

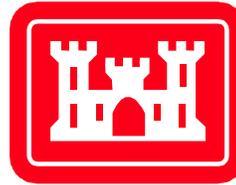
FINAL DRAFT REPORT

ENVIRONMENTAL BASELINE
SURVEY
SITES Y AND Z
FORT GEORGE G. MEADE
ANNE ARUNDEL COUNTY,
MARYLAND

CONTRACT NO. W912DR-04-D-0003, DELIVERY ORDER 0005

Prepared on behalf of

U.S. Army Corps of Engineers
Baltimore District



Prepared for

Fort George G. Meade
Environmental Division



October 6, 2006

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Executive Summary

URS Group, Inc. (URS), under contract number W912DR-04-D-0003 with the U.S. Army Corps of Engineers (USACE), conducted an Environmental Baseline Survey (EBS) of two areas (designated Sites Y and Z) at the U.S. Army Garrison Fort George G. Meade (FGGM), located in Anne Arundel County, MD (Figure 1-1). Teams of qualified URS environmental professionals conducted the EBS in accordance with applicable U.S. Army regulations and American Society for Testing and Materials (ASTM) Standard Practice D 6008-96. The URS teams reviewed existing documents pertaining to the sites, conducted a reconnaissance of the subject properties, interviewed FGGM personnel, reviewed historical topographic maps and historical aerial photographs of FGGM, and reviewed environmental database summaries. Based on the information gathered from these activities, URS assigned an Environmental Conditions of Property (ECOP) classification for each site.

Sites Y and Z are adjacent sites located in the far eastern portion of FGGM, to the north and south of Reece Road and east of Maryland Route 175 (Figure 1-2). In general, the topography of FGGM is relatively flat. The elevation of Site Y varies from about 150 feet to about 250 feet above mean sea level (amsl), and the elevation of Site Z varies from 150 to 190 feet amsl. Both sites are forested except for some small cleared areas in Site Y.

FGGM is located on the unconsolidated sands, clays, and silts of the Atlantic Coastal Plain physiographic province. Shallow groundwater flow generally follows surface drainage; deep groundwater flows to the southeast. There are upper and lower groundwater aquifers beneath FGGM that are generally separated by a low permeability clay unit that keeps these aquifers mostly distinct. FGGM is located in the Little Patuxent and Severn River Watersheds. Sites Y and Z are located within the Severn River watershed and contain perennial and intermittent stream channels that drain to Severn River tributaries.

FGGM has been an active military facility since 1917, and has undergone many physical changes over the past 90 years. The two sites investigated as part of this EBS were purchased by the U.S. Government in 1919 for FGGM. Both sites have remained essentially undeveloped since that time.

Site Y includes about 125 acres in an irregularly shaped parcel located north of Reece Road. There are no paved roads within the site boundaries, but several trails meander through the site. The site is almost completely forested, and it contains several streams, drainage channels, and some wetland areas. During the site reconnaissance, typical household dumping items (e.g., bottles, cans, and paper) were observed in portions of the site, as well as an abandoned car. Several monitoring wells were also observed on the site.

A circular clearing near the northeastern boundary of the site, at the easternmost extension of 22nd Street, corresponds to the site of a former incinerator. The incinerator reportedly operated from 1947 until 1975. No information was available regarding the specifics of the incinerator (e.g., types of materials incinerated, types of waste generated, closure of the facility, etc.). A comprehensive site assessment of the former incinerator area conducted by Versar, Inc. in 1998 did not find any building material or waste believed to be associated with the old incinerator. Versar concluded that the shallow subsurface was not significantly affected by the former incinerator facility, and no further assessment or remediation was deemed necessary (Versar, 1999a). However, groundwater was not encountered or sampled during this investigation, and the condition of groundwater is therefore unknown; downwind dioxin samples were not collected, and lead in soil from possible lead-based paint used on the structure(s) onsite was not assessed.

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An adjacent area to the west of Site Y, near the easternmost extension of 20th Street and an existing pond (see Figure 1-3), was reportedly used as a trap and skeet range from the mid-1970s until 1994. A comprehensive site assessment of the former range found deposits of lead shot, skeet fragments, plastic shell casings, and plastic wads in several areas around the pond. Elevated levels of polynuclear aromatic hydrocarbons (PAHs) were detected in soil and sediment in these areas. Elevated concentrations of total lead were detected in some soil and dry stream channel sediment samples. Future assessment and/or remediation were recommended for the area, including further contamination delineation and an expanded sampling program (Versar, 1999b). The west-central portion of Site Y is downgradient of this site. Lead shot and clay pigeon may be present on Site Y due to over shooting. Lead and arsenic (added to lead shot to assist in rounding) may occur in the soils downrange of the trap and skeet range, on Site Y.

Buildings 1976, 1977, 1978, and 2128 located west of Site Y have documented releases to groundwater. Groundwater flow direction is toward site Y. These buildings were used for storage of paints, petroleum products, adhesives, and hazardous materials, they were used for vehicle maintenance, and they contained an underground storage tank in the past. In addition, waste may have been discarded onsite at Building 2128. Due to the groundwater flow direction, contaminated groundwater may be present under the western portion of Site Y.

Natural resources constraints at Site Y include wetlands, streams, and Forest Conservation Act (FCA) areas along the eastern portion of the site. Development of this site would require a complete wetlands and streams delineation and coordination with the USACE for any proposed impacts to Waters of the United States. Coordination may be required with the U.S. Fish and Wildlife Service (USFWS) regarding the potential for quality habitat of the federally-listed swamp pink, which is known to occur in forested wetlands in Anne Arundel County. Furthermore, as FGGM voluntarily complies with the Maryland FCA's requirements for land development activities, the most valuable portions of the forest would require a preservation plan.

The majority of Site Y is suitable for transfer with an ECOP classification of 1, which is defined as "areas where no release or disposal of hazardous substances or petroleum products has occurred (including migration of these substances from adjacent areas)." Three areas of site Y, the former incinerator site, the area adjacent to the former trap and skeet range, and the area east of buildings 1976, 1977, 1978, and 2128 have been assigned an ECOP classification of 7, which is defined as "areas that have not been evaluated or require additional evaluation." The northeastern portion of Site Y around the former incinerator was classified 7 due to lack of groundwater quality and downwind dioxin information, and the lead contamination potential in soil at this location. The west-central portion of Site Y was classified 7 due to lack of information on lead and arsenic in soil and groundwater. Groundwater in the western portion of Site Y would score a 7 due to lack of information on a potential groundwater plume of contamination.

Site Z includes about 48 acres in a roughly rectangular parcel south of Reece Road. The site is completely forested and contains three unimproved roads or trails and several drainage features. Typical household dumping items (e.g., tires, hot water heaters, a lawnmower, trash, papers, bottles, and cans) were observed throughout the site, as well as a concrete debris pile and a rusted, empty 275-gallon capacity above-ground storage tank (AST). According to a historical

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records review, a former training area and Grenade and Bayonet Range B once extended onto the southwest corner of Site Z (Malcolm Pirnie, 2006a).

Development of Site Z would involve several natural resources constraints. A complete wetlands and streams delineation and coordination with the USACE for any proposed impacts to Waters of the United States would be required. Coordination may be required with the USFWS regarding the potential for quality habitat of the federally-listed swamp pink, and the requirements of Maryland FCA would have to be integrated into the development plan. Site Z is suitable for transfer; the ECOP category for the site is 1.

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ACRONYMS

ACM	Asbestos-Containing Material
amsl	Above Mean Sea Level
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
bgs	Below Ground Surface
BRAC	Base Realignment and Closure
CAA	Clean Air Act
CAP	Corrective Action Plan
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
cm/s	Centimeters Per Second
CO	Carbon Monoxide
COMAR	Code of Maryland Regulations
CORRACTS	Resource Conservation and Recovery Act Corrective Action Sites
CSA	Comprehensive Site Assessment
dB	Decibel
DMM	Discarded Military Munitions
DNL	Day-Night Level
DoD	Department of Defense
DRO	Diesel-Range Organics
EBS	Environmental Baseline Survey
ECOP	Environmental Conditions of Property Classification
ED	Environmental Division
EDR	Environmental Data Resources
EPA	U.S. Environmental Protection Agency
ERNS	Emergency Response Notification System
FCA	Forest Conservation Act
FGGM	U.S. Army Garrison Fort George G. Meade
FSD	Forest Stand Delineation
HRR	Historical Records Review
IDW	Investigation Derived Waste
INRMP	Integrated Natural Resources Management Plan
LBP	Lead-Based Paint
LUST	Leaking Underground Storage Tank
MC	Munitions Constituents
MDE	Maryland Department of the Environment
MDNR	Maryland Department of Natural Resources
mgd	Millions of Gallons Per Day

ACRONYMS

MMRP	Military Munitions Response Program
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NPL	National Priorities List
NO ₂	Nitrogen Dioxide
NRHP	National Register of Historic Places
NSA	National Security Agency
NWI	National Wetland Inventory
O ₃	Ozone
OCF	Oil Control Program
OCPCASES	Oil Control Program Cases
PAH	Polynuclear Aromatic Hydrocarbons
Pb	Lead
pCi/L	picoCuries per Liter
PCB	Polychlorinated Biphenyls
PETN	Pentaerythritoltetranitrate
PID	Photo-Ionization Detector
PM	Particulate Matter
ppb	Parts Per Billion
RBC	Risk-Based Concentration
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
REC	Recognized Environmental Condition
RI	Remedial Investigation
RK&K	Rummel, Klepper, & Kahl Consulting Engineers
SHWS	State Hazardous Waste/Superfund
SI	Site Investigation
SO ₂	Sulfur Dioxide
SQG	Small Quantity Generator
STP	Sewage Treatment Plant
SVOC	Semi-Volatile Organic Compound
SWF/LF	Solid Waste Facilities/Landfill
SWMU	Solid Waste Management Unit
SX	Endangered Extirpated
TCLP	Toxicity Characteristic Leaching Procedure
TNT	Trinitrotoluene
TPH	Total Petroleum Hydrocarbon

ACRONYMS

TSD	Treatment, Storage, or Disposal
URS	URS Group, Inc.
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
UST	Underground Storage Tank
UXO	Unexploded Ordnance
VCP	Voluntary Cleanup Program
VOC	Volatile Organic Compound

URS Group, Inc. (URS), under contract number W912DR-04-D-0003 with the U.S. Army Corps of Engineers (USACE), conducted an Environmental Baseline Survey (EBS) of two site areas at the U.S. Army Garrison Fort George G. Meade (FGGM), located in Anne Arundel County, Fort Meade, MD, approximately equidistant from Baltimore, MD, and Washington, DC (Figure 1-1). The two areas, designated as Sites Y and Z, contain a total of approximately 173 acres. The adjacent sites are located to the north and south of Reece Road, east of Maryland Route 175, in the far northeastern portion of FGGM (Figure 1-2).

1.1 PURPOSE AND SCOPE

The purpose of this EBS is to determine the presence, or potential presence, of releases of hazardous substances or petroleum products, and to document existing natural and cultural resources at the two sites in support of future tenant activity. The EBS assesses the likelihood of a future release into structures or the ground, groundwater, or surface water on the subject property, based on current conditions on the subject sites and on neighboring properties. This EBS is intended to provide sufficient information to adequately identify the potential environmental contamination liabilities and potential natural and cultural resource constraints associated with real property acquisition, lease, transfer, or disposal.

This EBS was performed in accordance with Army Regulation 200-1 *Environmental Protection and Enhancement* (2000), Army Regulation 200-2 *Environmental Effects of Army Actions* (2000), and Department of the Army Pamphlet 200-1 *Environmental Protection and Enhancement* (2000). This EBS reflects the general scope and methodology as defined by the American Society for Testing and Materials (ASTM, currently known as ASTM International) Standard Practice D 6008-96 *Standard Practice for Conducting Environmental Baseline Surveys* (1996).

This EBS evaluates the environmental conditions at two sites on FGGM, including the existence of hazardous waste or toxic substance contamination and the potential threat to human health and the environment. The sites have been categorized in this EBS according to seven Environmental Conditions of Property classifications (ECOP) as described in the Department of Defense (DoD) Fall 1995 Base Realignment and Closure (BRAC) Cleanup Plan Guidebook (DoD, 1995). The seven categories are presented in Table 1-1.

Table 1-1: Environmental Condition of Property Area Types

Category	Description
1	Areas where no release or disposal of hazardous substances or petroleum products has occurred (including migration of these substances from adjacent areas).
2	Areas where only release or disposal of petroleum products has occurred.
3	Areas where release, disposal, and/or migration of hazardous substances have occurred, but at concentrations that do not require a removal or remedial response.
4	Areas where release, disposal, and/or migration of hazardous substances have occurred, and all removal or remedial actions to protect human health and the environment have been taken.

Category	Description
5	Areas where release, disposal, and/or migration of hazardous substances have occurred, and removal or remedial actions are underway, but all required remedial actions have not yet been taken.
6	Areas where release, disposal, and/or migration of hazardous substances have occurred, but required actions have not yet been implemented.
7	Areas that have not been evaluated or require additional evaluation.

Source: DoD, 1995

The scope of this EBS includes a review of:

- Existing installation environmental documents.
- Reasonably obtainable Federal, State, and local government records.
- Aerial photographs.
- Historic maps and documents.
- Site conditions via conducting visual inspections and personal interviews.
- Natural and cultural resource information to support National Environmental Policy Act (NEPA) compliance for Sites Y and Z.

1.2 LIMITATIONS OF THE STUDY

This EBS formulates an opinion on the environmental suitability of the sites for future actions relative to the environmental conditions of, and concerns relative to, the land, facilities, and real property at the sites. Opinions in this report, relative to the potential recognized environmental conditions and physical and historical setting sources at the sites, are based on information derived from site reconnaissance conducted during August 2006, and obtained from reasonably available information sources and personal interviews, all of which were assumed to be accurate and complete. Although this EBS was performed professionally and used the most current and reliable data, site conditions cannot be fully characterized or guaranteed based solely on the information presented herein. Furthermore, due to the size of both sites and to areas of densely wooded land, it cannot be reasonably expected that URS personnel were able to cover every square foot of each site. However, it is believed that the appropriate level of care and due diligence have been applied to justify the findings and recommendations of this report as it relates to the properties.

1.3 LOCATION AND SITE DESCRIPTIONS

FGGM is located in Anne Arundel County, MD (Figure 1-1), and consists of 5,415 acres with 65.5 miles of paved roads, 3.3 miles of secondary roads, and about 1,300 buildings (U.S Army, 2005). Sites Y and Z are in the northeastern portion of the Garrison (Figure 1-2).

Site Y occupies an irregularly shaped parcel of about 125 acres of land located east of Maryland Route 175 (MD 175) and north of Reece Road (Figure 1-3). The site is bisected by a tributary of Severn Run.

Site Z occupies about 48 acres of land east of MD 175 and south of Reece Road (Figure 1-3).

This section describes the variety of methods used to document and survey the environmental conditions at the two sites reviewed for this EBS.

2.1 DOCUMENTS REVIEWED

A review of relevant files and documents for FGGM was conducted to obtain information about past and current uses of the sites, evaluate environmental conditions, and identify natural and cultural resources. Table 2-1 is a list of the primary documents reviewed.

Table 2-1: Documents Reviewed

Document Name	Author	Publication Date	Applicable Sites
Comprehensive Site Assessment, Former Incinerator Building, 21 ½ Street, Ft. George G. Meade, Fort Meade, Maryland	Versar, Inc.	June 8, 1999	Y
Comprehensive Site Assessment, Former Trap and Skeet Range, 20 th Street, Fort George G. Meade, Fort Meade, Maryland	Versar, Inc.	June 10, 1999	Y
Final Corrective Action Plan, Former Trap and Skeet Range, 20 th Street, Fort George G. Meade, Fort Meade, Maryland	Versar, Inc.	December 17, 2002	Y
Volume II, Sampling Visits, Solid Waste Management Unit (SWMU) 22, Building 1976; SWMU 23, Building 1977; SWMU 24, Building 1978; SWMU 25, Building 2120C; SWMU 26, Building 2120C; Fort George G. Meade, Fort Meade, Maryland	Versar, Inc.	September 16, 1999	Adjacent to Y
Volume III, Sampling Visits, SWMU 27, Building 2120C; SWMU 28, Building 2120C; SWMUs 29 and 30, Building 2121; SWMU 31, Building 2122; SWMU 32, Building 2123; SWMUs 33 and 34, Building 2124; SWMUs 35 and 36, Building 2128, Fort George G. Meade, Fort Meade, Maryland	Versar, Inc.	September 16, 1999	Adjacent to Y
Site Investigation Report, Building 2120C (SWMU 25), Fort George G. Meade, Ft. Meade, Maryland	Versar, Inc.	October 30, 2001	Adjacent to Y

Document Name	Author	Publication Date	Applicable Sites
Aerial Photographic Analysis, Fort George G. Meade – Cantonment Area, Anne Arundel County, Maryland	U.S. Environmental Protection Agency (EPA)	March 1996	Y and Z
Working Draft Site Management Plan, Fort George G. Meade.	EM Federal Corporation	July 2004	
Final Historical Records Review, Fort George G. Meade, Fort Meade, Maryland	Malcolm Pirnie, Inc.	May 2006	Y and Z
Phase I Archaeological Survey of Approximately 2,210 Acres at Fort George G. Meade, Anne Arundel County, Maryland	R. Christopher Goodwin and Associates, Inc.	1995	Y and Z
Final Integrated Natural Resource Management Plan, Fort George G. Meade, Maryland, 1999 to 2004	CH2M HILL	1999	Y and Z
A Rare, Threatened, and Endangered Species Habitat Search (5 year update) at Fort George Meade	Eco-Science Professionals, Inc.	February 19, 2001	Y and Z
Fort Meade, Phase II Archaeological Evaluation of Sites 18AN398, 18AN929, 18AN982, 18AN983, 18AN988, and 18AN989, Anne Arundel County, Maryland	URS	November 2003	Y and Z

2.2 SITE RECONNAISSANCE

URS personnel conducted a reconnaissance of the subject properties on August 9 and 11, 2006. The site visits were performed using teams of qualified environmental professionals. FGGM personnel were not needed during the site visits, as the sites are undeveloped and URS personnel had unrestricted access to both of the sites. A grid system with a series of cells was applied to each of the sites to allow for accurate location referencing. Aerial photos showing the grid systems referenced in the EBS for Sites Y and Z are provided as Figures 2-1 and 2-2, respectively. Selected photographs taken during the site visits are included in Appendix A.

2.3 INTERVIEWS

Interviews with key facility employees and Army personnel were conducted to aid in the identification of environmental conditions at the subject properties. Summaries of the interviews are included in Appendix B. The following list summarizes the personnel interviewed and the topics discussed:

Name	Item(s) Discussed or Assistance Provided
Mick Butler	Environmental Areas at or near Sites Y and Z
Heather Carolan	Forest Conservation Areas at Sites Y and Z
Joseph DiGiovanni	Archaeology at Sites Y and Z and Old Incinerator at Site Y
Don Marquardt	Wetlands at Sites Y and Z

2.4 HISTORICAL TOPOGRAPHIC MAPS REVIEWED

Historical topographic maps were accessed through Environmental Data Resources, Inc. (EDR), an independent data and database research firm. These maps were reviewed to evaluate past land uses and environmental features at the two sites. Table 2-2 provides a list of the topographic maps obtained and reviewed for this EBS. Copies of the historic topographic maps reviewed are provided in Appendix C.

Table 2-2: Historical Topographic Maps Reviewed

Map Date	Source	Applicable Sites
1907	EDR	Y, Z
1908	EDR	Y, Z
1947	EDR	Y, Z
1949	EDR	Y, Z

Map Date	Source	Applicable Sites
1957	EDR	Y, Z
1970	EDR	Y, Z
1979	EDR	Y, Z

2.5 HISTORICAL AERIAL PHOTOGRAPHS REVIEWED

Historical aerial photographs of FGGM were reviewed to evaluate past land uses at the two sites. A list of aerial photographs reviewed for this study is provided in Table 2-3. Copies of the aerial photographs reviewed are provided in Appendix D.

Table 2-3: Historical Aerial Photographs Reviewed

Aerial Photograph Date	Source	Applicable Sites
1957	EDR	Y, Z
1963	EDR	Y, Z
1970	EDR	Y, Z
1980	EDR	Y, Z
1988	EDR	Y, Z

2.6 EXISTING DATABASE SEARCHES

Agency records were accessed through EDR. Databases were queried on the search distances recommended by ASTM D6008-96, the ASTM standard Practice for Conducting an EBS (ASTM, 1996) and ASTM E 1527-00, the ASTM Standard Practice for Environmental Site Assessments, Phase I Environmental Site Assessment Process (ASTM, 2000). The standard search distances were extended an extra 0.25 mile due to the large acreage of both sites. Table 2-4 lists the environmental databases that were included in the EDR search. Copies of the EDR reports generated for Sites Y and Z are provided in Appendix E.

Table 2-4: Environmental Database Summary for Sites Y and Z at FGGM, MD

Type of Database/ Date	Description of Database/Effective Date	Radius Searched
NPL	The National Priorities List (NPL) identifies uncontrolled or abandoned hazardous waste sites. To appear on the NPL, sites must have met or surpassed a predetermined hazard ranking system score, been chosen as a State's top priority site, pose a significant health or environmental threat, or be a site where the EPA has determined that remedial action is more cost-effective than removal action. Effective Date – 4/06	1.25 miles
CERCLIS	The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database identifies hazardous waste sites that require investigation and possible remedial action to mitigate potential negative impacts on human health or the environment. Effective Date – 2/06	0.75 mile
CERCLIS-NFRAP	No Further Remedial Action Planned (NFRAP). As of February 1995, CERCLIS sites designated as NFRAP have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. Effective Date – 2/06	0.75 mile
RCRIS TSD	Resource Conservation & Recovery Information System (RCRIS) Treatment, Storage, or Disposal (TSD) sites. Effective Date – 3/06	0.75 mile
CORRACTS	Resource Conservation and Recovery Act Corrective Action Sites (CORRACTS) is a listing of RCRA facilities that are undergoing corrective action. Corrective actions may be required beyond the facility's boundary, and can be required regardless of when the release occurred, even if it predates RCRA. Effective Date – 3/06	1.25 miles
RCRIS Large Quantity Generators	RCRA-regulated hazardous waste generator notifiers list. Effective Date – 3/06	0.50 mile
RCRIS Small Quantity Generators	RCRA-regulated hazardous waste generator notifiers list. Effective Date – 3/06	0.50 mile

Type of Database/ Date	Description of Database/Effective Date	Radius Searched
ERNS	EPA's Emergency Response Notification System (ERNS) list contains reported spill records of oil and hazardous substances. Effective Date – 12/05	0.25 mile
SHWS	State Hazardous Waste/Superfund (SHWS) permanent list of priorities. Effective Date – 9/05	1.25 miles
SWF/LF	Solid Waste Facilities/Landfill Sites (SWF/LF). Effective Date – 3/06	0.75 mile
OCP Cases	Cases monitored by the Oil Control Program (OCP) that include leaking underground storage tanks and other below ground releases, leaking aboveground storage tanks, spills, and inspections. Effective Date – 4/06	0.75 mile
Historical LUST	List of leaking underground storage tanks (LUST) that are undergoing closure and/or removal. Effective Date – 03/99	0.75 mile
UST	List of underground storage tank (UST) sites registered with the State Agency. Effective Date – 5/06	0.50 mile
VCP	Voluntary Cleanup Program (VCP) Sites. Effective Date – 4/06	0.75 mile

2.7 SANBORN MAPS

The Sanborn Map Company of Pelham, NY, produced a uniform series of large-scale maps, dating from 1867 to the present, that were designed to assist fire insurance agents in determining the degree of hazard associated with a particular property. The maps provide a source of historical information about the structure and use of buildings, and are typically a valuable source of information when preparing EBSs.

According to EDR, Sanborn maps were not available for the FGGM area (EDR, 2006g, 2006h; Appendix F).

3.1 CLIMATOLOGY

FGGM is located in the continental climate zone of the eastern United States. This climate region is typified by mild winters and summers that are long, warm, and often humid because of persistent maritime tropical air. Temperate weather prevails in the spring and summer.

Annual temperatures in the region range from less than -6 degrees Fahrenheit (°F) in winter to highs over 100°F in summer. FGGM's annual mean temperature is 61°F, with daily average highs of 71°F and a minimum of 45°F. The average annual precipitation is 41 inches (including 22 inches of snow). Strong thunderstorms throughout the summer cause the greatest amount of rainfall. These occur mainly during August (USACE, 2004).

3.2 TOPOGRAPHY

In general, the topography of FGGM is characterized by flat land that gently slopes toward scattered water bodies throughout the base. Local small-scale variations in elevation are abundant. Much of the base topography has been altered by development. The highest elevation is about 300 feet above mean sea level (amsl) in the northwest corner of the base. The lowest elevation at FGGM is under 100 feet amsl, which occurs in the southwest corner of FGGM along the Little Patuxent River (CH2M HILL, 1999).

The topography of Site Y slopes to the south and east. The elevation of site Y ranges from around 220 feet amsl in the north, to 125 feet amsl in the southwest, to around 150 ft amsl in the east. The topography of Site Z slopes to the south. The elevation of site Z ranges from around 190 feet amsl in the north, to around 145 feet amsl in the south.

3.3 GEOLOGY AND SOILS

FGGM is located on the unconsolidated sands, clays, and silts of the Atlantic Coastal Plain physiographic province. The Coastal Plain is characterized by a low, broad plain on an unlithified, eastward-thickening wedge of sediments dipping gently to the southeast. Figure 3-1 is a conceptual cross-sectional representation of these sediments. These sediments were deposited on Precambrian crystalline rocks that are exposed west of the Fall Line, the boundary between the Coastal Plain and Piedmont provinces, which runs several miles to the west of FGGM. Thickness of the Coastal Plain sediments (or depth to the crystalline bedrock) ranges from zero at the Fall Line, the western boundary of the Coastal Plain, to over 10,000 feet at the coast line.

Cretaceous sediments of the Potomac Group constitute the Coastal Plain sediments at FGGM. This group consists of, from youngest to oldest, the Patapsco, Arundel, and Patuxent Formations, and has a total thickness of approximately 600 feet in the vicinity of the Garrison. These formations were formed as fluvial and lacustrine deposits, and include sands with interbedded gravel, silt, and clay layers.

The Patapsco Formation has been subdivided into upper, middle, and lower units. The upper Patapsco is thickest, approximately 40 feet, at the east side of FGGM, and thins to an erosional edge on the west side of the Garrison. This upper unit consists of mottled, medium fine sand to silty sand, usually yellow-brown, yellow-orange, light brown, or gray in color. Rare intercalated

beds of clay and gravel are present. This is the water table aquifer on the southeastern portion of FGGM.

The middle Patapsco unit consists of a thick, hard, highly plastic, mottled, reddish-brown to light gray colored clay. This unit has an average thickness of 50 feet, with a maximum thickness of 102 feet recorded on the post. Very fine silty sand lenses, 2 to 16 feet in thickness, are present throughout the middle unit, while an intercalated black coal seam was encountered in the lower section of the middle Patapsco unit. This unit outcrops to the west of the erosional limit of the upper Patapsco.

The lower Patapsco unit consists of medium fine silty sand that grades vertically to a coarse sand with minor silt. This unit's color varies from pale to dark yellow-orange, dark brown, and dark yellow. The transition between the middle and lower unit is very gradual, marked by alternating silty sands and silty clays. The regional thickness of this unit ranges from 80 to 100 feet. For most of FGGM the lower Patapsco is a confined aquifer.

The Arundel Formation is approximately 250 feet thick (Mack and Achmad, 1986). This formation consists of massive beds of red, brown, and gray clay with several more permeable interbeds. The Patuxent Formation underlies the Arundel Formation and overlies crystalline bedrock. The Patuxent Formation is composed principally of sand and gravel, with minor amounts of silty clay and clay.

Bedrock in the vicinity of FGGM consists of igneous and metamorphic crystalline rocks of Precambrian to early Cambrian age. These are the crystalline rocks that are exposed at the Fall Line which, in the vicinity of FGGM, lies close to Interstate Highway 95.

Soil types found in the FGGM vicinity belong to two major associations. Most of the area is comprised of the loamy and clayey sand of the Muirkirk-Evesboro soil association, and the remaining soils are of the Evesboro-Rumford-Sassafras association (E.M. Federal Corporation, 2004).

The Muirkirk-Evesboro soils comprise underdeveloped forestland and some portions of the developed sections. These soils are loamy and clayey, underlain by unstable clay of low permeability. This association primarily supports a mixture of pine and hardwood vegetation.

The Evesboro-Rumford-Sassafras soils usually have an unstable and slowly drained substratum that seasonally enhances a high water table. The Evesboro series is characterized by coarse, loose, and drought soils with clayey substratum of low permeability. The Rumford series is composed of loose loamy soils with sandy loamy subsoil. The Sassafras series consists of fine sandy loamy material overlain on sandy-clayey-loamy subsoil.

Studies done in the northern portion of Site Y, west of Site Y, and northwest of Site Z reveal some information about the shallow sedimentary deposits in the vicinity of these two sites. Shallow subsurface sediments in the vicinity of Sites Y and Z are beige to orange, fine to medium grained sand interbedded with gray to brown, slightly coarse silty sand, medium to fine sand, or clayey silt, with occasional layers of gravel. These deposits are consistent with sediments of the Lower Patapsco Unit (Versar, Inc., 1999a, 1999b, 1999c, 1999d, 2001, and 2002).

3.4 HYDROGEOLOGY

Three distinct aquifers are present in the unconsolidated sediments beneath FGGM: the upper and lower Patapsco and the Patuxent aquifers (Figure 3-1). Each of these units is dominantly sand with some silty and clayey interbeds. Two distinct confining layers separate the three aquifers. The middle Patuxent clay unit separates the upper and lower Patapsco aquifers. The Arundel Formation is the aquitard that separates the lower Patapsco and the Patuxent aquifers.

The upper Patapsco aquifer, which is limited to the southeastern part of FGGM, is an unconfined water-table aquifer. Here, the topography controls surface water movement and influences the groundwater flow in the water table aquifer.

The lower Patapsco and Patuxent aquifers are in confined conditions under most of FGGM. On part of northern FGGM, the lower Patapsco aquifer crops out and water table conditions prevail. Patuxent sands outcrop west of Route 295, the Baltimore-Washington Parkway. Regionally, the groundwater in these aquifers flows to the southeast toward the Chesapeake Bay, although minor local flow variations are encountered.

Hydraulic conductivity is the parameter that characterizes the ability of groundwater to flow through porous material. Vertical conductivity is a measure of how well a confining impedes the downward flow of contaminants Table 3-1 presents the conductivities that have been reported from various well investigations for the two Patapsco aquifers and the two confining units underlying Ft Meade. The great range of this parameter requires the exponential format to compare the flow in the highly productive aquifers to the almost impenetrable confining units.

Table 3-1: Hydraulic Conductivity - Potomac Group Sediments, FGGM, MD

Aquifer Unit	Horizontal Conductivity (cm/s)
Upper Patapsco	3×10^{-5} to 6×10^{-3}
Lower Patapsco	4×10^{-4} to 2×10^{-3}
Confining Unit	Vertical Conductivity (cm/s)
Middle Patuxent	1×10^{-8} to 2×10^{-7}
Arundel Clay	2×10^{-10}

cm/s = centimeters/second

Studies done in the northern portion of Site Y, west of Site Y, and northwest of Site Z reveal some information about shallow groundwater in the vicinity of these two sites (Versar, Inc., 1999a, 1999b, 1999c, 1999d, 2001, and 2002). Shallow groundwater was encountered at depths of 2.5 to 43 feet at some locations but not encountered at depths from 15 to 30 feet at other locations. Perched groundwater was encountered at some locations at depths from 1 to 14 feet. The majority of this information comes from soil borings. It is possible that some reports of shallow groundwater are actually perched groundwater. Local groundwater flow direction was estimated to be to the northeast, the east, the south, and the southeast. Shallow groundwater flow usually mimics the surface topography, which in the vicinity of Sites Y and Z, slopes to the south and southeast. Releases to groundwater on Sites Y and Z would therefore, flow to the east, south, or southeast and releases to groundwater west and north of these sites would flow through the subsurface under sites Y and Z.

3.5 WATER RESOURCES

FGGM is located in the Little Patuxent and Severn River Watersheds. The Severn River flows east-southeast and is located to the east of FGGM. Sites Y and Z are located entirely within the Severn River Watershed. The Little Patuxent River flows to the southeast and is located southwest of the Garrison. Several tributaries on FGGM flow into the Little Patuxent River.

Most of FGGM east of Maryland Route 175 is drained by intermittent and perennial stream channels that discharge to unnamed tributaries of the Severn River. The Severn River is listed by the Maryland Department of the Environment (MDE) as an impaired waterway that does not maintain adequate water quality to sustain its designated uses. The listed impairments for the Severn River watershed are nutrients, suspended sediment, and biological (MDE, 2006).

Most of the middle and western portions of the base are drained by Midway Branch, a tributary to the Little Patuxent River that flows north to south through the middle of the base. Franklin Branch flows to the south and is located in, and drains most of, the eastern portion of the base. Franklin Branch flows through Kelly Pool (also called Burba Lake) before connecting with Midway Branch. Midway Branch eventually enters Soldier Lake (also called Allen Lake), located south of the base and Maryland Route 32 before entering the Little Patuxent River.

Other unnamed tributaries drain the remainder of the western portion of the base. These tributaries flow into the Little Patuxent River. Kelly Pool is the only enclosed water body on the base, not including several stormwater management ponds (CH2M Hill, 1999).

Drainages are generally flat and wide. Marshy lands occur along portions of the Patuxent and Little Patuxent Rivers. Both rivers are mature, and their floodplains in the vicinity of FGGM are meandering and fairly level topographically.

The Little Patuxent River water quality is generally poor. Several significant discharges occur to the river upstream of FGGM, including the Johns Hopkins University Farm, W.R. Grace, Co., The University of Maryland Farm, the Maryland House of Corrections Sewage Treatment Plant (STP), and the Savage STP. High bacteriological and viral counts, associated primarily with STP effluent, are the main sources of contamination. Other sources of bacteria include discharges from faulty septic tank systems, on-post STPs, and runoff from urban and agricultural areas. Suspended solids, turbidity, and phosphorus and nitrogen loading also contribute to the degradation of the Little Patuxent River. The most significant discharge that affects FGGM comes from the Savage STP (EM Federal Corporation, 2004).

According to available records that were reviewed, there have been no reported releases to surface water on the portion of Ft Meade that drains to the Severn River watershed. Releases to surface water on Sites Y and Z would generally flow to the southeast, in the Severn River Watershed. Releases to surface water immediately north and west of Sites Y and Z would be considered upstream and would flow onto Sites Y and Z.

3.6 AIR QUALITY

EPA has set National Ambient Air Quality Standards (NAAQS) for six principal pollutants, which are called “criteria” pollutants. They include: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), lead (Pb), particulate matter less than or equal to 10 microns (PM₁₀) and 2.5 microns (PM_{2.5}), and sulfur dioxide (SO₂). The MDE Air and Radiation Management

Administration administers Federal and State air quality regulations statewide. FGGM is located in Maryland Air Quality Control Region 3.

Title V of the Clean Air Act (CAA) establishes thresholds for criteria pollutants. Anne Arundel County is in moderate non-attainment for 1-hour and 8-hour O₃, and in attainment for all other criteria pollutants. The former air quality monitoring station that was located on Y Street at FGGM had monitored criteria pollutants from 1983 to 2005. The NAAQS peak hourly attainment threshold for O₃ is 125 parts per billion (ppb). From 1996 until 2001, FGGM exceeded this threshold 16 times. Each occurrence was recorded only in summer months between June and August (MDE, 2005).

3.7 NOISE

Noise is defined as unwanted or unwelcome sound. Sound is measured in decibels (dB) on the A-weighted scale, corresponding to the range of human hearing. The EPA sets guidelines that state outdoor sound levels in excess of 55 dB day-night level (DNL) are “normally unacceptable” for noise-sensitive land uses such as residences, schools, and hospitals. The maximum permissible levels for workers in high noise areas vary by exposure time and dB.

3.7.1 Site Y

The majority of noise at Site Y is created by vehicular traffic along nearby Reece Road and Maryland Route 175. Noise is being generated in the northwestern portion of the site as a result of new construction activities in parcels adjacent to Site Y. This is most likely a temporary source of noise. However, the new industrial/commercial developments being constructed adjacent to the northwestern portion of Site Y may create additional noise sources once they become fully operational.

3.7.2 Site Z

Site Z has fewer noise sources than Site Y, because large portions of the site are bordered by undeveloped land. The northeastern and western portions of the site are bordered by residential development, so the only significant source of noise on Site Z is the vehicular traffic along Reece Road, adjacent to Site Z to the northeast.

3.8 PLANT AND ANIMAL ECOLOGY

FGGM is extensively developed; however, Sites Y and Z are both almost entirely undeveloped forested areas. There are, however, two small portions of Site Y that have been developed. One is a small open sandy area in the northern portion of Site Y that has been cleared and graded (Figure 2-1; grid cells B5 and B6). The other area is in the northeastern portion of Site Y, and has been recently developed as part of the ongoing construction adjacent to the site (Figure 2-1; grid cells B4 and B5). Sites Y and Z have very similar vegetative and wildlife communities, as the sites are bisected only by Reece Road. The vegetation on both sites consists generally of a relatively mature maple/pine stand. Both sites are heavily incised with several intermittent drainage features that collect and pool water during wet periods. More hydrophytic vegetation occurs throughout the sites in these low-lying areas. Sites Y and Z likely provide moderate-

quality habitat for wildlife because of the mature canopy and water sources throughout the sites. The sites are limited as quality wildlife habitat by their insular nature, being surrounded almost entirely by residential and industrial/commercial development. Most wildlife species found at FGGM are those associated with urban-suburban areas: white-tailed deer, gray squirrel, beaver, raccoon, opossum, eastern chipmunk, field mouse, vole, mole, and fox.

Bird species found at FGGM are those that have adapted to the urban-suburban habitat of the base and surrounding developed areas. Common birds include the American robin, catbird, Carolina chickadee, house wren, Carolina wren, mockingbird, common flicker, house sparrow, rock dove, morning dove, downy woodpecker, and song sparrow (CH2M HILL, 1999). Some migratory birds, such as raptors and warblers, use the post for feeding; however, evidence of these species using the site to breed has not been observed. Four migratory birds either observed or heard at FGGM are listed on the Maryland Watchlist for Breeding populations: sharp-shinned hawk, spotted sandpiper, northern waterthrush, and northern junco (Eco-Science Professionals, Inc., 2001)

3.8.1 Site Y

Site Y consists of a relatively mature forest stand, dominated by Virginia pine (*Pinus virginiana*) and red maple (*Acer rubrum*), but also contains a diverse canopy of pin oak (*Quercus palustris*), white oak (*Quercus alba*), and tuliptree (*Liriodendron tulipifera*). The understory comprises a high-quality mix of highbush blueberry (*Vaccinium corymbosum*); red maple, white oak, and pin oak saplings; American holly (*Ilex verticillata*); black gum (*Nyssa sylvatica*); and bristly greenbrier (*Smilax rotundifolia*). Groundcover species throughout the site include ground cedar (*Lycopodium complanatum*), smartweed species (*Polygonum spp.*), low sweet blueberry (*Vaccinium angustifolium*), and poison ivy (*Toxicodendron radicans*). A large wetland complex, bisecting Site Y from west to east, is dominated in the groundcover vegetative layer by Japanese stilt grass (*Microstegium vimineum*), an exotic and highly aggressive nuisance species. This area of Japanese stilt grass has been mapped in previous studies of the area, and appears on Figures 3-2 and 2-1; grid cells E4, E5, F5, F6, F7, and F8. Observations made by URS scientists during August 2006 indicate that the extent of the Japanese stilt grass invasion has increased since this mapping was created. (Appendix A.1, Photographs NR-Y1 through NR-Y7).

A small pond located offsite, adjacent to the western central portion of Site Y, provides a drinking water source for wildlife, although the pond itself does not provide optimal waterfowl habitat because the adjacent land to the northwest of the pond has been cleared and developed (Figure 2-1; northwest of grid cell G4). No waterfowl were observed during August 2006 site visits. (Appendix A.1, Photograph NR-Y8).

3.8.2 Site Z

Site Z is very similar in vegetative composition to Site Y. The percent dominance of evergreen vegetation (pine/holly mix) appears to be somewhat smaller in Site Y. Dominant vegetation in the uplands consists of Virginia pine, American holly, red and pin oaks, red maple, and tuliptree. As with Site Y, the low-lying areas are dominated by more hydrophytic species, including green ash (*Fraxinus pennsylvanica*), sweetgum (*Liquidambar styraciflua*), and red maple in the overstory and understory; and sensitive fern (*Onoclea sensibilis*), Japanese barberry (*Berberis*

thunbergii), and Japanese stilt grass in the understory. (Appendix A.1, Photographs NR-Z1 through NR-Z5).

On FGGM mapping provided by base personnel, several “Flora-Species Sites” appear along Reece Road on Site Z. During a URS site visit in August 2006, no distinguishing vegetative features were observed in these locations. These flora species may be specimen trees identified in previous studies as individual trees worth saving.

3.9 THREATENED AND ENDANGERED SPECIES

Under the Endangered Species Act, the U.S. Fish and Wildlife Service (USFWS) identifies plants and wildlife to be listed on the Federal threatened and endangered species list. No federally listed or proposed species are known to occur on Sites Y or Z (CH2M HILL, 1999).

In the State of Maryland, special-status species are given legal protection by inclusion on the State Threatened and Endangered Species List (Code of Maryland Regulations [COMAR] 08.03.08). Not all species listed by the Maryland Wildlife and Heritage Division have been granted legal protection. No State-legally-protected species are known to occur on either Site Y or Z. A Rare, Threatened, and Endangered Species habitat search was conducted between August 1993 and August 1994, and again between March 2000 and November 2000 (Eco-Science Professionals, Inc., 2001). No special status species or habitat protection areas were identified in the Eco-Science report for the areas encompassed by Sites Y and Z, however, it was not clear from the report if these areas were addressed in the study. A summary of Species of Concern at Sites Y and Z is provided below.

3.9.1 Site Y

Four federally-listed threatened or endangered species have the potential to occur within Anne Arundel County. Of these, sensitive joint-vetch (*Aeschynomene virginica*) only occurs in brackish/saltwater marshes, and therefore would not occur on FGGM. Bald eagles (*Haliaeetus leucocephalus*) require habitat that includes a waterbody large enough to provide a fish food source year-round. The habitat at neither Site Y nor Z would sustain bald eagles long-term. The swamp pink (*Helonias bullata*) occurs in forested wetlands of Maryland’s coastal plain (MDNR, 2004). Two populations are known to occur in Ann Arundel County. During August 2006 site visits, URS scientists did not observe swamp pinks in any of the wetland areas within Site Y. Chaffseed (*Schwalbea Americana*), a federally endangered species, prefers sandy, acidic, seasonally moist soils in sunny or partly sunny areas subject to frequent fires in the growing season (USFWS, 2006). Chaffseed is ranked as Endangered Extirpated (SX) in Maryland, which includes species that were once a viable component of the flora or fauna of the State, but for which no naturally occurring populations are known to exist in the State. It is believed to be extirpated in Maryland, with virtually no chance of rediscovery (MDNR, 2004).

3.9.2 Site Z

Site Z provides habitat potential equal to that of Site Y. No waterbodies exist to support the fishing requirements of bald eagles. Forested wetland areas in the southwestern portion of Site Z have the potential to support swamp pinks; however, no individuals of this species were observed during the August 2006 site visits.

3.10 PROTECTION AREAS

3.10.1 Critical Habitat Protection Areas

Certain areas within FGGM have been designated as protection areas by the Department of the Army due to the presence of State rare and listed species (Eco-Science, 2001). There are no designated critical habitat protection areas within Site Y or Z.

3.10.2 Forest Conservation Act Areas

The current Integrated Natural Resources Management Plan (INRMP) for FGGM (CH2MHILL, 1999) identifies numerous areas at FGGM that have been designated as Forest Conservation Act (FCA) areas. FGGM voluntarily supports the Maryland FCA and complies with the Act on a case-by-case basis (CH2MHILL, 1999). The FCA applies to all activities requiring a permit for subdivision, grading, or sediment control that is larger than 40,000 square feet, or slightly less than 1 acre. The FCA provides guidelines for the amount of forest land retained or planted after the completion of development projects. These guidelines vary for each development site and are based on land use categories. FCA areas identified for disturbance require a Forest Stand Delineation (FSD) in compliance with the Maryland Forest Conservation Manual, and a plan for conserving the most valuable portions of the forest. In lieu of performing an FSD for individual development projects, FGGM requires that the equivalent of 20 percent of a project area be forested. To further comply with the Maryland FCA, FGGM has adopted a policy of preserving and protecting dominant indigenous trees and observing and maintaining 25-meter stream buffers (Colianni, pers. comm.). In addition, land development projects are designed to Low Impact Development Standards to further protect natural resources.

3.11 WETLANDS

On-site wetlands were identified through site investigations and existing mapping, including a review of the National Wetland Inventory (NWI) maps and wetland mapping provided by FGGM. The presence and composition of wetlands noted within the subject areas on existing mapping were field-verified.

3.11.1 Site Y

The NWI map depicts a large PFO1A (palustrine, forested, broad-leaved deciduous, temporarily-flooded) wetland system, bisecting Site Y into a northern and southern portion. Several small streams and drainageways throughout the site flow into the perennial stream in the center of this wetland system, and eventually flow offsite together in an easterly direction (Figure 2-1; grid cells E4, E5, F5, F6, F7, and F8). Japanese stilt grass has invaded most of the wetland system and was observed encroaching into several of the ephemeral streams and drainageways. Several small potential wetland areas, not depicted on the NWI maps, were observed during the August 2006 site investigations. These areas are associated with intermittent streams throughout Site Y. (Appendix A.1, Photographs NR-Y1 through NR-Y7).

The NWI map also indicates a small PUBFh (Palustrine, unconsolidated bottom, semi-permanent/permanent) wetland that corresponds to the small pond observed offsite, adjacent to

the western property boundary (Figure 2-1; northwest of grid cell G4 and Appendix A.1, Photograph NR-Y8).

3.11.2 Site Z

The NWI map depicts a PFO1A (palustrine, forested, broad-leaved deciduous, temporarily-flooded) wetland in the southeastern portion of Site Z. The PFO1A wetland depicted on the map is a relatively large wetland system; however, only a portion of the mapped wetland lies within the property boundaries of Site Z (Figure 2-2; grid cell D1). An intermittent stream is associated with this forested wetland system, as are numerous ephemeral streams. This network of braided stream channels dominates most of the far western portion of Site Z (Figure 2-2; grid cells A1, B1, C1, and D1 and Appendix A.1, Photograph NR-Z3).

Several old roads and trails exist within Site Z, many of which accumulate surface water regularly and as a result, have developed into potential wetland areas. Additionally, an intermittent stream system flows through the central portion of Site Z (Figure 2-2; grid cells B3 and C3). The stream flows from north to south and is highly incised, indicating the stream receives a high volume of surface water during storm events. Impervious surfaces at surrounding developments contribute to the high velocity of this intermittent stream. The stream passes through a culvert at the old road crossing in the central portion of Site Z as it flows in a south/southeasterly direction (Figure 2-2; grid cell B3 and Appendix A.1, Photographs NR-Z1, NR-Z2, and NR-Z4 through NR-Z6).

3.12 HISTORICAL AND CULTURAL RESOURCES

The Fort Meade property has been subject to several separate cultural resources investigations. Prior to a post-wide survey conducted by R. Christopher Goodwin and Associates, Inc. (Goodwin) in 1995, several small project-driven surveys were completed on the post. From 1993 through 1995, Goodwin conducted archaeological surveys on Fort Meade. The 1995 Phase I survey of approximately 2,210 acres resulted in identification of 29 sites, ranging in date from the prehistoric Archaic Period to the historic eighteenth through early twentieth century (Goodwin 1995). A final Phase I Survey was conducted by URS in 2003 on portions of the property occupied by the National Security Agency (NSA).

From 2002 to 2004, URS conducted Phase II evaluations of previously identified sites on Fort Meade. The Phase II archaeological evaluation of 21 sites was conducted to determine whether each site was eligible for listing on the National Register of Historic Places (NRHP) and/or the Maryland Register of Historic Properties. To be eligible for the NRHP, the resources were required to meet one of four significance criteria. The Phase II sites included five historic, three multi-component, and 13 prehistoric sites. Prehistoric sites ranged in date from the Early Archaic through the Late Woodland Periods. Historic sites dated to the mid-eighteenth through early twentieth century; they included domestic, military, and post office sites. As a result of the Phase II evaluation, one prehistoric site (18AN1240) was determined eligible for inclusion in the NRHP and recommended for preservation or Phase III data recovery (URS 2003).

All buildings on Fort Meade built before 1960 were surveyed and evaluated for the NRHP. The Fort Meade Historic District, Building 8688, and the water treatment plant are determined

eligible for the NRHP. One additional building constructed in 1954 was identified that may be eligible.

3.12.1 Site Y

Site Y was tested for archaeological resources during the Phase I investigation of the Fort Meade property completed by R. Christopher Goodwin and Associates in 1995. The Phase I investigation included a pedestrian survey in areas with a low potential for archaeological resources, and excavation of shovel test pits at a 20 meter interval in high potential areas. Shovel test pits excavated in and around Site Y produced non-diagnostic prehistoric artifacts, and historic artifacts dating from the late eighteenth century to the modern period (within the past 50 years).

One historic site (18AN984) was identified during the Phase I investigation. Site 18AN984 contains historic artifacts dating from the late nineteenth to early twentieth century. Those artifacts include among others window glass, bricks, whiteware sherds, and redware sherds. This site was determined ineligible for inclusion in the NRHP, and was not recommended for further work.

3.12.2 Site Z

Site Z was also tested for archaeological resources during the Phase I investigation of the Fort Meade property in 1995. Excavations in and around Site Z uncovered only a small number of artifacts, all of which were modern. Several features relating to military training activities were observed within the boundaries of Site Z. Those features constitute site 18AN990 and include rifle pits, trenches, and foxholes probably dating to the early twentieth century. Based on its probable association with training activities during and leading up to World War I, the site was determined potentially eligible for inclusion on the NRHP.

In 2003 URS Corporation completed a Phase II investigation of the features at 18AN990. During the investigation, a total of 46 associated features were defined, photographed, and mapped, however no additional excavations were completed at that time. As a result of the Phase II investigations, it was determined that additional work at the site would not yield new information, and the site did not have the potential to yield significant information about early twentieth century military tactics. The site was determined ineligible for inclusion on the NRHP, and no additional work was recommended.

4.1 GENERAL SITE HISTORY

In May 1917, Congress passed a bill authorizing the construction of 16 cantonments for training troops for World War I. On June 23, 1917, a general contract was signed by the government to lease the land from George Bishop, president of WB&A Electric Railroad Company. Prior to its transfer to the government, the land was used for farming (Figure 4-1) (USACE, 2004).

Construction on the cantonment began on July 2, 1917, and the area was named "Camp Meade" after Major General George G. Meade of the Civil War. The first troops arrived at Camp Meade on September 15, 1917. During World War I, over 100,000 men and women were trained at Camp Meade. When the war ended in November 1918, Camp Meade was used as a demobilization center for over 96,000 troops returning from Europe. During this time, the government determined that the land (over 7,500 acres) should be purchased and they began the process. In 1919, the Tank Corps was formed and located at Camp Meade. In addition, summer training camps were held at Camp Meade to provide military training for civilian personnel.

In 1928, Camp Meade was made a permanent installation and renamed Fort Leonard Wood. The name was changed in 1929 to Fort George G. Meade (USACE, 2004).

In 1941, FGGM was expanded in preparation for World War II. FGGM acquired an additional 6,137.87 acres, increasing the size of the installation to over 13,800 acres. The 29th Division, consisting of National Guard units, was activated and assigned to FGGM (USACE, 2004). During World War II, FGGM's primary mission was troop training and it is estimated that nearly 3.5 million people passed through the facility. FGGM also served as the Prisoner of War Information Bureau and housed some prisoners of war from Germany and Italy. FGGM continued its mission to supply troops until 1945, when operations were changed and FGGM became a separation center for processing troops eligible for discharge. This operation continued into 1946 (USACE, 2004).

Expansion of FGGM during and after World War II transformed the surrounding area with the establishment of large residential and business districts. In 1994, as a result of a BRAC round, approximately 50 percent of FGGM (the most southwestern portion) was given to the Department of the Interior for the development of a wildlife refuge. Today, FGGM provides support and services for more than 78 tenant units, which include the Defense Information School, Headquarters Command Battalion, the U.S. Army Field Band, the National Security Agency (NSA), and the U.S EPA Environmental Science Center Library.

4.2 CURRENT AND PAST SITE USES

This section presents an overview of current and historical operations at Sites Y and Z and provides a description of the installation facilities. Historic land uses of Sites Y and Z and the rest of FGGM have been researched and documented by various organizations conducting investigations of FGGM. This information has been assembled and added to information collected through EBS record searches, interviews, aerial photographs, and map reviews. This section also contains a general description of structures previously located at the site and removed as described through existing documentation or site visits.

4.2.1 Site Y

Site Y is mostly undeveloped, wooded land. Several trails and streams/creeks run throughout the site. A small, circular sand clearing (location of a former incinerator) is located near the northern boundary of the site. The site is primarily classified in the Forest Zone, with small slivers of Low to High Density Residential, as well as Institutional Zones along the northern and southwestern boundaries (RK&K, 2004) (Figure 4-2).

The U.S. Government purchased the property in 1919 for the construction of the military base. A period plat map showing the landholdings for the military base identifies the following owners of the property at the time of acquisition by the government: H.E. Allen owned the southeastern 1/3 of the site, Emil Schultz owned the central portion of the site, W.N. Elliot owned small pieces of the northern and western portions of the site, and John T. Jenkins and August Bussey owned small pieces along the western border of the site (Figure 4-1) (Office of the Quartermaster General, 1919).

The area that makes up Site Y has been predominantly undeveloped for many years. A 1938 map (FGGM, 1938) shows several trails running throughout the site (Figure 4-3). An incinerator on a small clearing of land is shown on the northern portion of the site in the 1957, 1963, and 1970 (EDR, 2005d) aerials, as well as in the 1947, 1949, 1957, 1970, and 1979 (EDR, 2005c) historic topographic maps. The rest of the site is shown as undeveloped wooded land in the 1957, 1963, 1970, 1980, and 1988 (EDR, 2005d) aerials. According to a 1998 EBS, the incinerator operated from 1947 until 1975 (Versar, 1999a).

4.2.2 Site Z

Site Z currently consists of undeveloped, wooded land. Three unimproved roads or trails, as well as several drainage ditches (possible intermittent streams) run throughout the site. The site is classified in the Forest Zone (RK&K, 2004) (Figure 4-2).

The U.S. Government purchased the property in 1919 for the construction of the military base. A period plat map showing the landholdings for the military base identifies H.E. Allen as the owner of the property at the time of acquisition by the government (Figure 4-1) (Office of the Quartermaster General, 1919).

The area that makes up Site Z has been undeveloped for many years. A 1938 map (FGGM, 1938) shows an unimproved road trending northwest-southeast through the western 1/3 of the site (Figure 4-3). It appears as though there are a few drainage ditches or intermittent streams that run throughout the western 1/3 of the site.

The site is shown as undeveloped wooded land in the 1957, 1963, 1970, 1980, and 1988 (EDR, 2005d) aerials. Two more unimproved roads or trails trending west-east and west-southeast are shown branching off from the original road in all of the aerials. In addition, a small circular clearing of land on the southwest corner of the site is shown in the 1957 aerial (EDR, 2005d). Grenade and Bayonet Range B, a former training area, once extended onto the southwest portion of the site (Malcolm Pirnie, 2006), and may account for the clearing.

4.3 DOCUMENTS REVIEWED

4.3.1 Site Y

Versar, Inc. June 8, 1999. Comprehensive Site Assessment, Former Incinerator Building, 21 ½ Street, Ft. George G. Meade, Fort Meade, Maryland.

In June 1999, Versar, Inc. prepared a Comprehensive Site Assessment (CSA) report for the Former Incinerator Building located on 21 ½ Street (at the clearing on the northeastern portion of Site Y). According to an EBS conducted by the Environmental Division (ED) in 1998, a former incinerator building existed on the site between 1947 and 1975. The ED did not have any information regarding the specifics of the incinerator (e.g., types of materials incinerated, types of wastes generated, closure of the facility, etc). The purpose of Versar's CSA was to verify the presence or absence of improperly disposed, potentially hazardous materials associated with the former incinerator operations; delineate the extent and types of buried materials and structures; assess shallow soil and groundwater quality; determine the risk to human receptors; and evaluate remediation options.

Versar did not find any building material or waste believed to be associated with the old incinerator during their site visit. Distinguishing features at the time of the site visit included a large bowl-shaped sand pit that was approximately 200 feet by 275 feet, with 5-foot to 10-foot slopes (this pit is no longer present), and two rusted metal items (these two items are still present). A large, partially buried piece of metal was excavated by Ft. Meade shortly after the EBS in 1998. It is unclear whether this pit is related to that excavation.

A geophysical survey revealed the presence of four anomalies. Four test pits were excavated to 8 feet below ground surface (bgs) at the locations of these four anomalies. Two of the anomalies were associated with the two large metal pieces on the site; one was a crushed soda can immediately beneath the surface, and one was buried metal debris, including sheet metal. No soil staining, odors, or photo-ionization detector (PID) readings were noted at the test pits.

Eleven locations were investigated using direct push sampling. Nine of the soil samples were analyzed for volatile organic compounds (VOC), diesel-range organics total petroleum hydrocarbons (DRO-TPH), and metals. Five of the samples were also analyzed for semi-volatile organic compounds (SVOCs). Staining and odors were not noted in any boring. DRO-TPH and SVOCs were not detected. Toluene, barium, and chromium were detected at concentrations below their residential Risk-Based Concentrations (RBCs).

Versar concluded that the shallow subsurface was not significantly affected by the former incinerator facility. No complete pathways of exposure to potential human receptors were identified. Versar reported that no further assessment and/or remediation were necessary, but recommended the disposal of the two pieces of metal machinery and the excavated debris observed on the property. Versar's conclusions of no further action were based on the premise that the site was inactive and access was partially limited to approved visitors. In addition, groundwater was not encountered in the shallow subsurface, and contaminant concentrations in soils were well below RBCs for residential soils.

Sand washing, for use in sand bags, was conducted on this site at some time prior to the 1998 EBS (Butler, 2006). The two rusted metal items on site are probably related to the sand washing. The 200-foot by 275-foot sand pit is also probably a remnant of the sand washing operation (i.e.,

sand borrow area). The source of the water for the sand washing is unknown. Because the site was disturbed from the sand washing, potential surficial incinerator fallout would have been disturbed. Heavy metal deposits at the surface due to the incinerator operations also would have been disturbed. Versar did not collect any surface soil samples, and it would be difficult to determine what soil would have been surface soil, due to the disruption of the soil for sand washing. Versar also did not sample groundwater, because it was not encountered in their borings (all their borings were reportedly drilled to refusal). In addition, downwind sampling for dioxins was not conducted. Since it is unknown what was burned in the incinerator, the potential for dioxin generation cannot be ruled out.

Versar, Inc. June 10, 1999. Comprehensive Site Assessment, Former Trap and Skeet Range, 20th Street, Fort George G. Meade, Ft. Meade, Maryland.

In June 1999, Versar, Inc. prepared a Comprehensive Site Assessment for the Former Trap and Skeet Range located on the eastern extent of 20th Street. This site is adjacent to the west of Site Y, next to the pond. According to an EBS of this subject property, conducted by the ED in 1998, the site was used as a trap and skeet range from the mid-1970s until 1994. The purpose of this study was to delineate the extent of surficial deposits of lead shot, skeet fragments, and plastic shell fragments; characterize those deposits, assess shallow soil, sediment, and surface water quality; determine the risk to potential site and nearby human receptors; and evaluate remediation options.

During the visual inspection, Versar observed lead shot, skeet fragments, plastic shell casings, and plastic wads in several areas. Deposits were mainly concentrated on the northwestern side of the pond, the southern portion of the pond, and along the western face of the berm (all adjacent to the western edge of Site Y). The plastic shell casings and wadding on the southern, eastern, and western side of the pond suggest that these areas functioned as firing stations. A composite sample of these deposits was analyzed for toxic characteristics of pesticides, herbicides, SVOCs, VOCs, and metals using the Toxicity Characteristic Leaching Procedure (TCLP). The only analyte that was detected in the sample was the metal barium. The concentration of barium in the leachate was below the EPA Region III RBC value for tap water.

Soil, sediment, and surface water samples were analyzed for total lead using EPA Method 6010B/3050A, and polynuclear aromatic hydrocarbons (PAHs) using EPA Method 8270/3510. Elevated levels of PAHs in soil and sediment were detected in the areas where heavy and moderate deposits of lead shot, skeet fragments, and shell fragments were observed during the visual inspection. Elevated concentrations of total lead were only detected in the outlying soil and dry stream channel sediment samples. Versar indicated that this may be a result of lead shot clearing the berm and resting in these areas.

A sensitive receptor survey identified several complete pathways (soil and sediment) of exposure to potential human and ecological receptors. Versar recommended future assessment and/or remediation at the site, including further contamination delineation and an expanded sampling program. If the site is to be developed, Versar recommended that a Corrective Action Plan (CAP) should address disposal requirements for disturbed media and exposure risks to site workers.

This site is on the western edge of the central portion of Site Y. The potential exists for lead and lead shot to be present in the area down range (east) of the berm, which would be on the western edge of Site Y.

Versar, Inc. December 17, 2002. Final Corrective Action Plan, Former Trap and Skeet Range, 20th Street, Fort George G. Meade, Ft. Meade, Maryland.

In December 2002, Versar Inc. prepared a CAP for the Former Trap and Skeet Range (located on the eastern extent of 20th Street adjacent to and west of Site Y), based on the findings of their CSA from June 1999 and follow-up assessment activities conducted in October and December 1999. Based on the CSA and recent assessments, the past use of the site as a trap and skeet range has affected the site soil. The purpose of the CAP was to summarize the results of previous investigations; evaluate soil, sediment, surface water, and groundwater quality; determine site-specific human health risks; and describe corrective action measures.

Deposits of lead shot, skeet fragments, and plastic shell fragments were identified on the ground surface and bottom of the site pond. PAH concentrations above the EPA Region II, RBC for residential soil were found in soil samples at depths of up to 3.5 feet bgs. The affected soils correspond to the locations of the observed deposits. Elevated concentrations of lead were detected in soil samples outside the main shooting area east of the berm. PAHs were not detected in any surface water or groundwater samples. An elevated concentration of total lead was detected in one surface water sample, where the stream enters the pond. Total lead was also detected in a majority of groundwater samples, but Versar indicated that this may be the result of natural background conditions at Fort Meade.

Versar reported that the soil exposure pathway is complete for both authorized and unauthorized recreation site visitors. However, the carcinogenic risks from PAHs for these receptor populations do not exceed the upper limit of the EPA's target risk range. Versar concluded that if access to the site is limited (e.g., installation of a security fence around the affected area), the likelihood of human exposure would be greatly reduced. If future residential, commercial/industrial, or construction development of the site is planned, the exposure risk will exceed the lower limit of the EPA's carcinogenic risk range for PAHs, and the residential risks will exceed the upper limit of the risk range for PAHs.

Versar concluded that corrective action measures are necessary, and recommended that PAH-affected soil be excavated and removed. The maximum depth of excavation should be 3.5 feet bgs. Versar also recommended that the pond be drained and the deposits removed from the bottom.

As indicated above, this site is on the western edge of the central portion of Site Y. The elevated concentrations of lead detected in soil samples outside the main shooting area, east of the berm, are in the western portion of Site Y. The elevated concentration of total lead detected in the surface water sample where the stream enters the pond is also on the western portion of Site Y. However, Versar reported that the risk range for PAHs can be exceeded if access was not restricted. Versar indicated that if groundwater use is expected in the future, further investigation for lead contamination in groundwater would be warranted.

The following twelve reports are similar and relate to the same general area. They are summarized in the table below, but presented in more detail under their respective report titles. All these sites are either west of the central portion of Site Y, or west of the northern portion of site Y and all have the potential to cause contamination in the western portion of Site Y.

Table 4-1: Summary of Reports for Solid Waste Management Units 22 through 36

Report	Soil Compounds Detected		Groundwater Compounds Detected		Summary and Conclusions
	Below Action Levels	Above Action Levels	Below Action Levels	Above Action Levels	
SWMU 22, Bldg 1976	acetone, methylene chloride, carbon disulfide, flouranthene, phenanthrene, bis (2-ethylhexyl) phthalate, and pyrene, barium, chromium, lead		2-Butanone, barium, chromium, TPH-GRO, TPH-DRO	Arsenic, lead	current and past activities have affected the site; further investigation or remedial activities recommended
SWMU 23, Bldg 1977	Naphthalene, cis 1,2 dichloroethane, barium, cadmium, chromium, lead	bis (2-Ethylhexyl) Phthalate	carbon disulfide 2-butanone, barium		
SWMU 24, Bldg 1978	arsenic, barium, cadmium, chromium, lead		2-butanone, acetone, cis 1,2-dichloroethane barium, chromium, lead	Trichloroethene, arsenic, cadmium	
SWMU 25, Bldg 2120C	methylene chloride, arsenic, barium, cadmium, chromium, lead		1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 4-methyl-2-pentanone, naphthalene, p-isopropyl toluene, barium, DRO-TPH		current and past activities had not affected the site; further investigation or remedial activities not recommended
SWMU 26, Bldg 2120C	arsenic, barium, cadmium, chromium, lead		Not sampled	Not sampled	
SWMU 27, Bldg 2120C	acetone, ethylbenzene, isopropyl benzene, naphthalene, n-butylbenzene, p-isopropyltoluene, sec-butylbenzene, 1,2,4 trimethylbenzene, 1,3,5 trimethylbenzene, m,p-xylene, o-xylene, toluene, barium, chromium, lead, GRO-TPH		barium		
SWMU 28, Bldg 2120C	acetone, ethylbenzene, isopropyl benzene, naphthalene, N-butylbenzene, P-isopropyltoluene, sec-butylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, barium, cadmium, chromium, lead	Arsenic	barium, chromium, mercury	cadmium, lead	
SWMUs 29 and	acetone, ethylbenzene, naphthalene, o-xylene,		Not sampled	Not sampled	

Report	Soil Compounds Detected		Groundwater Compounds Detected		Summary and Conclusions
	Below Action Levels	Above Action Levels	Below Action Levels	Above Action Levels	
30, Bldg 2121	toluene, 1,4-dichlorobenzene, 1,2,4-trimethylbenzene, arsenic, barium, cadmium, chromium, lead				
SWMU 31, Bldg 2122	acetone, arsenic, barium, cadmium, chromium, lead		Not sampled	Not sampled	
SWMU 32, Bldg 2123	arsenic, barium, cadmium, chromium, lead		Not sampled	Not sampled	
SWMUs 33 and 34, Bldg 2124	barium, cadmium, chromium, lead, mercury	Arsenic	Not sampled	Not sampled	
SWMUs 35 and 36, Bldg 2128	barium, cadmium, chromium, lead, mercury, GRO-TPH	Arsenic	2-butanone, carbon disulfide, acetone, barium chromium	lead	current and past activities had affected the site; further investigation or remedial activities recommended

Versar, Inc. September 16, 1999. Sampling Visit, Solid Waste Management Unit 22, Building 1976, (from Volume II, Sampling Visits, Solid Waste Management Units), Ft. George G. Meade, Fort Meade, Maryland.

In December 1998 and January 1999, Versar, Inc. collected samples from five direct push borings for SWMU 22 at Building 1976 located south of 20th Street (adjacent to the west of Site Y). The building was formerly used for administrative support activities for missile operations, but was being used as a supply warehouse at the time of Versar's sampling activities.

No visual staining, odors, or PID readings were detected in the soil borings during field activities. Three VOCs (acetone, methylene chloride, and carbon disulfide), four SVOCs (flouranthene, phenanthrene, bis (2-ethylhexyl) phthalate, and pyrene), and three metals (barium, chromium, and lead) were detected in the soil samples at concentrations below their respective EPA Region III RBC for industrial soils. TPHs were not detected in any of the soil samples.

No visual evidence (free product) or odors were detected in any of the groundwater samples. One VOC, 2-Butanone, was detected in the groundwater samples. However, no RBC for tap water has been established for this analyte. Barium and chromium were detected in one of the groundwater samples at concentrations below their RBCs; arsenic and lead were detected in samples above their RBCs. In addition, gasoline and diesel-range TPH were detected in the groundwater samples at concentrations below the MDE limits.

Versar concluded that current and past activities had affected the site, and therefore recommended further investigation or remedial activities.

Versar, Inc. September 16, 1999. Sampling Visit, Solid Waste Management Unit 23, Building 1977, (from Volume II, Sampling Visits, Solid Waste Management Units), Ft. George G. Meade, Fort Meade, Maryland.

In December 1998 and January 1999, Versar, Inc. collected samples from four direct push borings for SWMU 23 at Building 1977, located south of 20th Street (adjacent and to the west of Site Y). At the time of Versar's sampling activities, the building was used for storage of paints, petroleum products, and adhesives.

No visual staining, odors, or PID readings were detected in the soil borings during field activities. Two VOCs (naphthalene and cis 1,2 dichloroethane) and four metals (barium, cadmium, chromium, and lead) were detected in the soil samples at concentrations below their respective EPA Region III RBC for industrial soils. One SVOC, bis (2-Ethylhexyl) Phthalate, was detected in soil samples at concentrations above their RBCs for industrial soil. TPHs and polychlorinated biphenyls (PCBs) were not detected in any of the soil samples.

No visual evidence (free product) or odors were detected in any of the groundwater samples. Two VOCs (carbon disulfide and 2-butanone) were detected in the groundwater samples at concentrations below their respective EPA Region III RBCs for tap water. Barium was detected in the groundwater samples at concentrations below its RBC. TPHs, PCBs, and SVOCs were not detected in any of the groundwater samples.

Versar concluded that current and past activities had affected the site; and therefore, recommended further investigation or remedial activities.

Versar, Inc. September 16, 1999. Sampling Visit, Solid Waste Management Unit 24, Building 1978, (from Volume II, Sampling Visits, Solid Waste Management Units), Ft. George G. Meade, Fort Meade, Maryland.

In December 1998 and January 1999, Versar, Inc. collected samples from six direct push borings for SWMU 24 at Building 1978, located south of 20th Street (adjacent and to the west of Site Y). At the time of Versar's sampling activities, the building was used for administrative activities for the 35th Artillery brigade missile operations, and for storage of small quantities of hazardous materials.

No visual staining, odors, or PID readings were detected in the soil borings during field activities. Five metals (arsenic, barium, cadmium, chromium, and lead) were detected in the soil samples at concentrations below their respective EPA Region III RBC for industrial soils. TPHs, PCBs, VOCs, and SVOCs were not detected in any of the soil samples.

No visual evidence (free product) or odors were detected in any of the groundwater samples. Three VOCs (2-butanone, acetone, cis 1,2-dichloroethane) and three metals (barium, chromium, lead) were detected in the groundwater samples at concentrations below their respective EPA Region III RBCs for tap water. Trichloroethene was detected in a sample at a concentration above its RBC. Arsenic and cadmium were detected in this same sample above their RBCs for tap water. TPH, PCBs, and SVOCs were not detected in any of the groundwater samples.

Versar concluded that current and past activities had affected the site; and therefore, recommended further investigation or remedial activities.

Versar, Inc. September 16, 1999. Sampling Visit, Solid Waste Management Unit 25, Building 2120C, (from Volume II, Sampling Visits, Solid Waste Management Units), Ft. George G. Meade, Fort Meade, Maryland.

In December 1998 and January 1999, Versar, Inc. collected samples from four direct push borings for SWMU 25 at Building 2120C, located south of 22nd Street (adjacent and to the west of Site Y). At the time of Versar's sampling activities, the building had been used to maintain and repair vehicles since 1982.

No visual staining, odors, or PID readings were detected in the soil borings during field activities. One VOC, methylene chloride, and five metals (arsenic, barium, cadmium, chromium, and lead) were detected in the soil samples at concentrations below their respective EPA Region III RBC for industrial soils. TPHs and SVOCs were not detected in any of the soil samples.

No visual evidence (free product) or odors were detected in the groundwater sample. Five VOCs (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 4-methyl-2-pentanone, naphthalene, and p-isopropyl toluene) and one metal, barium, were detected in the groundwater sample at concentrations below their respective EPA Region III RBCs for tap water. RBCs had not been established for naphthalene or p-isopropyl toluene. Diesel-range TPH was detected in the sample at a concentration below its MDE reporting limit. Gasoline-range TPH and SVOCs were not detected in the groundwater sample.

Versar concluded that current and past activities had not affected the site; and therefore, further investigation or remedial activities were not recommended.

Versar, Inc. September 16, 1999. Sampling Visit, Solid Waste Management Unit 26, Building 2120C, (from Volume II, Sampling Visits, Solid Waste Management Units), Ft. George G. Meade, Fort Meade, Maryland.

In December 1998 and January 1999, Versar, Inc. collected samples from three direct push borings for SWMU 26 (the oil-water separator that collects waste water from the building) at Building 2120C located south of 22nd Street (adjacent and to the west of Site Y).

No visual staining, odors, or PID readings were detected in the soil borings during field activities. Five metals (arsenic, barium, cadmium, chromium, and lead) were detected in the soil samples at concentrations below their respective EPA Region III RBC for industrial soils. TPHs, VOCs, and SVOCs were not detected in any of the soil samples.

Versar concluded that the oil-water separator had not affected this site; and therefore, further investigation or remedial activities were not recommended.

Versar, Inc. September 16, 1999. Sampling Visit, Solid Waste Management Unit 27, Building 2120C, (from Volume III, Sampling Visits, Solid Waste Management Units), Ft. George G. Meade, Fort Meade, Maryland.

In December 1998 and January 1999, Versar, Inc. collected samples from four direct push borings for SWMU 27 (the wash rack) at Building 2120C, located south of 22nd Street (adjacent to the west of Site Y). At the time of Versar's sampling activities, the wash rack had been used as a truck wash pit since 1982.

No visual staining, odors, or PID readings were detected in the soil borings during field activities. Twelve VOCs (acetone, ethylbenzene, isopropyl benzene, naphthalene, n-

butylbenzene, p-isopropyltoluene, sec-butylbenzene, 1,2,4 trimethylbenzene, 1,3,5 trimethylbenzene, m,p-xylene, o-xylene, and toluene) and three metals (barium, chromium, and lead) were detected in the soil samples at concentrations below their respective EPA Region III RBC for industrial soils. RBCs had not been established for isopropyl benzene, naphthalene, or p-isopropyl toluene. Gasoline-range TPH was detected in soil samples at concentrations below MDE limits. Diesel-range TPH and SVOCs were not detected in any of the soil samples.

No visual evidence (free product) or odors were detected in the groundwater sample. One metal, barium, was detected in the groundwater sample at a concentration below its respective EPA Region III RBC for tap water. TPHs and VOCs were not detected in the groundwater sample.

Versar concluded that the wash rack had not affected the site; and therefore, further investigation or remedial activities were not recommended.

Versar, Inc. September 16, 1999. Sampling Visit, Solid Waste Management Unit 28, Building 2120C, (from Volume III, Sampling Visits, Solid Waste Management Units), Ft. George G. Meade, Fort Meade, Maryland.

In December 1998 and January 1999, Versar, Inc. collected samples from four direct push borings for SWMU 28 (the oil-water separator that collected wastewater from the truck wash pit) at Building 2120C located south of 22nd Street (adjacent and to the west of Site Y).

No visual staining or odors were detected in the borings during field activities. An elevated PID reading was detected at one of the boring locations. Nine VOCs (acetone, ethylbenzene, isopropyl benzene, naphthalene, N-butylbenzene, P-isopropyltoluene, sec-butylbenzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene) and four metals (barium, cadmium, chromium, and lead) were detected in the soil samples at concentrations below their respective EPA Region III RBCs for industrial soils. Arsenic was detected in one sample at a concentration above its RBC. TPHs and SVOCs were not detected in any of the soil samples.

No visual evidence (free product) or odors were detected in the groundwater sample. Three metals (barium, chromium, and mercury) were detected in the groundwater sample at concentrations below their respective EPA Region III RBCs for tap water, and two metals (cadmium and lead) were detected in one sample at concentrations above their RBCs. TPHs and VOCs were not detected in either of the groundwater samples.

Versar concluded that the oil-water separator had not affected this site; and therefore, further investigation or remedial activities were not recommended.

Versar, Inc. September 16, 1999. Sampling Visit, Solid Waste Management Units 29 and 30, Building 2121, (from Volume III, Sampling Visits, Solid Waste Management Units), Ft. George G. Meade, Fort Meade, Maryland.

In December 1998 and January 1999, Versar, Inc. collected samples from four direct push borings for SWMUs 29 and 30 at Building 2121, located south of 22nd Street (adjacent and to the west of Site Y). Building 2121 was once a vehicle and small engine maintenance and repair facility that stored various chemicals, such as antifreeze and oil.

No visual staining or odors were detected in the soil borings during field activities. Elevated PID reading was detected at three of the sampling locations. Seven VOCs (acetone, ethylbenzene, naphthalene, o-xylene, toluene, 1,4-dichlorobenzene, and 1,2,4-trimethylbenzene) and five metals (arsenic, barium, cadmium, chromium, and lead) were detected in the soil samples at

concentrations below their respective EPA Region III RBC for industrial soils. An RBC had not been established for naphthalene. TPHs and SVOCs were not detected in any of the soil samples.

Versar concluded that past and current site activities had not affected this site; and therefore, further investigation or remedial activities were not recommended.

Versar, Inc. September 16, 1999. Sampling Visit, Solid Waste Management Unit 31, Building 2122, (from Volume III, Sampling Visits, Solid Waste Management Units), Ft. George G. Meade, Fort Meade, Maryland.

In December 1998 and January 1999, Versar, Inc. collected samples from four direct push borings for SWMU 31 at Building 2122, located south of 22nd Street (adjacent and to the west of Site Y). Building 2122 was once a vehicle maintenance facility. At the time of Versar's field activities, the building was being used for storage of various types of military equipment.

No visual staining or odors were detected in the soil borings during field activities. Elevated PID reading was detected at two of the sampling locations. One VOC, acetone, and five metals (arsenic, barium, cadmium, chromium, and lead) were detected in the soil samples at concentrations below their respective EPA Region III RBCs for industrial soils. TPHs and SVOCs were not detected in any of the soil samples.

Versar concluded that past and current site activities had not affected this site; and therefore, further investigation or remedial activities were not recommended.

Versar, Inc. September 16, 1999. Sampling Visit, Solid Waste Management Unit 32, Building 2123, (from Volume III, Sampling Visits, Solid Waste Management Units), Ft. George G. Meade, Fort Meade, Maryland.

In December 1998 and January 1999, Versar, Inc. collected samples from four direct push borings for SWMU 32 at Building 2123, located south of 22nd Street (adjacent to the west of Site Y). Building 2123 was once a vehicle maintenance facility. At the time of Versar's field activities, the building was being used for storage of tents and jeeps.

No visual staining, odors, or elevated PID readings were detected in the soil borings during field activities. Five metals (arsenic, barium, cadmium, chromium, and lead) were detected in the soil samples at concentrations below their respective EPA Region III RBC for industrial soils. TPHs, VOCs, and SVOCs were not detected in any of the soil samples.

Versar concluded that past and current site activities had not affected this site; and therefore, further investigation or remedial activities were not recommended.

Versar, Inc. September 16, 1999. Sampling Visit, Solid Waste Management Units 33 and 34, Building 2124, (from Volume III, Sampling Visits, Solid Waste Management Units), Ft. George G. Meade, Fort Meade, Maryland.

In December 1998 and January 1999, Versar, Inc. collected samples from four direct push borings for SWMUs 33 and 34 at Building 2124, located south of 22nd Street (adjacent and to the west of Site Y). At the time of Versar's field activities, the building was being used for storage of vehicles and tools. In the past, waste from the building activities may have been discarded onsite.

No visual staining, odors, or elevated PID readings were detected in the soil borings during field activities. Five metals (barium, cadmium, chromium, lead, and mercury) were detected in the soil samples at concentrations below their respective EPA Region III RBC for industrial soils.

Arsenic was detected in one sample at a concentration above its RBC. TPHs, VOCs, and SVOCs were not detected in any of the soil samples.

Versar concluded that past and current site activities had not affected this site; and therefore, further investigation or remedial activities were not recommended.

Versar, Inc. September 16, 1999. Sampling Visit, Solid Waste Management Units 35 and 36, Building 2128, (from Volume III, Sampling Visits, Solid Waste Management Units), Ft. George G. Meade, Fort Meade, Maryland.

In December 1998 and January 1999, Versar, Inc. collected samples from six direct push borings for SWMUs 35 and 36 at Building 2128, located south of 22nd Street (adjacent and to the west of Site Y). At the time of Versar's field activities, the building was being used as a vehicle maintenance facility. In the past, waste from the building activities may have been discarded onsite.

No visual staining was observed in the soil borings during field activities. Odors and an elevated PID reading were detected at one of the sampling locations. Five metals (barium, cadmium, chromium, lead, and mercury) were detected in the soil samples at concentrations below their respective EPA Region III RBCs for industrial soils. Arsenic was detected in one sample at a concentration above its RBC. Gasoline-range TPH was detected in one soil sample at a concentration below the MDE limits. DRO-TPH, VOCs, and SVOCs were not detected in any of the soil samples.

No visual evidence (free product) or odors were detected in the groundwater sample. Three VOCs (2-butanone, carbon disulfide, and acetone) and two metals (barium and chromium) were detected in the groundwater sample at concentrations below their RBCs. Lead was detected in the groundwater sample above its RBC. TPHs and SVOCs were not detected in the groundwater sample.

Versar concluded that current and past activities had affected the site; and therefore, recommended further investigation or remedial activities.

Versar, Inc. October 30, 2001. Site Investigation Report, Building 2120C (SWMU 25), Ft. George G. Meade, Fort Meade, Maryland.

In October 2001, Versar, Inc. prepared a Site Investigation (SI) Report for SWMU 25 at Building 2120C, located south of 22nd Street (adjacent and to the west of Site Y). The purpose of the SI Report was to further evaluate soil and groundwater quality in areas where constituents were detected at elevated concentrations. These elevated concentrations were initially detected during a site visit to analyze soil and groundwater samples for additional constituents. At the time of Versar's sampling activities, the building had been used to maintain and repair vehicles since 1982.

No evidence of hazardous materials or hazardous wastes associated with past or current site activities were observed during a visual inspection.

No staining or odors were detected at the sampling locations during field activities. Three VOCs (toluene, acetone, and naphthalene) and four pesticides (heptachlor epoxide, 4,4-DDE, 4,4-DDD, and 4,4-DDT) were detected in the soil samples, but at concentrations below their respective EPA Region III RBC for residential and industrial soils and MDE cleanup standards. One VOC, methylene chloride, was detected in the soil samples at a concentration above MDE cleanup

standards for groundwater protection, but below the RBCs. Six metals (arsenic, barium, cadmium, chromium, lead, and selenium) were detected in the samples at levels that are within the expected natural background ranges for the Fort Meade area. TPHs, SVOCs, and herbicides were not detected in any of the soil samples.

No visual evidence (free product) or odors were detected in any of the groundwater samples. Three VOCs (acetone, 1,2,4-trimethylbenzene, and naphthalene) and one metal, barium, were detected in the groundwater samples at concentrations below their respective EPA Region III RBCs for tap water. TPH were detected in the samples at concentrations above their MDE cleanup standards, but below tap water RBCs. SVOCs, herbicides, and pesticides were not detected in any of the groundwater samples.

Environmental Protection Agency. March 1996. Aerial Photographic Analysis, Fort George G. Meade – Cantonment Area, Anne Arundel County, Maryland (as recorded in URS March 2005, Draft PA Report).

In 1996, the EPA conducted an aerial photographic analysis of Fort Meade to identify possible areas of environmental concern. This analysis did not identify environmental concerns at this site.

EM Federal Corporation, July 2004, Working Draft Site Management Plan, Fort George G. Meade.

The Site Management Plan contains information on numerous sites at Ft Meade. Several sites were adjacent to or near Site Y. Since these sites are only adjacent to Site Y and not on Site Y, only discussions of groundwater are included. It is assumed that any soil contamination would not readily migrate onto Site Y.

SWMUs 22-24. Buildings 1974, 1976, 1977, and 1978 supported the Nike Missile Control Site until 1972. A UST and saturated soil removal was performed at Building 1977 in 1990. Free product was encountered on the water table during subsequent sampling in 1999 and 2000, along with VOC, SVOC, metals, and TPH-DRO exceedences in groundwater. The ground surface slopes moderately to the north-northeast. Groundwater was encountered at depths of 4-17 feet. Local groundwater flow direction was estimated to be to the northeast, toward Site Y. At Partnership meetings held in 2001, it was determined that further action under CERCLA is required. A Remedial Investigation (RI) work plan was completed in June 2003 to address these issues.

SWMUs 25 and 26. Building 2120C (SWMU 25) was used to maintain and repair motor vehicles since 1982. SWMU 26 was the oil/water separator. In 1999 and 2000 sampling, naphthalene, TPH-DRO, and GRO exceedences were recorded for groundwater. The ground slopes gently to the east. Groundwater was encountered at 8-21 feet at four locations, and not encountered to the explored depth of 30 feet at other locations. Groundwater flow is estimated to flow to the south or southeast, towards Site Y. At Partnership meetings held in 2002 it was determined that further action under RCRA is required.

SWMUs 27 and 28. SWMU 27 is a truck wash pit and SWMU 28 is an oil/water separator associated with Building 2120C. In 1999 and 2000 sampling, arsenic, cadmium, copper, and lead exceedences were recorded for groundwater. The ground surface slopes gently to the east. Perched groundwater was encountered at 5-14 feet, otherwise the borings were dry to 17 feet. Localized groundwater is estimated to flow south/southeast, following the local topography. At

Partnership meetings held in 2002, it was determined that no further action is required at these sites.

SWMUs 29-34. Former Building 2121 (SWMUs 29-30) operated as a vehicle and small engine repair and maintenance facility. Former Building 2122 (SWMU 31) was used as a vehicle maintenance facility. Building 2123 (SWMU 32) and Building 2124 (SWMUs 33 and 34) were used as vehicle maintenance facilities. In 1999 and 2000 sampling, no groundwater was encountered at explored depths of up to 28 feet. At these locations, the surface slopes gently to the southeast and groundwater flow was estimated to flow to the south or southeast, towards Site Y. At Partnership meetings held in 2001 and 2002, it was determined that no further action is required at any of these buildings.

SWMUs 35 and 36. Building 2128 was a former Heavy Equipment and Generator Maintenance Shop. In 1999 and 2000 sampling, arsenic, thallium, and lead exceedences in groundwater were recorded. VOCs, SVOCs, and TPH exceedences were recorded during groundwater sampling in 2002. The ground surface slopes to the east. Perched groundwater was encountered at 1-7 feet, but not encountered at 15 feet at most locations. Groundwater flow is estimated to be to the south-southeast, towards Site Y, but may vary locally. At Partnership meetings held in 2002, it was determined that further evaluation is required under MDE's Oil Control Program.

Malcolm Pirnie. July 2006. Final Historical Records Review, Fort George G. Meade, Fort Meade, Maryland.

In May 2006, Malcolm Pirnie conducted a historical records review (HRR) to identify defense sites with munitions and explosives of concern; unexploded ordnances (UXO), discarded military munitions (DMM), and munitions constituents (MC) at Fort Meade. The sites where UXO, DMM, and MC are known or expected, and where the release occurred prior to September 30, 2002, would be eligible for the Military Munitions Response Program (MMRP).

Pirnie also identified areas of interest during the HRR. These areas of interest were determined to be MMRP ineligible. Pirnie identified the southwest portion of Site Y, the area just south of 20th Street, as an "area of interest" based on its possible former use as a training area (aerial photographs from 1938 until 1952 show disturbed ground). No details were available regarding the types of training that may have been conducted at the site.

4.3.2 Site Z

Environmental Protection Agency. March 1996. Aerial Photographic Analysis, Fort George G. Meade – Cantonment Area, Anne Arundel County, Maryland.

In 1996, the EPA conducted an aerial photographic analysis of Fort Meade to identify possible areas of environmental concern. The analysis identified a small pit on the 1700 block in a wooded area (located on the southern, central portion of Site Z) in a 1952 aerial. Although the EPA's report did not identify environmental concerns at this site, it is unknown if the pit was used for waste disposal. Subsequent aerial photographs did not identify environmental concerns at the site. URS performed a detailed site reconnaissance in 2005 and found no evidence of pits.

Malcolm Pirnie. July 2006. Final Historical Records Review, Fort George G. Meade, Fort Meade, Maryland.

In May 2006, Malcolm Pirnie conducted an HRR to identify defense sites with munitions and explosives of concern (UXO, DMM, and MC) at Fort Meade. The sites where UXO, DMM, and MC are known or expected, and where the release occurred prior to September 30, 2002, would be eligible for the MMRP.

Pirnie indicates that former “Grenade and Bayonet Range B” extends onto the southwest portion of Site Z. Range B is a 19-acre former range. Live and practice grenade training, as well as bayonet training, was conducted at the range according to a training memorandum from 1943. The hand grenades could have included fragmentation, practice, and WP hand grenades. According to the Pirnie report, a 1943 aerial photograph shows a structure (possible grenade bunker) and disturbed ground to the south of the structure that may have been the grenade impact area. Disturbed ground is also shown to the north of the structure in the aerial photograph. The range is also surrounded to the north and east (Site Z) by a training area that appears on aerial photographs in this report from 1938 until 1947. In the 1952 aerial photograph in this report, military housing is shown on the northern half of the range. In the 1957 aerial photograph, military housing covers the entire former range. Pirnie reported that there was a potential that munitions debris items could be located on the former range area. MCs associated with hand grenades include black powder, smokeless powder, trinitrotoluene (TNT), perchlorate, and pentaerythritoltetranitrate (PETN). At the time of the report, no soil samples had been collected and analyzed for these MCs. Pirnie identified several potentially complete pathways for human and ecological receptors in the surface and subsurface soils.

Pirnie also identified areas of interest during the HRR. These areas of interest were determined to be MMRP ineligible. Pirnie identified the entire Site Z as an “area of interest” based on its possible former use as a training area (aerial photographs from 1938 until 1952 show disturbed ground). No details were available regarding the types of training that may have been conducted at the site.

4.4 SITE RECONNAISSANCE AND INTERVIEWS

The site descriptions in this section are based on visits to these sites and interviews conducted during August 2006. The photographs referenced in this section can be found in Appendix A.

4.4.1 Site Y

Site Y primarily consists of undeveloped wooded land. A few dirt trails and several creeks and streams were observed throughout the site. The following observations were made during the reconnaissance of Site Y (see Figure 2-4 for the locations of grid cells identified below):

- Three monitoring wells were observed in the north corner of grid cell G3, the north-central edge of grid cell G2, and near the southwest edge of grid cell G2 (Appendix A.2, Photograph EA-Y5).
- An approximately 5- by 10-foot rectangular hole filled with stormwater located near the north-central edge of grid cell H4. Two long, 2-inch wide cables are attached to the trees adjacent to the hole (Photos EA-Y1 and EA-Y2).
- A rusted, abandoned car in the central portion of grid cell D6 (Photo EA-Y9).

- A circular, sand clearing is located in grid cells B5 and B6. This is the site of the former incinerator that reportedly operated from 1947 until 1975. Two large metal debris objects, most likely part of the former incinerator, were observed in the clearing (Photos EA-Y10 through EA-Y13).
- A pole-mounted transformer was observed just outside the southern-most corner of the site along Reece Road. The transformer had a “non-PCB” label and no evidence of staining or leaking was observed on the ground beneath (Photo EA-Y8).

4.4.2 Site Z

Site Z primarily consists of undeveloped wooded land with a few dirt trails and drainage ditches/intermittent streams. The following observations were made during the reconnaissance of Site Z (see Figure 2-5 for the locations of grid cells identified below):

- The following unimproved dirt trails were observed:
 - Trending northwest-southeast on the western 1/3 of the site
 - Trending northwest-east (branching off from above-mentioned trail) running through the central portion of the site
 - Trending west-east (branching off from first named trail) on the western-central portion of the site
 - Trending southwest-northeast and bordering the site to the south
- Drainage ditches and intermittent streams throughout the site.
- A dirt berm extending approximately 15 feet in the northern portion of grid cell C1.
- Used tires in the northern and eastern portion of grid cell C1 and in the eastern edge of grid cell A4.
- Concrete debris pile in the southern portion of grid cell A1.
- A 275-gallon capacity aboveground storage tank (AST) in the northeast corner of grid cell C3 (Photo EA-Z3). According to the label, the tank once contained kerosene, but appeared to be empty at the time of the site reconnaissance. The tank is heavily rusted; however, no staining or leaking was evident in the immediate surrounding areas.
- A lot of dumping along the northeast perimeter of the site, in the northeast edge of grid cell A4, most likely from the adjacent residential properties. Discarded items include: a hot water heater, lawn mower, tires, and trash (Photos EA-Z5 and EA-Z6).
- Typical litter and trash, such as paper, bottles, and cans were observed throughout the site.
- A pole-mounted transformer was observed just outside the northeast corner of the site along Reece Road. The transformer had a “non-PCB” label, and no evidence of staining or leaking was observed on the ground beneath (Photo EA-Z7).

4.5 HISTORICAL TOPOGRAPHIC MAPS

This section discusses the historic topographic maps that were reviewed as part of this study. The maps indicate land use and natural resource changes that help characterize the environmental conditions at and around the sites. Maps from 1907, 1908, 1947, 1949, 1957, 1970 and 1979 were reviewed for each of the sites. In addition, maps from 1950, 1966, and 1974 were reviewed for the northernmost tip of Site Y. Copies of the topographic maps depicting each site are included as Figures 4-4 through 4-10. Copies of the original topographic maps (without the site locations) are included in Appendix C.

4.5.1 Site Y

Table 4-2 below summarizes changes at Site Y observed on the available topographic maps.

Table 4-2: Summary of Historic Topographic Maps Depicting Changes at Site Y

Date	Location	Observation
1907	Subject Property	The site is shown predominantly as undeveloped land, with an intermittent stream trending northwest-southeast running through the central portion of the site. An unimproved road is also shown running southwest-northeast through the central portion of the site.
	Adjacent	North: Undeveloped land followed by roadways and a few small structures. East: The intermittent stream and unimproved roadway that run through the site, as well as a couple small structures and a church along Reece Road. South: Reece Road followed by undeveloped land (Site Z) and a few small structures. West: A few small structures followed by Annapolis Road.
1908	Subject Property	Appears similar to the 1907 topographic map.
	Adjacent	North: Appears similar to the 1907 topographic map. East: Appears similar to the 1907 topographic map. South: Appears similar to the 1907 topographic map. West: Appears similar to the 1907 topographic map.
1947	Subject Property	Appears similar to the 1907 topographic map, except the site is part of the Fort George G. Meade Military Reservation, and the number of unimproved roads running through the central portion of the site has increased. A chimney (most likely the former incinerator) is portrayed on the northern portion of the site, at the easternmost extent of 22 nd Street.
	Adjacent	North: An intermittent stream followed by a few small structures and a roadway. East: Small structures and associated roadways. South: Reece Road followed by undeveloped wooded land (Site Z). West: Small structures and associated roadways followed by Annapolis Road. A cemetery and a water tank are south of 20 th Street, east of Annapolis Road.
1949	Subject Property	No major changes since the 1947 topographic map.

Date	Location	Observation
	Adjacent	North: Appears similar to the 1947 topographic map. East: Appears similar to the 1947 topographic map. South: Appears similar to the 1947 topographic map. West: Appears similar to the 1947 topographic map.
1957	Subject Property	No major changes from the 1949 topographic map, except that there are no longer any unimproved roads on the site, but the extension of 22 nd Street enters the site. There is a small clearing on the northern portion at the end of a dirt road, which extends east from 22 nd Street where the incinerator was located.
	Adjacent	North: Undeveloped wooded land and a few small structures and roadways. East: No major changes since the 1949 topographic map, except that Meade Heights Elementary School is located southeast, adjacent to the site, along Reece Road. South: Reece Road followed by undeveloped wooded land (Site Z) and small structures and roadways to the southwest. West: No major changes since the 1949 topographic map.
1970	Subject Property	No major changes since the 1957 topographic map.
	Adjacent	North: No major changes since the 1957 topographic map. East: No major changes since the 1957 topographic map. South: No major changes since the 1957 topographic map. West: No major changes since the 1957 topographic map.
1979	Subject Property	Appears similar to the 1970 topographic map.
	Adjacent	North: No major changes since the 1970 topographic map. East: No major changes since the 1970 topographic map. South: No major changes since the 1970 topographic map. West: No major changes since the 1970 topographic map.

4.5.2 Site Z

Table 4-3 below summarizes changes at Site Z observed on the available topographic maps.

Table 4-3: Summary of Historic Topographic Maps Depicting Changes at Site Z

Date	Location	Observation
1907	Subject Property	The site is shown as undeveloped land.
	Adjacent	North: Reece Road followed by undeveloped land and three small structures (most likely residential) to the northwest. East: Undeveloped land. South: Undeveloped land. West: Two small structures (most likely residential) followed by Annapolis Road.

Date	Location	Observation
1908	Subject Property	Appears similar to the 1907 topographic map.
	Adjacent	North: Appears similar to the 1907 topographic map. East: Appears similar to the 1907 topographic map. South: Appears similar to the 1907 topographic map. West: Appears similar to the 1907 topographic map.
1947	Subject Property	Appears similar to the 1947 topographic map, except the site is part of the Fort George G. Meade Military Reservation. The site is shown as undeveloped wooded land, with an unimproved road trending northwest-southeast on the western portion of the site. An intermittent stream is located on the southwest corner of the site.
	Adjacent	North: Reece Road followed by undeveloped wooded land and a few small buildings, a cemetery, and a water tank to the northwest. East: Several small structures and a roadway. South: An unimproved road running southwest-northeast, followed by the Fort Meade boundary and then undeveloped wooded land and a roadway. West: Undeveloped wooded land and cleared land with a cemetery followed by Annapolis Road.
1949	Subject Property	No major changes since the 1947 topographic map, except that another unimproved road is shown branching off from the first one, trending southeast through the center of the site.
	Adjacent	North: Appears similar to the 1947 topographic map. East: Appears similar to the 1947 topographic map. South: Appears similar to the 1947 topographic map. West: Appears similar to the 1947 topographic map.
1957	Subject Property	The unimproved road that appeared in the 1949 topographic map is now shown as a trail. Another unimproved road is shown branching off from the original unimproved road and running west.
	Adjacent	North: Meade Heights Elementary School and undeveloped wooded land. Small and medium size structures and associated roadways are shown to the northwest, as well as the tank and cemetery previously mentioned. East: No major changes since the 1949 topographic map. South: No major changes since the 1949 topographic map. West: An unimproved road followed by numerous small to medium size structures and associated roadways.
1970	Subject Property	No major changes since the 1957 topographic map, except that the unimproved, western trending road that appeared in the 1957 map is no longer portrayed.
	Adjacent	North: No major changes since the 1957 topographic map. East: No major changes since the 1957 topographic map. South: No major changes since the 1957 topographic map. West: No major changes since the 1957 topographic map, except that the unimproved road is no longer shown.
1979	Subject Property	Appears similar to the 1970 topographic map.

Date	Location	Observation
	Adjacent	North: No major changes since the 1970 topographic map. East: No major changes since the 1970 topographic map. South: No major changes since the 1970 topographic map. West: No major changes since the 1970 topographic map.

4.6 HISTORICAL AERIAL PHOTOGRAPHS REVIEW

This section discusses the historic aerial photographs that were reviewed as part of this study. The aerial photographs indicate land use and natural resource changes that help characterize the environmental conditions at the sites. Aerial photographs from 1957, 1963, 1970, 1980, and 1988 were reviewed for each of the sites. Copies of these aerial photographs with site depictions are included as Figures 4-11 through 4-20. Copies of the original aerial photographs are included in Appendix D.

4.6.1 Site Y

Table 4-4 below summarizes changes at Site Y observed on the available aerial photographs.

Table 4-4: Summary of Historic Aerial Photographs Depicting Changes at Site Y

Date	Location	Observation
1957	Subject Property	The site appears as mostly undeveloped wooded land. A stream is shown trending west-east in the central portion of the site. Numerous smaller stream channels are depicted throughout the site. On the northern portion of the site, at the easternmost extent of 22 nd Street, there is a clearing with a building (most likely the former incinerator).
	Adjacent	North: Some clearings with structures and roadways (most likely residential neighborhoods and farms) and undeveloped wooded land. East: Meade Heights Elementary School along Reece Road, the stream channel, and undeveloped wooded land followed by clearings with structures and roadways (most likely residential neighborhoods). South: Reece Road followed by undeveloped wooded land (Site Z) and a residential neighborhood to the southwest. West: Medium size structures and roadways (most likely Fort Meade support buildings) on the northern two-thirds; a clearing with a few small structures and roadways (most likely the former Trap and Skeet Range) adjacent to the west of the central portion of the site; and small structures and roadways (most likely residential neighborhoods) on the southern third.

Date	Location	Observation
1963	Subject Property	Appears similar to the 1957 aerial photograph.
	Adjacent	North: Appears similar to the 1957 aerial photograph. East: Appears similar to the 1957 aerial photograph. South: Appears similar to the 1957 aerial photograph. West: Appears similar to the 1957 aerial photograph.
1970	Subject Property	No major changes since the 1963 aerial photograph, except that the woodland appears less dense, with more trails and clearings in the central portion of the site, south of the incinerator.
	Adjacent	North: Appears similar to the 1963 aerial photograph, except for more clearings northeast of the subject property. East: Appears similar to the 1963 aerial photograph, except for more clearings northeast of the subject property. South: Appears similar to the 1963 aerial photograph. West: Appears similar to the 1963 aerial photograph.
1980	Subject Property	No major changes since the 1970 aerial photograph, except that the woodland area that previously appeared less dense with more trails in the central portion of the site is now filled in again. In addition, the incinerator structure is no longer located in the clearing on the northern portion of the site.
	Adjacent	North: Appears similar to the 1970 aerial photograph. East: Appears similar to the 1970 aerial photograph. South: Appears similar to the 1970 aerial photograph. West: Appears similar to the 1970 aerial photograph, except that a pond is shown near the Trap and Skeet range at the easternmost extension of 20 th Street.
1988	Subject Property	No major changes since the 1980 aerial photograph.
	Adjacent	North: Appears similar to the 1980 aerial photograph, except more housing appears to the northeast of the subject property. East: Appears similar to the 1980 aerial photograph. South: Appears similar to the 1980 aerial photograph. West: Appears similar to the 1980 aerial photograph.

4.6.2 Site Z

Table 4-5 below summarizes changes at Site Z observed on the available aerial photographs.

Table 4-5: Summary of Historic Aerial Photographs Depicting Changes at Site Z

Date	Location	Observation
1957	Subject Property	The site is predominantly undeveloped wooded land. A few trails run through the site, and a small circular clearing is located on the southwest corner of the site.
	Adjacent	North: Reece Road followed by Meade Heights Elementary School and then undeveloped wooded land (Site Y). East: A trail trending northwest-southeast, followed by a few residential structures and undeveloped wooded land. South: A few trails and undeveloped wooded land. West: Residential neighborhood.
1963	Subject Property	No major changes from the 1957 aerial photograph, except that the trails are not as pronounced, and the clearing that was located on the southwest corner is now grown in with trees.
	Adjacent	North: Appears similar to the 1957 aerial photograph. East: No major changes from the 1957 aerial photograph. South: Appears similar to the 1957 aerial photograph. West: Appears similar to the 1957 aerial photograph.
1970	Subject Property	Appears similar to the 1963 aerial photograph.
	Adjacent	North: Appears similar to the 1963 aerial photograph. East: Appears similar to the 1963 aerial photograph. South: Appears similar to the 1963 aerial photograph. West: Appears similar to the 1963 aerial photograph.
1980	Subject Property	Appears similar to the 1970 aerial photograph.
	Adjacent	North: Appears similar to the 1970 aerial photograph. East: No major changes from the 1970 aerial photograph, except that it appears that a residential neighborhood has been built on the cleared land to the east. South: Appears similar to the 1970 aerial photograph. West: Appears similar to the 1970 aerial photograph.
1988	Subject Property	Appears similar to the 1980 aerial photograph.
	Adjacent	North: Appears similar to the 1980 aerial photograph. East: Appears similar to the 1980 aerial photograph. South: Appears similar to the 1980 aerial photograph. West: Appears similar to the 1980 aerial photograph.

4.7 DATABASE SEARCHES

URS reviewed information gathered from several environmental databases through EDR to evaluate whether activities on or near the subject properties have the potential to create a Recognized Environmental Condition (REC) on the subject properties. EDR reviews databases

compiled by Federal, State, and local governmental agencies. The complete list of databases reviewed by EDR is provided in EDR's report, which is included in Appendix D. It should be noted that this information is reported as URS received it from EDR, which in turn reports information as it is provided in various government databases. It is not possible for either URS or EDR to verify the accuracy or completeness of information contained in these databases. However, the use of and reliance on this information is a generally accepted practice in the conduct of environmental due diligence. A description of the databases searched was provided in Section 2.6 of this report. The information obtained in those databases is summarized below:

4.7.1 Groundwater Well Records

EDR lists several wells from Federal and State databases that are within or near Sites Y and Z (Figure 4-21 and Appendix E). Figure 4-21 shows the well locations as plotted by EDR and also shows the same wells plotted by the well location road name and distance from road provided by EDR. In many cases, the two locations did not correspond. The majority of the wells closest to or plotted within the boundaries of Sites Y and Z are relatively shallow; from 20 feet to a little over 100 feet deep with an occasional well extending to several hundred feet deep. The majority of the wells reviewed were drilled in the early 1990's, with completion dates ranging from the mid 1960's to 2004. EDR reports all these wells as being water wells; no public water supply wells were mapped by EDR.

4.7.2 Site Y

Subject Property: The subject property was not listed in any of the regulatory databases, except for being listed as a DoD site.

Surrounding Properties: The EDR report identified the following three sites in the surrounding area in regulatory databases:

- 1925 Reece Road, ~ 1/8 mile west-southwest, identified as Meade Heights Elementary: listed on the Resource Conservation and Recovery Act (RCRA) Small-Quantity Generator (SQG) database (no violations) and the UST database (no record of leaking tank). No releases of hazardous materials have been reported from this site.
- 1942-94 Annapolis Road, < 1/2 mile west and ~ 1/8 mile south, identified as Firestone Store #0435: listed on the Historical UST database (tank has been removed). No releases of hazardous materials have been reported from this site.
- Annapolis Road/Clark Road, 1/4 mile west-southwest, identified as Meade High School: listed on the MD Oil Control Program Cases (OCPCASES) database (Facility Status: Closed; release and cleanup documented). Releases of hazardous materials from this site have been remediated to the satisfaction of the MDE, and are not expected to have any impact on Site Y.

Orphan Sites: URS reviewed the Orphan Sites List, which are sites that have not been geocoded based on lack of sufficient data regarding their exact location within the general area. The review of the Orphan Sites List identified the following property that is located in the vicinity of Site Y:

- 20 1/2 Street/Route 175, < 1/2 mile south and west, identified at Ft. Meade ECS 86: listed on the MD OCPCASES database (Facility Status: Closed). Releases of

hazardous materials from this site have been remediated to the satisfaction of the MDE, and are not expected to have any impact on Site Y.

4.7.3 Site Z

Subject Property: The subject property was not listed in any of the regulatory databases, except for being listed as a DoD site.

Surrounding Properties: The EDR report identified the following four sites in the surrounding area in regulatory databases:

- 1925 Reece Road, ~ ¼ mile west, identified as Meade Heights Elementary: listed on the RCRA SQG database (no violations) and the UST database (no record of leaking tank). No releases of hazardous materials have been reported from this site.
- 1942-94 Annapolis Road, < ½ mile northwest, identified as Firestone Store #0435: listed on the Historical UST database (tank has been removed). Although a release of hazardous materials from this site has not been reported, the case is not closed and the status is unknown. The impact of to Site Z is unknown.
- Annapolis Road/Clark Road, ~ ½ mile northwest, identified as Meade High School: listed on the MD OCPCASES database (Facility Status: Closed; release and cleanup documented). Releases of hazardous materials from this site have been remediated to the satisfaction of the MDE, and are not expected to have any impact on Site Y.
- 1604 Annapolis Road, ~ ½ mile south-southwest, identified as Amoco Paceway: listed on the HIST LUST database (Case Status: Open; Case Number: 90-1737AA; Recovery Type: Hand Bailing monitoring wells for free product); this property is unlikely to create a REC on Site Z, because of its downgradient location and intervening topography and infrastructure.

Orphan Sites: URS reviewed the Orphan Sites List, which are sites that have not been geocoded based on lack of sufficient data regarding their exact location within the general area. The review of the Orphan Sites List identified the following property that is located in the vicinity of Site Y:

- 20 ½ Street/Route 175, < ½ mile south and west, identified at Ft. Meade ECS 86: listed on the MD OCPCASES database (Facility Status: Closed). Releases of hazardous materials from this site have been remediated to the satisfaction of the MDE, and are not expected to have any impact on Site Y.

4.8 POTENTIAL FUTURE SITE USES

Potential future site uses include development with buildings and infrastructure. A commercial park is proposed for both Sites Y and Z.

4.8.1 Water Systems

FGGM operates a water treatment plant. It receives water from six groundwater wells and the Little Patuxent River. The river water intake and low lift pumping station extract about 7 million gallons per day (mgd). The wells vary in depth from 70 to 800 feet. Because of planned and

proposed development within Ft Meade boundaries, availability of potable water for Sites Y and Z is unknown at this time.

4.8.2 Sanitary Systems

An extensive sanitary system serves FGGM. With both gravity and force mains, service connection sewers, a major pumping station, and many small pumping stations, FGGM's sewage treatment plant treats approximately 2.3 mgd and has a reported peak design treatment capacity of 4.6 mgd. Because of planned and proposed development within Ft Meade boundaries, availability of sanitary sewage treatment for Sites Y and Z is unknown at this time.

4.8.3 Electrical Systems

Power is supplied to FGGM by the Baltimore Gas and Electric Company (BGE). No electrical power is currently generated on site, although the base does have many emergency, stand-by generators. Availability of electricity for Sites Y and Z would depend upon the type of development and negotiations with BGE.

4.8.4 Transportation

Several roadways allow direct access to FGGM from Maryland Route 32, Maryland Route 175, and Maryland Route 275. From the west, there is direct access from Maryland Route 295. From the east, FGGM can be accessed from Maryland Route 175 at Rockenbach Road, Reese Road, Mapes Road, and Llewellyn Avenue. From the south, Mapes Road off Maryland Route 32 and Pepper Road access the base. The NSA maintains exclusive use of FGGM's western boundary and maintains several gates. Main thoroughfares through the base consist of Rock Avenue, Llewellyn Avenue, Mapes Road, Reece Road, and Rockenbach Road going east-west, and Ernie Pyle Street, MacArthur Road, Cooper Avenue, O'Brien Road, and Canine Road running north-south.

Both Site Y and Site Z can be accessed without passing through a FGGM gate and subsequent security checkpoint.

Two commuter railroad lines service FGGM. The closest station for the western line is located in Jessup, approximately 1.5 miles to the west. The closest for the eastern line is at Odenton, 1.5 miles to the east.

Maryland Mass Transit Administration does not offer bus service to FGGM.

4.8.5 Asbestos

4.8.5.1 Site Y

At the time of the site visit, there were no structures on Site Y. Therefore, asbestos-containing materials (ACMs) are unlikely to be present on the site.

4.8.5.2 Site Z

At the time of the site visit, there were no structures on Site Z. Therefore, ACMs are unlikely to be present on the site.

4.8.6 Lead

4.8.6.1 Site Y

In 1999, direct-push soil samples were collected in the area of the former incinerator (operating from 1947-1975), which is located on the northern portion of Site Y at the easternmost extension of 22nd Street. Lead was not detected in any of the soil samples (Versar, 1999a). However, since the surface soils were disturbed during sand washing operations, and surface soil was not sampled, the potential for lead contaminated soil still exists.

There was at least one building associated with the old incinerator site in the northeast portion of Site Y. Due to the age of the building, lead from lead-based paint (LBP) may have been used on the building, and lead may have accumulated in the soil around the former building location. An investigation of potential lead in soil due to probable lead based paint used on structures in this location has not been performed. Since there are no other structures on the site, LBP is unlikely to be present elsewhere on the site.

Also in 1999, soil, sediment, and surface water samples were collected from the former trap and skeet range, which is located on the easternmost extension of 20th Street (adjacent to the west of Site Y next to the pond). EPA Method 6010B/3050A was used to test for total lead. Lead was detected in the outlying soil samples and the dry stream channel sediment samples. It was concluded that these elevated concentrations were the result of lead shot clearing the berm (on the east side of the pond) and coming to rest in the outlying areas (the western edge of Site Y) (Versar, 1999b). Lead was also detected in the majority of groundwater samples collected in the vicinity of the former trap and skeet range. However, Versar indicated that this may be the result of natural background conditions at Fort Meade (Versar, 2002).

4.8.6.2 Site Z

The southwest portion of Site Z served as a training area (possibly Grenade and Bayonet Range B) in the past. Surface and subsurface investigations have not been conducted at the site; therefore, it is unclear whether lead shot is present in onsite soils. Since there are no structures on the site, LBP is unlikely to be present on the site.

4.8.7 Pesticides and Herbicides

4.8.7.1 Site Y

Pesticides and herbicides were not observed on Site Y during the site reconnaissance. In 1999, a composite sample of lead shot, skeet fragments, plastic shell casings, and plastic wad deposits was collected from the former trap and skeet range (located on the easternmost extension of 20th Street adjacent to the west of Site Y). The sample was analyzed for pesticides and herbicides;

none were detected in the composite sample (Versar, 1999b). The site does not have a history of intense agricultural use during the time that pesticides and herbicides were widely available.

4.8.7.2 Site Z

Pesticides and herbicides were not observed on Site Z during the site reconnaissance. URS did not obtain any documentation that suggests that the site has ever been tested for pesticides and herbicides. The site does not have a history of intense agricultural use during the time that pesticides and herbicides were widely available.

4.8.8 Radon

Radon is a naturally occurring radioactive gas that is found in soil and rocks. Radon flows through the voids in rocks and soils to the surface. Radon is of some concern when it collects in low-lying enclosed spaces, such as an occupied basement.

An EPA survey by zip code of indoor radon concentrations indicated that none of the 10 zip code locations tested for FGGM were greater than 4.0 picoCuries per Liter (pCi/L), the EPA action level for radon. The Federal EPA Radon Zone for Anne Arundel County is 2, which is a moderate level.

4.8.9 Hazardous Materials

Hazardous materials were not observed on Site Y or Site Z.

4.8.10 Radioactive Materials

Radioactive materials were not observed on Site Y or Site Z. There have not been studies conducted to determine the presence of radioactive materials.

5.1 SITE Y

Site Y primarily consists of undeveloped, wooded land. Several trails and streams/creeks run throughout the site. Typical household dumping items (i.e. bottles, cans, and paper) were observed in portions of the site, as well as an abandoned car. Several monitoring wells were also observed on the site. According to aerial photographs and historical topographic maps, the site has been mostly undeveloped since at least 1919.

A small, circular sand clearing (the site of a former incinerator) is located near the northeastern boundary of the site, at the easternmost extension of 22nd Street. The incinerator reportedly operated from 1947 until 1975. The ED does not have any information regarding the specifics of the incinerator (e.g., types of materials incinerated, types of waste generated, closure of the facility, etc.). A comprehensive site assessment of the former incinerator area did not find any building material or waste believed to be associated with the old incinerator. A subsurface investigation found no contaminants at levels above residential standards. No complete pathways of exposure to potential human receptors were identified, and no further assessment was recommended (Versar, 1999a). However, (1) surface soils (the most likely place to find contamination) were not sampled, and the ground was disturbed due to the sand washing operations; (2) groundwater was not encountered or sampled during this investigation, and the condition of groundwater is therefore unknown; and (3) downwind dioxin samples were not collected.

Adjacent to the west of Site Y is a pond with a dirt berm along the perimeter of the eastern edge of the pond (just east of the berm is the western boundary of Site Y). According to the ED, the area to the west of the pond, the easternmost extension of 20th Street, was used as a trap and skeet range from the mid-1970s until 1994. A comprehensive site assessment of the former range found deposits of lead shot, skeet fragments, plastic shell casings, and plastic wads in several areas around the pond. Deposits were mainly concentrated on the property adjacent to Site Y to the west. Elevated levels of PAHs in soil and sediment were detected at these locations on the adjacent property. A sensitive receptor survey identified several complete pathways (soil and sediment) of exposure to potential human and ecological receptors. Future assessment and/or remediation at the site was recommended, including further contamination delineation and an expanded sampling program (Versar, 1999b). It was also recommended that the pond be drained and deposits removed from the bottom (Versar, 2002). The west-central portion of Site Y is downrange of this site. Lead shot and clay pigeon may be present on Site Y due to over shot. Lead and arsenic (added to lead shot to assist in rounding) may occur in the soils downrange of the Trap and Skeet Range, on Site Y.

Buildings 1976, 1977, 1978, and 2128, located west of Site Y, have documented releases to groundwater. Groundwater flow direction is toward site Y. These buildings were used for: storage of paints, petroleum products, adhesives, and hazardous materials; vehicle maintenance; and contained a UST (removed). In addition, waste may have been discarded onsite at Building 2128. Due to the groundwater flow direction, contaminated groundwater may be present under the western portion of Site Y.

Because the site is undeveloped, except for the location of the old incinerator, ACM and LBP are unlikely to be present on Site Y. Likewise, except for the locations mentioned above, potential

sites of hazardous materials, radioactive materials, pesticides, or herbicides were not observed during the site reconnaissance.

Natural resources constraints at Site Y include wetlands, streams, and the FCA areas along the eastern portion of the site. Development of this site would require a complete wetlands and streams delineation and coordination with the USACE for any proposed impacts to Waters of the United States. Coordination may be required with the USFWS regarding the potential for quality habitat of the federally-listed swamp pink that is known to occur in forested wetlands in Anne Arundel County. Furthermore, as FGGM voluntarily complies with the Maryland FCA's requirements for land development activities, the most valuable portions of the forest would require a preservation plan, detailing how dominant indigenous trees would be protected and 25-foot stream buffers would be observed. The FCA guidelines also include retaining or planting forested land. Site Y was determined ineligible for inclusion on the NRHP, therefore, no cultural restraints would preclude development of the site.

The majority of Site Y is suitable for transfer; the ECOP category for the majority of the site is 1. The northeastern portion of Site Y, around the former incinerator, would score a 7 due to lack of groundwater quality, lead in soil, and downwind dioxin information. There is the potential for lead (from possible LBP) to be present in soil in the vicinity of the former building at this location. The west-central portion of Site Y, downrange of the Trap and Skeet Range, would also score a 7, due to lack of information on lead and arsenic in soil and groundwater. Groundwater in the western portion of Site Y would score a 7 due to lack of information on a potential plume of contamination.

5.2 SITE Z

Site Z currently consists of undeveloped, wooded land. Three unimproved roads or trails, as well as several drainage ditches (possible intermittent streams) run throughout the site. Typical household dumping items (e.g., tires, hot water heaters, a lawnmower, trash, papers, bottles, and cans) were observed throughout the site, as well as a concrete debris pile and a rusted, empty 275-gallon capacity AST. In addition, a dirt berm that extended approximately 15 feet was observed on the western portion of the site. According to aerial photographs and historical topographic maps, the site has been mostly undeveloped since at least 1919.

According to a historical records review, a former training area, Grenade and Bayonet Range B, once extended onto the southwest corner of Site Z (Malcolm Pirnie, 2006a). A small circular clearing of land on the southwest corner of the site appears in the 1957 (EDR, 2005d) aerial, and may be related to this former training area. In addition, a small pit, located on the southern, central portion of Site Z, was identified in a 1952 aerial. It is unknown whether the pit was used for waste disposal (EPA, 2005d). No pits were observed during the site reconnaissance.

Because the site is undeveloped, ACM and LBP are unlikely to be present on Site Y. Likewise, except for the locations mentioned above, potential sites of hazardous materials, radioactive materials, pesticides, or herbicides were not observed during the site reconnaissance.

As is the case with Site Y, development of Site Z would involve several natural resources constraints. A complete wetlands and streams delineation and coordination with the USACE for any proposed impacts to Waters of the United States would be required. Coordination may be

required with the USFWS regarding the potential for quality habitat of the federally-listed swamp pink, and the requirements of Maryland FCA would have to be integrated into the development plan. Site Z was determined ineligible for inclusion on the NRHP, therefore, no cultural restraints would preclude development of the site.

Site Z is suitable for transfer; the ECOP category for the site is 1.

The following URS personnel contributed to this report:

Table 6-1: List of URS Personnel Contributing to the EBS Report

Name	Title	Years of Experience	Sections of Report Contributed to
Jerry Kashatus, PG	Principal Geologist	23	2.1 to 2.2, 2.4 to 2.7, 4, 5
Janet Frey, PG	Principal Scientist	19	All (independent technical review).
Lynne McMullen	Environmental Scientist	4	2.1 to 2.2, 2.4 to 2.7, 4, 5
Molly Notestine	Senior Ecologist	5	3.7 to 3.11
Kelly Arford	Senior Archaeologist	8	3.12

- Army Map Services. 1922. *Terrain map Maryland Fort George G. Meade and Vicinity*. Army Map Services, U.S. Army, Washington D.C.
- American Society for Testing and Materials (ASTM) Standard Practice D 6008-96, *Standard Practice for Conducting Environmental Baseline Surveys*. 1996.
- ASTM Standard Practice ASTM E 1527-00. *Standard Practice for Environmental Site Assessments, Phase I Environmental Site Assessment Process*. 2000.
- CH2M HILL. 1999. *Final Integrated Natural Resource Management Plan, Fort George G. Meade, Maryland, 1999 to 2004*. Reston, VA.
- CH2M HILL. *Final Integrated Natural Resource Management Plan, Fort George G. Meade, Maryland 1994 to 2004*.
- Department of the Army, Headquarters. 1988. Army Regulation 200-2. Environmental Quality. *Environmental Effects of Army Actions*. December 23, 1988.
- Department of the Army, Headquarters. 1997. Army Regulation 200-1. Environmental Quality. *Environmental Protection and Enhancement*. February 21, 1997.
- Department of the Army, Headquarters. 1997. Army Regulation 405-80. Real Estate. *Management of Title and Granting Use of Real Property*. October 10, 1997.
- Department of the Army. 2000. Pamphlet 200-1 *Environmental Protection and Enhancement*.
- Department of Defense (DoD), Fall 1995. *Base Realignment and Closure (BRAC) Cleanup Plan Guidebook*. Accessed from <http://aec.army.mil/usaec/cleanup/popup/library>.
- DoD. 2001. BRAC Environmental Restoration Analysis. http://www.dtic.mil/envirodod/Policies/BRAC/FY01_BCPAbstractAnalysis_final.pdf. (March 4, 2005).
- Eco-Science Professionals, Inc. 2001. *A Rare, Threatened, and Endangered Species Habitat Search (5 year update) at Fort George Meade*. February 19, 2001.
- Environmental Data Resources (EDR). 2005a. EDR Historical Topographic Map Report, Fort Meade EBS Site Y. August 4, 2006.
- EDR. 2005b. EDR Historical Topographic Map Report, Fort Meade EBS Site Z. August 4, 2006.
- EDR. 2005c. EDR Aerial Photo Decade Package, Fort Meade EBS Site Y. August 4, 2006.
- EDR. 2005d. EDR Aerial Photo Decade Package, Fort Meade EBS Site Z. August 4, 2006.
- EDR. 2005e. EDR Radius Map with GeoCheck, Fort Meade EBS Site Y. August 4, 2006.
- EDR. 2005f. EDR Radius Map with GeoCheck, Fort Meade EBS Site Z. August 4, 2006.
- EDR. 2005g. EDR Sanborn Map Report, Fort Meade EBS Site Y. August 4, 2006.
- EDR. 2005h. EDR Sanborn Map Report, Fort Meade EBS Site Z. August 4, 2006.
- EDR. 2005i. EDR NEPA Check, Fort Meade EBS Site Y. August 4, 2006.
- EDR. 2005j. EDR NEPA Check, Fort Meade EBS Site Z. August 4, 2006.

- EM Federal Corporation, 2004, *Working Draft Site Management Plan, Fort George G. Meade*. Prepared for U.S. Army Corp of Engineers, Baltimore District, Contract No. DACA31-02-P-0175. July 2004
- EM Federal Corporation. 2004. *Fort George G. Meade Closed Sanitary Landfill, Site Specific Addendum to the Generic Field Sampling Plan*. Prepared for U.S. Army Corp of Engineers, Baltimore District, Contract No. DACA31-03-D-0019. February 2004.
- Environmental Protection Agency (EPA). 1996d. *Aerial Photographic Analysis, Fort George Meade - Cantonment Area, Anne Arundel County, Maryland*, March 1996.
- Fort Meade. 1938. *Special Military Map, Fort George G. Meade, MD, Grid Zone "A"* surveyed 1923, revised November 1938.
- Mack, Frederick K. and G, Achmad. 1986. *Evaluation of the Water Supply Potential of Aquifers in the Potomac Group of Anne Arundel County, Maryland*. Report of Investigation No. 46. Prepared in Cooperation with the U.S. Department of the Interior Geological Survey and Anne Arundel County Office of Planning and Zoning.
- Malcolm Pirnie, Inc. 2006a. *Final Historical Records Review, Fort George G. Meade, Fort Meade, Maryland*. Prepared for U.S. Army Corps of Engineers, Baltimore District and Fort George G. Meade, Environmental Office. May 2006.
- Malcolm Pirnie, Inc. 2006b. *Final Work Plan, Quality Assurance Plan Part II. Health and Safety Plan Part III. November 2000. Revised Final Work Plan, Field Sampling Plan Part I. Remedial Investigation, Fort George G. Meade, Maryland*. Prepared for U.S. Army Corps of Engineers, Baltimore District and Fort George G. Meade, Environmental Office, Contract No. DACA31-94-D-0017. March 2000.
- Maryland Department of Natural Resources (MDNR) 2004. *Rare, Threatened, and Endangered Species of Anne Arundel County, Maryland*, May 10, 2004. MDNR Wildlife and Heritage Services. <http://www.dnr.state.md.us/wildlife/rte/rte04anne.pdf>. Accessed August 1, 2006.
- Maryland Department of the Environment (MDE). 2005. *Fort Meade Peak 1-Hour Ozone Levels*. http://www.mde.state.md.us/Air/air_quality/HistoricalData/ftmeade.asp. Accessed March 2, 2005.
- Office of the Quartermaster General. 1919. *Property Description; 1919; Camp Meade Property Files; Real Estate Records, 1917-1922; Records of the Office of the Quartermaster General*.
- R. Christopher Goodwin and Associates, Inc. (Goodwin). 1995 *Phase I Archaeological Survey of Approximately 2,210 Acres at Fort George G. Meade, Anne Arundel County, Maryland*. Report prepared by Goodwin Associates for Fort Meade. Frederick, MD.
- Rummel, Klepper & Kahl Consulting Engineers (RK&K). 2004. *Comprehensive Expansion Master Plan*. Revised Preliminary Submittal. November 2004.
- URS. 2003. *Fort Meade, Phase II Archaeological Evaluation of Sites 18AN398, 18AN929, 18AN982, 18AN983, 18AN988, and 18AN989, Anne Arundel County, Maryland*. Report prepared for U.S. Army, Fort Meade Environmental Management Office. November 2003.
- U.S. Army Corps of Engineers (USACE). 2004. *Final Environmental Baseline Survey. Site M, Fort Meade, Maryland*. Prepared for National Security Agency. May 2004.

- U.S. Army Garrison, Fort Meade, (2005). *Fort George G. Meade*. <http://www.ftmeade.army.mil/newcomers.html>. Accessed March 31, 2005.
- U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM). 1994. *Ground-water Consultation No. 38-26-K33W-94, Initiation of Detection Monitoring Program, Fort George G. Meade, Maryland*. March 23–June 30, 1994.
- U.S. Fish and Wildlife Service (USFWS). 2006. Species Information, Threatened and Endangered Animals and Plants. <http://www.fws.gov/angered/wildlife.html>. Accessed August 1, 2006.
- Versar, Inc. 1999a. *Comprehensive Site Assessment, Former Incinerator Building, 21 1/2 Street, Fort George G. Meade, Maryland*. Prepared for Fort George G. Meade, ANME-PWE, Environmental Management Office. Contract No. DADA31-97-D0013. June 8, 1999.
- Versar, Inc. 1999b. *Comprehensive Site Assessment, Former Trap and Skeet Range, 20th Street, Fort George G. Meade, Fort Meade, Maryland*. Prepared for Fort George G. Meade, ANME-PWE, Environmental Management Office, Contract No. DADA31-97-D0013. June 10, 1999.
- Versar, Inc. 1999c. *Volume II, Sampling Visits, Solid Waste Management Units, Fort George G. Meade, Fort Meade, Maryland*. Prepared for Fort George G. Meade, ANME-PWE, Environmental Management Office. September 16, 1999.
- Versar, Inc. 1999d. *Volume III, Sampling Visits, Solid Waste Management Units, Fort George G. Meade, Fort Meade, Maryland*. Prepared for Fort George G. Meade, ANME-PWE, Environmental Management Office. September 16, 1999.
- Versar, Inc. 2001. *Site Investigation Report, Building 2120C (SWMU 25), Fort George G. Meade, Fort Meade, Maryland*. Prepared for Fort George G. Meade, ANME-PWE, Environmental Management Office, Contract No. DACA31-00-D-0008. October 30, 2001.
- Versar, Inc. 2002. *Final Corrective Action Plan, Former Trap and Skeet Range, 20th Street, Fort George G. Meade, Fort Meade, Maryland*. Prepared for Fort George G. Meade, ANME-PWE, Environmental Management Office, Contract No. DACA65-95-D-0064. December 17, 2002.

Personal Communications

- Colianni, Angelo. E-mail to Heather Carolan on March 2, 2005.
- Butler, Mick 2006. Meeting and subsequent communications with Jerry Kashatus August 15, 2006.
- Carolan, Heather 2006. Meeting and subsequent communications with Jerry Kashatus August 15, 2006.
- DiGiovanni, Joseph 2006. Meeting and subsequent communications with Jerry Kashatus August 15 through 21, 2006.
- Marquardt, Don. 2006. Meeting and subsequent communications with Jerry Kashatus August 15 through 21, 2006.