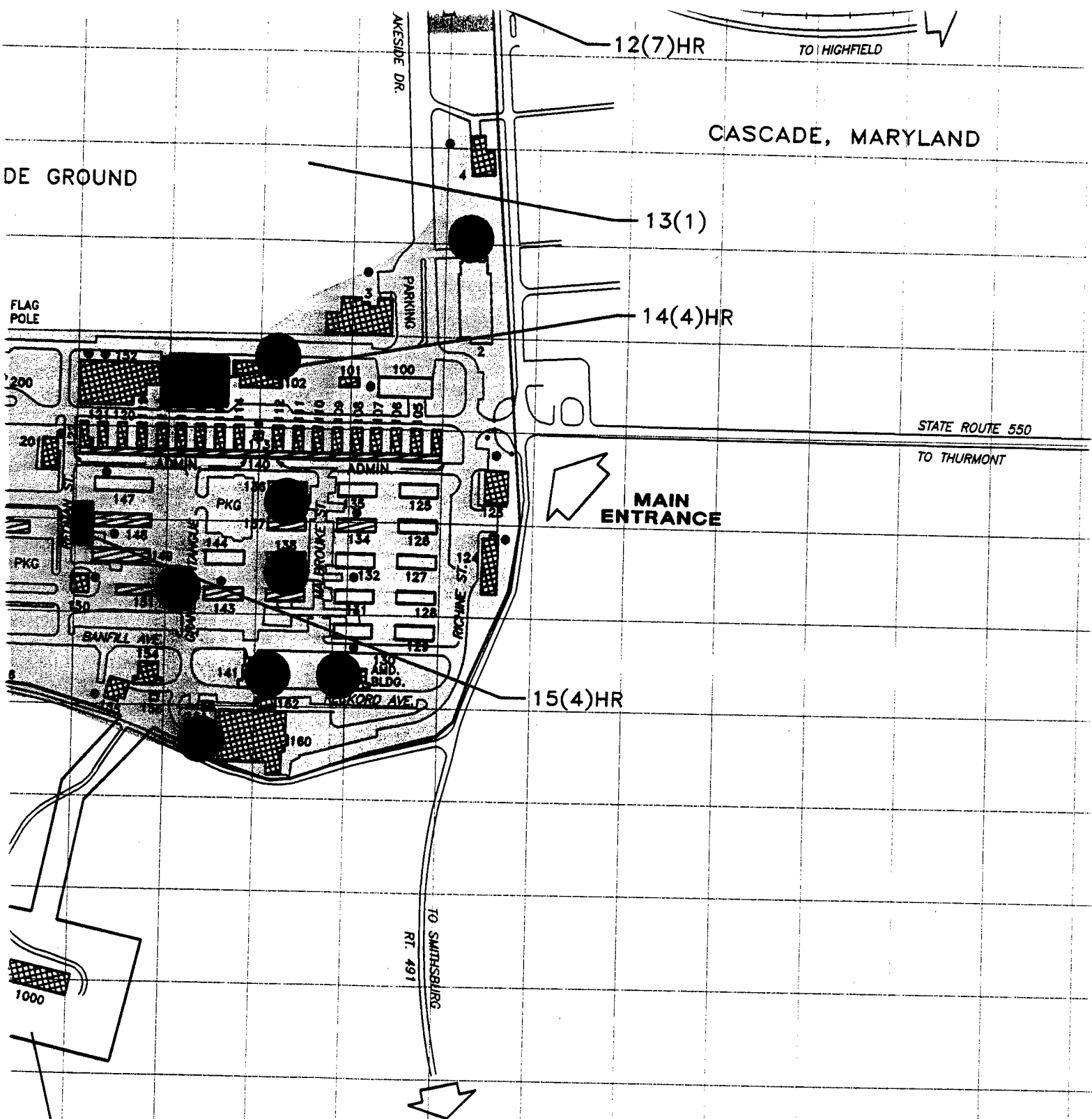
**MAIN
ENTRANCE**

15(4)HR

TO SMITHSBURG
RT. 491

16(1)

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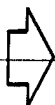


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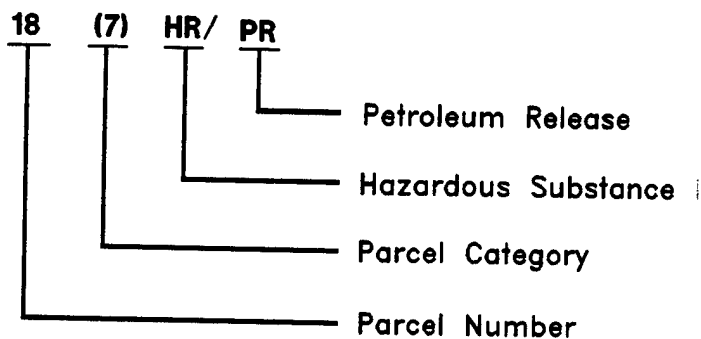
MARYLAND

STATE ROUTE 550

TO THURMONT



PARCEL LABEL DEFINITIONS:



LEGEND:



PERMANENT BUILDING



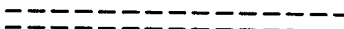
SEMI-PERMANENT BUILDING



TEMPORARY/DEMOLISHED BUILD



ROADS, PARKING, ETC, PAVED



EARTH OR GRAVEL ROAD, TRAIL



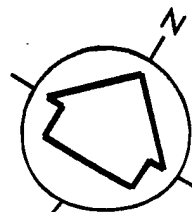
BRAC PROPERTY BOUNDARY



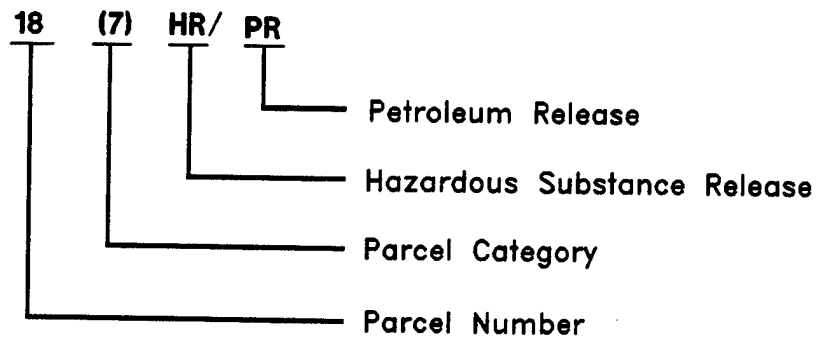
USTs



ASTs



PARCEL LABEL DEFINITIONS:



LEGEND:



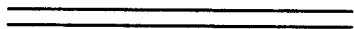
PERMANENT BUILDING



SEMI-PERMANENT BUILDING



TEMPORARY/DEMOLISHED BUILDING



ROADS, PARKING, ETC, PAVED



EARTH OR GRAVEL ROAD, TRAIL, ETC.



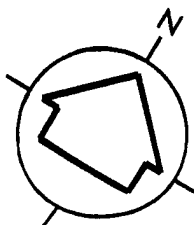
BRAC PROPERTY BOUNDARY

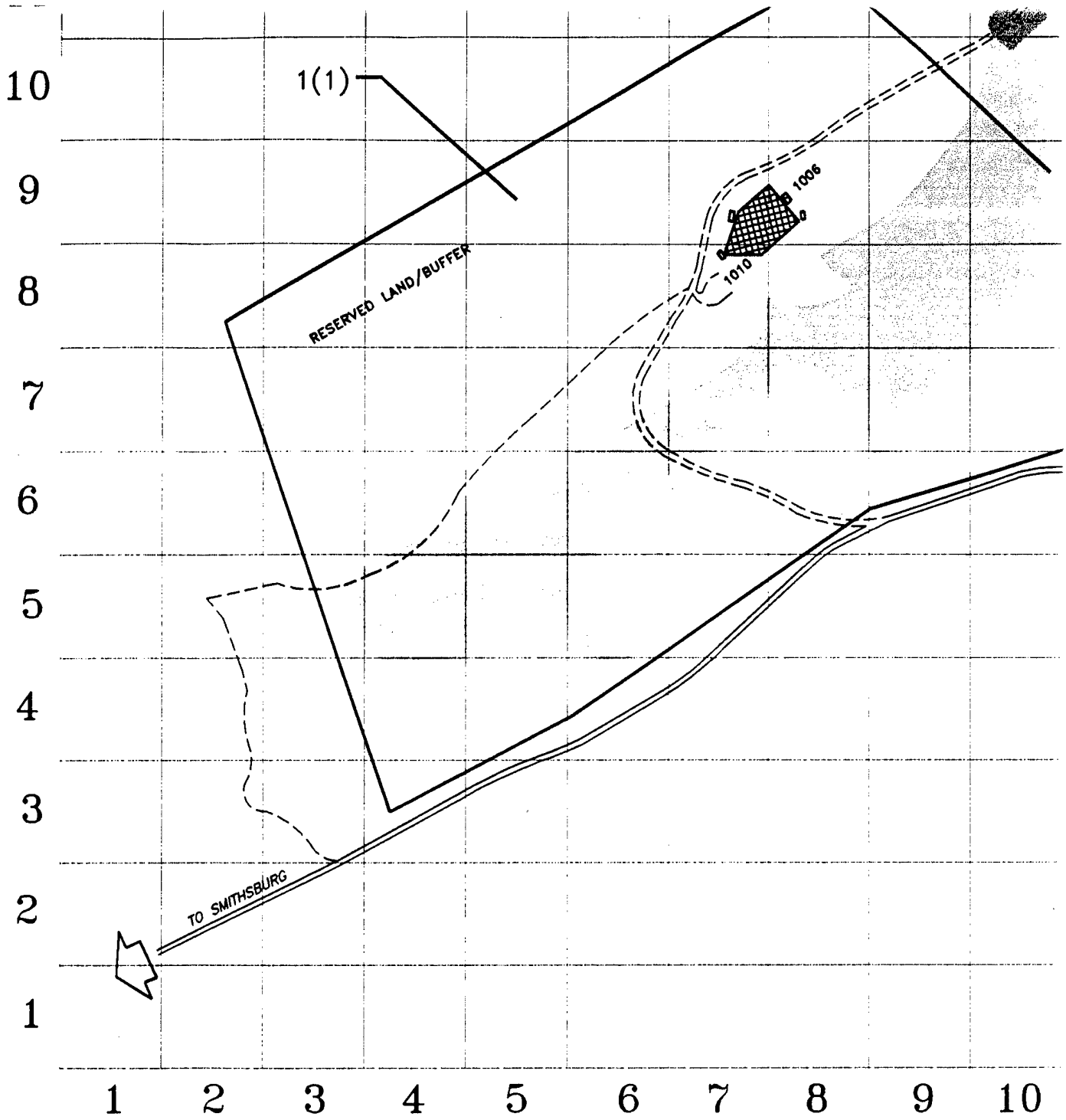


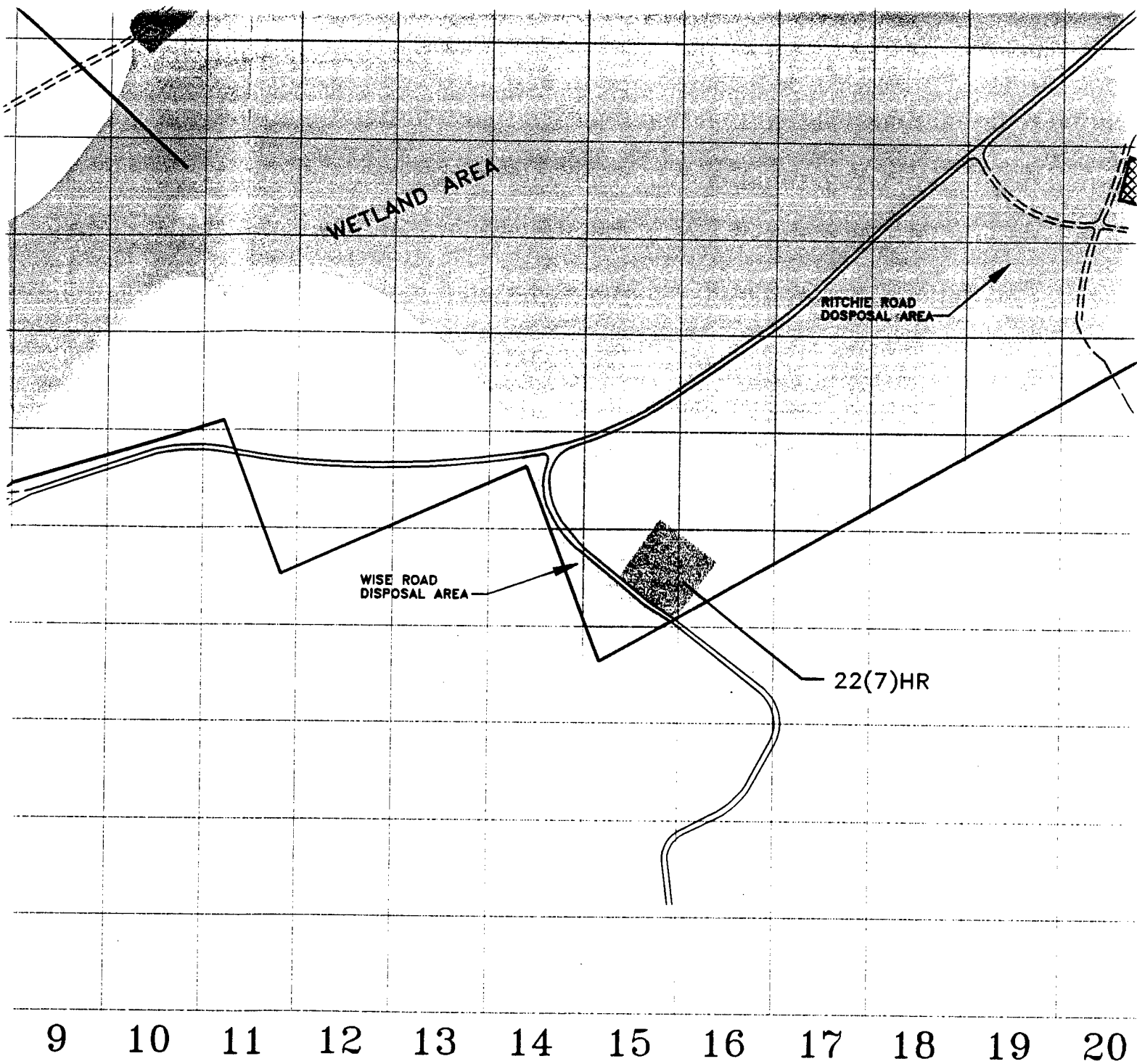
USTs

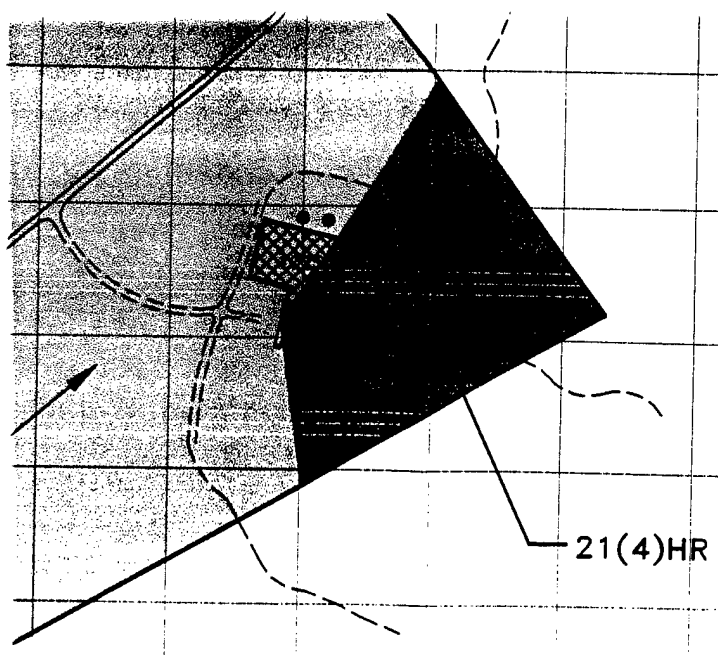


ASTs









21(4)HR

19 20 21 22 23 24 25 26 27 28 29 30

42,18	141	1
41,19	151	1
41,17	160	1
38,20	202	1
37,28	834	1
37,28	835/6	1
37,19	327	1
37,18	330	1
36,20	334/5	1
35,24	603	1
35,24	605	1
35,22	302	1
34,22	302	1
34,21	303	1
34,19	346	1
32,27	700	1
32,26	716	1
31,29	724	1
31,19	515	5
25,18	490	1
24,18	493	1
24,17	486	2
23,18	491	1
22,19	480	1
22,19	489	1
20,17	481	2
20,17	479	2
20,16	477	2
20,15	470	2
20,15	475	2

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[illegible]

38 39 40 41 42 43

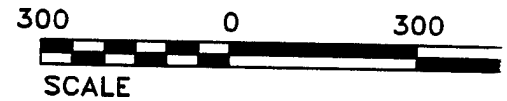
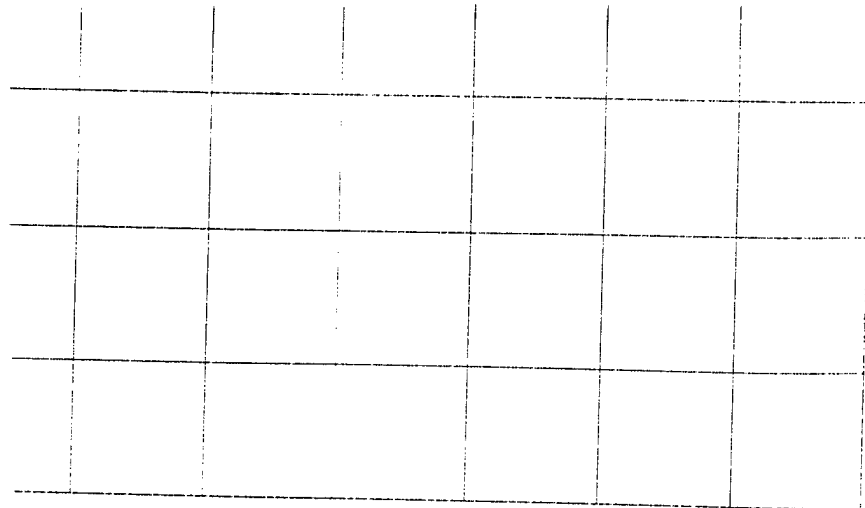
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PREPARED CST

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DATE 03/24/9



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US ARMY ENVIRONMENTAL CEN'

CONTRACT NO. DACA31-94-D-0064

FIG
FO

⇒ **ICF KAISER**

2113 EMMORTON PARK RD.
EDGEWOOD, MD. 21040
(410) 612-6350

CERF
DES

PREPARED CST

TASK NO: 66225

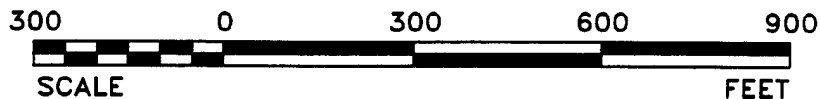
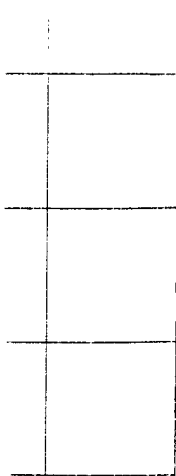
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ICF DWG NO:

DATE 03/24/98

CIN-RITC

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US ARMY ONMENTAL CENTER

1-94-D-0064

113 EMMORTON PARK RD.
DGEWOOD, MD. 21040
(410) 612-6350

SK NO: 66225

DWG NO:

CIN-RITC

FIGURE 3-4

FORT RITCHIE

CERFA PARCEL
DESIGNATION
MAP

(21)

Table 3-9. CERFA Parcel Descriptions.

Parcel No.	Description	Color
1(1)	Reserved Land Buffer	White
2(3)HR	Wetlands Area	Lt. Green
3(7)HR	Reservoir Rd Disposal Area	Gray
	Burn Area	
4(3)HR	Firing Ranges	Lt. Green
	Service Station (Building 515)	
5(1)	Unexploded Ordnance Impact Area	White
6(3)HR	Former Shooting Range	Lt. Green
7(7)HR	DEH Maintenance Area	Gray
8(3)HR	Former Pistol Range	Lt. Green
	700 Family Housing Area	
9(7)HR/PR	Motor Pool	Gray
	Upper and Lower Lakes	
10(7)HR	Incinerator Area	Gray
11(4)HR	Lakeside Club Parking Lot	Dk. Green
12(7)HR	Golf Course Maintenance	Gray
13(1)	Parade Ground	White
14(4)HR	Building 152 parking lot	Dk. Green
15(4)HR	Office, Bldg 148 Roadside	Dk. Green
16(1)	Reservoir	White
17(3)HR	Admin Area	Lt. Green
18(2)PR	Installation-wide Petroleum Releases	Blue
19(7)HR	Substation	Gray
20(1)	400 Family Housing Area	White
21(4)HR	Skeet Range	Dk. Green
22(7)HR	Wise Road Disposal Area	Gray

3.4.2 Category 2: Areas Where Only Release or Disposal of Petroleum Products has Occurred

This area type is defined as a geographically contiguous and mappable area where the results of investigations show only the release or disposal of petroleum products has occurred. This area type is color-coded blue in Figure 3-4. A determination of this area type must be made in accordance with the same requirements in Section 120(h)(4) of CERCLA as listed in the above paragraph.

3.4.3 Category 3: Areas Where Release, Disposal, and/or Migration of Hazardous Substances has Occurred but Require No Remedial Action

This area type is defined as a geographically contiguous and mappable area where environmental evidence demonstrates that hazardous substances have been released or disposed, but are present at concentrations that require no response action to protect human health and the environment. This area type is color-coded light green in Figure 3-4.

It should be noted that the designation of a Category 3 area cannot be made with confidence unless a minimum level of information gathering and assessment has been completed. As such, all determinations

should be made on the basis of a Site Inspection, or equivalent level of effort, which includes biased field sampling and laboratory analysis to support a conceptual understanding of the area.

3.4.4 Category 4: Areas Where Release, Disposal, and/or Migration of Hazardous Substances has Occurred and All Remedial Actions Have Been Taken

This area type is defined as a geographically contiguous and mappable area where all RAs necessary to protect human health and the environment have been conducted. This area type is color-coded dark green in Figure 3-4. Category 4 areas include those areas in which an EBS report documents that hazardous substances are known to have been released or disposed of on the property, but all RAs necessary to protect human health and the environment, with respect to any hazardous substances remaining on the property, have already been taken to meet the provisions of CERCLA Section 120(h)(3). Clarification of the meaning of "all remedial action has been taken" is found in Section 12(h)(4)(B)(i) of CERCLA. BRAC Cleanup Teams preparing suitability of property for transfer maps should be aware that "all remedial action has been taken" means that the construction and installation of an approved remedial design has been completed and that the remedy has been demonstrated to USEPA to be operating properly and successfully (in practice, usually a year).

3.4.5 Category 5: Areas Where Release, Disposal and/or Migration of Hazardous Substances has Occurred and Action is Underway but Not Final

This area type is defined as a geographically contiguous and mappable area where the presence of sources or releases of hazardous substances is confirmed based on the results of sampling and analysis available in electronic databases and/or environmental restoration and compliance reports. This area type is color-coded yellow in Figure 3-4. By definition, this area type contains contaminant concentrations above action levels. Such concentrations do not meet the criteria that would allow a determination of a Category 3 area. Remedial systems for Category 5 areas are partially or entirely in place but have not been fully demonstrated.

3.4.6 Category 6: Areas Where Release, Disposal, and/or Migration of Hazardous Substances has Occurred, but Required Response Actions Have Not Been Taken

This area type is defined as a geographically contiguous and mappable area where the presence of sources or releases of hazardous substances is confirmed based on the results of sampling and analysis as contained in electronic databases and/or environmental restoration and compliance reports. This area type is color-coded red in Figure 3-4. This area type contains concentrations of contaminants above action levels. Such concentrations do not meet the criteria that would allow a determination of a Category 3 area. Additionally, required remedial systems have not been selected or implemented.

3.4.7 Category 7: Areas that are Not Evaluated or Require Additional Evaluation

This area type is defined as a geographically contiguous and mappable area where the presence of sources or releases of hazardous substances or petroleum products (including derivatives) is suspected, but not well characterized, based on the results of a properly scoped records search, chain of title review, aerial photography review, visual inspection, set of employee interviews, and possibly sampling and analysis. This area type is color-coded gray in Figure 3-4. They do not, with certainty, fit any of the previous area types because evaluation efforts have not occurred, are ongoing, or are inconclusive.

3.4.8 Suitability of Installation Property for Transfer by Deed

SARA Title I, Section 120 of CERCLA requires that any deed for transferred Federal property, on which any hazardous substance was:

- stored for one year or more;
- known to have been released; or
- known to have been disposed of;

contain, to the extent that such information is available based on a complete search of agency files, the following information:

- A notice of the type and quantity of such hazardous substances;
- A 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 RAs necessary to protect human health and the environment with respect to any such substance remaining on the property have been taken before the date of such transfer, and any additional RAs found to be necessary after the date of such transfer shall be conducted.

The U.S. Army has begun the identification of property suitable for transfer under CERCLA through the CERFA identification process. The CERFA process is a screening mechanism to identify those properties immediately transferable. Properties identified as immediately transferable have had no activities which could potentially preclude them from transfer under CERCLA. A number of parcels at Fort Ritchie have been identified as suitable to transfer (Figure 3-5). However, the potential presence of UXO precludes the transfer of the remaining parcels identified based on CERFA guidelines as suitable for transfer (classified as Categories 1 to 4 on Figure 3-4). As the OE/UXO study continues, pending BCT approval, additional parcels at Fort Ritchie are expected to become transferable.

3.5 STATUS OF COMMUNITY INVOLVEMENT

Information regarding the following community relations activities that have taken place at Fort Ritchie is available through the BCT:

- Information Repositories - Information repositories on the Fort Ritchie BRAC have been set up at the Blue Ridge Summit and Washington County Libraries;
- Administrative Record;
- Community Relations Plan;
- Restoration Advisory Board - A Restoration Advisory Board (RAB) consists of twenty-four members including twenty-one community members, the BEC, and the USEPA and MDE representatives. The RAB has held meetings on the fourth Wednesday of each month since February 28, 1996;
- Mailing List;
- Fact Sheets;
- Open Houses;
- Tours; and
- Public Meetings.

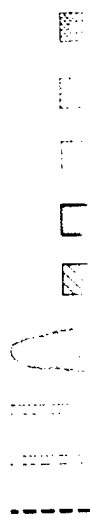
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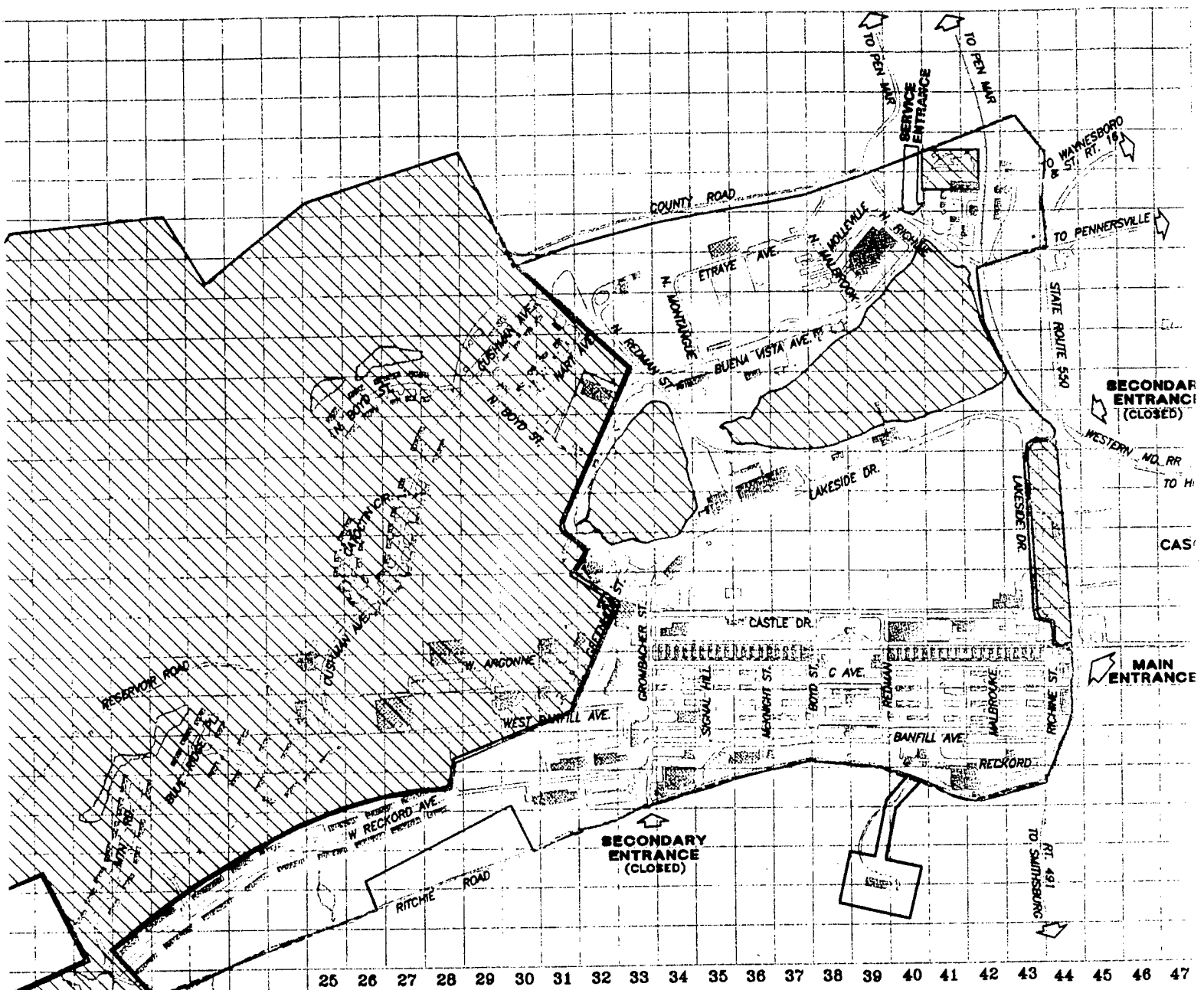
One Acre Grid Square
Coordinate Location: (3,35)

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LEGEND:



PERMANENT BUILDING



SEMI-PERMANENT BUILDING



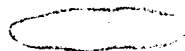
DEMOLISHED BUILDING



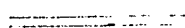
PARCELS SUITABLE TO TRANSFER



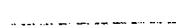
PARCELS NOT SUITABLE TO TRANSFER



WETLAND AREA



ROADS, PARKING, ETC., PAVED



EARTH OR GRAVEL ROAD, TRAIL, ETC.



BRAC PROPERTY BOUNDARY



SOURCE: 1993 U.S. ARMY

ENVIR

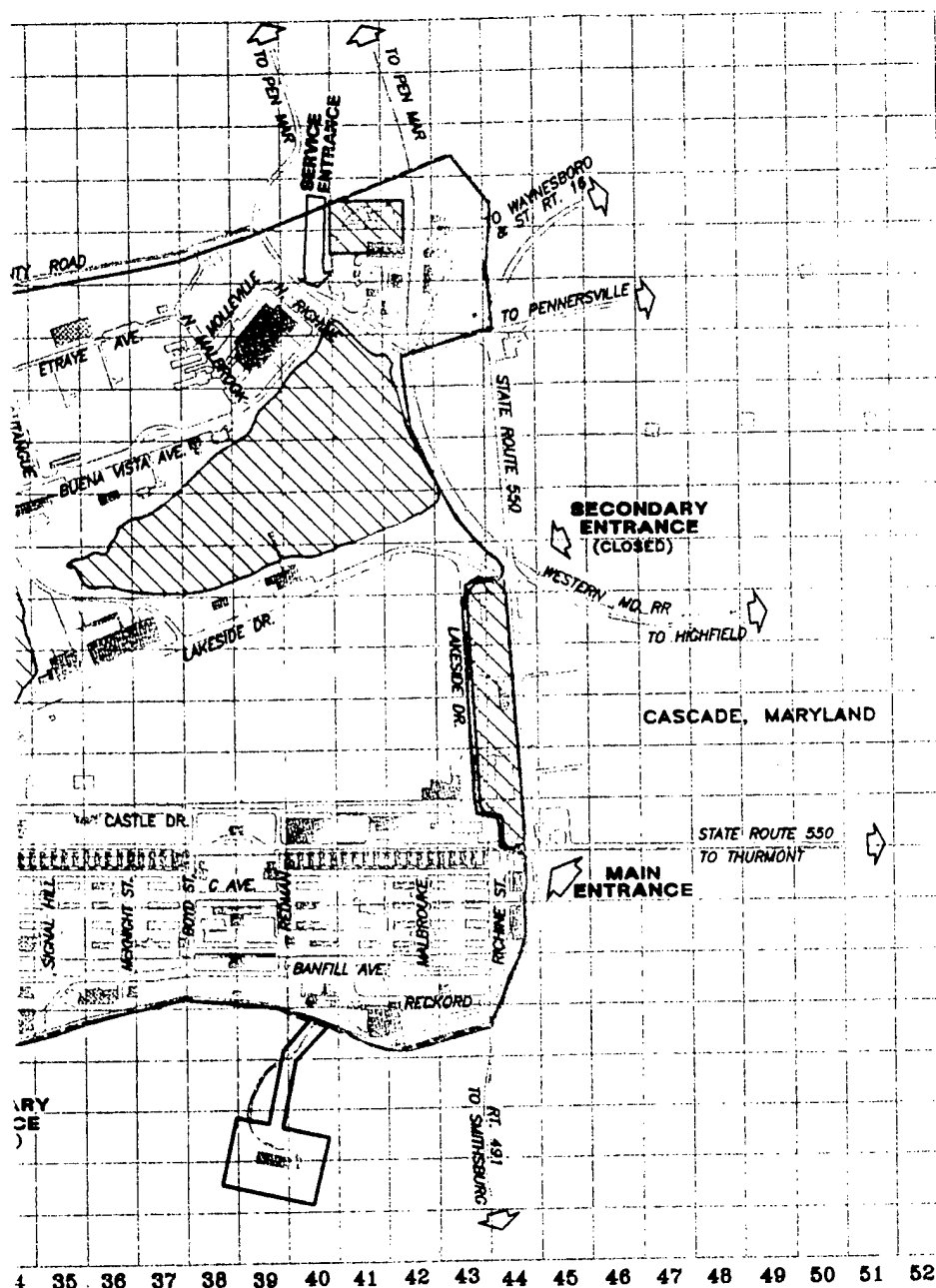
CONTRACT NO. DACA

◆ ICF KAISER

PREPARED JNW

CHECKED JHH

DATE 1-22-98



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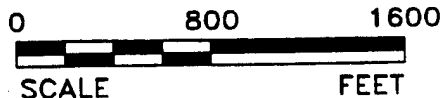
BLE TO TRANSFER

SUITABLE TO TRANSFER

IG, ETC, PAVED

VEL ROAD, TRAIL, ETC.

Y BOUNDARY



SOURCE: 1993 U.S. ARMY, ENVIRONMENTAL OVERLAY MAP (EXISTING CONDITIONS)

US ARMY ENVIRONMENTAL CENTER

CONTRACT NO. DACA31-94-D-0064

FIGURE 3-5
FORT RITCHIE

◆ ICF KAISER

2113 EMMORTON PARK RD.
EDGEWOOD, MD. 21040
(410) 612-6350

PREPARED JNW

TASK NO: 66225

CHECKED JHH

ICF DWG NO:

DATE 1-22-98

FRBCP3-6

SUITABILITY OF
PROPERTY TO
TRANSFER

4.0 INSTALLATION-WIDE STRATEGY FOR ENVIRONMENTAL RESTORATION

This chapter describes and summarizes the installation-wide environmental restoration and compliance strategy for Fort Ritchie. With the closure announcement, the installation's strategy shifted from supporting an active U.S. Army mission to responding to disposal and reuse considerations. Accordingly, an EBS has been conducted and a SI has been initiated. 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, will be developed on a case-by-case basis by the BCT.

4.1 OPERABLE UNIT DESIGNATION AND STRATEGY

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

4.1.1 Operable Unit Designations

OUs are defined as discrete response actions or steps toward comprehensive environmental restoration and 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. Given this flexibility, and the findings to date, the BCT has defined 16 interim OUs. Table 4-1 depicts the relationship between OUs, reuse parcels, CERFA parcels, and districts.

4.1.2 Sequence of Operable Units

A comprehensive OU strategy has been developed by the Fort Ritchie BCT. This strategy consolidated restoration sites into OUs for investigation, and then defined a logical sequence of addressing all past releases associated with these sites. The site cleanup sequence at Fort Ritchie is summarized in Table 4-2. When developed, Figure 4-1 will identify the timeline for generation of primary documents necessary to complete site cleanup actions. The schedule will be developed using a critical path analysis method.

4.1.3 Environmental Early Actions Strategy

Additional early actions that would accelerate cleanup activities have not been identified at this time. Information regarding additional removal actions, interim RAs, or treatability studies will be provided by the BCT (Table 4-3).

4.1.4 Remedy Selection Approach

Remedies will be selected for the appropriate OUs after adequate characterization of the nature and extent of contamination has been completed. The remedies will be selected in accordance with statutory and National Oil and Hazardous Substance Pollution Contingency Plan (NCP) criteria. The Fort Ritchie BCT will involve all parties, who have an impact on the actions 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 RAs will be identified by the BCT. The effectiveness of alternatives in reducing concentrations of contaminants below 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;

Table 4-1. Relationship Between Operable Units, Parcels, and Districts

Operable Unit ¹	Description	Reuse Parcel ²	CERFA Parcel ³	District ²
1	Golf Course Maintenance Shop (Building 5)	N/A	12(7)HR	N/A
2	Former Incinerator Area (Buildings 907, 908, 909)	N/A	10(7)HR	N/A
3	Lake Royer and Lake Wastler	N/A	9(7)HR/PR	N/A
4	Motor Pool (Building 700)	10	9(7)HR/PR	North Slope
5	DPW Maintenance Equipment Area (Buildings 731 to 736)	N/A	7(7)HR	N/A
6	Autocraft Shop (Building 401)	5	17(3)HR	Central Flats
7	Abandoned Firing Ranges	14 to 17	4(3)HR 6(3)HR 8(3)HR 20(1)	Valley Edge
8	PX Auto Service Station (Building 515)	N/A	18(2)HR	Central Flats
9	Administration Building Area (100-, 200-, and 300-Series Buildings)	1 to 4	14(4)HR 15(4)HR 17(3)HR 18(2)PR	Original Core
10	Wise Road Disposal Area	N/A	22(7)HR	N/A
11	Wetland Area	N/A	2(3)HR	N/A
12	Former Hospital Area	8 to 9	5(1)	North Slope
13	OE/UXO Impact Areas	14 to 17	5(1) 20(1) 21(4)HR	Valley Edge
14	Former Burn Area	14	3(7)HR	Valley Edge
15	Reservoir Road Disposal Area	14 & 17	3(7)HR	Valley Edge
16	Electrical Substation	4	19(7)HR	Original Core

DPW Department of Public Works
N/A Not Applicable
OE/UXO Ordnance and Explosives/Unexploded Ordnance
PX Post Exchange

¹ OUs are illustrated on Figure 3-2.

² Reuse parcels and districts are illustrated on Figure 2-2.

³ CERFA parcels are illustrated on Figure 3-4.

Table 4-2. Cleanup Sequence

Reuse Parcel	Site	Environmental Risk	Reuse Priority	Cleanup Sequence	Reconcile Comments
		The cleanup sequence at Fort Ritchie has not been established at this time.			

Table 4-3. Environmental Restoration Planned Early Actions

Site	Action	Objective	Time Frame
	The BCT has not identified any restoration early actions for Fort Ritchie.		

The sequence and timelines for OUs have not been determined at this time.

Figure 4-1. Sequence and Primary Document Timeline for Operable Unit

- **Applicable Remedies.** The presumptive remedy selection approach advocated in USEPA's 30-day study will be applied in selected cases. Focused Feasibility Studies (FSs) will be developed where appropriate; and
- **Future Land Use.** Cleanup goals need to 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 during the initial screening of alternatives (ISA) stage to ensure the FS focuses on the appropriate types of remedies for each site or OU.

4.2 COMPLIANCE STRATEGY

This section describes the strategies for addressing compliance-related environmental issues at Fort Ritchie prior to closure and/or property transfer. These environmental compliance strategies have been developed to ensure that installations are compliant with Federal and State regulatory programs, and DoD and U.S. Army directives and regulations throughout the BRAC process. Table 4-4 identifies the environmental compliance early actions for Fort Ritchie.

Table 4-4. Environmental Compliance Planned Early Actions

Site	Action	Objective	Time Frame
	There are no identified compliance early actions for Fort Ritchie at this time.		

4.2.1 Storage Tanks

Seventy-three (73) USTs and 4 ASTs currently remain in use at Fort Ritchie and are in compliance with State and Federal regulations. Management of these storage tanks will continue to meet all Federal and State regulations. There are also four USTs that have been abandoned in place at Fort Ritchie.

4.2.2 Hazardous Materials/Waste Management

The majority of hazardous wastes generated at Fort Ritchie will continue to be disposed of under a shipping contract administered by the DRMO. These wastes are shipped to various TSDFs in the surrounding states for disposal. Limited quantities of non-hazardous chemical solutions used in photographic processing will continue to be disposed of in the sanitary sewer system.

4.2.3 Solid Waste Management

Non-hazardous solid waste will continue to be hauled by contractors and disposed of off site in a State-sanctioned landfill and/or recycled.

4.2.4 Polychlorinated Biphenyls

PCB testing of all transformers on post revealed that three transformers at Building 119 on pole 253 were the only remaining PCB-containing transformers on post. The three transformers have been replaced. All other transformers are PCB-free.

4.2.5 Asbestos

An asbestos removal policy was developed for the installation in 1992 based on the results of a 1991/1992 asbestos survey. Ongoing asbestos abatement activities will continue as needed until the closure of Fort Ritchie.

4.2.6 Radon

Testing efforts and available information indicate that radon is not a concern for any of the buildings on the Fort Ritchie property.

4.2.7 RCRA Facilities

Fort Ritchie does not have any RCRA permitted facilities.

4.2.8 NPDES Permits

The existing NPDES outfalls will continue to be permitted and monitored under Fort Ritchie's current NPDES permit.

4.2.9 Oil/Water Separators

The five oil/water separators on the Fort Ritchie property will continue to operate with four of them discharging to the sanitary sewer system and the fifth discharging to Lake Wastler.

4.2.10 Lead-Based Paint

Installation buildings have been tested for the presence of LBP in three main testing efforts. Ongoing LBP activities will continue as needed until the closure of Fort Ritchie.

4.2.11 Unexploded Ordnance

All UXO impacted areas will continue to be restricted until such areas are cleared of UXO.

4.2.12 NRC Licensing

Fort Ritchie has four NRC licenses for various equipment and devices that contain radionuclides and are used by the 572nd Military Police Company. Fort Ritchie will continue to operate in compliance with NRC regulations and requirements.

4.2.13 Pollution Prevention

Fort Ritchie will continue to practice pollution prevention until closure. The possibility of recycling any materials during remedial activities will be considered during the design phase.

4.2.14 Mixed Waste

Mixed waste is not generated at Fort Ritchie; therefore, there are no compliance requirements or strategies under this program for Fort Ritchie.

4.2.15 Radiation

There are currently no radiation compliance issues at Fort Ritchie.

4.2.16 National Environmental Policy Act

An Environmental Impact Statement (EIS) for the transfer of Fort Ritchie was conducted by Lewis Berger and Associates, Inc. The Draft EIS Report was released to the public on 1 August 1997.

4.2.17 Medical Waste

Medical waste is generated by two Fort Ritchie tenants, the U.S. Army Health Clinic and the U.S. Army Dental Clinic. Medical waste will continue to be transported and disposed of off site until closure.

4.2.18 Air Permits

Fort Ritchie does not have an air permit because Fort Ritchie does not have any major air emission sources. Fort Ritchie will continue to comply with applicable air requirements and regulations.

4.3 NATURAL AND CULTURAL RESOURCES STRATEGIES

This section discusses the strategies that will be developed for natural and cultural resources programs at Fort Ritchie in an effort to manage these resources throughout the BRAC cleanup and installation closure process.

4.3.1 Vegetation

Fort Ritchie will continue to maintain the existing vegetation until closure.

4.3.2 Wildlife

Fort Ritchie will continue to maintain the existing wildlife habitats until closure.

4.3.3 Wetlands

Fort Ritchie will continue to comply with wetlands regulations for the installations' wetland area throughout the property disposal process.

4.3.4 Rare, Threatened, and Endangered Species

Fort Ritchie will continue its effort to protect the floral and faunal species of concern that have been identified at the installation.

4.3.5 Cultural Resources

Fort Ritchie will continue to comply with applicable regulations for the historic district.

4.3.6 Other Resources

No other natural or cultural resources have been identified at Fort Ritchie.

4.4 COMMUNITY INVOLVEMENT/STRATEGY

The Community Relations Plan (CRP) facilitates communication between the U.S. Army; other Federal, State, or local agencies; and interested groups and other community residents concerning restoration activities at Fort Ritchie. This communication ensures 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 provides a mechanism for all parties to provide input into the decision-making process of the environmental restoration program.

The strategy for a proactive community relations program at Fort Ritchie, in accordance with CERCLA Section 117, includes:

- Holding regular RAB meetings;
- Holding informal and formal public meetings as required during the response process;
- Providing an opportunity for public comment on removal actions;
- Maintaining an information repository at the installation; and
- Publishing facts sheets on the progress of environmental restoration and disposal programs.

5.0 ENVIRONMENTAL PROGRAM MASTER SCHEDULES

Master Schedules of anticipated activities in Fort Ritchie's environmental programs will include the following: environmental restoration activities, compliance activities, and natural and cultural resources activities. These schedules will be developed from detailed network and operational schedules that will be prepared to support site-specific work plans and compliance agreements. Each of these schedules will display the critical path analysis for the respective installation program.

5.1 ENVIRONMENTAL RESTORATION PROGRAM

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

5.1.1 Response Schedules

The schedule for environmental response actions for Fort Ritchie is shown in Figure 5-1. The installation's ability to meet the milestones of the schedule hinges on (1) the preparation of draft reports and baseline risk assessments (i.e., not impeded by discovery of additional sources in the OUs), and (2) expedited review of submitted documents. The schedule is detailed in Figure 5-1. The following actions will be taken by the BCT to expedite the schedule:

- Draft documents will be reviewed in a timely fashion;
- Documents will be revised for quick turnaround/resubmission as Final; and
- Public comment periods for all documents will be reduced to 30 days.

5.1.2 Funding Requirements by Fiscal Year

The detailed funding requirements information by FY is presented in Table A-1. The total funds allocated for installation-wide environmental restoration in FY 1998 are \$2,330,000. The total funds allocated for FY 1997 through FY 2001 are \$14,203,000.

5.2 COMPLIANCE PROGRAMS

This section presents master compliance schedules and outlines fiscal year requirements for Fort Ritchie's environmental compliance programs.

5.2.1 Master Compliance Schedules

There are no mission/operational-related compliance programs or closure-related compliance programs at Fort Ritchie at this time; therefore, there are no master compliance schedules. If necessary, they will be provided as Figure 5-2 and 5-3, respectively.

5.2.2 Funding Requirements by Fiscal Year

The detailed requirements information by fiscal year is not available at this time. When available, it will be incorporated into this document by reference, and summary information on funding requirements will be presented in Appendix A.

5.3 NATURAL AND CULTURAL RESOURCES PROGRAMS

This section presents master natural and cultural resources activity schedules and outlines fiscal year requirements for Fort Ritchie's natural and cultural resources programs.

Figure 5-1. Projected Master Restoration Schedule*

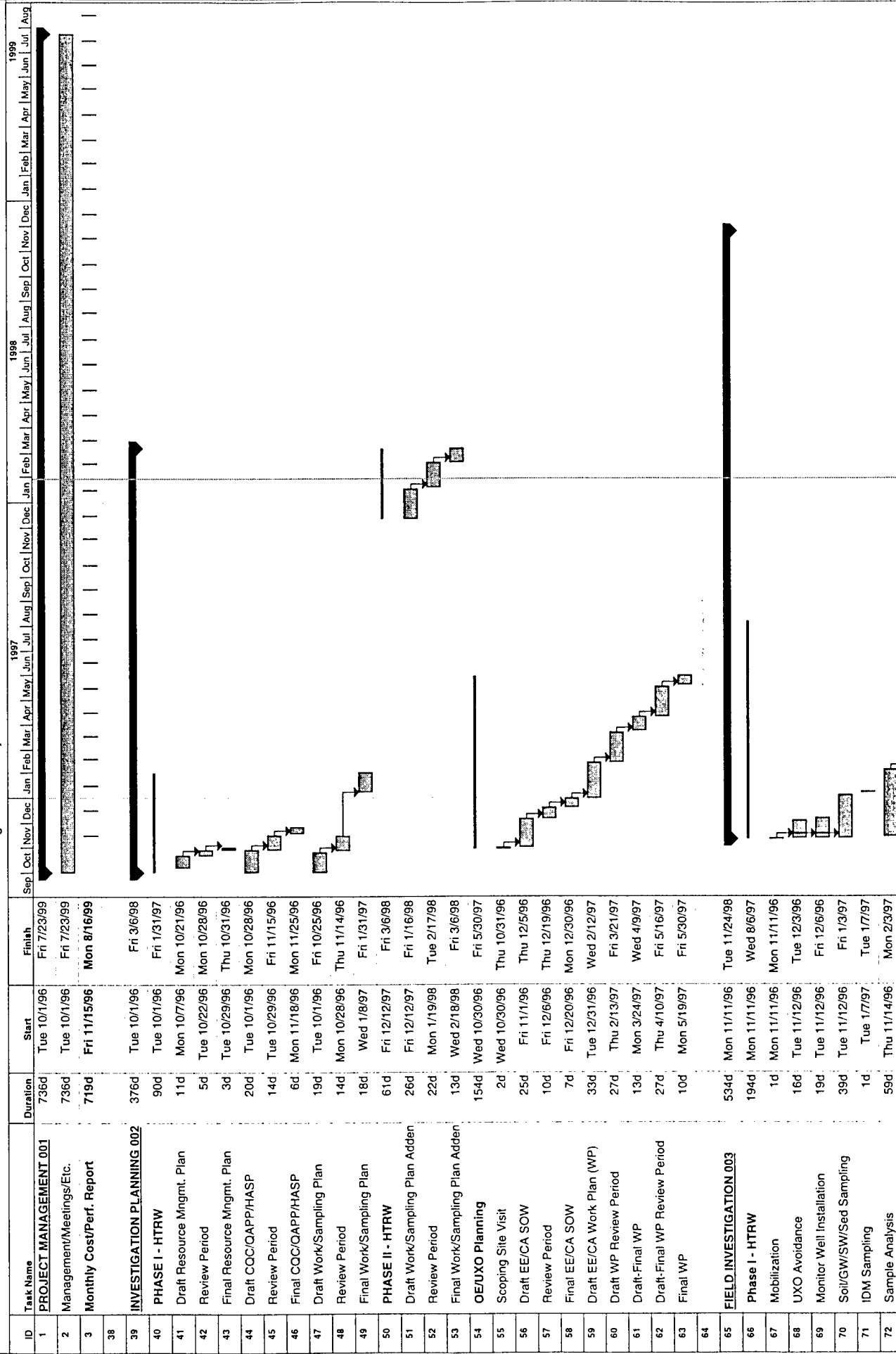


Figure 5-1. Projected Master Restoration Schedule*

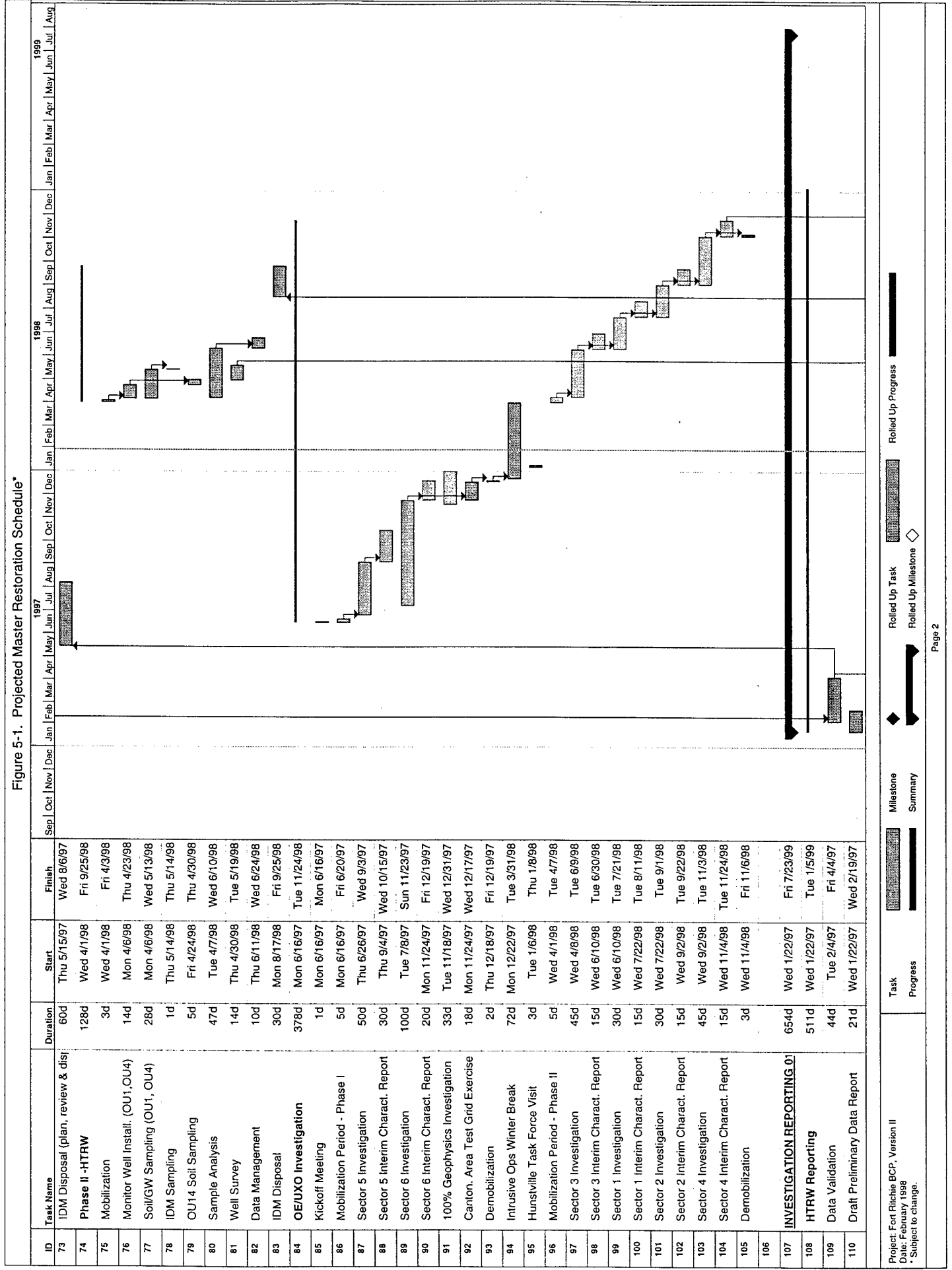
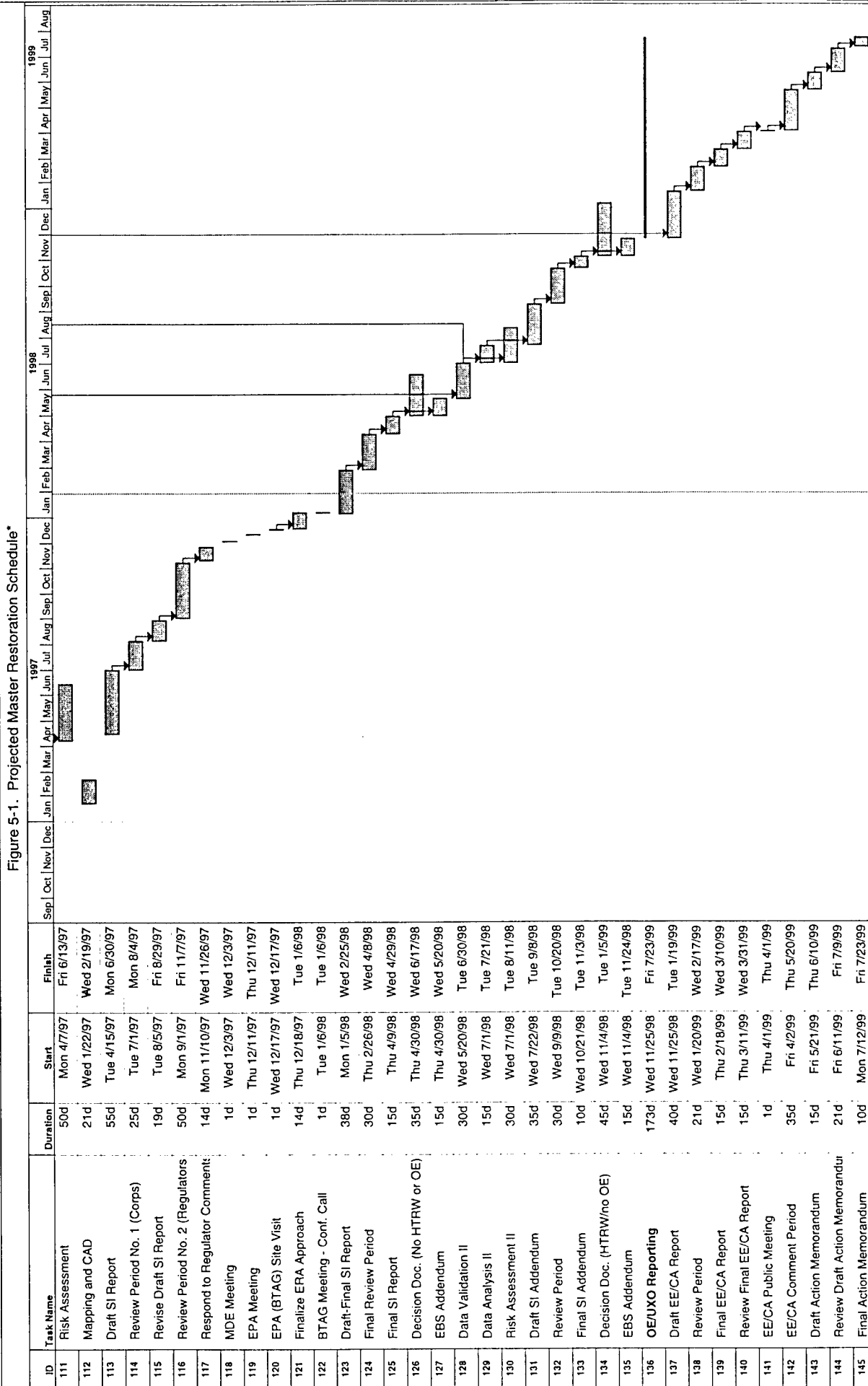


Figure 5-1. Projected Master Restoration Schedule*



There is no master schedule for mission/operational-related compliance programs at this time.

Figure 5-2. Projected Master Schedule for Mission/Operational-Related Compliance Programs

There is no master schedule for closure-related compliance programs at this time.

Figure 5-3. Projected Master Schedule for Closure-Related Compliance Programs

5.3.1 Natural and Cultural Resources Schedule

The natural and cultural resources schedule for Fort Ritchie is provided as Figure 5-4.

5.3.2 Funding Requirements by Fiscal Year

The detailed requirements information by fiscal year is not available at this time. When available, it will be incorporated into this document by reference, and summary information on funding requirements will be presented in Appendix A.

5.4 BCT/PROJECT MEETING SCHEDULE

Meetings are scheduled to promote an expedited restoration schedule for Fort Ritchie. Meetings are scheduled as required by the applicable process and are typically held as follows:

- BCT Meetings - monthly or as needed;
- Document Presentation Meetings - within 10 days of document submittal;
- Technical/Issue Resolution Meetings - as necessary to facilitate continued movement of the restoration program or compliance activities;
- Restoration Advisory Board - monthly or as needed; and
- BRAC In-Progress Review Meetings - weekly, monthly or as necessary.

A list of currently scheduled meetings is provided in Table 5-1.

Figure 5-4. Projected Schedule for Natural and Cultural Resources Activities

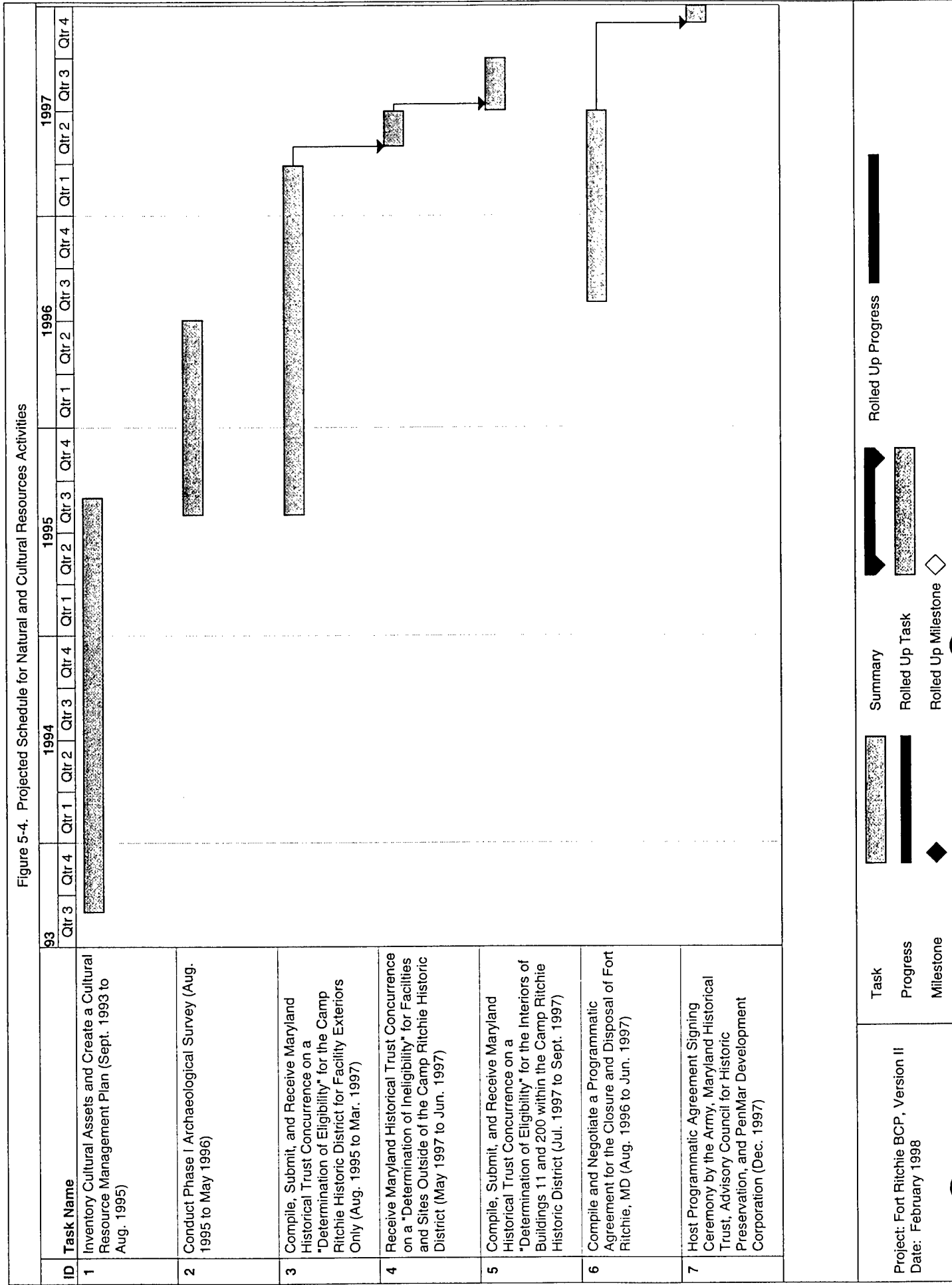


Table 5-1. BCT Meeting Schedule

Date/Frequency	Topic
January 2, 1996	BCP Kick-off meeting
May 22, 1996	BCP Version I Coordination Meeting
June 1996	Public Meeting
February 25, 1997	Public Meeting - Reuse Plan
April 24, 1997	Public Meeting - EIS
September 11, 1997	Public Meeting - EE/CA
TBD	Public Meeting - OE/UXO
4th Wednesday of Every Month	BCT Meeting
4th Wednesday of Every Month	RAB Meeting
Monthly	PMDC Executive Council Meeting

BCP	BRAC Cleanup Plan
BCT	BRAC Cleanup Team
EE/CA	Engineering Evaluation/Cost Analysis
EIS	Environmental Impact Statement
PMDC	Pen Mar Development Corporation
RAB	Restoration Advisory Board
TBD	To-Be-Determined

6.0 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; the usability of historical data; data gaps; natural (background) levels of elements and compounds in soil, groundwater, surface water, and sediment; 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 summarizes 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

Future action items may focus on improving coordination of, access to, and management of environmental restoration and real estate-type data generated at Fort Ritchie.

6.1.2 Rationale

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

6.1.3 Status/Strategy

Strategies have been developed to address data usability requirements as part of the Quality Assurance program for Fort Ritchie. Data Quality Objectives (DQOs) have been developed to ensure data collected during the field investigation/RA process will be of known defensible quality suitable for achieving project objectives.

6.2 DATA INTEGRATION AND MANAGEMENT

This section summarizes unresolved issues pertaining to the validity of using historical data sets in the installation environmental restoration program. Future action items may focus on continuing to ensure the acceptability of data generated through: 1) compliance with USEPA guidance on data validation; and 2) execution of field work in accordance with procedures established in approved Sampling and Analysis Plans.

6.2.1 BCT Action Items

The BCT will continue to ensure all parties involved in environmental restoration activities at Fort Ritchie are able to share data for decision making.

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 all site characterization efforts, comprehensive conceptual model development, risk assessments, and ultimately the selection of RAs to protect human health and the environment.

6.2.3 Status/Strategy

Data gathered for environmental restoration efforts at Fort Ritchie are stored in database format.

6.3 DATA GAPS

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

6.3.1 BCT Action Items

Future action items may include the assessment of data gaps for the ongoing development of an environmental restoration strategy.

6.3.2 Rationale

Effective identification and filling of data gaps will permit the development of comprehensive conceptual site models for site characterization and risk assessment. Effective analysis of data gaps will also facilitate the completion of investigation efforts so that appropriate RAs can be identified and evaluated. This information will also facilitate the identification of clean areas at Fort Ritchie.

6.3.3 Status/Strategy

Areas requiring additional characterization sampling have been proposed in the SI Report and Workplan Addendum (ICF KE, 1997b and ICF KE, 1998). However, the BCT has not made a final determination regarding additional field work at this time. The future strategy may incorporate the use of BCT meetings to resolve data gap issues prior to the execution of additional field work.

6.4 BACKGROUND LEVELS

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

6.4.1 BCT Action Items

Background levels will be reviewed and evaluated in conjunction with the SI Report.

6.4.2 Rationale

Background concentration values of analytes in the soil, groundwater, surface water, and sediment have been established. The values are representative of analyte concentrations which are naturally occurring and analyte concentrations which are due to anthropogenic sources. USEPA and MDE are expected to concur with these values.

6.4.3 Status/Strategy

Background concentrations for surface soil, subsurface soil, groundwater, surface water, and sediment were established during the SI. Background locations were selected to represent the most upgradient areas of Fort Ritchie which do not lie within an OU or otherwise potentially contaminated areas.

6.5 RISK ASSESSMENT

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

6.5.1 BCT Action Items

The Risk Assessment will be reviewed in conjunction with the SI Report. Future action items may include continuing evaluation of the role of anticipated land use as a criterion in selection assumptions in the exposure assessment.

6.5.2 Rationale

Based on the results of the Comprehensive Redevelopment Plan, future land use ranges from residential to industrial. This risk assessment must take all potential future uses into account during exposure analysis.

6.5.3 Status/Strategy

A draft baseline risk assessment has been conducted, as part of the SI based on the initial sampling data, to identify and characterize the toxicity and potential effects on human health and ecological receptors associated with any hazardous substances present at Fort Ritchie. The risk assessment forms the basis for determining whether or not further investigation/RA is necessary at Fort Ritchie and justification for performing any action that may be required. The risk assessment will be expanded/updated based on additional data collected.

The Human Health Risk Assessment (HHRA) examines plausible exposure scenarios under both current land use and future land use conditions. Under the current land use scenario, the HHRA looked at both a site worker/caretaker and a teenage trespasser/visitor as receptors. Under the future land use scenario, a child resident, adult resident, excavation worker, and/or dredge worker are examined as potential receptors. Ecological receptors identified in the Ecological Risk Assessment (ERA) include terrestrial plants, soil invertebrates, terrestrial wildlife, and aquatic life.

6.6 INSTALLATION-WIDE REMEDIAL ACTION STRATEGY

This section summarizes unresolved issues pertaining to an installation-wide RA strategy. An RA strategy has not been developed for Fort Ritchie to address the ongoing environmental restorations. The future land use risk assessment for remedy selections is presented in Table 6-1.

6.6.1 BCT Action Items

The RA strategy for cleanup at Fort Ritchie has not yet been established. The BCT will develop this strategy after reviewing the SI Report, and revise the remediation schedule accordingly.

6.6.2 Rationale

The installation-wide RA strategy would be structured to achieve expedited RAs while controlling costs.

6.6.3 Status/Strategy

The activities presented in the Work Plan (ICF KE, 1997a) are currently being implemented and additional investigations outlined in the Workplan Addendum (ICF KE, 1998) are planned for Spring 1998. The schedule for investigation and cleanup activities is presented on Figure 5-1.

6.7 INTERIM MONITORING OF GROUNDWATER AND SURFACE WATER

This section summarizes unresolved issues pertaining to monitoring groundwater and surface water.

6.7.1 BCT Action Items

No BCT action items have been identified at Fort Ritchie at this time regarding interim monitoring of groundwater and surface water.

6.7.2 Rationale

Long-term monitoring may be necessary as part of remedial efforts for selected sites at Fort Ritchie.

6.7.3 Status/Strategy

Because there are no BCT action items for interim monitoring, there is no strategy.

Table 6-1. Future Land Use Risk Assessment for Development of Remedy Selections

OU	Risks	Contaminants of Concern			Current Use	Adjacent Uses	Anticipated Uses
		Groundwater	Surface Soil/ Subsurface Soil	Surface Water/ Sediment			
1	Incidental ingestion and dermal absorption of surface soil	None ^b	SS - SVOCs and metals SB - metals	N/A	Golf Course Maintenance Shop	Recreational	Open space adjacent to a golf course
2	Incidental ingestion and dermal absorption of surface soil	None ^b	SS - SVOCs, PCB, dioxin, and metals SB - metals	N/A	Incinerator Area - no longer in use (surrounded by locked fence)	None	Storage area
3	Incidental ingestion and dermal absorption of sediment and surface water	N/A	SS - N/A ^c SB - N/A ^d	SW - VOC, SVOCs, and pesticides SD - SVOCs, metals, and pesticides	Recreational use of Lake Royer and Lake Wastler	Office and recreation	Recreational use of Lake Royer and Lake Wastler
4	Incidental ingestion and dermal absorption of subsurface soils	None ^b	SS - N/A ^c SB - metals	N/A	Motor Pool - maintenance and refueling station	Maintenance	Office or conference/ educational uses
5	Incidental ingestion and dermal absorption of surface soil	None ^b	SS - SVOCs, PCB, and metals SB - metals	N/A	DPW Maintenance Equipment Area	Maintenance and housing	Maintenance
6	Incidental ingestion and dermal absorption of surface soil	None ^b	SS - SVOCs, PCB, and metals SB - metals	N/A	Autocraft Shop	Administrative buildings	Office or conference/ educational uses

DPW Department of Public Works
N/A Not Applicable
SB Subsurface Soil

SVOC Semivolatile Organic Compound
PCB Polychlorinated Biphenyl
VOC Volatile Organic Compound

^a The contaminants of concern listed in this table do not necessarily correspond with the chemicals exceeding LOCs in Table 3-3, because background concentrations were not used as screening values for the risk assessment.

^b Shallow groundwater (not currently used as a potable water source) is not a viable future drinking water source based on a very low recharge rate; however, VOCs (such as TCE and PCE) and heptachlor were detected in two wells.

^c No surface soil samples were collected from OUs 3, 4, 10, or 11.

^d No subsurface soil samples were collected from OUs 3, 7, 8, 9, 11, or 12.

Table 6-1. Future Land Use Risk Assessment for Development of Remedy Selections (Continued)

OU	Risks	Contaminants of Concern			Current Use	Adjacent Uses	Anticipated Uses
		Groundwater	Surface Soil/ Subsurface Soil	Surface Water/ Sediment			
7	Incidental ingestion and dermal absorption of surface soil	N/A	SS - metals SB - N/A ^d	N/A	Abandoned Firing Ranges Areas - no longer in use	Housing areas	Office or conference/ educational uses; as well as golf course
8	Incomplete pathways	None ^b	SB - N/A ^d	N/A	PX Service Station	Administrative buildings	Office or conference/ educational uses
9	Incidental ingestion and dermal absorption of surface soil	None ^b	SS - SVOCs, PCB, and metals SB - N/A ^d	N/A	Administrative Buildings	Open space and other office buildings	Office or conference/ educational uses
10	Incidental ingestion and dermal absorption of subsurface soils	N/A	SS - N/A ^c SB - metals	N/A	Wise Road Disposal Area - no longer in use	Residential	Open Space
11	Incidental ingestion and dermal absorption of sediment and surface water	N/A	SS - N/A ^c SB - N/A ^d	SW - metals and pesticides SD - metals and pesticides	Wetlands Area	Disposal areas and former skeet range	Open space
12	None	None ^b	SB - N/A ^d	N/A	Former Hospital Area	Administrative buildings and Lakes	Office or conference/ educational uses

DDT Dichlorodiphenyltrichloroethane SD Sediment SVOC Semivolatile Organic Compound
N/A Not Applicable SS Surface Soil PCB Polychlorinated Biphenyl
SB Subsurface Soil SW Surface Water PX Post Exchange

- ^a The contaminants of concern listed in this table do not necessarily correspond with the chemicals exceeding LOCs in Table 3-3, because background concentrations were not used as screening values for the risk assessment.
- ^b Shallow groundwater (not currently used as a potable water source) is not a viable future drinking water source based on a very low recharge rate; however, VOCs (such as TCE and PCE) and heptachlor were detected in two wells.
- ^c No surface soil samples were collected from OUs 3, 4, 10, or 11.
- ^d No subsurface soil samples were collected from OUs 3, 7, 8, 9, 11, or 12.

Table 6-1. Future Land Use Risk Assessment for Development of Remedy Selections (Continued)

OU	Risks	Contaminants of Concern ^a			Current Use	Adjacent Uses	Anticipated Uses
		Groundwater	Surface Soil/ Subsurface Soil	Surface Water/ Sediment			
13		SUBJECT TO FUTURE RISK ASSESSMENT			OE/UOXO Impact Areas - no longer in use	Housing areas	Housing areas and golf course
14		SUBJECT TO FUTURE RISK ASSESSMENT			Former Burn Area - no longer in use	Open Space	Open Space
15		SUBJECT TO FUTURE RISK ASSESSMENT			Reservoir Road Disposal Area - no longer in use	Open Space	Open Space
16		SUBJECT TO FUTURE RISK ASSESSMENT			Electrical Substation	Administrative buildings	Office or conference/ educational uses

^a The contaminants of concern listed in this table do not necessarily correspond with the chemicals exceeding LOCs in Table 3-3, because background concentrations were not used as screening values for the risk assessment.

6.8 EXCAVATION OF CONTAMINATED MATERIALS

This section summarizes unresolved issues pertaining to the excavation of contaminated materials. At this time, excavation of contaminated material has not been planned at Fort Ritchie.

6.8.1 BCT Action Items

No BCT action items for the excavation of contaminated materials have been identified at Fort Ritchie at this time.

6.8.2 Rationale

Excavation of contaminated materials may be required as part of the environmental restoration efforts at Fort Ritchie.

6.8.3 Status/Strategy

A strategy for excavation of contaminated materials will be established subsequent to additional characterization at Fort Ritchie.

6.9 PROTOCOLS FOR REMEDIAL DESIGN REVIEWS

This section summarizes unresolved issues pertaining to the development of protocols for the review of remedial designs. At this time, protocols have not been developed.

6.9.1 BCT Action Items

No BCT action items have been identified at Fort Ritchie at this time. Future action items may include the development of protocols for the review of remedial designs.

6.9.2 Rationale

Review of remedial designs is critical to ensure that cleanup goals will be achieved and that they are technically and administratively feasible.

6.9.3 Status/Strategy

Because there are no BCT action items for developing protocols for remedial design reviews, there is no strategy.

6.10 CONCEPTUAL MODELS

This section summarizes unresolved issues pertaining to the development of conceptual models for environmental restoration efforts at Fort Ritchie. At this time, conceptual site models have not been prepared for Fort Ritchie.

6.10.1 BCT Action Item

No BCT action items have been identified at Fort Ritchie at this time. Future action items may include the development of conceptual models.

6.10.2 Rationale

The conceptual site models will be developed based on the results of past investigations and ongoing RAs.

6.10.3 Status/Strategy

Because there are no BCT action items for conceptual models, there is no strategy.

6.11 CLEANUP STANDARDS

This section summarizes unresolved issues pertaining to the development of cleanup standards. Cleanup standards will be used to identify remedial alternatives capable of achieving cleanup goals and determine the time when remediation will be complete.

6.11.1 BCT Action Items

The BCT will review the cleanup standards prior to the implementation of any RA at Fort Ritchie.

6.11.2 Rationale

Cleanup standards will be established after review and evaluation of the risk assessment and potential reuse and based on the level of concern (LOC) concentrations identified during the SI. LOC values are media-specific, chemical concentrations, which are derived from ARARs.

6.11.3 Status/Strategy

The LOCs established for soil, groundwater, and surface water were selected based upon the most stringent values available from either USEPA Region III or MDE. Since regulatory standards are not available for sediment, several reference sources were used to develop a list of sediment guidance values. LOCs for human health and the environment are presented in Tables 6-2 through 6-5.

6.12 INITIATIVES FOR ACCELERATING CLEANUP

This section summarizes unresolved issues pertaining to the development of initiatives for accelerating cleanup at Fort Ritchie. During 1992 and 1993, the U.S. Army developed a general Acceleration Plan for contaminated sites that was reviewed, and concurred with, by the regulatory agencies. The cleanup acceleration initiatives applicable to Fort Ritchie are:

- Overlap SI at identified OUs with any necessary Remedial Design (RD) and RA phases;
- Acceleration of procurement actions;
- Concurrent U.S. Army/regulatory review of all work plans, investigation reports, and secondary documents;
- Compression of time allocated to produce revised documents and comment response packages;
- Compression of field schedules;
- Supplementing existing work plans for future work instead of producing new work plans (includes Quality Assurance Project Plans and Health and Safety Plans);
- Initiating field work after review and resolution of comments on draft work plans;
- Using SI data packages as the decision point for NFRAP, RAs, or continued study; and
- The use of presumptive remedies.

6.12.1 BCT Action Items

The BCT will attempt to incorporate all applicable initiatives for accelerating cleanup into the restoration program at Fort Ritchie.

6.12.2 Rationale

It is desirable to initiate accelerated cleanups at Fort Ritchie to facilitate the property transfer process.

Table 6-2
Levels of Concern for Soil

USEPA Region III RBC Value*		
Analyte	Residential	Industrial
Inorganics (mg/kg)		
Aluminum	78000	1000000
Antimony	31	820
Arsenic	0.43	3.8
Barium	5500	140000
Beryllium	0.15	1.3
Cadmium	39	1000
Calcium (a)	4000000	4000000
Chromium	390	10000
Cobalt	4700	120000
Copper	3100	82000
Iron	23000	610000
Lead (b)	400	1000
Magnesium (a)	800000	800000
Manganese	1800	47000
Mercury	23	610
Nickel	1600	41000
Potassium (a)	1000000	1000000
Selenium	390	10000
Silver	390	10000
Sodium (a)	1000000	1000000
Thallium (c)	6.3	160
Vanadium	550	14000
Zinc	23000	610000
Total Cyanide	1600	41000
Volatiles (ug/kg)		
Acetone	7800000	200000000
Benzene	22000	200000
Bromodichloromethane	10000	92000
Bromoform	81000	720000
Bromomethane	110000	2900000
2-Butanone	47000000	1000000000
Carbon Disulfide	7800000	200000000
Carbon tetrachloride	4900	44000
Chlorobenzene	1600000	41000000
Chloroethane	31000000	820000000
2-Chloroethylvinyl ether (d)	2000000	51000000
Chloroform	100000	940000
Chloromethane	49000	440000
Dibromochloromethane	7600	68000
1,1-Dichloroethane	7800000	200000000
1,2-Dichloroethane	7000	63000
1,2-Dichloroethene(total)	700000	18000000
1,1-Dichloroethene	1100	9500
1,2-Dichloropropane	9400	84000
cis-1,3-Dichloropropene (e)	3700	33000
trans-1,3-Dichloropropene (e)	3700	33000
Ethylbenzene	7800000	200000000
2-Hexanone (f)	--	--
4-Methyl-2-pentanone	6300000	160000000
Methylene chloride	85000	760000
Styrene	16000000	410000000
1,1,2,2-Tetrachloroethane	3200	29000
Tetrachloroethene	12000	110000
Toluene	16000000	410000000
trans-1,2-Dichloroethene	1600000	41000000
1,1,1-Trichloroethane	2700000	72000000

Table 6-2 (continued)
Levels of Concern for Soil

USEPA Region III RBC Value*		
Analyte	Residential	Industrial
1,1,2-Trichloroethane	11000	100000
Trichloroethene	58000	520000
Vinyl Acetate	78000000	1000000000
Vinyl chloride	340	3000
Xylenes (total)	160000000	1000000000
Semivolatiles (ug/kg)		
Acenaphthene	4700000	120000000
Acenaphthylene (g)	2300000	61000000
Anthracene	23000000	610000000
Benzo[a]anthracene	880	7800
Benzo[a]pyrene	88	780
Benzo[b]fluoranthene	880	7800
Benzo[g,h,i]perylene (g)	2300000	61000000
Benzo[k]fluoranthene	8800	78000
Benzoic acid	310000000	1000000000
Benzyl alcohol	230000000	610000000
bis(2-Chloroethoxy) methane (h)	--	--
bis(2-Chloroethyl) ether	580	5200
bis(2-Chloroisopropyl) ether	9100	82000
4-Bromophenyl-phenylether	4500000	120000000
Butyl benzyl phthalate	16000000	410000000
di-n-Butylphthalate	7800000	200000000
Carbazole	32000	290000
4-Chloroaniline	310000	8200000
4-Chloro-3-methylphenol (h)	--	--
2-Chloronaphthalene	6300000	160000000
2-Chlorophenol	390000	10000000
4-Chlorophenyl phenyl ether (h)	--	--
Chrysene	88000	780000
Dibenz[a,h]anthracene	88	780
Dibenzofuran	310000	8200000
1,2-Dichlorobenzene	7000000	180000000
1,3-Dichlorobenzene	7000000	180000000
1,4-Dichlorobenzene	27000	240000
3,3'-Dichlorobenzidine	1400	13000
2,4-Dichlorophenol	230000	6100000
Diethylphthalate	63000000	1000000000
Dimethyl phthalate	780000000	1000000000
2,4-Dimethylphenol	1600000	41000000
2,4-Dinitrophenol	160000	4100000
2,4-Dinitrotoluene	160000	4100000
2,6-Dinitrotoluene	78000	2000000
bis(2-Ethylhexyl)phthalate	46000	410000
Fluoranthene	3100000	82000000
Fluorene	3100000	82000000
Hexachlorobenzene	400	3600
Hexachlorobutadiene	8200	73000
Hexachlorocyclopentadiene	550000	14000000
Hexachloroethane	46000	410000
Indeno[1,2,3-cd]pyrene	880	7800
Isophorone	670000	6000000
2-Methylnaphthalene (g)	2300000	61000000
2-Methylphenol	3900000	100000000
4-Methylphenol	390000	10000000
4,6-Dinitro-2-methylphenol (h)	--	--
Naphthalene	3100000	82000000
2-Nitroaniline	4700	120000

Table 6-2 (continued)
Levels of Concern for Soil

USEPA Region III RBC Value*		
Analyte	Residential	Industrial
3-Nitroaniline	230000	6100000
4-Nitroaniline	230000	6100000
Nitrobenzene	39000	1000000
2-Nitrophenol (f)	--	--
4-Nitrophenol	4800000	13000000
N-Nitroso-di-n-propylamine	91	820
N-nitrosodiphenylamine	130000	1200000
di-n-Octylphthalate	1600000	41000000
2,2'-oxybis-(1-chloropropane) (i)	9100	82000
Pentachlorophenol	5300	48000
Phenanthrene (g)	2300000	61000000
Phenol	47000000	100000000
Pyrene	2300000	61000000
1,2,4-Trichlorobenzene	780000	20000000
2,4,5-Trichlorophenol	7800000	200000000
2,4,6-Trichlorophenol	58000	520000
Pesticides/PCBs (ug/kg)		
Aldrin	38	340
Aroclor 1016	5500	140000
Aroclor 1221 (j)	320	2900
Aroclor 1232 (j)	320	2900
Aroclor 1242 (j)	320	2900
Aroclor 1248 (j)	320	2900
Aroclor 1254	1600	41000
Aroclor 1260	320	2900
alpha-BHC	100	910
beta-BHC	350	3200
delta-BHC (e)	--	--
gamma-BHC (Lindane)	490	4400
Chlordane	490	4400
alpha-Chlordane (k)	490	4400
gamma-Chlordane (k)	490	4400
4,4'-DDD	2700	24000
4,4'-DDE	1900	17000
4,4'-DDT	1900	17000
Dieldrin	40	360
Endosulfan I (l)	470000	12000000
Endosulfan II (l)	470000	12000000
Endosulfan sulfate (l)	470000	12000000
Endrin	23000	610000
Endrin aldehyde (m)	23000	610000
Endrin ketone (m)	23000	610000
Heptachlor	140	1300
Heptachlor epoxide	70	630
Methoxychlor	390000	10000000
Toxaphene	580	5200
Herbicides (ug/kg)		
2,4-D	780000	20000000
Dalapon	2300000	61000000
2,4-DB	630000	16000000
Dicamba	2300000	61000000
Dichloroprop (f)	--	--
Dinoseb	78000	2000000
MCPA	39000	1000000
MCPP (h)	--	--
Silvex	630000	16000000
2,4,5-T	780000	20000000

Table 6-2 (continued)
Levels of Concern for Soil

USEPA Region III RBC Value*		
Analyte	Residential	Industrial
Dioxins/Furans (ug/kg)		
1,2,3,4,6,7,8-HpCDD (n)	0.4	4
1,2,3,4,6,7,8-HpCDF (n)	0.4	4
1,2,3,4,7,8,9-HpCDF (n)	0.4	4
1,2,3,4,7,8-HxCDD (n)	0.04	0.4
1,2,3,6,7,8-HxCDD (n)	0.04	0.4
1,2,3,7,8,9-HxCDD (n)	0.04	0.4
1,2,3,4,7,8-HxCDF (n)	0.04	0.4
1,2,3,6,7,8-HxCDF (n)	0.04	0.4
1,2,3,7,8,9-HxCDF (n)	0.04	0.4
2,3,4,6,7,8-HxCDF (n)	0.04	0.4
Octachlorodibenzo-p-dioxin (n)	4	40
Octachlorodibenzo-p-furan (n)	4	40
1,2,3,7,8-PeCDD (n)	0.008	0.08
1,2,3,7,8-PeCDF (n)	0.08	0.8
2,3,4,7,8-PeCDF (n)	0.008	0.08
2378-TCDD (n)	0.004	0.04
2378-TCDF (n)	0.04	0.4
TPH (ug/kg)		
Diesel Fuel (h)	--	--
Gasoline (h)	--	--
Heavy Oil (h)	--	--
Jet Fuel (h)	--	--
Kerosene (h)	--	--
Mineral Oil (h)	--	--
Naphtha (h)	--	--
Paint Thinner (h)	--	--
Stoddard Solvent (h)	--	--
Total Unknown (h)	--	--

- * Soil screening values are USEPA Region III Residential or Industrial Soil RBCs (USEPA 1996).
- (a) = Average Daily Intake Value given
- (b) = Because lead does not have an RBC, the 1000 mg/kg industrial and 400 mg/kg residential soil screening level (USEPA 1994) was used for soil.
- (c) = The most conservative RBC for thallium salts was used.
- (d) = No Value Given; Tentatively Identified Compound
- (e) = Value given for 1,3-Dichloropropene
- (f) = No value given; chemical of potential concern
- (g) = Value given for Pyrene (lowest PAH RBC value)
- (h) = No value given
- (i) = Value given for Bis(2-chloroisopropyl)ether
- (j) = The value for carcinogenic PCBs was used.
- (k) = Value given for Chlordane
- (l) = Value given for Endosulfan
- (m) = Value given for Endrin
- (n) = The RBCs for dioxin congeners other than 2,3,7,8-TCDD were derived by multiplying the RBC for 2,3,7,8-TCDD by the respective toxic equivalency factor (TEF).

Table 6-3
Levels of Concern for Groundwater

Federal and State Groundwater Levels of Concern			
Analyte	Maryland MCL (ug/L)	Federal MCL (ug/L)	RBC* (ug/L)
Inorganics			
Aluminum	NA	NVG	37000
Antimony	6	6	15
Arsenic	50	50	0.045
Barium	2000	2000	2600
Beryllium	4	4	0.016
Cadmium	5	5	18
Calcium (l)	NA	NL	400000
Chromium	100	100	180
Cobalt	NA	NL	2200
Copper (c)	NA	1300	1500
Iron	NA	NL	11000
Lead (c)	50	15	15
Magnesium (i)	NA	NL	80500
Manganese	NA	NVG	840
Mercury (a)	2	2	11
Nickel (b)	100	100	730
Potassium (i)	NA	NL	100000
Selenium	50	50	180
Silver	50	NVG	180
Sodium (i)	NA	NVG	100000
Thallium	2	2	2.9
Vanadium	NA	NVG	260
Zinc	NA	NVG	11000
Total Cyanide	NA	200	730
Volatiles			
Acetone	NA	NL	3700
Benzene	5	5	0.36
Bromodichloromethane	NA	100	0.17
Bromoform	NA	100	2.4
Bromomethane	NA	NVG	8.7
2-Butanone	NA	NL	1900
Carbon Disulfide	NA	NL	1000
Carbon tetrachloride	5	5	0.16
Chlorobenzene	100	NL	39
Chloroethane	NA	NVG	8600
2-Chloroethylvinyl ether	NA	NL	150
Chloroform	NA	100	0.15
Chloromethane	NA	NVG	1.4
Dibromochloromethane	NA	NL	0.13
1,1-Dichloroethane	NA	NL	810
1,2-Dichloroethane	5	5	0.12
1,2-Dichloroethene (total) (g)	70	70	55
1,1-Dichloroethene	7	7	0.044
1,2-Dichloropropane	5	5	0.16
cis-1,3-Dichloropropene (f)	NA	0	0.077
trans-1,3-Dichloropropene (f)	NA	NVG	0.077
Ethylbenzene	700	700	1300
2-Hexanone (m)	NA	NL	NVG
4-Methyl-2-pentanone	NA	NL	2900
Methylene chloride	5	NL	4.1
Styrene	100	100	1600
1,1,2,2-Tetrachloroethane	NA	NVG	0.052
Tetrachloroethene	5	5	1.1
Toluene	1000	1000	750
trans-1,2-Dichloroethene	100	100	120
1,1,1-Trichloroethane	200	200	790

Table 6-3 (continued)
Levels of Concern for Groundwater

Federal and State Groundwater Levels of Concern			
Analyte	Maryland MCL (ug/L)	Federal MCL (ug/L)	RBC* (ug/L)
1,1,2-Trichloroethane	5	5	0.19
Trichloroethene	5	5	1.6
Vinyl Acetate	NA	NL	37000
Vinyl chloride	2	2	0.019
Xylenes (total)	10000	10000	12000
Semivolatiles			
Acenaphthene	NA	NVG	2200
Acenaphthylene	NA	NL	1100
Anthracene	NA	NVG	11000
Benzo[a]anthracene	NA	NVG	0.092
Benzo[a]pyrene	0.2	0.2	0.0092
Benzo[b]fluoranthene	NA	NVG	0.092
Benzo[g,h,i]perylene	NA	NVG	1100
Benzo[k]fluoranthene	NA	NVG	0.92
Benzoic acid	NA	NL	150000
Benzyl alcohol	NA	NL	11000
bis(2-Chloroethoxy) methane	NA	NL	NA
bis(2-Chloroethyl) ether	NA	NL	0.0092
bis(2-Chloroisopropyl) ether	NA	NVG	0.26
4-Bromophenyl-phenylether	NA	NL	2100
Butyl benzyl phthalate	NA	NVG	7300
di-n-Butylphthalate	NA	NL	3700
Carbazole	NA	NL	3.4
4-Chloroaniline	NA	NL	150
4-Chloro-3-methylphenol	NA	NL	NA
2-Chloronaphthalene	NA	NL	2900
2-Chlorophenol	NA	NVG	180
4-Chlorophenyl phenyl ether	NA	NL	NA
Chrysene	NA	NVG	9.2
Dibenz[a,h]anthracene	NA	NL	0.0092
Dibenzofuran	NA	NL	150
1,2-Dichlorobenzene	600	600	270
1,3-Dichlorobenzene	NA	NVG	540
1,4-Dichlorobenzene	75	75	0.44
3,3'-Dichlorobenzidine	NA	NL	0.15
2,4-Dichlorophenol	NA	NVG	110
Diethylphthalate	NA	NVG	29000
Dimethyl phthalate	NA	NVG	370000
2,4-Dimethylphenol	NA	NL	730
2,4-Dinitrophenol	NA	NL	73
2,4-Dinitrotoluene	NA	NVG	73
2,6-Dinitrotoluene	NA	NVG	37
bis(2-Ethylhexyl)phthalate	NA	NL	4.8
Fluoranthene	NA	NL	1500
Fluorene	NA	NVG	1500
Hexachlorobenzene	1	1	0.0066
Hexachlorobutadiene	NA	NVG	0.14
Hexachlorocyclopentadiene	50	50	0.15
Hexachloroethane	NA	NVG	0.75
Indeno[1,2,3-cd]pyrene	NA	NVG	0.092
Isophorone	NA	NVG	71
2-Methylnaphthalene	NA	NL	1100
2-Methylphenol	NA	NL	1800
4-Methylphenol	NA	NL	180
4,6-Dinitro-2-methylphenol	NA	NL	NA
Naphthalene	NA	NVG	1500
2-Nitroaniline	NA	NL	2.2

Table 6-3 (continued)
Levels of Concern for Groundwater

Federal and State Groundwater Levels of Concern			
Analyte	Maryland MCL (ug/L)	Federal MCL (ug/L)	RBC* (ug/L)
3-Nitroaniline	NA	NL	110
4-Nitroaniline	NA	NL	110
Nitrobenzene	NA	NL	3.4
2-Nitrophenol (m)	NA	NL	NVG
4-Nitrophenol	NA	NVG	2300
N-Nitroso-di-n-propylamine	NA	NL	0.0096
N-nitrosodiphenylamine	NA	NL	14
di-n-Octylphthalate	NA	NL	730
2,2'-oxybis-(1-chloropropane)	NA	NVG	0.26
Pentachlorophenol	1	1	0.56
Phenanthrene	NA	NVG	1100
Phenol	NA	NVG	22000
Pyrene	NA	NVG	1100
1,2,4-Trichlorobenzene	70	70	190
2,4,5-Trichlorophenol	NA	NL	3700
2,4,6-Trichlorophenol	NA	NVG	6.1
Pesticides/PCBs			
Aldrin	NA	NVG	0.004
Aroclor 1016 (e)	0.5	0.5	2.6
Aroclor 1221 (e)	0.5	0.5	0.034
Aroclor 1232 (e)	0.5	0.5	0.034
Aroclor 1242 (e)	0.5	0.5	0.034
Aroclor 1248 (e)	0.5	0.5	0.034
Aroclor 1254 (e)	0.5	0.5	0.73
Aroclor 1260 (e)	0.5	0.5	0.034
alpha-BHC	NA	NL	0.011
beta-BHC	NA	NL	0.037
delta-BHC (m)	NA	NL	NVG
gamma-BHC (Lindane)	0.2	0.2	0.052
Chlordane	2	2	0.052
alpha-Chlordane (d)	NA	2	0.052
gamma-Chlordane (d)	NA	2	0.052
4,4'-DDD	NA	NL	0.28
4,4'-DDE	NA	NL	0.2
4,4'-DDT	NA	NL	0.2
Dieldrin	NA	NVG	0.0042
Endosulfan I (k)	NA	NL	220
Endosulfan II (k)	NA	NL	220
Endosulfan sulfate (k)	NA	NL	220
Endrin	2	2	11
Endrin aldehyde (h)	NA	2	11
Endrin ketone (h)	NA	2	11
Heptachlor	0.4	0.4	0.0023
Heptachlor epoxide	0.2	2	0.0012
Methoxychlor	40	40	180
Toxaphene	3	3	0.061
Herbicides			
2,4-D	70	70	61
Dalapon	200	200	1100
2,4-DB	NA	NL	290
Dicamba	NA	NVG	1100
Dichloroprop (m)	NA	NL	NVG
Dinoseb	7	7	37
MCPA	NA	NVG	18
MCP	NA	NL	NA
Silvex	50	50	290
2,4,5-T	NA	NVG	370

Table 6-3 (continued)
Levels of Concern for Groundwater

Federal and State Groundwater Levels of Concern			
Analyte	Maryland MCL (ug/L)	Federal MCL (ug/L)	RBC* (ug/L)
Dioxins/Furans			
1,2,3,4,6,7,8-HpCDD	NA	NL	0.00004
1,2,3,4,6,7,8-HpCDF	NA	NL	0.00004
1,2,3,4,7,8,9-HpCDF	NA	NL	0.00004
1,2,3,4,7,8-HxCDD	NA	NL	0.000004
1,2,3,6,7,8-HxCDD	NA	NL	0.000004
1,2,3,7,8,9-HxCDD	NA	NL	0.000004
1,2,3,4,7,8-HxCDF	NA	NL	0.000004
1,2,3,6,7,8-HxCDF	NA	NL	0.000004
1,2,3,7,8,9-HxCDF	NA	NL	0.000004
2,3,4,6,7,8-HxCDF	NA	NL	0.000004
Octachlorodibenzo-p-dioxin	NA	NL	0.0004
Octachlorodibenzo-p-furan	NA	NL	0.0004
1,2,3,7,8-PeCDD	NA	NL	0.0000008
1,2,3,7,8-PeCDF	NA	NL	0.0000008
2,3,4,7,8-PeCDF	NA	NL	0.0000008
2378-TCDD	0.00003	0.00003	0.0000004
2378-TCDF	NA	NL	0.000004
TPH			
Diesel Fuel	NA	NL	NA
Gasoline	NA	NL	NA
Heavy Oil	NA	NL	NA
Jet Fuel	NA	NL	NA
Kerosene	NA	NL	NA
Mineral Oil	NA	NL	NA
Naphtha	NA	NL	NA
Paint Thinner	NA	NL	NA
Stoddard Solvent	NA	NL	NA
Total Unknown	NA	NL	NA

*Groundwater screening water levels are Region III Tap Water RBCs (USEPA 1996)

NA = Not available

NVG = No value given

NL = Not listed

(a) = Inorganic

(b) = MCLG & MCL is being remanded

(c) = *MCL=action level

(d) = Value used for Chlordane

(e) = Value used for PCBs

(f) = Value used for 1,3-dichloropropene

(g) = Value for cis-1,2-dichloroethene

(h) = Value for Endrin

(i) = Average Daily Intake value given

(j) = Because lead does not have an RBC, the 15 ug/L action level (USEPA 1990) was used.

(k) = RBC value used for Endosulfan

(l) = RBC value used for Pyrene

(m) = No value given; chemical of potential concern

(n) = No Value Given; Tentatively Identified Compound

(o) = The most conservative RBC for thallium salts was used.

Table 6-4
Levels of Concern for Surface Water

Selected Values from Federal and Maryland Quality Criteria for Water		
Analyte	Federal LOC ug/l	Maryland LOC ug/l
Inorganics		
Aluminum (b***)	87	NL
Antimony (c)	14	NL
Arsenic (c,r)	0.018	50
Barium (e,r)	4	2000
Beryllium (c*)	0.0037	NL
Cadmium (b**,q2)	1.1	1.1
Calcium	NVG	NL
Chromium (b,r,l)	11	11
Cobalt (b)	23	NL
Copper (b**,q2)	12	12
Iron (c*)	300	NL
Lead (b**,q2)	3.2	3.2
Magnesium	NVG	NL
Manganese (c*)	50	NL
Mercury (b,q2)	0.012	0.012
Nickel (b,r)	160	100
Potassium	NVG	NL
Selenium (b,q2)	5	5
Silver (b,q1')	0.12	4.1
Sodium	NVG	NL
Thallium (c)	1.7	NL
Vanadium (e)	20	NL
Zinc (b,q**)	110	110
Total Cyanide (b,q2)	5.2	5.2
Volatiles		
Acetone (e)	1500	NL
Benzene (c,r)	1.2	5
Bromodichloromethane (c)	0.27	NL
Bromoform (c)	4.3	NL
Bromomethane	NL	NL
2-Butanone (e)	14000	NL
Carbon Disulfide (e)	0.92	NL
Carbon tetrachloride (c)	0.25	NL
Chlorobenzene (e)	64	NL
Chloroethane	NL	NL
2-Chloroethylvinyl ether	NL	NL
Chloroform (c)	5.7	NL
Chloromethane	NL	NL
Dibromochloromethane (c)	0.41	NL
1,1-Dichloroethane (e)	47	NL
1,2-Dichloroethane (c)	0.38	NL
1,2-Dichloroethene(total) (e)	590	NL
1,1-Dichloroethene (c,r)	0.057	7
1,2-Dichloropropane (c)	0.52	NL
cis-1,3-Dichloropropene (e*,f)	0.055	NL
trans-1,3-Dichloropropene (e*,f)	0.055	NL
Ethylbenzene (e)	7.3	NL
2-Hexanone (e)	99	NL
4-Methyl-2-pentanone (e)	170	NL
Methylene chloride (c)	4.7	NL
Styrene	NL	NL
1,1,2,2-Tetrachloroethane (c)	0.17	NL
Tetrachloroethene (c*)	0.8	NL
Toluene (e)	9.8	NL
trans-1,2-Dichloroethene (e,g)	590	NL
1,1,1-Trichloroethane (e,r)	11	200
1,1,2-Trichloroethane (c)	0.6	NL
Trichloroethene (c,r)	2.7	5
Vinyl Acetate (e)	16	NL

Table 6-4 (continued)
Levels of Concern for Surface Water

Selected Values from Federal and Maryland Quality Criteria for Water		
Analyte	Federal LOC ug/l	Maryland LOC ug/l
Vinyl chloride (c*)	2	NL
Xylenes (total) (e)	13	NL
Semivolatiles		
Acenaphthene (b^)	520	NL
Acenaphthylene	NL	NL
Anthracene (e)	0.73	NL
Benzo[a]anthracene (e)	0.027	NL
Benzo[a]pyrene (e)	0.014	NL
Benzo[b]fluoranthene	NL	NL
Benzo[g,h,i]perylene	NL	NL
Benzo[k]fluoranthene	NL	NL
Benzoic acid (e)	42	NL
Benzyl alcohol (e)	8.6	NL
bis(2-Chloroethoxy) methane	NL	NL
bis(2-Chloroethyl) ether	NL	NL
bis(2-Chloroisopropyl) ether	NL	NL
4-Bromophenyl-phenylether (+)	1.5	NL
Butyl benzyl phthalate (+)	19	NL
di-n-Butylphthalate (e)	35	NL
Carbazole	NL	NL
4-Chloroaniline	NL	NL
4-Chloro-3-methylphenol (a^)	30	NL
2-Chloronaphthalene	NL	NL
2-Chlorophenol (c)	120	NL
4-Chlorophenyl phenyl ether	NL	NL
Chrysene (c)	0.0028	NL
Dibenz[a,h]anthracene	NL	NL
Dibenzofuran (e)	3.7	NL
1,2-Dichlorobenzene (o^)	763	NL
1,3-Dichlorobenzene (c)	400	NL
1,4-Dichlorobenzene (c)	400	NL
3,3'-Dichlorobenzidine (c)	0.04	NL
2,4-Dichlorophenol (c)	93	NL
Diethylphthalate (e)	210	NL
Dimethyl phthalate	NL	NL
2,4-Dimethylphenol (c)	540	NL
2,4-Dinitrophenol (c)	70	NL
2,4-Dinitrotoluene (c*)	0.11	NL
2,6-Dinitrotoluene (p^)	230	NL
bis(2-Ethylhexyl)phthalate (c)	1.8	NL
Fluoranthene (e)	6.16	NL
Fluorene (+)	3.9	NL
Hexachlorobenzene (c)	0.00075	NL
Hexachlorobutadiene (c)	0.44	NL
Hexachlorocyclopentadiene (b^)	5.2	NL
Hexachloroethane (c)	1.9	NL
Indeno[1,2,3-cd]pyrene	NL	NL
Isophorone (c)	8.4	NL
2-Methylnaphthalene (e,h)	2.1	NL
2-Methylphenol (e)	13	NL
4-Methylphenol (e,i)	13	NL
4,6-Dinitro-2-methylphenol (c*)	13.4	NL
Naphthalene (b^)	620	NL
2-Nitroaniline	NL	NL
3-Nitroaniline	NL	NL
4-Nitroaniline	NL	NL
Nitrobenzene (c)	17	NL
2-Nitrophenol (b,j^)	150	NL
4-Nitrophenol (b,j^)	150	NL
N-Nitroso-di-n-propylamine (c)	0.005	NL

Table 6-4 (continued)
Levels of Concern for Surface Water

Selected Values from Federal and Maryland Quality Criteria for Water		
Analyte	Federal LOC ug/l	Maryland LOC ug/l
N-nitrosodiphenylamine (c)	5	NL
di-n-Octylphthalate	NL	NL
2,2'-oxybis-(1-chloropropane)	NL	NL
Pentachlorophenol (c)	0.28	NL
Phenanthrene (b, ++)	6.3	NL
Phenol (b ⁺)	2560	NL
Pyrene (c)	960	NL
1,2,4-Trichlorobenzene (+)	110	NL
2,4,5-Trichlorophenol (b, ++)	63	NL
2,4,6-Trichlorophenol (c)	2.1	NL
Pesticides/PCBs		
Aldrin (c,s)	0.00013	0.00079
Aroclor 1016 (c,s)	0.000044	0.00079
Aroclor 1221 (c,s)	0.000044	0.00079
Aroclor 1232 (c,s)	0.000044	0.00079
Aroclor 1242 (c,s)	0.000044	0.00079
Aroclor 1248 (c,s)	0.000044	0.00079
Aroclor 1254 (c,s)	0.000044	0.00079
Aroclor 1260 (c,s)	0.000044	0.00079
alpha-BHC (c)	0.0039	NL
beta-BHC (c)	0.014	NL
delta-BHC (c)	0.019	NL
gamma-BHC (Lindane) (c,q2)	0.019	0.08
Chlordane (c)	0.00057	NL
alpha-Chlordane (c,k)	0.00057	NL
gamma-Chlordane (c,k)	0.00057	NL
4,4'-DDD (c)	0.00083	NL
4,4'-DDE (c)	0.00059	NL
4,4'-DDT (c,s)	0.00059	0.00024
Dieldrin (c,s)	0.00014	0.00076
Endosulfan I (b)	0.056	NL
Endosulfan II (b)	0.056	NL
Endosulfan sulfate (b,l)	0.056	NL
Endrin (b,q)	0.0023	0.0023
Endrin aldehyde (b,m)	0.0023	NL
Endrin ketone (b,m)	0.0023	NL
Heptachlor (c ⁺)	0.00021	NL
Heptachlor epoxide (c)	0.0001	NL
Methoxychlor (b)	0.03	NL
Toxaphene (b,r)	0.0002	0.0002
Herbicides		
2,4-D	NVG	NL
Dalapon	NL	NL
2,4-DB	NL	NL
Dicamba	NL	NL
Dichloroprop	NL	NL
Dinoseb	NL	NL
MCPA	NL	NL
MCPP	NL	NL
Silvex	NVG	NL
2,4,5-T	NL	NL
Dioxins/Furans		
1,2,3,4,6,7,8-HpCDD	NL	NL
1,2,3,4,6,7,8-HpCDF	NL	NL
1,2,3,4,7,8,9-HpCDF	NL	NL
1,2,3,4,7,8-HxCDD	NL	NL
1,2,3,6,7,8-HxCDD	NL	NL
1,2,3,7,8,9-HxCDD	NL	NL
1,2,3,4,7,8-HxCDF	NL	NL
1,2,3,6,7,8-HxCDF	NL	NL

Table 6-4 (continued)
Levels of Concern for Surface Water

Selected Values from Federal and Maryland Quality Criteria for Water		
Analyte	Federal LOC ug/l	Maryland LOC ug/l
1,2,3,7,8-HxCDF	NL	NL
2,3,4,6,7,8-HxCDF	NL	NL
Octachlorodibenzo-p-dioxin	NL	NL
Octachlorodibenzo-p-furan	NL	NL
1,2,3,7,8-PeCDD	NL	NL
1,2,3,7,8-PeCDF	NL	NL
2,3,4,7,8-PeCDF	NL	NL
2378-TCDD (b ¹ ,s)	0.00001	0.0000012
2378-TCDF	NL	NL
TPH		
Diesel Fuel	NL	NL
Gasoline	NL	NL
Heavy Oil	NL	NL
Jet Fuel	NL	NL
Kerosene	NL	NL
Mineral Oil	NL	NL
Naphtha	NL	NL
Paint Thinner	NL	NL
Stoddard Solvent	NL	NL
Total Unknown	NL	NL

NL = Not listed

NVG = no value given

(a) = Fresh Criterion Maximum Concentration (acute), Quality Criteria for Water (USEPA, 1995)

(b) = Fresh Criterion Continuous Concentration (chronic), Quality Criteria for Water (USEPA, 1995)

(c) = Water & Organisms, Quality Criteria for Water (USEPA, 1995)

(d) = Organisms Only, Quality Criteria for Water (USEPA, 1995)

(e) = Tier II Suter and Tsao (1996) chronic value

(f) = Value for 1,3-Dichloropropene

(g) = Value for 1,2-Dichloroethene

(h) = Value for 1-Methylnaphthalene

(i) = Value for 2-Methylphenol

(j) = Value used for Nitrophenols

(k) = Value used for Chlordane

(l) = Value used for Endosulfan

(m) = Value used for Endrin

(n) = Value used for Heptachlor

(o) = Value used for Dichlorobenzenes

(p) = Value used for 2,4-Dinitrotoluene

(q1) = md freshwater acute

(q2) = md freshwater chronic

(r) = md HH drinking water

(s) = md HH fish consumption

(t) = Value used for Chromium VI

(*) = Published value used

(**) = Hardness dependent (100mg/CaCO₃ used)

(***) = pH dependent criteria (aluminum value appropriate for
pH ranges from 6.5 to 9.0; 7.8 pH used for pentachlorophenol)

(+) = Tier II chronic value from USEPA (1996)

(++) = Proposed criterion

(^*) = Value presented is the L.O.E.L. (Lowest Observed Effect Level)

(*) = The chronic NAWQC for heptachlor (0.0038 ug/l) is based on final residue values;
for benchmarks to protect aquatic life, a secondary chronic value was calculated.

Table 6-5
Levels of Concern for Sediment

Selected Levels of Concern for Sediment Media	
Analyte	LOC*
Inorganics (mg/kg)	
Aluminum	NA
Antimony (d)	2
Arsenic (a)	5.9
Barium	NA
Beryllium	NA
Cadmium (a)	0.596
Calcium	NA
Chromium (a)	37.3
Cobalt	NA
Copper (a)	35.7
Iron (b)	20000
Lead (a)	35
Magnesium	NA
Manganese (b)	460
Mercury (a)	0.174
Nickel (a)	18
Potassium	NA
Selenium	NA
Silver (d)	1
Sodium	NA
Thallium	NA
Vanadium	NA
Zinc (a)	123
Total Cyanide	NA
Volatiles (ug/kg)	
Acetone (e)	8.77
Benzene (f)	57
Bromodichloromethane	NA
Bromoform	NA
Bromomethane	NA
2-Butanone (e)	271
Carbon Disulfide (e)	0.856
Carbon tetrachloride (e)	47.6
Chlorobenzene (e)	417
Chloroethane	NA
2-Chloroethylvinyl ether	NA
Chloroform (e)	99.4
Chloromethane	NA
Dibromochloromethane	NA
1,1-Dichloroethane (e)	27.2
1,2-Dichloroethane(e)	255
1,2-Dichloroethene(total) (e)	400
1,1-Dichloroethene (e)	31.2
1,2-Dichloropropane	NA
cis-1,3-Dichloropropene (e,g)	0.0512
trans-1,3-Dichloropropene (e,g)	0.0512
Ethylbenzene (e)	89.7
2-Hexanone (e)	22.6
4-Methyl-2-pentanone (e)	33.2
Methylene chloride (e)	375
Styrene	NA
1,1,2,2-Tetrachloroethane (f)	940
Tetrachloroethene (e)	416
Toluene (e)	49.8
trans-1,2-Dichloroethene (e,s)	400
1,1,1-Trichloroethane (e)	30.3

Selected Levels of Concern for Sediment Media	
Analyte	LOC*
1,1,2-Trichloroethane (e)	1251
Trichloroethene (e)	218
Vinyl Acetate (e)	0.84
Vinyl chloride	NA
Xylenes (total) (e)	156
Semivolatiles (ug/kg)	
Acenaphthene (c)	1300
Acenaphthylene	NA
Anthracene (b)	220
Benzo[a]anthracene (a)	31.7
Benzo[a]pyrene (a)	31.9
Benzo[b]fluoranthene (b,k)	240
Benzo[g,h,i]perylene (b)	170
Benzo[k]fluoranthene (b)	240
Benzoic acid	NA
Benzyl alcohol (e)	1.07
bis(2-Chloroethoxy) methane	NA
bis(2-Chloroethyl) ether	NA
bis(2-Chloroisopropyl) ether	NA
4-Bromophenyl-phenylether (e)	1241
Butyl benzyl phthalate (e)	10900
di-n-Butylphthalate (f)	11000
Carbazole	NA
4-Chloroaniline	NA
4-Chloro-3-methylphenol	NA
2-Chloronaphthalene	NA
2-Chlorophenol	NA
4-Chlorophenyl phenyl ether	NA
Chrysene (a)	57.1
Dibenz[a,h]anthracene (b)	60
Dibenzofuran (e)	418
1,2-Dichlorobenzene (e)	332
1,3-Dichlorobenzene (e)	1682
1,4-Dichlorobenzene (e)	347
3,3'-Dichlorobenzidine	NA
2,4-Dichlorophenol	NA
Diethylphthalate (e)	606
Dimethyl phthalate	NA
2,4-Dimethylphenol	NA
2,4-Dinitrophenol	NA
2,4-Dinitrotoluene	NA
2,6-Dinitrotoluene	NA
bis(2-Ethylhexyl)phthalate (e)	893000
Fluoranthene (a)	111
Fluorene (b)	190
Hexachlorobenzene (b)	20
Hexachlorobutadiene	NA
Hexachlorocyclopentadiene	NA
Hexachloroethane (f)	1000
Indeno[1,2,3-cd]pyrene (b)	200
Isophorone	NA
2-Methylnaphthalene (d)	65
2-Methylphenol (e)	11.8
4-Methylphenol (e,y)	11.8
4,6-Dinitro-2-methylphenol	NA
Naphthalene (d)	340
2-Nitroaniline	NA

Table 6-5 (Continued)
Levels of Concern for Sediment

Selected Levels of Concern for Sediment Media	
Analyte	LOC*
3-Nitroaniline	NA
4-Nitroaniline	NA
Nitrobenzene	NA
2-Nitrophenol	NA
4-Nitrophenol	NA
N-Nitroso-di-n-propylamine	418
N-nitrosodiphenylamine	NA
di-n-Octylphthalate	NA
2,2'-oxybis-(1-chloropropane)	NA
Pentachlorophenol	NA
Phenanthrene (a)	41.9
Phenol (e)	32
Pyrene (a)	53
1,2,4-Trichlorobenzene (f)	9200
2,4,5-Trichlorophenol	NA
2,4,6-Trichlorophenol	NA
Pesticides/PCBs (ug/kg)	
Aldrin (b)	2
Aroclor 1016 (b)	7
Aroclor 1221 (e)	118
Aroclor 1232 (e)	602
Aroclor 1242 (e)	170
Aroclor 1248 (b)	30
Aroclor 1254 (b)	60
Aroclor 1260 (b)	5
alpha-BHC (b)	6
beta-BHC (b)	5
delta-BHC (b,m)	3
gamma-BHC (Lindane) (a)	0.94
Chlordane (a)	4.5
alpha-Chlordane (a,l)	4.5
gamma-Chlordane (a,l)	4.5
4,4'-DDD (a)	3.54
4,4'-DDE (a)	1.42
4,4'-DDT (b)	8
Dieldrin (a)	2.85
Endosulfan I (f)	2.9
Endosulfan II (e)	5.5
Endosulfan sulfate (f,u)	5.4
Endrin (a)	2.67
Endrin aldehyde (a,v)	2.67
Endrin ketone (a,v)	2.67
Heptachlor (h)	0.3
Heptachlor epoxide (a)	0.6
Methoxychlor (e)	18.8
Toxaphene (f)	28
Herbicides (ug/kg)	
2,4-D	NA
Dalapon	NA
2,4-DB	NA
Dicamba	NA
Dichloroprop	NA
Dinoseb	NA

Selected Levels of Concern for Sediment Media	
Analyte	LOC*
MCPA	NA
MCPP	NA
Silvex	NA
2,4,5-T	NA
Dioxins/Furans (ug/kg)	
1,2,3,4,6,7,8-HpCDD	NA
1,2,3,4,6,7,8-HpCDF	NA
1,2,3,4,7,8,9-HpCDF	NA
1,2,3,4,7,8-HxCDD	NA
1,2,3,6,7,8-HxCDD	NA
1,2,3,7,8,9-HxCDD	NA
1,2,3,4,7,8-HxCDF	NA
1,2,3,6,7,8-HxCDF	NA
1,2,3,7,8,9-HxCDF	NA
2,3,4,6,7,8-HxCDF	NA
Octachlorodibenzo-p-dioxin	NA
Octachlorodibenzo-p-furan	NA
1,2,3,7,8-PeCDD	NA
1,2,3,7,8-PeCDF	NA
2,3,4,7,8-PeCDF	NA
2378-TCDD	NA
2378-TCDF	NA
TPH (ug/kg)	
Diesel Fuel	NA
Gasoline	NA
Heavy Oil	NA
Jet Fuel	NA
Kerosene	NA
Mineral Oil	NA
Naphtha	NA
Paint Thinner	NA
Stoddard Solvent	NA
Total Unknown	NA

NA = Not available

(a) = Threshold effect level (TEL) from Smith et al. (1996).

(b) = Lowest effect level (LEL) from OMEE (1993).

(c) = Draft Sediment Quality Criterion (SQC) from USEPA (1993)

(d) = Effects Range-Low (ER-L) from Long and Morgan (1990).

(e) = Sediment Quality Benchmark (SQB) by equilibrium partitioning from Jones et al. (1996), based on 1% organic carbon content.

(f) = Sediment Quality Benchmark (SQB) by equilibrium partitioning from USEPA (1996), based on 1% organic carbon content.

(g) = 1,3-Dichloropropene value

(h) = No Effect Level (NOEL) from OMEE (1993).

(k) = Benzo(k)fluoranthene value

(l) = Chlordane value

(m) = BHC value

(s) = 1,2-Dichloroethene value

(u) = Endosulfan value

(v) = Endrin value

(y) = 2-Methylphenol value

6.12.3 Status/Strategy

Initiatives for accelerating cleanup that can be implemented by the BCT include the following:

- Evaluate the use of OUs that reflect current environmental restoration investigations to expedite the investigation and review process;
- Target Source Areas - Target source areas for early RAs;
- Identify ARARs - Early in the project, develop a list of ARARs by obtaining lists of ARARs from the State and other agencies and examine the remedies for similar sites in the same State to identify which ARARs are likely to apply;
- Risk-based Cleanup - Pursue negotiations with the regulators to agree on risk-based cleanup standards based on future land usage;
- Agreements - The use of an Interagency Agreement, such as a DoD/Maryland Memorandum of Agreement to expedite cleanup, needs to be explored;
- Defined Document Review Process - Negotiate terms with the regulatory reviewers to streamline the review process by agreeing to a definitive time cycle;
- Concurrent Reviews - Develop a complete list of reviewers early and pursue parallel review tracks to eliminate delays;
- Team Approach - Build a strong team -- consisting of the BEC, U.S. Army Environmental Center (USAEC), USACE representatives, contractors, and Federal and Maryland regulatory personnel -- that has the authority, responsibility, and accountability for implementing innovative solutions to remediate and close sites in a timely, cost-effective manner;
- Joint Preparation - Expedite document preparation and review/approval by forming a working team with USEPA and MDE when preparing required documents such as action memoranda;
- Community Involvement - Involve the community during the remedial process to encourage support at the time of site closure. By informing the community during the process, the likelihood of opposing comments during the public comment period will be lessened;
- Innovative Technologies - Pursue collaborative projects using innovative technologies being researched at the USAEC or USACE or those suggested by the contractor;
- Generic Procedures - Develop generic procedures and Scopes of Work for common problems or common types of contaminated sites (such as fuel contamination in soil). These procedures should be flexible enough for site-specific modifications to be made;
- Innovative Contracting - Maximize flexibility of contracting procedures, investigate the use of level-of-effort, direct/cost reimbursement, award incentives, and other flexible contracting methods; and
- Personnel and Resource - Determine personnel expertise and funding required to handle existing and proposed environmental restoration/compliance programs, including support to the BCT.

6.13 REMEDIAL ACTIONS

This section summarizes unresolved issues pertaining to the execution and completion of RAs.

6.13.1 BCT Action Items

No BCT action items have been identified at this time regarding remedial actions.

6.13.2 Rationale

Technical issues must be addressed in a timely manner to ensure that the RA schedules are not adversely affected. It is desirable that RAs required at Fort Ritchie be completed prior to closure.

6.13.3 Status/Strategy

Because there are no BCT action items for RAs there is no strategy.

6.14 REVIEW OF AND APPLICATION OF SELECTED TECHNOLOGIES FOR EXPEDITED SOLUTIONS

This section summarizes unresolved issues pertaining to the review and application of selected technologies to expedite remedial solutions.

6.14.1 BCT Action Items

No BCT action items have been identified at Fort Ritchie at this time. Future action items may include the review of selected technologies for expedited RAs on an as-needed basis.

6.14.2 Rationale

It is desirable to expedite evaluation of remedial technologies at Fort Ritchie in order to facilitate the property transfer process.

6.14.3 Status/Strategy

Because there are no BCT action items for review of technologies, there is no strategy.

6.15 HOT SPOT REMOVALS

This section summarizes unresolved issues pertaining to the removal of hot spots. As defined in the DoD guidance, this review item involves implementation of rapid removal of "hot spots" while investigations continue.

6.15.1 BCT Action Items

No BCT action items have been identified at Fort Ritchie at this time. Future action items may include the review of identified hot spots 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 RA strategy for the installation.

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

The BCT may elect to implement removal actions in hot spot areas identified during the SI after confirmation sampling is conducted.

6.16 IDENTIFICATION OF CLEAN PROPERTIES

This section summarizes unresolved issues pertaining to identification of clean properties at Fort Ritchie. The primary method for identification of clean parcels will be dependent upon MDE concurrence with the revised CERFA parcels identified in this report and the findings of the SI.

6.16.1 BCT Action Items

No BCT action items have been identified at Fort Ritchie at this time regarding identification of clean properties.

6.16.2 Rationale

Initial identification of clean properties may expedite property transfer efforts.

6.16.3 Status/Strategy

Because there are no BCT action items for the identification of clean properties, there is no strategy. The BCT may use the updated CERFA Parcel Map as the initial identifier of clean parcels.

6.17 OVERLAPPING PHASES OF THE CLEANUP PROCESS

This section summarizes unresolved issues pertaining to potential overlap of cleanup process phases.

6.17.1 BCT Action Items

No BCT action items have been identified at Fort Ritchie at this time. Future action items may include BCT review of the remedial design to evaluate where opportunities exist for combining RAs in order to eliminate duplication of effort.

6.17.2 Rationale

Overlapping RAs can eliminate redundant efforts and facilitate property transfer.

6.17.3 Status/Strategy

Because there are no BCT action items for overlapping phases of cleanup effort, there is no strategy.

6.18 IMPROVED CONTRACTING PROCEDURES

This section summarizes unresolved issues pertaining to improving contracting procedures. Efficient and cost-effective contracting procedures are necessary to expedite the restoration process.

6.18.1 BCT Action Items

There are no BCT action items for improved contracting procedures.

6.18.2 Rationale

Timelines in the contracting process are important for expeditiously completing restoration activities.

6.18.3 Status/Strategy

Because there are no BCT action items for improving contracting procedures, there is not strategy.

6.19 INTERFACING WITH THE COMMUNITY REUSE PLAN

This section summarizes unresolved issues pertaining to the community reuse plan. Interfacing with the community reuse plan is desirable to expedite the implementation of RAs.

6.19.1 BCT Action Items

The LRA has developed a draft Comprehensive Redevelopment Plan for Fort Ritchie (as mentioned in Section 2.2). The BCT provides support in the development and implementation of the plan.

6.19.2 Rationale

Coordination with the community reuse plan contributes to the selection of appropriate cleanup standards and facilitates implementation of remedial alternatives, ultimately resulting in the successful transfer of property.

6.19.3 Status/Strategy

The BCT works with the LRA and other local agencies to ensure that reuse activities are compatible with restoration activities.

6.20 BIAS FOR CLEANUP INSTEAD OF STUDIES

This section summarizes unresolved issues pertaining to emphasizing cleanup instead of studies. Whenever possible, the BCT may 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

No BCT action items have been identified at Fort Ritchie at this time. Future action items may include the BCT making every effort to implement any necessary remedial action as soon as possible to facilitate the transfer of Fort Ritchie.

6.20.2 Rationale

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

6.20.3 Status/Strategy

Where applicable, the BCT will promote cleanup rather than studies.

6.21 EXPERT INPUT ON CONTAMINATION AND POTENTIAL REMEDIAL ACTIONS

This section summarizes unresolved issues pertaining to expert input on contamination and potential RAs. It is necessary that proper resources are used to evaluate contamination and associated RAs.

6.21.1 BCT Action Items

No BCT action items have been identified at Fort Ritchie at this time. Future action items may include the BCT utilizing MDE, USEPA, USAEC, and contractors to ensure that the proper resources are used to evaluate contamination and potential RAs.

6.21.2 Rationale

The use of several entities involved in the restoration at Fort Ritchie promotes an expedited property transfer process.

6.21.3 Status/Strategy

The USEPA, MDE, USAEC, USACE, and contractors will continue to ensure that the property resources are used to evaluate contamination and potential RAs.

6.22 PRESUMPTIVE REMEDIES

This section summarizes unresolved issues pertaining to presumptive remedies. USEPA has issued guidance on presumptive remedies for a few specific contamination scenarios. For example, one of the presumptive remedies for vadose zone volatile organic compound (VOC) contamination is soil vapor

extraction. Presumptive remedies may be applicable to Fort Ritchie if contamination scenarios are similar to those in the presumptive remedy guidance.

6.22.1 BCT Action Items

No BCT action items have been identified at Fort Ritchie at this time. Future action items may include the BCT considering presumptive remedies to expedite implementation of the installation's RA strategy.

6.22.2 Rationale

The use of presumptive remedies may potentially accelerate the cleanup process by allowing for expedited implementation of cleanup technologies.

6.22.3 Status/Strategy

Because there are no BCT action items for presumptive remedies, there is no strategy.

6.23 PARTNERING (USING INNOVATIVE MANAGEMENT, COORDINATION, AND COMMUNICATION TECHNIQUES)

This section summarizes unresolved issues pertaining to partnering. Partnering is the process of fostering cooperation and communication between key players in the BRAC process.

6.23.1 BCT Action Items

The BCT will continue fostering partnerships currently active at Fort Ritchie, including the RAB, LRA, and BCT itself. Partnering actions at Fort Ritchie include scheduled meetings and document reviews.

6.23.2 Rationale

Close cooperation and coordination between Fort Ritchie, USAEC, the community, and regulators helps foster good working relationships. It can also accelerate implementation of the installation's RA strategy by keeping key players informed of the status of environmental efforts, soliciting their input, and addressing potential concerns in the remediation process.

6.23.3 Status/Strategy

The BCT plans to continue its activities and encourage information exchange between the LRA, USAEC, USACE, and the community.

6.24 UPDATING THE EBS AND NATURAL/CULTURAL RESOURCES DOCUMENTATION

This section summarizes unresolved issues pertaining to updating the Fort Ritchie EBS and natural and cultural resources documentation. The CERFA Letter Report, including parcel classifications has been updated for use in this document based on the results of ongoing activities at Fort Ritchie.

6.24.1 BCT Action Items

The CERFA parcel map must be updated based on the results of the SI.

6.24.2 Rationale

Updates of the CERFA Letter Report are necessary to reflect changes in parcel classification based on completion of RAs. It is anticipated that parcel reclassification will ultimately result in most, if not all, of Fort Ritchie becoming eligible for property transfer.

6.24.3 Status/Strategy

The CERFA parcel map has been updated and presented in this document as Figure 3-4, for use by the BCT.

6.25 IMPLEMENTING THE POLICY FOR ON-SITE DECISION MAKING

This section summarizes unresolved issues pertaining to implementing policy for on-site decision making. If decisions leading to investigation, remediation, and transfer of Fort Ritchie can be made on site, implementation of the installation-wide RA strategy can be expedited.

6.25.1 BCT Action Items

No BCT action items have been identified at Fort Ritchie at this time regarding the implementation of policies for on-site decision making.

6.25.2 Rationale

Decisions which can be made by on-site personnel may significantly expedite the Fort Ritchie property transfer process.

6.25.3 Status/Strategy

Because there are no BCT action items for on-site decision making, there is no strategy.

6.26 STRUCTURAL AND INFRASTRUCTURE CONSTRAINTS TO REUSE

This section summarizes unresolved issues pertaining to structural and infrastructure constraints to reuse.

6.26.1 BCT Action Items

The BCT supports the LRA in the evaluation of the existing structures and infrastructure at Fort Ritchie. Constraints to reuse will be identified prior to transfer.

6.26.2 Rationale

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

6.26.3 Status/Strategy

As a component of the Comprehensive Redevelopment Plan, the LRA evaluated the existing building character/quality and the condition of the infrastructure at Fort Ritchie. Conclusions and recommendations based on this detailed evaluation are available in the LRA Report (LRA, 1997).

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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APPENDIX A
FISCAL YEAR FUNDING REQUIREMENTS/COSTS

Table A-1. Projected Restoration Program Cost Requirements

Program	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	Total
Installation-Wide Environmental Restoration	\$2,278,000	\$2,330,000	\$5,460,000	\$2,565,000	\$1,570,000	\$14,203,000

FY - Fiscal Year

Table A-2. Projected Compliance Program Cost Requirements

Program	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	Total
There are no anticipated Compliance Program costs for Fort Ritchie.						

FY - Fiscal Year

Table A-3. Projected Natural and Cultural Resources Program Cost Requirements

Program	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	Total
There are no anticipated Natural and Cultural Resources Program costs for Fort Ritchie.						

FY - Fiscal Year

Table A-4. Projected Total Environmental Programs Cost Requirements

Program	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	Total
Installation-Wide Environmental Restoration	\$2,278,000	\$2,330,000	\$5,460,000	\$2,565,000	\$1,570,000	\$14,203,000

FY - Fiscal Year

Table A-5. Historical Expenditure by Site

Program	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	Total
	A summary of historical expenditures by site has not been prepared for Fort Ritchie at this time.					

FY - Fiscal Year

The past restoration schedule is unavailable at this time.

Figure A-1. Past Restoration Schedule

APPENDIX B
INSTALLATION ENVIRONMENTAL RESTORATION DOCUMENTS SUMMARY TABLES

Table B-1. Project Deliverables

Year	Project Title	Report No.	Sites Examined	Deliverable Date/By Whom
1990	Real Property Master Plan	1	Installation-wide	1990/ US Army Garrison Fort Ritchie
1990	Installation Spill Contingency Plan	2	Installation-wide	May 1990/ US Army Garrison Fort Ritchie
1991	Industrial Radiation Survey	3	Installation-wide	Apr. 1991/ USAEHA
1991	Geohydrologic Study No. 38-26-K974-91	4	PX Auto Service Station	July-Aug. 1991/ USAEHA
1991	Lead Based Paint Survey for Housing Units	5	Housing units	Nov. 1991/ Dewberry & Davis
1991-92	An Asbestos Users Guide and Management Plan	6	Installation-wide	Sept. 1993/ Dewberry & Davis
1991-96	Fort Ritchie UST Final Action Plan Summaries	7	Installation-wide	US Army Garrison Fort Ritchie
1992	UST Removal – Additive I: Fort Ritchie Housing Units	8	Housing units	May 1992/Goode Environmental Services
1992	Fort Ritchie Jurisdictional Wetlands Investigation	9	Installation-wide	July 1992/ Dewberry & Davis
1992	Follow-up Sampling Report (Letter Report)	10	Former Skeet Shooting Range	Sept. 1992/ Spotts, Stevens and McCoy
1993	Environmental Sampling Report (Letter Report)	11	Former Skeet Shooting Range	Jan. 1993/ Spotts, Stevens and McCoy
1993	Fort Ritchie Installation Environmental Assessment Based on the Real Property Master Plan	12	Installation-wide	Feb. 1993/ USACE, Baltimore District
1993	Spill Prevention Control and Countermeasure Plan	13	Installation-wide	Oct. 1993/ US Army Garrison Fort Ritchie
1993	Environmental Assessment, Maryland National Guard Construction Site	14	Former Skeet Shooting Range	Nov. 1993/ Hillmann Environmental Company of VA

Table B-1. Project Deliverables (Continued)

Year	Project Title	Report No.	Sites Examined	Deliverable Date/By Whom
1994	Tank Closure Reports	15	Installation-wide	Jan. 1994/ ENSAT
1994	Final Report – Air Pollution Emission Statement for Fort Ritchie	16	Installation-wide	Sept. 1994/ Geomet Technologies, Inc.
1994	Lead Based Paint Survey for Administrative Buildings	17	Administrative Buildings	Nov. 1994/Powell Construction
1994	Environmental Compliance Assessment	18	Installation-wide	Dec. 1994/ US Army Garrison Fort Ritchie
1995	Hazardous and Medical Waste Study No. 37-2517-95; Former Skeet Shooting Range Investigation	19	Former Skeet Shooting Range	Mar. 1995/ USACHPPM
1995	Final Report – Inventory of Terrestrial Vertebrates at Fort Ritchie and Site R Military Reservation, MD and PA	20	Installation-wide	June 1995/ Shippensburg Univ. Vertebrate Museum
1995	Annex to Real Property Master Plan - Cultural Resources Management Plan and Historic Property Rehabilitation Guidelines for Fort Ritchie	21	Installation-wide	Aug. 1995/ Dames & Moore
1995	Integrated Natural Resources Management Plan	22	Installation-wide	Aug. 1995/ USACE, Baltimore District
1995	Hazardous and Medical Waste Study No. 37-26-4436-95; Former Skeet Shooting Range Investigation, Phase II	23	Former Skeet Shooting Range	Nov. 1995/ USACHPPM
1996	Environmental Baseline Survey, Final Document	24	Installation-wide	June 1996/ ICF KE
1996	Fort Ritchie Sampling and Analysis Recommendation	25	Installation-wide	June 1996/ ICF KE
1996	BRAC Cleanup Plan, Version I, Final Document	26	Installation-wide	Sept. 1996/ ICF KE
1997	Ordnance, Ammunition and Explosives - Archive Search Report	27	Installation-wide	Jan. 1997/ USACE
1997	Site Investigation Report, Draft	28	Installation-wide	Sept. 1997/ ICF KE

Table B-1. Project Deliverables (Continued)

Year	Project Title	Report No.	Sites Examined	Deliverable Date/By Whom
1997	Environmental Impact Statement, Draft Document	29	Installation-wide	August 1997/ Lewis Berger & Associates, Inc.
1997	Programmatic Agreement for the Closure and Disposal of Fort Ritchie, MD	30	Installation-wide	Dec. 1997/ US Army Garrison Fort Ritchie

Table B-2. Site Deliverables by Phase*

Site	EA	SI	FS	DD	EE/CA	LTM	NFRAP	Close -Out
Abandoned Firing Ranges	12	28						
Administrative Building Area (100-, 200-, and 300-series buildings)	12	28						
Autocraft Shop (Building 401)	12	28						
DPW Maintenance Equipment Area (Buildings 731 to 736)	12	28						
Electrical Substation								
Former Burn Area	12							
Former Hospital Area	12	28						
Former Incinerator Area (Buildings 907, 908, 909)	12	28						
Former Skeet Range	12, 14	28, 19, 23						
Golf Course Maintenance Shop (Building 5)	12	28						
Lake Royer and Lake Wastler	12	28						
Motor Pool (Building 700) Maintenance Shop and Refueling Station	12	28						
OE/UXO Impact Areas	12	28						
PX Service Station (Building 515)	12	28, 4						
Reservoir Road Disposal Area	12							
Wetland Area	12	28						
Wise Road Disposal Area	12	28						

EA - Environmental Assessment
EE/CA - Engineering Evaluation/Cost Analysis
DD - Decision Document
FS - Feasibility Study

LTM - Long-Term Monitoring
NFRAP - No Further Response Action Planned
SI - Site Investigation

* The numbers in the body of this table correspond to the deliverables listed in Table B-1.

Table B-3. Technical Documents/Data Loading Status Summary

Date	IRP Title	Site/OU	Contractor	Service Center	IRDMIS Status/Other
	There are no plans to load the Fort Ritchie data into IRDMIS at this time.				

IRDMIS - Installation Restoration Data Management Information System

IRP - Installation Restoration Program

OU - Operable Unit

APPENDIX C

DECISION DOCUMENT/ROD SUMMARIES

Decision Documents/ROD summaries have not yet been prepared for Fort Ritchie.

APPENDIX D
NFRAP SUMMARIES

Appendix D is not applicable to Fort Ritchie at this time.

APPENDIX E
CONCEPTUAL MODEL DATA SUMMARIES

There are no conceptual model data summaries at this time.

APPENDIX F
ANCILLARY BCP MATERIALS

There are no ancillary BCP materials at this time.