

**ENVIRONMENTAL ASSESSMENT  
FOR THE  
CONSTRUCTION AND OPERATION OF  
PROPOSED PROJECTS ON AREA B OF FORT  
DETRICK IN FREDERICK COUNTY, MARYLAND**



**Prepared by:**

**U.S. Army Garrison  
Fort Detrick, MD 21702**

**With Technical Assistance from:**

**BSA Environmental Services, Inc.  
Beachwood, OH 44122**

**24 December 2010**

THIS PAGE INTENTIONALLY LEFT BLANK

**ENVIRONMENTAL ASSESSMENT  
FOR THE  
CONSTRUCTION AND OPERATION OF  
PROPOSED PROJECTS ON AREA B OF FORT DETRICK IN  
FREDERICK COUNTY, MARYLAND**

Prepared by:

U.S. Army Garrison  
Fort Detrick, MD 21702

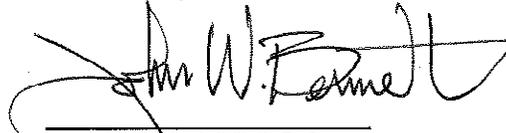
December 2010

Reviewed by:



ROBERT P. CRAIG, P.E.  
Chief, Environmental Management Office  
U.S. Army Garrison

Reviewed by:



JOHN W. BENNETT, R.A.  
Master Planner, Directorate of Installation Services  
U.S. Army Garrison

Approved by:



JUDITH D. ROBINSON  
COL, MS  
Commanding

THIS PAGE INTENTIONALLY LEFT BLANK

## EXECUTIVE SUMMARY

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act of 1969 (NEPA), as amended (Title 42, U.S. Code [USC], 4321-4347), and regulations of the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] 1500-1508) and the Army NEPA Regulation, 32 CFR 651, by the U.S. Army Garrison (USAG), Fort Detrick, Maryland, with technical assistance from BSA Environmental Services, Inc. This document has been printed on recycled paper.

The Proposed Action (Alternative I, the preferred alternative) and subject of this EA is the Construction and Operation of Proposed Projects, which include a Department of Homeland Security (DHS) Antenna, Recreational Vehicle (RV) Parking Lot, Training Campus, and Infrastructure Improvements, on Area B of Fort Detrick in Frederick County, Maryland. The construction and operation of new facilities and infrastructural improvements, within the Installation (the Proposed Projects), will allow USAG and its Mission Partners to meet their respective mission requirements.

The construction and operation of the proposed projects were systematically reviewed and assessed for their potential impact on the environment and human health. This analysis considers impacts expected from conducting the proposed activities, cumulative impacts that might occur after several years, and impacts resulting from association with other activities in the area. Feasible alternative to the Proposed Action were also evaluated, both with regard to the needs of the U.S. and the Department of the Army (DA) and for potential adverse impacts on the environment.

During the preparation of this EA, one alternative to the Proposed Action was identified. This alternative is to Not Construct and Operate the Proposed Projects on Area B of Fort Detrick in Frederick County, Maryland (Alternative II, No Action).

This EA characterizes and analyzes the probable and possible environmental impacts associated with implementation of Alternative I (the Proposed Action) and Alternative II (the No Action Alternative) on Area B of Fort Detrick, Maryland. Any contemplated or likely action is considered a proposed activity. This analysis considers impacts expected from current and proposed Installation activities, cumulative impacts that might occur after several years, and impacts resulting from association with other activities in the area. Conceptual Projects are projects that are being considered, but not part of the Proposed Action. The potential environmental impacts, utility consumption, and waste stream disposal requirements of these projects are not identified in this EA. These projects would be evaluated in future NEPA analyses.

During the construction phase, the following impacts are anticipated: negligible impacts to the local climate, potential negligible to minor impacts to geology, potential minor impacts to soils, minor impacts to water resources, minor impacts to wetlands, negligible impacts to floodplains, minor impacts to plants and animals, minor impacts to air quality, no impacts to historical and cultural resources, positive impacts to the local socioeconomic environment, minor impacts from noise and lighting, negligible to minor impacts from odors, minor impacts to traffic, negligible impacts to energy resources, negligible impacts to waste streams, minor impacts to hazardous materials management, negligible impacts to human health and safety, and minor cumulative impacts.

During the operational phase, the following impacts are anticipated: minor impacts to land use, negligible impacts to the local climate, potential minor to negligible impacts to geology, negligible impacts to soils, potential minor impacts to water resources, minor impacts to wetlands, negligible impacts to floodplains, positive impacts to plants and animals, negligible impacts to air quality, no impacts to historical and cultural resources, no impacts to the local socioeconomic environment, negligible impacts from noise, negligible impacts from lighting, minor impacts from odors, no impacts to traffic, negligible impacts to energy resources, negligible impacts to waste streams, negligible impacts to hazardous materials management, negligible impacts to human health and safety, and minor cumulative impacts.

The principal conclusions of this EA are: (1) implementing Alternative I (the preferred alternative) would not result in significant adverse environmental impacts, provided that best management practices (BMPs) to mitigate these potential environmental impacts are adhered to during construction and operation of the Proposed Projects; (2) implementing the Proposed Action will provide Fort Detrick with infrastructural improvements which will allow the USAG and DHS to achieve their respective mission requirements; (3) construction and operation of Proposed Projects on Area B of Fort Detrick (the Proposed Action) will provide facilities necessary to satisfy training requirements for the Fort Detrick Police and Fire Departments; (4) implementing Alternative I is consistent with the land use planning objectives for Fort Detrick; (5) implementing Alternative II (No Action) would not provide Fort Detrick with much-needed infrastructure and facilities and would hamper the ability of the USAG and DHS to meet their respective mission requirements; (6) implementing Alternative II (No Action) is not consistent with land use planning objectives for Fort Detrick; and (7) implementing the No Action alternative would eliminate the negligible to minor environmental impacts associated with the implementation of Alternative I, but would also eliminate the beneficial impacts of the Proposed Action.

## TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY.....</b>	<b>i</b>
<b>1.0 PURPOSE AND NEED FOR PROPOSED ACTION .....</b>	<b>1-1</b>
1.1 INTRODUCTION.....	1-1
1.2 THE PURPOSE AND NEED FOR THE PROPOSED PROJECTS.....	1-1
1.3 ASSESSMENT METHODOLOGY .....	1-2
1.4 ORGANIZATION OF THIS ENVIRONMENTAL ASSESSMENT .....	1-5
1.5 PUBLIC PARTICIPATION.....	1-5
<b>2.0 DESCRIPTION OF THE PROPOSED ACTION .....</b>	<b>2-1</b>
2.1 PROPOSED PROJECTS.....	2-1
2.2 CONCEPTUAL PROJECTS.....	2-3
2.3 CONSTRUCTION REGULATIONS AND CONSTRAINTS .....	2-4
2.3.1 Site Selection Regulations.....	2-4
2.3.2 Construction Waste Management .....	2-4
2.3.3 Stormwater Management, Erosion, and Sediment Control .....	2-7
2.3.4 Forest Conservation Requirements.....	2-8
2.3.5 Cultural Resource Requirements .....	2-11
2.3.6 Air Quality Requirements.....	2-11
2.4 UTILITY REQUIREMENTS FOR ROUTINE OPERATIONS.....	2-11
2.4.1 Water Supply.....	2-11
2.4.2 Energy Systems .....	2-12
2.5 WASTE STREAM MANAGEMENT AND POLLUTION PREVENTION .....	2-12
2.5.1 Wastewater.....	2-13
2.5.2 Solid Waste .....	2-13
2.6 SUSTAINABLE DESIGN AND OPERATION OF NEW FACILITIES .....	2-13
<b>3.0 ALTERNATIVES CONSIDERED.....</b>	<b>3-1</b>
3.1 ALTERNATIVE I – CONSTRUCT AND OPERATE PROPOSED PROJECTS ON AREA B OF FORT DETRICK IN FREDERICK COUNTY, MARYLAND .....	3-1
3.2 ALTERNATIVE II – DO NOT CONSTRUCT AND OPERATE PROPOSED PROJECTS ON AREA B OF FORT DETRICK IN FREDERICK COUNTY, MARYLAND – NO ACTION.....	3-1
<b>4.0 AFFECTED ENVIRONMENT .....</b>	<b>4-1</b>
4.1 LOCATION AND LAND USE .....	4-1

4.2	CLIMATE.....	4-2
4.3	GEOLOGY .....	4-2
4.4	SOILS.....	4-3
4.5	WATER RESOURCES.....	4-10
4.5.1	Surface Water.....	4-10
4.5.2	Groundwater.....	4-11
4.5.3	Stormwater .....	4-11
4.5.4	Drinking Water.....	4-12
4.6	WETLANDS AND FLOODPLAINS.....	4-13
4.7	PLANT AND ANIMAL ECOLOGY .....	4-14
4.7.1	Vegetation .....	4-14
4.7.2	Wildlife .....	4-15
4.8	AIR QUALITY .....	4-16
4.8.1	Regional Air Quality.....	4-16
4.8.2	Fort Detrick Air Pollution Sources.....	4-17
4.9	HISTORICAL AND CULTURAL RESOURCES .....	4-18
4.9.1	Archeological Resources.....	4-19
4.10	SOCIOECONOMIC ENVIRONMENT .....	4-19
4.11	NOISE AND LIGHTING.....	4-20
4.12	ODORS .....	4-21
4.13	TRANSPORTATION .....	4-21
4.14	ENERGY RESOURCES .....	4-22
4.15	POLLUTION PREVENTION AND WASTE MANAGEMENT .....	4-23
4.15.1	Wastewater.....	4-23
4.15.2	Municipal Solid Waste and Recycling.....	4-23
4.15.3	Special Medical Waste .....	4-26
4.15.4	Hazardous Waste .....	4-27
4.16	HAZARDOUS MATERIAL MANAGEMENT .....	4-27
4.16.1	Pesticide Management .....	4-28
4.17	ENVIRONMENTAL RESTORATION AND IMPROVEMENT .....	4-31
4.17.1	Environmental Concerns in Area B .....	4-31
4.17.2	Land Use Constraints .....	4-44
4.17.3	Environmental Management System.....	4-44

4.17.4	Environmental performance assessment review .....	4-46
<b>5.0</b>	<b>ENVIRONMENTAL CONSEQUENCES .....</b>	<b>5-1</b>
5.1	INTRODUCTION.....	5-1
5.2	ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION.....	5-1
5.2.1	Land Use .....	5-1
5.2.2	Climate .....	5-2
5.2.3	Geology .....	5-2
5.2.4	Soils.....	5-2
5.2.5	Water Resources.....	5-2
5.2.6	Wetlands and Floodplains .....	5-3
5.2.7	Plant and Animal Ecology.....	5-4
5.2.8	Air Quality .....	5-4
5.2.9	Historical and Cultural Resources .....	5-5
5.2.10	Socioeconomic Environment .....	5-5
5.2.11	Noise and Lighting.....	5-5
5.2.12	Odors.....	5-6
5.2.13	Transportation .....	5-6
5.2.14	Energy Resources .....	5-6
5.2.15	Pollution Prevention and Waste Stream Management.....	5-7
5.2.16	Hazardous Material Management .....	5-7
5.2.17	Human Health and Safety .....	5-8
5.2.18	Environmental Justice .....	5-8
5.2.19	Public Opinion .....	5-9
5.2.20	Cumulative Impacts .....	5-9
5.3	ENVIRONMENTAL IMPACTS OF ALTERNATIVE I.....	5-9
5.4	ENVIRONMENTAL IMPACTS OF ALTERNATIVE II.....	5-10
<b>6.0</b>	<b>CONCLUSIONS .....</b>	<b>6-1</b>
<b>7.0</b>	<b>REFERENCES .....</b>	<b>7-1</b>
<b>8.0</b>	<b>PERSONS AND AGENCIES CONTACTED .....</b>	<b>8-1</b>
<b>9.0</b>	<b>PREPARERS.....</b>	<b>9-1</b>
<b>10.0</b>	<b>ACRONYMS AND ABBREVIATIONS.....</b>	<b>10-1</b>

**LIST OF FIGURES**

Figure 1-1. Regional Location Map ..... 1-3  
Figure 2-1. Area B Proposed Projects Map ..... 2-5  
Figure 2-2. Area B Forestation, Wetlands, and Floodplains. .... 2-9  
Figure 4-1. Area B Geology Map. .... 4-5  
Figure 4-2. Area B Soils Map..... 4-7  
Figure 4-3. Area B Environmental Concerns Map. .... 4-33

**LIST OF TABLES**

Table 2-1. Forestation Requirements for the Proposed Action..... 2-8  
Table 4-1. Major Air Pollutant Emissions Sources in Frederick County, Maryland in 2007. .... 4-18  
Table 5-1. Summary of Potential Environmental Impacts Related to Construction of the  
Proposed Action..... 5-11  
Table 5-2. Summary of Potential Environmental Impacts Related to Operation of the Proposed  
Action. .... 5-13  
Table 5-3. Summary of Mitigation Measures and Mechanisms. .... 5-15

**LIST OF APPENDICES**

**APPENDIX A: RECORD OF NON-APPLICABILITY**

## 1.0 PURPOSE AND NEED FOR PROPOSED ACTION

### 1.1 INTRODUCTION

The National Environmental Policy Act (NEPA) of 1969 requires all Federal agencies to give appropriate consideration to potential environmental effects of proposed major actions in planning and decision-making. The Council on Environmental Quality (CEQ) is responsible for issuing regulations (40 Code of Federal Regulations [CFR] 1500 *et seq.*) implementing the provisions of NEPA. CEQ regulations in turn are supplemented by procedures adopted on an agency-specific basis. For the Department of the Army (DA), the pertinent regulations are 32 CFR 650 *Environmental Protection and Enhancement*, and 32 CFR 651 *Environmental Analysis of Army Actions*. This Environmental Assessment (EA) was developed pursuant to these laws and regulations.

An EA is intended to assist agency planning and decision-making. While required to assess environmental impacts and evaluate their significance, it is routinely used as a planning document to evaluate environmental impacts, develop alternatives and mitigation measures, and allow for agency and public participation (32 CFR 651.20).

Fort Detrick includes six non-contiguous land parcels designated as Areas A, B, Area C Water Treatment Plant (WTP), Area C Waste Water Treatment Plant (WWTP), Forest Glen Annex, and Glen Haven Housing Area. Areas A, B, and C, are located within Frederick County, Maryland. Within Frederick County, Fort Detrick encompasses approximately 1,212 acres. The U.S. Army Garrison (USAG), Fort Detrick, has command and control of approximately 1,143 acres, and the National Cancer Institute at Frederick (NCI-Frederick) has command and control of approximately 69 acres. The NCI-Frederick is "on" Fort Detrick, yet it is not on Army-controlled land. The 1,143 acres of Army-controlled land are divided into four separate parcels identified as Areas A (728 acres), B (399 acres), Area C WTP (7 acres), and Area C WWTP (9 acres). The USAG also recently assumed command and control of the Forest Glen Annex (132 acres) and Glen Haven Housing Area (20 acres) in Montgomery County, MD due to Base Realignment and Closure (BRAC) (see Figure 1-1).

### 1.2 THE PURPOSE AND NEED FOR THE PROPOSED PROJECTS

The Proposed Action (Alternative I, the preferred alternative) and subject of this EA is the Construction and Operation of Proposed Projects, which include a Department of Homeland Security (DHS) Antenna, Recreational Vehicle (RV) Parking Lot, Training Campus and Infrastructure Improvements, on Area B of Fort Detrick in Frederick County, Maryland. The construction and operation of new facilities and infrastructural improvements, within the Installation (the Proposed Projects), will allow the USAG and its Mission Partners to meet their respective mission requirements. The Proposed Projects are described in detail in Section 2.0.

The DHS requires high frequency (HF) radio systems for communications and compatibility with existing DHS and other communications networks (DHS, 2010). DHS completed the installation of one HF radio system on Area B in May 2010 and a second HF transmitter was installed in fall 2010. In order for the second system to become functional and provide DHS with multiple antenna capabilities, an antenna is required (DHS, 2010).

Currently, the Army and other Department of Defense (DoD) Service Departments operate RV sites throughout the U.S. on military installations and recreation areas. Fort Detrick is proposing to operate a RV vehicle parking location comparable to those located in other military installations around the country.

In order to satisfy training requirements for the Fort Detrick Police and Fire Departments, the post is proposing to construct a training campus. The fire training tower would provide valuable live-fire training exercises to trainees. Additionally, the training tower would provide local fire departments with valuable training opportunities that would assist the respective departments in maintaining a highly trained, skilled and experienced group of firefighters. An asphalt training pad is proposed, which would provide the Fort Detrick Police and Fire Departments with the necessary means to complete bus, motorcycle and skid training exercises. Additionally, classrooms and training rooms would provide the post with areas for classroom instruction. Locating the fire training tower, training pad and classrooms adjacent to one-another will provide Fort Detrick with a contiguous campus devoted exclusively to safety and protection.

Area B of Fort Detrick currently does not have the adequate infrastructure to support any new development; therefore upgrades to infrastructure are necessary. Upgrades will include water lines, sewer lines, electrical service, and roadways (Powell, 2010).

### 1.3 ASSESSMENT METHODOLOGY

This EA provides the best available information, as of November 2010, including guidance provided by Installation personnel on Proposed Projects that may impact land use. Data presented in Sections 2.0 and 4.0 were updated to reflect the current conditions at Fort Detrick. Where conditions have not changed or updated studies have not been accomplished, reference is made to the most recent available source.

This EA is based, in part, on earlier NEPA documentation. This approach entails referencing specific analyses, discussions, and conclusions of these documents without providing detailed discussion in the present EA. Consistent with CEQ guidance, the following NEPA studies relevant to Fort Detrick are incorporated by reference:

- *Environmental Assessment for the Real Property Master Plan for Army-Controlled Land at Areas A and C of Fort Detrick in Frederick County Maryland (USAG, 2010b);*
- *Environmental Assessment for the Frederick County Potomac Pipeline Interconnect to Fort Detrick via the Existing City of Frederick Water System (USAG, 2009b);*
- *Final Integrated Natural Resources Management Plan Environmental Assessment, U.S. Army Garrison, Fort Detrick, Maryland (USAG, 2007c);*
- *Final Environmental Impact Statement, Construction and Operation of New U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) Facilities and Decommissioning and Demolition and/or Re-use of Existing USAMRIID Facilities at Fort Detrick, Maryland (U.S. Army Medical Research and Materiel Command [USAMRMC] and USAG, 2006);*
- *Environmental Assessment for the Construction and Operation of a Cogeneration Utility Plant (CUP) by Chevron Energy Solutions Company and Keenan Development (CK) on the East-Central Portion of Area A at Fort Detrick, Maryland (USAG, 2005);*

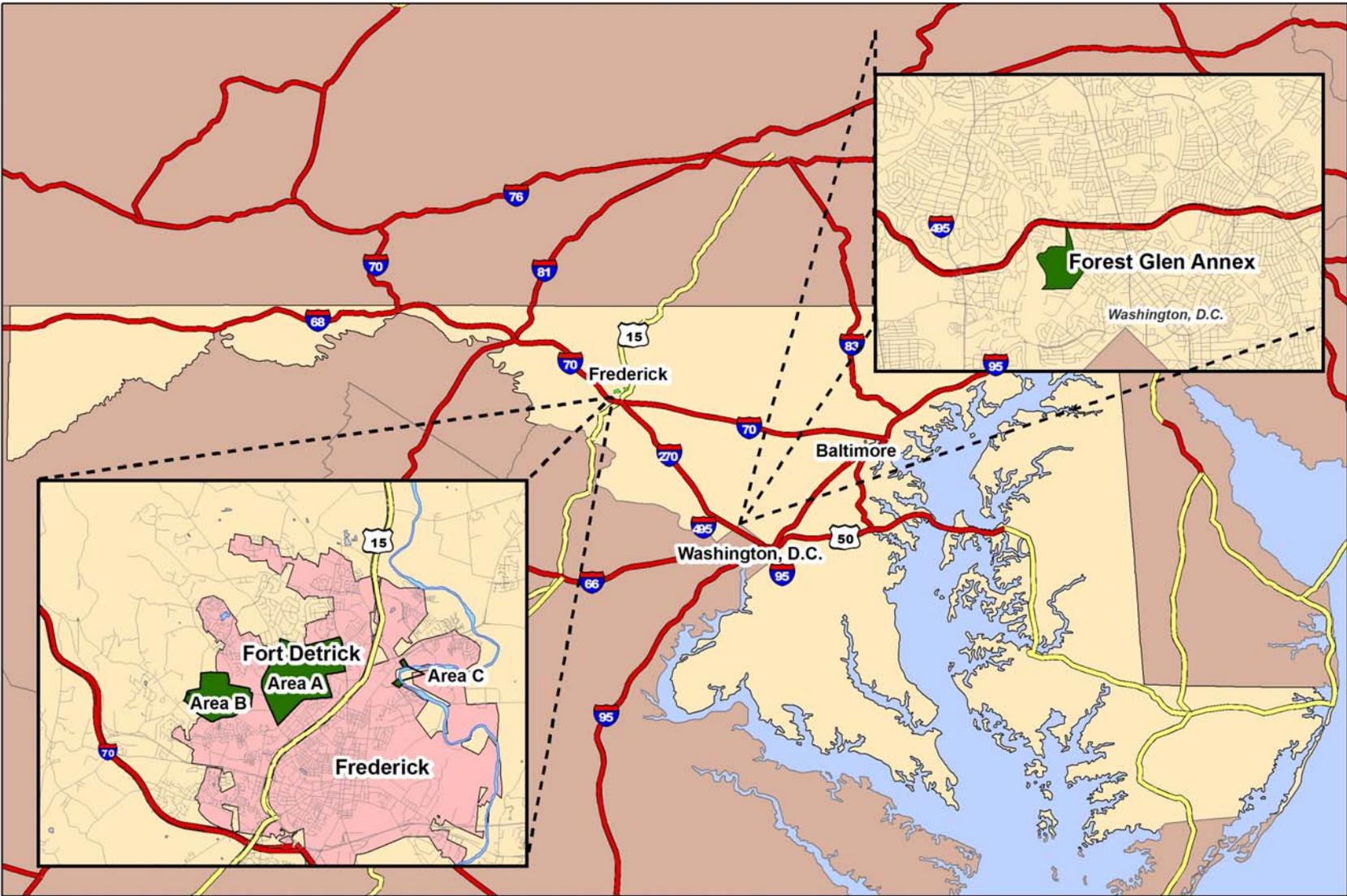


Figure 1-1. Regional Location Map.

THIS PAGE INTENTIONALLY LEFT BLANK

- *Final Environmental Impact Statement, Construction and Operation of the National Biodefense Analysis and Countermeasures Center (NBACC) Facility by the Department of Homeland Security (DHS) at Fort Detrick, Maryland (DHS and USAG, 2004);*
- *Environmental Assessment, Installation Master Plan (IMP) for Fort Detrick, Maryland (USAG, 2003a);*
- *Environmental Assessment for the Construction and Operation of New Commissary and Post Exchange (PX) Facilities and Other Infrastructural Improvements on the South Central Portion of Area A - Fort Detrick, Maryland (USAG, 2002a);*
- *Environmental Assessment for the Construction and Operation of Family Housing Quarters at Fort Detrick, Maryland (USAG, 2002d);*
- *Environmental Assessment Fluoridation of the Fort Detrick Drinking Water System (USAG, 2002e);*

#### 1.4 ORGANIZATION OF THIS ENVIRONMENTAL ASSESSMENT

Section 2.0 of this EA provides a complete description of the new facilities and infrastructural improvements that comprise the Proposed Action. This includes an overview of Fort Detrick and current Mission Partners. Section 3.0 outlines the alternatives considered, including the Proposed Action. Section 4.0 presents a history of the Installation and a description of the existing environment that would be affected by the Proposed Action. The consequences of the Proposed Action on the existing environmental attributes are described in Section 5.0. Overall conclusions of the effects of the Proposed Action on the environment are given in Section 6.0. Reference material for this document is provided in Section 7.0. A list of persons and agencies contacted during the preparation of this document is compiled in Section 8.0. The list of preparers is provided in Section 9.0. Section 10.0 provides the list of acronyms and abbreviations.

#### 1.5 PUBLIC PARTICIPATION

In accordance with NEPA, public comment is being solicited and encouraged. In accordance with 32 CFR 651, unless comments are received which necessitate a change to this EA; the present document will be considered final as of the end of the public comment period.

THIS PAGE INTENTIONALLY LEFT BLANK

## 2.0 DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action and subject of this EA is the Construction and Operation of Proposed Projects, which include a DHS Antenna, RV Parking Lot, Training Campus and Infrastructure Improvements, on Area B of Fort Detrick in Frederick County, Maryland. Section 2.1 details the planned construction activities for the Proposed Action (see Figure 2-1), and Section 2.2 briefly summarizes the Conceptual Projects which are not part of the Proposed Action. Descriptions of projects outside the Proposed Action are intended to provide a meaningful estimate of future baseline conditions, such that the collective environmental impacts (i.e., cumulative impacts) of all the projects can be determined. Section 2.3 discusses regulatory and permitting requirements for mitigation of potential environmental impacts during construction. Section 2.4 presents the routine operational activities for the Proposed Action, including utility requirements and regulatory and permitting requirements for mitigation of potential environmental impacts during that phase of the Proposed Action. Section 2.5 discusses future sustainability requirements for Federal facilities.

### 2.1 PROPOSED PROJECTS

#### Antenna for DHS (Proposed Project)

This project is being evaluated in this EA for its potential environmental impacts. The DHS will install a new HF antenna on the northern portion Area B. Fort Detrick has been supporting DHS Science and Technology (S&T) since 2004. In 2005, the DHS S&T facility was completed on Area A. In September 2005, the Real Property Planning Board (RPPB) authorized a DHS radio transmitter facility along with two antenna sites. HF radios are required for DHS communications and compatibility with existing DHS and other communications networks (DHS, 2010).

Two HF antennas were located on Area B, (a conical monopole and a log periodic). After evaluation for serviceability, the conical monopole was retained and the log periodic antenna was removed. DHS completed the installation of one HF radio system in May 2010 and a second HF transmitter was installed in fall 2010. An antenna is required for the second system to become functional. The proposed antenna will be located at an existing antenna pad. It will provide DHS with a multiple antenna capability and will be approximately 36 feet (ft) tall (DHS, 2010; Polley, 2010a).

#### RV Parking Lot (Proposed Project)

This project is being evaluated in this EA for its potential environmental impacts. The Army and other DoD Service Departments operate RV sites throughout the U.S. on military installations and recreation areas. This project will provide a RV parking lot on the eastern portion of Area B along the existing service road. The RV parking lot will be approximately 110 ft by 270 ft for a total of 29,700 sf.

#### Training Campus (Proposed Project)

This project is being evaluated in this EA for its potential environmental impacts. A Training Campus for use by the Fort Detrick Police Department and the Fort Detrick Fire Department is needed to satisfy training requirements. The proposed location of the campus is near the

existing training building in the central portion of Area B. It will contain a simulator building, a fire training tower, a fire training tower annex, and a driver training pad.

The simulator building is a planned classroom building. The building will house three simulator training rooms (weapons, motorcycle, and driver) with specialized equipment. The weapons simulator is proposed to have five lanes, and one motorcycle simulator and one driver simulator are also proposed. In addition to the simulator rooms the building will have scalable classroom space. Classrooms will have dividers, allowing for large training groups and/or multiple training groups. The approximate building size is 100 ft x 50 ft totaling approximately 5,000 square ft (sf). The building will have water, sewer, and natural gas service. Exterior lights will only be used when necessary and will be off all other times.

The proposed fire training tower will be pre-engineered with approximately four stories and a one story annex. The tower will be approximately 15 ft wide by 18 ft long and 44 ft high. The annex will be approximately 15 ft wide by 14 ft long and 10 ft high. The buildings will be used for training exercises approximately once a month by the Fort Detrick Fire Department and will also be open for use to Mount Weather, Camp David, Raven Rock and local volunteer fire departments. The tower will be centrally located in Area B on a structural concrete pad which will have an approximately 50 ft concrete apron surrounding the building. The tower annex will have a burn room that will use excelsior burn blocks, a product composed of wood slivers cut from logs, for fire training. The tower will have movable maze partitions in order to change room configurations to make training more realistic.

Fires set in the training tower may be extinguished with either water or foam, but foam is corrosive to some training tower materials; therefore, foam will be rinsed off with water after training exercises. Water will be supplied from either a booster tank, drafting from a static source (i.e. pond), or from a hydrant by way of a pumper. At least one fire hydrant is proposed to be located in the vicinity of the training tower. It may be necessary to add a water line to the fire hydrant or a detention pond that conveys water to the fire hydrant via a pump-house. A detention pond is proposed to be located south of the fire training tower. Pest management actions may be required for mosquito and aquatic weed control for the detention pond. Due to the Karst geology in Area B, pond design and construction will be evaluated very carefully to account for any possible sinkhole formation and pond drainage into the ground surface or into the subsurface. Additionally, the design of the training tower will include the capture, potential reuse, and proper disposal of the collected water to prevent potential contamination of the aquifer. Including this design would also provide the fire department with the flexibility to train for other fire scenarios than using only wood fires. The building is not expected to have any exterior lighting or be provided utilities. According to Code of Maryland Regulations (COMAR) 26.11.07.04, an air permit will not be required for the fires associated with the training exercises.

A multi-purpose asphalt training pad will be centrally located in Area B, north of the training tower and simulator building. The training pad will be used for at least three training exercises: bus training, motorcycle training, and skid training. The dimensions of the training pad will be approximately 240' x 300'. The training pad will have no utilities.

The Training Campus will be planned in such a way that parking can be shared among several projects. An existing gravel parking lot will be upgraded to provide parking for a maximum of 30 vehicles. Any overflow parking will be directed to hardstand areas such as the training pad and training tower apron.

### Area B Infrastructure Development (Proposed Project)

This project is being evaluated in this EA for its potential environmental impacts. Area B does not have adequate infrastructure to support any new development. In order to support planned growth, upgrades to infrastructure are necessary. Upgrades will include water lines, sewer lines, electrical service, natural gas lines, and roadways (Powell, 2010). An existing roadway leading to the proposed locations of the Training Campus and RV Parking Lot may need to be improved. Existing infrastructure may need to be improved for the DHS Antenna.

Installation of new water, sewer, gas, and electric lines will be needed to service the Training Campus. Electricity and water will both come from the general vicinity of the Reserve Center. The electric service to the Reserve Center is purchased directly from Allegheny. Therefore, by extension, the electric service from the Reserve Center to the training campus will also be directly purchased from Allegheny. The gas line will come across the center of Area B to the proposed Training Campus, parallel to the existing road. There are two options for providing sewer service at the training campus. One is gravity flow to Shookstown Road. Another is a pumped line back to the Reserve Center (see Figure 2-1). If the gravity flow option is chosen there may be a small easement required due to digging on non-Army owned land. If the pump sewer line is chosen, it will run parallel to the electric and water line in a separate trench.

## 2.2 CONCEPTUAL PROJECTS

Conceptual projects at Fort Detrick are those which are currently under study and will be addressed in more detail in future NEPA documentation. There are three conceptual projects for Area B which includes the construction and operation of a city road easement, family morale, welfare, and recreation (FMWR) facilities, and a Photovoltaic Array.

### Frederick County Road Easement on Area B (Conceptual Project)

Fort Detrick plans to provide an easement to Frederick County for a road that will cut across the western portion of Area B. Due to a dangerous curve occurring where Kemp Lane is diverted around the western perimeter of Area B, the County seeks to extend Kemp Lane southward through Area B, thus avoiding the unsafe curve, to connect with Shookstown Road on the other side. The road development will not only improve current Kemp Lane driving conditions but it may also alleviate some traffic issues at the current intersection of Kemp Lane and Shookstown Road, as well as the adjacent intersection of Bowers Road and Shookstown Road. The proposed road and water transmission main will not be built over the capped portions of the Area B western disposal areas which include: B-6, B-8, Trenches North of B-8, B-18, B-10 disposal areas, and B-11. All necessary precautionary measures will be taken by Frederick County and the Army during design and construction in order to ensure that the western disposal area capped areas are not impacted or disturbed. At least two tree stands may be impacted during construction, the largest of which occurs in the southwest corner of Area B where the proposed road will exit Fort Detrick property. Any impacts to existing forested areas will be subject to the requirements of the Maryland Forest Conservation Act and the Fort Detrick Forest Conservation Plan.

### Family Morale, Welfare and Recreation Facilities (Conceptual Project)

FMWR is a comprehensive network of support and leisure services designed to enhance the lives of soldiers, their families, civilian employees, military retirees and other eligible participants. Conceptual FMWR facilities include a bowling center, golf driving range, chipping and putting greens, rock climbing structures, paint ball, dog kennel with wash and runs, outdoor equipment rentals, self storage units, fitness trail, and pavilions. FMWR facilities will deliver high quality programs and services to eligible participants.

### Area B Photovoltaic Array (Conceptual Project)

A photovoltaic array totaling approximately 20 acres will be constructed on Area B. The exact location is undecided but may be built partially over landfills which have limited uses; therefore, construction of the photovoltaic array will maximize the land in a cost-effective manner. The solar panels will provide Fort Detrick with an environmentally friendly source of electricity that will reduce the carbon dioxide emissions from the Installation. The entire installation will benefit from the renewable, secure supply of clean energy that the photovoltaic array would provide.

## 2.3 CONSTRUCTION REGULATIONS AND CONSTRAINTS

### 2.3.1 SITE SELECTION REGULATIONS

AR 420-1 establishes and prescribes the Army real property master planning process, and it assigns responsibilities and prescribes policies and procedures relating to the development, content, submission, and maintenance of a Real Property Master Plan (RPMP). AR 405-80, *Management of Title and Granting Use of Real Property* (dated 10 October 1997), regulates granting use of real property controlled by the DA, including delegating authority to issue outgrants authorizing the use of such real property by non-Army users. The Secretary of the Army has the authority to grant the use of real property under his administrative control. The Assistant Secretary of the Army (Installations, Logistics and Environment) has the primary responsibility for DA real estate programs. The Assistant Chief of Staff for Installation Management makes a Determination of Availability prior to issuing outgrants, such as leases.

Site selection regulations at Fort Detrick are furthermore guided by Fort Detrick Policy Memorandum FD 01-09, *Fort Detrick Environmental Policy*. FD 01-09 is broadly applicable to most activities on the Installation, which states that "it is Fort Detrick's [environmental] policy that cost-effective common-sense stewardship of our environmental, cultural, and natural resources will be incorporated into all facets of operations at this Installation." Fort Detrick Policy Memorandum FD 01-09 also commits the USAG "to maintaining a sustainable environment while fully supporting mission readiness."

### 2.3.2 CONSTRUCTION WASTE MANAGEMENT

All solid waste from the construction of the Proposed Projects, including construction and land clearing debris, will be managed in accordance with Federal, DA, USAG, and state requirements and properly disposed of at a permitted solid waste disposal facility. The Fort Detrick Municipal Waste Landfill on Area B (see Section 2.9.2) will not accept any wastes generated by the construction of new buildings. The USAG has an established policy that

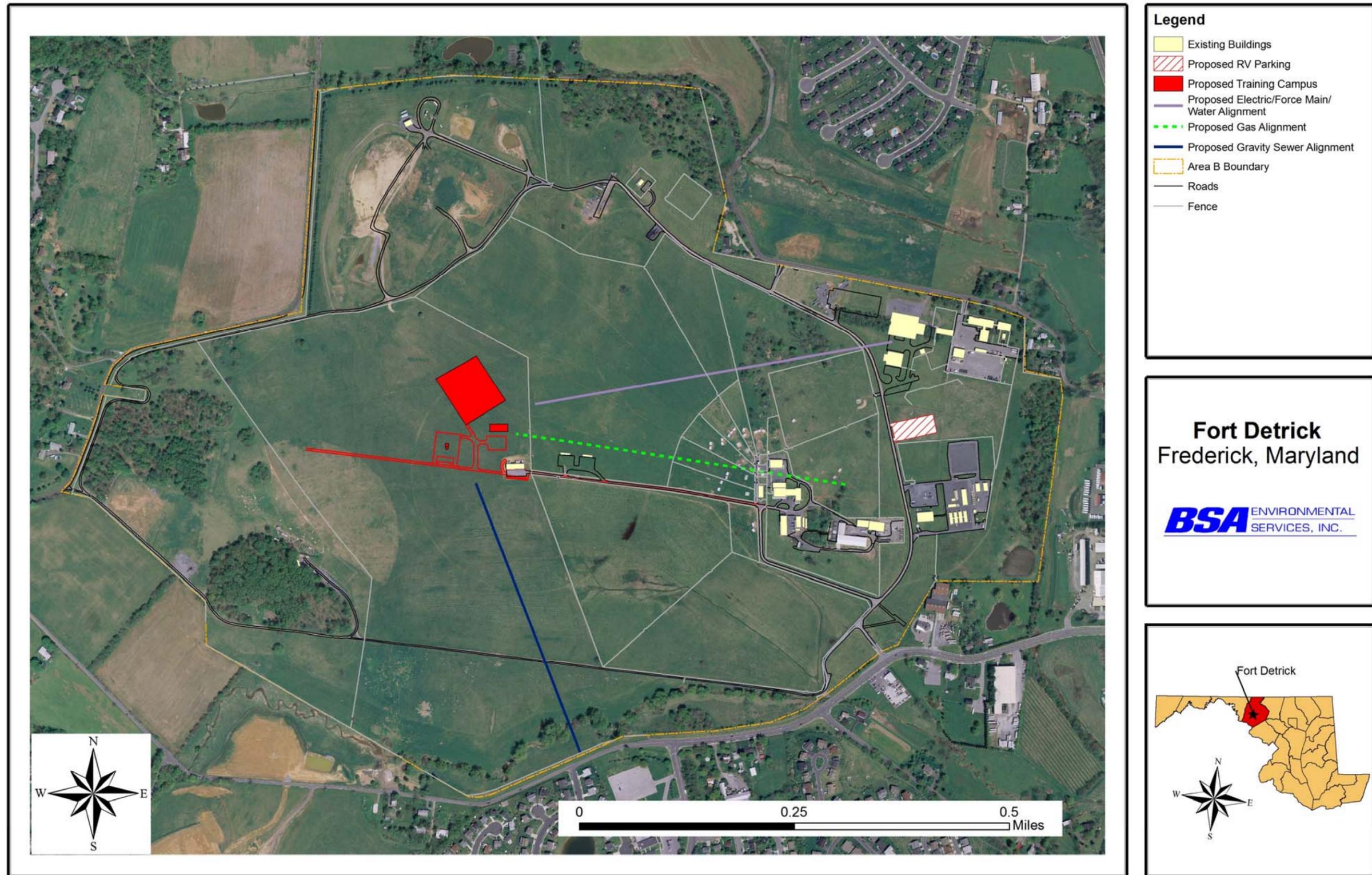


Figure 2-1. Area B Proposed Projects Map

THIS PAGE INTENTIONALLY LEFT BLANK

dictates that all construction debris generated from buildings on the Installation must be disposed of at an off-post location.

The construction contractors will be responsible for the disposal of wastewater, municipal solid waste (MSW), and hazardous waste generated by their activities, as well as the construction debris, at permitted facilities off the Installation in accordance with Federal, state, and local regulatory requirements. In accordance with Army policy for *Sustainable Management of Waste in Military Construction, Renovation, and Demolition Activities* (DA, 2006) and Executive Order (EO) 13514, the contracts will include a performance requirement for 50 percent minimum diversion of construction and demolition waste by weight from landfill disposal. The contract specifications will include submission of a contractor's construction Waste Management Plan.

### 2.3.3 STORMWATER MANAGEMENT, EROSION, AND SEDIMENT CONTROL

Stormwater management (SWM) measures are required for projects that disturb more than 5,000 sf (approximately 0.115 acres) of land area on Federal property according to COMAR 26.17.02 and the *Maryland Stormwater Management Guidelines for State and Federal Projects*, 15 April 2010. The SWM measures will be designed consistent with the with the *2000 Maryland Stormwater Design Manual Volumes I and II*, 2009 Model Standard Stormwater Management Plan and 2009 Model Stormwater Management Ordinance (Maryland Department of the Environment [MDE], 2009). Additionally, all projects will be in compliance with the new regulations of the MDE Stormwater Management Act of 2007.

An erosion and sediment control plan for land clearing, grading, or other earth disturbance approved by the MDE is required under COMAR 26.17.01 for construction activities involving more than 100 cubic yards or more than 5,000 sf. During construction, application of best management practices (BMPs) will minimize soil erosion and potential airborne particulate matter in compliance with COMAR 26.11.06.03D (*Particulate Matter from Materials Handling and Construction*) and the *Final 2010 Effluent Guidelines* published by the U.S. Environmental Protection Agency (USEPA).

If the area disturbed is more than one acre, a general permit under the National Pollutant Discharge Elimination System (NPDES) is also required. Authority for the Maryland NPDES General Permit for Construction Activity is through the Federal Clean Water Act Section 402 and 40 CFR 122.26, and the State Environment Article, Title 9, Subtitle 3: COMAR 26.08.04. All projects one acre or more must submit an individual permit application. The application requires a minimum 45-day public notification period. The preliminary estimate of disturbed area in Table 2-1 indicates total disturbance of approximately 4.34 acres, including approximately 2.89 acres of impervious surfaces, due to construction of the Proposed Projects.

Low Impact Development (LID) and Environmental Site Design sustainability features for SWM will be incorporated into the design of the Proposed Projects to the maximum practical extent and will help mitigate the impacts of stormwater runoff. Application of LID is required by EO 13423, dated 26 January 2007, *Strengthening Federal Environmental, Energy, and Transportation Management*, which directs all agencies to incorporate the LID approach to land development and SWM into landscape programs, policies, and practices. Design of LID features will follow the DoD guidelines as set forth in the Unified Facilities Criteria 3-210-10, *Design: Low Impact Development Manual 25 October 2004*.

### 2.3.4 FOREST CONSERVATION REQUIREMENTS

The Fort Detrick Forest Conservation Plan requires that any project that disturbs over 40,000 sf (0.92 acres) of unforested land must afforest (convert open land by planting trees) 15 percent of the equivalent surface area. Additionally, any project that disturbs over 40,000 sf (0.92 acres) of forested land must reforest the equivalent surface area at a 2:1 ratio. These plantings will contribute to the growth and development of the designated forest areas within the Installation. The Maryland Department of Natural Resources (MDNR) typically must approve forestation plans before a project can break ground (USAMRMC and USAG, 2006). Construction activities related to the Proposed Action will result in an estimated total land disturbance of approximately 6.23 acres (271,450 sf), necessitating afforestation of a total of 0.93 acres (see Table 2-1 and Figure 2-2). Forested land will not be disturbed as a result of the Proposed Projects.

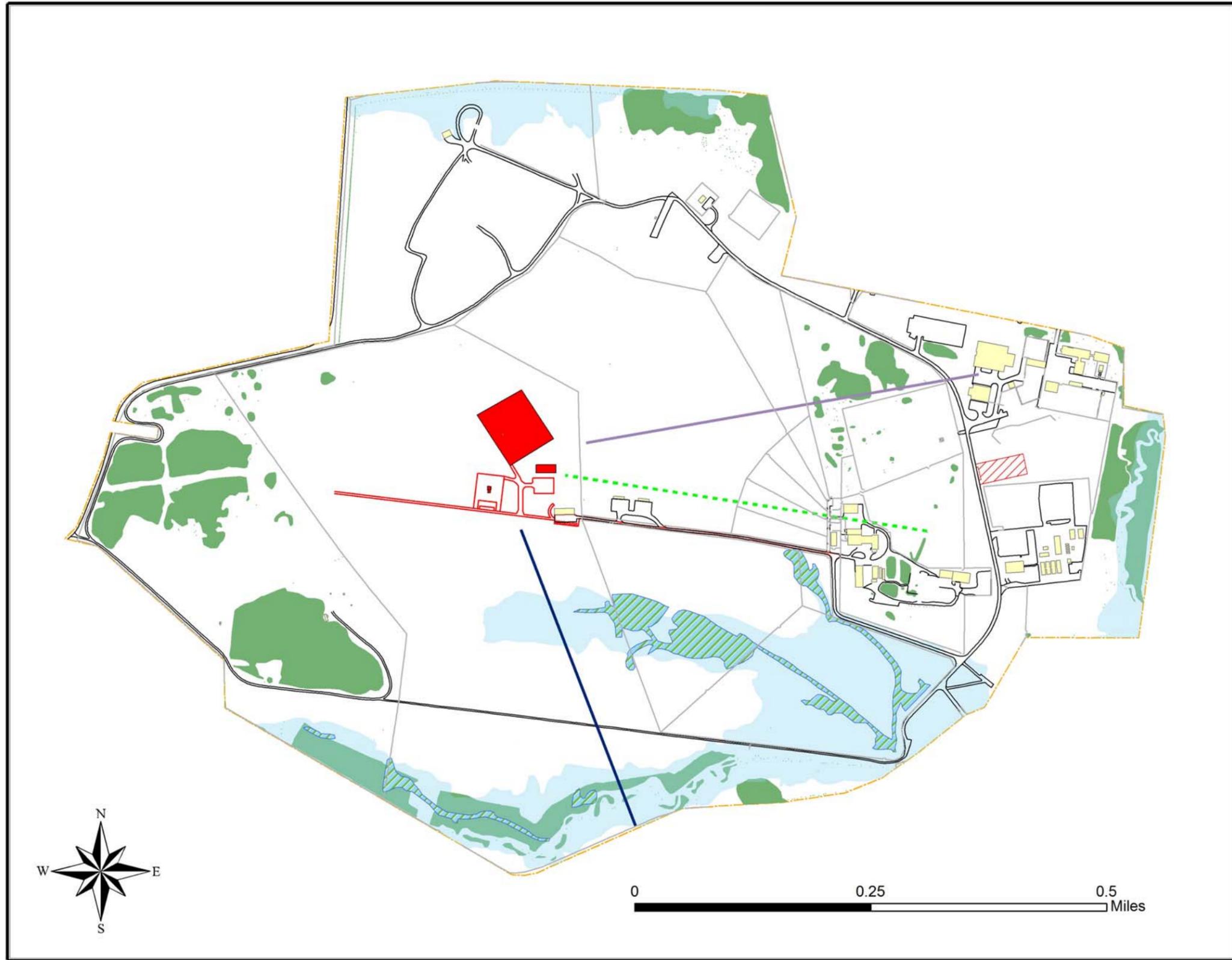
**Table 2-1. Forestation Requirements for the Proposed Action.**

PROPOSED PROJECT	Project Total Gross Square Feet	Total Impervious Area	Total Disturbed Area	Forestation Requirement
		Square Feet (acres)	Square Feet (acres)	Square Feet (acres)
DHS Antenna (a)	N/A	N/A	N/A	N/A
RV Parking Lot (b)	29,700	29,700 (0.68)	44,550 (1.02)	6,683 (0.15)
Training Campus (b)	96,600	96,600 (2.21)	144,900 (3.32)	21,735 (0.49)
Infrastructure Improvements (a)	82,000		82,000 (1.88)	12,300 (.28)
<b>Total Amount for Entire Project</b>	<b>126,300</b>	<b>126,300 (2.89)</b>	<b>271,450 (6.23)</b>	<b>40,718 (0.93)</b>

a) Projects that are estimated to be disturbed less than 40,000 sf.

b) When disturbed area was unavailable for a particular project, it was assumed that disturbed area would be equal to the total impervious area of the project plus half of the total impervious area.

In accordance with the Fort Detrick Integrated Natural Resource Management Plan (INRMP) (under revision), tree plantings will consist of a minimum of five (5) different hardwood species which are native to Maryland (MDNR, 2002) and/or the Northeast forest region (U.S. Department of Agriculture [USDA], 2007) of the United States. The recommended size of trees to be planted for hardwood are 1-inch caliper trees (1-inch caliper at 6 inches above root collar/ground level) and planted at a rate of 200 per acre or 2-inch caliper trees (2-inch caliper at 6 inches above root collar/ground level) planted at a rate of 100 per acre. A warranty for a survival rate of 100 percent for newly planted trees must be offered for the first year of planting and any dead trees during this warranty period must be replaced with trees of a like size and kind. Tree plantings or replacements will only be allowed during the late winter or early spring months (March to May) or late summer to early fall (October to December). The MDNR Forest Service can conduct an onsite visit to Fort Detrick at any time to inspect for compliance. Site visits are coordinated through the Natural Resource Manager, Environmental Management Office (EMO), at least one week prior to the visit to allow time for proper security clearance.



**Legend**

- Existing Buildings
- Proposed RV Parking
- Proposed Training Campus
- Proposed Electric/Force Main/ Water Alignment
- Proposed Gas Alignment
- Proposed Gravity Sewer Alignment
- Area B Boundary
- Wetlands
- 100 Year Floodplain
- Forestation

**Fort Detrick**  
Frederick, Maryland

**BSA** ENVIRONMENTAL  
SERVICES, INC.

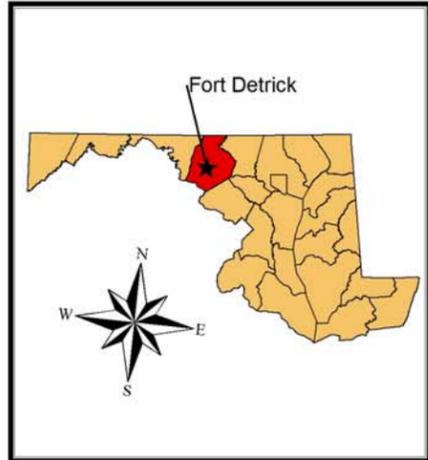


Figure 2-2. Area B Forestation, Wetlands, and Floodplains.

THIS PAGE INTENTIONALLY LEFT BLANK

### 2.3.5 CULTURAL RESOURCE REQUIREMENTS

The *National Historic Preservation Act of 1966* (NHPA), as amended (16 U.S. Code [USC] 470), mandates national policy for protection and restoration of significant historic, architectural, archeological, or cultural resources. The 1980 amendments to the NHPA provide for historic preservation costs to be included in project planning and budgeting. The State Historic Preservation Office (SHPO) has primary responsibility for ensuring adherence to the NHPA. In accordance with AR 200-1, *Environmental Protection and Enhancement*, Fort Detrick maintains an Integrated Cultural Resources Management Plan (ICRMP) that serves as a guide for compliance with the NHPA of 1966 and other applicable Federal laws and regulations (USAG, 2006b).

Under Section 106 of the NHPA, historic properties include buildings that are eligible for listing in the National Register of Historic Places (NRHP). There are no buildings listed, or eligible to be listed, on the NRHP on Area B. Furthermore, no buildings will be demolished as a result of implementation of the Proposed Action.

### 2.3.6 AIR QUALITY REQUIREMENTS

Air quality permits to construct are required for generators greater than 500 horsepower or 373 kilowatts and for fuel burning equipment greater than or equal to 1 Million British Thermal Units (MMBtu) per hour. Air quality permits to operate are required for fuel burning equipment and hot water heaters with maximum rated capacities of 50 MMBtu per hour or more (COMAR 26.11.02). As noted in Section 4.8.1, Fort Detrick is located in an air quality attainment area for ozone and fine particulate matter. Because Fort Detrick has actual emissions of nitrogen oxides (NO<sub>x</sub>) greater than 100 tons per year (tpy) and sulfur dioxide (SO<sub>2</sub>) greater than 100 tpy, it is a major source for *Clean Air Act* (CAA)/Title V permit purposes.

In conjunction with the permitting process and in accordance with the CAA and COMAR 26.11.17, a New Source Review (NSR) and/or a Prevention of Significant Deterioration (PSD) evaluation will be required if any air pollutant emissions resulting from the operational phase of the Proposed Projects surpass their threshold levels. A NSR evaluation must be prepared before construction and installation of any new permitted major sources or any major modifications of permitted major sources in nonattainment areas that have the potential to cause significant increases of the criteria pollutants (carbon monoxide [CO], lead [Pb], NO<sub>x</sub>, particulate matter, SO<sub>2</sub>, and volatile organic compounds [VOCs]). A PSD evaluation must be prepared before construction and installation of certain types of listed sources in attainment areas that have the potential to emit certain threshold quantities of criteria pollutants.

## 2.4 UTILITY REQUIREMENTS FOR ROUTINE OPERATIONS

### 2.4.1 WATER SUPPLY

Fort Detrick has an excellent record of meeting water quality standards, as set by Federal (Safe Drinking Water Act [SDWA]), state (COMAR 26.04.01), and DA criteria. Details of the WTP treatment processes and operations are presented in Section 4.5.4. The Installation Water Appropriation Permit FR1943S001(3), effective through 1 July 2015, limits the WTP to an annual average of 2.0 million gallons per day (mgd) from the Monocacy River and a maximum daily withdrawal of 2.5 mgd (USAG, 2010b). Following construction of the Potomac Pipeline Interconnect, Fort Detrick will be provided with an additional source of drinking water from the

Potomac River (USAG, 2009b). Further discussion of the water supply for the Installation is provided in Section 4.5. Water consumption by the Proposed Action will be a small fraction of the overall Installation consumption.

## 2.4.2 ENERGY SYSTEMS

### 2.4.2.1 *Electricity*

The Potomac Edison DBA Allegheny Power provides electrical power to the Installation via two 34.5 kilovolt (kV) power lines. Due to the energy-intense nature of research activities conducted at Fort Detrick, the demand for electricity at the Installation is high. Power to Area B is supplied by a 100 amp overhead line from Area A. This power supply line, installed over 40 years ago, crosses Rosemont Avenue and enters Area B in the southeast corner of the property (USAG, 2004). When the new Reserve Center was built, a new electric service was purchased directly from Allegheny due to the limited capacity of the existing power supply. During fiscal year (FY) 2010, the total electrical consumption for the Installation was approximately 88 million kilowatt hours (kWh). Area B consumed approximately one to two percent of this total (Lewis, 2010). Electrical consumption by the Proposed Action will be a small fraction of the overall Installation consumption.

### 2.4.2.2 *Natural Gas and No. 6 Fuel Oil*

Natural gas is furnished by the Frederick Gas Company. Natural gas usage on Area B of Fort Detrick is primarily consumed for heating purposes. During FY 2010, natural gas consumption for the entire Installation was approximately 390,000 MBTU. Area B consumed approximately 0.4 percent of this total (Lewis, 2010). During FY 2010, the No. 6 fuel oil consumption on the Installation was approximately 224,955 gallons. There are currently no processes or activities on Area B that utilize No. 6 fuel oil (Lewis, 2010). Implementation of the Proposed Action will result in negligible increase in natural gas consumption on the Installation.

### 2.4.2.3 *Steam*

Until 2008, steam generation at Fort Detrick was produced exclusively by USAG on Area A at the Boiler Plant and as waste heat recovered from the solid waste combustors. Since 2008, three additional steam generation sources have come on line. During FY 2010, approximately 314,695,464 pounds (lbs) of steam was generated on the Installation (Lewis, 2010). There are no steam generation sources on Area B, and no processes or activities on Area B consume steam. Implementation of the Proposed Action will result in no increase in steam consumption on the Installation.

## 2.5 WASTE STREAM MANAGEMENT AND POLLUTION PREVENTION

During the construction and operation phases of the Proposed Projects, pollution prevention will be practiced through reduction or elimination of wastes and emissions of toxic materials to the environment, in accordance with the *Pollution Prevention Act of 1990* (42 USC 133); EO 12856, *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements* (August 1993); EO 13423, and EO 13514. As noted in Section 2.6.2, the construction contractors will be responsible for the disposal of construction debris at permitted facilities off the Installation. The contractors must abide by the DA and EO 13514 performance requirement for 50 percent

minimum diversion of construction and demolition waste by weight from landfill disposal (DA, 2006).

The nature of activities currently conducted on Area B of Fort Detrick will generally remain the same under the Proposed Action. As a result, implementation of the Proposed Action is not expected to result in qualitatively different waste streams than what is currently generated on the Area B. Waste generated from the Proposed Action will primarily include construction waste (see section 2.6.2), wastewater, and MSW.

### 2.5.1 WASTEWATER

The Fort Detrick WWTP, located in Area C, provides secondary treatment through the use of trickling filters. Treated effluent from the WWTP discharges into the Monocacy River, downstream from both the City of Frederick and Fort Detrick WTP water intakes. The daily sanitary wastewater flows are well within the maximum WWTP capacity (2.0 mgd average daily flow) under NPDES Permit No. MD0020877, effective through 30 November 2014 (USAMRMC and USAG, 2006). During FY 2010, the WWTP treated approximately 324 million gallons of water (Lewis, 2010). The Proposed Projects are not expected to significantly contribute to the yearly wastewater total at Fort Detrick. Further details on wastewater generation and treatment at Fort Detrick appear in Section 4.15.1.

### 2.5.2 SOLID WASTE

The generators of MSW at Fort Detrick sort the recyclable materials from waste prior to collection by the USAG Directorate of Installation Services (DIS). During FY 2010, DIS recycled approximately 3,106,000 lbs of waste that were generated on the Installation (Adkins, 2010a). The recycled materials included paper, plastic, metals, and glass (see Section 4.15.2 for details). Combustible waste materials that cannot be recycled are transported to the Incinerator Plant for processing in the two municipal waste incinerators. Residual ash from the incinerators is transported by the USAG DIS to the Fort Detrick Municipal Landfill (located in Area B) for ultimate disposal. Further details of the existing MSW management system appear in Section 4.15.2.

During FY 2010, approximately 4,520,000 lbs of MSW was generated on the Installation. Area B generated approximately 50,000 lbs (or one percent) of the total generated on the Installation in FY 2010 (Adkins, 2010a). The Proposed Projects are not expected to contribute to the total MSW generated yearly on Area B. All MSW generated by the Proposed Projects will be managed and disposed of in accordance with Federal, DA, USAG, and state regulatory requirements.

## 2.6 SUSTAINABLE DESIGN AND OPERATION OF NEW FACILITIES

The *Army Strategy for the Environment: Sustain the Mission – Secure the Future*, signed 1 October 2004, proclaimed the importance of a healthy environment (i.e., land, water, and air) in carrying out current and future Army missions (U.S. Army, 2008). This strategy outlines the importance of sustainability in connecting current and future activities, with sound business and environmental practices. More specifically, a sustainable Army works to simultaneously meet current and future requirements worldwide, safeguards human health, improves quality of life, and enhances the natural environment (U.S. Army, 2008). The interrelationship of these

concepts is known as the Army's Triple Bottom Line Plus (TBL+) of sustainability: mission, community, environment, plus economy.

EO 13423 defines sustainability as creating and maintaining conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of the present and future generations of Americans. This has become a premise for Federal environmental legislation. Requirements stated in Federal legislation on the environment and sustainability extends mandates to Federal buildings (i.e., Army installations) for sustainable design, construction, and operation. Sustainability in Federal buildings is implemented through six fundamental principles: optimizing site potential, optimizing energy use, protecting and conserving water, using environmentally preferable products, enhancing indoor environmental quality, and optimizing operation and maintenance practices (Whole Building Design Guide, 2010).

It was acknowledged in the *Army Strategy for the Environment* that merely meeting environmental regulations will not ensure the ability of the Army to sustain its mission. Therefore, the Army strives to exceed Federal environmental mandates.

Fort Detrick is characterized as a Sustainable Community of Excellence and will continue to excel in sustainability (USAG, 2010a). The SuSP will be a driving force for this achievement. The Infrastructure and Utilities Team has integrated and aligned sustainable design and operations into the SuSP and will continue to do so in the future.

It is the policy of Fort Detrick to certify new buildings to the Leadership in Energy and Environmental Design (LEED)-Silver standard. Currently, Fort Detrick is exceeding the Army standards by not only designing and the constructing new facilities as LEED-Silver "certifiable", but will submit the new construction projects to the Green Building Certification Institute (GBCI) for LEED-Silver certification. Fort Detrick has identified 11 projects that will be submitted to the GBCI for formal certification. Additionally, Fort Detrick is embarking on an aggressive LEED-Existing Buildings (EB) program and has identified four existing buildings that will be submitted to GBCI under LEED-EB that will incorporate LEED, sustainable design and development (SDD), Energy Independence and Security Act (EISA), and EOs requirements.

Several additional milestones for sustainability have been met at Fort Detrick. Following nine years of environmental work, in January 2009 an Environmental Performance Assessment System (EPAS) audit found Fort Detrick in compliance with International Organization for Standardization (ISO) 14001 Environmental Management System (EMS) standards. This achievement was seven months ahead of the 31 December 2009 mandatory compliance date for implementation of the Installation-wide EMS program as stated in EO 13423 (EMO, 2009a).

The main goal of the Fort Detrick EMS is to minimize the Installation environmental footprint by setting objectives and targets beyond compliance requirements (FD EMO, 2009b). The Fort Detrick EMS has taken an active role in supporting targets, goals, and objectives established by the sustainability and strategic planning process. To evaluate significant environmental aspects on the Installation, an Environmental Aspects Ranking report is frequently prepared and evaluates significant environmental impacts of new projects, modified activities, and future strategic planning. In August 2010, the Installation-wide Environmental Aspects Ranking were updated and revised. Listed below are the prioritized significant environmental aspects (FD EMO, 2009b):

- **Resource Consumption** - Includes the acquisition and use of all goods and materials used in association with installation operations.
- **Energy Consumption** – Includes electricity (renewable/nonrenewable), and fuels (petroleum-based fossil fuel and alternative fuel).
- **Air Emissions** – Includes Stationary Sources (boilers, incinerators, generators, chlorine gas storage, and petroleum storage) and Mobile Sources (vehicle emission, government-owned and personally owned vehicles, and equipment).
- **Water Quality** – Includes all elements of sanitary wastewater management, SWM, and drinking water quality.
- **Waste Generation** – Includes all elements of solid waste, recycling, and hazardous waste management.
- **Spills, Leaks, or Releases to Soil or Water** – Includes spills, leaks or releases to soil or water or sewage, hazardous material, hazardous waste, or oil-based products.

Other environmental considerations evaluated within the Environmental Aspects Ranking that were not deemed to be significant are listed below:

- **Natural Resource Conservation**– Includes operations associated with the potential to impact natural resources including construction, demolition and installation restoration program activities. Also includes land management, wildlife management, and invasive species management.
- **Noise** – Includes noise associated with all installation operations.
- **Cultural Resource Preservation** – Includes historic properties, archeological sites, etc.
- **Odor** – Includes unpleasant or offensive odor associated with installation operations.

During construction and operation of the Proposed Projects, Fort Detrick will consider all environmental aspects listed above and abide by all Federal mandates on sustainability. Some specific environmental targets to be achieved by FY2020 are the reduction of greenhouse gas emissions from non-combat activities 34 percent, reduction of petroleum consumption by two percent per year, reduction of potable water intensity by two percent annually (26% total reduction), and ensure all new Federal buildings that enter the planning process in 2020 and thereafter are designed to achieve zero-net-energy standards by 2030, as well as ensure procurement preference for EPEAT-registered electronic products.

THIS PAGE INTENTIONALLY LEFT BLANK

### **3.0 ALTERNATIVES CONSIDERED**

An EA must identify and explain the existing “range of alternatives” to the Proposed Action, which includes all reasonable alternatives to the Proposed Action that would avoid or minimize adverse impacts. Reasonable alternatives must be rigorously explored and objectively evaluated before being eliminated from detailed study with a brief discussion of the reasons for their elimination (40 CFR 1502.14[a]). In addition, consideration of a no action alternative is required.

The Proposed Action (Alternative I, the preferred alternative) and subject of this EA is the Construction and Operation of the Proposed Projects, which include a DHS Antenna, RV Parking Lot, Training Campus, and Infrastructure Improvements on Area B of Fort Detrick in Frederick County, Maryland as described in Section 2.0. During the preparation of this EA, a reasonable alternative to the Proposed Action was identified and evaluated. Alternative II, No Action, is Do Not Construct and Operate the Proposed Projects on Area B of Fort Detrick in Frederick County, Maryland. Both of these alternatives are deemed to be reasonable. The No Action alternative has been included in accordance with CEQ regulations [40 CFR 1502.14(d)]. Although it would not satisfy the purpose of and need for the projects, the No Action alternative does establish the baseline to which the action alternative can be compared.

These alternatives are briefly discussed in Sections 3.1 and 3.2 below. Environmental analyses of the alternatives are comprised of detailed discussion of the existing (baseline) environment in Sections 4.1 through 4.17, review of the environmental consequences of the Proposed Action in Section 5.2, and comparison of the two alternatives in Section 5.3 and Section 5.4.

#### **3.1 ALTERNATIVE I – CONSTRUCT AND OPERATE PROPOSED PROJECTS ON AREA B OF FORT DETRICK IN FREDERICK COUNTY, MARYLAND**

The Proposed Action (Alternative I, the Proposed Projects) and subject of this EA is the Construction and Operation of the Proposed Projects on Area B of Fort Detrick in Frederick County, Maryland. This is comprised of a DHS Antenna, RV Parking Lot, Training Campus, and Infrastructure Improvements. Alternative I will provide facilities and infrastructural improvements that will enable Fort Detrick and its Mission Partners to advance their respective missions, as established in Section 1.2. Implementation of this alternative will provide the Fort Detrick Fire and Police Departments with advanced training capabilities to better serve the Installation and surrounding community. This alternative would also provide DHS with a much needed antenna for communications. The potential adverse environmental impacts of this alternative were found to be negligible to minor and mitigable for all environmental attributes.

#### **3.2 ALTERNATIVE II – DO NOT CONSTRUCT AND OPERATE PROPOSED PROJECTS ON AREA B OF FORT DETRICK IN FREDERICK COUNTY, MARYLAND – NO ACTION**

Alternative II, the No Action Alternative, is Do Not Construct the Proposed Projects for Army-controlled land at Area B of Fort Detrick in Frederick County, Maryland. This alternative would avoid the potential adverse environmental impacts associated with Alternative I, but it would eliminate the beneficial impacts. If the Proposed Action is not implemented, the USAG and its Mission Partners would not be as effective at meeting their respective mission requirements. Implementation of Alternative II would not allow the second DHS HF radio transmitter system from becoming functional and would not provide the Fort Detrick Police and Fire Departments

necessary training facilities. This No Action Alternative is included in accordance with the CEQ regulations. Although Alternative II is not the preferred alternative, it does establish the baseline to which Alternative I can be compared.

## 4.0 AFFECTED ENVIRONMENT

This section of the EA discusses aspects of the environment that potentially may be impacted by the implementation of the Proposed Action. The following description of the affected environment relies heavily on previous NEPA analyses (i.e., *Environmental Assessment for the Real Property Master Plan for Army-Controlled Land at Areas A and C of Fort Detrick in Frederick County Maryland (USAG, 2010b)*). Relevant aspects of the affected environment (baseline conditions) are discussed below by environmental attribute area.

### 4.1 LOCATION AND LAND USE

Frederick County covers approximately 665 square miles, comprised of 79.7 percent agricultural land/woodland, 10.3 percent residential land, 5.3 percent parkland and open space, 2.5 percent utilities and government land, 1.3 percent industrial and limited industrial land, and 0.9 percent commercial land (Frederick County Division of Planning, 1998). The City of Frederick covers an area of 20.8 square miles. According to the 2004 *City of Frederick Comprehensive Plan*, land use within the city is distributed as follows: 29 percent is residential, 21 percent is institutional, 8 percent is commercial, 5 percent is industrial, 25 percent is vacant, and the remaining 11 percent includes mixed use, conservation, recreation and rights of way (City of Frederick, 2004).

The Installation consists of six non-contiguous land parcels designated as Areas A, B, Area C WTP, Area C WWTP, Forest Glen Annex, and Glen Haven Housing Area. Areas A, B, and C of Fort Detrick are located within the northwest portion of the City of Frederick in Frederick County, Maryland. Within Frederick County, Fort Detrick encompasses approximately 1,212 acres. The USAG, Fort Detrick, has command and control of approximately 1,143 of those acres, and the NCI-Frederick has command and control of approximately 69 of those acres. The 1,143 acres of Army-controlled land are divided into four separate parcels identified as Areas A (728 acres), B (399 acres), Area C WTP (7 acres), and Area C WWTP (9 acres). The USAG also recently assumed command and control of the Forest Glen Annex (132 acres) and Glen Haven Housing Area (20 acres) in Montgomery County, MD due to BRAC.

Area B of Fort Detrick (approximately 399 acres) is located west-southwest of Area A and is separated from it by an area of land in width from 0.2 to 1.0 mile. It contains three land use categories including: Ranges and Training, Troop, and Professional/Institutional. Area B is used for agricultural research, animal grazing and maintenance, U.S. Army Reserve training, Air Force Medical Evaluation Support Activity, a Theater Army Medical Laboratory, and Field Identification of Biological Warfare Agents. Area B contains communication antennas, an indoor shooting range, paintball fields, and a sanitary landfill (USAMRMC and USAG, 2006).

The proposed location for the DHS Antenna is on the northern portion of Area B. The proposed DHS Antenna site is located on a concrete pad of a former antenna. The proposed DHS Antenna location is surrounded by trees to the north and open/landfill area to the south and an existing building to the east. The proposed Training Campus location is in the open land of the central portion of Area B. North of the campus is permitted landfill area, to the south is open land and wetlands. The proposed RV parking lot is located on the eastern portion of Area B. The Armed Forces Reserve Center is located to the north of the proposed parking lot and to the south is an existing building. The service road is adjacent to the west and there is open area to the east of the proposed parking lot.

## 4.2 CLIMATE

Frederick County has a temperate, continental climate with four distinct seasons. Summers are usually short, warm, and occasionally humid. Winters are mostly mild with intermittent periods of cold. Local weather patterns are influenced by the Catoclin Mountains; a north-south trending mountain range located approximately five miles west of Fort Detrick (USAG, 1998). The annual average temperature, in the City of Frederick, is 50.3 degrees Fahrenheit (°F), with average temperatures of 36.7 °F in the winter and 73.2 °F in the summer, and historical extreme temperatures of -10 °F in the winter and 106 °F in the summer. The average annual precipitation for Frederick is 40.17 inches (Southeast Regional Climate Center, 2009). During normal years, precipitation in the region is sufficient to provide an adequate water supply. However, the Central Region of Maryland was in a drought emergency for the greater part of 2002. The resulting Level I and Level II mandatory water usage restrictions were lifted in February 2003. As of 31 August 2010, the hydrologic indicators of rainfall, stream flow, reservoirs, and groundwater in the central region of Maryland are classified as normal (MDE, 2009b).

The prevailing wind direction for the area is west-southwesterly with an annual average velocity of 7.4 miles per hour. Prevailing winds in the region influence seasonal climatic variations in the Fort Detrick area. In the winter months (October - April), prevailing winds are from the northwest and bring clear, cool weather. During the summer (May - September), a large high-pressure system in the Atlantic Ocean, known as the Bermuda High, frequently influences the region. This system brings warm, moist air into the region from a southwesterly direction (Maryland Office of Environmental Programs, 1986).

The storm events database of the National Climatic Data Center (NCDC) lists the following extreme weather events for Frederick County between 1 January 1950 and 30 June 2010: 11 droughts, 72 floods, 47 hail events, 21 heavy rain events, 115 heavy snow and ice events, 27 lightning events, 253 thunderstorms and high wind events, and 28 tornados (NCDC, 2010). All of Maryland and surrounding states received historic amounts of snow during a five day period in February 2010. On 5 February 2010, Governor Martin O'Malley issued a Declaration of Emergency as a major winter storm occurred in the Middle Atlantic region (Maryland Office of the Governor, 2010). President Jan Gardner of the Frederick Board of County Commissioners declared a Local State of Emergency due to another severe winter storm with blizzard conditions on 10 February 2010 (Frederick County Government, 2010).

## 4.3 GEOLOGY

Area B of Fort Detrick lies in the western part of the Piedmont Plateau Physiographic Province (Appalachian Highlands) in a geologic subdivision known as Frederick Valley. The Piedmont Plateau extends from the Fall Line between the Coastal Plain and Piedmont Plateau Physiographic Province in the east to the Catoclin Mountains of the Blue Ridge Physiographic Province in the west. The Piedmont Plateau is characterized by rolling terrain and rather deeply incised stream valleys and comprises approximately 29 percent of Maryland land area. Frederick Valley trends north to south, extends 26 miles, and is six miles wide. Directly west of Frederick Valley are the Catoclin Mountains. The Frederick Valley is known as the Frederick Syncline, and the Catoclin Mountains are part of an overturned anticline known as the South Mountain Anticlinorium (U.S. Army Corps of Engineers [USACE], 2000b).

The regional geology underlying Area B is the fractured limestone and dolomite of the Upper Cambrian Frederick Formation and the Triassic shales, mudstones, and limestone conglomerates (see Figure 4-1). Area B is mainly comprised of the New Oxford Formation, with much of it containing limestone and quartz-pebble conglomerates. The southern section of Area B is underlain by the Rocky Springs Station Member of the Upper Cambrian Frederick Formation. The Triassic shales and mudstones, residual clay with low permeability, are moderately hard and moderately jointed. The Triassic conglomerate is a consolidated matrix of coarse silt, sand and clay (USACE, 1993b). Rock strata dip in Area B is to the east-southeast and is usually steep, ranging from 30° to 50° (USAG, 2003a).

Based on previous interpretation of aerial photographs and U.S. Geological Survey (USGS) quadrangle maps for topographic characteristics, vegetation, and soil tone, several sinkholes/depressions have been identified on or near Area B of Fort Detrick. Area B contains five regions where sinkholes are present (see Figure 4-1). There are two sinkholes along the north central boundary, one partially within the eastern boundary, two along the southeastern boundary, three in the west central portion and one in east central portion of Area B (USACE, 2001). There are two large sinkholes near the Area B entrance gate that formed during the drilling of a monitoring well in 2010. The geological units and soil combinations in Area B create a low to high potential for sinkhole development. The combination of the Triassic geological unit and Morven soils creates a low potential for sinkhole development. The combination of Triassic geological unit and Springwood soils creates a moderate potential for sinkhole development but Triassic and rocky Springwood soils create a high potential for sinkhole development. The Rocky Spring Station-West geological unit has a high sinkhole potential when combined with Dryrun or Adamstown soils (USDA, 2002). There are no sinkholes on the proposed sites. There is a large sinkhole to the south and the west of the proposed Training Campus. There is also a sinkhole under the existing road to the proposed Training Campus. Most of the sinkholes are really depressions formed from old sinkholes that filled in and no active sinkholes.

Fracture traces and lineaments are linear features that may suggest the presence of natural, geologic features, such as faults and joints; or they may reflect man-made structures, such as fence lines, or drainage ditches (see Figure 4-1). Subterranean fracture traces that are connected to the aquifer may represent pathways for groundwater flow and influence the regional groundwater flow regime (USACE, 2002a). Aerial photographs and USGS maps identify fracture traces and lineaments in Areas A, B, and C (USACE, 2001). There are several fracture traces south of the proposed Training Campus. One fracture trace runs through the proposed RV Parking Lot site. No fracture traces are on the proposed DHS Antenna site.

Fort Detrick is located within a Seismic Zone 1 area with seismic coefficients ranging from 0.03 to 0.07. Seismic coefficients, in general, range from 0.0 to 0.27, with high values indicating high risk of earthquake. Seismic Zone 1 is characterized as an area that may receive minor damage due to distant earthquakes (USAG, 2003a). Nearly all of Maryland, including Frederick County, is classified as a "region of negligible seismicity with very low probability of collapse of the structure" Between 1758 and 2009, 66 earthquakes occurred in the State of Maryland (Maryland Geological Survey, 2009).

#### 4.4 SOILS

The soils of Frederick County consist of a combination of residual lime soils and wind-transported soils, and they are among the most agriculturally productive in the State of

Maryland. Duffield series soils are found extensively throughout the Frederick Valley (USACE, 2000b). Duffield soils consist of very deep, well-drained soils with moderate permeability. Available water capacity for the Duffield series soils is low to moderate (USDA, 2010). The soils in Area B include Adamstown-Funkstown complex, Codorus and Hatboro silt loams, Dryrun gravelly loam, Foxville and Hatboro soils, Hagerstown – Opequon silty clay loams, Lindside silt loam, Morven loam, Penn channery loam, Reaville silt loam, Springwood gravelly loam, Springwood-Rock outcrop complex, and Udorthents (see Figure 4-2).

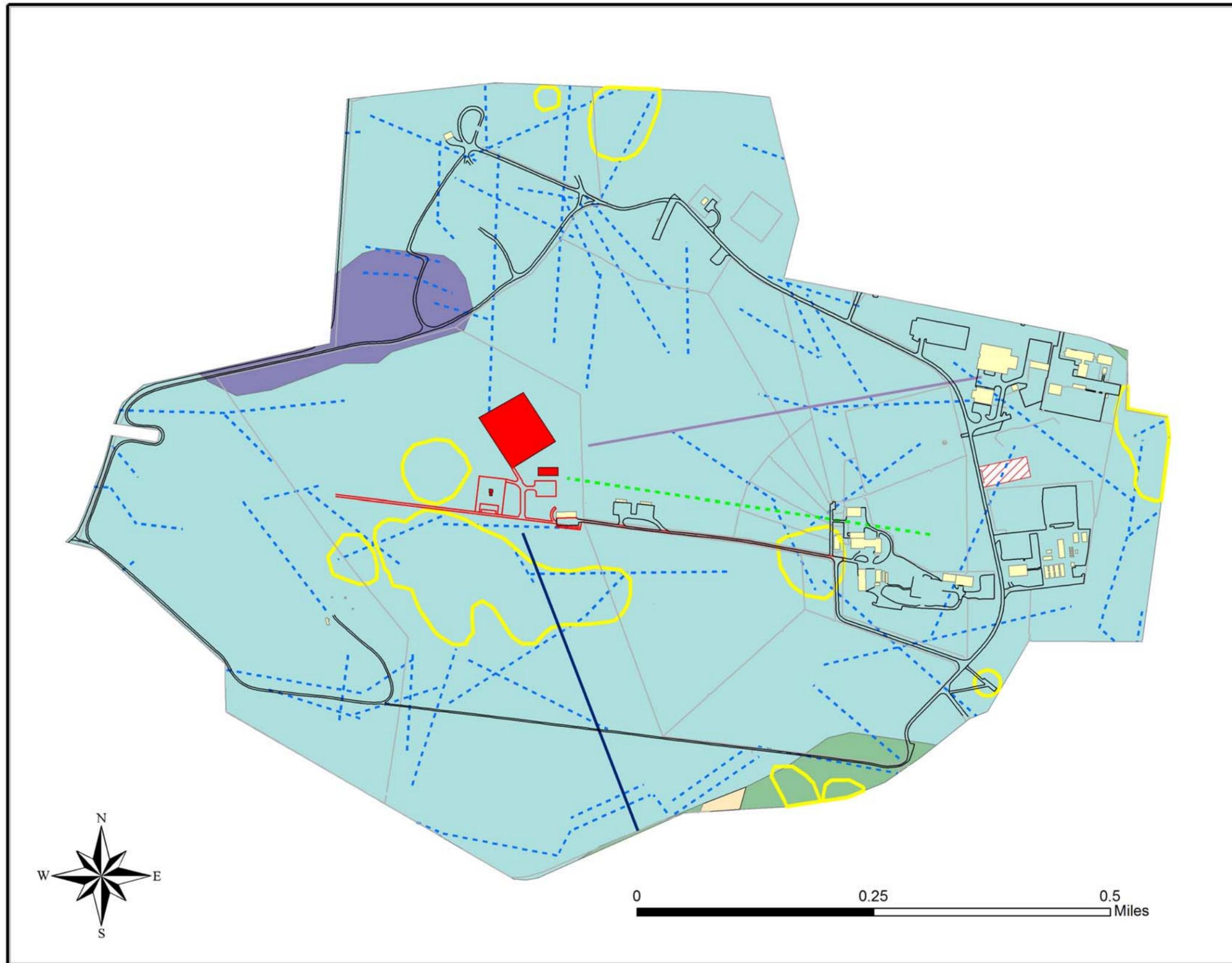
**Adamstown-Funkstown complex, 0 to 8 percent slopes (AfB):** The Adamstown series consists of very deep, moderately well drained soils that have slow to moderately slow permeability. They formed in local colluviums over limestone residuum. The Adamstown series occurs on slightly concave upland flats and swales. The Funkstown series consists of very deep, moderately well drained, moderately permeable soils. These soils formed from colluvial and alluvial material washed down from surrounding uplands which covers the underlying limestone residuum. The Funkstown series occurs on upland drainage-ways and head slopes. The Adamstown – Funkstown complex occurs in the extreme eastern boundary and along the extreme southern boundary of Area B (USDA, 2010).

**Codorus and Hatboro silt loams, 0 to 3 percent slopes (CgA):** The Codorus series consists of very deep, moderately well drained soils that formed in recently deposited alluvium materials from metamorphic and crystalline rocks. The Codorus series occurs on nearly level active flood plains. The Hatboro series consists of very deep, poorly drained soil that developed in alluvial material eroded from micaceous and phyllitic uplands. The Hatboro series occurs on nearly level flood plains. Development in the Codorus and Hatboro silt loams is very limited due to shallow depth to saturation and flooding. The Hatboro series is designated as a hydric soil. The Codorus and Hatboro silt loams are mapped along a tributary to Carroll Creek along the eastern boundary of Area B (USAG, 2004).

**Dryrun gravelly loam, 0 to 3 percent slopes (DqA):** The Dryrun gravelly loam is a moderately well drained soil that developed from parent material comprised of limestone, sandstone, and shale. The soil occurs on old alluvial fans in valleys. There is a moderate to high potential for the formation of sinkholes in the Dryrun series. The Dryrun gravelly loam is a dominant soil mapped on the site and occurs at several locations in the southern two thirds of Area B (USAG, 2004).

**Foxville and Hatboro soils, 0 to 3 percent slopes (FxA):** The Foxville series is a very deep, somewhat poorly drained soil that developed in alluvium and colluvium derived from mixed greenstone, greenstone schist, quartzite and phyllite. The soils occur on nearly level and gently sloping, high gradient floodplains. The Hatboro series consists of very deep, poorly drained soil that developed in alluvial material eroded from micaceous and phyllitic uplands. The Hatboro series occurs on nearly level flood plains. Development in the Foxville and Hatboro soils is very limited due to shallow depth to saturation, flooding, ponding, and the occurrence of large stones. The Foxville and Hatboro soils are designated as hydric. The mapping unit occurs in a narrow band along the northern boundary of Area B (USAG, 2004).

**Hagerstown-Opequon silty clay loams, 3 to 8 percent slopes, rocky (HcB):** The Hagerstown series is a very deep, well drained soil that developed in residuum derived from limestone. The soil occurs on nearly level to moderately steep uplands. The Opequon series is a shallow, well drained soil that formed in residuum weathered from massive limestone. This soil occurs on nearly level to steep uplands. The Hagerstown-Opequon silty clay loams occur on



**Legend**

- Existing Buildings
- Proposed RV Parking
- Proposed Training Campus
- Proposed Electric/Force Main/  
Water Alignment
- Proposed Gas Alignment
- Proposed Gravity Sewer Alignment
- Sinkholes
- Fracture Traces

**Geology**

- Frederick Formation, Rocky Springs  
Station Member
- Frederick Formation, Rocky Springs  
Station Member, breccia bed
- New Oxford Formation
- New Oxford Formation,  
conglomerate

**Fort Detrick**  
Frederick, Maryland

**BSA** ENVIRONMENTAL  
SERVICES, INC.

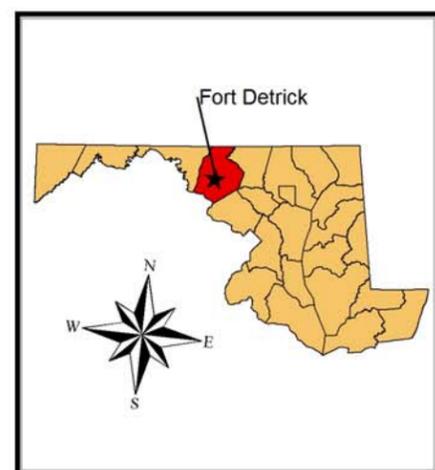
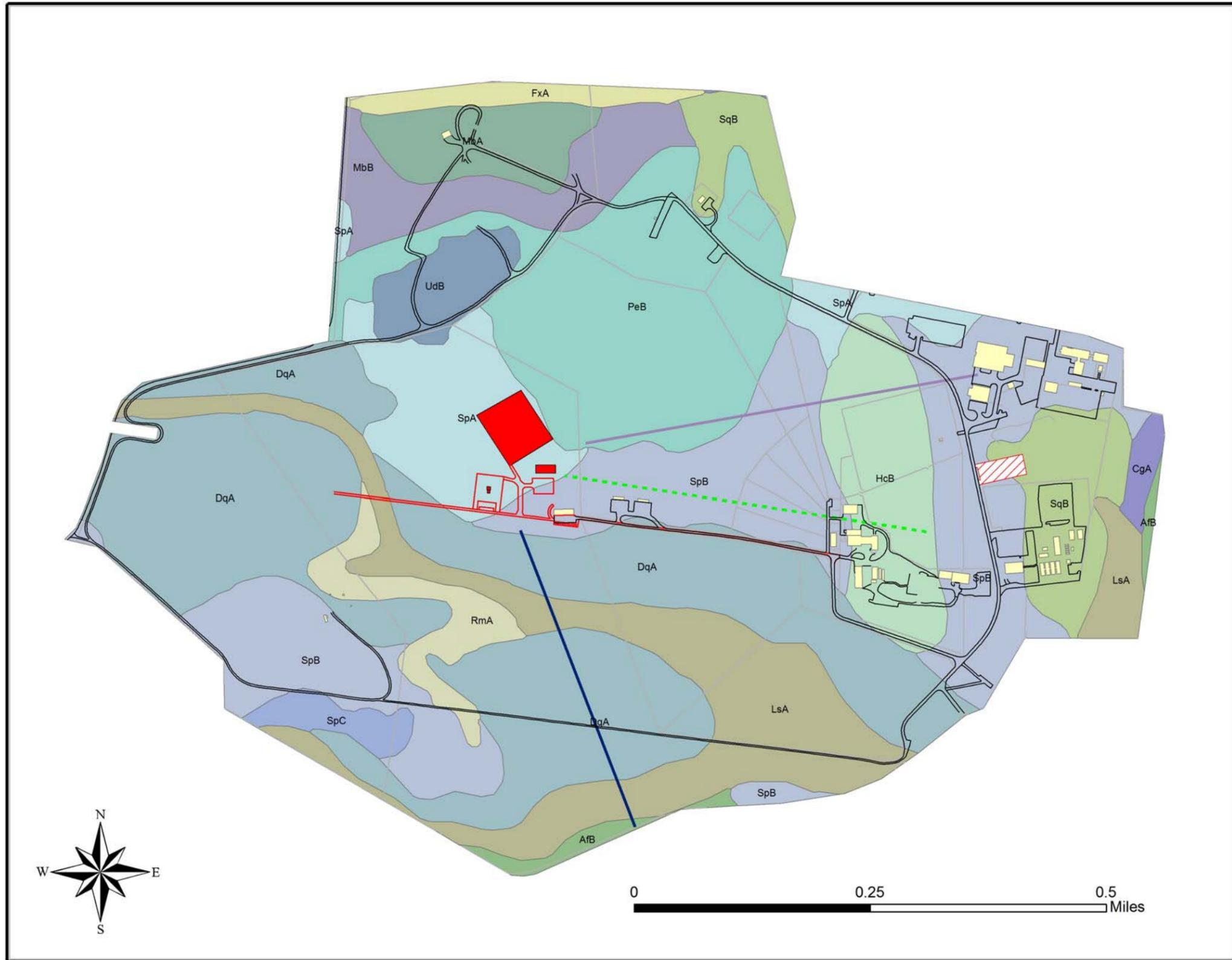


Figure 4-1. Area B Geology Map.

THIS PAGE INTENTIONALLY LEFT BLANK



**Legend**

- Existing Buildings
- Proposed RV Parking
- Proposed Training Campus
- Proposed Electric/Force Main/Water Alignment
- Proposed Gas Alignment
- Proposed Gravity Sewer Alignment

**Soils**

- Adams-Funkstown 0-8% (AFB)
- Codorus and Hatboro silt loams 0-13% (CgA)
- Dryrun gravelly loam 0-3% (DqA)
- Foxville and Hatboro soils 0-3% (FxA)
- Hagerstown-Opequon silty clay loams 3-8% (HcB)
- Lindsie silt loam 0-3% (LsA)
- Morven loam 0-3% (MbA)
- Morven Loam 3-8% (MbB)
- Penn channery loam 3-8% (PeB)
- Reaville silt loam 0-3% (RmA)
- Springwood gravelly loam 0-3% (SpA)
- Springwood gravelly loam 3-8% (SpB)
- Springwood gravelly loam 8-15% (SpC)
- Springwood-Rock outcrop complex 3-8% (SqB)
- Udrthents, smooth 0-8% (UdB)

**Fort Detrick**  
Frederick, Maryland

**BSA** ENVIRONMENTAL SERVICES, INC.

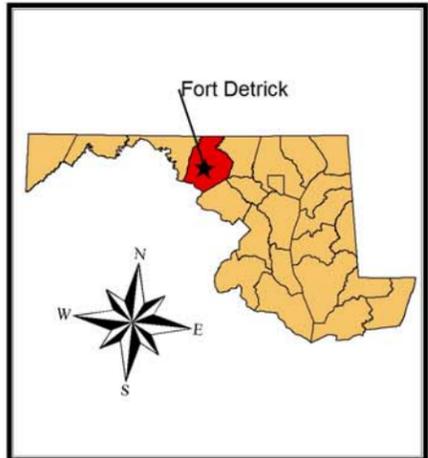


Figure 4-2. Area B Soils Map.

THIS PAGE INTENTIONALLY LEFT BLANK

karst landscapes. There is a moderate to very high potential for the development of sinkholes in the mapping unit and active and inactive sinkholes can make up as much as 10 percent of the unit. Development in the mapping unit is also somewhat to very limited due to the occurrence of shrink-swell clays. The Hagerstown-Opequon silty clay loams are mapped in the eastern one-third of Area B (USAG, 2004).

**Lindside silt loam, 0 to 3 percent slopes (LsA):** The Lindside series is a very deep, moderately well drained soil that formed in alluvium eroded from limestone uplands. These soils occur on nearly level active flood plains. Development in the Lindside silt loam is very limited due to shallow depth to saturation and flooding. This mapping unit occurs along streams and spring drainages in Area B (USAG, 2004).

**Morven loam, 0 to 3 percent slopes (MbA):** The Morven loam is a very deep, well drained soil that developed in colluvium from calcareous conglomerate. The soils occur on nearly level and gently sloping upland swales in saddles at the head of drainage ways, and on footslopes. This mapping unit occurs in the northwest corner of Area B (USAG, 2004).

**Morven loam, 3 to 8 percent slopes (MbB):** See above for the description of the Morven loam. The soil is mapped in the northwest corner of Area B.

**Penn channery loam, 3 to 8 percent slopes (PeB):** The Penn series consists of moderately deep, well drained soils that formed in residuum from noncalcareous red shale, siltstone, and fine grained sandstone. This soil occurs on dissected uplands. Development in the Penn channery loam is somewhat limited due to a shallow depth to hard bedrock. This mapping unit occurs in the north central section of Area B (USAG, 2004).

**Reaville silt loam, 0 to 3 percent slopes (RmA):** The Reaville series consists of a moderately deep, somewhat poorly drained soil that formed in residuum from red shale, siltstone and fine grained sandstone. These soils occur on nearly level and gently sloping interfluvies in saddles and swales. Development in the Reaville silt loam is very limited due to a shallow depth to saturation, flooding, and ponding. This mapping unit occurs in a narrow band in association with spring drainages in the southwest section of Area B (USAG, 2004).

**Springwood gravelly loam, 0-3 percent slopes (SpA):** Springwood gravelly loam is a very deep, well drained soil that formed in residuum from calcareous conglomerate. The soil occurs on the summits and backslopes of valleys. The Springwood series has a moderate potential for the occurrence of sink holes. The Springwood gravelly loam, 0-3 percent slopes occurs at locations in the west central and northeastern sections of Area B (USAG, 2004). Springwood gravelly loam soils underlay the majority of the proposed Training Campus site.

**Springwood gravelly loam, 3-8 percent slopes (SpB):** See above for the description for the Springwood gravelly loam. The 3-8 percent slope phase of the Springwood gravelly loam has a moderate potential for the occurrence of sink holes. The Springwood gravelly loam, 3-8 percent slopes is mapped in an area along the eastern boundary of Area B (USAG, 2004). Springwood gravelly loam underlay a portion of the proposed RV Parking Lot site and a portion of the proposed Training Campus site.

**Springwood gravelly loam, 8-15 percent slopes (SpC):** See above for the description for the Springwood gravelly loam. The 8-15 percent slope phase of the Springwood gravelly loam has a

high potential for the occurrence of sink holes. Slope is also a limitation for development in the 8-15 percent slope phase of the series. The Springwood gravelly loam, 8-15 percent slopes mapping unit is found in a small area along the southwestern boundary of Area B (USAG, 2004).

**Springwood-Rock outcrop complex, 3 to 8 percent slopes (SqB):** See above for the description for the Springwood series. The rocky outcrop, 3 to 8 percent slope phase of the Springwood series has a high to very high potential for the occurrence of sink holes. The Springwood-Rock outcrop complex, 3 to 8 percent slopes is mapped adjacent to the eastern boundary of Area B (USAG, 2004). Springwood-Rock outcrop complex underlay a portion of the proposed RV Parking Lot site.

**Udorthents, smooth, 0 to 8 percent slopes (UdB):** Areas in this mapping unit are highly disturbed and many of the original soil characteristics have been altered. Cut and fill material may range from 1 to over 20 ft in thickness. Onsite characterization is necessary to determine uses and limitations for this mapping unit. Udorthents are mapped at the landfill in the northwest section of Area B (USAG, 2004).

## 4.5 WATER RESOURCES

### 4.5.1 SURFACE WATER

Fort Detrick is located within the Monocacy River drainage basin, a sub-basin of the Potomac River Basin. The Monocacy River watershed covers approximately 800 square miles of land within the 14,000 square miles that the Potomac River watershed covers. Approximately 75 percent of the Monocacy River watershed area is located within Maryland, and 56 percent of this land is located within Frederick County (Watershed Alliance, 2010).

Surface water sources at Area B include one permanent pond, one transitory pond, Carroll Creek, and its tributaries. Post Pond has a surface area of approximately 0.23 acres and is located in the southeastern corner of Area B. A transitory pond exists in the wetland area in the central portion of Area B and has a surface area of approximately 0.15 acres. Carroll Creek and its tributaries comprise the primary surface water features occurring in the vicinity of Area B. Carroll Creek flows east and south from its source in the Catoclin Mountains, then south along the eastern boundary of Area B. To the south of Area B, Carroll Creek flows southeast and east for approximately 3.5 miles before joining the Monocacy River.

Three unnamed tributaries to Carroll Creek also provide drainage to Area B. An unnamed tributary which flows along the northern boundary of the site, originates near Catoclin Mountains to the west then flows east to its confluence with Carroll Creek near the northeast corner of Area B. A second tributary originates from two springs located in the central section of Area B, and flows east southeast across the site into the third unnamed tributary that flows along the southern boundary of Area B. A manmade channel extends to the west of the two springs and directs drainage from the west central section of Area B into drainage from the springs. A small tributary originates from the east central portion of Area B, then flows southeast and south and joins the unnamed tributary just north of the southeast boundary of Area B. The unnamed tributary that flows along the southern boundary of Area B originates to the west of the site in the Catoclin Mountains, then flows southeast and east before joining Carroll Creek approximately 2,000 ft offsite near the southeast corner of Area B. A short spring fed drainage also occurs in the west central section of the site. Flow in the drainage channel originates at a

spring located just offsite near the western boundary of Area B. The shallow drainage channel was dug to collect and direct flow from the spring. The channel ends in the west central section of Area B where surface flow discontinues at a sinkhole (U.S. Army Garrison, 2004).

#### 4.5.2 GROUNDWATER

Groundwater in the Frederick area occurs in hard rock aquifers associated with the formations of the Frederick Valley subdivision of the Piedmont Physiographic Province. The hard rock aquifers occurring in the area are the most productive aquifers of this type in the State of Maryland. These aquifers generally have good water quality and approximately 20 percent of the formations have the potential to yield water at rates of 50 gallons or more per minute (U.S. Army Garrison, 2003a). Most of the wells in the area draw water from fractures or solution channels located within carbonate rocks (e.g., limestone and dolomite) associated with the Frederick Valley. Groundwater is transported through the carbonate aquifers via bedding planes, fractures, joints, faults, and other partings, which have been enlarged by the dissolution of the carbonate bedrock by acidic recharge. Groundwater in the immediate vicinity of Area B flows to the southeast, toward the Monocacy River. The depth of the water table in Area B fluctuates over a great extent throughout the year and typically fluctuates up to 25 ft. during the spring (U.S. Army Garrison, 2003a). Environmental concerns associated with Area B groundwater are described in detail in Section 4.17.1.12.

There is a potential for rapid transport of contaminants entering carbonate aquifer systems as a result of relatively unrestricted flow along conduits (bedding planes, fractures, and joints) that have been affected by dissolution. These conduits can form a highly interconnected system for relatively unrestricted flow within the aquifer system. Based on a photogeologic analysis of Fort Detrick conducted by the USACE in 2001, numerous fracture traces and lineament features occur on the surface in Area B (Figure 4-1). In addition, several sink holes occur in the area, indicating that solution weathering of carbonate rocks in the area is occurring (USAG, 2004).

#### 4.5.3 STORMWATER

Fort Detrick is permitted to discharge stormwater runoff from land used for industrial operations in accordance with State Discharge Permit No. 02-SW-0124. This permit prohibits the discharge of non-stormwater into surface waters, requires annual site compliance evaluations, and mandates maintenance of a Stormwater Pollution Prevention Plan (SWPPP). Sampling of stormwater is not required; however, sampling may be conducted as a proactive measure. The Fort Detrick SWPPP identifies potential sources of pollution associated with industrial activity on the Installation and outlines BMPs to minimize potential contamination of stormwater exiting Fort Detrick (USAG, 2003d).

SWM measures are required for projects that disturb more than 5,000 sf (approximately 0.115 acres) of land area on Federal property according to the COMAR 26.17.02 and the *Maryland Stormwater Management Guidelines for State and Federal Projects*, 15 April 2010. The SWM measures will be designed consistent with the with the *2000 Maryland Stormwater Design Manual Volumes I and II*, 2009 Model Standard Stormwater Management Plan and 2009 Model Stormwater Management Ordinance (MDE, 2009). Additionally, all projects will be in compliance with the new regulations of the MDE Stormwater Management Act of 2007.

All stormwater from Area B drains into Carroll Creek via outfall culverts B-1 and B-2. The Carroll Creek watershed is designated as an interjurisdictional flood hazard watershed due to historic and documented flood damages. Development in the interjurisdictional flood hazard watershed may not increase the downstream peak discharge for the 100-year frequency storm event. There are three separate SWM basins in Area B. There is an erosion and sediment control basin associated with the landfill located east of the maintenance building. A Water Treatment Plant sludge infiltration basin is located south of the landfill (Permit No. 06-DP-3557). And there is also a SWM basin associated with the new Reserve Center on the northeastern portion of Area B (Lewis, 2010).

#### 4.5.4 DRINKING WATER

The Monocacy River supplies drinking water to both Fort Detrick<sup>1</sup> and the City of Frederick. The Monocacy River is a tributary to the Potomac River and is the most heavily utilized river in the Potomac River Basin. In FY 2010, Fort Detrick withdrew approximately 437.6 million gallons (1.19 mgd) from the Monocacy River (Lewis, 2010). Additionally, the City of Frederick withdrew 28.7 percent of its drinking water (an average of approximately 1.6 mgd) from the Monocacy River (City of Frederick, 2009).

The distribution of the source water withdrawn from the Monocacy River is processed through the Fort Detrick WTP located in Area C, located approximately 2.5 miles to the east of Area B. The WTP has a maximum processing capacity of 4.25 mgd, but due to the size of the existing distribution pipes, the WTP can only provide a maximum of 3.1 mgd of finished water without exceeding the maximum pressure for distribution (USAMRMC and USAG, 2006). The MDE Water Management Administration has authorized Fort Detrick to withdraw a daily average of 2.0 mgd of water with a maximum daily withdrawal of 2.5 mgd from the Monocacy River under the current Water Appropriation and Use Permit No. FR1943S001(3). This water allocation permit expires in 1 July 2015 (USAG, 2003a). Water obtained in accordance with the current Fort Detrick Water Appropriation and Use Permit No. FR1943S001(3) is utilized as potable water, cooling water, and for sanitary facilities. Although Fort Detrick relies on the Monocacy River as a source for drinking water, in cases of emergency or if a plant is shut down for repair, Fort Detrick and the City of Frederick exchange water between their water distribution systems through a manual metered connection on Area A (USAMRMC and USAG, 2006).

Following construction of the NEPA Approved Potomac Pipeline Interconnect, Fort Detrick will be provided with an additional source of drinking water when required and the flexibility to utilize water from the Monocacy River up to a maximum of 2.5 mgd and from the Potomac River up to 2.66 mgd (USAG, 2009b). Withdrawal from both sources combined will not exceed 2.66 mgd (USAG, 2010b). This additional water will be withdrawn from the Potomac River and will be processed through the Frederick County New Design Water Treatment Plant. Water pumped from the WTP will be wheeled through the City of Frederick to Fort Detrick via the Fort Detrick and the City of Frederick water connection (USAG, 2010b). Starting 1 January 2011, Fort Detrick will be required to purchase at least 365 million gallons of water from Frederick County

---

<sup>1</sup> Fort Detrick has a mutual agreement with the City of Frederick to provide water in the event of an emergency. The City's water supply sources include groundwater, Linganore Creek, Fishing Creek, and the Potomac River in addition to the Monocacy River.

per year. The agreement between Fort Detrick and the City of Frederick was signed in September 2010 (Craig, 2010).

#### 4.6 WETLANDS AND FLOODPLAINS

Wetlands are jointly defined by the USEPA and the USACE as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas” (40 CFR 230.3(t) and 33 CFR 328.3(b)). Wetlands on Fort Detrick are beneficial to SWM, erosion control, and sediment control. They also provide habitat for ducks, geese, herons, shore birds, muskrat, mink, and beaver and support numerous species of annual and perennial herbaceous plants (USAG, 2001). Federal activities within floodplains and wetlands are restricted under EO 11988, 33 CFR 1977, EO 11990, and AR 415-15. The INRMP for Fort Detrick serves as a guide for the management and protection of wetlands at Fort Detrick (USAG, 2007c).

The INRMP notes that there is great potential for development and expansion of the wetland habitat which can be achieved through two wetland objectives of Fort Detrick. The objectives are maintaining no net loss of existing wetlands and enhancing wetlands size, function and health. According to the INRMP, Fort Detrick proposes to implement actions in support of the objectives. The actions include creating a series of shallow pools or wet areas along an existing drainage swale; continual monitoring and eradicating of invasive wetland plants, particularly common reed (*Phragmites australis*) as part of the Fort Detrick Invasive Plant Management Plan; replanting control sites with native wetland plant species and establishing new and expand existing no-mow zones to buffer wetland sites (USAG, 2007c).

The wetlands on Fort Detrick are limited in size and number (see Figure 2-2). An April 2005 study conducted by USACE, *Wetland Delineation for Fort Detrick* (USACE, 2005a), included a thorough field reconnaissance of the Installation, including all of Area B. The USACE study of Area B identified five jurisdictional wetland sites totaling 6.65 acres. All are wet meadows that drain into an unnamed perennial tributary of Carroll Creek that extends along the southern boundary of Area B, and along a broad drainage swale that flows through the central and southeastern section of the site. The USACE study also identified two ponds of 0.15 acres and 0.36 acres that may represent transitory features. The 0.36 acre pond no longer exists due to sinkhole formation, which consequently drained the pond (Gortva, 2009). The site reconnaissance identified 98 herb species, 22 shrub and vine species, and 25 tree species for a total of 145 plant species in the wetland areas. The soils of the wetlands are all hydric while the soils of the adjacent up land are nonhydric and relic hydric (USACE, 2005a; 2005b). There are no wetlands present on any of the proposed locations for the Proposed Projects.

The floodplain study conducted by USACE on Area B found floodplains occur in association with Carroll Creek and five tributaries of Carroll Creek. Carroll Creek and Tributary #96 are the primary streams that may produce flooding on Area B. Carroll Creek flows along the eastern and northeastern boundary of Area B. Tributary #96 flows along the southern boundary of Area B, and Tributary #95 flows into Carroll Creek north of Area B. Tributary #96A and Tributary #96B flow exclusively on Area B, southeasterly to their confluence with Tributary #96 just upstream of Montevue Lane. Tributary #95A is located northwest of Area B and flows under

Kemp Lane to its confluence with Tributary #95 north of Area B. The proposed gravity sewer line option (if chosen) would go through two parts of the 100 year floodplain.

#### 4.7 PLANT AND ANIMAL ECOLOGY

Most of the ecosystems at Fort Detrick have been highly altered due to urbanization and human activities. Much of the native vegetation has been destroyed or displaced by species that are more tolerant to disturbances. The three remaining types of natural communities on the Installation are upland forests, grasslands, and wetland/riparian communities. Fort Detrick maintains approximately 500 acres of pasture, grassland, forested areas, and experimental agricultural fields (USAG, 2006c).

The INRMP for Fort Detrick (USAG, 2007c) describes the activities related to the remaining natural resources on the Installation and proposes a range of new projects and initiatives to be implemented in the years 2006-2010 for the future management of these resources. The plan was prepared in accordance with the Sikes Act Improvement Act (SAIA) and other applicable laws and regulations. The SAIA requires that the INRMP be reviewed on a regular basis, and not less than every five years (USAG, 2007c). The goal of the previous INRMP (USAG, 2001) was to enhance biodiversity on a local and regional level. Implementation of this plan contributes to protecting the health of the ecosystem and the environmentally sensitive areas on the Installation and enables Fort Detrick to meet local, regional, state, and national goals for ecosystem management and enhancement of biodiversity (USAG, 2001). The current INRMP will allow the Installation to implement procedures that will improve on the previous INRMP by:

- Improving the integration of the INRMP with other Installation planning documents and Garrison activities;
- Providing explicit goals and objectives to which ongoing and newly-proposed natural resources projects will contribute; and
- Providing an effective turnover document to facilitate program consistency (USAG, 2007c).

##### 4.7.1 VEGETATION

Vegetation occurring in Area B is characteristic of open farmland habitats of northern Maryland. Past intensive grazing on the open spaces in Area B has reduced the diversity of plants that would normally be expected to occur in similar natural grassland and forested communities in this region. Area B is characterized primarily as a large open field composed of pasture land with bluegrass, fescue, and other common grasses and forbs typical of the region. Wooded areas occur primarily around the perimeter of Area B (USAG, 2004).

There are two forest blocks on Area B. Forest Block 1, is approximately ten acres and is located in the northwestern corner of Area B. Block 1 is planted grove with an immature understory and minimal species diversity. The understory is not well developed, and two large openings cut through the block at perpendicular angles that effectively separate the tract into four small forested areas. Examples of tree species occurring in Block 1 included black locust (*Robinia pseudoacacia*), tree of heaven (*Ailanthus altissima*), red maple (*Acer rubrum*), black cherry (*prunus serotina*), sassafras (*Sassafras albidum*), mulberry (*Morus spp.*), and hackberry (*Celtis occidentalis*) (USAG, 2004).

Forest Block 2 is located to the south of Block 1 adjacent to the western boundary of Area B. Forest Block 2 comprises approximately nine acres. Examples of tree species occurring in Block 2 include red maple, sycamore (*Platanus occidentalis*), white oak (*Quercus alba*), northern red oak (*Q. rubra*), southern red oak (*Q. falcate*), American elm (*Ulmus americana*), tulip poplar (*Liriodendron tulipifera*), silver maple (*Acer saccharinum*), black locust, black walnut (*Juglans nigra*), hackberry, black cherry, sassafras, and tree of heaven. Examples of dominant species occurring in the understory include greenbrier (*Smilax rotundifolia*), mayapple (*Podophyllum peltatum*), and poison ivy (*Toxicodendron radicans*) (USAG, 2004).

Additional small wooded areas occur in the northeast corner and along the eastern boundary of Area B. Examples of trees occurring in these areas include red maple white oak, pin oak (*Q. palustris*), American elm, Siberian elm (*Ulmus pumila*), black locust, honey locust (*Gleditsia triacanthos*), tulip poplar, hackberry, black cherry, white pine (*Pinus strobes*), red pine (*Pinus resinosa*), black walnut, and tree of heaven (USAG, 2004).

#### Fort Detrick Forestation Plan

As part of the Fort Detrick ongoing forestation initiative, 16.5 acres on Fort Detrick have been planted with trees and shrubs since 2000. In accordance with the State Forest Conservation Program (COMAR 08.18.04), described in Section 2.6.4, Fort Detrick developed a Forest Conservation Plan in 2003. According to the INRMP, the current plan calls for a 114-acre increase in forests, which will increase total forest cover to 193 acres; 79 acres in Area A and 114 acres in Area B. In Area B, nearly all perimeter areas not currently forested would be planted with trees, with the largest concentration planned for the south central portion along Montevue Lane and Shookstown Road (see Figure 2-2; USAG, 2007a). In recent years, Area B of Fort Detrick has been planted with approximately 11.25 acres of trees. In the near future, approximately 20.96 additional acres of trees will be planted (Lewis, 2010).

The INRMP also describes the Fort Detrick plan to enhance forest ecosystem health. The overall health of the fragmented forest blocks is compromised by invasive species, insect pests and disease, and overbrowsing by white-tailed deer (*Odocoileus virginianus*). The impacts of invasive plant species on forest health have been and will continue to be addressed through aggressive implementation of the Fort Detrick Invasive Plant Management Plan (Invasive Plant Control, Inc. [IPC] 2004). Besides invasive species, there is increased concern about insect pests and disease in both forest blocks and landscaped areas (USAG, 2007c).

#### 4.7.2 WILDLIFE

The number of wildlife habitats on Fort Detrick is limited due to human activities and urbanization. Faunal assemblages are predominantly composed of species that are adapted to the living conditions in urban, suburban, and agricultural habitats; though some species typical of the oak-hickory and northern hardwood forest associations are present in the forested areas of Fort Detrick (USAG, 2001).

The altered environment of Fort Detrick provides little high-quality habitat for most species of wildlife. There are no records for Federal- or state-listed rare, threatened, or endangered species of plants or animals within the boundaries of the Installation (USAG, 2010b; USAG, 2001). A survey for rare, threatened, and endangered small mammals and a survey for rare, threatened, and endangered plants were prepared by the Maryland Natural Heritage Program of

the MDNR in February 2002. Both surveys found no evidence of special status species on Fort Detrick. However, the presence of such species on the Installation cannot be precluded with certainty. For example, the open areas and fields of the Installation may provide sufficient habitat for endangered or declining bird species including the Savannah sparrow (*Passerculus sandwichensis*), listed as declining populations in Maryland, as well as the loggerhead shrike (*Lanius ludovicianus*) and upland sandpiper (*Bartramia longicauda*), listed as endangered in Maryland (USAMRMC and USAG, 2006; USAG, 2001). The status of species may change over time as a result of changes in listing status for Federal and state threatened and endangered species and as a result of new surveys of the Installation (USAG, 2001).

#### 4.8 AIR QUALITY

##### 4.8.1 REGIONAL AIR QUALITY

Area B of Fort Detrick lies within the USEPA Mid-Atlantic Region 3, which is responsible for Federal environmental programs in Maryland, Delaware, Pennsylvania, Virginia, West Virginia, and the District of Columbia (USEPA, 2010b). MDE Air and Radiation Management Administration administers Federal and state air quality regulations statewide. Maryland has adopted USEPA National Ambient Air Quality Standards (NAAQS), as set forth under the CAA, to control a select group of widely occurring pollutants. These standards establish safe concentration levels for the six criteria pollutants: CO, Pb, NO<sub>x</sub>, ozone, particulate matter less than 10 microns in aerodynamic diameter, and SO<sub>2</sub>. Particulate matter is divided into two classes, coarse particulate matter (PM<sub>10</sub>), i.e., particles between 2.5 and 10 microns in diameter, and fine particulate matter (PM<sub>2.5</sub>), i.e., particles less than 2.5 microns in diameter (MDE, 2010).

As of 16 September 2010, all of Maryland, including the City of Frederick region, was in attainment for all NAAQS criteria pollutants except for ozone (USEPA, 2010c). On 5 April 2005, USEPA officially designated Frederick County as being a PM<sub>2.5</sub> nonattainment area; however, after review of the revised USEPA Area Designations for 2006 24-Hour PM<sub>2.5</sub> Standards, the entire state of Maryland is currently designated as an unclassifiable/attainment area for PM<sub>2.5</sub> (USEPA, 2010d).

On March 12, 2008, USEPA significantly strengthened its NAAQS for ground-level ozone and revised the 8-hour "primary" ozone standard to a level of 0.075 parts per million (ppm). The previous standard, set in 1997, was 0.08 ppm. Because ozone is measured out to three decimal places, the standard effectively became 0.084 ppm as a result of rounding. USEPA also strengthened the secondary 8-hour ozone standard to the level of 0.075 ppm making it identical to the revised primary standard. USEPA decided to strengthen the secondary ozone standard after concluding that the 1997 secondary standard was not adequate to protect public welfare. In addition to changing the level of the standards from 0.08 ppm to 0.075 ppm, USEPA now specifies the level of the standard to the third decimal; therefore, an area will meet the revised standards if the three-year average of the annual fourth-highest daily maximum 8-hour average at every ozone monitor is less than or equal to the level of the standard (i.e., 0.075 ppm). Based on monitored air quality from 2006-2008, Frederick County is a nonattainment area that violates the NAAQS for ground level ozone with a concentration of 0.084 ppm (USEPA, 2010e).

On 6 January 2010, USEPA proposed to strengthen the 8-hour primary standard for ground-level ozone to a level within the range of 0.060-0.070 ppm. USEPA is also proposing to establish a distinct cumulative, seasonal "secondary" standard, designed to protect sensitive

vegetation and ecosystems, including forests, parks, wildlife refuges and wilderness areas. USEPA is proposing to set the level of the secondary standard within the range of 7-15 ppm hours. The proposed secondary standard is a “cumulative peak-weighted index,” called W126. The W126 index is calculated by:

- “Weighting” each hourly ozone measurement occurring during the twelve daylight hours (8:00 am to 8:00 pm) each day, with more weight given to higher concentrations. This “peak weighting” emphasizes higher concentrations more than lower concentrations, because higher concentrations are disproportionately more damaging to sensitive trees and plants;
- Adding these 12 weighted hourly ozone measurements for each day, to get a cumulative daily value;
- Summing the daily values for each month, to get a cumulative monthly value;
- Identifying the three consecutive months during the ozone season with the highest index value, to get the cumulative seasonal index value, and;
- Averaging these maximum seasonal index values over three years.

An area would meet the proposed secondary standard if the three-year average of the cumulative seasonal index values is less than or equal to the level of the standard (i.e. 7-15 ppm-hours). The USEPA will issue final standards by 31 August 2010 (USEPA, 2010e). As of 30 September 2010, the USEPA has not issued final reconsidered NAAQS.

#### 4.8.2 FORT DETRICK AIR POLLUTION SOURCES

There are no major sources of air pollution on Area B. Smaller sources of air pollution on Area B consist of commuter and on-site traffic, back-up generators, and routine building operations. The main stationary sources of air pollution at Fort Detrick are primarily located on Area A, and include the boilers, incinerators and emergency diesel generators. Commuter and on-site traffic constitute the mobile sources of air pollution at the Installation (USAG, 2003a). According to Title V of the CAA, a stationary source is considered a “major source” of air pollution if its actual emissions exceed the regional threshold levels for regulated air pollutants. Regulated pollutants are the criteria air pollutants or their precursors (e.g., VOCs or NO<sub>x</sub> as precursors to ozone), hazardous air pollutants (HAPs) as specified in Title III of the CAA, toxic air pollutants (TAPs) as specified in COMAR 26.11.15, and Class I and Class II ozone depleting substances as specified in Title V of the CAA. Potential emissions are those that would be emitted assuming a maximum operating schedule of 24 hours per day, 365 days per year, at the unit’s maximum capacity. By definition, potential emissions are equal to or greater than actual emissions. The threshold levels for a Title V major source located in Frederick County are:

- 100 tpy of CO
- 100 tpy of Pb
- 100 tpy of SO<sub>2</sub>
- 10 tpy of any one HAP or 25 tpy of any combination of HAPs
- 100 tpy of NO<sub>x</sub>
- 100 tpy of PM<sub>10</sub>
- 100 tpy of VOCs

For permitting purposes, a group of stationary sources that lie within a contiguous area under common control, as is the case on Fort Detrick, are treated as a single stationary source. Title V of the CAA requires all “major sources” of criteria air pollutants or their precursors to file a Part 70 application for an operating permit. A Title V Part 70 permit application must be submitted to MDE for facilities located in Frederick County with emissions that exceed the threshold levels

listed above. According to Title V of the CAA, Fort Detrick is considered a major source of air pollution because emissions of both NO<sub>x</sub> and SO<sub>x</sub> exceed the threshold of 100 tpy. Fort Detrick Title V Part 70 Operating Permit (No. 24-021-00131) was issued by MDE effective through 31 March 2014 (USAG, 2010b).

Fort Detrick was ranked as the third largest source of NO<sub>x</sub> in Frederick County in 2006 and the second largest in 2007 (latest data available, USAG, 2010b; see Tables 4-2 and 4-3). The majority of the Installation NO<sub>x</sub> emissions originate from the Boiler Plant. This is evident in the “Boilers” columns summaries of Fort Detrick actual criteria air pollutant emissions from stationary sources in 2007 and 2008, presented in Tables 4-4 and 4-5, respectively (USAG, 2010b). The criteria air pollutant emissions for 2009 are not available as of this date, but NO<sub>x</sub> emissions from the Boiler Plant are expected to continue to decline again by as much as 50 percent (USAG, 2010b).

**Table 4-1. Major Air Pollutant Emissions Sources in Frederick County, Maryland in 2007.**

Major Source	SO <sub>x</sub> (tpy)	NO <sub>x</sub> (tpy)	VOCs (tpy)	PM <sub>10</sub> (tpy)	TSP (tpy)	HAPS (tpy)	CO (tpy)
Lehigh Cement-Woodsboro	962	68	0	93	0	0	42
EASTALCO-Frederick	0	1	0	0	0	0	1
ESSROC Materials, Inc.	1279	2377	11	124	0	10	54
Redland Brick-Rocky Ridge Plant	0	8	1	0	0	8	26
Fort Detrick	120	91	5	38	0	0	29
George Weston Bakeries	0	3	34	0	0	0	3
Canam Steel	0	3	129	1	0	0	0
Reichs Ford Sanitary Landfill	2	18	12	3	0	1	11

Source: USAG, 2010b

Identified as one of the major environmental aspects of Fort Detrick, air emissions contributors include stationary sources (boilers, incinerators, generators, chlorine gas storage, and petroleum storage) and mobile sources (vehicle emissions and equipment). Goals and targets from EO 13514, EO 13423 and existing statutes guide federal managers in establishing air emissions reduction requirements and reduction of greenhouse gas (GHG) related to different processes on Fort Detrick. A more detailed discussion of these actions is presented in Section 2.6.

#### 4.9 HISTORICAL AND CULTURAL RESOURCES

The DA must protect prehistoric and historic cultural resources on DA property according to the NHPA and other Federal laws and regulations. The NHPA, as amended (16 USC 470), mandates national policy for protection and restoration of significant historic, architectural, archeological, or cultural resources. The 1980 amendments to the NHPA provide for historic preservation costs to be included in project planning and budgeting. The SHPO has primary responsibility for ensuring adherence to the NHPA (USACE, 2000a).

In accordance with AR 200-1, *Environmental Protection and Enhancement*, Fort Detrick maintains an ICRMP that serves as a guide for compliance with the NHPA and other applicable

Federal laws and regulations (USAMRMC and USAG, 2006). According to 36 CFR 800, *Protection of Historic Properties*, Federal agencies must allow the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on any Federal undertakings affecting historic properties. Federal undertakings include construction, demolition, rehabilitation, repair, licensing, permitting, financing, and planning. Under Section 106 of the NHPA, historic properties include buildings that are eligible for listing in the NRHP. There are no structures or archaeological sites located on Area B that are currently listed or eligible for listing in the NRHP.

#### 4.9.1 ARCHEOLOGICAL RESOURCES

Fort Detrick is located in the Monocacy River Drainage Basin of the Piedmont Province, which is part of Maryland Archeological Unit 17. The 1992 ICRMP for the Installation determined that approximately 625 acres in Areas A, B, and C might have high potential for archeological resources (USACE, 1992). A Phase I Archeological Survey was performed at Fort Detrick from October 1992 through January 1993 (Goodwin and Associates, 1993). This study was conducted in accordance with recommendations set forth in AR 420-40, *Historic Preservation*, and the ICRMP for the Installation. This investigation was intended to assist the DA in carrying out responsibilities outlined in Section 106 and 110 of the NHPA.

Of the 625 acres investigated during the Phase I study, a total of eight sites were discovered on the Installation, only two of which (Site 18FR679 and Site 18FR682) occur on Area B. Results of the Phase I study identified Site 18FR679, located in the south-central region of Area B, as an archeological site that did not warrant further evaluation because it lacked integrity and archeological research potential. Further evaluations were necessary for Site 18FR682, and in 1995 a Phase II archeological survey was conducted. Site 18FR682, comprising approximately 400 sf in the extreme north-central part of Area B, is a historical lime kiln characterized by a rubble foundation, a chimney fall and an early twentieth century fill. Artifacts recovered from the site date from the late nineteenth and early twentieth centuries, except for some pieces of stoneware. Unaltered (not burnt or broken) kitchen items recovered from the kiln indicate that these items may have been placed in the kiln after production had ceased. Site 18FR682 may provide information on the historic occupation of the Monocacy Valley (e.g., nineteenth century farming and cottage industries). The Phase II study concluded that it does not qualify for listing on the NRHP because it lacks archeological and structural integrity. No further investigation of this site is warranted (USACE, 2000a).

#### 4.10 SOCIOECONOMIC ENVIRONMENT

Fort Detrick is located in the City of Frederick, Frederick County, Maryland. The population of Frederick County was estimated at 236,583 as of 1 July 2010 (Frederick County Division of Planning, 2010a). At the time of the 2000 census, the Frederick County population was 195,277; therefore, the population has increased by approximately a 21 percent since 2000 (U.S. Census Bureau, 2006). Growth projections predict that the population will reach approximately 287,913 by the year 2020 (Frederick County Division of Planning, 2010b). Frederick County population growth is fueled by competitive home prices, ample developable land, and its proximity to the Baltimore and Washington metropolitan areas. The City of Frederick contains approximately 26.5 percent of the Frederick County total population with an estimated total of 62,647 residents as of 1 July 2010 (Frederick County Division of Planning, 2010a).

The civilian labor force for Frederick County in July 2010 was 124,294, of which an average of 116,137 were employed (Maryland Department of Labor, Licensing and Regulation, 2010). The private sector is the largest employment sector in Frederick County, comprising approximately 83.7 percent of all jobs in the county. Within the private sector, trade, transportation, and utilities industries provide 16.5 percent of jobs in the county, followed by professional and business services (15.6 percent), educational and health services (12.9 percent), leisure and hospitality (9.9 percent), and construction (8.5 percent). The government sector provides 17.1 percent of all jobs in the county, with 12.3 percent local government employees, 4.1 percent Federal employees, and 0.7 percent state employees (Maryland Department of Labor, Licensing and Regulation, 2009a). Employment projections as of 2006 estimated that the total labor force of Frederick County is projected to increase by 24.5 percent by 2016 (Maryland Department of Labor, Licensing and Regulation, 2009b). The July 2010 unemployment rate in Frederick County was 6.6 percent, which is less than the state and national averages of 7.1 percent and 9.5 percent, respectively (Maryland Department of Labor, Licensing and Regulation, 2010).

Fort Detrick is the largest employer in Frederick County. The number of Fort Detrick employees located on-post varies each month; however, as of December 2009, Fort Detrick employed 8,792 personnel, approximately 1,229 of which are active duty military personnel and 2,765 of which are employed at NCI-Frederick (USAG, 2010b). After implementation of NEPA approved projects described in *Environmental Assessment: Real Property Master Plan for Army-Controlled Land at Areas A and C of Fort Detrick in Frederick County, Maryland, 18 March 2010*, on-post employment growth is expected to increase by approximately 1,000 employees by 2018 (USAG, 2010b). There will be no additional employees added by the Area B Proposed Projects (Lewis, 2010).

EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low Income Populations*, requires that Federal agencies prepare NEPA documents to address any significant adverse impacts of Federal projects on minority or low-income populations. Within the City of Frederick, as described above, 7.5 percent of all persons were living below the poverty level in 2008 (U.S. Census Bureau, 2008). A "poverty area" is defined by the U.S. Census Bureau as an area in which at least 20 percent of the population lives below the poverty level. Therefore, the City of Frederick is not considered to be a poverty area.

#### 4.11 NOISE AND LIGHTING

The State of Maryland (COMAR 26.02.03.02 and 26.02.03.03) and the City of Frederick (Ordinance G-02-9) have established environmental noise standards that set maximum allowable noise levels for receivers located in industrial, commercial, and residential districts. The regulatory limits for noise levels for receivers in residential areas are 65 decibels (Type A; dBA) during daytime hours (0700-2200 hours) and 55 dBA at night (i.e., 2200-0700 hours). The regulatory limit for noise levels for receivers in industrial areas is 75 dBA anytime. Noise levels exceeding maximum standards are not permitted beyond the property line of the source (USAMRMC and USAG, 2006).

Area B of Fort Detrick is considered a relatively quiet environment with no significant noise pollution sources. Sources of noise on Area B are comparable to those found in a residential area. Minor sources of noise on Area B include vehicular traffic, and the routine operations at Air Force Medical Evaluation Support Activity and Armed Forces Reserve Center. Noise level standards must be met for residential land use at the Installation boundary for all applicable

activities within Fort Detrick. If warranted, a noise level monitoring system using an approved sound level analyzer may be located at or within the property line of the receiving property.

Lighting at Area B of Fort Detrick is comparable to that found in residential areas and is not expected to create any nuisance to neighbors. Citizen complaints regarding lighting originating from Area B of Fort Detrick have not occurred (Lewis, 2010).

#### 4.12 ODORS

Odor sources emanating from Area B of Fort Detrick originate from the landfill and routine operations conducted at the Installation. Garbage odors arise during the transport of waste to the landfill. Citizen complaints regarding objectionable odors originating from Area B of Fort Detrick have not occurred (Lewis, 2010).

#### 4.13 TRANSPORTATION

Fort Detrick is located in the northwestern portion of Frederick, Maryland, approximately 45 miles north of Washington, DC and 45 miles west-northwest of Baltimore. Fort Detrick can be reached via a number of interstate and U.S. highways including I-70, I-270, U.S. 40, and U.S. 15. I-270 and other major roadways that converge in the City of Frederick provide convenient access to Washington, DC, Baltimore, and other employment centers in the region. Local access to the Installation is via the surrounding roadway network of city streets, county roads, and state highways. U.S. 15 is a divided highway serving both regional and local commuter traffic in the City of Frederick. This highway is located approximately one-half mile south of Fort Detrick.

Rocky Springs Road is a minor artery running northwest to southeast that forms a portion of the northeast boundary of Area B. Montevue Lane which is a minor artery that turns into Shookstown Road approximately 0.60 miles west of Rosemont Avenue provides access to Area B as well as forming a portion of the southern boundary. The western boundary is formed by Kemp Lane which is a minor artery running north and south through the City of Frederick.

Currently there is only one access gate to Area B, which is located off of Montevue Lane. The gate has fencing along Montevue Lane and one guard house to operate the gate. There is a right turn lane located on the west bound side of Montevue Lane to allow traffic to enter and a west bound merger lane for traffic exiting the Installation. Area B is encircled by a narrow utility road that is located just inside the boundary. This road is paved for the majority of its length except for the western portion that borders Kemp Lane and is grass covered. The service road provides access to every structure located on Area B.

Although Area B is not specifically served by Frederick County Transit routes, Fort Detrick is served by four. The Frederick Towne Mall Connector (Route 30) provides hourly service between the Frederick Maryland Rail Commuter (MARC) Station Transit Center in downtown Frederick and the Frederick Towne Mall. Route 30 has three stops that provide convenient access to Fort Detrick. The Frederick Community College (FCC) Connector (Route 60) operates from the Transit Center to FCC with the closest bus access to Fort Detrick at the intersection of Seventh Street and Taney Avenue approximately 600 ft from Veterans Gate. The Midtown Connector (Route 70) operates from the Transit Center to Frederick Shopping Center and

Monocacy Shopping Center with the closest bus access to Fort Detrick at the intersection of Seventh Street and Taney Avenue (Jacobs and AECOM, 2009).

A vanpool incentive program has recently been introduced at Fort Detrick to help individuals save money, gas, time and the environment. With this program each participating individual receives \$230 a month towards the lease of a van, free gas, maintenance and free insurance. This program is designed to reduce the amount of air pollution from personal vehicles and traffic congestion. Vanpool routes include Hagerstown/Boonesboro MD, Martinsburg WV, Waynesburg PA, and several other cities located in Pennsylvania (Adkins, 2010c).

The City of Frederick was connected to the MARC Brunswick Rail Line on 17 December 2001. Service from Frederick includes three trains each morning into Union Station, just outside downtown Washington, DC, and three returning trains in the evening. Trains head for Washington, DC on the Brunswick Line from Point of Rocks. The MARC lines also provide service to Washington, DC, Baltimore, Maryland, and West Virginia (Jacobs and AECOM, 2009). The CSX Railroad system provides rail freight service in Brunswick, Maryland, and Harpers Ferry, WV. The Norfolk Southern Railroad system provides rail freight service in Hagerstown, MD.

The Baltimore/Washington International Thurgood Marshall Airport, Dulles International Airport, and Reagan National Airport provide commercial airline service and are located approximately 54 miles to the east, 43 miles to the southeast, and 50 miles to the southeast, respectively, from the Frederick area. The Hagerstown Municipal Airport provides cargo air service and is located 36 miles northwest of Fort Detrick. The Frederick Municipal Airport is located approximately three miles east of Fort Detrick.

#### 4.14 ENERGY RESOURCES

The Potomac Edison DBA Allegheny Power provides electrical power to the Installation via two 34.5 kilovolt (kV) power lines. Due to the energy-intense nature of research activities conducted at Fort Detrick, the demand for electricity at the Installation is high. Power to Area B is supplied by a 100 amp overhead line from Area A. This power supply line, installed over 40 years ago, crosses Rosemont Avenue and enters Area B in the southeast corner of the property (USAG, 2004). When the new Reserve Center was built, a new electric service was purchased directly from Allegheny due to the limited capacity of the existing power supply (Lewis, 2010).

As discussed in Section 2.4.2, the Frederick Gas Company furnishes natural gas to Fort Detrick. Natural gas consumption for the entire Installation was 390,000 MBTU in FY 2010 and Area B consumed only 0.4 percent of this total for heating purposes (Lewis, 2010). There are currently no processes or activities on Area B that consume or generate No. 6 fuel oil or steam.

Replacement of fossil fuels for energy production, reduction of energy intensity, and reduction of GHG emissions are required for compliance with Federal environmental mandates. Fort Detrick will abide by legislative requirements stated in these mandates (see Section 2.6).

## 4.15 POLLUTION PREVENTION AND WASTE MANAGEMENT

### 4.15.1 WASTEWATER

Fort Detrick maintains two sewer systems: the sanitary sewer system and the existing Laboratory Sewer System (LSS). Wastewater originating from some of the laboratories on the Installation (i.e., USAMRIID and USDA) is considered to be potentially infectious and is therefore collected separately via the existing LSS for pretreatment at the existing steam sterilization plant (SSP) before discharge into the sanitary sewer system. This wastewater is pumped northeastward approximately 2.4 miles to the WWTP, which is located on Area C, via two parallel 12 inch pipelines. The combined wastewater stream at the WWTP amounts to 60 percent to 80 percent of the Fort Detrick WTP production. It is estimated that 90 percent of the total wastewater generated at Fort Detrick is sanitary sewage; the remainder is industrial wastewater (USAMRMC, 2001). (Note: the wastewater includes inflow and infiltration in addition to the sources indicated above). The WWTP has sufficient capacity under the NPDES permit to treat up to 730 million gallons per year of wastewater generated by activities at Fort Detrick. The WWTP treated approximately 198,587,000 gallons in FY 2008, 216,689,000 gallons in FY 2009, and 324,257,000 gallons in FY 2010 (Lewis, 2010).

The Fort Detrick WWTP, located in Area C, provides secondary treatment through the use of trickling filters. The WWTP currently operates at 20 to 45 percent of its permitted capacity (2.0 mgd), treating 0.4 to 0.9 mgd of wastewater (USAG, 2010b). Influent wastewater at the current plant is treated using the following process: primary clarification, trickling filter biological treatment, secondary clarification, disinfection using chlorine, de-chlorination using SO<sub>2</sub> and oxidation prior to discharge into the Monocacy River. The WWTP outfall is downstream from both the City of Frederick WTP and Fort Detrick WTP water intakes (USAG, 2010b).

The Fort Detrick WWTP discharges treated wastewater into the Monocacy River, a tributary of the Potomac River, which eventually empties into the Chesapeake Bay. Deterioration of the water quality in the bay has occurred over the last 30 years. Former Governor Parris N. Glendening issued an EO, *Nutrient Pollution Reduction Goals for Chesapeake Bay*, instructing the MDE to develop and implement an Enhanced Nutrient Removal (ENR) policy for WWTPs to meet the 2010 goal set in the new Chesapeake Bay Agreement. The USEPA Administrator, the Mayor of Washington, DC, and the Governors of Maryland, Pennsylvania, and Virginia signed the new Chesapeake Bay Agreement in 2000, replacing the first agreement signed in 1987. The new agreement sets nutrient loading goals of 3.0 milligrams per liter (mg/L) for nitrogen and 0.3 mg/L for phosphorus for WWTPs with a design capacity at or above 0.5 mgd. These goals will apply for a total of 66 WWTPs in Maryland, which account for approximately 30 percent of the nutrient loading of the Chesapeake Bay. The existing WWTP does not meet the MDE reduced discharge limits for nitrogen and phosphorus to satisfy ENR standards. The new discharge permit issued to Fort Detrick on 1 December 2009 requires Fort Detrick to bring the plant up to current standards. Upgrades to the WWTP are currently underway. Per the modified permit, the construction completion date for the project must be by 30 June 2011. The plant will be required to meet all ENR standards starting 1 July 2011.

### 4.15.2 MUNICIPAL SOLID WASTE AND RECYCLING

#### 4.15.2.1 Fort Detrick Incinerator Plant

The Incinerator Plant consists of two MSW incinerators (B-1 and B-4) and two medical waste incinerators (B-5 and B-6) located at the western border of Area A. The MSW units were

installed in 1975. In 1995, the facility was expanded by 5,000 ft.<sup>2</sup> to accommodate the medical waste incinerators.

The overall operation of the incinerators is subject to conditions of Refuse Disposal Permit (No. 2010-WIN-0341) issued by the MDE Waste Management Administration (WMA), effective through 29 November 2015. Operation of the two municipal waste and two medical waste incinerators is also subject to conditions of the CAA Title V Part 70 Operating Permit (No. 24-021-00131) issued by MDE Air and Radiation Waste Management Administration (ARMA) effective through 31 March 2014 (USAG, 2010b). Both permits set capacity limits on the incinerators.

The MDE WMA Refuse Disposal Permit sets capacity limits based on the average amount of waste projected to be incinerated in the next five consecutive years. Currently, the Refuse Disposal Permit sets a total combined limit of all incinerators at 8,400,000 lbs per year. MDE has indicated that the refuse disposal permitted capacity may be increased when/as needed by submitting a formal request to the Department (USAG, 2010b).

The MDE ARMA CAA Title V Part 70 Operating Permit sets capacity limits based on the design of the incinerators and their combustion process, and the discharges produced. This permit does not specify the number of days a year the incinerators can burn. For purposes of this EA, calculations were based on the incinerators typical operation of five days a week (260 days a year). The CAA Title V Part 70 Operating Permit states capacity for each municipal waste incinerator is 78,000 lbs per day; therefore during a 260 day operating year the combined capacity is 40,560,000 lbs. The permit states the capacity for each medical waste incinerators capacity is 24,000 lbs per day; therefore the combined medical waste incinerator capacity is 12,480,000 lbs per year. In summary, the Refuse Disposal permit capacity is a projection that can be revised when necessary while the CAA Title V Part 70 Operating Permit defines incinerator capacity based on design. Therefore, the Operating Permit capacity is used throughout the EA when calculating capacity utilization.

Each of the two MSW incinerators has the capacity to incinerate over 3,000 lbs per hour and can only accept residential, commercial, and mixed residential and commercial MSW from Fort Detrick. Currently the municipal waste incinerators are operating at approximately 11 percent of capacity (USAG, 2010b).

The amount of MSW incinerated at Fort Detrick was 5,950,103 lbs in FY 2010. Area B generated approximately 50,000 lbs (or one percent) of the total generated on the Installation in FY 2010 (Adkins, 2010a). NCI-Frederick is the main contributor of MSW, accounting for approximately 45 percent of total MSW stream (USAG, 2010b).

#### *4.15.2.2 Fort Detrick Municipal Landfill*

The Fort Detrick Municipal Landfill holds Refuse Disposal Permit (No. 2010-WMF-0327) issued by MDE WMA on 9 August 2010, and effective through 8 August 2015 (USMRMC and USAG, 2006). The permitted area consists of a 60.9-acre fill area within Area B. There is a separate gate for the landfill, which remains locked when landfill operators are not present, in accordance with the permit requirements (DHS and USAG, 2004). This landfill may only accept domestic, municipal, commercial, industrial, agricultural, silvicultural, and construction waste generated at Fort Detrick. Types of waste that are not permitted for disposal at the Fort Detrick Municipal

Landfill include controlled hazardous substances, liquid waste, special medical waste, radioactive materials, automobiles, large containers such as drums or tanks (unless flattened or crushed and empty of contents), animal carcasses, untreated sewage, truckloads of separately collected yard waste, and tires, unless otherwise specifically authorized by a valid permit issued under COMAR.

The landfill is constructed with compacted cell floors, synthetic geomembrane liners, and a leachate collection system. A cover of six inches of compacted earth is placed over exposed solid waste daily to prevent odor and particulate emissions, and to minimize infiltration of rainwater into active cells. Intermediate and final covers over completed lifts are installed to depths of one-foot and two-ft, respectively. The disposal site is graded to minimize runoff, to prevent erosion and ponding, and to drain surface water from the landfill area (USAMRMC and USAG, 2006).

In compliance with the permit to operate, the Fort Detrick Municipal Landfill has groundwater monitoring wells installed for leak detection, and a leachate disposal system to collect waste liquids percolating through the landfill, pump it to Area A for discharge into the sanitary sewer system and treatment at the Fort Detrick WWTP (See Section 4.15.1). Leachate volumes and local rainfall amounts are reported monthly to the MDE Solid Waste Program in accordance with the waste disposal permit (URS, 2005). In CY 2009, approximately 2.2 million gallons of leachate was collected and treated from Area B. Additionally, Ft. Detrick rainfall totals for CY 2009 were approximately 45 inches (Lewis, 2010).

During the decommissioning of the DA's facilities using radioisotopes at Fort Detrick, the landfill leachate also was monitored for radioisotope contents. Analysis of periodic leachate samples from March 2003 to April 2004 showed a low-level concentration of tritium, on average below the drinking water standard set by USEPA (USAG, 2003b). The DA's independent audit report indicated that the tritium in the leachate might be from other non-licensed tritium sealed sources, such as compasses disposed at the landfill (USAG, 2003c). No tritium or other radioisotopes were detected in the groundwater monitoring wells around the landfill. The Nuclear Regulatory Commission (NRC) and MDE allow the leachate to be pumped to the WWTP for treatment, and the discharge of tritium in the WWTP effluent to the Monocacy River was shown to have negligible environmental consequences (USAG, 2004).

Additionally, monitoring of the landfill leachate for bis (2-ethylhexyl) phthalate was conducted, as required under the landfill permit, from June 2000 through June 2005 and reported to MDE. This monitoring was done on a monthly basis from June 2000 to April 2002, and then revised to quarterly testing based on non-detects for all results from July 2001 through April 2002. Based on consistently negative results, the leachate monitoring program has been revised; beginning in Spring 2006, the landfill leachate is analyzed semi-annually, on the same schedule, and for the same parameters as the groundwater monitoring wells at the landfill (USAMRMC and USAG, 2006).

At the end of 2009, the remaining landfill capacity reported to MDE was 902,019 cubic yards (cu. yd.). From 2007 thru 2009, the Fort Detrick Municipal Landfill accepted 2,464 cu. yd. of material. Each year since 2005, a detailed topographical survey was completed of the landfill area and confirms records of the remaining capacity at the landfill. This survey is completed annually and compared to the site data to make acceptance totals as accurate as possible (USAG, 2010b). The estimated average annual rate of waste disposal based on this three-year

average is approximately 821 cu. yd., which includes ash, refuse, fill, sludge, and cover material. Using this rate as an indication of future activity, assuming that solid waste quantities do not increase significantly, the Fort Detrick Municipal Landfill will reach its maximum permitted capacity in 437 years (USAG, 2010b).

#### 4.15.2.3 Recycling

A variety of materials at Fort Detrick are recycled, including newspaper, white paper, cardboard, glass, aluminum cans, steel cans, and various scrap metals. Computer cards and scrap metal are shipped to the Defense Reutilization and Marketing Service (DRMS) at the Letterkenny Army Depot for recycling. Other DRMS facilities are located in Mechanicsburg, PA and Fort Meade, MD (USAG, 2003a). Waste oil is also recycled at Fort Detrick. A contracted recycling firm collects the waste oil from various points on the Installation (USAG, 2003a). Approximately 3,106,000 lbs of waste was recycled at the Installation during FY 2010 (Adkins, 2010a).

#### 4.15.3 SPECIAL MEDICAL WASTE

Medical waste is subject to Federal, state, and local regulations to protect transporters and the public from potential hazards that are associated with possible infectious agents in the waste. Medical waste at Fort Detrick is incinerated in accordance with *Biosafety in Microbiological and Biomedical Laboratories* (BMBL) guidelines (CDC and National Institutes of Health [NIH], 2007). In general, special medical waste includes human and animal blood or materials soiled with blood, cultures and stocks of infectious agents or materials soiled with infectious agents, syringes, needles, and certain animal bedding.

All infectious medical waste must be properly packaged for transportation to the disposal site. Special medical waste is collected in 4-millimeter-thick, waterproof, tear-resistant, non-chlorinated, red plastic bags. Contaminated sharps are handled separately and are stored in combustible, impenetrable, and puncture-resistant containers. Packaging and handling procedures for medical waste must be followed precisely, as directed by immediate supervisors and the Installation Safety Officer. All medical waste is disposed of via the Fort Detrick medical waste incinerators in compliance with Federal, state, and local regulatory requirements (USAMRMC and USAG, 2006).

Fort Detrick operates the two medical waste incinerators under Refuse Disposal Permit (No. 2010-WIN-0341) issued by the MDE WMA on 30 November 2010, as noted in Section 4.15.2.1. The two medical waste incinerators have the capability to safely incinerate and decontaminate infectious materials generated from the Installation research activities. Currently, the medical waste incinerators are operated 8 hours a day, 5 days a week, and dispose of an average of approximately 5,400 lbs of medical waste per day (USAG, 2010b). Typically one medical waste incinerator is in operation while the other is down for routine maintenance, although both of them can be operated at the same time and up to 24 hours per day under the permit conditions (Adkins, 2010b). The total amount of medical waste incinerated was 1,430,000 lbs in FY 2010 (Adkins, 2010a). The major generators of medical waste at Fort Detrick are NCI-Frederick (the largest), USAMRIID, and the USDA. Area B generated approximately 591 lbs (or 0.04 percent) of the medical waste generated on the Installation in FY 2010 (Adkins, 2010a).

#### 4.15.4 HAZARDOUS WASTE

Under the provisions of the Resource Conservation and Recovery Act (RCRA), Area B of Fort Detrick is registered as a large quantity generator of hazardous wastes (USEPA Identification [USEPA ID] No. MD4211600958). This USEPA ID No. applies only to hazardous waste generated on the Army-owned portion of Area B (USACE, 2006). RCRA is administered in Maryland by the MDE Hazardous Waste Program through regulatory requirements for Controlled Hazardous Substances (COMAR 26.13). Except where noted, the section as follows applies only to the Fort Detrick USAG and tenant activities covered under USEPA ID No. MD4211600958.

Hazardous wastes may not be disposed of through the Fort Detrick municipal trash, sanitary sewers or to the LSS. This applies to all generators on the Installation. Hazardous waste or spent hazardous material that is generated on Area B (subject to the USAG USEPA ID number for Area B) is accumulated by the generator within Satellite Accumulation Points (SAP). Wastes collected from the SAPs may be transported to a 90 day collection site to await shipment off site. Within 90 days after the accumulation start date (the date that a hazardous waste leaves a SAP or the date the waste is generated if not stored in a SAP); the hazardous waste must be removed from the Installation for shipment to a properly permitted offsite treatment storage disposal facility (TSDF). The USAG contracts with the Defense Reutilization Marketing Office for the packing, transportation, and disposal of hazardous waste. The hazardous waste must be packaged in accordance with the U.S. Department of Transportation (DOT) regulations (49 CFR 171-179), Federal, state, and TSDF requirements. In FY 2010, Area B generated approximately 450 lbs of hazardous waste (Lewis, 2010).

#### 4.16 HAZARDOUS MATERIAL MANAGEMENT

32 CFR 650, *Environmental Protection and Enhancement* (AR 200-1), provides guidance for the identification and management of hazardous materials at DA facilities. Mission partners and organizations at Fort Detrick are responsible for obtaining their own hazardous materials. Individual mission partners obtain hazardous materials from private manufacturers for shipment directly to their facilities. Hazardous materials are then stored in or near the users' laboratories typically in cabinets, refrigerators, or freezers. In addition to agency-specific Standard Operating Procedures (SOPs), all Mission Partners must comply with the requirements of Federal, DA, USAG, state, and local regulations with regard to the procurement, use, storage, and disposal of hazardous materials (USAMRMC and USAG, 2006).

The Fort Detrick Fire and Emergency Services Division (F&ESD) provides fire prevention and protection services to the Installation, which includes responding to emergencies involving hazardous materials. The F&ESD maintains and operates three fire engines, as well as a fully-equipped special operations vehicle. In addition to being a hazardous response unit, the special operations vehicle has the technology to detect chemical and biological agents, as well as the equipment necessary for decontaminating and medically treating people in the event of a terrorist attack (Frederick News-Post, 2004). Ambulance service is provided by Frederick County. DIS also maintains equipment and materials to assist in the cleanup of hazardous material spills. In accordance with the *Superfund Amendments and Reauthorization Act* (SARA), the F&ESD receives copies of all Material Safety Data Sheets (MSDSs) for hazardous materials stored in USEPA reportable quantities on the Installation. F&ESD personnel and

employees who manage or handle hazardous materials are trained in accordance with Federal, DA, USAG, state, and local regulations (USAMRMC and USAG, 2006).

#### 4.16.1 PESTICIDE MANAGEMENT

##### *4.16.1.1 Integrated Pest Management Approach*

All pest management activities at Fort Detrick are implemented in accordance with the current Installation Pest Management Plan (IPMP) (USAG, 2006c). The IPMP is a framework through which pest management is defined and accomplished at Fort Detrick. The plan identifies elements of the program including health and environmental safety, pest identification, and pesticide storage, transportation, use, and disposal. The IPMP is used as a tool to reduce reliance on pesticides, to enhance environmental protection, and to maximize the use of integrated pest management (IPM) techniques.

The Installation Pest Management Coordinator (IPMC) at Fort Detrick maintains the IPMP. Changes are made to the plan throughout the FY and it is reviewed and updated annually to reflect all changes made in the pest management program during the FY. Per AR 200-1, *Environmental Protection and Enhancement*, annual updates will be sent to the U.S. Army Environmental Command Pest Management Consultant (PMC) not later than 1 September (USAG, 2006c). The IPMP is submitted for a formal, full-document review every five years. The current Fort Detrick IPMP was approved through 30 September 2009 and will be fully reviewed in 2011 (USAG, 2010b).

The goal of the pest management program at Fort Detrick is to safeguard human health, as well as structures and aesthetic features on the Installation, while providing maximum protection to the local ecosystem and environment. To achieve this goal, the IPMP sets forth principles for an IPM approach, which aims to significantly reduce the use of pesticides by applying non-chemical pest management techniques, including mechanical and physical, cultural, and biological control techniques, whenever possible. Chemical control is considered last to mediate a problem (USAG, 2006c).

Mechanical and Physical control alters the environment in which a pest lives, traps and removes pests where they are not wanted, or excludes pests. This is the primary method for control at Fort Detrick. Cultural control involves the manipulation of environmental conditions by changing practices to suppress or eliminate pests. Biological control utilizes predators, parasites or disease organisms to control pest populations. Biological control may be effective in and of itself, but, is often used in conjunction with other types of control. Chemical control, the use of chemicals toxic to unwanted plants and animals (pesticides), is employed only when other pest control methods are ineffective or not practical (USAG, 2006c).

IPM strategies depend on surveillance to establish the need for control and to monitor the effectiveness of ongoing IPM efforts. While any one of these methods may solve a pest problem, often several methods are required and used concurrently, particularly if long-term control is needed. Adherence to the IPM will ensure effective, economical, and environmentally acceptable pest management and will maintain compliance with the terms of Merit 2 in DoD instruction 4150.7, *DoD Pest Management Program* (USAG, 2006c).

#### *4.16.1.2 Pesticide Storage, Mixing, and Transportation*

Pesticide storage and mixing facilities are constructed to meet standards as outlined in Military Handbook 1028/8A. Pesticides, materials, and equipment used in pest management operations are stored in a building on Area A. Pesticides are kept in flameproof safety cabinets in a climate-controlled room that features recessed, drain-less flooring for spill containment. Sufficient space and non-absorbent shelving is provided to allow a clear display of clearly labeled pesticide containers as well as spatial separation between pesticide classes. To reduce storage requirements, pesticides are purchased on an as-needed basis and in small quantities that do not exceed a one-year supply. Fort Detrick pest management technicians maintain a current inventory of stored pesticides. Copies of the inventory are sent to the PMC at Fort Detrick, and as requested, to the Fort Detrick fire departments every six months (USAG, 2006c).

Mixing of pesticides also takes place in a building on Area A. The mixing room is equipped with a deluge shower, eye lavage, and pesticide spill kit. In addition, it is also outfitted with recessed spill-containment flooring, a backflow prevention protected sink, and an exhaust hood. An outside water source, which is used to fill large spray tanks, also possesses a backflow prevention device. The building is equipped with an industrial fire suppression system, and both the pesticide storage room and mixing room contain a discrete ventilation system (USAG, 2006c).

Transportation of pesticides occurs in a designated pest management vehicle, which is equipped with lockable storage compartments, a portable eye lavage, a spill kit, and a fire extinguisher. Pesticides are secured in the storage compartments during travel and when the vehicle is unattended. At no time are pesticides or pesticide contaminated equipment transported in the cab of the vehicle. Care is taken to secure pesticides to prevent damage to containers that could result in spillage of chemicals. Fort Detrick pest management personnel are given the approved DoD Hazard Communication (HAZCOM) course relating to hazardous materials in the workplace. Following initial hazard communication classes, additional training is given when new hazardous materials are introduced into the workplace. Since pesticides are transported off the Installation on high-volume public roads when traveling, additional training in a 16 hour DOT level VIIB class on transport of regulated hazardous materials is provided by the Hazardous Material Management Office (HMMO) at Fort Detrick. The Fort Detrick Safety Office coordinates the HAZCOM training (USAG, 2006c).

Contractor pesticide applicators must use vehicles and equipment which are clearly identified and used for only pest management activities. The IPMC must provide information on such markings or company logos to the Provost Marshall's Office. Vehicles must contain spill and decontamination kits, and the contractor must provide documentation of spill prevention and cleanup training to the environmental and safety offices. The Installation must also provide a copy of the Installation Spill Prevention, and Control Countermeasure Plan to the RCI partner (USAG, 2006c).

#### *4.16.1.3 Pesticide Application*

The application of pesticides at Fort Detrick is carried out by trained and/or certified pest management personnel or by certified and licensed outside contractors. All pesticides are applied per USEPA and state approved label directions, and pesticide applications are conducted in a manner aimed to eliminate risks to human health and to limit potential, negative

impacts on the environment. Precautions are taken during pesticide application to protect the public, on and off the Installation (USAG, 2006c).

Pesticides are not applied outdoors when the wind speed exceeds five miles per hour. Whenever pesticides are applied outdoors, care is taken to make sure that any spray drift is kept away from individuals, including the applicator. Individuals wearing the proper personal protective clothing and equipment accomplish indoor and outdoor pesticide application. At no time are personnel permitted in a treatment area during pesticide application unless they have met the medical monitoring standards and are appropriately protected. Public notification, using placards, is done when outdoor turf and ornamental vegetation treatments have been made (USAG, 2006c).

Sensitive areas listed on pesticide labels are considered prior to pest control operations. Pest control personnel are aware of the potential impacts associated with pesticide use within sensitive areas at Fort Detrick. A sensitive area is any place where pesticide use could cause great harm if not used with special care and caution. Examples of sensitive areas include barracks, residences, recreational areas, dining facilities, medical clinics, playgrounds, childcare facilities, and all surface water sources including wetlands. No pesticides are applied directly to wetlands or water areas unless use in such sites is specifically approved on the label (USAG, 2006c).

Pest management personnel maintain records of all pest management activities conducted on the Installation. The pest control shop is required to fill out a Decision Document (DD) Form 1532 (Pest Management Report) each month which indicates the target pest, pesticide, amount applied, date, and operation. In FY 2010, Fort Detrick applied a total of approximately 89.7 lbs of active ingredient (Lewis, 2010).

#### *4.16.1.4 Occupational Health and Safety*

Protective measures to ensure the health and safety of workers involved in pest management activities include training and medical monitoring of personnel as required by Federal and state laws and regulations. All Fort Detrick pest management personnel participate in medical screening and surveillance, health education, and respiratory protection programs, which are administered through the Fort Detrick Occupational Health Clinic. Pest management personnel are given thorough, annual, physical exams to evaluate overall health and potential exposure to pesticides, especially cholinesterase inhibiting substances. This physical examination also includes liver and kidney function tests, a complete blood count and a respiratory evaluation. The U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) Technical Guide No. 114 is used as a guide for medical monitoring of pesticide applicators (USAG, 2006c).

Approved personal protective equipment (PPE) is provided to Fort Detrick pest management personnel as well as the contracting officer's representative (COR) who performs quality assurance evaluations as applicable. PPE includes items such as masks, respirators, mixing hoods, chemical resistant gloves and boots, and protective clothing. These items are used as required during the mixing and application of pesticides as required by law, regulation, and the pesticide label. Pesticide-contaminated protective clothing is not laundered at home and is laundered at the pest control shops. Severely contaminated clothing is not laundered, but is considered a pesticide-related waste and disposed of by the Defense Reutilization and

Marketing Office (DRMO) in accordance with current Environmental Office requirements. Detailed instructions on proper use and handling of PPE, as well as disposal of pesticide contaminated PPE is provided in the IPMP (USAG, 2006c).

The awareness of human disease threat from hantaviruses associated with rodents, their excrement, bedding, or other rodent contaminated items, has placed emphasis on using appropriate respiratory protection in areas that may be rodent infested or contaminated. Specifically, respirators equipped with high-efficiency particulate air filter cartridges are used. Additional protective measures are followed (e.g. area ventilation, disinfecting procedures, wearing protective clothing). Guidance is provided by the Department of Army and the Centers for Disease Control and Prevention (USAG, 2006c).

#### *4.16.1.5 Pesticide Disposal and Spill Clean-up*

To minimize pesticide waste and to limit disposal needs, pesticides are purchased in small quantities that can be used within a season. All excess pesticides must be returned to the Defense Logistics Agency Materials Return Program or to the DRMO (Armed Forces Pest Management Board Technical Guide No. 21). Pesticide waste, contaminated equipment, and pesticide spill residues, which are classified as HAZMAT, are disposed of in accordance with 32 CFR 650 and Armed Forces Pest Management Board Technical Information Guide No. 15 and No. 21. Non-HAZMAT pesticide materiel and pesticides are disposed of per the product's USEPA approved label (USAG, 2006b).

All accidental pesticide spill incidents are managed per procedures outlined in the Fort Detrick Spill Prevention Control and Countermeasure Plans (SPCCP) and the Installation Spill Contingency Plan (ISCP). Any spill is immediately reported to the Senior Emergency Fort Detrick Response Officer. The officer may call for additional support as needed from local fire and emergency resource teams under mutual aid agreements, and if necessary, State or Federal Fire/Emergency Response teams. The Fort Detrick Fire Department acts as the Installation Response team for immediate response to any incident accordance with procedures outlined in the SPCCP and ISCP. Pesticide spill clean-up kits are maintained in the existing building on Area A and on the pest management vehicle (USAG, 2006c).

### 4.17 ENVIRONMENTAL RESTORATION AND IMPROVEMENT

#### 4.17.1 ENVIRONMENTAL CONCERNS IN AREA B

Several sites in Area B were identified as areas of potential environmental concern through the Fort Detrick Installation Restoration Program (Figure 4-3). These areas, described below, include: Area B outdoor simulant testing grid (B-Grid); ammunition storage area (B-Ammo); Area B skeet range; B-20 N and S detonation areas; Area B-1 landfill; Area B-11 landfill; Area B-2 landfill; Area B-3 inactive landfill; Area B-6 landfill; Area B-8 and B18 landfill; Area B-10 landfills; and Area B groundwater (Gortva, 2010a).

##### *4.17.1.1 Area B Outdoor Simulant Testing Grid (B-Grid) (FTD 05)*

The Army installed an unlined circular open field as test grid in Area B (~38 acres) in the late 1940s. The test grid was used to observe the dissemination of biological simulants that were either suspended, air dropped or dispersed as aerosols, by detonation using compressed gas or small explosive charges. Biological simulants included *Serratia marcescens* and *Bacillus globigii*

microorganisms that are easily detected and not normally pathogenic. It is reported that limited outdoor testing of simulants may have begun as early as 1944. Metal residues from explosive containers and casings are the main source of concern for surface and subsurface soil in the grid area.

The collection of surface and near surface samples for metals in 1995 found that arsenic, chromium, iron, manganese, thallium, and vanadium exceeded residential screening levels. Of these metals, arsenic, iron, manganese, and vanadium were also detected at concentrations exceeding industrial screening levels. The only analyte of concern after the 1995 RI was arsenic based on analytical data. Additional studies were performed in 2004 including a new background study for metals. During the 2004 environmental investigation at the site, 20 additional surface soils were sampled and analyzed for arsenic only. Arsenic was detected at concentrations ranging from 2.7 to 5.7 milligram per kilogram (mg/kg). Although these concentrations exceed the residential screening level (0.43 mg/kg) and the industrial screening level (1.9 mg/kg), all concentrations are below the background 95 percent upper confidence limit (UCL) (5.77 mg/kg) for arsenic. This indicates that arsenic was naturally occurring in surface soil at Area B-Grid and was not the result of a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) release.

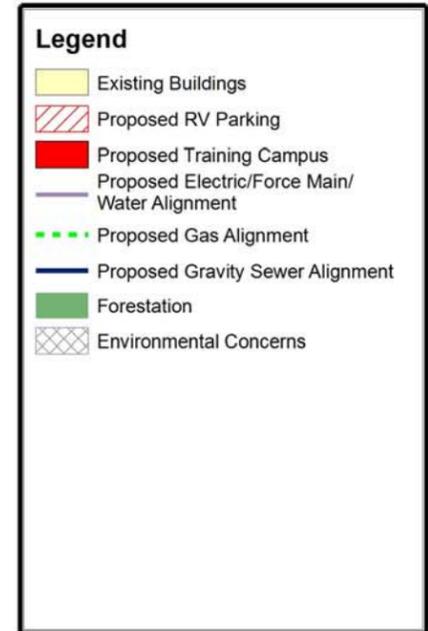
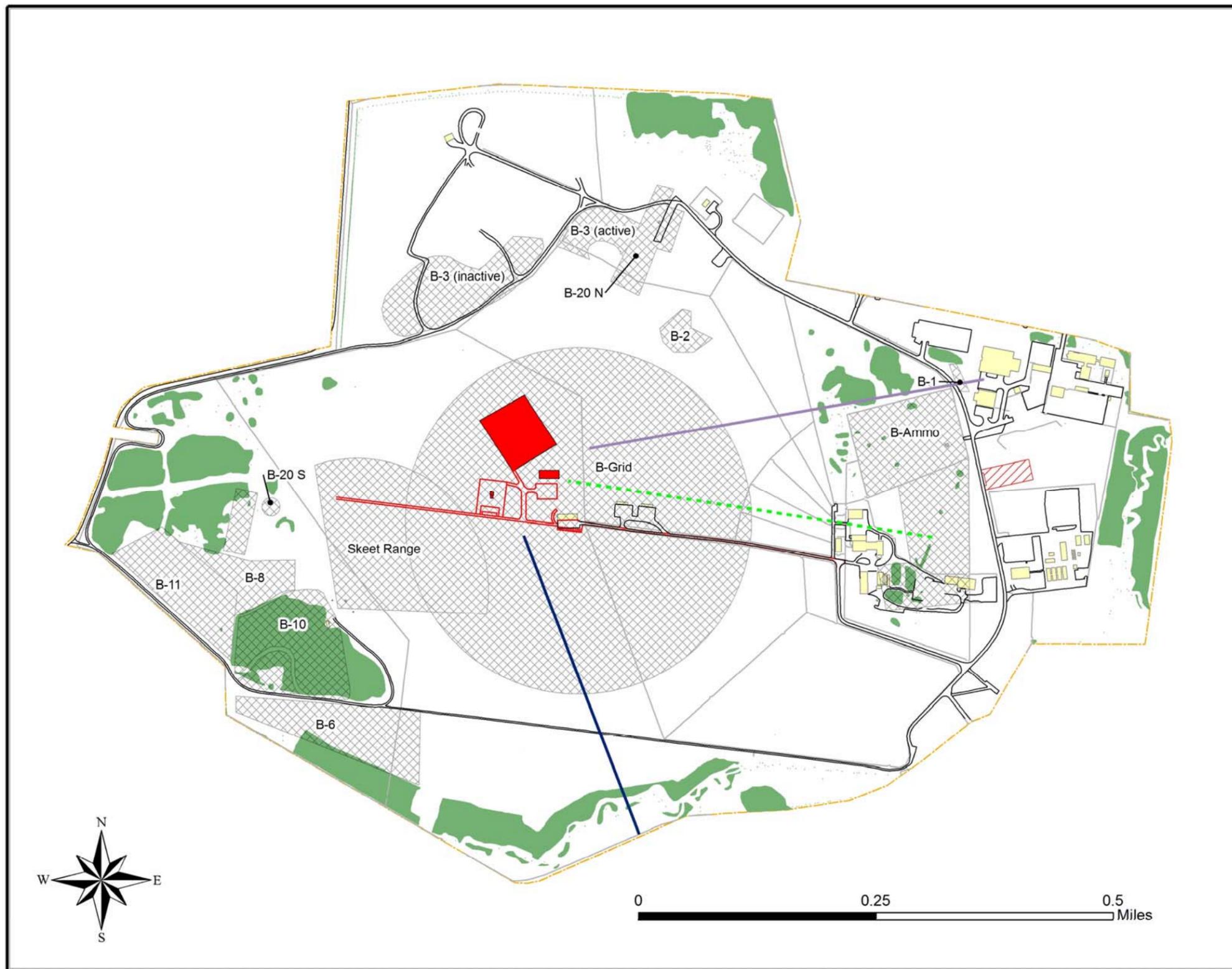
In 2008, the Remedial Investigation (RI) was completed to present all previous investigated findings, characterize the nature and extent of waste materials, and evaluate risks associated with the waste. The RI focused only on the waste and soil. Results from a Human Health Risk Assessment (HHRA) and a Screening-Level Ecological Risk Assessment (SLERA) indicated that there were no unacceptable human or ecological risks attributable to a CERCLA release. In February 2008, a DD was signed selecting no remedial action is necessary to ensure protection of human health and the environment. The MDE provided a letter supporting the selected remedy on 28 March 2008 (Gortva, 2010a).

#### *4.17.1.2 Ammunition Storage Area (B-Ammo) (FTD 07)*

Prior to 1971, munitions storage and loading facilities were present on the eastern portion of Area B. There were six sub-areas, where munitions were stored in magazines, and a munitions loading building. The storage facilities consisted of eleven above ground magazines, one earth-covered magazine, and three smaller magazines. The materials were removed, and the buildings were decontaminated in the 1970s. All of the magazines, except one, were dismantled in 1971. The site currently consists of pasture and storage areas for the USAMRIID animal farm.

Initial sampling results for the site did not indicate releases of contaminants above risk based concentrations of concern. In a 2001, USEPA aerial photographic review, several disturbed areas were noted. In 2004, Fort Detrick collected additional background and five site characterization surface and sub-surface soil samples. Sampling results did not indicate the presence of disposal activities. The Fort Detrick Partnering Team agreed on 10 May 2005 that no disposal activity occurred at Area B-Ammo Original and therefore, there is no CERCLA release as a result of disposal activity and closure of the Area B-Ammo Original is reasonable with no action (Gortva, 2010a).

In December 2006, the Army completed a RI of portions of Area B, including Area B ammunition areas. This investigation revealed concentrations of 2,4-dinitrotoluene, 2,6- dinitrotoluene, 4-



**Fort Detrick**  
Frederick, Maryland

**BSA** ENVIRONMENTAL SERVICES, INC.

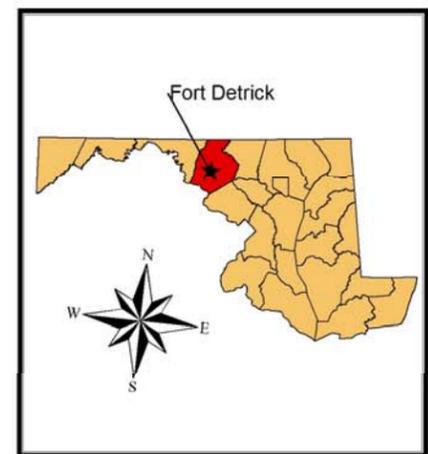


Figure 4-3. Area B Environmental Concerns Map.

THIS PAGE INTENTIONALLY LEFT BLANK

amino-2,6-dinitrotoluene, and nitrobenzene below residential screening levels in soil samples from explosives storage (including black powder, rocket motors, and trinitrotoluene bursters) and munitions loading. The RI focused only on the waste and soil. In the Area B-Ammo Original area, semi-volatile organic compounds (SVOCs) and explosives were not detected at concentrations exceeding USEPA Region III residential and industrial screening levels during the 1995 RI and the 1998 investigation in both surface and subsurface soil samples. Based on these analytical results, there was no concern due to explosives or SVOCs. In the Area B-Ammo Outside location, only one explosive (nitrobenzene) was detected at concentrations below the residential screening level (3.9 mg/kg) in both surface and subsurface soil. Arsenic, iron, and manganese exceeded residential and industrial screening levels in surface soil. Vanadium exceeded only residential screening levels in surface soil. Only manganese and thallium exceeded residential screening levels in subsurface soil. Only one sample contained thallium concentrations exceeding residential screening levels. This single elevated detection was isolated and was not characteristic of the area. Therefore, thallium was not considered a concern for Area B-Ammo Outside. Arsenic was evenly distributed in Area B-Ammo (no evidence of a source area). Consistent with what has been observed in subsurface soil, elevated arsenic concentrations may be due to mixing of surface material during construction activity. In addition, there was no unusual distribution of iron, manganese, and vanadium concentrations at Area B-Ammo Outside, which provided strong evidence that there was not a CERCLA release for metals. Results from a HHRA and a SLERA indicated that there were no unacceptable human and ecological risks for Area B-Ammo attributable to a CERCLA release. In February 2008, a DD was signed selecting no remedial action is necessary to ensure protection of human health and the environment. The MDE provided a letter supporting the selected remedy on 28 March 2008 (Gortva, 2010a).

#### *4.17.1.3 Area B-Skeet Range (FTD 29)*

The skeet range is located in the southwestern corner of Area B and extends north in a fan-like manner. It had been used by military and civilian personnel as a recreational skeet range since the 1950s. However, the skeet range was deactivated in 1999. Analytical results for surface and subsurface soil samples showed elevated concentrations of lead. In 2001, the ground surface of the skeet range was scraped to remove the majority of the lead shot and clay pigeon contamination. Soils that did not meet toxicity characteristic leaching procedure action levels for lead were removed as hazardous waste. The remaining soils were used as a daily cover material at the Fort Detrick Municipal Landfill. In 2005, surface soil confirmation samples were taken to determine the levels of lead and polycyclic aromatic hydrocarbons (PAHs) in soil. Samples indicated that an area close to the shooting stations contained significant quantities of clay pigeon debris and elevated PAHs. An additional post operation clean-up for pigeon debris was completed in August 2005. Subsequent sampling and risk analysis indicates that there is no longer an unacceptable human or ecological health risk for the site.

In September 2005, a draft final closeout document was presented to MDE. In January 2006 discussions, MDE stated that the Army should complete an RI and DD for this site. Fort Detrick completed the final RI document and signed a no further action DD for the site in February 2008 (Gortva, 2008).

#### *4.17.1.4 B-20 Detonation Areas (FTD 43)*

There are two explosive ordnance disposal areas located in Area B: one in the southwestern area within the fan of the skeet range and the second in the northern Area B. Area B-20 South was used as a controlled burn area for the destruction of small amounts of explosives. Area B-20 North was also used as a controlled burn area for the destruction of small amounts of explosives. The site is currently an open grassy field. Surface and subsurface soil samples were collected in both areas.

The Army used an unlined flat area within a 10-foot-high horseshoe-shaped earthen berm as a controlled burn area for the destruction of explosives. This area is known as B-20 South. Records indicate that the Army burned small quantities of explosive materials in cardboard boxes within the berm area. In 1995 and 1998, investigations of soil samples in Area B-20 South found arsenic, cadmium, chromium, iron, manganese, nickel, thallium and vanadium exceeded the residential screening levels and the 95 percent UCL for the soil background dataset in surface soil. Arsenic, chromium, iron, and vanadium exceeded both residential screening levels and the 95 percent UCL for the soil background dataset. The absence of elevated concentrations of explosives or PAHs indicated that former burning activities have not resulted in significant contamination at the Area B-20 South. In addition, the observed lack of debris/disposal materials in associated areas indicates that these samples were not collected from a "disposal area." In 2008, a RI was completed to present all previous investigated findings, characterize the nature and extent of waste materials, and evaluate risks associated with the waste. The RI focused only on the waste and soil. Based on the results of the previous investigations, HHRA, and SLERA, it was recommended that no further investigation (action) be conducted under CERCLA for this area. In February 2008, a DD was signed selecting no remedial action is necessary to ensure protection of human health and the environment. The MDE provided a letter supporting the selected remedy on 28 March 2008 (Gortva, 2010a).

In August 2006, the Army conducted a RI of Area B-20 North. The investigation found cadmium and thallium in surface soils at concentrations that exceeded three times the background concentrations. Twenty surface and subsurface soil samples were collected from 10 soil borings in Area B-20 North during the 1995 RI. No SVOCs or explosives exceeded residential screening levels. Chromium, iron, manganese, thallium, and vanadium exceeded residential screening levels. Iron was the sole metal detected at concentrations exceeding industrial screening levels. In 2004, four surface and subsurface soil samples were collected in the area of the former revetment. Two samples were also collected from former bunker areas and two samples were collected from the bottom of the septic drain field. No explosives were detected in the two samples collected from the Bunker Area. Subsurface soil samples were collected from a drain field area and were analyzed for metals only. Four metals (chromium, iron, manganese, and thallium) were detected at concentrations exceeding residential screening levels in the two samples. Iron was the only metal that also exceeded its industrial screening level in the samples. Surface soil samples were collected from the Revetment Area and were analyzed for metals and explosives. No explosives were detected at this area of B-20 North in surface soil samples. Chromium, thallium, and vanadium exceeded residential screening levels only, while arsenic and iron exceeded both the residential and industrial screening levels in surface soil. Subsurface soil samples were collected from the Revetment Area and were analyzed for metals and explosives. Explosives were not detected. Chromium and vanadium concentrations exceeded residential screening levels. Manganese and thallium exceeded residential screening levels. Iron exceeded industrial screening. The absence of significant concentrations of explosives or PAHs indicates that former burning activities have not resulted in significant

contamination at the site. Although five metals (chromium, iron, manganese, thallium, and vanadium) were detected in soil samples at concentrations above screening levels, the lack of debris/disposal materials at the site indicates that these samples were not collected from a "disposal area." In 2008, a RI was completed to present all previous investigated findings, characterize the nature and extent of waste materials, and evaluate risks associated with the waste. The RI focused only on the waste and soil. Based on the conclusions of the geophysical survey, and previous investigations, HHRA, and SLERA, it is recommended that no further investigation (action) be conducted under CERCLA for Area B- 20 North. In February 2008, a DD was signed selecting no remedial action is necessary to ensure protection of human health and the environment. The MDE provided a letter supporting the selected remedy on 28 March 2008 (Gortva, 2010a).

#### *4.17.1.5 Area B-1 Landfill (FTD 48)*

Area B-1 was reportedly a landfill that operated sometime between 1948 until approximately the mid-1970s. Investigations were previously performed in order to complete a RI of Area B as a whole; however, examination of the data collected and historical information indicates that a RI was not required for Area B-1. Areas of buried waste material could not be located using geophysical equipment, and no waste material was encountered in soil borings in the B-1 area. In addition to the Area B-1 geophysical survey, areas located south of Area B-1 were surveyed using geophysical techniques. No buried materials were detected in these areas either. Based on discussions with the Army, USEPA, MDE, USACE, and the USACHPPM, it has been agreed that no disposal activity has occurred at Area B-1. It was agreed that there was no CERCLA release and closure of Area B-1 was reasonable with no action. A site closeout document was signed by the partnering members in October 2004. The MDE signed a letter of concurrence in January 2005 (Gortva, 2010a).

#### *4.17.1.6 Area B-11 Landfill (FTD 49)*

Area B-11 is a 5.2 acre section of a larger 19.6 acre landfill complex including sites Area B-6 (FTD 69), Area B-8 (FTD 70), and Area B-10 (FTD 71). Area B-11 is the westernmost disposal area on the southwest side of Area B. It is composed of a variety of disposal sites created from the early 1950s through approximately 1972. The individual disposal sites in unlined trenches or pits include metals, wood, general waste from laboratory modifications and building demolition, refuse from housing and animal farm operations, acids and excess laboratory chemicals, incinerated medical waste, waste herbicides and insecticides, phosgene, a sludge pit, and radiological materials (including radioactive carbon, sulfur, and phosphorus compounds). Area B-11 received wastes from Fort Detrick, U.S. Bureau of Standards, and Walter Reed Army Medical Center.

In 1992, trichloroethene (TCE) contamination was discovered off-post in residential wells above maximum contaminant levels (MCLs). Data from a RI indicated that Area B-11 was the likely source of the groundwater contamination. There is currently limited residential use of this groundwater as potentially impacted residences were connected to Fort Detrick or the City of Frederick potable water supplies or offered bottled water.

Wastes buried in Area B-11 are believed to represent a primary source of TCE and perchloroethylene (PCE) contamination in Area B groundwater and surface water. In 1968, eight 55-gallon drums of TCE were reportedly disposed by Fort Detrick. If the drums were disposed in

Area B, the most likely place of disposal would have been the Pit 11 Area (U.S. Army Environmental Hygiene Agency [USAEHA], 1992). A DD on 14 July 2000 authorized Fort Detrick to begin work on a hot spot interim removal action. In 2001, after delineating the size of the pits, the scope of work changed drastically. The total volume of material to be excavated increased from 546 cubic yards to 2,768 cubic yards. During the excavation of chemical wastes, vials containing live pathogenic bacteria were also recovered. These vials were buried during the biological warfare program phase-out. The discovery of live pathogens in medical wastes at Area B-11 caused a temporary suspension of all intrusive work at the disposal area until additional safety measures and testing procedures were in place. In the course of excavation operations, approximately 59 intact cylinders and 35 perforated cylinders of unknown contents were recovered in various states of deterioration. All 94 cylinders were processed without incident; none of the cylinders were found to contain compressed gasses or hazardous waste materials. All excavation wastes and materials were characterized and disposed of properly. Soil samples from the bottom of the pit excavations contained TCE, PCE, and polychlorinated biphenyls (PCBs). The excavated areas were backfilled with clean soil, and the entire area was covered with clean soil and seeded. The Interim Removal Action was completed in May 2004. Because of the potential of finding live biological materials in other disposal areas, a prohibition of future intrusive activities in other Area B waste disposal areas was instituted due to the complex safety requirements and associated costs.

In April 2008, a RI/ Feasibility Study (FS) for the site was finalized. The RI focused only on the waste and soil. Groundwater is being addressed in the site Area B Groundwater (FTD 72). In accordance with USEPA presumptive remedy guidance, no quantitative estimates of potential risk were generated. However, potential exposure pathways were evaluated and chemicals detected at concentrations exceeding screening levels were identified as chemicals of potential concern (COPCs). Ecological contaminants of potential ecological concerns (COPECs) were identified and based on the characteristics of the proposed capping remedy; the results of the streamlined Ecological Risk Assessment (ERA) were not expected to adversely influence the selection of the preferred alternative. In addition, the preferred remedy was protective of the environment because all ecological exposure pathways would be interrupted by the implementation of the preferred remedy. Other than the B-11 pits that underwent a removal action, no "hot spots" were identified and no evidence of gross contamination was evident in any other trench. Comments on the Proposed Plan submitted by MDE, USEPA, and the public were addressed. In March 2009, a DD was signed selecting the USEPA presumptive remedy of a Landfill Cap with Land Use Controls. The capping remedy also met the State of Maryland regulations for industrial waste landfill closure defined by COMAR 26.04.07.21H. MDE provided a letter recommending finalization of the DD on 23 April 2009. The substantive portion of the capping remedy was completed in January 2010. Seeding and stabilization of the cover soil was completed in June 2010 (Gortva, 2010a).

#### *4.17.1.7 Area B-2 Landfill (FTD 50)*

This 1-acre landfill is located in the north-central portion of Area B. It operated between 1948 and the mid-1970s, receiving unknown quantities of metal, wood, and general waste from building demolition and laboratory remodeling. The material was reportedly decontaminated prior to disposal. In 1995, the Army conducted a RI of Area B-2 and found nine hazardous substances at elevated concentrations. In October 2006, the RI/FS for the site was finalized. The RI focused only on the waste and soil. Characterization of the waste materials was performed, although complete characterization was difficult due to the heterogeneous nature of landfill material. For this reason, and in accordance with USEPA presumptive remedy guidance,

no quantitative estimates of potential risk were generated. However, potential exposure pathways were evaluated and chemicals detected at concentrations exceeding human health risk-based criteria were identified as COPCs. Ecological COPECs were also identified and no rare, threatened, or endangered species were known to occur at the site. No “hot spots” were identified and no evidence of gross contamination was evident. There was no evidence that contaminants from Area B-2 waste have significantly migrated to groundwater. In December 2007, a DD was signed selecting the USEPA presumptive remedy of a Landfill Cap with Land Use Controls. The capping remedy also met the State of Maryland regulations for industrial waste landfill closure defined by COMAR 26.04.07.21H. MDE provided a letter supporting the selected remedy on 26 March 2008. The substantive portion of the capping remedy was completed in January 2010. Seeding and stabilization of the cover soil was completed in June 2010 (Gortva, 2010a).

#### *4.17.1.8 Area B-3 Inactive Landfill (FTD 51)*

Area B-3 is located in the north central portion of Area B. Area B-3 consists of the operating landfill (Area B-3 Active) and a group of inactive disposal areas known as Area B-3 East and West, collectively known as Area B-3 Inactive. B-3 West is immediately adjacent to the operating landfill, with its northern border defined by the southern edge of the active landfill liner. This area operated as the sanitary landfill for Fort Detrick from the 1970s through 1990 and received various types of waste. When the current, active landfill liner was installed in 1990, it effectively capped a portion of the older landfill, leaving a portion of B-3 West un-capped. Area B-3 East is the older disposal area, located on the north side of a grassy slope near the active landfill gate. B-3 East is physically separated from B-3 West and the active landfill by an access road and fence. This site is believed to have been in operation during the late 1950s or early 1960s. The disposal area received wastes that reportedly included decontaminated laboratory remodeling and building demolition material, herbicide and insecticide waste, decontaminated drums, metal, and general debris. A portion of the area may have also received autoclaved animal carcasses. Intrusive investigations in the landfill will be minimized due to the discovery of vials containing preserved pathogens during the B-11 interim removal action.

The RI/FS was completed for the site in August 2008. The RI focused only on the waste and soil. Characterization of the waste materials in Area B-3 East has been performed; although, complete characterization is difficult due to the heterogeneous nature of landfill material. For this reason, and in accordance with USEPA presumptive remedy guidance, no quantitative estimates of potential risk were generated. However, potential exposure pathways were evaluated and chemicals detected at concentrations exceeding screening levels were identified as COPCs. No “hot spots” were identified and no evidence of gross contamination was evident. There was no evidence that contaminants from Area B-3 Inactive have significantly migrated to groundwater. Comments on the Proposed Plan submitted by MDE, USEPA, and the public were addressed. In March 2009, a DD was signed selecting the USEPA presumptive remedy of a Landfill Cap with Land Use Controls. The capping remedy also meets the State of Maryland regulations for industrial waste landfill closure defined by COMAR 26.04.07.21H. MDE provided a letter recommending finalization of the DD on April 23, 2009. The substantive portion of the capping remedy was completed in January 2010. Seeding and stabilization of the cover soil was completed in June 2010 (Gortva, 2010a).

#### *4.17.1.9 Area B-6 Landfill (FTD 69)*

This 3.7-acre landfill is currently undeveloped grassland located in the southwest corner of Area B. From 1948 to 1960, this area received metal, wood, general debris from laboratory remodeling and building demolition, possibly including decontaminated (sterilized) materials from Fort Detrick laboratories dismantled in the early 1950s and autoclaved carcasses of animals ranging from mice to horses. These animals had been used in special operations with live biological agents and were reportedly autoclaved prior to leaving the laboratory. Investigations found metals above background concentrations, VOCs, explosives, and Aroclors 1254 and 1260 in soil samples. In April 2008, the RI/FS for the site was finalized. The RI focused only on the waste and soil. COPCs and their associated maximum concentrations were: arsenic (17 mg/kg), chromium (80.57 mg/kg), iron (88,000 mg/kg), vanadium (260 mg/kg), 2-methylnaphthalene (10,000 microgram/kilogram [ $\mu\text{g}/\text{kg}$ ]), 3,3'-dichlorobenzidine (41  $\mu\text{g}/\text{kg}$ ), benzo(a)pyrene (10,000  $\mu\text{g}/\text{kg}$ ), chloroform (12  $\mu\text{g}/\text{kg}$ ), naphthalene (30,000  $\mu\text{g}/\text{kg}$ ), PCE (17  $\mu\text{g}/\text{kg}$ ), and TCE (500  $\mu\text{g}/\text{kg}$ ) in soil. No COPCs were identified for surface water or sediment. Although analytical sampling of soil identified COPCs above screening levels, there were no indications of hot spots where gross contamination was evident. In accordance with USEPA presumptive remedy guidance, no quantitative estimates of potential risk were generated. However, potential exposure pathways were evaluated and chemicals detected at concentrations exceeding screening levels were identified as COPCs. Ecological COPECs were identified and based on the characteristics of the proposed capping remedy; the results of the streamlined ERA are not expected to adversely influence the selection of the preferred remedy. In addition, the preferred alternative was protective of the environment because all ecological exposure pathways will be interrupted by the implementation of the preferred remedy. Comments on the Proposed Plan submitted by MDE, USEPA, and the public were addressed. In March 2009, a DD was signed selecting the USEPA presumptive remedy of a Landfill Cap with Land Use Controls. The cap also meets the State of Maryland regulations for industrial waste landfill closure defined by COMAR 26.04.07.21H. MDE provided a letter recommending finalization of the DD on 23 April 2009. The substantive portion of the capping remedy was completed in January 2010. Seeding and stabilization of the cover soil was completed in June 2010 (Gortva, 2010a).

#### *4.17.1.10 Area B-8 Landfill (FTD 70)*

This 4.8-acre landfill is currently undeveloped grassland located on the western side of Area B. From 1948 to 1972, this area received a variety of wastes including metals, wood, general debris from laboratory remodeling and building demolition, household refuse, possibly including decontaminated (sterilized) materials from Fort Detrick laboratories dismantled in the early 1950s. Area B-8 also received 150 tons of liquid waste and decontamination plant sludge. The sludge in the facility contained viable anthrax spores and was mixed with hypochlorite to kill the anthrax prior to its transportation and disposal. Area B-8 also reportedly received radioactive carbon, sulfur, and phosphorus compounds. The investigation found metals above background concentrations and VOCs in soil samples. In April 2008, the RI/FS for the site was finalized. The RI focused only on the waste and soil. Although analytical sampling of soil identified COPCs above screening levels, there were no indications of hot spots where gross contamination was evident. COPCs and their associated maximum concentrations were: arsenic (22 mg/kg), chromium (46.9 mg/kg), iron (98,000 mg/kg), vanadium (210 mg/kg), benz(a)anthracene (2,000  $\mu\text{g}/\text{kg}$ ), alpha-benzene hexachloride (BHC) (47.9  $\mu\text{g}/\text{kg}$ ), and delta-BHC (1.15  $\mu\text{g}/\text{kg}$ ). In accordance with USEPA presumptive remedy guidance, no quantitative estimates of potential risk were generated. However, potential exposure pathways were evaluated and chemicals

detected at concentrations exceeding screening levels were identified as COPCs. Ecological COPECs were identified and based on the characteristics of the proposed capping remedy; the results of the streamlined ERA were not expected to adversely influence the selection of the preferred remedy. In addition, the preferred alternative was protective of the environment because all ecological exposure pathways will be interrupted by the implementation of the preferred remedy.

In January 1998, the RI of Area B found in trenches north of Area B-8 depressions thought to represent abandoned burial trenches. The investigation found metals above background concentrations and VOCs in soil samples. The Trenches North of Area B-8 were not annotated on historical drawings and therefore disposal activities at these locations are unknown. Historical aerial photographs suggest that the trenches were created around 1958. Based on field observations, geophysical data and visual subsurface observations, it is likely that the three elongated depressions north of Area B-8 represent trenches that were used to bury animal bedding material. In April 2008, the RI/FS for the site was finalized. The RI focused only on the waste and soil. Although analytical sampling of soil identified COPCs above screening levels, there were no indications of hot spots where gross contamination was evident. COPCs and their associated maximum concentrations were: arsenic (45.1 mg/kg), chromium (70.1 mg/kg), iron (100,000 mg/kg), thallium (9.02 mg/kg), and chloroform (5.4 µg/kg). In accordance with USEPA presumptive remedy guidance, no quantitative estimates of potential risk were generated. However, potential exposure pathways were evaluated and chemicals detected at concentrations exceeding screening levels were identified as COPCs. Ecological COPECs were identified and based on the characteristics of the proposed capping remedy; the results of the streamlined ERA were not expected to adversely influence the selection of the preferred alternative. In addition, the preferred remedy was protective of the environment because all ecological exposure pathways will be interrupted by the implementation of the preferred remedy.

Area B-18 represents a former disposal area located in the central western portion of Area B northeast of the trenches North of B-8 and northwest of Area B-20 South. The exact location was not accurately documented. Area B-18 was a landfill that received all types of waste and operated until 1950. Historical documents mention no other description of the types of waste that were disposed in Area B-18. An investigation in 1995 was conducted by collecting soil samples from five soil borings located in an area of apparently disturbed soils observed in a 1963 aerial photograph that was not attributed to another environmental site. No waste material was encountered in any of the borings. Analytical results from the soil samples indicated that only one volatile organic compound (acetone) and six SVOCs were detected at concentrations well below residential screening levels. One pesticide (dieldrin) was detected at an estimated concentration below the certified reporting limit. PCBs and herbicides were not detected. Metals detected above alluvial soil background (USACE, 2004) and current residential screening levels included: aluminum, iron, thallium, and vanadium. These metals each only exceeded screening levels in two samples. Manganese was detected above alluvial soil background (USACE, 2004) and current industrial screening levels in one soil sample. A small group of trees near the investigation site for Area B-18 was determined to be the true location of Area B-18. The site encompasses approximately 0.4 acres. This area contained several sinkholes and a disappearing stream. Surface debris and subsurface burial was confirmed at the site. In April 2008, the RI/FS for the site was finalized. The RI focused only on the waste and soil. The preferred remedy of capping was protective of the Human Health and environment because all exposure pathways will be interrupted by the implementation of the preferred remedy.

Comments on the Proposed Plan for Area B-8, Trenches North of B-8 and Area B-18 submitted by MDE, USEPA, and the public were addressed. In March 2009, a DD was signed selecting the USEPA presumptive remedy of a Landfill Caps with Land Use Controls. The capping remedy also meets the State of Maryland regulations for industrial waste landfill closure defined by COMAR 26.04.07.21H. MDE provided a letter recommending finalization of the DD on 23 April 2009. The substantive portion of the capping remedy was completed in January 2010. Seeding and stabilization of the cover soil was completed in June 2010 (Gortva, 2010a).

#### *4.17.1.11 Area B-10 and B-Grove Landfills (FTD 71)*

This 0.1 acre landfill site is currently undeveloped grassland and forested land in the southwestern portion of Area B. The tree-covered area making up the B-Grove portion of this site was also reported to be a disposal area for unregulated household trash and miscellaneous debris, such as metal containers and laboratory glassware. Waste burial activities at Area B-10 were reportedly conducted from 1965 to 1970, and included refuse, primarily bedding from normal animal farm operations. Area B-10 may have also received animal carcasses and special operations materials. Animal burial reportedly occurred when a laboratory incinerator was overloaded or down for repairs. The carcasses were reportedly sterilized by autoclave prior to burial. In April 2008, the RI/FS for the site was finalized. The RI focused only on the waste and soil. Although analytical sampling of soil identified COPCs above screening levels, there were no indications of hot spots where gross contamination was evident. COPCs and their associated maximum concentrations were: arsenic (21 mg/kg), iron (84,000 mg/kg), manganese (4,700 mg/kg), and vanadium (240 mg/kg). In accordance with USEPA presumptive remedy guidance, no quantitative estimates of potential risk were generated. However, potential exposure pathways were evaluated and chemicals detected at concentrations exceeding screening levels were identified as COPCs. Ecological COPECs were identified and based on the characteristics of the proposed capping remedy; the results of the streamlined ERA are not expected to adversely influence the selection of the preferred alternative. In addition, the preferred alternative was protective of the environment because all ecological exposure pathways will be interrupted by the implementation of the preferred alternative. Comments on the Proposed Plan submitted by MDE, USEPA, and the public were addressed. In March 2009, a DD was signed selecting the USEPA presumptive remedy of a Landfill Cap with Land Use Controls. The capping remedy also meets the State of Maryland regulations for industrial waste landfill closure defined by COMAR 26.04.07.21H. MDE provided a letter recommending finalization of the DD on 23 April 2009. The substantive portion of the capping remedy was completed in January 2010. Seeding and stabilization of the cover soil was completed in June 2010 (Gortva, 2010a).

#### *4.17.1.12 Area B Groundwater*

All groundwater in Area B was included in this site. In February 1992, TCE concentrations above the maximum contaminant level (MCL) and elevated levels of trichlorofluoromethane were detected in an Area B monitoring well being sampled as part of the Fort Detrick State Landfill permit requirements. Fort Detrick met with the USAEHA in March 1992 to discuss the elevated levels. Based on this meeting, USAEHA began a study of the active landfill and Area B that included installation and sampling of monitoring wells. The report was published in February 1993. In October 1992, MDE sampled 21 off-post residential wells adjacent to Area B. TCE concentrations above the MCL levels were identified in four of the tested wells. Following the discovery of TCE in domestic wells, the Army provided bottled water or connected potentially affected residences to public water. Approximately 3,500 tons of contaminated soil

and waste were removed during the project. Subsequently, groundwater contamination was reduced at Area B, and perchloroethylene (PCE) concentrations were reduced by 99.8 percent in several onsite wells. In order to deal with the remaining minor sources of contamination, Fort Detrick decided on a capping operation at the Area B disposal sites (previously discussed) to prevent the spread of contaminants into the groundwater. Installation of the landfill caps are now complete (Gortva, 2010).

The exact dimensions of the plume are unknown due in part to the Karst geology. In February 2008, The Army met with MDE and USEPA to present a Groundwater Conceptual Site Model. The model included 16 years of groundwater data and numerous geological and geophysical studies. Several key data gaps were identified. From February 2008 to June 2010, the Army has been partnering with the MDE and USEPA to form consensus on data gaps and additional fieldwork required to complete the model. The work plan was finalized in June 2010. Implementation of the work plan began in December 2010. At the end of the work plan data collection effort, the results will be evaluated to determine if additional data collection is necessary in a "Phase II" work plan. Once all necessary data are collected, the RI/FS will be completed. Selection of an appropriate remedy(ies) could occur within 1 year from the RI/FS completion.

In April 2009, the Area B groundwater site was placed on the National Priorities List. The Army and USEPA signed a Federal Facilities Agreement on 17 December 2010 to ensure that the environmental impacts associated with past-and present activities at the site are thoroughly investigated and appropriate remedial action taken as necessary to protect the public health and the environment. A public comment period for the FFA will last for 30 days following public notification. The agreement establishes a procedural framework and schedule for developing, implementing and monitoring appropriate response actions in accordance with CERCLA/SARA, the NCP, Superfund guidance and policy, RCRA, RCRA guidance and policy and facilitates cooperation, exchange of information and participation.

#### *4.17.1.13 Public Concerns Related to Post Activities on Area B*

Citizens of the City of Frederick have voiced concerns that groundwater contamination resulting from past activities on Area B has caused cancer among its residents. Additionally, citizens have voiced concerns over the possibility that past testing on Area B with a herbicide that was contaminated with dioxin during the manufacturing process is also causing cancer among residents. Fort Detrick is currently addressing all community concerns as described below.

In the fall of 2010, the Maryland Department of Health and Mental Hygiene provided a preliminary evaluation that a one-mile radius around the Army post and Area B currently has the rate of cancer expected for that area. The preliminary results were based on a complex process that the State of Maryland uses in determining how many cancer cases the state expects in any given area. Preliminary findings indicate that the area around Fort Detrick has as many cancer diagnoses as expected in Frederick County between 2000 and 2007 (1,059 cases of cancer) (Frederick News-Post, 2010a; 2010c). The area had slightly more cases than expected based on cancer rates for the State of Maryland, but the cancer rate of Frederick County is higher than the state rate (Frederick News-Post, 2010a). Further data analyses will be undertaken before any conclusions are reached. The state will examine the cancer registry data to determine if residents have been diagnosed with certain cancers at an unusual age or if there was any geographic pattern to the diagnoses. Results from this study are expected in January 2011 (Frederick News-Post, 2010b).

Since June 2010, Fort Detrick officials have tested 31 residential wells surrounding Areas A and B. No detectable levels of harmful chemicals were discovered in any of the wells (Barnard, 2010). Furthermore, Fort Detrick officials have agreed to retest wells of nearby residents and locate old test results upon request (Frederick News-Post, 2010b).

The USACE is currently conducting an archival study for historic records for Fort Detrick past activities to determine if there may have been releases to the environment at Fort Detrick that have not already been addressed as part of the ongoing restoration program. This includes the herbicide research activities that occurred in the 1940s, 1950s, and 1960s. This report is due to be released in the fall of 2011. The Public Health Command is also conducting tests for herbicides, pesticides, dioxins, and furans on the Installation. This report is scheduled to be finalized and released in early 2011 (Gortva, 2010b).

#### 4.17.2 LAND USE CONSTRAINTS

As discussed above in Section 4.17.1, the environmental concerns for Areas B limit the type of development and land uses available for some parcels (see Figure 4-3). Additionally, water bodies and wetlands either prohibit development or restrict future development to compatible land uses. Wetlands are afforded special protection under 32 CFR 650.

Similarly, historic properties and archeological sites are provided special consideration under AR 200-2, *Environmental Affects of Army Actions*. Coordination with the SHPO would be required prior to the development of these areas or areas adjacent to these historic and archeological parcels. No properties on Area B are listed or are eligible to be listed on the NRHP.

#### 4.17.3 ENVIRONMENTAL MANAGEMENT SYSTEM

The Fort Detrick Environmental Management System (EMS) is based on a 'Plan-Do-Check-Act' concept. The Fort Detrick EMS assists in minimizing the Installation environmental footprint by setting objectives and targets beyond compliance requirements. The Fort Detrick EMS is fully integrated with the Fort Detrick Sustainable Strategic Planning program to support all Installation missions and focus resources on minimizing its environmental impacts. Fort Detrick adheres to Army policy requiring its EMS to be conformant with the *International Organization for Standardization (ISO) 14001:2004, Environmental management systems – Requirements with guidance for use.* The most recent EPAS review at the Installation concluded that no major non-conformances were identified during the EPAS EMS audit and that it conformed with ISO 14001. All minor non-conformances were addressed and a corrective action plan was approved (DA, 2009).

The Fort Detrick EMS includes procedures and policies used to identify, evaluate, and manage environmental impacts of ongoing activities and services. It is designed to minimize Fort Detrick environmental liabilities through continual planning and monitoring of environmental performance and to take corrective action to avoid or reduce negative environmental impacts when necessary (CEQ, 2007). The continual improvement of the Fort Detrick EMS is important to the Installation-wide integration of environmental requirements into daily operations. The Fort Detrick EMS is used as the primary management approach for addressing all environmental aspects of internal operations and activities. All the USAG and mission partner activities that

occur within Areas A, B, and C, as well as the Forest Glen Annex, are included within the scope of the Fort Detrick EMS, with the exception of the National Cancer Institute (USAG, 2008).

The Fort Detrick EMS is guided by the Fort Detrick Environmental Policy, which is responsible for the Installation environmental compliance, pollution prevention, and continual improvement (USAG, 2008). At a minimum, all individuals working at Fort Detrick are required to have knowledge of the EMS. An EMS Management Representative is responsible for maintaining the Fort Detrick EMS under the guidance of the EQCC and the commanders and directors (i.e., USAG Commander). The EMS Steering Committee (formerly known as the EMS Team) serves as experts and representatives from Garrison and mission partners. The EMS Steering Committee supports the EMS by participating in EMS procedure and program development and by advising on EMS efforts. The EMS Program is fully integrated with the USAG Fort Detrick Sustainable Strategic Planning (SuSP) program as necessary. Objectives and targets are regularly reviewed and revised as necessary to reflect desired improvements in environmental performance. SuSP Team (SuSPT) maintains oversight of the SuSP process including the SuSP Customer Focused Teams (CFTs) of Workforce, Business Process, Infrastructure and Utilities, Customer Services, and Analysis and Assessment. The SuSP is the method the USAG Fort Detrick uses to plan strategic, operational, and tactical objectives. SuSPT membership consists of team leaders from the CFTs, representatives from all USAG Directorates, including the Installation Safety Management Office, and Environmental Management Office. These reviews take place at EMST meetings, Environmental Quality Control Committee (EQCC) meetings, and at SuSPT and SuSP CFT meetings.

The Fort Detrick EMS may be assessed both internally and externally. EMS Internal Assessments are conducted by Fort Detrick EMS Internal Assessors. EMS External Assessments are performed through DA EPAS Program.

#### *4.17.3.1 Current Fort Detrick EMS Environmental Objectives*

Environmental objectives are overall environmental goals that Fort Detrick sets for itself to minimize its environmental impacts. Environmental targets are more detailed performance requirements, applicable to Fort Detrick arising from its environmental objectives. Environmental objectives and targets take into consideration the Fort Detrick Environmental Policy, significant environmental aspects, technological, financial, and operational options and the views of interested parties (e.g., the Frederick community and regulatory agencies). The EQCC reviews and maintains approval authority of environmental objectives. EMS objectives are aligned with SuSP initiatives. These initiatives are coordinated by respective SuSP Customer Focused Teams (CFTs) for achievement and reported to the USAG Fort Detrick Board of Directors (BOD) and Installation Planning Board (IPB).

The six environmental aspects aim to reduce air emissions, improve water quality, reduce energy consumption, increase resource conservation and recovery, reduce waste generation and increase recycling, and reduce/clean-up spills, leaks or releases to soil or water. The environmental objectives are divided into a number of environmental targets, which are detailed performance requirements of EOs 13423 and 13514. Section 2.6 lists the requirements of EOs 13423 and 13514 as they relate to the following significant environmental aspects of Fort Detrick:

**Resource Consumption:** This environmental aspect includes the acquisition and use of all goods and materials used in association with installation operations.

**Energy Consumption:** This environmental aspect includes electricity (renewable/nonrenewable), and fuels (petroleum-based fossil fuel and alternative fuel).

**Air Emissions:** This environmental aspect includes Stationary Sources (boilers, incinerators, generators, chlorine gas storage, petroleum storage) and Mobile Sources (vehicle emissions [government-owned and POVs], and equipment).

**Water Quality:** This environmental aspect includes all elements of sanitary wastewater management, SWM, and drinking water quality.

**Waste Generation:** This environmental aspect includes all elements of solid waste, recycling, and hazardous waste management.

**Spills, Leaks or Releases to Soil or Water:** This environmental aspect includes all spills, leaks, or releases to soil or water of sewage, hazardous material, hazardous waste, or oil-based products.

#### 4.17.3.2 NEPA and EMS

Fort Detrick NEPA processes and the Fort Detrick EMS are designed to be used in conjunction with each other to improve environmental performance of Fort Detrick. In 2007, a guide entitled *Aligning National Environmental Policy Act Processes with Environmental Management Systems* was completed to provide information on how NEPA and EMS can be aligned. According to this guide, some elements of the Fort Detrick NEPA process could be included in the Fort Detrick EMS. Once NEPA forecasts the impacts of proposed actions during the proposal design and decision phase, the Fort Detrick EMS monitors and tracks these impact predictions and mitigation information in day-to-day operations. This tracking and monitoring leads to Fort Detrick EMS training, internal auditing, and the identification of corrective actions. As with the NEPA process, the Fort Detrick EMS focuses on the involvement of the public by providing information about current proposals (CEQ, 2007).

The Fort Detrick NEPA program manager works with the EMS Program Manager to ensure the integration of the NEPA program with the Fort Detrick EMS. EMS records, as well as NEPA documentation, are centrally archived within the Data Archival Retrieval Technology database so that records pertaining to either program may be accessed. In addition, the EMO Environmental Tracking database is used by the EMS to manage corrective and preventive actions. This database includes NEPA mitigation tracking, which tracks the minimization of environmental impacts of projects that have already completed the NEPA process. As with the Fort Detrick EMS, the Fort Detrick NEPA program is also subject to internal and external compliance evaluations (USAG, 2008).

#### 4.17.4 ENVIRONMENTAL PERFORMANCE ASSESSMENT REVIEW

The EPAS program was developed and implemented in 1991-92 in response to the recommendations made by the USEPA in 1986. When the program was known as Environmental Compliance Assessment System, it assessed active Army installations for

compliance with Federal, State, and DoD regulations. As per EO 13148, the EPAS program has since expanded and now includes environmental management performance auditing. The U.S. Army Environmental Command (USAEC) conducts risk-based scheduling to assess installations with greater environmental risk more frequently, while maintaining an assessment standard for installations with less environmental risk (USAEC, 2009).

The EPAS program assists all Army commanders in attaining, sustaining, and monitoring compliance with Federal, State, and local environmental laws and regulations, as well as DoD and Army compliance and performance requirements. EPAS external and internal multi-media assessments: identify non-compliance with environmental regulations and non-conformance with the ISO 14001 environmental performance standard used by Army EMS; provide suggestions for both immediate and long term corrective actions; and indicate resources needed for implementation (USAEC, 2009).

The most recent EPAS review was conducted at Fort Detrick on 5-9 January 2009. The USAEC EPAS review team determined that no major non-conformances were identified during the EPAS EMS audit (DA, 2009). The previous EPAS review conducted at Fort Detrick from 31 October to 9 November 2005 revealed three major concerns of non-conformance (DA, 2005). All minor non-conformances with the current EPAS review were addressed and a corrective action plan was approved. Based on the EPAS review, Fort Detrick formally declared that their EMS is fully implemented in accordance with EO 13423 and Army policy. The next EPAS review is scheduled for FY 2012, followed by subsequent reviews every three years (DA, 2009).

#### *4.17.4.1 Restoration Advisory Board*

The Fort Detrick Restoration Advisory Board (RAB) was created in 1993 to communicate information to the general public regarding the environmental investigations and cleanup activities being conducted at Fort Detrick. The RAB is composed of members of the community and governmental representatives of DA, USEPA, and MDE. The RAB performs the following functions (RAB, 2006):

- Conducts regular meetings that are open to the public and facilitates the exchange of information between parties;
- Maintains a mailing list of interested parties and disseminates information about cleanup activities at the Installation;
- Reviews and discusses documents related to cleanup activities; and
- Assists and participates in the cleanup decision-making process.

THIS PAGE INTENTIONALLY LEFT BLANK

## 5.0 ENVIRONMENTAL CONSEQUENCES

### 5.1 INTRODUCTION

This section will identify and analyze potential environmental impacts that may result from implementation of the Proposed Action (Implementation of the Proposed Projects for Army-controlled land at Areas B of Fort Detrick in Frederick County, Maryland) or the alternative (Do Not Implement the Proposed Projects for Army-controlled land at Area B of Fort Detrick in Frederick County, Maryland, No Action). Such an analysis entails detailing the potential impacts associated with the implementation of the Proposed Action or the alternative that are reasonably foreseeable, but may not necessarily occur. The term “consequence” refers to the results of an event or events without consideration of probability. Where possible and appropriate, potential events will be characterized both in terms of their potential consequence and the probability that they will occur. Consequences of the Proposed Action and the alternative on the public, on the workforce, and the environment will be considered. Direct, indirect, and cumulative effects also will be considered.

Section 5.2 discusses potential impacts to the affected environment associated with the implementation of the Proposed Action and the mitigation measures that would be applied. Section 5.3 and Section 5.4 present a comparison of the potential environmental impacts associated with the Proposed Action and the No Action Alternative.

### 5.2 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

#### 5.2.1 LAND USE

Land use impacts related to construction activities could potentially occur from excessive erosion during this phase of the Proposed Action. These impacts would be temporary, site-specific, and minor. Application of BMPs during construction, as discussed in Section 2.3.3, will prevent excessive erosion from the designated project sites. Runoff from the construction sites may potentially impact those areas of the Installation due to erosion or sedimentation. During construction, compliance with erosion and sediment control and SWM standards as determined by the MDE will be required for most of the facilities (see Section 2.3.3).

During the operational phase of the Proposed Action, land use impacts would be minor and site-specific. Implementation of the new construction projects comprising the Proposed Action would increase the area covered by impervious surfaces and increase the total volume of surface runoff in the immediate vicinity of the proposed new construction sites. The USEPA has prepared the *Final 2010 Effluent Guidelines* for surface runoff from new construction sites. Runoff resulting from the construction activities for the Proposed Projects will be sampled when necessary and adjustments to erosion, sediment, and pollution prevention will be made to comply with numeric limitations for effluent discharge under the Final 2010 Effluent Guidelines. During operations, compliance with SWM standards as determined by the MDE will be required for most of the facilities (see Section 2.3.3). In addition, FD REG 420-74, *Facilities Engineering - Storm Water Management*, requires that SWM practices and control measures must be implemented to mitigate any significant adverse impacts.

Implementation of Alternative II (No Action) would eliminate the minor impacts to land use associated with the Proposed Action.

## 5.2.2 CLIMATE

Implementation of either action alternative would have a negligible impact to climate. Potential impacts to air quality resulting from implementation of the Proposed Action are discussed in Section 5.2.8.

## 5.2.3 GEOLOGY

Geologic impacts of implementation of the Proposed Action will be negligible to minor and mitigable. Sinkholes, fracture traces, and lineaments must be considered for any development project at Fort Detrick because of underlying limestone formations, as noted in Section 4.3. In areas prone to potential sinkhole formation, uncontrolled development could result in significant consequences. Surface loading, surface drainage and subsurface flows, and soil conditions are among the considerations that should be addressed. The presence of sinkholes or fracture traces may also impact water resources by providing pathways for potential contamination of groundwater. During the construction of the Proposed Projects, the minor potential for sinkhole formation will be mitigated by adherence to good structural design practices. During the operational phase, the potential for groundwater contamination will be mitigated by engineering controls and adherence to SOPs.

Significant damage to the Proposed Projects resulting from earthquakes will be very unlikely. As noted in Section 4.3, Fort Detrick is located within an area that is subject to minor damage due to distant earthquakes.

Implementation of Alternative II (No Action) would eliminate the negligible to minor impacts on geology associated with the Proposed Action.

## 5.2.4 SOILS

The impact on soil resources during the construction phase of the Proposed Action will be minor. Some soils will be disturbed during excavation and installation of utility lines and re-grading of roads. As discussed in Section 2.3.3, application of BMPs during construction will prevent excessive erosion from wind and precipitation events. LID sustainability features for SWM will be incorporated into the design of the Proposed Projects to the maximum practical extent and will help mitigate the impacts of stormwater runoff.

During the operational phase, the impact on soil resources will be negligible. The Proposed Action does not involve the handling of toxic or hazardous materials or other activities that would impact soil resources.

Implementation of Alternative II (No Action) would eliminate the minor impacts to soils associated with the Proposed Action.

## 5.2.5 WATER RESOURCES

No significant adverse impacts to water resources will result from the construction and operation of the proposed facilities at the proposed sites, provided BMPs are utilized. Potential impacts to surface water could result during the construction phase of the Proposed Action if excessive erosion from the site entered Carroll Creek or the Monocacy River. Appropriate use of BMPs

during the construction phase will mitigate this potential impact. As discussed in Section 2.3.3, Section 4.5.1, Section 4.5.3 and Section 5.2.1, potential impacts to surface water associated with excessive runoff from the sites during operation of the gravel parking area and training campus will be mitigated by adherence to standards for SWM as determined by the MDE.

During the construction phases of the Proposed Action, it is unlikely that a water supply aquifer would be penetrated during excavation for building foundations or for utility connections of the Proposed Projects. Potential impacts to aquifers would be mitigated by good construction practices determined by construction contract terms and contract management. During the operational phase, no negative impacts to groundwater are anticipated.

SWM practices and control measures will be implemented to mitigate potential adverse impacts resulting from the increased stormwater runoff during both the construction and operation phases of the Proposed Projects. Additionally, all new construction projects will adhere to the USEPA *Final 2010 Effluent Guidelines*. All aspects of the SWM systems, including the drainage channels, culverts, and stormwater retention ponds, will be designed and consistent with the *2000 Maryland Stormwater Design Manual Volumes I and II* and constructed in accordance with an MDE-approved project plan incorporating BMPs. To the maximum practical extent, features of LID sustainability for SWM will be incorporated into the design of the Proposed Projects (see Section 2.3.3).

Under the No Action Alternative, the Proposed Projects would not be constructed, and potential hydrologic impacts would not occur.

## 5.2.6 WETLANDS AND FLOODPLAINS

Federal activities within floodplains and wetlands are restricted under EO 11988, 33 CFR 1977, EO 11990, and AR 415-15. The INRMP for Fort Detrick serves as a guide for the management and protection of wetlands at Fort Detrick to be in accordance with Federal laws and regulations (USAG, 2007c).

The proposed road improvement for the Training Campus is the closest project to wetlands. Wetlands are adjacent to the existing road that may need to be improved due to implementation of the Proposed Action. The construction and operational phases of the Proposed Action would result in minor impacts to wetlands mitigated by adherence to BMPs and compliance with sediment control requirements. The ongoing effort of Fort Detrick to increase the size and quality of wetlands on the Installation is outlined in the INRMP. According to the INRMP, riparian buffer zones between wetland areas, streams, ponds, and adjacent land uses will be provided and maintained for wildlife habitat and erosion control. To minimize sediment loading, land use in the vicinity of these wetland habitats will remain compatible with their protection. The objectives are maintaining no net loss of existing wetlands and enhancing wetlands size, function and health. The propose gravity flow sewer line option (if chosen) would go through the 100 year floodplains. Minor impacts would be mitigated by adherence to BMPS.

Implementation of Alternative II (No Action) would eliminate the minor adverse impacts to wetlands associated with the Proposed Action.

## 5.2.7 PLANT AND ANIMAL ECOLOGY

Local plant and animal ecology at the proposed sites could be negatively impacted during construction of the Proposed Action through the destruction of habitat from fugitive dust, erosion, and noise. Utilization of BMPs relevant to fugitive dust, erosion control, and noise will mitigate negative impacts to the local plant and animal ecology during the construction phase of the Proposed Action.

Implementation of the Proposed Action will likely disturb the plant and animal ecology in the immediate area of the Proposed Projects. Although the Installation is not frequented by special status species, the construction and utilization of some of the Proposed Projects will discourage some species, particularly birds and deer, from the area through habitat destruction. The Proposed Projects will be constructed on grassland areas of Area B. In accordance with the State Forest Conservation Program (COMAR 08.18.04), forestation will be required for the Proposed Action (see Section 2.3.4). The total amount of land disturbed for the proposed activities is approximately 271,450 sf (6.23 acres). The total amount of land that requires afforestation is approximately 0.93 acres.

Despite the loss in grassland areas, the future addition of forest will eventually increase the diversity of wildlife that inhabits Fort Detrick.

Implementation of Alternative II (No Action) would eliminate the minor impacts to grassland ecosystems associated with the Proposed Action. However, the significant ecological benefits resulting from increased forestation associated with implementation of the Proposed Action would not occur.

## 5.2.8 AIR QUALITY

During the construction phase of the Proposed Action, local air quality of Frederick could be impacted by fugitive dust emissions, by construction vehicle emissions, and by vehicular emissions from commuting activities of the workforce and suppliers. These impacts will be temporary and minor. Adherence to BMPs will mitigate potential fugitive dust emissions during construction. The vehicular emissions during the construction and operation phases of the Proposed Action will likely be an insignificant portion of the total transportation related emissions in the Frederick area. Impacts to local air quality during operation of the Proposed Projects will be negligible. The Proposed Action does not involve large fuel-burning equipment or other pollutant emission activities that will require a NSR/PSD review in accordance with the CAA (see Section 2.3.6 and Appendix A). However, potential negligible additional amounts of GHG emissions from fossil fuels, which affect air quality and the atmosphere, may be produced due to implementation of the Proposed Action. Additional GHG emissions will be offset by adherence to requirements in EO 13423 and EISA (see Section 2.6). These mandates require Federal agencies to use less energy generated by fossil fuels in new building construction and reduce GHG emissions through the reduction of energy intensity, thus improving air quality.

Implementation of Alternative II (No Action) would eliminate the negligible impacts to air quality associated with the Proposed Action.

## 5.2.9 HISTORICAL AND CULTURAL RESOURCES

Construction and subsequent use of the facilities could impact significant historic, cultural, or archeological resources if the Proposed Action were conducted near significant sites and in a manner which altered, lessened, or disturbed these resources. No significant historic or cultural resources are located on Area B; therefore, implementation of the Proposed Action or No Action will have no impact on historical and cultural resources (see Section 4.9).

## 5.2.10 SOCIOECONOMIC ENVIRONMENT

Positive impacts to the local economy will occur during the construction phase of the Proposed Action. Local vendors and construction contractors will benefit from the work associated with construction of the Proposed Action. Minority and/or low-income communities could be economically impacted if they are excluded from the economic benefits arising from construction activities. All vendors and contractors participating in the construction phase of the Proposed Action will be required to adhere to Equal Employment Opportunity and Affirmative Action considerations as identified in 29 CFR 1608.1.

Operation of the Proposed Projects will result in no impact to the socioeconomic environment, as no additional employees will be added as a result of implementation of the Proposed Action.

Implementation of Alternative II (No Action) would eliminate the positive impacts to the local economy associated with the Proposed Action.

## 5.2.11 NOISE AND LIGHTING

Noise impacts from the implementation of the Proposed Action will be minor and mitigable. Noise from construction activities and subsequent operation of the Proposed Projects may disturb the local plant and animal ecology, as noted in Section 5.2.7. Excessive noise levels could impact the health of the workforce and/or the residents of housing facilities on Fort Detrick or in neighboring communities. The State of Maryland (COMAR 26.02.03.02 and 26.02.03.03) and the City of Frederick (Ordinance G-02-9) have established environmental noise standards that set maximum allowable noise levels for receivers located in industrial, commercial, and residential districts.

During the construction phase of the Proposed Action, operation of power machinery and other construction activities will result in a temporary increase in the noise level in the immediate vicinity of the sites. Noise impacts on the health of construction workers will be mitigated by adherence to Occupational Safety and Health Act (OSHA) standards for occupational noise exposure associated with construction (29 CFR 1926.52). Noise impacts on nearby residents will be mitigated by adherence to the regulatory limit for construction activities of 90 dBA at the boundaries of the site [COMAR 26.02.03.03 A(2)(a); Ordinance G-02-9 ].

Noise impacts from normal operations at the Proposed Projects will be temporary, localized, and negligible, and will be similar to existing activities at Area B of Fort Detrick. As noted in Section 4.11, sound levels generated by existing Fort Detrick operations were determined to be compatible with nearby residential use. The regulatory limits for noise levels for receivers in residential areas are 65 dBA during daytime hours and 55 dBA at night.

Lighting for the Proposed Projects will be for parking and security purposes; it is not expected to create any nuisance to neighbors either within or outside the Installation, and will result in negligible impacts.

Implementation of Alternative II (No Action) would eliminate the minor noise and negligible light impacts associated with the implementation of the Proposed Action.

#### 5.2.12 ODORS

Odors, such as those generated by construction vehicles, may occur during the construction phase of the Proposed Action. The impacts of such odors on the workforce or residents will be transitory, localized, and negligible to minor. The Proposed Projects, with the exception of the fire training tower associated with the training campus, are similar to existing facilities elsewhere at Fort Detrick and do not involve significant odor sources. The fire training tower, however, may cause temporary smoke odors during fire training exercises. Thus, odor impacts during the operational phase of the Proposed Action would be minor.

Implementation of Alternative II (No Action) would eliminate the minor impacts to odors associated with the Proposed Action.

#### 5.2.13 TRANSPORTATION

The potential impacts to transportation resulting from implementation of the Proposed Action will be minor and mitigable. Construction of the Proposed Projects will result in an increase to traffic on Area B and in areas adjacent to the Installation. Roadways on Area B will need to be improved and upgraded (Powell, 2010). During the construction phase, contractor personnel, inspectors, and supply deliveries will temporarily increase vehicular traffic. Projected trip increases will not exceed 100 trips based upon the maximum expected workers of 50 (Powell, 2010). These additional trips will most likely be concentrated at the morning and afternoon commuting times. These temporary impacts may be mitigated by project-specific vehicle access restrictions (e.g., limiting hours).

There will be no increases in gate traffic resulting from operation of the Proposed Action. The employment population of Fort Detrick would not change due to the Proposed Projects located on Area B, thus no impact on the existing traffic conditions on Area B and the areas adjacent to the installation would result from the operation of the Proposed Action.

The minor impacts to transportation associated with implementation of the Proposed Action would not occur with implementation of the No Action Alternative.

#### 5.2.14 ENERGY RESOURCES

Construction of the Proposed Projects will have negligible impacts on energy resources relative to energy consumption in the Frederick area. During the construction phase, the impact of diesel fuel demands for power equipment and movement of materials, and gasoline for workforce commuting, would be temporary and negligible relative to the consumption of these fuels in the Frederick area.

As stated in Section 2.4.2, operation of the Proposed Projects would result in negligible impacts to electricity and natural gas consumption on the Installation. The operational activities in many of these facilities are not energy intensive. The processes and activities associated with implementation of the Proposed Action would consume relatively similar quantities as activities currently in operation on Area B. The Proposed Projects would not consume steam or No. 6 fuel oil.

Energy management practices of the Proposed Projects will follow the energy efficiency mandates in EO 13514, EO 13423, and EISA, which require energy reduction goals of 30 percent by 2015 relative to the 2003 baseline. As a direct result of energy consumption, GHG emissions will be decreased. Federal targets for reduction of direct (Scope 1) GHG and indirect (Scope 2 and Scope 3) GHG emissions have been established at a 28 percent by 2020. In addition, Federal agencies must report a comprehensive GHG inventory annually starting FY 2010.

Implementation of Alternative II (No Action) would eliminate the negligible impacts to energy consumption in the construction and operation of the Proposed Projects.

#### 5.2.15 POLLUTION PREVENTION AND WASTE STREAM MANAGEMENT

Construction of the Proposed Projects will have a negligible impact on Fort Detrick waste management systems. The construction contractor will have responsibility for adhering to regulatory requirements for the disposal of wastewater, solid waste, hazardous waste, and construction debris outside Fort Detrick and in accordance with Federal, state, and local regulatory requirements, as noted in Section 2.3.2. The contractors will not be allowed to use Fort Detrick facilities for waste disposal. On that basis, the potential environmental impacts of waste streams during construction will be negligible. In accordance with Army policy for *Sustainable Management of Waste in Military Construction, Renovation, and Demolition Activities* (DA, 2006), the contracts will include a performance requirement for 50 percent minimum diversion of construction and demolition waste by weight from landfill disposal. The contract specifications will include submission of a contractor's construction Waste Management Plan. Construction waste will be managed in accordance with LEED guidelines. During the construction phase of the Proposed Projects, pollution prevention will be practiced through source reduction and conservation in accordance with EO 13514, EO 13423, and EISA.

As stated in Section 2.5, the operational activities in these facilities are not expected to generate greater than average waste streams. The nature of activities currently conducted on Area B of Fort Detrick will generally remain the same under the Proposed Action. As a result, implementation of the Proposed Action is not expected to result in qualitatively different waste streams than what is currently generated on the Area B.

Under the No Action Alternative, the negligible adverse impacts to waste management systems at Fort Detrick would not occur.

#### 5.2.16 HAZARDOUS MATERIAL MANAGEMENT

The impact of hazardous material management associated with implementation of the Proposed Action will be minor. During the operational phase of the Proposed Projects, the USAG oversight of hazardous material handling will ensure compliance with applicable OSHA safety

regulations and RCRA regulations for hazardous waste treatment, storage, and disposal. Operation of the Proposed Projects will involve limited use of toxic or hazardous materials (i.e., materials normally associated with administrative and recreational activities). Hazardous materials management in the Proposed Projects will include an active pollution prevention program in accordance with the USAG policies. Pollution prevention will be practiced through source reduction and conservation or by elimination of toxic materials during the operational phase of the Proposed Action, following the objectives of the Fort Detrick EMS (see Section 4.17.3).

During the construction phase, adherence to contract provisions will ensure proper management of hazardous materials. Under the No Action Alternative, the minor impacts to hazardous material management systems at Fort Detrick would not occur.

#### 5.2.17 HUMAN HEALTH AND SAFETY

The risk to the workforce, residents of Fort Detrick, and public health from the proposed activities is negligible. Human health and safety impacts may potentially occur both during construction and operation of the Proposed Action. Potential impacts to the health and safety of construction workers will be minimized by adherence to accepted work standards and OSHA regulations (29 CFR Part 1926, *Safety and Health Regulations for Construction*). Operation of the facilities will be governed by the *Army Safety Program* (Army Regulation 385-10), implementing, by reference, all applicable Federal, state, local, DoD, and DA requirements.

Under the No Action Alternative, negligible impacts to human health and safety associated with the Proposed Action would not occur.

#### 5.2.18 ENVIRONMENTAL JUSTICE

The potential impacts to Environmental Justice from the implementation of the Proposed Action will be negligible and mitigable. During the construction phase of the Proposed Action, minority and/or low-income communities could be economically impacted if they are excluded from the economic benefits arising from construction activities. Such adverse Environmental Justice impacts are mitigated by the requirement that all vendors and contractors participating in the construction and operational phases of the Proposed Action must adhere to Equal Employment Opportunity and Affirmative Action considerations as identified in 29 CFR 1608.

EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low Income Populations*, requires Federal agencies to consider whether their projects will result in disproportionate adverse impacts on minority or low-income populations. The U.S. Census considers a poverty area as one where at least 20 percent of the population lives below the poverty level, which it defines as the income level (based on family size, age of householder, and the number of children under 18 years of age) that is considered too low to meet essential living requirements, without regard to the local cost of living. As discussed in Section 4.10, the Frederick area is not considered a poverty area.

It is unlikely that implementation of the Proposed Action will have proportionately greater impact on disadvantaged (e.g., minority, low income) populations than the No Action Alternative.

### 5.2.19 PUBLIC OPINION

Public opinion towards a Proposed Action must be considered to the maximum extent practicable in accordance with NEPA and 32 CFR 651. Evaluation of public opinion includes an assessment of national and/or local perception of issues. As part of the NEPA process, public comments are being solicited and encouraged.

### 5.2.20 CUMULATIVE IMPACTS

The CEQ regulations implementing NEPA define cumulative impacts to the environment as those effects resulting from the impact of implementation of either Alternative I or Alternative II when combined with past, present, and future actions (40 CFR 1508.7). Thus, cumulative impacts are the sum of all direct and indirect impacts, both adverse and positive, that result from the incremental impacts of implementation of either Alternative I or Alternative II when added to other past, present, and reasonably foreseeable future actions regardless of source. Cumulative impacts may be accrued over time and/or in conjunction with impacts from other activities in the area (40 CFR 1508.25).

The collective increases in building construction activities, and associated environmental impacts with the overall development of Fort Detrick are detailed throughout Section 5.0 by environmental attribute area. Activities qualitatively and quantitatively similar to the Proposed Action (i.e., infrastructural construction/improvement and utilization) have occurred on the Installation for over 60 years without evidence of adverse cumulative impacts to the environment. It is unlikely that significant cumulative impacts will result from implementation of the Proposed Action. The potential cumulative impacts resulting from implementation of the Proposed Action will be minor and mitigable.

## 5.3 ENVIRONMENTAL IMPACTS OF ALTERNATIVE I

As summarized in Table 5-1 and Table 5-2, no significant environmental impacts are anticipated with implementation of the Proposed Action.

Possible negligible to minor adverse impacts associated with construction include:

- negligible impacts to climate;
- potential negligible to minor impacts to geology;
- potential minor impacts to soils;
- minor impacts to water resources;
- minor impacts to wetlands;
- negligible impacts to floodplains;
- minor impacts to plants and animals;
- minor impacts to air quality;
- no impacts to historical and cultural resources;
- positive impacts to the local socioeconomic environment (the City of Frederick);
- minor impacts from noise and lighting;
- negligible to minor impacts from odors;
- minor impacts to traffic;
- negligible impacts to energy resources;

- negligible impacts to waste streams;
- minor impacts to hazardous material management; and
- negligible impacts to human health and safety.

Possible negligible to minor adverse impacts, and positive impacts associated with operation include:

- negligible impacts to climate;
- negligible to minor impacts to geology;
- negligible impacts to soils;
- minor impacts to water resources;
- minor impacts to wetlands;
- negligible impacts to floodplains;
- positive impacts to plant and animal ecology (creation of high quality habitat through forestation);
- negligible impacts to air quality;
- no impacts to historical and cultural resources;
- no impacts to the Fort Detrick socioeconomic environment;
- negligible impacts from noise;
- minor impacts from odors;
- negligible impacts from lighting;
- no impacts to transportation;
- negligible impacts to energy resources;
- negligible impacts to waste streams;
- negligible impacts to hazardous material management; and
- negligible impacts to human health and safety.

Table 5-3 discusses mitigation measures which will be employed during the implementation of the Proposed Action. Application of BMPs during construction and operation of the Proposed Action will mitigate adverse impacts to Fort Detrick and areas adjacent to the Installation.

#### 5.4 ENVIRONMENTAL IMPACTS OF ALTERNATIVE II

Alternative II, the No Action alternative, is Do Not Construct and Operate Proposed Projects on Area B of Fort Detrick in Frederick County, Maryland. Under Alternative II, the USAG and its Mission Partners would not be as effective at meeting their respective mission requirements. Implementation of the No Action Alternative would eliminate the negligible to minor adverse impacts detailed above, but would also eliminate the positive impacts resulting from the Proposed Action.

**Table 5-1. Summary of Potential Environmental Impacts Related to Construction of the Proposed Action.**

<b>Environmental Attribute</b>	<b>Potential Environmental Impacts Related to Construction</b>
<b>Land Use</b>	Temporary, site-specific and minor land use impacts due to erosion and stormwater runoff. Mitigated by adherence to BMPs, compliance with erosion and sediment control and SWM requirements, and MDNR forestation requirements.
<b>Climate</b>	Negligible impacts to climate.
<b>Geology</b>	Negligible to minor impacts to geology due to potential sinkhole formation, mitigated by good structural design practices.
<b>Soils</b>	Minor impacts to soil resources due to erosion resulting from disturbance during excavation and installation of utility lines, mitigated by use of BMPs.
<b>Water Resources</b>	Minor impacts to surface water due to sedimentation, mitigated by adherence to BMPs and compliance with sediment control requirements. Minor impacts to groundwater, mitigated by compliance with groundwater protection requirements. Increased stormwater runoff will result in minor impacts to surface water, mitigated by additional SWM facilities.
<b>Wetlands and Floodplains</b>	Temporary minor impacts due to erosion and sedimentation, mitigated by adherence to BMPs and compliance with sediment control requirements. Negligible impacts to floodplains.
<b>Plant and Animal Ecology</b>	Temporary minor impacts to plant and animal resources including displacement of species through disruption of habitat, mitigated by BMPs. Positive impacts due to COMAR forestation requirements.
<b>Air Quality</b>	Temporary and minor impacts due fugitive dust and vehicular emissions. Fugitive dust mitigated by adherence to BMPs.
<b>Historic and Cultural Resources</b>	No impacts to historic and cultural resources.
<b>Socioeconomic Environment</b>	Positive economic impact to the economy of Frederick.
<b>Noise and Lighting</b>	Transitory minor increased noise at the construction and demolition sites and adjacent off-post areas. Mitigated by adherence to OSHA construction noise standards
<b>Odors</b>	Negligible to minor odor impacts due to transitory and localized odors generated by construction vehicles.
<b>Transportation</b>	Minor impacts on traffic congestion localized at the work sites.
<b>Energy Resources</b>	Temporary negligible impacts to depletable energy resources.
<b>Waste Streams</b>	Negligible impacts to waste streams.
<b>Hazardous Material Management</b>	Minor impacts expected. USAG oversight of hazardous material handling will insure compliance with OSHA and RCRA regulations.
<b>Human Health and Safety</b>	Negligible impact to construction workers and negligible impacts to public health and safety.
<b>Environmental Justice</b>	Disproportionate adverse impacts to minority or low-income populations are not anticipated.
<b>Cumulative Impacts</b>	Significant adverse cumulative impacts are not anticipated.

THIS PAGE INTENTIONALLY LEFT BLANK

**Table 5-2. Summary of Potential Environmental Impacts Related to Operation of the Proposed Action.**

<b>Environmental Attribute</b>	<b>Potential Environmental Impacts Related to Operation</b>
<b>Land Use</b>	Minor and site specific adverse impacts to land use
<b>Climate</b>	Negligible impacts to climate.
<b>Geology</b>	Negligible to minor impacts to geology, mitigated by engineering controls, proper facility design, and adherence to SOPs.
<b>Soils</b>	Negligible adverse impacts to soils.
<b>Water Resources</b>	Potentially minor impacts to surface water from increased stormwater runoff due to impervious surfaces, mitigated by adherence to MDE SWM standards.
<b>Wetlands and Floodplains</b>	Minor impacts to wetlands due to increase in impervious surfaces. Negligible impacts to floodplains.
<b>Plant and Animal Ecology</b>	Positive impacts to plant and animal resources due to forestation requirements.
<b>Air Quality</b>	Negligible air quality impacts.
<b>Historic and Cultural Resources</b>	No impacts to historic and cultural resources.
<b>Socioeconomic Environment</b>	No Impacts to the socioeconomic environment.
<b>Noise and Lighting</b>	Negligible noise impacts. Noise levels are not likely to increase over current levels. Negligible lighting impacts.
<b>Odors</b>	Temporary and minor odor impacts.
<b>Transportation</b>	No impacts to traffic.
<b>Energy Resources</b>	Negligible impacts to energy resources.
<b>Waste Streams</b>	Negligible impacts from waste streams.
<b>Hazardous Material Management</b>	Negligible impacts expected. USAG oversight of hazardous material handling will ensure compliance with OSHA and RCRA regulations.
<b>Human Health and Safety</b>	Negligible impacts to human health and safety.
<b>Environmental Justice</b>	Disproportionate adverse impacts to minority or low-income populations are not anticipated.
<b>Cumulative Impacts</b>	Significant adverse cumulative impacts are not anticipated.

THIS PAGE INTENTIONALLY LEFT BLANK

**Table 5-3. Summary of Mitigation Measures and Mechanisms.**

<b>Environmental Attribute</b>	<b>Impact</b>	<b>Mitigation Measure</b>
<b>Land Use</b>	Land disturbance	MDNR, afforestation requirement, BMPs, erosion and SWM requirements
<b>Geology</b>	Potential for sinkhole formation	Good structural design practices and use of BMPs during construction/demolition/renovation
	Potential pathways for groundwater contamination	Engineering controls and adherence to SOPs
	Potential adverse impacts to topography and stormwater runoff patterns	Use of BMPs during construction
<b>Soils</b>	Soil erosion during construction	Use of BMPs during construction
		Adherence to MDE SWM requirements
<b>Water Resources</b>	Sedimentation to surface waters	Use of BMPs during construction
		Adherence to MDE SWM requirements
	Increased stormwater runoff due to impervious surfaces	Adherence to MDE SWM requirements
	Damage to aquifer during construction	Good construction practices
<b>Plant and Animal Ecology</b>	Minor impacts to plant and animal species	Use of BMPs during construction
	Potential development of forested land	Forestation requirements
<b>Air Quality</b>	Fugitive dust	Use of BMPs during construction
<b>Noise</b>	Noise effects on construction worker hearing	OSHA compliance
	Impacts on public health during construction	Adherence to noise control regulations
<b>Transportation</b>	Potential increased traffic	Potential and ongoing infrastructural improvements, vehicle restrictions
<b>Pollution Prevention and Waste Management</b>	Construction wastes	Contract requirements for disposal of all wastes outside Fort Detrick and in accordance with regulatory requirements
	Wastes generated by operation of Proposed Projects	Pollution prevention through source reduction and conservation
<b>Human Health and Safety</b>	Potential construction-related injury	Compliance with OSHA regulations

THIS PAGE INTENTIONALLY LEFT BLANK

## 6.0 CONCLUSIONS

The Proposed Action (Alternative I, the preferred alternative) and subject of this EA is the Construction and Operation of Proposed Projects, which include a DHS Antenna, RV Parking Lot, Training Campus, and Infrastructure Improvements, on Area B of Fort Detrick in Frederick County, Maryland. The construction and operation of new facilities and infrastructural improvements, within the Installation (the Proposed Projects), will allow the USAG and its Mission Partners to meet their respective mission requirements. During the preparation of this EA, one alternative to the Proposed Action was identified. This alternative is to Not Construct and Operate the Proposed Projects, which include a DHS Antenna, RV Parking Lot, Training Campus and Infrastructure Improvements, on Area B of Fort Detrick in Frederick County, Maryland. (Alternative II, No Action).

This EA considered impacts expected from current and proposed Installation activities, cumulative impacts that might occur after several years, and impacts resulting from association with other activities in the area. Detailed analyses of the individual activities and impacts of the Proposed Action, as well as the actual cumulative impacts of other entities in the immediate vicinity of Fort Detrick, did not reveal any significant adverse environmental impacts.

During the construction phase, the following impacts are anticipated: negligible impacts to the local climate, potential negligible to minor impacts to geology, potential minor impacts to soils, minor impacts to water resources, minor impacts to wetlands, negligible impacts to floodplains, minor impacts to plants and animals, minor impacts to air quality, no impacts to historical and cultural resources, positive impacts to the local socioeconomic environment, minor impacts from noise and lighting, negligible to minor impacts from odors, minor impacts to traffic, negligible impacts to energy resources, negligible impacts to waste streams, minor impacts to hazardous materials management, negligible impacts to human health and safety, and minor cumulative impacts.

During the operational phase, the following impacts are anticipated: minor impacts to land use, negligible impacts to the local climate, potential minor to negligible impacts to geology, negligible impacts to soils, potential minor impacts to water resources, minor impacts to wetlands, negligible impacts to floodplains, positive impacts to plants and animals, negligible impacts to air quality, no impacts to historical and cultural resources, no impacts to the local socioeconomic environment, negligible impacts from noise, negligible impacts from lighting, minor impacts from odors, no impacts to traffic, negligible impacts to energy resources, negligible impacts to waste streams, negligible impacts to hazardous materials management, negligible impacts to human health and safety, and minor cumulative impacts.

The principal conclusions of this EA are: (1) implementing Alternative I (the preferred alternative) would not result in significant adverse environmental impacts, provided that BMPs to mitigate these potential environmental impacts are adhered to during construction and operation of the Proposed Projects; (2) implementing the Proposed Action will provide Fort Detrick with infrastructural improvements which will allow the USAG and DHS to achieve their respective mission requirements; (3) construction and operation of Proposed Projects on Area B of Fort Detrick (the Proposed Action) will provide facilities necessary to satisfy training requirements for the Fort Detrick Police and Fire Departments; (4) implementing Alternative I is consistent with the land use planning objectives for Fort Detrick; (5) implementing Alternative II (No Action) would not provide Fort Detrick with much-needed infrastructure and facilities and would hamper the ability of the USAG and DHS to meet their respective mission requirements; (6)

implementing Alternative II (No Action) is not consistent with land use planning objectives for Fort Detrick; and (7) implementing the No Action alternative would eliminate the negligible to minor environmental impacts associated with the implementation of Alternative I, but would also eliminate the beneficial impacts of the Proposed Action.

## 7.0 REFERENCES

- Adkins, Jennifer. 2010a. E-mail correspondence from Jennifer Adkins (USAG, EMO) to John Beaver (BSA Environmental Services, Inc.) on 27 October 2010.
- Adkins, Jennifer. 2010b. E-mail correspondence from Jennifer Adkins (USAG, EMO) to R. Hollis (BSA Environmental Services, Inc.) on 16 February 2010.
- Adkins, Jennifer. 2010c. E-mail correspondence from Jennifer Adkins (USAG EMO) to John Beaver (BSA Environmental Services, Inc.) on 30 September 2010.
- Advisory Council on Historic Preservation. 2007. About ACHP: General Information. Information obtained from <http://achp.gov/aboutachp.html> on 29 August 2007.
- Balfour Beatty Communities. 2009. Information regarding Fort Detrick residential military family housing units obtained from <http://www.ftdetrickhomes.com/defaultFamily.aspx?cid=25> on 19 January 2010.
- Barnard, Bob. 2010. *Fort Detrick Water Tests Show No Harmful Chemicals: Officials tested 70 water wells since June*. 2 November 2010. News story obtained from <http://www.myfoxdc.com/dpp/news/maryland/fort-detrick-water-tests-show-no-harmful-chemicals-110110> on 3 November 2010.
- Business Wire. 2010. Information regarding Frederick County economics obtained from <http://www.businesswire.com/news/home/20100409005582/en/Fitch-Rates-Frederick-County-MDs-GOs-AA> 23 September 2010.
- Centers for Disease Control and Prevention and National Institutes of Health. 2007. *Biosafety in Microbiological and Biomedical Laboratories*. Fifth Edition. U.S. Government Printing Office. February 2007.
- City of Frederick. 2009. The City of Frederick Annual Drinking Water Quality Report 2009 Summary. Information obtained from <http://www.cityoffrederick.com/cms/files/dpw/annual-drinking-water-quality-report.pdf> on 24 September 2010.
- City of Frederick. 2004. *City of Frederick Comprehensive Plan*. 16 September 2004 Alliance for the Chesapeake Bay, Inc. 2006. Monocacy River Fact Sheet. Monocacy River information obtained from <http://www.acb-online.org/pubs.cfm> on 28 October 2010.
- Cole, L. K. 2009. E-mail correspondence from L. K. Cole (USAG, GMH Military Housing, Community Manager) to R. Sheffer (USAG, Environmental Engineer, EMO) on 17 December 2009.
- Council on Environmental Quality. 2007. *Aligning National Environmental Policy Act Processes with Environmental Management Systems*. April 2007.
- Covert, N.M. 2000. *Cutting Edge: A History of Fort Detrick, Maryland*. Prepared by the Public Affairs Office, Fort Detrick, Maryland. Fourth Edition.

Craig, Robert. 2010. E-mail correspondence from Robert Craig (USAG, EMO) to R. Hollis (BSA Environmental Services, Inc.) on 21 October 2010.

Department of the Army. 2009. *Declaration of Conformance to Environmental Management System Requirements in EO 13423 Based on External Audit Results*. 2009.

Department of the Army. 2006. DA. Office of the Assistant Chief of Staff for Installation Management. *Requirements for Sustainable Management of Waste in Military Construction, Renovation and Demolition Activities*. 13 January 2006.

Department of the Army. 2005. *Environmental Performance Assessment System Executive Summary*. 28 November 2005.

Department of Homeland Security, 2010. *DHS Antenna System: Fort Detrick Area B* - powerpoint presentation obtained via E-mail correspondence from W. Polley (Battelle Memorial Institute) to R. Craig (EMO, Chief) on 18 June 2010.

Department of Homeland Security and U.S. Army Garrison. 2004. *Final Environmental Impact Statement, Construction and Operation of the National Biodefense Analysis and Countermeasures Center Facility by the Department of Homeland Security at Fort Detrick, Maryland*. 23 December 2004.

Directorate of Installation Services. 2005a. *Fort Detrick Wastewater Treatment Plant Biomonitoring Evaluation (State Discharge Permit Application No. 03-DP-2527), First Quarterly Report for the Period January 1, 2005 to March 31, 2005*. 3 March 2005.

Directorate of Installation Services. 2005b. *Fort Detrick Wastewater Treatment Plant Toxic Chemical Testing Evaluation (State Discharge Permit Application No. 03-DP-2527), First Quarterly Report for the Period January 1, 2005 to March 31, 2005*. 17 March 2005.

Directorate of Installation Services. 2005c. *Fort Detrick Wastewater Treatment Plant Biomonitoring Evaluation (State Discharge Permit Application No. 03-DP-2527), Second Quarterly Report for the Period April 1, 2005 to June 30, 2005*. 13 May 2005.

Directorate of Installation Services. 2005d. *Fort Detrick Wastewater Treatment Plant Biomonitoring Evaluation (State Discharge Permit Application No. 03-DP-2527), Third Quarterly Report for the Period July 1, 2005 to September 30, 2005*. 15 August 2005.

Fort Detrick Environmental Management Office. 2009a. Mission: Sustainability-Volume 7. Information obtained from <http://www.detrack.army.mil/emo/newsletter07.pdf> accessed on 10 February 2010.

Fort Detrick Environmental Management Office. 2009b. Environmental Management System manual: Fort Detrick, MD and Forest Glen Annex, MD. 15 December 2008.

Frederick County Department of Planning and Zoning. 2002. *Frederick Region Plan*. Planning Information obtained from <http://www.co.frederick.md.us/planning/CompPlan/Frederick/FRPlanText.htm> on 6 December 2005.

Frederick County Division of Planning. 2010a. Frederick County Division of Planning statistics found at <http://www.frederickcountymd.gov/index.aspx?NID=1479> on 23 September 2010.

Frederick County Division of Planning. 2010b. Frederick County Division of Planning statistics found at <http://www.frederickcountymd.gov/index.aspx?NID=1480> on 23 September 2010.

Frederick County Division of Planning. 2008. A Demographic Exploration of Frederick County Population and Housing Updates found at <http://www.co.frederick.md.us/archives/59/Feb08.pdf> on 23 September 2010.

Frederick County Government, 2010. Press Release: February 10, 2010. Count Commissioners' President Declares Local State of Emergency.

Frederick News-Post. 2010a. "Early data: No cancer cluster near Detrick." 5 October 2010.

Frederick News-Post. 2010b. "Residents push for cancer cluster recognition." 2 November 2010.

Frederick News-Post. 2010c. "Army to interview residents, ex-employees about environmental contamination issues." 15 October 2010.

Frederick News-Post. 2004. "Battle Ready: Army Post's New Special Operations Vehicle is Equipped for Response to Terror Attacks." 15 December 2004.

Goodwin and Associates, Inc. 1993. Phase I Archeological Survey of Fort Detrick. Prepared for the U.S. Army Corps of Engineers. August 1993.

Gortva, J. 2010a. E-mail correspondence between J. Gortva (USAG, EMO) and R. Hollis (BSA Environmental Services) on 23 June 2010.

Gortva, J. 2010b. Personal communication: Telephone conversation between J. Gortva (USAG, Safety, Environment and Integrated Planning Office) and J. Beaver (BSA Environmental Services) on 3 November 2010.

Gortva, J. 2009. E-mail correspondence between J. Gortva (USAG, EMO) and J. Beaver (BSA Environmental Services) on 23 December 2009.

Gortva, J. 2008. E-mail correspondence between J. Gortva (USAG, Safety, Environment and Integrated Planning Office), EMO personnel, and A. Comrov (BSA Environmental Services, Inc.) on 19 April, 2008.

Herald-Mail. 2005. "Smoke Released into Air from Fort's Boiler Plant." 7 May 2005.

Invasive Plant Control, Inc. 2004. Fort Detrick Invasive Plant Management Plan. August 2004.

Jacobs and AECOM. 2009. BRAC Public Transportation Report. Prepared for: Maryland Transit Administration. June 2009.

- Lewis, 2010. E-mail correspondence from M. Zangara, J. Adkins, J. Gortva to M. Lewis (Analytical Services, Inc., EMO) provided to R. Hollis (BSA Environmental Services, Inc.) on 4 November 2010.
- Maryland Department of the Environment, Water Management Administration. 2008. *Maryland Policy for Nutrient Cap Management and Trading in Maryland's Chesapeake Bay Watershed* obtained from <http://www.mde.maryland.gov/Water/nutrientcap.asp> on 21 October 2009.
- Maryland Department of the Environment. 2010. NAAQS information for Maryland obtained from [http://www.mde.state.md.us/Air/air\\_information/sixcommon.asp](http://www.mde.state.md.us/Air/air_information/sixcommon.asp) on 20 January 2010.
- Maryland Department of the Environment. 2009a. Discharge Permit (National Pollutant Discharge Elimination System Permit No. MD0020877) for the Fort Detrick Wastewater Treatment Plant. Maryland Department of the Environment, Water Management Administration, Surface Discharge Permit Division.
- Maryland Department of the Environment. 2009b. Water Conservation Conditions in Maryland, 30 September 2009 and previous, obtained from [http://www.mde.state.md.us/Programs/WaterPrograms/Water\\_Conservation/Current\\_Conditions/index.asp](http://www.mde.state.md.us/Programs/WaterPrograms/Water_Conservation/Current_Conditions/index.asp) on 17 September 2010.
- Maryland Department of the Environment. 2000. *2000 Maryland Stormwater Design Manual Volumes I and II*. Center for Watershed Protection.
- Maryland Department of Labor, Licensing and Regulation. 2010. Civilian Labor Force, Employment and Unemployment - Maryland Monthly Labor Review - October 2009 found at <http://www.dllr.state.md.us/lmi/mlr/lausaug98.shtml> on 14 January 2010.
- Maryland Department of Labor, Licensing and Regulation. 2009a. Frederick County Fact Sheet 2008 found at <http://www.dllr.state.md.us/lmi/wiafacts/frederickcounty.pdf> on 23 September 2010.
- Maryland Department of Labor, Licensing and Regulation. 2009b. Frederick County WIA Occupational Projections - 2006-2016 found at <http://www.dllr.state.md.us/lmi/iandoproj/frederick/occtotal.shtml> on 23 September 2010.
- Maryland Department of Natural Resources. 2008. *Maryland's Chesapeake Bay Tributary Strategy Statewide Implementation Plan* obtained from [http://www.dnr.state.md.us/bay/tribstrat/implementation\\_plan.html](http://www.dnr.state.md.us/bay/tribstrat/implementation_plan.html) on 22 October 2009.
- Maryland Department of Natural Resources, 2002. Information about hardwood species native to Maryland accessed at <http://www.dnr.state.md.us/criticalarea/trees.html> on 26 February 2010.
- Maryland Department of Natural Resources. 1999. *State of the Streams: 1995-1997 Maryland Biological Stream Survey Results*. July 1999.

- Maryland Department of Transportation. 2009a. *Frederick County Traffic Volume Map: 2009 Annual Average Daily Traffic*. obtained from [http://www.roads.maryland.gov/Traffic\\_Volume\\_Maps/frederick.pdf](http://www.roads.maryland.gov/Traffic_Volume_Maps/frederick.pdf). on 14 October 2010.
- Maryland Department of Transportation. 2009b. *I-270/US 15 Multi-Modal Corridor Study*. Obtained from <http://www.i270multimodalstudy.com/> on 14 October 2010.
- Maryland Geological Survey. 2009. Earthquake and Maryland. Pamphlet compiled by J.P. Reger in 1987 and updated 8 April 2009, obtained from <http://www.mgs.md.gov/esic/brochures/earthquake.html> on 20 September 2010 and additional data obtained from <http://www.mgs.md.gov/seismics/events.shtml>
- Maryland Office of Environmental Programs. 1986. *Maryland Air and Water Quality Atlas, Second Edition*.
- Maryland Office of the Governor, 2010. Press Release: February 5, 2010. Governor O'Malley Declares State of Emergency for the Entire State of Maryland.
- Maryland Office of the Governor. 2003. Press Release: February 20, 2003. Governor Ehrlich Lifts Drought Emergency in Central Maryland.
- Maryland State Data Center. 2009. Median Household Income for Maryland's Jurisdictions. Obtained from [http://www.mdp.state.md.us/msdc/hhinc\\_median&mean.shtml](http://www.mdp.state.md.us/msdc/hhinc_median&mean.shtml) on 23 September 2010.
- Mayles, D. 2009. "Building Sustainability with EMS Tools", Society of American Military Engineers: Joint Engineer Training Conference and Expo, Salt Lake City, Utah, Salt Palace Convention Center.
- National Climatic Data Center. 2010. Records of weather-related events in Frederick County, Maryland, from 01 January 1950 to 31 October 2009 obtained from <http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms> on 24 September 2010.
- Polley, W. 2010a. E-mail correspondence from W. Polley (Battelle Memorial Institute) to R. Craig, (EMO, Chief) on 28 June 2010.
- Polley, W. 2010b. E-mail correspondence from W. Polley (Battelle Memorial Institute) to J. Beaver, (BSA Environmental Services, Inc.) on 9 December 2010.
- Powell, K. 2010. E-mail correspondence from K. Powell (USAG, DIS) to R. Hollis (BSA Environmental Services, Inc.) on 9 November 2010.
- Restoration Advisory Board. 2006. Fort Detrick Restoration Advisory Board information obtained from <http://www.detrick.army.mil/detrick/rab/index.cfm> on 13 March 2006.
- Southeast Regional Climate Center. 2009. Climatic and precipitation records from 1948-2002, obtained from <http://www.sercc.com/cgi-bin/sercc/cliMAIN.pl?md3348> on 17 September 2010.

- U.S. Army. 2008. *Sustain the Mission, Secure the Future: the Army Strategy for the Environment*. 1 October 2004.
- U.S. Army Center for Health Promotion and Preventive Medicine. 2006. Final Report: Air Pollution Emission Assessment No. 43-EL-004JR-06 Fort Detrick General Refuse Incinerators B1 and B4, Fort Detrick, Maryland. 23 January – 2 February 2006.
- U.S. Army Center for Health Promotion and Preventive Medicine. 2005. *Baseline Wastewater Evaluation and Local Limits Development. Fort Detrick, Maryland. 19 - 28 April 2005*.
- U.S. Army Corp of Engineers. 2006. *Environmental Assessment for BRAC 05 Realignment at Fort Detrick, Maryland*. U.S. Army Corp of Engineers, Mobile District. November 2006.
- U.S. Army Corps of Engineers. 2005a. Wetland Delineation for Fort Detrick. April 2005. U.S. Army Corps of Engineers.
- U.S. Army Corps of Engineers. 2005b. Floodplain Analysis and Mapping for Fort Detrick. April 2005. U.S. Army Corps of Engineers.
- U.S. Army Corps of Engineers. 2002a. *Bldg. 190 Groundwater Study, Work Management Plan – Well Installation, Area A, U.S. Army Garrison, Fort Detrick, Frederick, Maryland*. 15 March 2002.
- U.S. Army Corps of Engineers. 2001. *Fort Detrick Photogeologic Analysis Amended Final Report, Maryland*. U.S. Army Corps of Engineers, Engineer Research and Development Center, Topographic Engineering Center, Alexandria, Virginia, April 2001.
- U.S. Army Corps of Engineers. 2000a. Integrated Cultural Resources Management Plan, Fort Detrick, Maryland. January 2000. U.S. Army Corps of Engineers.
- U.S. Army Corps of Engineers. 2000b. *Fort Detrick Remedial Investigation Report, Area A, Revised Final, Parts I and II*. June 2000. IT Corporation, Edgewood, Maryland.
- U.S. Army Corps of Engineers. 1993b. *Geophysical Investigation of Fort Detrick, Maryland*. U.S. Army Corps of Engineers.
- U.S. Army Corps of Engineers. 1992. Cultural Resources Management Plan and Maintenance, Rehabilitation and Repair Guidelines for Fort Detrick, Maryland. August 1992. U.S. Army Corps of Engineers.
- U.S. Army Environmental Center. 2009. Information regarding the EPAS program obtained from <http://aec.army.mil/usaec/support/epas00.html> on 14 January 2010.
- U.S. Army Garrison. 2010a. Maryland Performance Excellence Award FY 2010 Application, U.S. Army Garrison, Fort Detrick, Maryland. 19 February 2010. U.S. Army Garrison, Fort Detrick, Maryland.

- U.S. Army Garrison. 2010b. *Environmental Assessment – Real Property Master Plan for Army-Controlled Land at Areas A and C of Fort Detrick in Frederick County, Maryland*. 18 March 2010. U.S. Army Garrison, Fort Detrick, Maryland.
- U.S. Army Garrison. 2009a. *Emergency and Hazardous Chemical Inventory: Tier II Report*. 27 February 2009. U.S. Army Garrison, Fort Detrick, Maryland.
- U.S. Army Garrison. 2009b. *Environmental Assessment for the Frederick County Potomac Pipeline Interconnect to Fort Detrick via the Existing City of Frederick Water System*. September 2009. U.S. Army Garrison, Fort Detrick, Maryland.
- U.S. Army Garrison. 2008. *Environmental Management System Manual*. 15 December 2008. U.S. Army Garrison, Fort Detrick Maryland. U.S. Army Garrison, Fort Detrick, Maryland.
- U.S. Army Garrison. 2007a. *U.S. Army Garrison, Fort Detrick, Maryland Strategic Plan*. November 2007. U.S. Army Garrison, Fort Detrick, Maryland.
- U.S. Army Garrison. 2007c. *Final Integrated Natural Resources Management Plan 2006-2010 for U.S. Army Garrison, Fort Detrick, Maryland*. January 2007. U.S. Army Garrison, Fort Detrick, Maryland.
- U.S. Army Garrison. 2006b. *Integrated Cultural Resources Management Plan, Fort Detrick, Maryland*. June 2006. U.S. Army Garrison, Fort Detrick, Maryland.
- U.S. Army Garrison. 2006c. *Pest Management Plan for Fort Detrick, Frederick, Maryland*. 2006. U.S. Army Garrison, Fort Detrick, Maryland.
- U.S. Army Garrison. 2005. *Environmental Assessment for the Construction and Operation of a Cogeneration Utility Plant (CUP) by Chevron Energy Solutions Company and Keenan Development (CK) on the East-Central Portion of Area A at Fort Detrick, Maryland*. 30 September 2005. U.S. Army Garrison, Fort Detrick, Maryland.
- U.S. Army Garrison. 2004 *Environmental Assessment, Revised Area B Master Plan, Fort Detrick Maryland*. 17 May 2004. U.S. Army Garrison, Fort Detrick, Maryland.
- U.S. Army Garrison. 2003a. *Environmental Assessment, Installation Master Plan for Fort Detrick, Maryland*. 1 September 2003. U.S. Army Garrison, Fort Detrick, Maryland.
- U.S. Army Garrison. 2003b. *Wastewater Treatment Plant Final Radiological Survey Plan*. U.S. Army Garrison, Fort Detrick, Maryland.
- U.S. Army Garrison. 2003c. *Investigation of Elevated Tritium Levels in the Garrison's Sanitary Landfill Located in the Fort Detrick Area B*. September 2003. U.S. Army Garrison, Fort Detrick, Maryland.
- U.S. Army Garrison. 2003d. *Storm Water Pollution Prevention Plan*. 31 January 2003. U.S. Army Garrison, Fort Detrick, Maryland.

- U.S. Army Garrison. 2002a. *Environmental Assessment for the Construction and Operation of New Commissary and Post Exchange (PX) Facilities, and Other Infrastructural Improvements on the South Central Portion of Area A- Fort Detrick, Maryland*. December 2002.
- U.S. Army Garrison. 2002d. *Environmental Assessment for the Construction and Operation of Family Housing Quarters at Fort Detrick, Maryland*. April 16, 2002. U.S. Army Garrison, Fort Detrick, Maryland.
- U.S. Army Garrison. 2002e. *Environmental Assessment, Fluoridation of the Fort Detrick Drinking Water System*. March 2002. U.S. Army Garrison, Fort Detrick, Maryland.
- U.S. Army Garrison. 2002f. *Integrated Natural Resources Management Plan for U.S. Army Garrison Fort Detrick*. February 2002. U.S. Army Garrison, Fort Detrick Maryland.
- U.S. Army Garrison. 2001. *Integrated Natural Resource Management Plan*. 2001. U.S. Army Garrison, Fort Detrick, Maryland.
- U.S. Army Garrison. 1998. *Fort Detrick Environmental Planning Guide*. U.S. Army Garrison. Fort Detrick, Frederick, Maryland. June 1998.
- U.S. Army Garrison. 1997a. *Environmental Assessment for the Construction of Two Sterilization Facilities, Conversion and Abandonment of the Laboratory Sewer System and Deactivation of the Steam Sterilization Plant*. February 1997. U.S. Army Garrison, Fort Detrick, Maryland.
- U.S. Army Medical Research and Materiel Command. 2001. *Environmental Assessment of U.S. Army Medical Research Institute of Infectious Diseases*, June, 2001. U.S. Army Medical Research and Materiel Command, Fort Detrick, Maryland.
- U.S. Army Medical Research and Materiel Command and U.S. Army Garrison. 2006. *Final Environmental Impact Statement, Construction and Operation of New U.S. Army Medical Research Institute of Infectious Diseases Facilities and Decommissioning and/or Re-Use of Existing USAMRIID Facilities at Fort Detrick, Maryland*. 29 December 2006.
- U.S. Census Bureau. 2010. *U.S. Census Bureau, State and County Quickfacts*. Information regarding the demographics of Frederick, Maryland obtained from <http://quickfacts.census.gov/qfd/states/24/24021.html> on 19 January 2010.
- U.S. Census Bureau. 2008. *U.S. Census Bureau, American FactFinder*. Information regarding the demographics of Frederick County, Maryland, and the City of Frederick based on the 2006-2008 U.S. Census estimates, obtained from <http://factfinder.census.gov/> on 23 September 2010.
- U.S. Census Bureau. 2006. *U.S. Census Bureau, American FactFinder*. Information regarding the demographics of Frederick, Maryland, based on the 2000 U.S. Census, obtained from <http://factfinder.census.gov> on 23 June 2006.

- U.S. Department of Agriculture, 2010. Natural Resources Conservation Service. Information obtained from <http://soils.usda.gov/technical/classification/osd/index.html> on 1 November 2010.
- U.S. Department of Agriculture, 2007. Information about hardwood species native to Maryland accessed at <http://orb.at.ufl.edu/TREES/index.html> on 26 February 2010.
- U.S. Department of Agriculture. 2002. *Soil Survey of Frederick County, Maryland*. U.S. Department of Agriculture, Natural Resources Conservation Service, Washington, D.C.
- U.S. Environmental Protection Agency, 2010a. Safe Drinking Water Information System Report: Fort Detrick. Information obtained from [http://oaspub.epa.gov/enviro/sdw\\_report\\_v2.first\\_table?pws\\_id=MD0100011&state=MD&source=Surface\\_water&population=7500&sys\\_num=0](http://oaspub.epa.gov/enviro/sdw_report_v2.first_table?pws_id=MD0100011&state=MD&source=Surface_water&population=7500&sys_num=0) accessed 1 February 2010.
- U.S. Environmental Protection Agency, 2010b. Region 3: The Mid-Atlantic States- About the Mid-Atlantic Region. Information obtained from <http://www.epa.gov/region03/about.htm> on 17 August 2010.
- U.S. Environmental Protection Agency, 2010c. The Green Book Nonattainment Areas for Criteria Pollutants. Information obtained from <http://www.epa.gov/oar/oaqps/greenbk/index.html> on 2 August 2010.
- U.S. Environmental Protection Agency, 2010d. Particulate Matter. Information obtained from <http://www.epa.gov/air/particlepollution/index.html> on 2 August 2010.
- U.S. Environmental Protection Agency, 2010e. Ground- Level Ozone: Regulations. Information obtained from <http://www.epa.gov/air/ozonepollution/actions.html#stand> on 2 August 2010.
- U.S. Geological Survey. 2010a. USGS 01643000 Monocacy River at Jug Bridge near Frederick, Maryland. Streamflow and watershed information obtained from [http://waterdata.usgs.gov/usa/nwis/uv/?site\\_no=01643000](http://waterdata.usgs.gov/usa/nwis/uv/?site_no=01643000) on 24 September 2010.
- U.S. Geological Survey. 2010b. USGS 01643000 Monocacy River at Monocacy River Blvd near Frederick, Maryland. Streamflow and watershed information obtained from <http://waterdata.usgs.gov/nwis/uv?01642190> on 24 September 2010.
- Watershed Alliance, 2010. Monocacy and Catoctin: Watershed Alliance. Information obtained from [http://www.watershed-alliance.com/mcwa\\_watershed.html](http://www.watershed-alliance.com/mcwa_watershed.html) on 24 September 2010.
- Whitman, Requardt and Associates, 2007. Frederick County Interconnect to Fort Detrick. Final Alignment Study. Prepared for Frederick County Division of Utilities and Solid Waste Management. March 2007.
- Whole Building Design Guide. 2010. Overview of Sustainable Design Guidance. Information obtained from <http://www.wbdg.org/design/sustainable.php> accessed on 10 February 2010.

THIS PAGE INTENTIONALLY LEFT BLANK

## 8.0 PERSONS AND AGENCIES CONTACTED

<b>Individual</b>	<b>Affiliation</b>	<b>Telephone</b>
Jennifer Adkins	USAG, EMO, Analytical Services	(301) 619-3169
Robert Craig, P.E.	USAG, EMO, Chief	(301) 619-8345
Joseph Gortva	USAG, EMO, Environmental Restoration Program Manager	(301) 619-3196
Mark Lewis	USAG, EMO, EMO	(301) 619-3136
Karrie Reckley	USAG EMO Storage Tank Manager and EMS Program Manager	(301) 619-1266
Eric Williams	USAG, DIS, GIS Department Manager, STV	(301) 619-2712

THIS PAGE INTENTIONALLY LEFT BLANK

## 9.0 PREP ARERS

The following preparers, under contract to the U.S. Army Medical Research Acquisition Activity, provided instrumental technical assistance in preparation of this EA. They have no financial or other interest in the outcome of the Proposed Action.

John R. Beaver  
Ph.D., Environmental Engineering Sciences

BSA Environmental Services, Inc.  
Beachwood, Ohio

Rachel M. Davidson  
B.S., Conservation Science

BSA Environmental Services, Inc.  
Beachwood, Ohio

Jeremy Gerger  
M.S., Environmental Science and Management

BSA Environmental Services, Inc.  
Beachwood, Ohio

Jeffrey H. Jowett  
M.A., Geography and Planning

BSA Environmental Services, Inc.  
Beachwood, Ohio

THIS PAGE INTENTIONALLY LEFT BLANK

## 10.0 ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
AR	Army Regulation
ARMA	Air and Radiation Management Administration
BHC	benzene hexachloride
BMBL	<i>Biosafety in Microbiological and Biomedical Laboratories</i>
BMPs	best management practices
BRAC	Base Realignment and Closure
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	carbon monoxide
COMAR	Code of Maryland Regulations
COPC	chemicals of potential concern
COPEC	contaminants of potential ecological concern
cu. yd.	cubic yards
CUP	Central Utility Plant
CY	calendar year
DA	Department of the Army
dBA	decibels type A
DD	Decision Document
DHS	Department of Homeland Security
DIS	Directorate of Installation Services
DoD	Department of Defense
DOT	Department of Transportation
DRMO	Defense Reutilization and Marketing Office
DRMS	Defense Reutilization and Marketing Service
EA	Environmental Assessment
EISA	Energy Independence and Security Act
EMO	Environmental Management Office
EMS	Environmental Management System
EMST	Environmental Management System Team
ENR	Enhanced Nutrient Removal
EO	Executive Order
EPAS	Environmental Performance Assessment System
EQCC	Environmental Quality Control Committee
ERA	Ecological risk assessment
F&ESD	Fire and Emergency Services Division
FCC	Frederick Community College
FD REG	Fort Detrick Regulation
FMWR	Family and Morale, Welfare, and Recreation
FS	Feasibility Study
ft.	feet
FY	fiscal year
GBCI	Green Building Certification Institute

GHG	Greenhouse Gas
HAPs	Hazardous Air Pollutants
HAZCOM	Hazard Communication
HF	High Frequency
HHRA	Human Health Risk Assessment
HMMO	Hazardous Material Management Office
ICRMP	Integrated Cultural Resources Management Plan
IMP	Installation Master Plan
INRMP	Integrated Natural Resource Management Plan
IPM	integrated pest management
IPMC	Installation Pest Management Coordinator
IPMP	Installation Pest Management Plan
ISO	International Organization for Standardization
kV	kilovolt
kWh	kilowatt hours
lbs	pounds
LEED	Leadership in Energy and Environmental Design
LEED-EB	Leadership in Energy and Environmental Design- Existing Buildings
LID	Low Impact Development
LSS	laboratory sewer system
MARC	Maryland Rail Commuter
MCLs	Maximum Contaminant Levels
MDE	Maryland Department of the Environment
MDNR	Maryland Department of Natural Resources
mg/kg	milligram per kilogram
mg/L	milligrams per Liter
mgd	million gallons per day
MMBtu	Million British Thermal Unit
MSDSs	Material Safety Data Sheets
MSW	Municipal Solid Waste
NAAQS	National Ambient Air Quality Standards
NBACC	National Biodefense Analysis and Countermeasures Center
NCDC	National Climatic Data Center
NCI-Frederick	National Cancer Institute at Frederick
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NIH	National Institutes of Health
NO <sub>x</sub>	Nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NRHP	National Register of Historic Places
NSR	New Source Review
°F	degrees Fahrenheit
OSHA	Occupational Safety and Health Act
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
Pb	lead

PCE	perchloroethylene
PM <sub>10</sub>	particulate matter between 2.5 and 10 microns in aerodynamic diameter
PM <sub>2.5</sub>	particulate matter less than 2.5 microns in aerodynamic diameter
PMC	Pest Management Consultant
PPE	Personal Protective Equipment
ppm	parts per million
PSD	Prevention of Significant Deterioration
PX	Post Exchange
RAB	Restoration Advisory Board
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RPMP	Real Property Master Plan
RPPB	Real Property Planning Board
RV	Recreational Vehicle
S&T	Science and Technology
SAIA	Sikes Act Improvement Act
SAP	satellite accumulation points
SARA	Superfund Amendments and Reauthorization Act
SDD	Sustainable Design and Development
SDWA	Safe Drinking Water Act
sf	square feet
SHA	State Highway Administration
SHPO	State Historic Preservation Office
SLERA	Screening-level ecological risk assessment
SO <sub>2</sub>	sulfur dioxide
SOPs	Standard Operating Procedures
SPCCP	Spill prevention control and countermeasure plans
SSP	Steam Sterilization Plant
SVOCs	semi-volatile organic compounds
SWM	stormwater management
SWPPP	Stormwater Pollution Prevention Plan
TAPs	toxic air pollutants
TBL+	Triple Bottom Line Plus
TCE	Trichloroethene
tpy	tons per year
TSDf	Treatment Storage Disposal Facility
TSP	Total Suspended Particulate
UCL	upper confidence limit
µg/kg	microgram/kilogram
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USACE	U.S. Army Corps of Engineers
USAEC	U.S. Army Environmental Command
USAEHA	United States Army Environmental Hygiene Agency
USAG	U.S. Army Garrison
USAMRIID	U.S. Army Medical Research Institute of Infectious Diseases
USAMRMC	U.S. Army Medical Research and Materiel Command
USC	U.S. Code
USCHPPM	United States Army Center for Health Promotion and Preventive Medicine
USDA	U.S. Department of Agriculture

USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
VOCs	volatile organic compounds
WMA	Waste Management Administration
WTP	water treatment plant
WWTP	wastewater treatment plant