Environmental Assessment
Decommissioning and Demolition of Steam Sterilization Plant and Laboratory Sewer System
U.S. Army Garrison Fort Detrick, Maryland

November 2019

FINDING OF NO SIGNIFICANT IMPACT
ENVIRONMENTAL ASSESSMENT
DECOMMISSIONING AND DEMOLITION OF STEAM STERILIZATION PLANT AND LABORATORY SEWER SYSTEM
U.S. Army Garrison Fort Detrick, Frederick County, Maryland

Name of Action: Decommissioning and Demolition of Steam Sterilization Plant and Laboratory Sewer System at U.S. Army Garrison Fort Detrick, Maryland.

Description of Proposed Action: U.S. Army Garrison Fort Detrick (Fort Detrick) proposes to decommission and demolish the Steam Sterilization Plant (SSP) and Laboratory Sewer System (LSS). Building 375 (the existing SSP) will be decommissioned when the new U.S. Army Medical Research Institute of Infectious Diseases SSP is completed. The demolition project will remove approximately 24,138 gross square feet (the existing SSP). Approximately 5,440 linear feet of existing LSS piping will be abandoned-in-place or demolished. Building 375, all tanks and the LSS will all be decontaminated prior to demolition. The main trunk line of the LSS between Buildings 1425 and 375 will be abandoned-in-place or demolished. The collection systems and laterals from the National Cancer Institute buildings that enter the LSS from the north and south will be decontaminated, capped and abandoned-in-place at the point where they meet the LSS trunk line. Once the new SSP is operational the existing plant will be decommissioned.

Alternatives Evaluated: An Environmental Assessment (EA) has been prepared to evaluate the potential environmental, cultural, transportation and socioeconomic effects associated with the Proposed Action. The Proposed Action includes decommissioning and demolishing the SSP and LSS on Fort Detrick.

One other alternative was considered, but dropped. This alternative incorporated decommissioning of the SSP and decommissioning and abandonment of the LSS. Decommissioning activities would decontaminate the SSP (and associated equipment) and LSS so that there is no remaining laboratory research contaminates associated with the facility. The facility structure and all existing equipment would remain. The deteriorating facility and equipment are past their lifespan and unusable. The facility would remain vacant and ultimately begin to deteriorate into unsafe and unappealing conditions.

As required, a No-Action Alternative was also included in the EA which reflects the status quo and serves as a benchmark against which federal actions can be evaluated. In this EA, the No-Action Alternative assumes Fort Detrick would not decommission or demolish the SSP and LSS system. Although it would not satisfy the purpose of and need for this project, the No-Action Alternative does establish the baseline to which the Action Alternatives can be compared. The new SSP will be in operation and the existing facility would remain in an idle and unused condition. Research contamination concerns of the SSP and LSS would remain with the potential for environmental impacts of laboratory wastes. The facility structure and all existing equipment would remain. The deteriorating facility and equipment are past their lifespan and unusable. The facility would remain vacant and ultimately begin to deteriorate into unsafe and unappealing conditions.

Anticipated Impacts: Based on the analysis contained in the EA, implementation of the Proposed Action is anticipated to result in impacts during demolition and following completion of demolition.

During the demolition activities, the following general and on-going impacts are anticipated: beneficial impacts to land use; minor, beneficial impacts to jobs; short-term, adverse impacts associated with contaminated and hazardous materials and human health and safety; long-term, moderate, adverse impacts to cultural resources; short-term, minor, adverse impacts on topography and previously-disturbed soils, vegetation, transportation, traffic and parking and wildlife; minor, adverse impacts on groundwater; short-term, minor, adverse impacts to air quality and odors; short-term, adverse impacts to noise; and short-term, adverse cumulative impacts. Negligible impacts are anticipated to environmental justice, surface waters and energy. And no impacts are anticipated to the protection of children, geology, and wetlands.

Following completion of demolition activities, the following impacts are anticipated: beneficial impacts to land use, contaminated and hazardous materials, human health and safety, and energy. Negligible impacts are anticipated to jobs, environmental justice, cultural resources, geology and soils, water resources, vegetation and wildlife, wetlands, air quality and odors, noise, and transportation, traffic and parking. It is anticipated that cumulative impacts would be minor.

The Proposed Action will comply with all applicable federal, state and local regulations and permit requirements.

Public Involvement: Agency consultation letters were sent out on 29 November 2018 to appropriate local, state and federal agencies.

The Draft EA and Draft FNSI were made available for public review from {*date*} to {*date*} at the C. Burr Artz Public Library, 110 East Patrick Street, Frederick, Maryland 21701. A Notice of Availability of the Draft EA and Draft FNSI was published in the Frederick News Post and were mailed to interested agencies/parties.

Finding of No Significant Impact: *Anticipated Wording: After a review of the EA, I have determined that the Proposed Action evaluated may be selected for implementation. I have concluded that implementation of the Proposed Action will have no significant impacts to the natural environment, cultural resources or human environment. Therefore, preparation of an Environmental Impact Statement is not required.*

Date: _____

_____
DEXTER NUNNALLY
Colonel, SC
Commanding

ENVIRONMENTAL ASSESSMENT
Decommissioning and Demolition of
Steam Sterilization Plant and Laboratory Sewer System
U.S. Army Garrison Fort Detrick
Fort Detrick, Maryland

Reviewed and
Recommended for Approval by:

_____**Date**_____
DEXTER NUNNALLY
Colonel, SC
Commanding

Reviewed by:

_____**Date** _____
Joseph J. Gortva
Chief, Environmental Management Division

_____**Date**_____
Carl B. Pritchard
Director of Public Works

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, US 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.

The Proposed Action and subject of this EA is the decommissioning and demolition of the Steam Sterilization Plant (SSP) and Laboratory Sewer System (LSS) and associated equipment and facilities, and the resulting impacts to the natural and human environment.

One alternative to the Proposed Action was evaluated in this EA – the No-Action Alternative, which would not decommission or demolish the SSP and LSS system.

This EA characterizes and evaluates the potential environmental impacts associated with the implementation of both the Proposed Action and the No-Action Alternative at Fort Detrick, Maryland.

During the demolition activities, the following general and on-going impacts are anticipated: beneficial impacts to land use; minor, beneficial impacts to jobs; short-term, adverse impacts associated with contaminated and hazardous materials and human health and safety; long-term, moderate, adverse impacts to cultural resources; short-term, minor, adverse impacts on topography and previously-disturbed soils, vegetation, transportation, traffic and parking and wildlife; minor, adverse impacts on groundwater; short-term, minor, adverse impacts to air quality and odors; short-term, adverse impacts to noise; and short-term, adverse cumulative impacts. Negligible impacts are anticipated to environmental justice, surface waters and energy. And no impacts are anticipated to the protection of children, geology, and wetlands.

Following completion of demolition activities, the following impacts are anticipated: beneficial impacts to land use, contaminated and hazardous materials, human health and safety, and energy. Negligible impacts are anticipated to jobs, environmental justice, cultural resources, geology and soils, water resources, vegetation and wildlife, wetlands, air quality and odors, noise, and transportation, traffic and parking. It is anticipated that cumulative impacts would be minor.

The primary conclusions of this EA are:

1. Implementation of the Proposed Action would not result in significant adverse environmental impacts, due to the use of Best Management Practices (BMPs) to mitigate potential impacts during both demolition activities and operation;
2. Implementation of the Proposed Action will fulfill the Purpose and Need for Fort Detrick to upgrade infrastructure and associated facilities, increase efficiency, and discontinue the use of a dilapidated system;
3. Implementation of the Proposed Action is consistent with land use planning objectives at Fort Detrick;

4. Implementation of the No-Action Alternative would not provide Fort Detrick with upgraded infrastructure and associated facilities, would not increase efficiency, and would continue the use of a dilapidated system;
5. Implementation of the No-Action Alternative would not be consistent with the Purpose and Need of the action; and
6. Implementation of the No-Action Alternative would eliminate the negligible to minor environmental impacts associated with the implementation of the Proposed Action, but it would also eliminate the long-term beneficial impacts of the Proposed Action.

Table ES-1: Summary of Impacts of the Proposed Action and No-Action Alternative

RESOURCE CATEGORY	PROPOSED ACTION	NO-ACTION ALTERNATIVE
Land Use	Long-term, beneficial impacts	No Impacts
Socioeconomics	Short-term, beneficial impacts	No Impacts
Environmental Justice	Negligible Impacts	No Impacts
Protection of Children	No Impacts	No Impacts
Waste Management	Short-term, adverse and long-term, beneficial impacts	Long-term, adverse impacts
Human Health and Safety	Short-term, adverse and long-term, beneficial impacts	Negligible Impacts
Cultural Resources	Long-term, moderate, adverse, impacts	No Impacts
Geology and Soils	Short-term, minor, adverse and long-term, beneficial impacts	Long-term, adverse impacts
Water Resources	Short- and long-term, minor, adverse and beneficial impacts	Long-term, adverse impacts
Plant and Animal Ecology	Short-term, minor, adverse impacts	No Impacts
Wetlands	No Impacts	No Impacts
Energy	Negligible Impacts	No Impacts
Air Quality and Odors	Short-term, minor, adverse impacts	No Impacts
Noise	Short-term, minor, adverse impacts	No Impacts
Transportation, Traffic, and Parking	Short-term, minor, adverse impacts	No Impacts

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

THIS PAGE INTENTIONALLY LEFT BLANK

1.0 PURPOSE, NEED AND SCOPE

1.1 INTRODUCTION

Fort Detrick is an U.S. Army Installation Management Command (IMCOM) facility. The U.S. Army Garrison, Fort Detrick (Fort Detrick), provides sustainable base operations support, quality of life programs, and environmental stewardship to facilitate the sustainment of vital national interests. Fort Detrick supports five cabinet-level agencies: The Department of Defense, Department of Veterans Affairs, department of Agriculture, Department of Homeland Security and Department of Health and Human Services. Within the Department of Defense, Fort Detrick supports elements of all four military services. Major Department of the Army (DA) mission partners include the U.S. Army medical Research and Materiel Command and 21st Signal Brigade. The primary missions at Fort Detrick are biomedical research and development, medical logistics and materiel management and global DoD telecommunications.

Fort Detrick is located within the city limits of Frederick in Frederick County, Maryland (Appendix A, Figure 1). Fort Detrick is approximately 45 miles west-northwest of Baltimore and 45 miles northwest of Washington DC. Interstate 70, Interstate 270 and U.S. Route 15 are the three major routes which provide access to the Installation.

Fort Detrick consists of six separate parcels of land designated as Area A, Area B, two parcels that make up Area C, Forest Glen Annex and Glen Haven Housing Area. Areas A, B and C are located in Frederick, Maryland. Within Frederick, Fort Detrick encompasses approximately 1,212 acres, including 69 acres in Area A owned and operated by Frederick National Laboratory for Cancer Research (FNLCR).

1.2 BACKGROUND

The National Environmental Policy Act (NEPA) requires all federal agencies to consider the impact of their proposed actions on the environment in compliance with regulations implementing NEPA promulgated by the Council on Environmental Quality (CEQ; 40 Code of Federal Regulations [CFR] Parts 1500 to 1508). This Environmental Assessment (EA) was prepared for the United States Army Corps of Engineers, Baltimore District, pursuant to NEPA and Army Regulation 200-2, *Environmental Effects of Army Actions*, as promulgated in 32 CFR 651 by the US Army Garrison (USAG), Fort Detrick, Maryland.

The Steam Sterilization Plant (SSP) and Laboratory Sewer System (LSS) were built in 1953 in support of Fort Detrick's biological research activities. The existing SSP is contained mainly within Building 375. Most of the building is one-story, with a partial basement that houses the six 50,000-gallon main storage tanks at the lowest level and pump rooms at an intermediate level. The entire SSP facility is approximately 24,000 Square Feet (SF). The partial basement is approximately 40 feet deep and covers approximately 7,500 SF. There are also nine 50,000-gallon auxiliary storage tanks north of the SSP at Building 384 which is classified as a containment dike.

The six 50,000-gallon tanks in the basement of Building 375 receive the gravity-fed initial inflow, which is made up of biological waste water and potentially contaminated. The inflow is

then pumped into one of the nine 50,000-gallon exterior tanks at Building 384 to await treatment. The waste water is then released back via gravity to the SSP for treatment. The treated water is then discharged into the sewer system.

The current SSP operates 8 hours a day for 3-4 days per week, throughout the year. Approximately 50,000-gallons of laboratory wastewater is treated at the steam sterilization plant during an 8 hour shift. All laboratories located at Fort Detrick, with the exception of the existing U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID), have independent sterilization facilities for the decontamination of laboratory wastes. A new USAMRIID SSP is expected to be operating in the near future. The existing SSP will not be necessary for decontamination activities once the new USAMRIID SSP is operational.

The existing LSS is a subsurface sewer system, entirely separate from the sanitary sewer system, used for the collection of potentially contaminated wastewater and conveyance of that wastewater generated by laboratory activities at the existing USAMRIID facilities (Buildings 1408, 1412, and 1425) and the U.S. Department of Agriculture (USDA) Greenhouse 374, to the existing Steam Sterilization Plant (SSP) for sterilization by injection of steam, providing the required pretreatment in accordance with Biosafety in Microbiological and Biomedical Laboratories (BMBL) standards for USAMRIID laboratory activities involving dangerous and highly infectious etiologic agents (U.S. Army Garrison, 2006).

The LSS traverses Fort Detrick from Buildings 1425 and 1412 to Building 375 at depths ranging from four feet to over 20 feet. The pipe varies in size up to 12-inch, and is encased in a 3-foot-square concrete box for its entire length. There is approximately 12,480 linear feet of laboratory sewer line on post. Some of the LSS is not in use and has been abandoned.

A Leak Detection Investigation was performed in 1995 on the entire LSS line and the investigation found leakage in several spots. Approximately a third of the LSS was replaced due to suspected leakage. That section was abandoned in place and replaced with a parallel line in 2001.

The U.S. Army Corps of Engineers (USACE) is currently conducting Phase I Assessments associated with the USAMRIID laboratory decommissioning activities. The intent of the Phase I Assessment activities is to identify where chemical, radiological and other hazardous materials/wastes were either used or contained (asbestos, lead based paint, etc.) in buildings. The Phase I Assessment will include an archive search for historical information, interviews with current/former employees and site investigations. The Phase I Assessment will summarize the findings and be used to conduct future physical phase II assessments (sampling). The legacy SSP and LSS will be included in Phase I Assessment activities.

The Proposed Action, and the subject of this EA is the decommissioning and demolition of the SSP (Building 375) and LSS, and their associated appurtenances, including under-ground and above-ground tanks. This EA also evaluates the No-Action Alternative to the Proposed Action. This document will update information in the 1997 Fort Detrick EA that covered the abandonment of the LSS and the deactivation of the SSP, and will also include an evaluation of impacts associated with demolition activities.

1.3 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action detailed in this EA is to implement the projects detailed in Section 2.0 on Fort Detrick. The Proposed Action is needed because Fort Detrick is in the process of locating the functions of the SSP and the LSS to new facilities located at Fort Detrick. In addition, the LSS had been previously confirmed to be leaking into the subsurface soils, and there is potential for leakage to impact groundwater (Department of the Army, 1997). However, the portion of the LSS previously known to be leaking (lower third) was repaired (STV and Gallup, 2009). With the exception of the current SSP, all laboratories generating potentially infectious waste have independent sterilization facilities that decontaminate laboratory wastes prior to discharge into the domestic sanitary sewer system. This eliminates the requirement of transporting wastes closer to the source. The independent treatment facilities also utilize current technology and equipment for the decontamination of potentially infectious laboratory wastewater. This serves to minimize potential risk and reduce repair and maintenance.

1.4 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

This EA was prepared to analyze the potential environmental impacts associated with the decommissioning and demolition of the SSP (Building 375) and LSS, and their associated appurtenances, including under-ground and above-ground tanks at Fort Detrick, Maryland.

Environmental impacts would include those related to construction and operation of the Proposed Action. Section 2.0 contains a detailed description of the Proposed Action, Section 3.0 contrasts the alternatives, Section 4.0 describes the affected environment and Section 5.0 analyzes the impacts of the alternatives. Section 6.0 provides a list of references used to develop this EA and Section 7.0 includes acronyms and abbreviations found throughout the EA.

1.5 OTHER RELATED NEPA DOCUMENTATION

In accordance with CEQ regulations for implementing NEPA and with the intent of reducing the size of this document, the following materials relevant to the Proposed Action are incorporated by reference:

- United States Army Garrison, Fort Detrick. 2010. *Environmental Assessment for the Real Property Master Plan for Army-Controlled Land at Areas A and C of Fort Detrick, in Frederick County, Maryland.*

- United States Army Garrison, Fort Detrick. 2006. *Final Environmental Impact Statement for the 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.*

- United States Army Garrison, Fort Detrick. 1997. *Environmental Assessment for the Construction of Two Sterilization Facilities, Conversion and Abandonment of the Laboratory Sewer System, and Deactivation of the Steam Sterilization Plant.*

- Project Support Documentation, *In Support of a Project for Steam Sterilization Plant Decommissioning and Demolition*, August 2009.

1.6 PUBLIC INVOLVEMENT

A Public Notice was released on 29 November 2018 to appropriate local, state and federal agencies. In addition, coordination with the U.S. Fish and Wildlife Service (USFWS), the Maryland Department of Natural Resources (MDNR) and the Maryland State Historic Preservation Officer (SHPO) were initiated on 29 November 2018. Copies of the Public Notice, coordination letters, mailing lists and response letters are included in Appendix B.

Public participation opportunities with respect to this EA and decision making on the Proposed Action are guided by 32 CFR Part 651. The Draft EA was made available to the public for 30 days, from {*Insert date*} to {*Insert date*}, along with a Draft Finding of No Significant Impact (FNSI). At the end of the 30-day public review period, {*Anticipated wording: no comments were received on the Proposed Action, Draft EA or Draft FNSI.*} As such, the Army will execute the FNSI and proceed with implementation of the Proposed Action; the Proposed Action will not result in significant impacts, and preparation of an Environmental Impact Statement (EIS) is not needed.

1.7 ENVIRONMENTAL LAWS AND REGULATIONS

Army decisions that affect environmental resources and conditions occur within the framework of numerous laws, regulations and Executive Orders (EOs). Some of these authorities prescribe standards for compliance while others require specific planning and management actions to protect environmental values potentially affected by Fort Detrick actions. These include, but are not limited to: the Clean Air Act (CAA); Clean Water Act (CWA); Noise Control Act; Endangered Species Act (ESA); Bald Eagle Protection Act; Migratory Bird Treaty Act; National Historic Preservation Act (NHPA); Archaeological Resources Protection Act; Native American Graves Protection and Repatriation Act; American Indian Religious Freedom Act; Resource Conservation and Recovery Act; EO 11988, *Floodplain Management*; EO 11990, *Protection of Wetlands*; EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*; EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*; EO 13112, *Invasive Species*. Key provisions of appropriate statutes and EOs and compliance are described in more detail throughout the text of this EA and in Table 1-1.

Table 1-1: Compliance with Federal Environmental Statutes and Executive Orders

ACTS	COMPLIANCE
Clean Air Act, as amended (42 United States Code [U.S.C.] ch. 85, subch. I §7401 et seq.)	FULL
Clean Water Act, as amended (33 U.S.C. ch. 23 §1151)	FULL
Coastal Zone Management Act (16 U.S.C. ch. 33 §1451 et seq.)	FULL
Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (42 U.S.C. §9601 et seq.)	FULL
Endangered Species Act of 1973, as amended (16 U.S.C. ch. 35 §1531 et seq.)	FULL
Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e)	FULL
Migratory Bird Treaty Act (16 U.S.C §§703-712, et seq.)	FULL
National Environmental Policy Act of 1969 (42 U.S.C. §4321 et seq.)	FULL
National Historic Preservation Act of 1966, as amended (16 U.S.C. ch. 1A, subch.II §470 et seq.)	FULL
Noise Control Act of 1972, as amended (42 U.S.C. §§4901-4918, et seq.)	FULL
Resource Conservation and Recovery Act (42 U.S.C. ch. 82 §6901 et seq.)	FULL
Safe Drinking Water Act, as amended (42 U.S.C. §300f)	FULL
Toxic Substances Control Act of 1976 (15 U.S.C. ch.53, subch. I §§2601-2629)	FULL
Watershed Protection and Flood Prevention Act of 1954 (16 U.S.C. §1101, et seq.)	FULL
North American Wetlands Conservation Act (16 U.S.C. 4401-4412)	FULL
Sikes Act, as amended (16 U.S.C. 670a-670o)	FULL
Archaeological Resources Protection Act, as amended (16 U.S.C. §§470aa-470mm)	FULL
EXECUTIVE ORDERS (EO)	
Floodplain Management (EO 11988)	FULL
Protection of Wetlands (EO 11990)	FULL
Environmental Justice in Minority Populations and Low-Income Populations (EO 12898)	FULL
Federal Compliance with Pollution Control Standards (EO 12088)	FULL
Protection of Children from Environmental Health Risks and Safety Risks (EO 13045)	FULL
Invasive Species (EO 13112)	FULL
Consultation and Coordination with Indian Tribal Governments (EO 13175)	FULL
Efficient Federal Operations (EO 13834)	FULL
Chesapeake Bay Protection and Restoration (EO 13508)	FULL

THIS PAGE INTENTIONALLY LEFT BLANK

2.0 DESCRIPTION OF PROPOSED ACTION

The Proposed Action will consist of the decommissioning and demolition of the SSP and LSS. Building 375 (the existing SSP) will be decommissioned when the new USAMRIID SSP is completed. The demolition project will remove approximately 24,138 gross square feet (gsf) (the existing SSP). Approximately 5,440 linear feet of existing LSS piping will be abandoned-in-place or demolished. Building 375, all tanks and the LSS will all be decontaminated prior to demolition (Appendix A, Figure 2). Deactivation and decontamination activities associated with the existing SSP, and disinfection and abandonment of the LSS were evaluated in the February 1997 EA for the *Construction of Two Sterilization Facilities, Conversion and Abandonment of the Laboratory Sewer System, and Deactivation of the Steam Sterilization Plant*, prepared by U.S. Army Garrison (USAG), Fort Detrick, and are therefore, not evaluated within this document. The main trunk line of the LSS between Buildings 1425 and 375 will be abandoned-in-place or demolished. The collection systems and laterals from the National Cancer Institute (NCI) buildings that enter the LSS from the north and south will be decontaminated, capped and abandoned-in-place at the point where they meet the LSS trunk line. Once the new SSP is operational the existing plant will be decommissioned.

This will fulfill the purpose and need for the Proposed Action by decontaminating the SSP (and associated equipment) and LSS so that there is no remaining laboratory research contaminates associated with the facility. The SSP facility, including all associated equipment, will be demolished and the site will be reclaimed for future use. The LSS will be rendered unusable and abandoned in place.

THIS PAGE INTENTIONALLY LEFT BLANK

3.0 ALTERNATIVES CONSIDERED

3.1 INTRODUCTION

This section discusses screening criteria, alternatives that were evaluated in this EA and alternatives that were eliminated from further consideration. It was important for Fort Detrick to consider a range of reasonable alternatives in order to find the best fit for their mission.

In addition to the Proposed Action discussed in Section 2.0, potential alternative actions to address Fort Detrick's needs for expansion were identified and considered. Only the Proposed Action and the No-Action Alternative have been carried forward for detailed discussion in Sections 4.0 and 5.0 of this document.

3.2 NO-ACTION ALTERNATIVE

The No-Action Alternative, is to not decommission or demolish the SSP and LSS system. Although it would not satisfy the purpose of and need for this project, the No-Action Alternative does establish the baseline to which the Action Alternatives can be compared. The new SSP will be in operation and the existing facility would remain in an idle and unused condition. Research contamination concerns of the SSP and LSS would remain with the potential for environmental impacts of laboratory wastes. The facility structure and all existing equipment would remain. The deteriorating facility and equipment are past their lifespan and unusable. The facility would remain vacant and ultimately begin to deteriorate into unsafe and unappealing conditions.

3.3 PROJECT ALTERNATIVES CONSIDERED BUT DROPPED

This alternative incorporates decommissioning of the SSP and decommissioning and abandonment of the LSS. Decommissioning activities would decontaminate the SSP (and associated equipment) and LSS so that there is no remaining laboratory research contaminates associated with the facility. The facility structure and all existing equipment would remain. The deteriorating facility and equipment are past their lifespan and unusable. The facility would remain vacant and ultimately begin to deteriorate into unsafe and unappealing conditions. Therefore, it was determined that this is a non-viable alternative and it was eliminated from further evaluation in this EA.

THIS PAGE INTENTIONALLY LEFT BLANK

4.0 AFFECTED ENVIRONMENT

4.1 LAND USE

Fort Detrick, which is situated within the limits of the City of Frederick, Frederick County, Maryland maintains its own land use planning, which is designed to conform and complement local community planning to the maximum extent possible (U.S. Army Garrison, 2006). Fort Detrick is primarily surrounded by medium to low density residential development as well as Frederick County Community College. The Project Area (Area A) of Fort Detrick is approximately 797 acres and is the largest and most intensively developed of the four parcels, comprised of administrative buildings, community service facilities, recreation areas, advanced research and development complexes, communications facilities, and military and family housing units (U.S. Army Garrison, 2006). The SSP is located near the western Area A property boundary in a highly-developed area surrounded by several buildings, roads and parking areas, and the LSS extends from the SSP, generally to the northeast toward the interior of the property, within the subsurface through highly-developed areas comprised of multiple buildings and facilities, and with little green space except for non-contiguous, maintained grassy areas.

The decommissioning and demolition of the SSP and LSS is addressed in concept within the 2010 Environmental Assessment for the Real Property Master Plan for Army-Controlled Land at Areas A and C of Fort Detrick.

The LSS originates in an area designated Research and Development, according to Appendix A, Figure 3 land use mapping produced by the Directorate of Public Works at Fort Detrick, dated April 2014. According to this mapping, the LSS then runs in a northeast-to-southwest direction toward the SSP through a land use area designated as Community Facility, located approximately between Veterans Drive and Ditto Avenue. From there, the LSS passes within the subsurface of a land use category designated as Recreational, along Chandler Street between Ditto Avenue and Doughten Drive. The National Cancer Institute – Frederick is located along Chandler Street between Doughten Drive and Boyles Street, and is shown in the white area in Appendix A, Figure 3 – 2014 Existing Landscape Map. A large portion of the LSS is located within the subsurface of this area. This National Cancer Institute – Frederick area is located immediately adjacent to the east of an area designated as Research and Development, within which the SSP and the LSS above-ground tanks are located.

4.1.1 Land Use Controls

Fort Detrick's 2016 Installation Action Plan (IAP) outlines the total multiyear cleanup program for the installation. The plan identifies environmental cleanup requirements at each site or area of concern (AOC), and proposes a comprehensive, installation-wide approach, along with the costs and schedules associated with conducting investigations and taking the necessary remedial actions (RA). The IAP incorporates several Land Use Controls (LUC) and land use restrictions for areas included in the IAP, including media specific restrictions which serve to prohibit, or otherwise manage excavation, and landfill restrictions, prohibiting activities that would impact landfill caps or cover systems and associated drainage systems (Fort Detrick, 2016).

4.2 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND PROTECTION OF CHILDREN

Socioeconomic data are provided in this section to establish baseline conditions. Data consist primarily of publicly-available information about Frederick County.

Executive Order (EO) 12898 declared that each federal agency will make environmental justice part of its mission. Environmental justice focuses on the protection for racial and ethnic minorities and/or low-income populations to be disproportionately affected by project-related impacts. Analysis of environmental justice is initiated by determining the presence and proximity of these segments of the population relative to the specific locations that would experience adverse impacts to the environment. As defined for the purposes of identifying relevant populations, minority areas are census block groups with a 50 percent or greater proportion of the population consisting of racial minorities, including those of Hispanic origin. Poverty areas are defined as census block groups where 20 percent or more of the population lives in households with incomes below the poverty line.

EO 13045, Protection of Children from Environmental Health Risks and Safety Risks, requires federal agencies to identify, assess, and address disproportionate environmental health and safety risks to children from federal actions.

4.2.1 Population Trends

Table 4-1 shows population in Frederick County, the State of Maryland, and the United States from 1990 to 2010.

Table 4-1: Population, 1990-2010

AREA	1990	2000	2010	CHANGE 1990 TO 2000 (%)	CHANGE 2000 TO 2010 (%)	CHANGE 1990 TO 2010 (%)
Frederick County	136,694	195,277	233,385	30	17	42
Maryland	4.8 million	5.3 million	5.8 million	10	9	19
United States	249.6 million	282.2 million	309.3 million	13	10	21

Sources: Maryland Manual Online; U.S. Census American Fact Finder Profile of General Population and Housing Characteristics: 2010 (Frederick County); U.S. Army Garrison, 2006.

4.2.2 Demographics

Table 4-2 shows Frederick County race in comparison to Maryland and the United States, according to the 2010 U.S. Census.

Table 4-2: Race, Alone or in Combination[1], 2010

AREA	WHITE (%)	BLACK OR AFRICAN AMERICAN (%)	ASIAN (%)	HISPANIC OR LATINO (%)	AMERICAN INDIAN OR ALASKA NATIVE (%)	NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER (%)
Frederick County	84	9.9	4.7	7.3	0.9	0.1
Maryland	60.4	30.9	6.4	8.2	1	0.2
United States	74.8	13.6	5.6	16.3	1.7	0.4

Source: U.S. Census American Fact Finder Profile of General Population and Housing Characteristics: 2010 (Frederick County)

Table 4-3 below presents data on educational attainment for Frederick County, the State of Maryland, and the United States as of the 2010-2014 5 year estimates.

Table 4-3: Educational Attainment[2], 2010-2014, 5-year Estimates

LEVEL OF EDUCATION	FREDERICK COUNTY (%)	MARYLAND (%)	UNITED STATES
Did not complete high school	8	7	8
High school or equivalent, no college	25	26	28
Some college or Associate degree	28	26	29
Bachelor's degree or advanced degree	39	37	29

Source: U.S. Census American Fact Finder Educational Attainment 2010-2014 American Community Survey 5-Year Estimates (Frederick County)

Table 4-4 below provides household characteristics data for Frederick County, the State of Maryland, and the United States.

[1] Respondents were able to identify themselves as one or more races so percentage totals may exceed 100 percent.
[2] Educational attainment for individuals aged 25 years or older.

Table 4-4: Household Characteristics, 2010

AREA	POPULATION IN HHS[3]	TOTAL HHS	AVG. HH SIZE	% FAMILY HH	MEDIAN HH INCOME	MEDIAN INCOME FOR WORKERS WITHIN HH	HHS BELOW POVERTY LEVEL	% HHS BELOW POVERTY LEVEL
Frederick County	229,203	84,800	2.7	72.2	$81,686	$41,872	1,530	2.9
Maryland	5,635,177	2,156,411	2.6	67.1	$70,647	$38,261	173,696	8.2
United States	300,758,215	114,235,996	2.6	66.4	$51,914	$29,701	14,865,322	13.0

Source: U.S. Census American Fact Finder 2010; 2006-2010 American Community Survey 5-year Estimates

4.2.3 Employment and Income

Frederick County's three largest employers are Fort Detrick, Frederick County Public Schools, and Frederick Memorial Healthcare. According to the City of Frederick, Fort Detrick employs approximately 6,400 individuals, which includes military, civilian and National Cancer Institute employees (City of Frederick, 2016). Table 4-5 below provides labor force statistics for Frederick County, the State of Maryland, and the United States.

Table 4-5: Labor Force, Employment, and Unemployment in 2000 and 2010

AREA AND TIMEFRAME		LABOR FORCE	EMPLOYED	UNEMPLOYED	UNEMPLOYMENT RATE[4] (%)
Frederick County	2000	107,151	102,856	3,289	2.2
	2010	128,268	121,237	6,120	4.8
	% Change 2000 to 2010	8	8	5	4.5
Maryland	2000	2,811,657	2,711382	100,275	3.6

Source: U.S. Census American Fact Finder Profile of Selected Economic Characteristics: 2000; 2006-2010 American Community Survey 5-year Estimates

Table 4-6 provides data on average annual pay in Frederick County, the State of Maryland and the United States for the years 2000 and 2010.

[3] By definition, population in households consists of the resident population, excluding people living in group quarters (i.e. 9 or more people living together who are unrelated to the householder).
[4] Changes in the unemployment rate from 1990 to 2000 are expressed in terms of percentage points

Table 4-6: Average Annual Pay[5], 2001-2010

AREA	2001	2010	CHANGE (%)
Frederick County[6]	$36,020	$58,360	38
Maryland	$36,750	$50,880	28
United States	$34,020	$44,410	23

Source: U.S. Bureau of Labor Statistics 2001 and May 2010 Bureau of Labor Statistics Occupational Employment Statistics (OES) Survey

4.2.4 Environmental Justice

Appendix A, Figure 4 shows minority population areas (Census Block Groups with populations that are 50 or more percent minority) in Frederick County that exist within one mile of the Project Area. The Project Area is located in Census Tract 751201, Block Group 1, and is not located within an area that has a population of greater than 50 percent minority. Table 4-7 below lists the block groups with populations that are greater than 50 percent minority within one mile of the Project Area.

Table 4-7: Minority Population Areas in Frederick County Within One Mile of the Proposed Project Site

GEOGRAPHIC ID	CENSUS TRACT	BLOCK GROUP DESCRIPTION	TOTAL POPULATION	MINORITY POPULATION	PERCENTAGE MINORITY (%)
240217505041	750504	Block Group 1	2,144	1,620	75.6
240217507022	750702	Block Group 2	839	710	84.6
240217505034	750503	Block Group 4	477	318	66.7
240217505044	750504	Block Group 4	333	223	67.0

Source: U.S. Census American Community Survey 2014, Table X02: Race.

Appendix A, Figure 5 shows low-income population areas in Frederick County located within one mile of the Project Area. The Project Area is not located within a low-income area. Table 4-8 below lists the block groups with populations of 10 percent or more below the poverty line.

[5] Average annual pay for all employees covered by unemployment insurance

[6] BLS Baltimore, MD PMSA data used for 2001 information and Bethesda-Frederick-Gaithersburg, MD Metropolitan Division used for 2010 information.

Table 4-8: Low-income Population Areas (> 10%) in Frederick County Within One Mile of the Proposed Project Site

GEOGRAPHIC ID	CENSUS TRACT	BLOCK GROUP DESCRIPTION	TOTAL POPULATION	MINORITY POPULATION	PERCENTAGE MINORITY (%)
240217505041	750504	Block Group 1	2144	738	35.5
240217505034	750503	Block Group 4	477	92	22.0
240217507022	750702	Block Group 2	839	168	19.6
240217508013	750801	Block Group 3	749	138	18.2
240217507021	750702	Block Group 1	1562	328	17.8
240217508012	750801	Block Group 2	1483	250	16.7
240217505051	750505	Block Group 1	2419	321	14.0
240217505044	750504	Block Group 4	333	49	13.9
240217508011	750801	Block Group 1	814	94	12.6
240217651002	765100	Block Group 2	928	112	12.4
240217501001	750100	Block Group 1	646	71	11.2

Source: U.S. Census American Community Survey 2015, Table B17021: Poverty Status of Individuals in the Past 12 Months.

4.2.5 Protection of Children

A Child Development Center (CDC) is located at Fort Detrick on Ditto Avenue (Building 1776), which provides quality full-time and hourly child care for children aged 6 weeks through 5 years. Small ratio groups are available for addressing individualized needs for each child. Children of active duty military personnel, appropriated and non-appropriated Department of Defense (DoD) civilian personnel, reservists and National Guard on active duty or during inactive duty training, and DoD contractors working at Fort Detrick may use the services provided by the program. The CDC is nationally accredited through the National Association for the Education of Young Children (NAYEC) (CDC website, 2016).

In addition, School Age Center (SAC) provides affordable before-school and after-school care in a program that meets the needs of youth and parents. The SAC provides programs which help youth to grow and develop in a positive way. The program offers age appropriate activities which promote the social, emotional, cognitive and physical development of youth. The SAC program provides age appropriate activities and events in four (4) service areas: Sports and Fitness; Mentoring, Intervention, and Support Services; Leisure and Recreation; and Life Skills, Citizenship, and Leadership.

The Youth Center provides activities for youth typically in grades 6-12. Through formal partnerships with nationally-recognized youth-serving organizations such as 4-H and Boys & Girls Clubs of America (BGCA) youth have access to programs, standardized curricula, special events, camps, scholarships, and more. Computer labs and homework assistance are available at every Youth Center. There are two components to the Youth Program: The Middle School Program is generally for youth in grades 6-8 and the Teen Program is generally for youth in grades 9-12. The Youth Program is open after school, school closures and summer. Specialty camps and trips are held throughout the year.

Fort Detrick also offers Family Child Care (FCC) services as an alternative to center-based care for children aged six weeks through 12 years. FCC is in-home care provided by an adult who is certified by Child Development Services (CDS) in CDS-certified government quarters or a state-licensed home located off-post. Children of active-duty service members, DoD civilians, and contractor employees at Fort Detrick are eligible for the program (FCC website, 2016).

4.3 WASTE MANAGEMENT

4.3.1 Wastewater

As previously stated, the existing LSS conveys potentially infectious wastewater generated by laboratory activities at the existing USAMRIID facilities and the USDA Greenhouse 374 to the existing SSP for sterilization by injection of steam, providing the required pretreatment in accordance with BMBL standards for USAMRIID laboratory activities involving dangerous and highly infectious etiologic agents (U.S. Army Garrison, 2006).

Fort Detrick hosts specialized laboratories that are designed to maximize the protection of scientists while conducting research to protect our nation. These labs are designed with redundant systems to ensure uninterrupted power, engineered controls including negative airflow, and sterilized waste streams that prevent exposure to employees and the community. Laboratories at Fort Detrick produce biological waste that cannot be reliably treated by the standard processes used at the wastewater treatment plant (WWTP). Laboratory research wastewater is treated by multiple processes to ensure the protection of the community and environment. Laboratory wastewater is sterilized using chemical and thermal treatment methodologies prior to being introduced into the domestic sanitary waste stream. Chemical sterilization is conducted at the initial disposal location within the laboratories. The waste then flows to the laboratories steam sterilization facility for thermal sterilization. This redundant process ensures the safety of the community and environment. The sterilized wastewater is mixed with domestic sanitary wastewater for final treatment at the Fort Detrick WWTP.

The current SSP operates 8 hours a day for 3-4 days per week, throughout the year. Approximately 50,000-gallons of laboratory wastewater is treated at the steam sterilization plant during an 8 hour shift. Operating procedures for the steam sterilization disinfection activities have a cycle time of approximately 3 hrs. The system is pre-warmed to 120°F, it is then held at 190°F for 60 minutes and finally it is held at 270°F for 20 minutes. A cool down time is required before discharge. Post disinfection fecal coliform monitoring is conducted daily on days of operation. All laboratory disinfected wastes are discharged and combined with domestic sanitary wastes within the Fort Detrick sanitary sewer system for ultimate treatment at the Fort Detrick WWTP.

4.3.2 Solid Waste and Recycling

The Fort Detrick Municipal Landfill is located in Area B (outside of the current Project Area), and is comprised of approximately 61 acres. The landfill is permitted to accept domestic, municipal, commercial, industrial, agricultural, sylvicultural, and construction waste generated at Fort Detrick (U.S. Army Garrison, 2006). Types of waste that are not permitted to be accepted at the landfill include controlled hazardous substances, liquid waste, special medical waste,

radioactive materials, automobiles, large containers such as drums and tanks (unless emptied and flattened or crushed), animal carcasses, untreated sewage, truckloads of separately collected yard waste, and tires (U.S. Army Garrison, 2006).

The Fort Detrick Municipal Landfill will not accept any wastes generated by the construction of new buildings and the U.S. Army Garrison has an established policy that dictates that all construction debris generated from buildings at Fort Detrick must be disposed of at an off-post location. All construction contractors are responsible for the disposal of wastewater, municipal solid waste, construction debris, and hazardous wastes generated by their activities, at permitted facilities located outside of Fort Detrick in accordance with Federal, state, and local regulatory requirements (U.S. Army Garrison, 2010). In addition, in accordance with Army policy for *Sustainable Management of Waste in Military Construction, Renovation, and Demolition Activities*, and EO 13834, all contracts will include a performance requirement for 50 percent minimum diversion of construction and demolition waste by weight from landfill disposal (U.S. Army Garrison, 2010).

In accordance with its operating permit, the Fort Detrick Municipal Landfill has groundwater monitoring wells installed to detect leaks, and a leachate disposal system to collect waste liquids percolating through the landfill, which are then pumped to Area A (Project Area) for discharge into the sanitary sewer system and treatment at the Fort Detrick WWTP (U.S. Army Garrison, 2006).

Pollution prevention practices at Fort Detrick include source reduction, closed-loop recycling, other types of recycling, energy recovery, and hazardous waste treatment or disposal (U.S. Army Garrison, 1997). variety of materials at Fort Detrick are recycled, including newspaper, white paper, cardboard, glass, aluminium 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, Pennsylvania and Fort Meade, Maryland. Waste oil is also recycled at Fort Detrick. A contracted recycling firm collects the waste oil from various points on the Installation (U.S. Army Garrison, 2016).

4.3.3 Medical Waste

All medical waste generated at Fort Detrick is managed in accordance with BMBL guidelines and applicable Federal, DA, USAG, and state regulations for the protection of transporters and the public from potential hazards associated with potential contaminants (U.S. Army Garrison, 2016). Special Medical Waste, as defined under COMAR 26.13.11.02 includes anatomical material, blood, blood-soiled articles, contaminated material (microbiological laboratory waste, feces of an individual diagnosed as having a disease that may be transmitted to another human being through the feces, articles soiled with feces of an individual diagnosed as having a disease that may be transmitted to another human being through the feces, or articles that have come into contact with a known infectious agent), microbiological laboratory waste (containing an infectious agent and including cultures or stocks of infectious agents and associated biologicals), and sharps (syringes, needles, surgical instruments, or other articles capable of cutting or puncturing human skin). Treatment (disinfection) of special medical waste and disposal by

incineration at Fort Detrick are in accordance with COMAR 10.06.06.04 and 10.06.06.06, respectively.

Fort Detrick operates two medical waste incinerators under Refuse Disposal Permit No. 2005-WIN-0341 issued by the MDE WMA effective through 29 June 2010 and CAA Title V Part 70 Operating Permit (No. 24-021-00131) issued by MDE ARMA effective through 31 March 2009 (U.S. Army Garrison, 2006). Each medical waste incinerator has a capacity of 1,000 lbs (0.5 tons) per hour. Currently, the medical waste incinerators are operated 8 hours a day, 5 days a week, and dispose of an average of approximately 3 tons of medical waste per day. 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 (U.S. Army Garrison, 2006).

4.3.4 Hazardous Waste

Under the provisions of the Resource Conservation and Recovery Act (RCRA), Area A of Fort Detrick is registered as a large quantity generator of hazardous wastes (EPA Identification (EPA ID) No. MD8211620267). This EPA ID No. applies only to hazardous waste generated on the Army-owned portion of Area A. Separate EPA ID numbers have been issued by the EPA to the USAG for Area B, and to the National Cancer Institute at Frederick (NCI-Frederick). It is anticipated that the NIAID IRF, DHS NBACC, and Cogeneration Utility Plant (CUP) facilities will be separately registered when they become operational. RCRA is administered in Maryland by the MDE Hazardous Waste Program through regulatory requirements for Controlled Hazardous Substances (COMAR 26.13).

Hazardous wastes may not be disposed of through the Fort Detrick sanitary sewers or to the LSS. With rare exceptions, hazardous waste or spent hazardous material that is generated on the Installation (subject to the Garrison's EPA ID number Area A) is collected by the generator within Satellite Accumulation Points (SAPs).

There are two 90-day hazardous waste storage sites on the Army-owned portion of Area A. The 90-day site at Building 262 is operated by the Garrison's Hazardous Materials Management Operation (HMMO). There is also a 90-day site operated by USAMRIID at Building 1425. Within 90 days after the accumulation start date (the date that a hazardous waste leaves the SAP), the hazardous waste must be removed from the Installation for shipment to a properly permitted offsite Treatment, Storage, and Disposal Facility (TSDF). The Garrison 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), Operational Services Command (OSC), Federal, state, and TSDF requirements.

With the exception of hazardous waste generated at USAMRIID, hazardous waste is transported from a SAP to the Garrison's 90-day hazardous waste storage site prior to being transported from Fort Detrick. At USAMRIID, the hazardous waste is transported from the RIID SAPs to the 90-day site at Building 1425.

Area A of Fort Detrick (the subject of this EA) historically housed the main laboratories and research facilities for investigating biological agents and developing dispersal methods or weaponization means for those agents, along with providing limited production capabilities of biological warfare (BW) agents (Fort Detrick, 2016). BW testing using agents and simulants that mimicked an agent included small scale laboratory tests and tests within enclosed chambers located inside buildings. Larger-scale open-air field tests conducted at Detrick were limited to use of BW simulants or a limited amount of anti-crops agents. Army installations located elsewhere provided large-scale production facilities or field locations for pathogen tests. Investigators Tests conducted with the pathogenic agents included bacteria, rickettsia, viruses, fungi, or toxins derived from living organisms (Fort Detrick, 2016).

Since the inception of BW research and development on Fort Detrick, the Army's primary safety concern was preventing releases of the BW agents to the surrounding environment. As such, Fort Detrick made extensive efforts to contain BW agents within the laboratories, test chambers, pilot plants and other facilities on the installation. Additionally, Detrick prohibited open air testing of BW agents on post, limiting the field tests to the use of BW simulants, non-toxic substance that mimicked the properties of the pathogens being tested in the laboratories. Field test also included a limited amount of anti-crops agents, the testing of which was timed in order to eliminate any potential threat to local crops. Area A is the center of Fort Detrick's activity, which has historically included a mix of both scientific research and development; and industrial support activities. The scientific research and development activities included laboratory testing of BW agents (e.g., anti-crop) and outdoor testing of simulants and anti-crop agents. Industrial support activities ranged from fuel storage, dispensing and use operations; vehicle maintenance (e.g., mechanical and wash racks), boiler operations, pest management, and various disposal activities (incineration, burn pit and burial) (Fort Detrick, 2016).

Anti-crop research was conducted at Area A, some of which included biological agents as well as chemical herbicides and defoliants. Small amounts of the herbicide 2, 4, 5-T (trichlorophenoxyacetic acid), one of the major components of what is known as Agent Orange, were used in tests at Area A (Fort Detrick, 2016).

The chlorinated solvents trichloroethylene (TCE) and perchloroethylene (PCE) were used for degreasing operations on Area A. Records identified the use of TCE in three Area A buildings for refrigeration and/or freeze-drying purposes for test chambers and other activities dating back to the 1960s. Accidental leaks or spills from a refrigeration operation in Building 568 resulted in TCE contamination of groundwater on Area A (Fort Detrick, 2016).

Industrial operations involving petroleum fuel storage, dispensing and use had associated infrastructure such as underground fuel lines, pumping/dispensing areas, and storage tanks [both above ground storage tanks (ASTs) and underground storage tanks (UST)]. As a result of infrastructure failure and accidental releases, Fort Detrick has a number of sites with historical petroleum contamination including gasoline releases from USTs associated with a former motor pool at Building 940 and #6 fuel oil from USTs at the Building 190 boiler plant (Fort Detrick, 2016).

4.4 HUMAN HEALTH AND SAFETY

An Investigation and Health Risk Evaluation was performed from October 1995 through July 1996 to confirm the presence or absence of the potential for biological and chemical health risks to occur due to potential liquid leaks in the LSS (Department of the Army, 1997). The investigation concluded that there were both chemical and microbial evidence at each study site to conclude that LSS wastewater is leaking into the subsurface soil at selected sites. However, there was no conclusive evidence that LSS wastewater had leaked into the groundwater below the study sites, but the data could not rule out the possibility of eventual transport of LSS hazards to the groundwater. The report identified the most probable exposure pathways to the public to guide Fort Detrick in performing appropriate response actions, in the event that the groundwater beneath the study sites becomes impacted in the future. The investigation also concluded that there were no [current] health risks from LSS contents, which were thought to be potentially impacting the groundwater, however, site excavation workers may be exposed to contaminants in the soil at the study sites (Department of the Army, 1997). The extent of soil impacts could not be defined with the data from the 1997 Investigation, and there was no confident indication at the time of the report that the groundwater had been impacted (Department of the Army, 1997).

Many of the tenant laboratories contributing to the LSS are involved in experimental investigations involving animals, plants, microorganisms, viruses, and human tissues. Most of the laboratory waste is not expected to contain viable organisms within the LSS, however, the investigation phase of the 1997 Investigation, detected a range of viable microbes both within the LSS and within the soil surrounding the system. The Standard Operating Procedures (SOPs) at the laboratories are designed to autoclave infectious materials and to sanitize other material before disposal and entry into the LSS, however, the potential for viable infectious (primarily fecal coliform) organisms to be present within the LSS is a consideration and was documented in the 1997 Investigation Report (Department of the Army, 1997).

4.5 CULTURAL RESOURCES

Cultural resources are “historic properties” as defined by the NHPA of 1966, “cultural items” as defined by the Native American Graves Protection and Repatriation Act of 1979 (NAGPRA), “archaeological resources” as defined by the Archaeological Resource Protection Act of 1979 (ARPA), “sacred sites” as defined by EO 13007 to which access is afforded under the American Indian Religious Freedom Act of 1987 (AIRFA), and collections and associated records as defined in 36 CFR 79.

Archaeological resources consist of locations where prehistoric or historic activity measurably altered the earth or produced deposits of physical remains. Architectural resources include standing buildings, districts, bridges, dams, and other structures of historic significance. Traditional cultural properties include locations of historic occupations and events, historic and contemporary sacred and ceremonial areas, prominent topographical areas that have cultural significance, traditional hunting and gathering areas, and other resources that Native Americans or other groups consider essential for the persistence of their traditional culture.

Several federal laws and regulations, including NHPA, ARPA, NAGPRA, and AIRFA, have been established to manage cultural resources. In order for a cultural resource to be considered

significant, it must meet one or more of the following criteria for inclusion on the National Register of Historic Places (NRHP):

> The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and: 1) that are associated with events that have made a significant contribution to the broad patterns of our history; or 2) that are associated with the lives or persons significant in our past; or 3) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or 4) that have yielded, or may be likely to yield, information important in prehistory or history.

Cultural resources are finite, non-renewable, and often fragile, and are frequently threatened by development activities. In accordance with AR 200-4, *Cultural Resources Management*, Fort Detrick maintains an Integrated Cultural Resources Management Plan (ICRMP) that serves as a guide for compliance with the NHPA, and other applicable Federal laws and regulations (U.S. Army Garrison, 2006). This document identifies several historic properties that have the potential to be directly or indirectly affected by the proposed action.

4.5.1 Architectural Resources

According to the NHRP online database, there is one architectural historic property listed on the National Register located within the confines of the Project Area, the One-Million-Liter Test Sphere (listed in 1977), NRHP Reference Number 77000696.

The One-Million-Liter Test Sphere (Building 527) is located in the southwest corner of Fort Detrick, and is listed on the NRHP due to its national significance in the scientific development of aerobiology and for its unique structural engineering. It consists of a 40-foot-diameter, gas-tight, steel sphere that was used for aerobiological studies of pathogenic agents from 1950 to 1970 (U.S. Army Garrison, 2006). The Sphere is located approximately 140 feet from the portion of the existing LSS located within the subsurface adjacent to Chandler Street and approximately 1,460 feet from the existing SSP, at their nearest points to the Sphere location.

According to MHT's online database, other buildings have been determined to be eligible for the NRHP, but have not been formally listed on the NRHP. The Pilot Plant (Building 470), Boiler Plant (Building 190), SSP (Building 375), Medical Research Lab (Building 1301), R&D Greenhouse (Building 1302), Green House (Building 1303-1306), Laboratory (Building 1412), Incinerator (Building 1414), and Administration Building (Building 1415) have all been determined to eligible based on their association with Cold war activities at Fort Detrick. These buildings are spread out and separated by modern infill. While all these buildings have the potential to be indirectly affected by the proposed action, Building 375, specifically, would be directly affected by the proposed action by its demolition.

4.5.2 Archaeological Resources

Fort Detrick is located within the Monocacy River Drainage Basin of the Piedmont Physiographic Province, which is part of Maryland Archaeological Unit 17. While archaeological sites have been recorded at Fort Detrick, no NRHP eligible site has been identified within the proposed project area (U.S. Army Garrison, 2006).

4.6 GEOLOGY AND SOILS

Fort Detrick lies in the Western Lowlands Section of the Piedmont Plateau Physiographic Province (the Appalachian Highlands) in a geologic subdivision known as the Frederick Valley. The Piedmont Plateau extends from the Fall Line between the Coastal Plain and Piedmont Plateau Physiographic Province in the east to the Catoctin Mountains of the Blue Ridge Physiographic Province in the west. The Piedmont Plateau is characterized by rolling terrain and deeply incised stream valleys and encompasses approximately 29 percent of Maryland's land area. The Frederick Valley extends 26 miles by six miles wide and runs from north to south. The Frederick Valley is known as the Fredrick Syncline, and the Catoctin Mountains, located directly west of the Frederick Valley, are part of an overturned anticline known as the South Mountain Anticlinorium (USACE, 2000). The Piedmont Plateau elevations range from approximately 100 feet to 1,000 feet above sea level (MDNR, 1999). Fort Detrick elevations range from 320 feet to more than 400 feet above sea level (USGS, 1993). The entire state of Maryland is classified as a seismic zone 1 area with a low probability of experiencing a damaging earthquake within a 50-year period (USAG, 2003).

The soils of Frederick County are among the most productive in Maryland and consist of a combination of residual lime soils and wind-transported soils (Telemarc, Inc., 1993). The soils within the Project Area are predominately made up of the Adamstown, Duffield, Funkstown, Hagerstown, and Ryder series. In addition, a significant portion of the Project Area is comprised of urban lands (USDA, 2014).

The Adamstown series soils are fine-loamy, well drained soils. These soils are found on drainageways and swales primarily used for cropland, woodland, and urban development. The Duffield series soils consist of deep and very deep, well drained soils formed in residuum from limestone bedrock. These soils are primarily used for cropland (a small acreage is used for woodlots of mixed oak). The Funkstown series soils are very deep, moderately well drained, and formed from colluvial and alluvial material washed down from surrounding uplands which cover underlying limestone residuum. These soils are primarily used for cropland or pastureland. The Hagerstown series soils are very deep, well drained, and formed from hard gray limestone residuum. These soils are primarily used for cropland and mixed hardwood forests. The Ryder series soils are moderately deep, well drained soils, formed in residuum weathered from thin bedded shaly limestone. These soils are primarily used for cropland, with the remainder used for pastureland and mixed hardwood forests (USDA, 2014). Adamstown, Duffield, Funkstown, and Ryder series soils and Urban land are found throughout the Project Area. Hagerstown series soils are primarily found within the northwestern portion of the Project Area (Appendix A, Figure 6).

The soils mapped within the Project Area are Adamstown silt loam (0 to 3% slopes), Adamstown-Funkstown complex (0 to 8% slopes), Duffield-Ryder silt loams (0 to 8% slopes),

Duffield-Hagerstown-Urban land complex (3 to 8% slopes), Hagerstown loam (0 to 15% slopes), Urban land (0 to 15% slopes), and Water. Soils are moderately well drained to well drained, have moderate permeability, and no soils are listed as hydric soils.

4.7 WATER RESOURCES

4.7.1 Surface Water

Fort Detrick is located within the Monocacy River drainage basin, a sub-basin of the Middle Potomac River Basin in the Chesapeake Bay watershed. The Monocacy River ranges from 40 feet to 375 feet in width and from 0.5 feet to 18 feet in depth. The Monocacy River originates in near the Maryland-Pennsylvania border and flows south and to the east of Fort Detrick and Frederick City, continuing 15 miles downstream to the Potomac River. The Project Area is located approximately 1.5 miles to the west of the Monocacy River (DHS and USAG, 2004).

The Monocacy River is classified by the State of Maryland as Use IVP Recreational Trout Waters and Public Water Supply (COMAR 26.08.02). The Monocacy River is designated as a state scenic river under the Maryland Scenic and Wild Rivers Act of 1968. A scenic river, as designated in Natural Resources Article 8-402(d)(2), is "a free-flowing river whose shorelines and related lands are predominantly forested, agricultural, grassland, marshland, or swampland with a minimum of development for at least 2 miles of the river length". It is State policy to preserve and protect the natural values of designated scenic and/or wild rivers, enhance their water quality, and fulfill vital conservation purposes by wise use of resources within their surrounding environment.

Primary surface waters within the Project Area, as shown in Appendix A, Figure 7, include the Nallin Farm Pond (3.3 acres) and two, low-order tributaries of the Monocacy River (USACE, 2004). The Nallin Farm Pond, located in the northeast portion of the Project Area, was formed by the diking of natural springs (USAG, 2003a). Federal Emergency Management Agency (FEMA) Tributary #10 (Two Mile Run) extends south and then east from Nallin Farm Pond, exiting Area A at Outfall A-6,for approximately one mile before discharging into the Monocacy River (DA, DIS, 2001). FEMA Tributary #9 (Detrick Branch) extends east from the south-central portion of the Project Area, exiting Area A at Outfall A-4, for approximately one mile before discharging into the Monocacy River (DHS and USAG, 2004).

4.7.2 Groundwater

Groundwater in the area of Fort Detrick occurs in hard rock aquifers associated with the Frederick Valley subdivision of the Piedmont Physiographic Province. These are some of Maryland's most productive aquifers, with approximately 20 percent of the formations yielding water at rates of at least 50 gallons per minute (USAG. 2011). Groundwater in and around Fort Detrick is generally of good quality and is drawn from fractures or solution channels located within carbonate rocks (e.g. limestone and dolomite). Water is transported through the carbonate aquifers via bedding planes, fractures, joints, faults, and other partings towards the Monocacy River (USAG, 2003). Groundwater underlying the Fort Detrick area flows generally to the southeast, towards the Monocacy River (USACE, 2000b). The water table in the Project Area fluctuates and ranges from 6 to 27 feet throughout the year (USAG, 2003).

For the purpose of research, under MDE Permit No. FR1943G101(08), Fort Detrick is permitted to withdraw a daily average of 8,000 gallons of well water on a yearly basis and a daily average of 12,000 gallons for the month of maximum use (USAG, 2003). Groundwater acquired from wells is used for aquaculture research. Results from groundwater investigations within the Project Area have detected the occurrence of trichloroethylene at levels above the U.S. Environmental Protection Agency (USEPA) Maximum Contaminant Level of 5 parts per billion for drinking water (40 CFR 141.32) (USAG, 2003). The groundwater is treated using granular activated carbon for contaminant removal prior to research activities.

4.7.3 Stormwater

Stormwater from the central and western portions of the Project Area drain west into Carroll Creek and stormwater from the eastern portion of the Project Area drains into Tributaries #9 and #10 (DHS and USAG, 2004). There are numerous stormwater management basins and practices located throughout the installation for quantity and quality management of stormwater runoff. There are eight separate surface water outfalls that drain from the project area. Four of these outfalls (A-1, A-2, A-7, and A-8) drain toward Carroll Creek and the other four outfalls (A-3, A-4, A-5, and A-6) drain toward the Monocacy River (General Physics, 2004; USAG, 2005). The majority of stormwater in the Project Area is diverted through a system of surface ditches, culverts, inlets, and storm sewer lines.

4.7.4 Drinking Water

Fort Detrick owns and operates a community water system regulated by the Maryland Department of the Environment (MDE) under Public Water System Identification MD010-0011. The system provides drinking water to approximately 7,900 people. The water treatment plant (WTP) operates 24 hours a day, seven days a week. A mixture of drinking water produced by both Fort Detrick and Frederick County/City is provided to the Fort Detrick community. Fort Detrick has established a long-term agreement with Frederick County to purchase drinking water for use at the installation. The Fort Detrick Water Appropriation Permit allows for the acquisition of water for drinking water purposes from either the Monocacy River (Fort Detrick WTP) or Potomac River (Frederick County New Design WTP). The permit further details that combined cumulative water use from both treatment facilities cannot exceed a daily average of 2.0 million gallons on a yearly basis and a maximum daily withdrawal of 2.6 million gallons. The annual average water usage in 2016 at Fort Detrick was 1.34 million gallons per day (MGD). The annual average water produced in 2016 at the Fort Detrick WTP was 0.59 MGD. The remaining water consumed at Fort Detrick was obtained from Frederick County/City sources.

Surface water treated at the Fort Detrick WTP is obtained from the Monocacy River and is pumped from the low lift pump station to the static mixer for chemical addition, then to the two pre-sedimentation basins. Coagulant is added at the rapid mix and the water is fed through the flocculation/sedimentation basins. Liquid alum will be fed in the summer months and poly aluminum chloride in the winter. Pre-chlorination is also conducted. Settled water is then filtered to remove additional sediment and treated with ultraviolet (UV) disinfection at one of two UV contactors. Water is then chlorinated, fluoridated and treated with zinc orthophosphate (for corrosion control) prior to flowing to two underground clearwells (450,000 and 500,000

gallons). The high lift station pumps the water to the distribution system through both a 12-inch and 16-inch line, which converge to a single 18-inch line.

The Fort Detrick distribution system has piping ranging in size between 4 to 18-inches in diameter. Piping material is polyvinylchloride (PVC) and cast iron. The majority of the distribution system is more than 40 years old and may require increased maintenance and repair to maintain integrity.

The distribution system has four water storage tanks used to balance supply versus demand variations in the system and to maintain operating pressure. There are three elevated water towers and one ground level storage tank. There is one 300,000-gallon storage tank (facility 725) located near building 722, one 500,000-gallon storage tank (facility 1409) located near building 1776, and one 500,000-gallon storage tank (facility 1057) located near building 1054. A 2 million gallon ground level tank (facility 8725) is located in the north central area of the Post. Tanks are operated simultaneously and water levels are maintained between 50% and 90%, but normally no lower than 80% of maximum capacity. A supervisory control and data acquisition (SCADA) system remotely monitors the storage tanks and allows for managing of water levels.

4.8 PLANT AND ANIMAL ECOLOGY

Fort Detrick was originally covered by an oak-hickory hardwood forest, characterized by species such as northern red oak (*Quercus rubra*), black oak (*Q. velutina*), white oak (*Q. alba*), scarlet oak (*Q. coccinea*), chestnut oak (*Q. montana*), and several species of hickories (*Carya* spp). Species such as sassafras (*Sassafras albidum*), sourwood (*Oxydendrum arboreum*), wild grape (*Vitis* spp), Virginia creeper (*Parthenocissus quinquefolia*), and poison ivy (*Toxicodendron radicans*) comprise the understory of oak-hickory forests. As a result of urbanization at Fort Detrick, most of the native vegetation has been destroyed or highly altered.

A Planning Level Survey (PLS) was performed from July to August 2010 and is included as Appendix C of the Fort Detrick Integrated Natural Resources Management Plan (INRMP) (USACE, 2011). The installation was delineated into multiple habitats and vegetation and wildlife species were identified in each habitat. There are seven plant communities generally present within the Project Area, including: forested upland, mowed, maintained lawns, old field, vegetative basin, emergent wetland, forested wetland, and open water. Forested upland areas are located in the central, northern, and eastern portions of the Project Area and are characterized by tree species such as box elder (*Acer negundo*), black locust (*Robinia pseudoacacia*), and slippery elm (*Ulmus rubra*), and ground layer species, such as garlic mustard (*Alliaria petiolate*), nodding thistle (*Carduus mutans*), Queen Anne's lace (*Daucus carota*), bush honeysuckle (*Lonicera japonica*), mile-a-minute (*Polygonum perfoliatum*), lady's thumb (*P. persicaria*), multiflora rose (*Rosa multiflora*), and poison ivy. Maintained mowed areas are located throughout the project area and are characterized by cover types such as chicory (*Chicorium intybus*), thistle species (*Cirsium* spp.), crabgrass (*Digitaria sanguinalis*), grass species (*Festuca* spp.), field peppergrass (*Lepidium campestre*), common plantain (*Plantago major*), common dandelion (*Taraxacum officinale*), and clover species (*Trifolium* spp.). Old field habitat is located in the northern and northeastern portions of the Project Area and comprised primarily of grasses, including horseweed (*Erigeron canadensis*), sheep fescue (*Festuca ovina*), wild timothy (*Muhlenbergia glomerate*), redtop panicgrass (*Panicum agrostoides*), switchgrass (*P. virgatum*), and common

timothy (*Phleum pretense*), as well as scattered tree and shrub species including tree-of-heaven (*Ailanthus altissima*), autumn olive (*Elaegnus umbellate*), red mulberry (*Morus rubra*), and weeping willow (*Salix babylonica*) (USACE, 2011).

Wildlife species observed within the Project Area during the PLS are representative and typical for communities found in the Project Area. Mammal species observed include white-tailed deer (*Odocoileus virginianus*), mouse (*Peromyscus* sp.), raccoon (*Procyon lotor*), and red fox (*Vulpes vulpes*). Bird species that dominated the Project Area include northern cardinal (Cardinalis cardinalis), American goldfinch (*Carduelis tristis*), gray catbird (*Dumetella carolinensis*), and American robin (*Turdus migratorius*). Insect species observed include field cricket (*Cryllus pennsylvanicus*), cicada (*Magicicada septendecim*), dragonfly species (Dragonfly spp), and cabbage white butterfly (*Pieris rapae*). There were no amphibian and reptile species observed within the Project Area and only one invertebrate species observed: rusty crawfish (*Orconectes rusticus*) (USACE, 2011).

The Monocacy River is a warm water fishery, Use IV-P (COMAR 26.08.02), and water quality must be maintained to support viable populations of warm water aquatic invertebrates and fish. The Monocacy River 1976-1983 report conducted by the Maryland DNR identified at least 43 fish species present in the river. Smallmouth bass (*Micropterus dolomieu*), black crappie (*Pomoxis nigromaculatus*), redbreast sunfish (*Lepomis auritus*), bluegill (*L. macrochirus*), catfish (*Ictalurus punctatus*), eels, shorthead redhorse (*Moxostoma macrolepidotum*), white sucker (*Catostomus commersonii*), and various shiners and minnows are the most common species of fish found within the middle segment of the Monocacy River (near Carroll Creek), with small populations of white crappie (*P. annularis*) and brown trout (*Salmo trutta*) (Advanced Sciences, Inc., 1991).

4.8.1 Rare, Threatened, and Endangered Species

Protected biological resources include plant and animal species listed by the State of Maryland as rare, threatened, or endangered or by the US Fish and Wildlife Services (USFWS) as threatened or endangered. Special concern species are not afforded the same level of protection, but their presence is taken into consideration by resource agency biologists involved in reviewing projects and permit applications.

Under the Endangered Species Act (ESA), an "endangered species" is defined as any species in danger of extinction throughout all or a significant portion of its range. A "threatened species" is defined as any species likely to become an endangered species in the foreseeable future. The ESA also provides for recovery plans to be developed describing the steps needed to restore a species population. Critical habitat for federally listed species includes "geographic areas on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection." Critical habitat can include areas not occupied by the species at the time of the listing but that are essential to the conservation of the species. The Sikes Act provides for cooperation by the Department of the Interior and Department of Defense with State agencies in planning, development, and maintenance of fish and wildlife resources on military reservations throughout the United States.

The Migratory Bird Treaty Act was implemented in 1918 makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations. The migratory bird species protected by the Act are listed in 50 CFR 10.13.

Special status species are listed as threatened or endangered, are proposed for listing, or are candidates for listing by the state and/or federal government. The USFWS Information for Planning and Conservation (IPaC) lists one threatened wildlife species in the Project Area: northern long-eared bat (NLEB) (*Myotis septentrionalis*). The NLEB was not observed in the Project Area during the 2010 PLS. The altered environmental characteristics of Fort Detrick provide poor habitat for most wildlife species and consequently there are no known critical habitats located on or adjacent to Fort Detrick.

4.9 WETLANDS

Wetlands are protected as a subset of the "waters of the United States" under the Clean Water Act (CWA). The term "waters of the United States" has a broad meaning under the CWA and incorporates deepwater aquatic habitats and special aquatic habitats (including wetlands). Jurisdictional wetlands are those wetlands subject to regulatory protection under Section 404 of the CWA and EO 11990. Wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. The U.S. Army Corps of Engineers (USACE) defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Part 328). Important wetland functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, storm water attenuation and storage, sediment detention, and erosion protection. Wetlands on Fort Detrick are beneficial to stormwater management, erosion, and sediment control. These wetlands provide habitat for ducks, geese, herons, shore birds, muskrat, mink, and beaver, and also support numerous species of annual and perennial herbaceous plants.

There are only a few wetlands located within Area A of Ft. Detrick. Three riverine wetland areas are mapped by the USFWS National Wetlands Inventory (NWI) Wetlands Mapper (Version 2) along the northwestern edge, in the northeastern corner, and along the eastern edge of the Project Area. These areas are mapped as riverine, unknown or lower perennial, unconsolidated bottom, and permanently flooded. In addition, there is a wetland area mapped by the USFWS NWI in the northeastern corner of the site as Palustrine, unconsolidated bottom, permanently flooded, and diked/impounded (USFWS, 2016).

USACE, Baltimore District completed a wetlands investigation from July to August 2010 within Area A., which did not identify wetland sites within the Project Area. Five separate wetland sites were identified within the northeast corner of Fort Detrick, within the vicinity of the Nallin Farm Pond, for a total of 3.58 acres. The five wetland sites are shown in Appendix A, Figure 8. The

wetlands investigation identified 75 herbaceous and vine species, 6 shrub species and 14 tree species within these five wetlands (USACE, 2011).

Wetland 1 is considered an emergent wetland, approximately 0.13 acres, located in the northeastern portion of Area A. This wetland is dominated by creeping bentgrass (*Agrostis stolonifera*), field bindweed, Canada thistle (*Cirsium arvense*) and strawcolored flatsedge (*Cyperus stigosus*).

Wetland 2 is considered a forested wetland, approximately 0.27 acres, located in the northeastern portion of Area A. This wetland is dominated by red maple (*Acer rubrum*), river birch (*Betula nigra*), silky dogwood, (*Cornus amomum*), rice cutgrass (*Leersia oryzoides*), common reed, clearweed (*Pilea pumila*) and black willow (*Salix nigra*).

Wetland 3 is considered an emergent wetland, approximately 0.74 acres, located in the northeastern portion of Area A. This wetland is dominated by creeping bentgrass, Frank's sedge (*Carex frankii*), fox sedge (*Carex vulpinoidea*), soft rush (*Juncus effusus*) and green bulrush (*Scirpus atrovirens*).

Wetland 4 is considered an emergent wetland, approximately 1.52 acres, located in the northeastern portion of Area A. This wetland is dominated by creeping bentgrass, Queen Anne's lace and tall fescue (*Festuca arundinacea*).

Wetland 5 is considered a mix between an emergent and forested wetland, approximately 0.92 acres, located in the northeastern portion of Area A. This wetland is dominated by marshmallow (*Althaea officinalis*), river birch, buttonbush (*Cephalanthus occidentalis*), spotted touch-me-not (*Impatiens capensis*), black willow and broad-leaf cattail (*Typha latifolia*).

4.10 ENERGY

Until 2008, steam generation at Fort Detrick was produced exclusively by the Boiler Plant (Building 190) and at Building 393 as heat recovered from the four solid waste combustors. However, since that time, three additional steam generation sources have come online. The NCI-Frederick (in which the SSP and a portion of the LSS are located), has constructed two natural gas fired steam generation facilities, which meet their entire steam requirement. As a result, the customer base of the steam generated by Building 190 and Building 393 has diminished, and is anticipated to continue to do so over time (U.S. Army Garrison, 2010). In addition, the CUP provides steam, chilled water, emergency electricity, and conditioned electricity to the National Interagency Biodefense Campus (NIBC) research facilities.

4.11 AIR QUALITY AND ODORS

Air quality is the ambient air concentration of specific pollutants determined by the USEPA to be of concern to the health and welfare of the public. The federal government has established National Ambient Air Quality Standards (NAAQS) for several criteria pollutants. These criteria pollutants include ozone (O3), carbon monoxide (CO), nitrogen dioxide (NO2), sulfur dioxide (SO2), particulate matter less than 2.5 microns in standards identify the maximum allowable concentrations of criteria pollutants that regulatory agencies consider diameter (PM2.5),

particulate matter less than 10 microns in diameter (PM10), and lead (Pb). These safe, with an additional adequate margin of safety to protect human health and welfare.

In addition to the ambient air quality standards for criteria pollutants, national standards exist for hazardous air pollutants (HAPs). The National Emission Standards regulate 188 HAPs based on available control technologies. The majority of HAPs are Volatile Organic Compounds (VOCs). A VOC is any organic compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate, which participates in atmospheric photochemical reactions, except those designated by EPA as having negligible photochemical reactivity and having an initial boiling point less than or equal to 250 degrees Celsius (°C) measured at a standard atmospheric pressure of 101.3 kilopascals (kPa) (EPA, 2016a).

4.11.1 Emissions Methodology

Air quality within a region is a function of the type and amount of pollutants emitted, size, and topography of the air basin, and prevailing meteorological conditions. Criteria pollutants affecting air quality in each region can come from either stationary or mobile sources. A smokestack typifies a stationary emission source. Mobile sources of emissions include emissions from cars and aircraft. Emissions are "primary" or "secondary" pollutants. Primary pollutants are those emitted directly into the atmosphere such as CO, SO2, PM2.5, and PM10. Secondary pollutants are those formed through chemical reactions in the atmosphere such as O3 and NO2. VOCs are precursors to the production of O3, SO2 and NO2 are reported as oxides of sulfur (SOx) and oxides of nitrogen (NOx), respectively. SO2 and NO2 constitute the majority of their respective oxides.

Regulatory agencies designate areas that violate ambient air quality standards as nonattainment areas. Nonattainment designations for O3, CO, PM2.5, and PM10 include subcategories indicating the severity of the air quality problem (e.g., the classifications range from moderate to serious for CO and PM10, and from marginal to severe for O3). Areas that comply with federal air quality standards are designated as attainment areas. Areas that are redesignated from nonattainment to attainment status become maintenance areas. Areas that lack monitoring data to demonstrate attainment or nonattainment status are unclassified and considered to be in attainment for regulatory purposes.

4.11.2 Greenhouse Gas Emissions

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere by absorbing infrared radiation. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The most common GHGs emitted from natural processes and human activities include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). The main source of GHGs from human activities is the combustion of fossil fuels, including crude oil and coal. Examples of GHGs created and emitted primarily through human activities include fluorinated gases (hydro fluorocarbons and per fluorocarbons) and sulfur hexafluoride.

Each GHG is assigned a global warming potential (GWP). The GWP is the ability of a gas or aerosol to trap heat in the atmosphere. The GWP rating system is standardized to CO_2, which has a value of one. For example, CH_4 has a GWP of 25, which means that it has a global warming effect 21 times greater than CO_2 on an equal-mass basis (IPCC, 2007). To simplify GHG analyses, total GHG emissions from a source are often expressed as a CO_2 equivalent (CO_2e). The CO_2e is calculated by multiplying the emissions of each GHG by its GWP and adding the results together to produce a single, combined emission rate representing all GHGs. While CH_4 and N_2O have much higher GWPs than CO_2, CO_2 is emitted in such higher quantities that it is the overwhelming contributor to CO_2e from both natural processes and human activities.

Federal agencies on a national scale address emissions of GHGs by reporting and meeting reductions mandated in federal laws, EOs, and agency policies. The most recent of these is EO 13834, *Efficient Federal Operations*.

Several states have promulgated laws as a means of reducing statewide levels of GHG emissions. To reduce energy consumption, reduce dependence on petroleum, and increase the use of renewable energy resources in accordance with the goals set by the EO 13834 and the Energy Policy Act of 2005, DoD has implemented a number of renewable energy projects.

On 18 February 2010, the Council on Environmental Quality (CEQ) proposed, for the first time, guidance on how federal agencies should evaluate the impacts of climate change and GHG emissions for NEPA documentation (CEQ, 2016). Specifically, if a proposed action emits 25,000 metric tons or more of CO_2e on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. The CEQ does not propose this reference point as an indicator of a level of GHG emissions that may significantly affect the quality of the human environment, but notes that it serves as a minimum standard for reporting emissions under the Clean Air Act (CAA). In the analysis of the direct impacts of a proposed action, the CEQ proposes that it would be appropriate to: (1) quantify cumulative emissions over the life of the project; (2) discuss measures to reduce GHG emissions, including consideration of reasonable alternatives; and (3) qualitatively discuss the link between such GHG emissions and climate change. In August of 2016 the CEQ revised the guidance to establish direction for:

- Advises agencies to quantify projected greenhouse gas emissions of proposed federal actions whenever the necessary tools, methodologies, and data inputs are available;

- Encourages agencies to draw on their experience and expertise to determine the appropriate level (broad, programmatic or project- or site-specific) and the extent of quantitative or qualitative analysis required to comply with NEPA;
- Counsels agencies to consider alternatives that would make the action and affected communities more resilient to the effects of a changing climate; and

- Reminds agencies to use existing information and science when assessing proposed actions.

4.11.3 Federal Requirements

Section 176(c) of the 1990 CAA Amendments contains the General Conformity Rule (40 CFR §§ 51.850-860 and 40 CFR §§ 93.150-160). The General Conformity Rule (updated 24 March 2010) requires any federal agency responsible for an action in a nonattainment or maintenance area to determine that the action conforms to the applicable State Implementation Plan (SIP). Emissions of attainment pollutants are exempt from conformity analysis. Actions would conform to a SIP if their annual direct and indirect emissions would remain less than the applicable *de minimis* thresholds. Formal conformity determinations are required for any actions that would exceed these thresholds.

The Region of Interest (ROI) for the Proposed Action at Fort Detrick is in the Central Maryland Air Quality Control Region (AQCR) for the state of Maryland (40 CFR Part 81.155). Fort Detrick is located in Frederick County and is classified as a non-attainment area for the 8-hour Ozone NAAQS (EPA, 2016b) and as an attainment maintenance area for the PM2.5 NAAQS (USEPA, 2016c). This area currently attains the NAAQS standards for all other criteria pollutants. The general conformity requirements and thresholds only apply to criteria pollutants in the ROI which are in nonattainment or maintenance of the NAAQS. Therefore, *de minimis* levels for the project area are 100 tons per year for PM2.5 and NOX. The VOC *de minimis* level is 50 tons per year as established for nonattainment areas located in an O3 transport area. New Source Review (NSR) thresholds are 250 tons per year of any pollutant. For planning purposes, these thresholds are used in the absence of applicable *de minimis* thresholds.

In 2006, the EPA lowered the daily PM2.5 standard from 65 µg/m3 to 35 µg/m3. Air quality monitoring data in the region shows that the region is in attainment of the 2006 daily PM2.5 standard.

4.11.4 Program Area

Fort Detrick operates under a Title V Part 70 Operating Permit. This permit is the oversight document for all Fort Detrick emissions sources, including 200 or more boilers, four large incinerators, more than 20 electric generators, more than 40 oil and gasoline storage tanks, laboratory fume hoods and sterilizers, and gasoline dispensing systems (MDE, 2015).

4.11.5 Air Emissions Data

Air emissions data for Fort Detrick are provided in the Emissions Certification Report that is submitted to the MDE annually. Reportable pollutants include SO2, CO, NOX, PM10, VOCs, and HAPs. (Note that VOCs are not considered to be "criteria pollutants," but are tracked and reported as precursors to the formation of ground level O3). Appendix A, Figure 9 illustrates Maryland's progress relative to the NAAQS. Emission data from 2002 to 2014 shows the declining trend of criteria pollutant concentration in ambient air.

4.11.6 Odor

Waste generated through research activities at Fort Detrick includes contaminated laboratory materials, animal bedding and food, animal carcasses, wastewater, and infectious and medical

wastes. Excluding wastewater, these wastes must be rendered sterile through autoclaving and incineration prior to disposal. Transiently offensive odors may result from autoclaving and incineration however, they are typically localized in area and time and are rapidly dispersed in the ambient atmosphere. Odors may be generated from the USAMRIID Facilities and the USDA Greenhouse (Building 374) from their sources of potentially infectious waste water which are processed through the LSS. Steam sterilization processes at the SSP (Building 375) emit odorous emissions. Minor odors may also originate from the sewage treatment plant (USACE, 1997).

4.12 NOISE

Noise is defined as an unwanted sound that can induce hearing loss or interfere with ordinary daily activities, such as communication or sleep. People's reaction to noise varies according to the duration, type, and characteristics of the source; distance between the source and the listener; listener sensitivity; background noise level; and time of day. It is important to keep in mind the distinction between the physical characteristics used to quantify sound levels and the more qualitative or subjective aspects of the person, animal, or object on the receiving end. It is the adverse reaction to sound or the annoyance created by sound that is then defined as noise. Despite the more subjective reaction, however, noise can be measured; that is, sound sources having certain characteristics can reasonably be expected to induce harm or annoyance, and this can be quantified in a statistically meaningful manner. Level of annoyance depends on the intensity, frequency weighting (pitch), and duration of the sound. To quantify noise and describe its impacts on the natural and human environment, a basic description of sound terminology is presented below.

As a sound wave moves through the atmosphere, a temporary increase in pressure occurs. It is the pressure change that is detected as sound. The magnitude of the pressure change is the loudness, and the frequency of those temporary changes is the pitch. The healthy human ear detects pressure differences over a wide range of sensitivities. A handy method for comparing these vast pressure differences is to describe them in exponential rather than linear terms. This simplifies the units and more closely depicts the way humans actually perceive sound levels. The decibel (dB) is a logarithmic ratio of the increase in atmospheric pressure a sound event causes compared to a defined reference or baseline pressure.

Because the human ear responds differently to different sound frequencies, the perceived loudness increases far more rapidly than it does for mid-frequency sounds. The sound pressure level represented by a given decibel value is, therefore, typically adjusted to make it more relevant to sounds that the human ear hears especially well. For example, an "Aweighted" decibel (dBA) is derived by emphasizing mid-range frequencies to which the human ear responds especially well and de-emphasizing, or penalizing, frequencies lower than 1,000 Hertz and frequencies higher than 5,000 Hertz.

Fort Detrick is generally relatively quiet with no significant noise pollution sources located within the Project Area. Minor noise sources include the Boiler Plant (Building 190), generators located in Buildings 1673 and 1677, usual vehicular traffic, the carpenter shop located in Building 199, and military unit physical training activities conducted between 0630 and 0800 hours (U.S. Army Garrison, 2006). Testing of emergency generators is limited to 1 minute weekly, during daylight hours and the bugle and cannon are exercised Monday through Friday at

1700 hours. In addition, there is a restriction for "no cadence calling" on portions of physical activity routes that adjoin residential areas external to the post. According to sound-level measurements performed at Fort Detrick, the noise generally generated from operations is compatible with residential use (U.S. Army Garrison, 2006).

A mass warning system (giant voice) is located at Fort Detrick. The giant voice is an emergency alert intercom system designed to alert the population throughout the Fort Detrick community. The system is designed to alert people who are outside of buildings because it cannot be heard indoors. Fort Detrick conducts periodic testing of the system to ensure proper operations in the event of an emergency.

Code of Maryland Regulations (COMAR) 26.02.03.02 and City of Frederick Noise Ordinance (Sec. 15-21) set maximum allowable noise levels for industrial, commercial and residential land uses. Maximum allowable noise levels for industrial land use is 75 decibels (dBA) anytime. Maximum allowable noise levels for residential land use is 65 dBA during daytime hours (0700 until 2200) and 55 dBA during nighttime hours (2200 until 0700). Maximum allowable noise levels for commercial land use is 67 dBA during daytime hours and 62 dBA during nighttime hours. Noise levels exceeding maximum criteria are not permitted beyond the property line of the source. If warranted, noise level monitoring shall be located at or within the property line of the receiving property determined by an approved sound level analyzer using A-weighted methodology.

Maximum noise criteria must be met for industrial land use at the property line for all facilities. Maximum noise criteria must be met for residential land use at the installation boundary for all applicable activities within Fort Detrick. COMAR and City of Frederick Ordinance states that noise levels from construction or demolition activities may not exceed 90 dBA during daytime hours. Daytime hours are defined within the regulations as 0700 to 2200. Fort Detrick has established constructions hours that are more stringent than COMAR and City of Frederick Ordinance regulatory requirements. The installation has established that noise levels emanating from construction or demolition activities may not exceed 90 dBA at the designated construction (limit of disturbance) property line between the hours of 0700 through 1630. Maximum noise levels cannot exceed regulatory industrial, commercial and residential noise level criteria between the hours of 1630 and 0700 (non-construction hours) as specified in previous paragraph. Construction activities may not permit prominent discrete tones and periodic noises (dump truck tail gates banging, etc.) that exceed a level which is 5 dBA lower than the noise criteria established in this requirement. Blasting operations associated with construction and demolition activities are exempt from COMAR and City of Frederick Ordinance regulatory noise requirements (daytime hours only). OSHA occupational noise exposure limits for construction workers must be met as detailed in 29 CFR 1926.52. Any construction activities conducted outside the hours specified in this requirement must be pre-approved through the installation command. Weekend construction activities must be pre-approved through the installation command.

4.13 TRANSPORTATION, TRAFFIC, AND PARKING

4.13.1 Existing Transportation Network

Fort Detrick is bordered by Opposumtown Pike to the east and Rosemont Avenue/Yellow Springs Road to the west, with residential areas abutting the installation to the north and south, as shown in Appendix A, Figure 10. There are currently three access control points (ACPs) located on the installation property: the intersection of Yellow Springs Road and Doughten Drive to the west (Old Farm Gate); the intersection of Opposumtown Pike and Veterans Drive to the east (Nallin Farm Entrance); and the intersection of Military Road, West 7th Street, and Veterans Drive to the south (7th Street Entrance).

Within the installation, there are several main roads that travel throughout the property and connect to smaller, side streets. From Opposumtown Pike, Porter Street travels west before curving north into Beasley Drive, providing a connection between the east and west areas of the installation. Ditto Avenue and Doughten Drive provide north-south routes between the southwest quadrant and northwest, residential quadrant.

4.13.2 Parking

Based on aerial imagery of Fort Detrick, on- and off-street parking is available throughout the entire installation (Appendix A, Figure 10). The largest amount of parking is concentrated in the southwest quadrant of the installation, where there are several off-street, surface lots and on-street parking spaces servicing the buildings in this area.

THIS PAGE INTENTIONALLY LEFT BLANK

5.0 ENVIRONMENTAL CONSEQUENCES

This section identifies and evaluates the anticipated environmental impacts associated with implementing the Proposed Action as well as the No-Action Alternative. To reiterate, the alternatives are summarized as follows:

- Proposed Action
- No-Action

The method used for evaluating the overall importance of impacts is based on the following four fundamental criteria:

1. Nature (beneficial or adverse);
2. Duration (short-term or long-term);
3. Areal extent (regional, local, or isolated); and
4. Intensity (negligible, minor, moderate, significant).

Nature of Impact. The nature of the impact can be described as beneficial or adverse. Beneficial impacts enhance the quality or access to a resource, while adverse impacts degrade the quality or limit access the resource.

Duration of Impact. The duration of an impact can be short-term or long-term.

Areal Extent of Impact. The areal extent of an impact refers to its area of influence and can be regional, local, or isolated to a particularly small and well defined area. An impact of regional extent exerts an influence far beyond the surroundings of the project area. The local area of influence refers to the communities located near Fort Detrick that could be affected by the project. An isolated impact is limited in extent to a small, readily defined area.

Intensity of Impact. The intensity of an impact concerns the scale or size of the impact on a resource. Intensity is evaluated as negligible, minor, moderate, or significant. A description of each measure of intensity is as follows:

- *Negligible.* This term indicates that the environmental impact is barely perceptible or measurable, remains confined to a single location, and will not result in a sustained recovery time for the resource impacted (days to months).

- *Minor.* This term indicates that the environmental impact is readily perceptible and measurable; however, the impact will be short-term and the resource should recover in a relatively short period of time.

- *Moderate.* This term indicates that the environmental impact is perceptible and measurable, and may not remain localized, impacting areas adjacent to the proposed action. Under the impact, recovery of the resource may require several years or decades.

- *Significant.* This term indicates significant impacts would occur. Under a significant impact, a resource may not recover and mitigation measures are considered to minimize the impact.

This section is organized by resource area following the same sequence as in the preceding Section 4.0. However, this section also includes a discussion of other environmental impacts, including cumulative impacts and irretrievable commitment of resources.

5.1 LAND USE

5.1.1 Proposed Action

It is anticipated that the implementation of the Proposed Action would result in no change to official land use designation of the areas associated with the demolition. The area would be left as re-vegetated open space, with no planned practical use. Therefore, long-term, beneficial impacts to land use are anticipated to occur as a result of the Proposed Action, as there would be a cessation of current operations, and demolition and removal of associated equipment, buildings and appurtenances of the dilapidated system.

5.1.2 No-Action

Implementation of the No-Action Alternative would not alter the existing land use within the Project Area. Therefore, no impacts would be anticipated.

5.2 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND PROTECTION OF CHILDREN

This socioeconomic impact analysis focuses on construction costs and the local economic benefit consequent to increases in personnel. Economic impacts are defined to include direct impacts, such as changes to employment and expenditures that affect the flow of dollars into the local economy and indirect impacts, which result from the "ripple effect" of spending and re-spending in response to the direct impacts. Results of economic impact analysis presented in this EA are all beneficial in nature. There are no expected detrimental economic impacts associated with any alternative. Therefore, for all economic impact results presented are expected to be beneficial.

This analysis also addresses potential disproportionately high and adverse impacts to minority and/or low income populations consistent with EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, and environmental health and safety risks to children consistent with EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*.

As discussed below, this EA has identified no adverse environmental or health impacts that would disproportionately affect minority or low-income populations. No environmental justice impacts are anticipated to occur as a result of implementation of the Proposed Action.

5.2.1 Proposed Action

5.2.1.1 Socioeconomics

Implementation of the Proposed Action will have minor beneficial economic impacts to Fort Detrick and its surrounding communities. During the course of project activities, local vendors, contractors, and construction workers will be utilized and will therefore benefit from an increased short-term benefit associated with the construction work.

Economic impacts from the project are expected to be beneficial and would, generally, stimulate the economy of the region through the creation of jobs, income, and economic output. While many of the jobs created would be taken by people in-migrating to the area for the purposes of working at Fort Detrick, it is anticipated that various jobs would be available to current residents of the area who are either currently unemployed or underemployed. The additional employment opportunities would be open for application to all racial groups at all levels of income.

5.2.1.2 Environmental Justice

Potential impacts to Environmental Justice associated with the Proposed Action could occur during the construction phase if minority and/or low-income communities are economically impacted by exclusion from the economic benefits arising from the construction activities. This can be mitigated by the requirement that all vendors and contractors participating in the construction phase adhere to the Equal Employment Opportunity and Affirmative Action considerations identified in 29 CFR 1608. Therefore, it is anticipated that potential impacts to Environmental Justice associated with the Proposed Action would be short-term and negligible.

5.2.1.3 Protection of Children

No impacts to the Protection of Children are anticipated as the on-site CDC is not located near the SSP or the LSS, and therefore, is not anticipated to be affected by the decommissioning or demolition activities. No adverse environmental health and safety risks are anticipated to disproportionately affect children due to the use of BMPs during the course of the project schedule.

5.2.2 No-Action

Under the No-Action Alternative, the Proposed Action would not be constructed and operated. Existing conditions would be unchanged.

5.3 WASTE MANAGEMENT

The significance of potential impacts associated with contaminated and hazardous materials, and their associated wastes is based on the toxicity, transportation, storage and disposal of these substances. Contaminated/hazardous materials and waste impacts would be considered significant if the storage, use, transportation or disposal of these substances substantially increases the human health risk or environmental exposure.

All contractors would be responsible for adhering to Fort Detrick policies and procedures and all applicable local, state and Federal regulations for storage, handling and disposal of contaminated and/or hazardous wastes.

5.3.1 Proposed Action

Implementation of the Proposed Action would likely result in beneficial, long-term operational impacts. It is anticipated that workers on site would wear appropriate Personal Protective Equipment (PPE) and follow all appropriate and required local, state and Federal requirements for handling, sampling, and disposing of potentially contaminated soils and/or encountered groundwater during demolition activities. In addition, decontamination activities will be conducted to minimize impacts associated with potential worker exposure to biological contaminants during demolition activities. Interior and exterior surfaces and equipment associated with the SSP would be sampled and tested for asbestos, lead-based paint, and other contaminants prior to demolition. Contractual obligations in the construction documents would require contractors to adhere to all applicable local, state and Federal regulations pertaining to contaminated and hazardous materials, including, but not limited to, those regarding handling, transport, and proper disposal. Metals and concrete recovered from demolition activities will be recycled to the extent practicable, in accordance with Army policy for *Sustainable Management of Waste in Military Construction, Renovation, and Demolition Activities*, and EO 13834. Therefore, it is anticipated that there would be no adverse impacts associated with the handling, transport or disposal of contaminated or hazardous materials.

5.3.2 No-Action

Implementation of the No-Action Alternative would result in adverse, long-term impacts, as it is known that the SSP and LSS have passed the end of their service life, and have become maintenance intensive. This alternative would result in continued labor and cost intensities that would pull from resources to be put to use for other installation needs.

5.4 HUMAN HEALTH AND SAFETY

5.4.1 Proposed Action

It is anticipated that workers on site would wear appropriate PPE and follow all appropriate and required local, state and Federal requirements for handling, sampling, and disposing of potentially contaminated soils and/or encountered groundwater during demolition activities. In accordance with the 1997 Investigation and Health Risk Evaluation of the LSS, proper health and safety protocols would be ensured for excavation workers during the demolition of the LSS (Department of the Army, 1997). Prior to commencement of excavation activities, the subsurface soils and groundwater would be sampled and tested, and groundwater samples would be preserved using all current and relevant ground water and microbial sampling protocols and in accordance with all applicable regulations. In the event that contaminated soils and/or groundwater are discovered, encountered and removed soils and groundwater would be stockpiled on liners and/or containerized, as appropriate, for hauling, and disposal at a licenced upland facility, in accordance with all applicable local, state, and federal regulations. Therefore,

since it is anticipated that, the long-term impacts to general human health and safety are expected to be beneficial.

5.4.2 No-Action

Implementation of the No-Action Alternative would result in impacts to personnel resources associated with the required maintenance of a dilapidated system, but would not be anticipated to result in a change to human health and safety from that which exists currently.

5.5 CULTURAL RESOURCES

5.5.1 Proposed Action

Implementation of the Proposed Action is expected to have long-term, moderate, adverse impacts to Cultural Resources. The SSP (Building 375) has been determined to be eligible for the NRHP, but has not been formally listed. In accordance with Section 106 of the NHPA, MHT will be consulted prior to any decommissioning and/or demolition activities associated with the Proposed Action to determine the potential impacts to cultural resources, including historic buildings, structures, districts, and archaeological sites, prior to the commencement of activities. Through consultation, efforts will be made to avoid, minimize, and mitigate adverse effects to historic properties. In the event that an adverse effect cannot be completely avoided, Fort Detrick will work with MHT to determine the appropriate mitigative measures.

5.5.2 No-Action

No architectural or archaeological resources would be impacted by the implementation of the No-Action Alternative.

5.6 GEOLOGY AND SOILS

5.6.1 Proposed Action

Implementation of the Proposed Action is expected to have no impacts on geology and short-term, minor, adverse impacts on topography and previously-disturbed soils. Soil disturbance in the form of excavation and grading would result from excavation and demolition activities. As a result, soils would be exposed, increasing the overall potential for erosion at the site. Adverse impacts to soils from the proposed demolition activities would be minimized by proper construction management and planning, and the use of appropriate site-specific BMPs for controlling runoff, erosion and sedimentation during construction activities. Standard erosion and sedimentation control techniques include using vegetative and structural protective covers (e.g., permanent seeding, groundcover), sediment barriers (e.g., straw bales, silt fence, brush), constructing water conveyances (e.g., slope drains, check dam inlet, and outlet protection), and repairing bare and slightly eroded areas quickly.

After demolition work has been completed, excavated clean soils would be reused to return disturbed areas to existing grades and these areas would be stabilized with short-term and final stabilization measures as required by MDE sediment and erosion control regulations. In the event

that contaminated soils are encountered and removed, soils would be stockpiled on liners and/or containerized, as appropriate, for hauling and disposal at a licensed upland facility, in accordance with all applicable local, state, and federal regulations. It is anticipated that workers on site would wear appropriate PPE and follow all appropriate and required local, state, and federal requirements for handling, sampling, and disposal of potentially contaminated soils during demolition activities.

Projects that disturb one or more acres of earth must apply to MDE for either a General or Individual Permit for Stormwater Associated with Construction Activity. In addition, an Environmental Site Design (ESD) is required for any project that exceeds 5,000 square feet (SF) in size. These plans must be reviewed and approved by MDE, Water Management Administration. Disturbed areas would be reseeded, replanted and/or re-sodded following completion of demolition activities, which would decrease the overall erosion potential of the site.

Section 438 of the Energy Independence and Security Act of 2007 requires that any development or redevelopment project involving a Federal facility with a footprint exceeding 5,000 SF shall use site planning, design, construction and maintenance strategies in order to maintain or restore the predevelopment hydrology of the property with regard to temperature, rate, volume and duration of flow. Compliance with this requirement can be met through the implementation of Low Impact Development (LID) technologies. LID techniques would strive to maintain or restore natural hydrologic functions of a site and achieve natural resource protection. Examples include, but are not limited to, minimizing total site impervious areas, direct building drainage to vegetative buffers, use permeable pavements where practical, and break up flow directions from large paved surfaces. Demolition of the SSP would remove impervious are from the site, increasing the vegetative cover after project completion.

With the implementation of previously described protective measures, implementation of the Proposed Action would have only short-term, minor, adverse impacts on soils and would have overall long-term, beneficial impacts due to the reduction in impervious area.

5.6.2 No-Action

Under the No-Action Alternative, the excavation of soils would not occur and, therefore, there is no potential for removal of those contaminated soils. Additionally, if the SSP is not decommissioned and demolished, there is a safety risk and potential for contamination from laboratory wastes to soils. This could result in more detrimental long-term, adverse impacts to the natural and human environment than implementation of the Proposed Action.

5.7 WATER RESOURCES

Impacts to water resources would be considered significant if impacts (1) substantially deplete groundwater supplies or interfere with groundwater recharge, (2) result in a violation of federal and/or state water quality standards, (3) degrade the area's ecosystem due to the direct discharge of fill material into a wetland, or (4) alter existing drainage patterns.

5.7.1 Proposed Action

Construction activities are anticipated to have short-term, minor, adverse impacts on water resources. Potential impacts of implementation of the Proposed Action on surface waters are anticipated to be short-term, negligible. Sedimentation and stormwater runoff at the construction site could occur during demolition activities. Adverse impacts to water resources from the proposed demolition activities would be minimized by proper construction management and planning, and the use of appropriate site-specific BMPs for controlling runoff, erosion and sedimentation during construction activities. In addition, projects that disturb one or more acres of land must apply to MDE for either a General or Individual Permit for Stormwater Associated with Construction Activity. In addition, an ESD is required for any project that exceeds 5,000 SF in size, which would include BMPs to protect surface water resources, as discussed in Section 4.6.1. These site-specific measures would reduce the impacts of sedimentation and stormwater runoff to surface waters within the Project Area.

Implementation of the Proposed Action may have short-term, minor, adverse impacts on groundwater resources during excavation activities to demolish the SSP building and the main trunk on the LSS. In the event that contaminated groundwater is encountered excavation work will adhere to groundwater protection requirements managed under the Resource Conservation and Recovery Act (RCRA) (40 CFR 261-270), the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (40 CFR Parts 300-399), and the Safe Drinking Water Act (SDWA) (42 USC Section 300(f) et. Seq. and 40 CFR Part 144).

The most likely impacts would be associated with non-point source loadings caused by stormwater runoff. As discussed in Section 4.7.1 and above, site-specific soil and sediment control measures would be implemented to minimize stormwater runoff and sedimentation into streams that drain Fort Detrick. Upon completion of demolition activities, the disturbed areas will be stabilized through plantings, would facilitate stormwater recharge and retention, and a reduction of impervious surface would result in an overall long-term, beneficial impact within the Project Area.

5.7.2 No-Action

Under the No-Action Alternative, the excavation would not occur and, therefore, there is no potential for removal of contaminated groundwater. Additionally, if the SSP is not decommissioned and demolished, there is a safety risk and potential for contamination from laboratory wastes to groundwater. This could result in more detrimental adverse impacts to the natural and human environment than implementation of the Proposed Action.

5.8 PLANT AND ANIMAL ECOLOGY

Factors considered in the analysis of potential impacts to plant and animal ecology include disruption to normal wildlife behavioural patterns or disturbance to habitat at a level that would substantially impede the respective Installation's ability to meet obligations outlined in their INRMP. No impacts to aquatic habitats or species are expected as no surface waters are within close proximity to the SSP and main trunk on the LSS and therefore, these resources have not been analyzed below.

5.8.1 Proposed Action

Short-term, minor, adverse impacts to vegetation in the Project Area are anticipated as a result of Proposed Action. Vegetation in the Project Area is very limited due to the overall urbanization in the Frederick region. Minor removal of grasses, landscaping, brush and trees would be expected during excavation and demolition activities. Construction would disturb the plant ecology, particularly grasses and herbaceous areas, in the immediate vicinity the SSP building and main trunk of the LSS. Short-term impacts to vegetation would not be significant and these areas would be replanted and stabilized upon completion of demolition work. The location of the SSP building would also be planted with native vegetation for stabilization upon completion of work. Short-term impacts to vegetation near the SSP building and main trunk of the LSS is not anticipated to impact wildlife in the Project Area due to the fact that the vegetated areas are not unique or habitat for rare, threatened or endangered species, and that there is an abundance of similar habitat in adjacent or nearby areas. Permanent removal of vegetative habitat is not anticipated.

Implementation of the Proposed Action would have short-term, minor, adverse impacts on wildlife. In the short-term, demolition activities would disturb wildlife on, and in the immediate area of the project locations. It is anticipated that any wildlife utilizing the disturbed areas would be temporarily discouraged from the area through due to noise and/or dust and would scatter to adjacent areas. Some wildlife may gradually return to the disturbed areas once demolition work is complete and these areas have been replanted. Long-term impacts to wildlife are not expected.

According to the USFWS, the NLEB has potential to occur within the Project Area. The NLEB was not observed in the Project Area during the 2010 PLS. The altered environmental characteristics of Fort Detrick provide poor habitat for most wildlife species and consequently there are no known critical habitats located on or adjacent to Fort Detrick. No impacts to these resources are expected.

5.8.2 No-Action

Under the No-Action Alternative, no impacts on plant and animal ecology are expected. Existing vegetation and habitat would be undisturbed and would continue to provide habitat and food for wildlife at Fort Detrick.

5.9 WETLANDS

5.9.1 Proposed Action

There are no wetlands mapped by the USFWS NWI and no wetland sites identified within the USACE July to August 2010 wetlands investigation within the vicinity of the SSP and the main trunk of the LSS. All wetland areas are located in the north-eastern portion of the Project Area. Soil erosion and sediment control measures would be implemented to minimize stormwater and pollutant runoff from the construction site. As such, no impacts to these resources are expected under the Proposed Action.

5.9.2 No-Action

Implementation of the No-Action Alternative would have no impacts to wetlands.

5.10 ENERGY

5.10.1 Proposed Action

Implementation of the Proposed Action, and thereby decommissioning and demolishing the SSP and LSS will have negligible impacts on energy as it is anticipated that the new, replacement facilities will be online and active prior to decommissioning and demolition activities. Therefore, the new facilities will be active at the time of demolition of the old facilities and the transfer of energy needs and resources will be negligible. The new facilities will function using improved technology and therefore, it's possible that energy use by the new facilities will ultimately be more efficient.

5.10.2 No-Action

Implementation of the No-Action Alternative would be expected to result in no impacts to energy resources or consumption from that which exists currently.

5.11 AIR QUALITY AND ODORS

Emission thresholds associated with federal CAA conformity requirements are the primary means of assessing the significance of potential air quality impacts associated with implementation of a Proposed Action under NEPA. A formal conformity determination is required for federal actions occurring in nonattainment or maintenance areas when the total direct and indirect stationary and mobile source emissions of nonattainment pollutants or their precursors exceed *de minimis* thresholds. Significant air quality impacts would occur if implementation of an action alternative would directly or indirectly:

- Expose people to localized (as opposed to regional) air pollutant concentrations that violate state or federal ambient air quality standards;

- Cause a net increase in pollutant or pollutant precursor emissions that exceeds relevant emission significance thresholds (such as CAA conformity *de minimis* levels or the numerical values of major source thresholds for nonattainment pollutants); or,

- Conflict with adopted air quality management plan policies or programs.

- Federal, state, and local air pollution standards and regulations set the criteria for determining the significance of air quality impacts. Impacts would also be potentially significant if estimated emissions would exceed the thresholds that trigger a conformity determination under Section 176(c) of the CAA of 1990.

5.11.1 Proposed Action

Under the Proposed Action, potential air quality impacts from proposed demolition activities would occur from:

1. Combustion emissions due to the use of fossil fuel-powered equipment and vehicles; and

2. Particulate emissions during demolition and earth-moving activities.

Construction vehicles used would consist of a mixture of graders/dozers, loaders, trucks, backhoes, and other vehicles and equipment typically associated with building demolition/construction activities. Appendix C contains a list of estimated equipment for demolition and construction operations, along with the emission calculations for the Proposed Action.

5.11.1.1 Air Pollution Emissions

Table 5-1 presents the estimated demolition/construction emissions due to implementation of the Proposed Action. Estimated annual emissions are projected to be below the *de minimis* levels for CAA conformity; therefore, a formal conformity determination under Section 176(c) of the CAA would not be required. Fort Detrick has prepared a Record of Non-Applicability (RONA) for CAA conformity (refer to Appendix C of this EA).

Table 5-1: Estimated Annual Construction and Operational Emissions

Emission Source	Emissions (tons/year)					
	VOC[1]	CO[2]	NO_X[1]	SO_2[2]	PM_{10}[2]	$PM_{2.5}$[1]
Proposed Action Construction Emissions	3.9	20.1	32.0	0.037	1.8	1.8
de minimis/New Source Review threshold	50	250	100	250	250	100
Exceeds *de minimis or NSR* threshold?	No	No	No	No	No	No

Notes: [1] The ROI is a marginal nonattainment area for the 8-hour O_3 NAAQS (VOCs and NOx are precursors to the formation of O_3), and is in attainment-maintenance of the PM2.5 NAAQS. *De minimis* thresholds are defined in 40 CFR 93 Section 153. VOC *de minimis* established for nonattainment areas located in an O_3 transport area.
[2] *De minimis* thresholds are not applicable to pollutants for which the area is in attainment for the NAAQS. New Source Review thresholds are 250 tons per year of any pollutant.
Sources: Arcadis, 2016.

Fugitive dust generated from demolition and construction activities and vehicle travel would temporarily affect local air quality. However, no long-term increases in fugitive dust are expected to occur because this source of emissions would cease upon completion of the Proposed Action. Particulate matter emissions would be moderated through BMPs for demolition and construction (SWBNO, 2012), thereby minimizing the total quantity of fugitive dust emitted during the Proposed Action activities. In addition, project construction equipment would emit minor amounts of HAPs. The main sources of HAPs would occur from the combustion of diesel fuel. Construction would be short-term and minor HAPs emissions could be further moderated through implementation of BMPs such as restricting excessive idling, adherence to equipment maintenance programs, use of particulate filters, and use of ultra-low sulfur diesel fuel if applicable.

5.11.1.2 Greenhouse Gas Emissions

Table 5-2 summarizes the annual GHG emissions associated with the Proposed Action activities. Refer to Appendix C for detailed calculations for the Proposed Action, GHG emissions (Arcadis, 2016). The Proposed Action emissions are projected to be below 25,000 metric tons of CO2e, which is the reporting threshold proposed in the NEPA guidance by the CEQ (CEQ, 2010). All GHG emissions contribute to the global, cumulative impacts of climate change. These impacts are anticipated to be minimized because annual emissions are short-term and will cease when the proposed project is anticipated to be complete. The short-term GHG emissions from demolition and construction activities can be moderated through implementation of BMPs such as restricting excessive idling and adherence to equipment maintenance programs.

Table 5-2: Estimated Annual Greenhouse Gas Emissions

Scenario/Activity	Emissions CO_2e (metric tons/year)
Proposed Action Construction Emissions	3,492
CEQ GHG Reporting threshold	25,000
Exceeds CEQ threshold?	No

Source: Arcadis, 2016.

5.11.1.3 Odors

The Proposed Action would potentially release odors from the demolition and handling of the LSS and SSP materials. Activities such as loading and unloading, storage, and transportation of waste are potential odor sources. These activities are anticipated to be short-term and will cease once handling of those potentially odorous materials are completed.

5.11.2 No-Action

Under the No-Action Alternative, the Proposed Action would not occur, therefore the short-term demolition and constructed emissions and odors would also not occur. The existing conditions would remain unchanged and there would be no impacts to air quality.

5.12 NOISE

5.12.1 Proposed Action

Adverse impacts associated with noise are anticipated to be short-term in duration. Noise impacts on the health of construction/demolition 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). Maximum noise level standards must be met for residential land use at the Installation boundary for all applicable activities within Fort Detrick. (U.S. Army Garrison, 2010). It is anticipated that noise mitigation measures, as needed, will be used during the demolition activities to ensure compliance with the applicable noise standards.

5.12.2 No-Action

Noise conditions under the No-Action Alternative would not change from that which exists currently.

5.13 TRANSPORTATION, TRAFFIC, AND PARKING

5.13.1 Proposed Action

Short-term, minor, adverse impacts to transportation, traffic, and parking would be expected as a result of the decommissioning and demolition of the SSP and LSS. During peak construction periods, there would be short-term increases in traffic throughout the installation due to the presence of construction crews and the installation of barriers necessary for rerouting vehicles around active demolition zones. The decommissioning and demolition of the SSP and LSS would occur over the course of several years, with a final completion date not yet determined.

The decommissioning and demolition of the SSP would likely temporarily, adversely impact adjacent roads including Ware Drive, Chandler Street, Boyles Street, and Beasley Drive specifically during demolition periods, when streets would be blocked off from all vehicular traffic. From the SPP, the LSS runs in several directions under various streets and parking lots before traveling northeast to the USAMRIID. Roads and parking lots surrounding portions of the LSS to be demolished would be temporarily, adversely impacted as a result of closures and barricades necessary to complete the Proposed Action.

Upon the demolition of the SSP and portions of the LSS, trucks would remove and transport debris off site to an approved facility licensed to manage construction waste and materials. Increased truck traffic exiting the installation during large debris hauls would likely cause minor delays at the ACP's located on the western and southern boundaries of the installation.

5.13.2 No-Action

The implementation of the No-Action Alternative would not result in impacts to transportation, traffic, or parking within Fort Detrick.

5.14 CUMULATIVE IMPACTS

The CEQ defines a cumulative impact as the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually insignificant but collectively significant actions taking place over a period of time (40 CFR 1508.7). The cumulative impacts analysis recognizes the impacts of the proposed alternatives on the various resources. It also recognizes the impacts of other past, present, and reasonably foreseeable future actions, and it describes the additive or cumulative impacts that might result. Although some cumulative impacts, however minimal, could be identified for virtually any resource or condition, the impacts described in this document are believed to be the most pertinent and most representative of those associated with the proposed action.

5.14.1 Future Development at Fort Detrick

5.14.1.1 U.S. Army Medical Research and Materiel Command Headquarters

The U.S. Army Medical Research and Materiel Command (USAMRMC) Headquarters (HQ) facility will be a four-story medical research administrative building. The facility will be approximately 175,000 gsf. This facility will support the HQ's command staff, medical research and development, medical logistics and acquisition management, data processing, conference rooms, administrative spaces, and other support spaces. USAMRMC HQ and its subordinate commands and activities operate in Buildings 243, 504, 504x, 504xx, 525, 505, 568, 722, 810, 844, 1053, 1054, 1058, 1077, 1078, 1452, 1520 and 1546. The workforce is spread out across numerous facilities on Fort Detrick consisting of World War II (WWII) era buildings and other buildings of opportunity. Some of the facilities are constructed from wood during the WWII era and have been prioritized for disposal. Numerous buildings are overcrowded with the current staff. The USAMRMC mission has significantly increased as the Army's medical materiel developer, with responsibility for medical research, development, and acquisition and medical logistics management. The USAMRMC's expertise in these critical areas helps establish and maintain the capabilities the Army needs to fight and win on the battlefield. While ensuring that the armed forces remain in optimal health and are equipped to protect themselves from disease and injury, particularly on the battlefield. The Command is staffed with highly qualified scientists, program managers, logisticians, contracting experts, and support personnel. Officers, enlisted soldiers, and civilians-many of whom are among the most respected and knowledgeable specialists in their fields-provide subject matter expertise in medical, scientific, and technical areas throughout the Command. Buildings 504, 505, 515, 525 and 722 will be demolished as a result of the project.

5.14.1.2 Staff Judge Advocate

The Staff Judge Advocate (SJA) facility for the USAMRMC and Fort Detrick will support legal staff activities of the Installation and the USAMRMC Commander. The SJA facility includes a courtroom, judge's chambers, jury deliberation/conference room, defense witness waiting area, offices for legal staff and support staff, legal library, waiting/reception, conference room, file and storage rooms. The SJA facility will be a multi-story, approximately 19,061 gsf building located directly east of Building 810. The SJA currently resides in a failing WWII-era cement masonry block Building 521. The facility is a substandard, single-story, 70-year-old semi-permanent building. This facility is deficient with respect to both the siting and space utilization. The facility was originally a laboratory which was repurposed in the early 80s for the SJA functions. Building 521 will be demolished as a result of the project.

5.14.1.3 U.S. Army Medical Materiel Development Activity

The U.S. Army Medical Materiel Development Activity (USAMMDA) will be a two-story medical research administration facility for the USAMRMC. The facility will be approximately 22,000 gsf and located southwest of Building 1451. USAMMDA currently operates in Building 1430. The conditions in the building are overcrowded with the current staff. The USAMMDA mission has significantly increased due to the continuing need to develop and deliver quality medical capabilities to protect, treat, and sustain the health of DoD service members to keep pace

with the military's increasing deployment missions. USAMMDA develops new drugs, vaccines and medical support equipment that enhance readiness, ensures the provision of the highest quality medical care to the DoD and maximizes survival of medical casualties on the battlefield. The staff also guides the advanced development of medical products for the U.S. Army Medical Department, other U.S. Services, the Joint Staff, the Office of the Secretary of Defense and U.S. Special Forces community. The acquisition process takes promising technology from DoD and academia to U.S. Forces, from the testing required for Food and Drug Administration approval or licensing to fielding of the finished product.

5.14.1.4 U.S. Army Medical Research Acquisition

The U.S. Army Medical Research Acquisition (USAMRA) facility will provide workspace to accommodate contracting staff supporting the Army worldwide medical research programs with primary support to the world-wide missions assigned to the USAMRMC headquartered at Fort Detrick. The USAMDAA facility will be a multi-story, approximately 55,000 gsf building located west of Building 810. Research acquisition facility consolidation project provides a centralized facility and eliminates four 70-year old buildings (circa 1945). The consolidated facility will provide a modern acquisition working environment that will eliminate the current shortfall of 13,000 SF for the staff of 260 including scientists, acquisition contract officers, and support personnel. Existing WWII-era facilities consist of four small wood frame buildings that cannot be effectively modernized where half of the staff work. The workforce resides in a building of opportunity that is needed for other uses. The staff of 260 research acquisition program analysts are currently dispersed across these obsolete and undersized facilities which do not provide sufficient workspace to efficiently develop and acquire materials for the global Army medical research effort including national security biological protection programs and special congressionally-funded initiatives tied to disease outbreaks and DoD efforts to assist in management of world health epidemics. Buildings 817, 818, 820 and 843 will be demolished as a result of the project.

5.14.1.5 U.S. Department of Agriculture

The planned USDA-Agricultural Research Service (ARS) Foreign Disease-Weed Science Research Laboratory development includes the construction of a new research building with a Biosafety Level 3 Enhanced (BSL-3 Enhanced) containment and five greenhouses with a total of approximately 79,000 SF of floor space. BSL-4 is the highest biosafety level that will not be included in the planned USDA-ARS facility. The footprint of planned development is approximately 28,000 SF. The limit of disturbance for construction is to extend to the perimeter fences to the east and south sides of the subject site, to Ditto Avenue adjacent to the west side of the subject site, and approximately ten feet north of the existing Propagation Greenhouse (Building 1304). The current plan is for existing Propagation Greenhouse 1304 to be replaced with a new structure of same size and type. A new Greenhouse will have an internal corridor connection to new research building. The basement of the New Building will be 14-16' deep overall, with a deeper room near the center for the Effluent Decontamination System (EDS) equipment. The EDS Room could be as much as 24' deep. The EDS will receive all of the wash-down water including toilets, sinks, etc. that will be collected in 2 holding tanks and processed in 3 treatment tanks (1 running, 1 filling, 1 spare) where steam and pressure will neutralize any of the biological contaminants prior to discharge to the sanitary sewer system.

5.14.1.6 Campground

The new campground will consist of an approximate 4.8 acre camp site with 10 recreational vehicle pads, 10 tent pads, 3 cabins and 1 comfort station. The comfort station will include separate men's and women's toilet/shower facilities, vending, laundry, mechanical/electrical room, and storage. Also included will be power, water, and sanitary sewage utility connections, equipment, and distribution from existing installation utilities to cabins, signage, exterior lighting, dumpster pad, roads, fixed site furniture/equipment, landscaping, and stormwater management.

It is assumed, for purposes of this document, that the timing of decommissioning and demolition activities may take place as individual events, and their schedules may not overlap. Therefore, it is anticipated that, cumulative impacts associated with these activities would be adverse, but short-term in duration, with the potential for a lapse in time between the activities associated with either the SSP or the LSS. It is therefore anticipated that cumulative impacts would be minimal, and any that arise could be mitigated through permitting conditions, BMPs, and logistical planning and timing of various construction activities including construction vehicle routes to and from the site, construction personnel on and offsite parking and carpooling requirements, dust suppression staggered construction work hours in proximity to sensitive receptors, etc. In addition, indirectly related to the decommissioning and demolition of the existing SSP and LSS, is bringing the new replacement facilities online. These facilities will incorporate new, and more effective and efficient technologies, which would create operational impacts that are beneficial, and long-term.

THIS PAGE INTENTIONALLY LEFT BLANK

6.0 REFERENCES

Advanced Sciences, Inc., 1991. *Installation Environmental Assessment, Fort Detrick, Frederick, Maryland*. February 1991.

Cai, e. a., 2013. *Updated Emission Factors of Air Pollutants from Vehicle Operations in GREET Using MOVES.* Lemont: Argonne National Laboratory.

City of Frederick, 2016. Major Employers. http://www.cityoffrederick.com/160/Major-Employers.

Department of the Army, Directorate of Installation Services, 2001. *Master Plan, Basic Information Maps, General Site Map*. October 2001. Department of the Army Installation Number 24225.

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*. December 2004. Department of Homeland Security and Army Garrison, Fort Detrick, Maryland.

Fort Detrick, 2016. *FY 2016 Fort Detrick Army Defense Environmental Restoration Program Installation Action Plan.* August 2016.

General Physics, 2004. *Fort Detrick Area A Stormwater Assessment*. Final. June 2004.Prepared for the U.S. Army Garrison.

Goldfuss, C., 2016. *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Enironmental Policy Act Reviews.* Washington: COUNCIL ON ENVIRONMENTAL QUALITY.

Intergovernmental Panel on Climate Change, 2007. *Climate Change 2007: Working Group I: The Physical Science Basis*. Retrieved Nov. 1, 2016

Maryland Department of Environment, 2015. *ARMA 2015 Accomplishments Report.* Baltimore: MDE Air and Radiation Management Administration Programs.

Maryland Department of Natural Resources, 1999. *State of the Streams: 1995-1997 Maryland Biological Stream Survey Results*. July 1999. Maryland Department of Natural Resources.

Maryland Manual Online; U.S. Census American Fact Finder Profile of General Population and Housing Characteristics: 2010 (Frederick County).

Metropolitan Washington Council of Governments, 2008. *State Implementation Plan (SIP) for Fine Particle (PM2.5) Standard and 2002 Base Year Inventory.* Washington: Metropolitan Washington Council of Governments.

Sewerage and Water Board of New Orleans, 2014. *Best Management Practices for Demolition, Construction, and Renovation Sites Under Five Acres.* New Orleans: Sewerage and Water Board of New Orleans.

Telemarc, Inc., 1993. *The U.S. Army Medical Research and Development Command Consolidated Operations Building Environmental Assessment, Frederick, Maryland*. March 1993. Telemarc, Inc.

U.S. Army Corps of Engineers, 2000. F*ort Detrick Remedial Investigation Report, Area A, Revised Final, Parts I and II*. June 2000. IT Corporation, Edgewood, Maryland.

U.S. Army Corps of Engineers, 2004. *Floodplain Analysis and Mapping for Fort Detrick Area A*. October 2004. Army Garrison Fort Detrick, Maryland.

U.S. Army Corps of Engineers, 2011. *Draft Integrated Natural Resources Management Plan Update 2010-2014*. U.S. Army Garrison Fort Detrick.

U.S. Army Garrison, 1997. *Construction of Two Sterilization Facilities, Conversion and Abandonment of the Laboratory Sewer*. Frederick: United States Army Garrison, Fort Detrick.

U.S. Army Garrison, 2001. *Integrated Natural Resource Management Plan*. 2001. Army Garrison, Fort Detrick, Maryland.

U.S. Army Garrison, 2003. *Environmental Assessment, Installation Master Plan for Fort Detrick, Maryland*. September 2003. Army Garrison, Fort Detrick, Maryland.

U.S. Army Garrison, 2005. *Fort Detrick Stormwater Management Plan for Drainage Areas A-3 and A-4*. Final. July 2005. Army Garrison, Fort Detrick, Maryland.

U.S. Army Garrison, 2006. *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.* December 2006. U.S. Army Medical Research and Material Command and Army Garrison Fort Detrick, Maryland.

U.S. Army Garrison, 2010. *Environmental Assessment, Real Property Master Plan for Army-Controlled Land at Areas A and C of Fort Detrick in Frederick County, Maryland.* March 2010. U.S. Army Garrison Fort Detrick, Maryland With Technical Assistance from BSA Environmental Services, Inc.

U.S. Army Garrison, 2011. *Draft Integrated Natural Resources Management Plan 2010-2014*. February 2011. Army Garrison Fort Detrick, Maryland.

U.S. Army Medical Research and Material 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 (USAMRIID) Facilities and Decommissioning and Demolition and/or Re-use of Existing USAMRIID Facilities and Fort Detrick, Maryland*. December 2006. U.S. Army Medical Research and Materiel Command, Fort Detrick, Maryland and Army Garrison, Fort Detrick, Maryland.

U.S. Bureau of Labor Statistics 2001 and May 2010, Bureau of Labor Statistics Occupational Employment Statistics (OES) Survey. http://www.bls.gov/oes/tables.htm.

U.S. Census American Community Survey 2014, Table X02: Race.

U.S. Census American Community Survey 2015, Table B17021: Poverty Status of Individuals in the Past 12 Months.

U.S. Census American Fact Finder 2010.

U.S. Census American Fact Finder 2006-2010 American Community Survey 5-year Estimates.

U.S. Census American Fact Finder Educational Attainment 2010-2014 American Community Survey 5-Year Estimates (Frederick County).

U.S. Census American Fact Finder Profile of General Population and Housing Characteristics: 2010 (Frederick County).

U.S. Census American Fact Finder Profile of Selected Economic Characteristics: 2000

U.S. Department of Agriculture, 2014. *Soil Survey Geographic Database for Frederick County, Maryland*. September 2014. U.S. Department of Agriculture, Natural Resources Conservation Service. http://websoilsurvey.nrcs.usda.gov.

U.S. EPA, 2009. *Emission Factors for Locomotives.* Durham: Office of Transportation and Air Quality.

U.S. EPA, 2014. *Emission Factors for Greenhouse Gas inventories.* Durham: U.S. EPA.

U.S. EPA, 2016. *Maryland/Virginia/Washington D.C. PM-2.5 Maintenance Area (1997 Standard).* Durham: U.S. EPA.

U.S. EPA, 2016. *Maryland/Washington D.C./Virginia/Delaware 8-hour Ozone Nonattainment Areas (2008 Standard).* Durham: U.S. EPA.

U.S. EPA, 2016, Nov. 1st. *Technical Overview of Volatile Organic Compounds*. Retrieved Nov. 1st, 2016

U.S. Fish and Wildlife Service, 2019. Information for Planning and Consultation. https://ecos.fws.gov/ipac/.

U.S. Fish and Wildlife Service, 2016. National Wetlands Inventory Wetlands Mapper – Version 2. www.fws.gov/wetlands/data/mapper.HTML.

U.S. Geological Survey, 1993. Frederick, Maryland 7.5 minute series topographic quadrangle.

7.0 ACRONYMS AND ABBREVIATIONS

ABSL	Animal Biosafety Level
ACPs	access control points
AOC	Area(s) of Concern
AST	above ground storage tank
AQCR	Air Quality Control Region
ARS	Agricultural Research Service
BGCA	Boys & Girls Clubs of America
BMBL	Biosafety in Microbiological and Biomedical Laboratories
BMPs	Best Management Practices
BW	biological warfare
°C	degrees Celsius
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CDC	Child Development Center
CDS	Child Development Services
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent
CUP	Cogeneration Utility Plant
CWA	Clean Water Act
DA	Department of the Army
dB	decibel
dBA	Aweighted decibel
DoD	Department of Defense
DOT	Department of Transportation

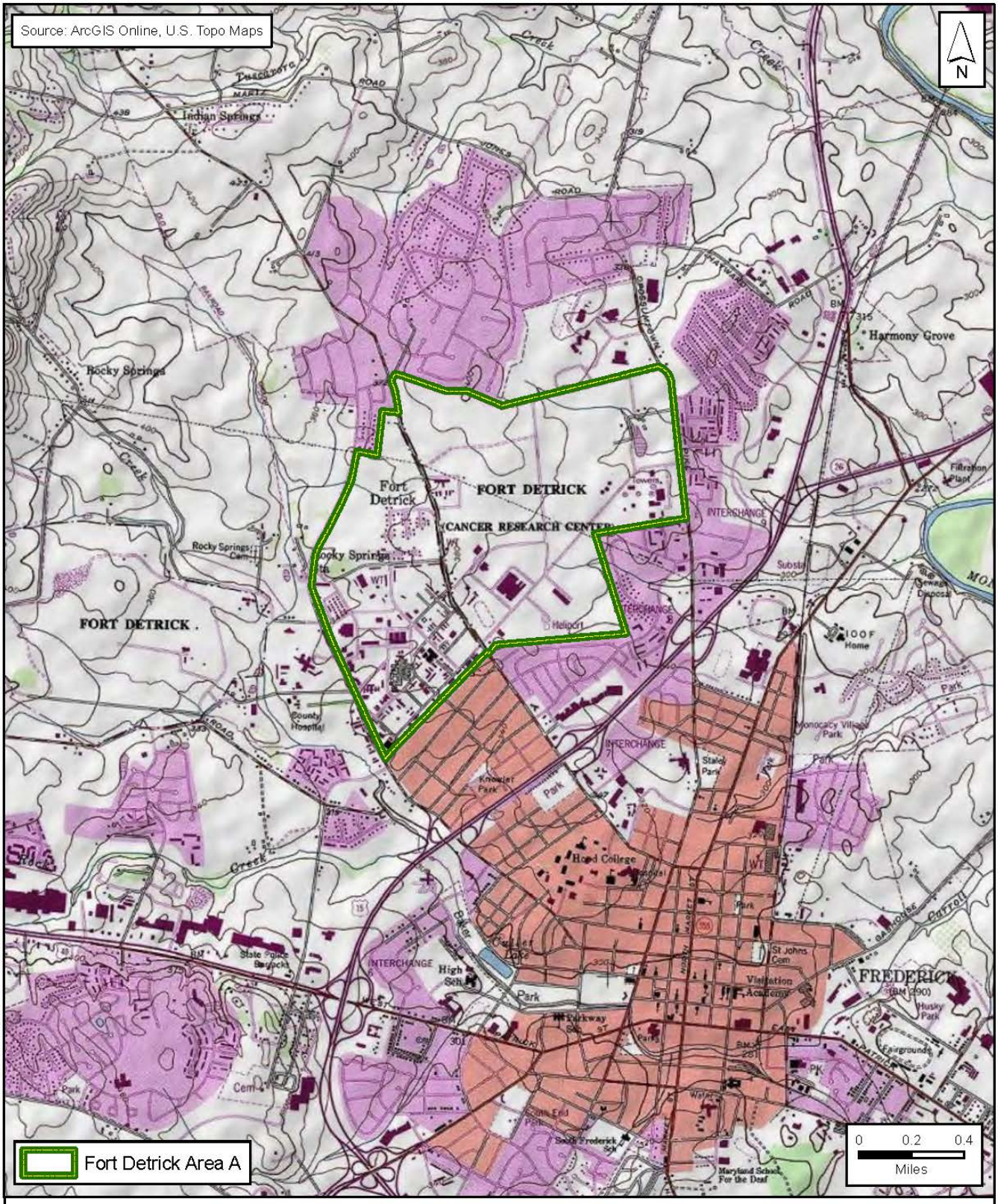
DRMS	Defense Reutilization and Marketing Service
EA	Environmental Assessment
EDS	Effluent Decontamination System
ESA	Endangered Species Act
ESD	Environmental Site Design
EO	Executive Order
FCC	Family Child Care
FEMA	Federal Emergency Management Agency
GHGs	greenhouse gases
GWP	global warming potential
HAP	hazardous air pollutants
HMMO	Hazardous Materials Management Operation
HQ	Headquarters
IAP	Installation Action Plan
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
IPaC	Information for Planning and Conservation
kPa	kilopascals
LF	linear feet
LID	Low Impact Development
LSS	Laboratory Sewer System
LUC	Land Use Controls
MDE	Maryland Department of the Environment
MHT	Maryland Historical Trust
NAAQS	National Ambient Air Quality Standards
NAYEC	National Association for the Education of Young Children
NEPA	National Environmental Policy Act of 1969
NCI	National Cancer Institute
NHPA	National Historic Preservation Act

NIBC	National Interagency Biodefense Campus
NLEB	Northern long-eared bat
N_2O	nitrous oxide
NO2	nitrogen oxide
NOx	oxides of nitrogen
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
O3	ozone
OSC	Operational Services Command
OSHA	Occupational Safety and Health Act
Pb	lead
PCE	perchloroethylene
PLS	Planning Level Survey
PM2.5	particulate matter less than 2.5 microns in diameter
PM10	particulate matter less than 10 microns in diameter
RA	remedial action(s)
RCRA	Resource Conservation and Recovery Act
ROI	Region of Interest
RONA	Record of Non-Applicability
SAC	School Age Center
SAP	Satellite Accumulation Point
SDWA	Safe Drinking Water Act
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SJA	Staff Judge Advocate
SO2	sulfur dioxide
SOx	oxides of sulfur
SOPs	Standard Operating Procedures
SSP	Steam Sterilization Plant

TCE	trichloroethylene
TSDF	Treatment, Storage, and Disposal Facility
USACE	U.S. Army Corps of Engineers
USAG	U.S. Army Garrison
USAMMDA	U.S. Army Medical Materiel Development Activity
USAMRA	U.S. Army Medical Research Acquisition
USAMRIID	U.S. Army Medical Research Institute of Infectious Diseases
USAMRMC	U.S. Army Medical Research and Material Command
USC	U.S. Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
VOCs	Volatile Organic Compounds
WWII	World War II

APPENDIX A

FIGURES



PROJECT AREA LOCATION

Figure 1. Project Area Location

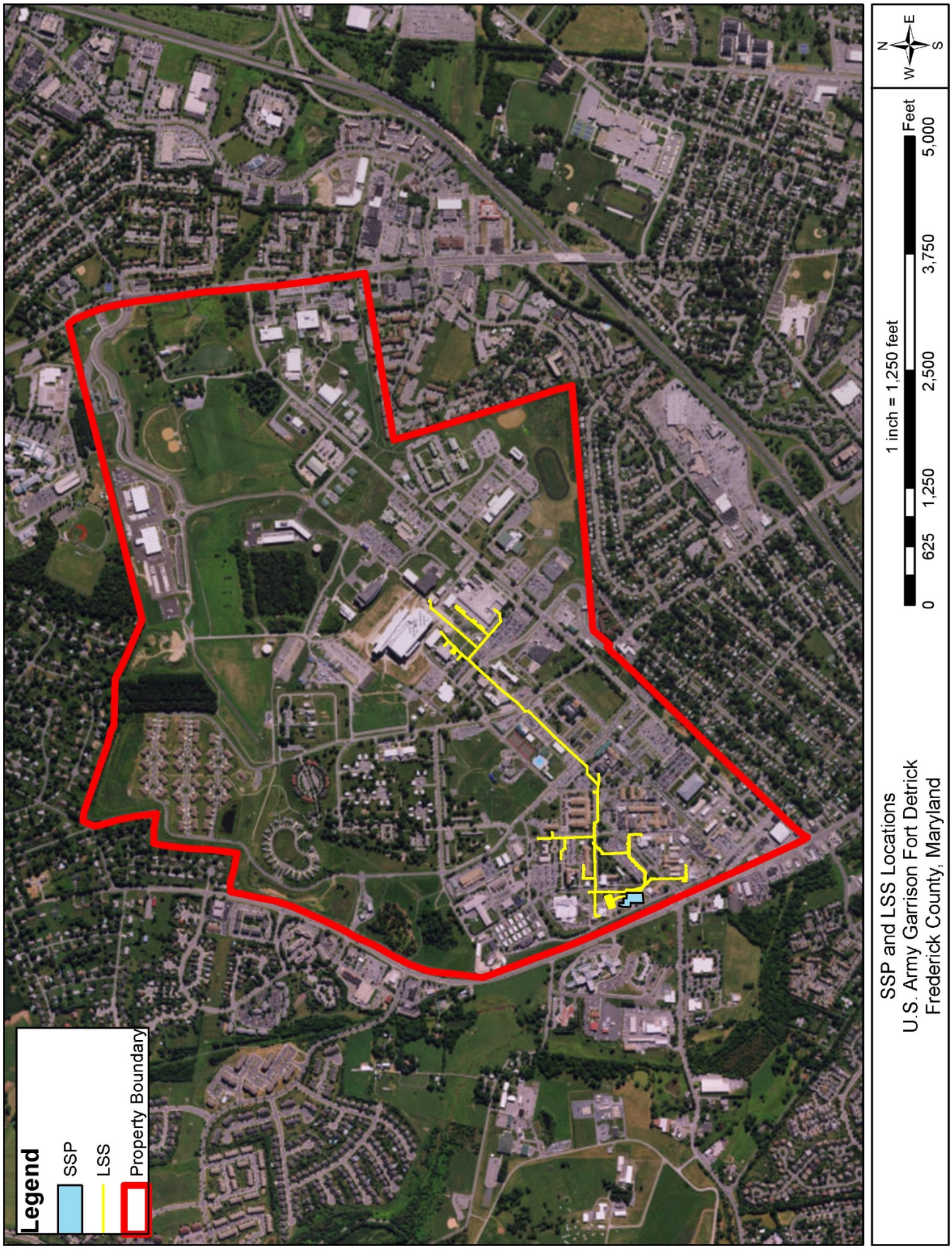


Figure 2. SSP and LSS Locations

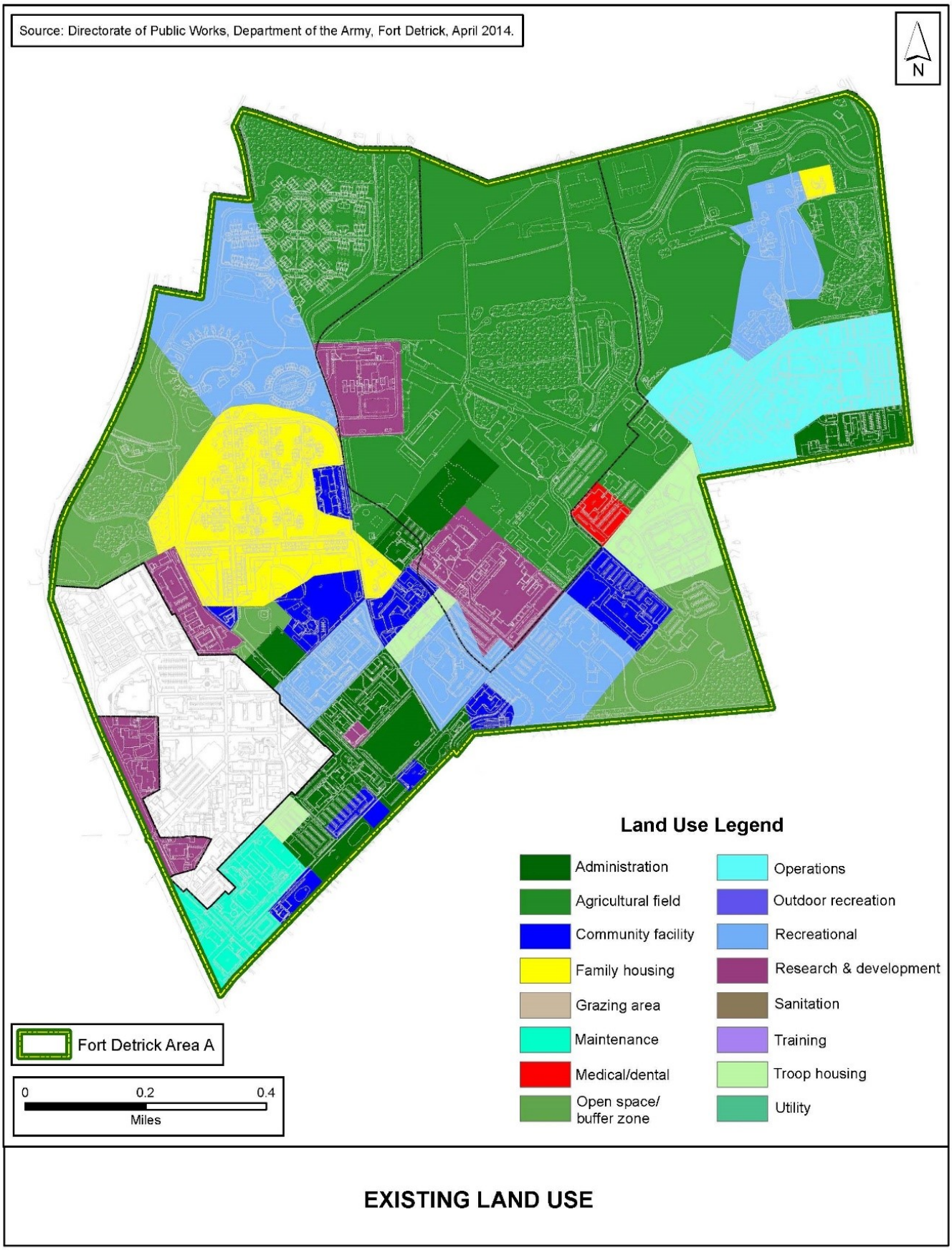


Figure 3. Existing Land Use Map

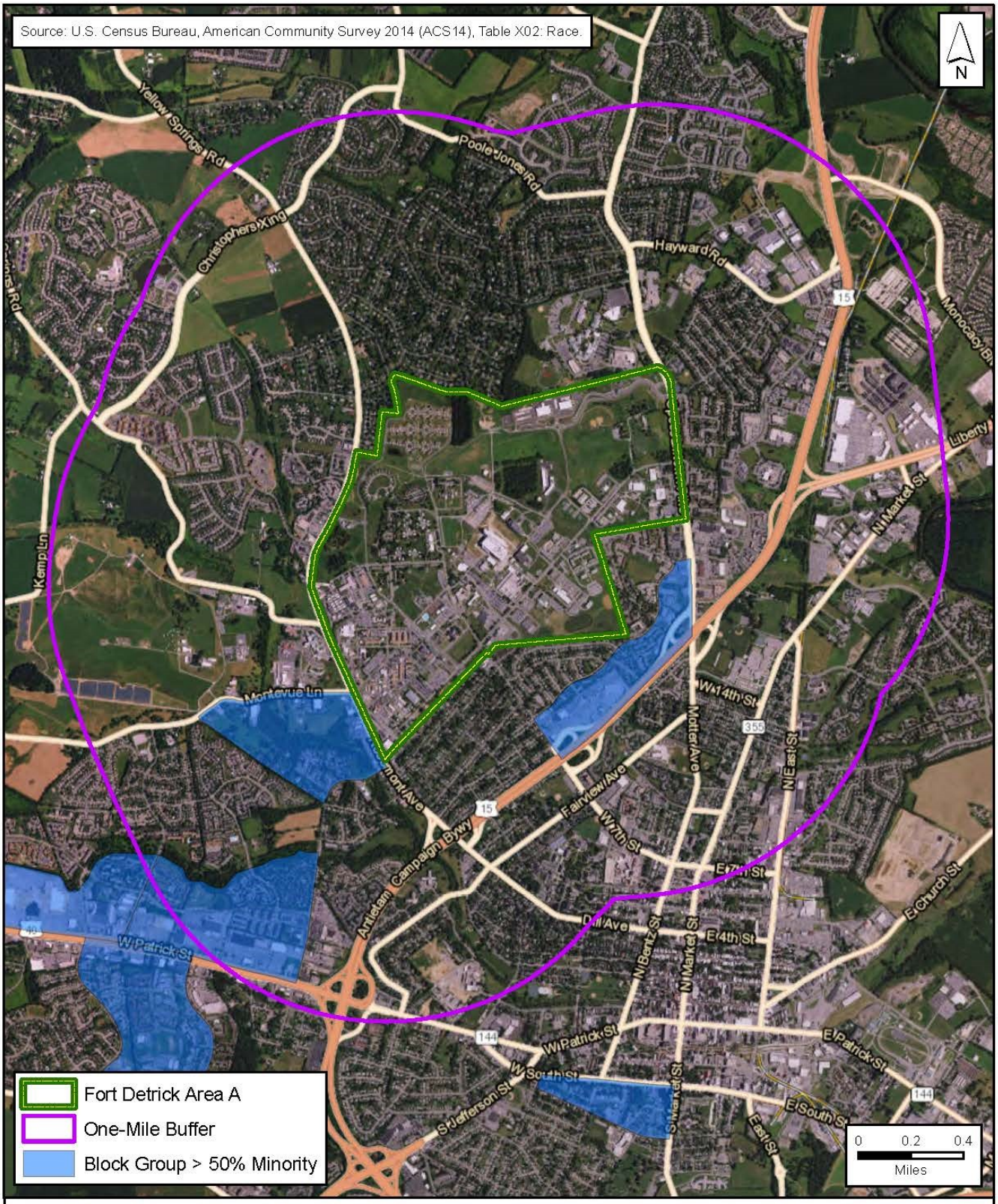


Figure 4. Minority Population Areas Near Project Area

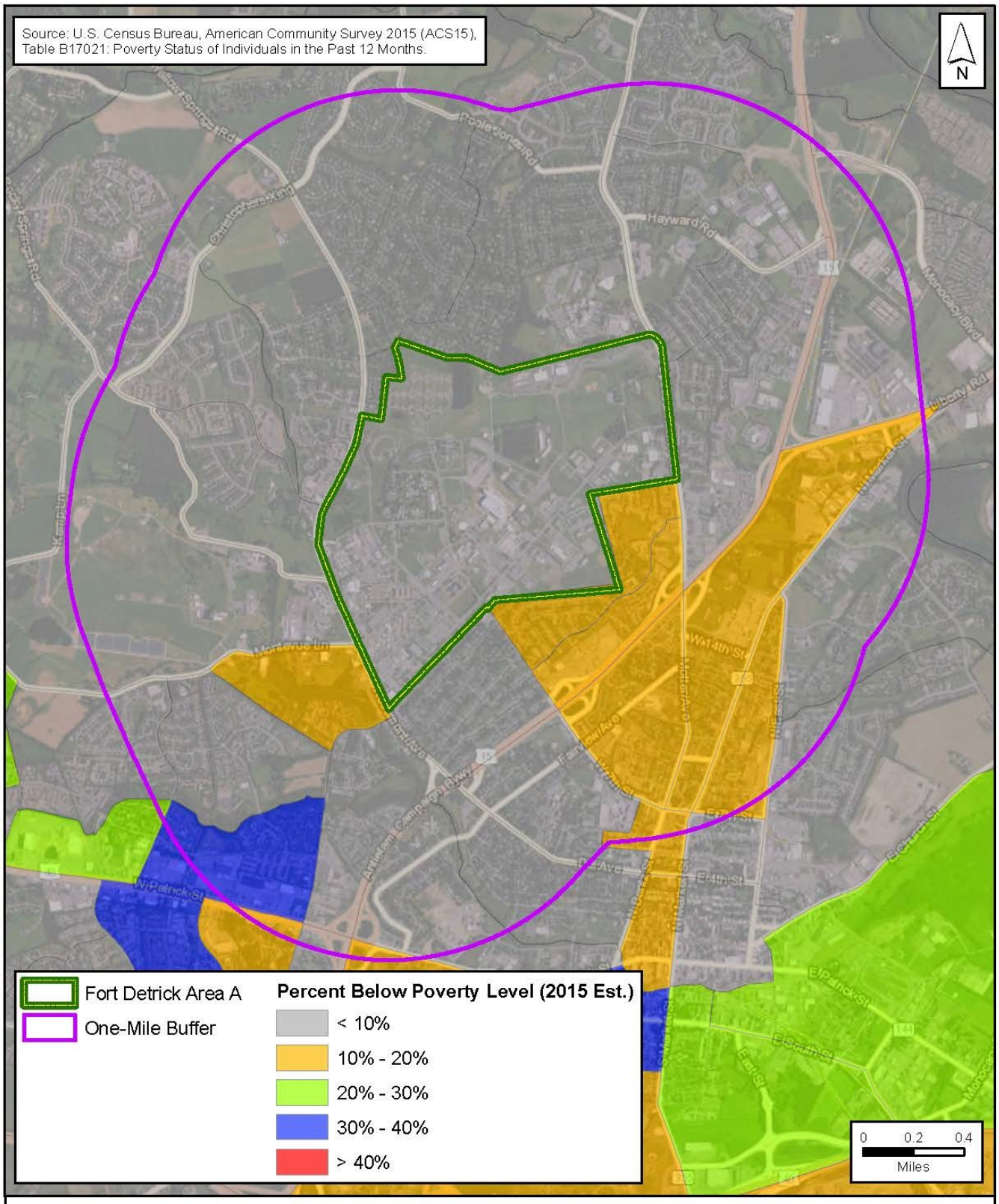
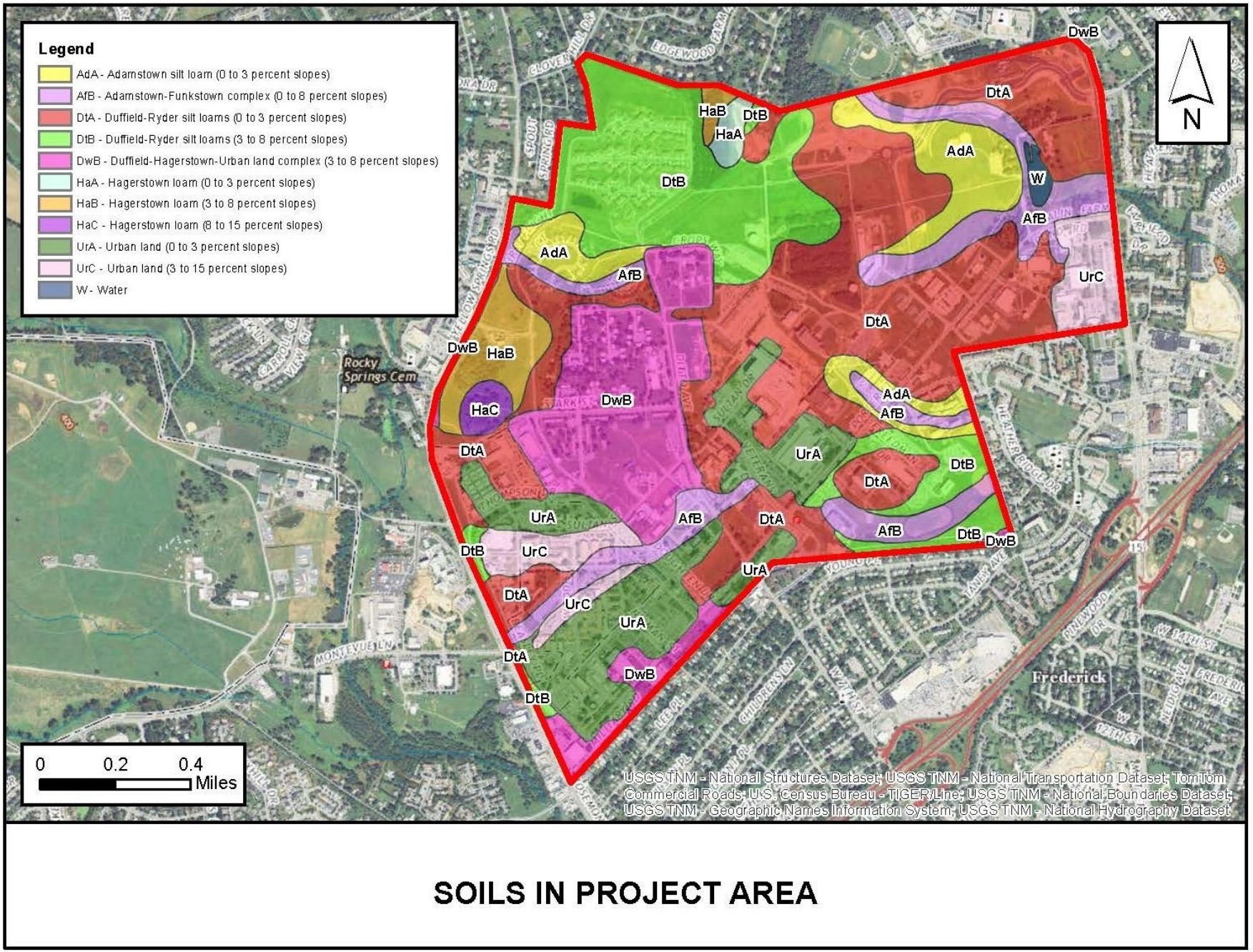
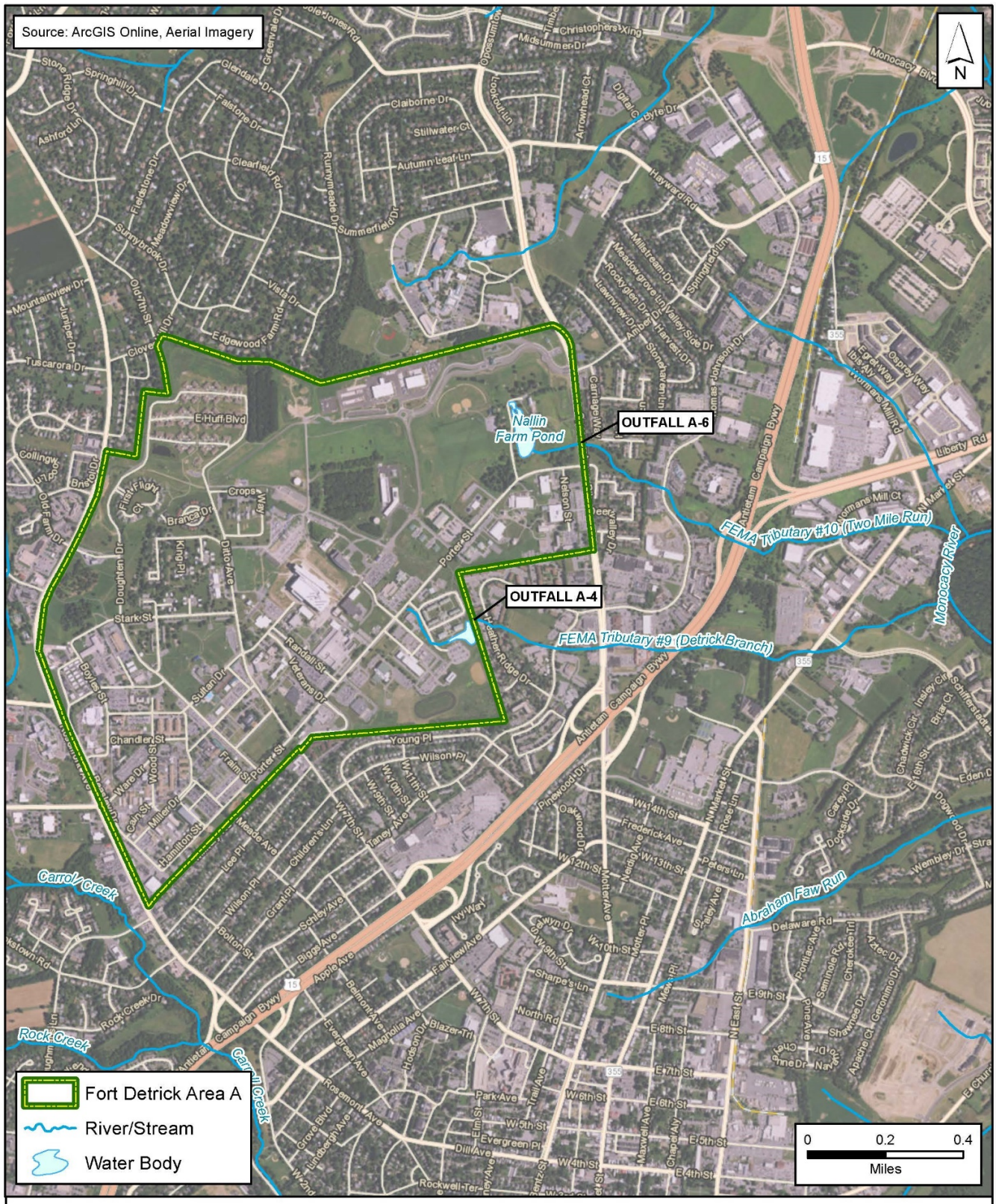


Figure 5. Low-Income Areas Near Project Area



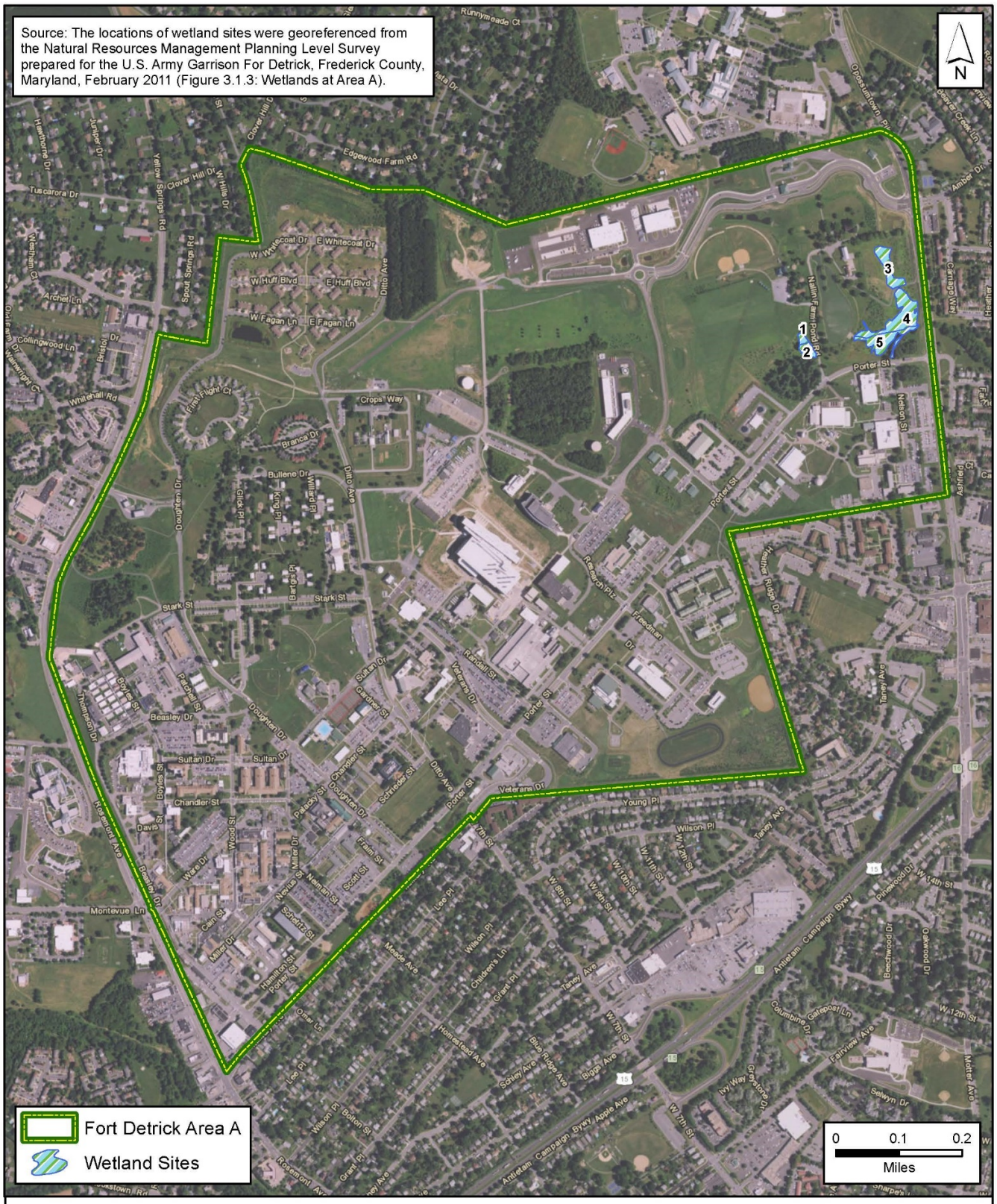
SOILS IN PROJECT AREA

Figure 6. Soils in the Project Area



SURFACE WATER FEATURES

Figure 7. Surface Water Features in Project Area



WETLANDS IN PROJECT AREA

Figure 8. Wetlands in the Project Area

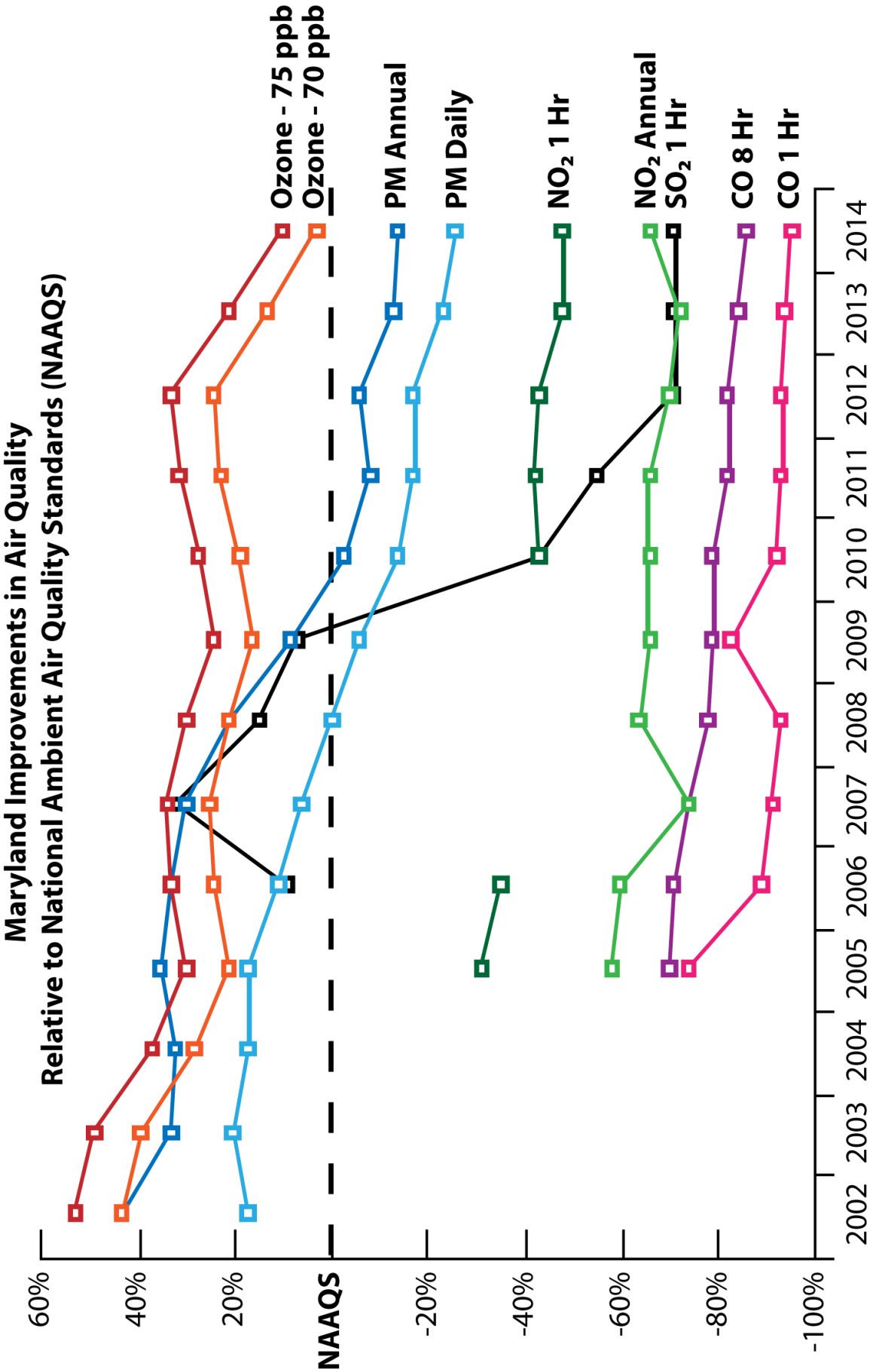


Figure 9. Maryland Air Quality Progress vs. NAAQS

Figure 10. Fort Detrick Existing Transportation and Parking Network

APPENDIX B

AGENCY COORDINATION

DEPARTMENT OF THE ARMY
U.S. ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT DETRICK
810 SCHREIDER STREET, SUITE 212
FORT DETRICK, MARYLAND 21702-5000

October 17, 2018

Ms. Elizabeth Hughes
State Historic Preservation Officer
Maryland Historic Trust
100 Community Place
Crownsville, Maryland 21032

Dear Ms. Hughes,

This letter is intended to initiate a consultation in accordance with Section 106 of the National Historic Preservation Act.

The U.S. Army Garrison, Fort Detrick, proposes to decommission and demolish Building 375, which is commonly known as the Steam Sterilization Plant (SSP) and demolish/abandon the Laboratory Sewer System (LSS) which transports laboratory wastes from the research facility to the SSP. Building 375 has been determined to be eligible for the National Register of Historic Places, although it has never been formally nominated for inclusion.

The SSP and LSS are currently in an advancing state of disrepair and will continue to deteriorate without a substantial investment. A new wastewater sterilization process is currently being brought online. Once online, discharges of laboratory wastewater to the LSS and SSP will cease. Projects are being planned for the final decontamination and decommissioning of the LSS and SSP. The decontamination and decommissioning process will likely require demolition of major portions of the LSS and SSP. Remaining structures would no longer be needed.

Rather than allow demolition of the remaining structures to occur through neglect, the Garrison proposes to demolish the building in a thoughtful manner, restoring the site with grass.

I request the concurrence and/or comments from the State Historic Preservation Office concerning this proposed undertaking.

If you need additional information, please do not hesitate to contact Melinda Norris, Cultural Resources Manager, at 301-619-8577 or melinda.f.norris.civ@mail.mil.

Sincerely,

Melinda Norris

Melinda Norris
Cultural Resource Management
Program Manager

MARYLAND DEPARTMENT OF
PLANNING
MARYLAND HISTORICAL TRUST

Larry Hogan, Governor
Boyd Rutherford, Lt. Governor

Robert S. McCord, Secretary

December 6, 2018

Melinda Norris
Environmental Program
Directorate of Public Works (DPW) – Environmental Management Division (EMD)
201 Beasley Drive, RM #204AA
Fort Detrick, MD 21702

Re: Proposed Demolition of Building 375, Steam Sterilization Plant
Frederick County, Maryland
Section 106 \ Historic Preservation Review

Dear Ms. Norris:

Thank you for initiating consultation with the Maryland Historical Trust (Trust) regarding the proposed demolition of Building 375, the Steam Sterilization Plant, at U.S. Army Garrison, Fort Detrick (Fort Detrick) in Frederick County. We understand the Army is currently bringing a new wastewater sterilization process online and is proposing to decontaminate and decommission the steam sterilization plant followed by the eventual demolition of Building 375. The Trust, Maryland's State Historic Preservation Office (SHPO), reviewed the submitted information to assess the project's effects on historic properties, pursuant to Section 106 of the National Historic Preservation Act. We offer the following comments and look forward to further consultation with Fort Detrick and other consulting parties to successfully complete the project's historic preservation review.

Identification of Historic Properties: Building 375, the Steam Sterilization Plant (Maryland Inventory of Historic Properties No. F-3-161), was documented and identified as a National Register of Historic Places eligible property as part of Fort Detrick's Integrated Cultural Resources Management Plan (U.S. Army Corps of Engineers, 2000). The Trust concurred with the determination. Building 375 is significant for its association with the Cold War (criterion A) and for its architecture (criterion C).

Assessment of Effects: As proposed, the demolition of Building 375 would constitute an **adverse effect** on historic properties.

Next Steps: Fort Detrick should complete the following next steps to proceed with the Section 106 consultation:

1. Continue consultation: Fort Detrick, as the responsible federal agency, must continue consultation with the Trust and other consulting parties to develop and evaluate alternatives or modifications to the undertaking in order to avoid, minimize, or mitigate the adverse effects. Consultation should include the following parties:

- Fort Detrick should notify the federal Advisory Council on Historic Preservation (Council) of the adverse effect and provide them the opportunity to participate in the consultation to resolve adverse effects [36 CFR800.6(a)(1)] if it has not already done so. The Council may choose or decline to participate in the consultation.
- Fort Detrick should involve consulting parties, including the Trust, other interested entities, and the public and consider the views shared by those parties in developing measures to resolve the adverse effect [36 CFR800.6(a)(2-4)]. Potential consulting parties to invite include the City of Frederick, Frederick County Historic Preservation Commission, Frederick Preservation Trust, Heart of the Civil War Heritage Area, as well as any other potentially interested party identified by Fort Detrick. Fort Detrick should notify potential consulting parties and the general public of the proposal and solicit their comments about ways to avoid, minimize, or mitigate the adverse effect.

2. Resolve the adverse effect: If Fort Detrick is not able to avoid the adverse effect it will need to develop and execute a Memorandum of Agreement (MOA) that specifies the measures that will be implemented to resolve and mitigate the adverse effect on the historic property [36 CFR800.6(b-c)]. The Trust appreciates Fort Detrick's careful consideration that the site should be restored with grass rather than allowing the building to be demolished by neglect. This idea should be explored with the consulting parties, as they may have other useful ideas for consideration.

3. Proceed with the undertaking: Redesign of the undertaking to avoid the adverse effects or execution of the MOA and implementation of its terms will evidence Fort Detrick's compliance with Section 106 for the project.

We look forward to continuing to work with Fort Detrick and other involved parties to successfully complete the Section 106 review of this undertaking. If you have any questions or we may be of assistance, please contact Natalie Loukianoff (regarding structures or landscape) at natalie.loukianoff@maryland.gov / 410-697-9587. Thank you for providing us this opportunity to comment.

Sincerely,

Elizabeth Hughes
Director / State Historic Preservation Officer
Maryland Historical Trust

EAH \ NSL\201805563

cc: Elizabeth Shatto (Heart of the Civil War Heritage Area)
Lisa Mroszczyk-Murphy (City of Frederick)
Denis Superczynski (Frederick County)

Public Notice

Decommissioning and Demolition of Steam Sterilization Plant and Laboratory Sewer System
U.S. Army Garrison Fort Detrick
Frederick, Maryland

All Interested Parties: The U.S. Army Garrison Fort Detrick (Fort Detrick) is preparing an Environmental Assessment in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, for the decommissioning and demolition of their Steam Sterilization Plant (SSP) and Laboratory Sewer System (LSS) at Fort Detrick in Frederick, Maryland (Enclosure 1).

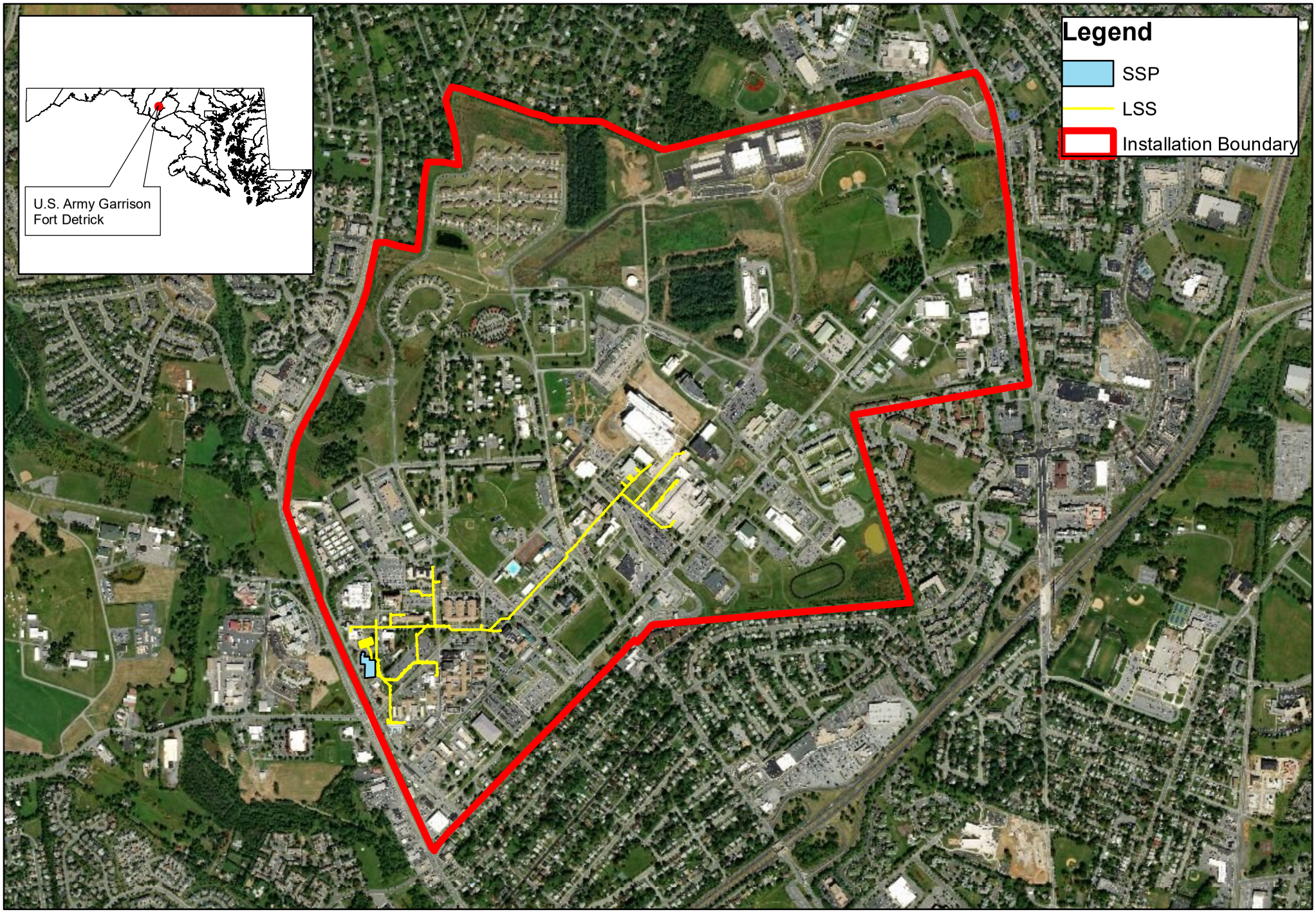
The Proposed Action will consist of the decommissioning and demolition of the SSP and LSS. Building 375 (the existing SSP) will be decommissioned when the new U.S. Army Medical Research Institute of Infectious Diseases SSP is completed. The demolition project will remove 24,138 gross square feet (the existing SSP). Approximately 5,440 linear feet of existing LSS piping will be abandoned-in-place or demolished. Building 375, all tanks and the LSS will all be decontaminated prior to demolition. The main trunk line of the LSS between Buildings 1425 and 375 will be abandoned-in-place or demolished. The collection systems and laterals from National Cancer Institute buildings that enter the LSS from the north and south will be decontaminated, capped and abandoned-in-place at the point where they meet the LSS trunk line. Once the new SSP is operational the existing plant will be decommissioned.

The documentation will be prepared in accordance with NEPA and will document potential impacts to the natural and human environments for the Proposed Projects as well as the No-Action Alternative. Interested parties are invited to submit written comments for consideration within 30 days of this notice. Any comments received will be considered in the preparation of the documentation. This Public Notice is being sent to organizations and individuals known to have an interest in this project (Enclosure 2). Please bring this matter to the attention of any other organizations or individuals with a similar interest. Comments and/or questions must be submitted within 30 days of the date of this notice to: FortDetrick_NEPA@usace.army.mil.

Mark Lewis
NEPA Program Manager
Environmental Management Division
Directorate of Public Works
201 Beasley Drive, Suite 204A
Fort Detrick, MD 21702

November 29, 2018

Enclosures



Enclosure 1
Location of U.S. Army Garrison Fort Detrick
SSP and LSS Project

1 inch = 1,250 feet

0 625 1,250 2,500 3,750 5,000 Feet

N
W E
S

Enclosure 2: Public Notice Mailing List

Mr. Greg Golden
Environmental Review Unit
Maryland Department of Natural Resources
Tawes State Office, Building B-3
580 Taylor Avenue
Annapolis, Maryland 21401
*sent separate letter

Ms. Linda C. Janey, J.D.
Director
Maryland State Clearinghouse
Maryland Office of Planning, Room 1104
301 West Preston Street
Baltimore, Maryland 21201-2365

Ms. Brigid E. Kenney
Planning Director
Maryland Department of the Environment
Office of the Secretary
1800 Washington Boulevard
Baltimore, Maryland 21230

Ms. Marie Halka
Deputy Director
Maryland Department of the Environment
SSA-Director's Office
1800 Washington Boulevard
Baltimore, Maryland 21230

Ms. Elizabeth Hughes
Director/State Historic Preservation Officer
Maryland Historical Trust
100 Community Place, 3rd Floor
Crownsville, Maryland 21032-2023
*sent separate letter

Ms. Genevieve Larouche
U.S. Department of the Interior
Fish & Wildlife Services
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, Maryland 21401
*sent separate letter

Mr. Jim Gugel
Director
Frederick County Department of Planning
30 North Market Street
Frederick, Maryland 21701

MARYLAND DEPARTMENT OF
PLANNING

Larry Hogan, Governor
Boyd Rutherford, Lt. Governor

Robert S. McCord, Secretary
Sandy Schrader, Deputy Secretary

January 4, 2019

Mr. Mark Lewis, NEPA Program Manager, Environmental Management Division
U.S. Army Garrison, Fort Detrick
201 Beasley Drive, Suite 204A
Fort Detrick, MD 21702

STATE CLEARINGHOUSE RECOMMENDATION

State Application Identifier: MD20181210-0942
Applicant: U.S. Army Garrison, Fort Detrick
Project Description: Pre-Environmental Assessment (EA) Public Notice: Proposed Action Includes Decommissioning and Demolition of the Steam Sterilization Plant and Laboratory Sewer System with a No-Action Alternative at U.S. Army Garrison, Fort Detrick in Frederick, MD; Comments Will be Considered in EA Preparation
Project Address: 810 Schreider Street, Fort Detrick, MD 21702
Project Location: Frederick County-City of Frederick
Recommendation: Consistent with Qualifying Comments and Contingent Upon Certain Actions

Dear Mr. Lewis:

In accordance with Presidential Executive Order 12372 and Code of Maryland Regulation 34.02.02.04-.07, the State Clearinghouse has coordinated the intergovernmental review of the referenced project. This letter constitutes the State process review and recommendation. This recommendation is valid for a period of three years from the date of this letter.

Review comments were requested from the Maryland Departments of General Services, Natural Resources, Transportation, the Environment; Maryland Military Department; Frederick County; City of Frederick; and the Maryland Department of Planning, including the Maryland Historical Trust. The Maryland Department of Natural Resources, Maryland Military Department, and City of Frederick did not have comments.

The Maryland Departments of General Services, and Transportation; Frederick County; and the Maryland Department of Planning found this project to be consistent with their plans, programs, and objectives.

The Maryland Department of Planning commented, "the subject project is located within the City of Frederick and its locally designated Priority Funding Area".

The Maryland Department of the Environment found this project to be generally consistent with their plans, programs, and objectives, but included certain qualifying comments summarized below.

1. If the proposed project involves demolition – Any above ground or underground petroleum storage tanks that may be on site must have contents and tanks along with any contamination removed. Please contact the Oil Control Program at (410) 537-3442 for additional information.

2. Any solid waste including construction, demolition and land clearing debris, generated from the subject project, must be properly disposed of at a permitted solid waste acceptance facility, or recycled if possible. Contact the Solid Waste Program at (410) 537-3315 for additional information regarding solid waste activities and contact the Waste Diversion and Utilization Program at (410) 537-3314 for additional information regarding recycling activities.

3. The Waste Diversion and Utilization Program should be contacted directly at (410) 537-3314 by those facilities which generate or propose to generate or handle hazardous wastes to ensure these activities are being conducted in compliance with applicable State and federal laws and regulations. The Program should also be contacted prior to construction activities to ensure that the treatment, storage or disposal of hazardous wastes and low-level radioactive wastes at the facility will be conducted in compliance with applicable State and federal laws and regulations.

4. Any contract specifying "lead paint abatement" must comply with Code of Maryland Regulations (COMAR) 26.16.01 - Accreditation and Training for Lead Paint Abatement Services. If a property was built before 1950 and will be used as rental housing, then compliance with COMAR 26.16.02 - Reduction of Lead Risk in Housing; and Environment Article Title 6, Subtitle 8, is required. Additional guidance regarding projects where lead paint may be encountered can be obtained by contacting the Environmental Lead Division at (410) 537-3825.

5. The proposed project may involve rehabilitation, redevelopment, revitalization, or property acquisition of commercial, industrial property. Accordingly, MDE's Brownfields Site Assessment and Voluntary Cleanup Programs (VCP) may provide valuable assistance to you in this project. These programs involve environmental site assessment in accordance with accepted industry and financial institution standards for property transfer. For specific information about these programs and eligibility, please contact the Land Restoration Program at (410) 537-3437.

6. Borrow areas used to provide clean earth back fill material may require a surface mine permit. Disposal of excess cut material at a surface mine may requires site approval. Contact the Mining Program at (410) 537-3557 for further details.

The Maryland Historical Trust stated that their finding of consistency is contingent upon the applicant taking the action summarized herein and in the enclosed supplemental comments letter. "Action contingent upon U.S. Army Garrison, Fort Detrick completing Section 106 Coordination. Comments provided by letter and sent directly to U.S. Army Garrison, Fort Detrick."

The State Application Identifier Number must be placed on any correspondence pertaining to this project. The State Clearinghouse must be kept informed if the approving authority cannot accommodate the recommendation.

Please remember, you must comply with all applicable state and local laws and regulations. If you need assistance or have questions, contact the State Clearinghouse staff person noted above at 410-767-4490 or through e-mail at sylvia.mosser@maryland.gov.

Thank you for your cooperation with the MIRC process.

Sincerely,

for MB

Myra Barnes, Lead Clearinghouse Coordinator

MB:SM
Enclosure
cc:

Tina Quinichette - MDOT	Wendy Scott-Napier - DGS	Mayor - FREDER
Amanda Redmiles - MDE	Daniel Pyle - MILT	Joseph Griffiths - MDPL
Greg Golden - DNR	Lori Barlet - FRDR	Beth Cole - MHT

18-0942_CRR.CLS.docx

FILE COPY

MARYLAND DEPARTMENT OF
PLANNING
MARYLAND HISTORICAL TRUST

Larry Hogan, Governor
Boyd Rutherford, Lt. Governor

Robert S. McCord, Secretary

December 6, 2018

Melinda Norris
Environmental Program
Directorate of Public Works (DPW) – Environmental Management Division (EMD)
201 Beasley Drive, RM #204AA
Fort Detrick, MD 21702

Re: Proposed Demolition of Building 375, Steam Sterilization Plant
Frederick County, Maryland
Section 106 \ Historic Preservation Review

Dear Ms. Norris:

Thank you for initiating consultation with the Maryland Historical Trust (Trust) regarding the proposed demolition of Building 375, the Steam Sterilization Plant, at U.S. Army Garrison, Fort Detrick (Fort Detrick) in Frederick County. We understand the Army is currently bringing a new wastewater sterilization process online and is proposing to decontaminate and decommission the steam sterilization plant followed by the eventual demolition of Building 375. The Trust, Maryland's State Historic Preservation Office (SHPO), reviewed the submitted information to assess the project's effects on historic properties, pursuant to Section 106 of the National Historic Preservation Act. We offer the following comments and look forward to further consultation with Fort Detrick and other consulting parties to successfully complete the project's historic preservation review.

Identification of Historic Properties: Building 375, the Steam Sterilization Plant (Maryland Inventory of Historic Properties No. F-3-161), was documented and identified as a National Register of Historic Places eligible property as part of Fort Detrick's Integrated Cultural Resources Management Plan (U.S. Army Corps of Engineers, 2000). The Trust concurred with the determination. Building 375 is significant for its association with the Cold War (criterion A) and for its architecture (criterion C).

Assessment of Effects: As proposed, the demolition of Building 375 would constitute an **adverse effect** on historic properties.

Next Steps: Fort Detrick should complete the following next steps to proceed with the Section 106 consultation:

1. Continue consultation: Fort Detrick, as the responsible federal agency, must continue consultation with the Trust and other consulting parties to develop and evaluate alternatives or modifications to the undertaking in order to avoid, minimize, or mitigate the adverse effects. Consultation should include the following parties:

- Fort Detrick should notify the federal Advisory Council on Historic Preservation (Council) of the adverse effect and provide them the opportunity to participate in the consultation to resolve adverse effects [36 CFR800.6(a)(1)] if it has not already done so. The Council may choose or decline to participate in the consultation.
- Fort Detrick should involve consulting parties, including the Trust, other interested entities, and the public and consider the views shared by those parties in developing measures to resolve the adverse effect [36 CFR800.6(a)(2-4)]. Potential consulting parties to invite include the City of Frederick, Frederick County Historic Preservation Commission, Frederick Preservation Trust, Heart of the Civil War Heritage Area, as well as any other potentially interested party identified by Fort Detrick. Fort Detrick should notify potential consulting parties and the general public of the proposal and solicit their comments about ways to avoid, minimize, or mitigate the adverse effect.

2. Resolve the adverse effect: If Fort Detrick is not able to avoid the adverse effect it will need to develop and execute a Memorandum of Agreement (MOA) that specifies the measures that will be implemented to resolve and mitigate the adverse effect on the historic property [36 CFR800.6(b-c)]. The Trust appreciates Fort Detrick's careful consideration that the site should be restored with grass rather than allowing the building to be demolished by neglect. This idea should be explored with the consulting parties, as they may have other useful ideas for consideration.

3. Proceed with the undertaking: Redesign of the undertaking to avoid the adverse effects or execution of the MOA and implementation of its terms will evidence Fort Detrick's compliance with Section 106 for the project.

We look forward to continuing to work with Fort Detrick and other involved parties to successfully complete the Section 106 review of this undertaking. If you have any questions or we may be of assistance, please contact Natalie Loukianoff (regarding structures or landscape) at natalie.loukianoff@maryland.gov / 410-697-9587. Thank you for providing us this opportunity to comment.

Sincerely,

Elizabeth Hughes
Director / State Historic Preservation Officer
Maryland Historical Trust

EAH \ NSL\201805563

cc: Elizabeth Shatto (Heart of the Civil War Heritage Area)
Lisa Mroszczyk-Murphy (City of Frederick)
Denis Superczynski (Frederick County)

DEPARTMENT OF THE ARMY
U.S. ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT DETRICK
810 SCHREIDER STREET, SUITE 212
FORT DETRICK, MARYLAND 21702-5000

November 29, 2018

Ms. Genevieve Larouche
U.S. Department of the Interior
Fish and Wildlife Service
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, Maryland 21401

Dear Ms. Larouche,

The U.S. Army Garrison Fort Detrick (Fort Detrick) is preparing an Environmental Assessment in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, for the decommissioning and demolition of their Steam Sterilization Plant (SSP) and Laboratory Sewer System (LSS) at Fort Detrick in Frederick, Maryland (Enclosure).

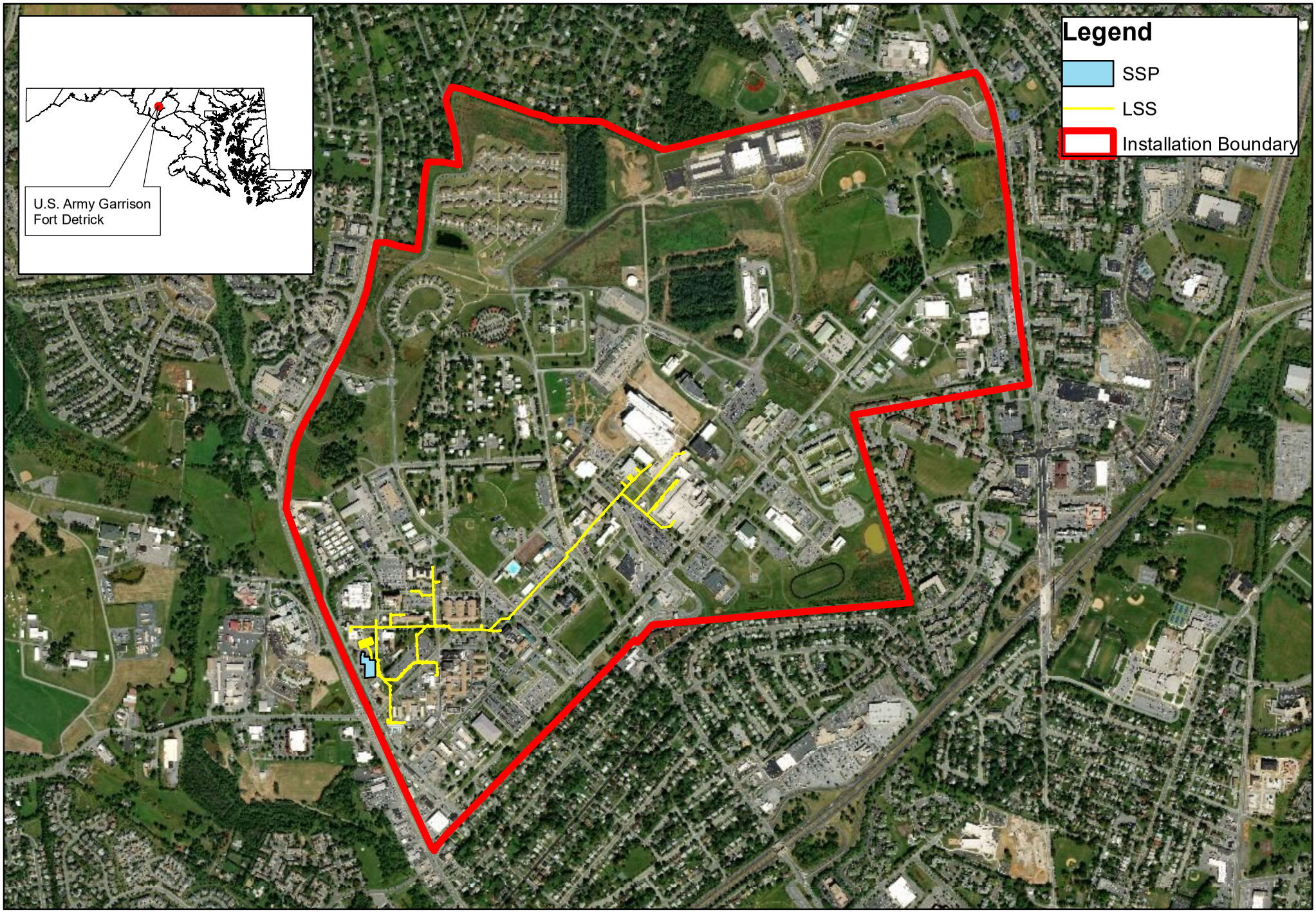
The Proposed Action will consist of the decommissioning and demolition of the SSP and LSS. Building 375 (the existing SSP) will be decommissioned when the new U.S. Army Medical Research Institute of Infectious Diseases SSP is completed. The demolition project will remove 24,138 gross square feet (the existing SSP). Approximately 5,440 linear feet of existing LSS piping will be abandoned-in-place or demolished. Building 375, all tanks and the LSS will all be decontaminated prior to demolition. The main trunk line of the LSS between Buildings 1425 and 375 will be abandoned-in-place or demolished. The collection systems and laterals from National Cancer Institute buildings that enter the LSS from the north and south will be decontaminated, capped and abandoned-in-place at the point where they meet the LSS trunk line. Once the new SSP is operational the existing plant will be decommissioned.

We request any information your office may have on the presence of federally protected species of animals and plants listed by the Fish and Wildlife Coordination Act and Section 7 of the Endangered Species Act (ESA). This request is for the project areas shown in the Enclosure. A coordination letter has also been sent to the Maryland Department of Natural Resources and Environmental Conservation for information concerning listed species managed under their jurisdiction. Please provide written comments within 30 days from the date of this letter to FortDetrick_NEPA@usace.army.mil.

Sincerely,

Mark Lewis
NEPA Program Manager
Environmental Management Division
Directorate of Public Works
201 Beasley Drive, Suite 204A
Fort Detrick, MD 21702

Enclosure



Enclosure 1
Location of U.S. Army Garrison Fort Detrick
SSP and LSS Project

1 inch = 1,250 feet

0 625 1,250 2,500 3,750 5,000 Feet

N
W E
S

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Ecological Services Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401-7307
Phone: (410) 573-4599 Fax: (410) 266-9127
http://www.fws.gov/chesapeakebay/
http://www.fws.gov/chesapeakebay/endsppweb/ProjectReview/Index.html

In Reply Refer To: November 13, 2019
Consultation Code: 05E2CB00-2018-SLI-1523
Event Code: 05E2CB00-2020-E-00495
Project Name: Fort Detrick SSP and LSS Decommissioning and Demolition

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. This species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Chesapeake Bay Ecological Services Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401-7307
(410) 573-4599

Project Summary

Consultation Code: 05E2CB00-2018-SLI-1523

Event Code: 05E2CB00-2020-E-00495

Project Name: Fort Detrick SSP and LSS Decommissioning and Demolition

Project Type: ** OTHER **

Project Description: The project description is decommissioning and demolishing the Steam Sterilization Plant (SSP) and Laboratory Sewer System (LSS) and associated equipment and facilities at Fort Detrick, Maryland.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/39.43631711105404N77.428691783944W

Counties: Frederick, MD

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis*	Threatened

No critical habitat has been designated for this species.

This species only needs to be considered under the following conditions:

- Projects with a federal nexus that have tree clearing = to or > 15 acres: 1. REQUEST A SPECIES LIST 2. NEXT STEP: EVALUATE DETERMINATION KEYS 3. SELECT EVALUATE under the Northern Long-Eared Bat (NLEB) Consultation and 4(d) Rule Consistency key

Species profile: https://ecos.fws.gov/ecp/species/9045

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

THERE ARE NO WETLANDS WITHIN YOUR PROJECT AREA.

DEPARTMENT OF THE ARMY
U.S. ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT DETRICK
810 SCHREIDER STREET, SUITE 212
FORT DETRICK, MARYLAND 21702-5000

November 29, 2018

Mr. Greg Golden
Environmental Review Unit
Maryland Department of Natural Resources
Tawes State Office Building B-3
580 Taylor Avenue
Annapolis, Maryland 21401

Dear Mr. Golden,

The U.S. Army Garrison Fort Detrick (Fort Detrick) is preparing an Environmental Assessment in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, for the decommissioning and demolition of their Steam Sterilization Plant (SSP) and Laboratory Sewer System (LSS) at Fort Detrick in Frederick, Maryland (Enclosure).

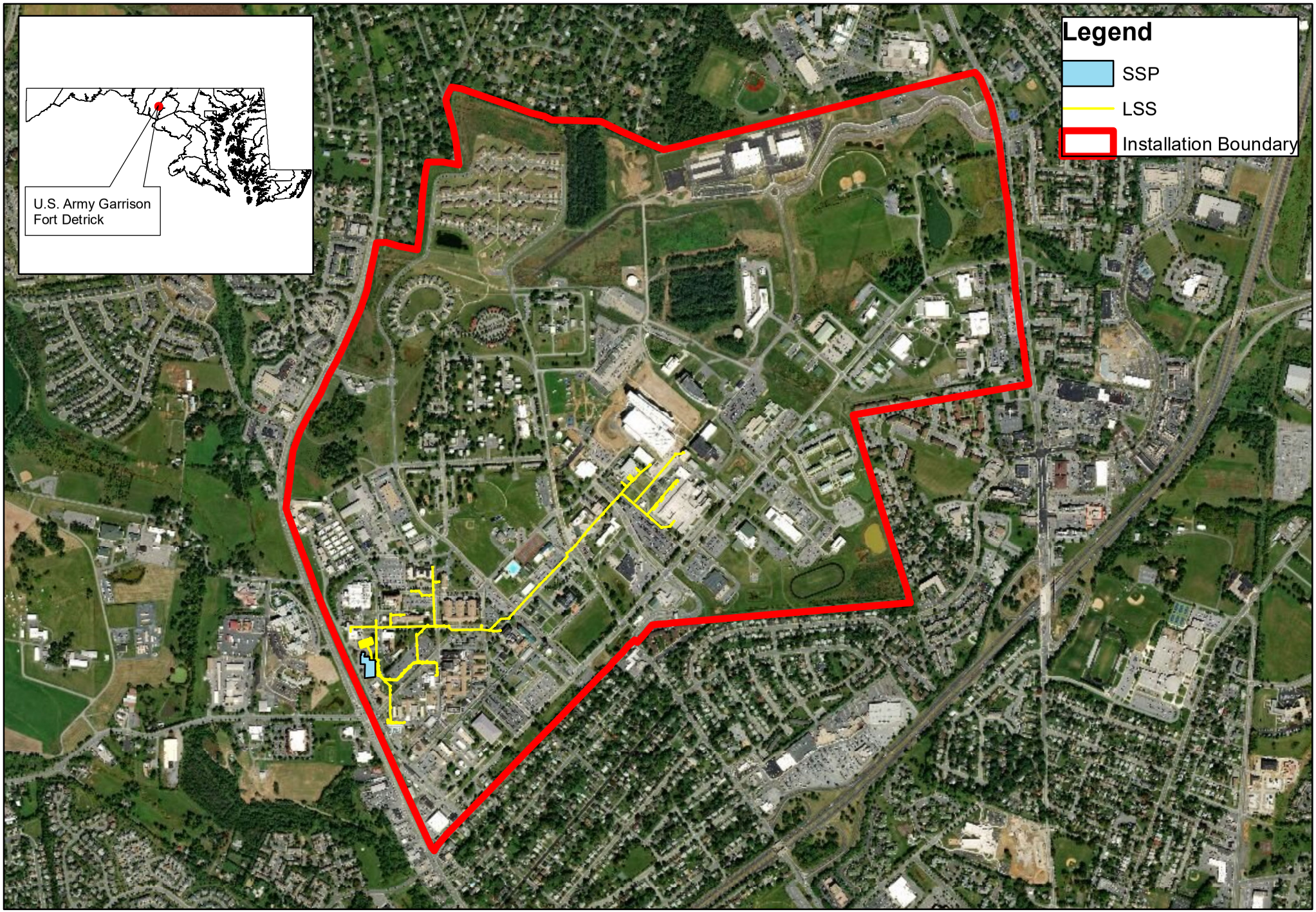
The Proposed Action will consist of the decommissioning and demolition of the SSP and LSS. Building 375 (the existing SSP) will be decommissioned when the new U.S. Army Medical Research Institute of Infectious Diseases SSP is completed. The demolition project will remove 24,138 gross square feet (the existing SSP). Approximately 5,440 linear feet of existing LSS piping will be abandoned-in-place or demolished. Building 375, all tanks and the LSS will all be decontaminated prior to demolition. The main trunk line of the LSS between Buildings 1425 and 375 will be abandoned-in-place or demolished. The collection systems and laterals from National Cancer Institute buildings that enter the LSS from the north and south will be decontaminated, capped and abandoned-in-place at the point where they meet the LSS trunk line. Once the new SSP is operational the existing plant will be decommissioned.

We request that your office provide an endangered species review of the proposed projects. This request is for the project areas shown in the Enclosure. A coordination letter has also been sent to the U.S. Fish and Wildlife Service for information concerning listed species managed under their jurisdiction. Please provide written comments within 30 days from the date of this letter to FortDetrick_NEPA@usace.army.mil.

Sincerely,

Mark Lewis
NEPA Program Manager
Environmental Management Division
Directorate of Public Works
201 Beasley Drive, Suite 204A
Fort Detrick, MD 21702

Enclosure



Enclosure 1
Location of U.S. Army Garrison Fort Detrick
SSP and LSS Project

1 inch = 1,250 feet

0 625 1,250 2,500 3,750 5,000 Feet

N
W E
S

DEPARTMENT OF THE ARMY
U.S. ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT DETRICK
810 SCHREIDER STREET, SUITE 212
FORT DETRICK, MARYLAND 21702-5000

November 29, 2018

Ms. Elizabeth Hughes
State Historic Preservation Officer
Maryland Historical Trust
100 Community Place, 3rd Floor
Crownsville, Maryland 21032

Dear Ms. Hughes:

In accordance with Section 106 of the National Historic Preservation act (NHPA), 36 CFR Part 800.3, U.S. Army Garrison, Fort Detrick (Fort Detrick) is writing this letter to initiate consultation with your office on the proposed undertaking to decommission and demolish the Steam Sterilization Plant (SSP), Building 375 and Laboratory Sewer System (LSS), and their associated appurtenances, including under-ground and above-ground tanks (Attachment A). The proposed undertaking is needed because Fort Detrick is in the process of relocating the functions of the SSP and the LSS to new facilities located at Fort Detrick.

The SSP and LSS were built in 1953 in support of Fort Detrick's biological research activities. The existing SSP is contained mainly within Building 375. Most of the building is one-story, with a partial basement that houses the six 50,000-gallon main storage tanks at the lowest level and pump rooms at an intermediate level. The entire SSP facility is approximately 24,000 square feet (SF). The partial basement is approximately 40 feet deep and covers approximately 7,500 SF. There are also nine 50,000-gallon auxiliary storage tanks north of the SSP at Building 384 which is classified as a containment dike.

The six 50,000-gallon tanks in the basement of Building 375 receive the gravity-fed initial inflow, which is made up of biological waste water and potentially contaminated. The inflow is then pumped into one of the nine 50,000-gallon exterior tanks at Building 384 to await treatment. The waste water is then released back via gravity to the SSP for treatment. The treated water is then discharged into the sewer system. The current SSP operates 8 hours a day for 3-4 days per week, throughout the year. Approximately 50,000-gallons of laboratory wastewater is treated at the steam sterilization plant during an 8 hour shift. All laboratories located at Fort Detrick, with the exception of the existing U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID), have independent sterilization facilities for the decontamination of laboratory wastes. A new USAMRIID SSP is expected to be operating in the near future. The existing SSP will not be necessary for decontamination activities once the new USAMRIID SSP is operational.

The existing LSS is a subsurface sewer system, entirely separate from the sanitary sewer system, used for the collection of potentially contaminated wastewater and conveyance of that wastewater generated by laboratory activities at the existing USAMRIID facilities (Buildings 1408, 1412, and 1425) to the existing SSP for sterilization by injection of steam, providing the required pretreatment in accordance with Biosafety in Microbiological and Biomedical Laboratories (BMBL) standards for USAMRIID laboratory activities involving dangerous and highly infectious etiologic agents. The LSS traverses Fort Detrick from Buildings 1425 and 1412 to Building 375 at depths ranging from four feet to over 20 feet. The pipe varies in size up to 12-inch, and is encased in a 3-foot-square concrete box for its entire length. There is approximately 12,480 linear feet of laboratory sewer line on post. Some of the LSS is not in use and has been abandoned.

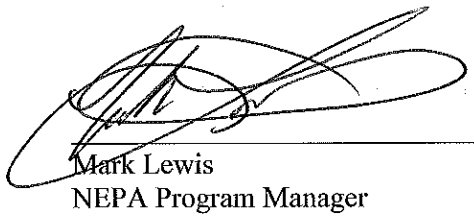
The proposed undertaking will entail the following:

1. The main trunk line of the LSS between Buildings 1425 and 375 will be abandoned-in-place or demolished.
2. The collection systems and laterals from National Cancer Institute (NCI) buildings that enter the LSS from the north and south will be decontaminated, capped, and abandoned-in-place at the point where they meet the LSS trunk line.
3. Once the new SSP is operational, Building 375 will be decommissioned.
4. The SSP facility, including all associated equipment, will be demolished so that there is no remaining laboratory research contaminates and the site will be reclaimed for future use.

With Maryland Historical Trust (MHT) concurrence, Building 375 was determined to be eligible for the National Register of Historic Places (NRHP) in 2000 (MIHP Survey Number F: 3-161) for its association with the Cold War (Attachment B). Therefore, the proposed undertaking has the potential to affect historic properties.

Fort Detrick is currently in the process of identifying historic properties that could be affected by the proposed undertaking. We look forward to consulting with your office on the proposed undertaking. If you have any questions or require further information, please contact Ms. Melinda Norris, 201 Beasely Drive, Fort Detrick, Maryland 21702, at 301-619-8577 or by email at melinda.f.norris.civ@mail.mil.

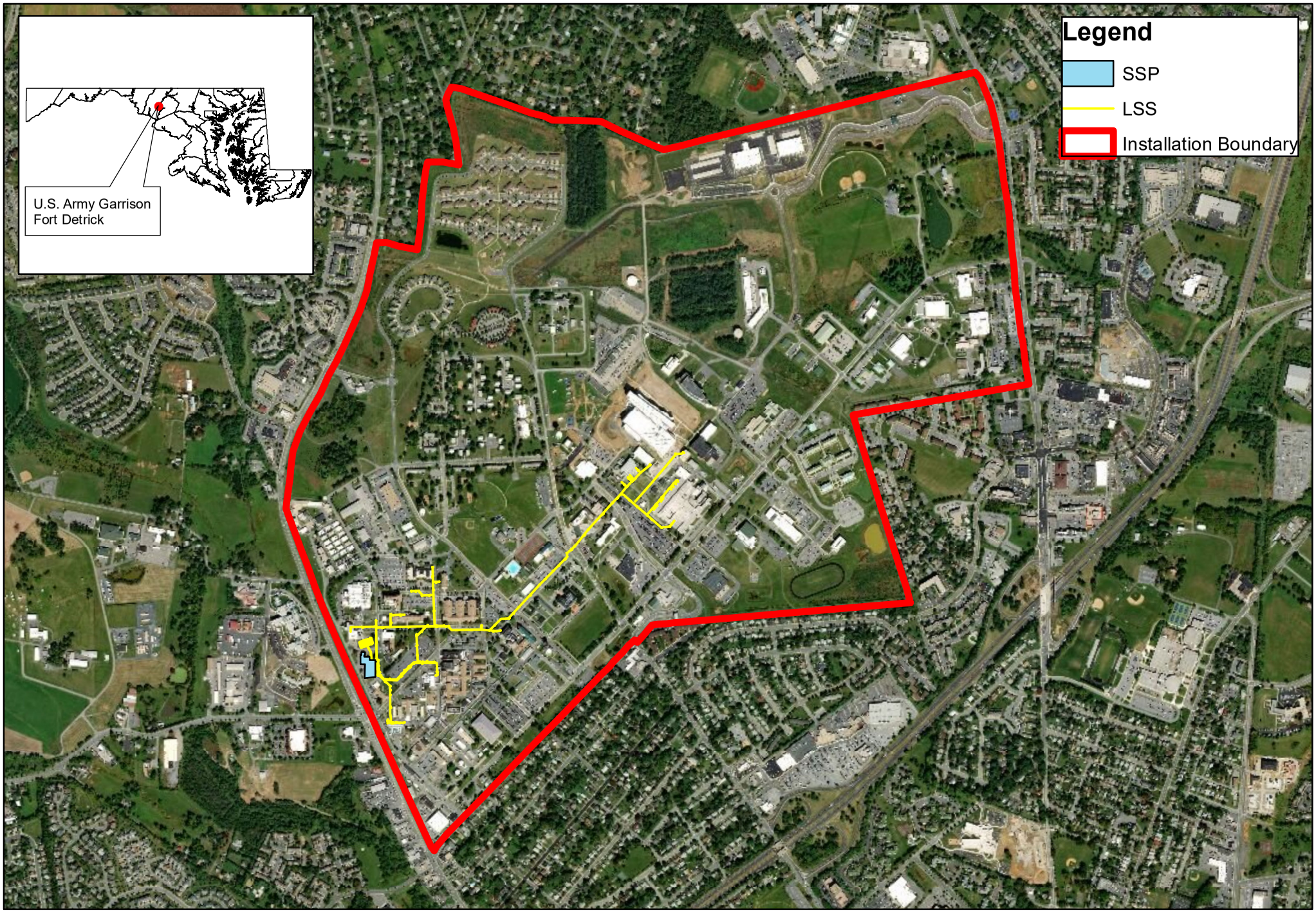
Sincerely,



Mark Lewis
NEPA Program Manager
Environmental Management Division
Directorate of Public Works
201 Beasley Drive, Suite 204A
Fort Detrick, MD 21702

Enclosures

Attachment A: Location Map and Project Area
Attachment B: MHT Review Form, Survey Number F: 3-161



Attachment A
Location of U.S. Army Garrison Fort Detrick
SSP and LSS Project

1 inch = 1,250 feet

0 625 1,250 2,500 3,750 5,000 Feet

N
W E
S

INDIVIDUAL PROPERTY/DISTRICT
MARYLAND HISTORICAL TRUST
INTERNAL NR-ELIGIBILITY REVIEW FORM

Property/District Name: Fort Detrick, Frederick County Survey Number: F:3-161

Project: ICRMP (Final) Agency: Army

Site visit by MHT Staff: ___ no _X_ yes Name Anne E. Bruder Date 10/13/1999

Eligibility recommended _X_ Eligibility **not** recommended ____

Criteria: _X_A ___B _X_C ___D Considerations: ___A ___B ___C ___D ___E ___F ___G
___None

Justification for decision: (Use continuation sheet if necessary and attach map)

Fort Detrick, Frederick County, Maryland was established in 1943 as a biological warfare research and development installation during World War II. It is a 1200 acre facility located northwest of Frederick. There are two campuses, Area "A" is the main base, and Area "B,' is west of the main grounds (see map). The research and development mission changed in 1969 following the outlawing of research on offensive biological weapons. The present ICRMP study examines all buildings constructed between 1946 and 1959 to determine if they have significance under Criterion A (events) for their association with the Cold War as architectural examples. The Army and the Trust agreed about the eligibility determinations for these resources, and attached is a list of all buildings included in the survey which show individual status. Building descriptions are contained in the ICRMP beginning at page 20.

Based on the information provided, it does not appear that there is an intact historic district on the base. The buildings which are eligible include the Boiler Plant, Steam Sterilization Plant, Medical Research Lab, R&D Greenhouse, Green House, Laboratory, Incinerator, and Administration Building. These buildings are spread across Area 'A' and there is modern infill around the buildings which prevents them from being considered together. Therefore, the historic property is more appropriately considered under the NR's Multiple Property Submission format.
Documentation on the property/district is presented in: Review & Compliance Files and Integrated Cultural Resources Management Plan (2 vols.)

Prepared by: Mark Baker, U.S. Army Corps of Engineers

Anne Bruder — 21 March 2000
Reviewer, Office of Preservation Services — Date

NR program concurrence: X yes ___ no ___ not applicable

RKurtz — 4/27/00
Reviewer, NR program — Date

Survey No. F-3-161

MARYLAND COMPREHENSIVE HISTORIC PRESERVATION PLAN DATA - HISTORIC CONTEXT

I. Geographic Region:

____ Eastern Shore	(all Eastern Shore counties, and Cecil)
____ Western Shore	(Anne Arundel, Calvert, Charles, Prince George's and St. Mary's)
__X__ Piedmont	(Baltimore City, Baltimore, Carroll, Frederick, Harford, Howard, Montgomery)
____ Western Maryland	(Allegany, Garrett and Washington)

II. Chronological/Developmental Periods:

____ Paleo-Indian	10000-7500 B.C.
____ Early Archaic	7500-6000 B.C.
____ Middle Archaic	6000-4000 B.C.
____ Late Archaic	4000-2000 B.C.
____ Early Woodland	2000-500 B.C.
____ Middle Woodland	500 B.C. - A.D. 900
____ Late Woodland/Archaic	A.D. 900-1600
____ Contact and Settlement	A.D. 1570-1750
____ Rural Agrarian Intensification	A.D. 1680-1815
____ Agricultural-Industrial Transition	A.D. 1815-1870
____ Industrial/Urban Dominance	A.D. 1870-1930
__X__ Modern Period	A.D. 1930-Present

____ Unknown Period (___ prehistoric ___ historic)

III. Prehistoric Period Themes:

____ Subsistence
____ Settlement
____ Political
____ Demographic
____ Religion
____ Technology
____ Environmental Adaptation

IV. Historic Period Themes:

____ Agriculture
__X__ Architecture, Landscape Architecture, and Community Planning
____ Economic (Commercial and Industrial)
____ Government/Law
__X__ Military
____ Religion
____ Social/Educational/Cultural
____ Transportation

V. Resource Type:

Category: Military base
Historic Environment: Rural
Historic Function(s) and Use(s): Research & development of hazardous materials.
Known Design Source: U.S. Army

Table 4
Buildings Evaluated - Constructed from 1946-1960

Photo?	Bldg No.	Date	Original Use	Current Use	Plan/Type	NR Elig?
X	190	1952	Oil Heat Plant	Boiler Plant	27-06-10	Yes
	192	1954	Power sub-station	Power sub-station		No
X	T-242	1952	Storage Shed	Storage Shed		No
X	281	1946	Power sub-station	Power sub-station		No
X	298	1946	Flag Pole	Flag Pole		No
X	326	1953	Storage Shed	Storage Shed		No
X	374	1952	Laboratory	Lab/Green House		No
X	375	1953	Steam Sterilization Plant	Steam Sterilization Plant	F 93-1-2500	Yes
X	384	1976	Tank Farm*	Tank Farm		No
X	385	1957	Transformer Bank	Transformer Bank		No
X	386	1989	Sentry Station*	Sentry Station		No
X	543	1959	Power sub-station	Power Sub-station		No
X	568	1952	Munitions Test Building	Administrative	37-06-03	No
X	730	1957	Power sub-station	Power sub-station		No
	731	1988	Sentry Station*	Sentry Station		No
X	S-800	1951	General Storage	Transient Housing	Temporary	No
X	S-801	1951	General Storage	Transient Housing	Temporary	No
X	S-802	1951	General Storage	Administrative/Housing	Temporary	No
	S-818	1951	General Storage	Administrative	Temporary	No
X	905	1949	Transit Shed	General Purpose Storage		No
X	937	1949	Outdoor Storage	Outdoor Storage	PE 107-5-49	No
X	938	1950	GP Storage	Magazine		No
X	939	1950	GP Storage	Magazine		No
X	941	1950	GP Storage	GP Storage	PE 35-5-52	No
X	T-942	1951	GP Storage	GP Storage		No
	944	1954	Power sub-station	Power sub-station		No

F-3-161

Table 4

Buildings Evaluated - Constructed from 1946-1960

Photo?	Bldg No.	Date	Original Use	Current Use	Plan/Type	NR Elig?
	1012	1950	Family Housing	Family Housing	21-01-70	No
X	1013	1950	Family Housing	Family Housing	21-01-70	No
X	1014	1950	Family Housing	Family Housing	21-01-70	No
X	1015	1950	Family Housing	Family Housing	21-01-70	No
X	1016	1951	Family Housing	Family Housing	25-01-105	No
	1017	1951	Family Housing	Family Housing	25-01-105	No
X	1054	1954	PE Maintenance Shop	Administrative		No
X	1056	1958	Storage Shed	Laboratory		No
X	1057	1959	Water Tower	Water Tower		No
X	1129	1954	Water Holding Tank	Water Holding Tank		No
X	1215	1951	Small Arms Magazine	Small Arms Magazine	SK-367	No
X	1221	1952	Munitions Loading Building	Storage Building	3706-01	No
X	1225	1953	Well Pump Station	Well Pump Station		No
X	1235	1957	Unknown*	Sporting Club		No
X	1240-43	1958	USAR Center	USAR Center		No
X	1301	1956	Medical Research Lab	Research Lab	35-06-46	Yes
X	1302	1956	R & D Greenhouse	Research	35-06-47	Yes
X	1303-06	1956	Green House	Green House	36-39-05	Yes
	T-1312	1957	Equipment Housing*	Equipment Housing		No
X	1316	1957	GP Storage	GP Storage		No
X	1400	1953	Residence	Residence	PE 65-12-32	No
X	1404	1957	Garage	Garage		No
X	1409	1955	Water Tower	Water Tower		No
X	1412	1958	Laboratory	Laboratory		Yes
X	1414	1958	Incinerator	Storage		Yes
X	1415	1959	Administration	Administration		Yes
X	1674	1959	Barracks	Barracks	21-01-69	No

Table 4
Buildings Evaluated - Constructed from 1946-1960

Photo?	Bldg No.	Date	Original Use	Current Use	Plan/Type	NR Elig?
X	1675	1958	Gen. Purpose Storage	Gen. Purpose Storage		No
	1736	1958	Family Housing	Family Housing	Capehart Housing	No
	1737		Storage	Storage	25-02-26	No
	1738		Storage	Storage	25-02-26	No
	1739	1958	Family Housing	Family Housing	Capehart Housing	No
	1740		Storage	Storage	25-02-26	No
	1741		Storage	Storage	25-02-26	No
	1742	1958	Family Housing	Family Housing	Capehart Housing	No
	1743		Storage	Storage	25-02-26	No
	1744		Storage	Storage	25-02-26	No
	1745	1958	Family Housing	Family Housing	Capehart Housing	No
	1746		Storage	Storage	25-02-26	No
	1747		Storage	Storage	25-02-26	No
	1748	1958	Family Housing	Family Housing	Capehart Housing	No
	1749		Storage	Storage	25-06-26	No
	1750		Storage	Storage	25-02-26	No
	1751	1958	Family Housing	Family Housing	Capehart Housing	No
	1752		Storage	Storage	25-02-26	No
	1753		Storage	Storage	25-02-26	No
	1754	1958	Family Housing	Family Housing	Capehart Housing	No
	1755		Storage	Storage	25-02-26	No
	1756		Storage	Storage	25-02-26	No
	1757	1958	Family Housing	Family Housing	Capehart Housing	No
	1758		Storage	Storage	25-02-26	No
	1759		Storage	Storage	25-02-26	No
	1760	1958	Family Housing	Family Housing	Capehart Housing	No
	1761		Storage	Storage	25-02-26	No

F-3-161

Table 4
Buildings Evaluated - Constructed from 1946-1960

Photo?	Bldg No.	Date	Original Use	Current Use	Plan/Type	NR Elig?
	1762		Storage	Storage	25-02-26	No
	1763	1958	Family Housing	Family Housing	Capehart Housing	No
	1764		Storage	Storage	25-02-26	No
	1765		Storage	Storage	25-02-26	No
	1766	1958	Family Housing	Family Housing	Capehart Housing	No
	1767		Storage	Storage	25-02-26	No
	1768		Storage	Storage	25-02-26	No
	1769	1958	Family Housing	Family Housing	Capehart Housing	No
X	S-1801	1958	Bus Shelter	Bus Shelter	D-93-1-5830	No
X	1803	1958	Family Housing	Family Housing	Capehart Housing	No
	1804		Storage	Storage	25-02-26	No
	1805		Storage	Storage	25-02-26	No
	1806	1958	Family Housing	Family Housing	Capehart Housing	No
	1807		Storage	Storage	25-02-26	No
	1808		Storage	Storage	25-02-26	No
	1809	1958	Family Housing	Family Housing	Capehart Housing	No
	1810		Storage	Storage	25-02-26	No
	1811		Storage	Storage	25-02-26	No
	1812	1958	Family Housing	Family Housing	Capehart Housing	No
	1813		Storage	Storage	25-02-26	No
	1814		Storage	Storage	25-02-26	No
	1815	1958	Family Housing	Family Housing	Capehart Housing	No
	1816		Storage	Storage	25-02-26	No
	1817		Storage	Storage	25-02-26	No
	1818	1958	Family Housing	Family Housing	Capehart Housing	No
	1819		Storage	Storage	25-02-26	No
	1820		Storage	Storage	25-02-26	No

F-3-191

Table 4 Buildings Evaluated - Constructed from 1946-1960						
Photo?	**Bldg No.**	**Date**	**Original Use**	**Current Use**	**Plan/Type**	**NR Elig?**
	1821	1958	Family Housing	Family Housing	Capehart Housing	No
	1822		Storage	Storage	25-02-26	No
	1823		Storage	Storage	25-02-26	No
X	1824	1958	Family Housing	Family Housing	Capehart Housing	No
	1825		Storage	Storage	25-02-26	No
X	1826		Storage	Storage	25-02-26	No
	1830	1958	Family Housing	Family Housing	Capehart Housing	No
	1831		Storage	Storage	25-02-26	No
	1832		Storage	Storage	25-02-26	No
	1833	1958	Family Housing	Family Housing	Capehart Housing	No
	1834		Storage	Storage	25-02-26	No
	1835		Storage	Storage	25-02-26	No
	1836	1958	Family Housing	Family Housing	Capehart Housing	No
	1837		Storage	Storage	25-02-26	No
	1838		Storage	Storage	25-02-26	No
	1839	1958	Family Housing	Family Housing	Capehart Housing	No
	1840		Storage	Storage	25-02-26	No
	1841		Storage	Storage	25-02-26	No
	1842	1958	Family Housing	Family Housing	Capehart Housing	No
	1843		Storage	Storage	25-02-26	No
	1844		Storage	Storage	25-02-26	No
	1845	1958	Family Housing	Family Housing	Capehart Housing	No
	1846		Storage	Storage	25-02-26	No
	1847		Storage	Storage	25-02-26	No
	1848	1958	Family Housing	Family Housing	Capehart Housing	No
	1849		Storage	Storage	25-02-26	No
	1850		Storage	Storage	25-02-26	No

F-3-161

Table 4
Buildings Evaluated - Constructed from 1946-1960

Photo?	Bldg No.	Date	Original Use	Current Use	Plan/Type	NR Elig?
	1851	1958	Family Housing	Family Housing	Capehart Housing	No
	1852		Storage	Storage	25-02-26	No
	1853		Storage	Storage	25-02-26	No
	1854	1958	Family Housing	Family Housing	Capehart Housing	No
	1855		Storage	Storage	25-02-26	No
	1856		Storage	Storage	25-02-26	No
	1857	1958	Family Housing	Family Housing	Capehart Housing	No
	1858		Storage	Storage	25-02-26	No
	1859		Storage	Storage	25-02-26	No
	1860	1958	Family Housing	Family Housing	Capehart Housing	No
	1861		Storage	Storage	25-02-26	No
	1862		Storage	Storage	25-02-26	No
	1863	1958	Family Housing	Family Housing	Capehart Housing	No
	1864		Storage	Storage	25-02-26	No

* Denotes Buildings that are more modern than indicated on the Real Property Inventory database.

F-3-161

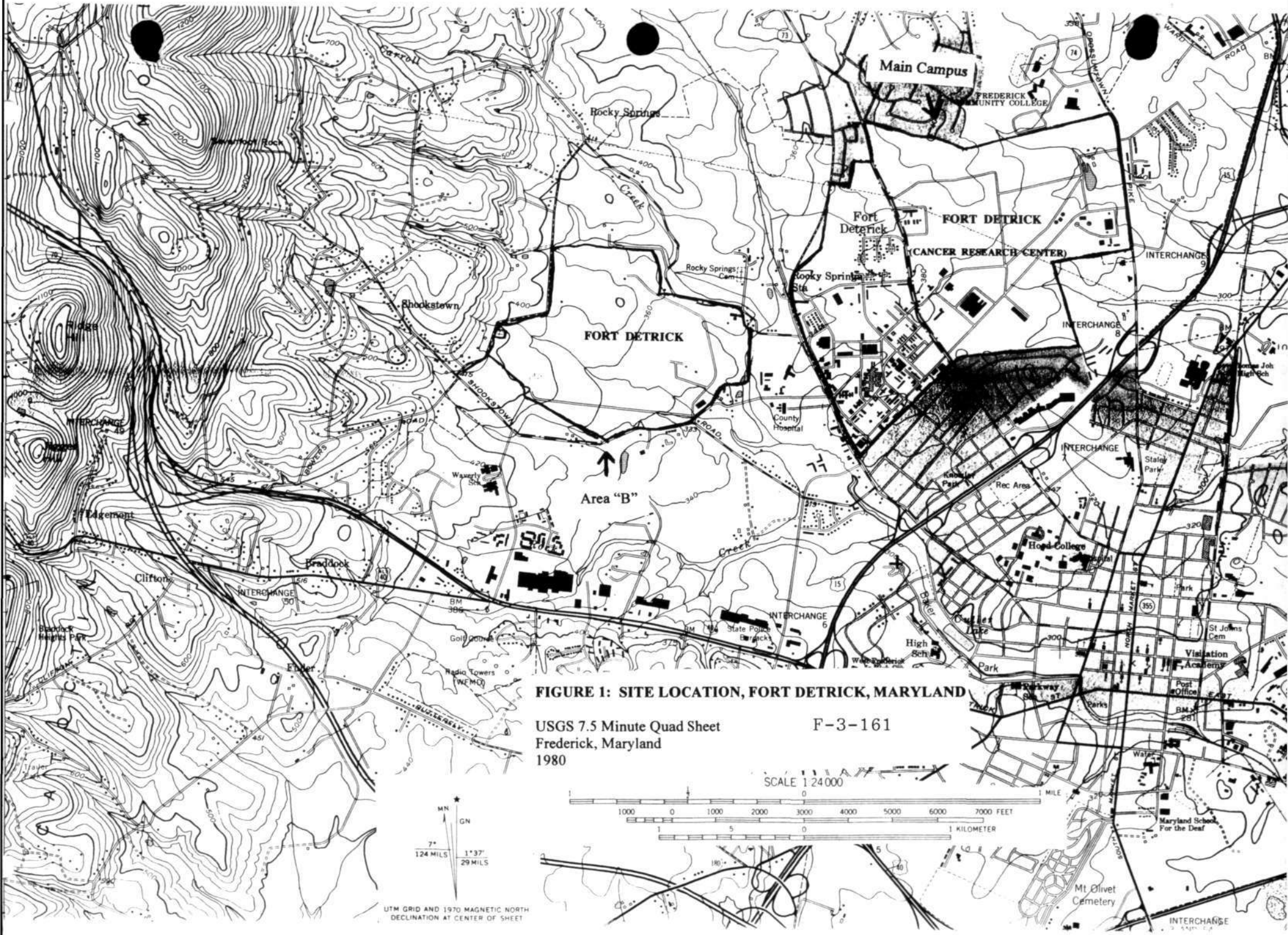
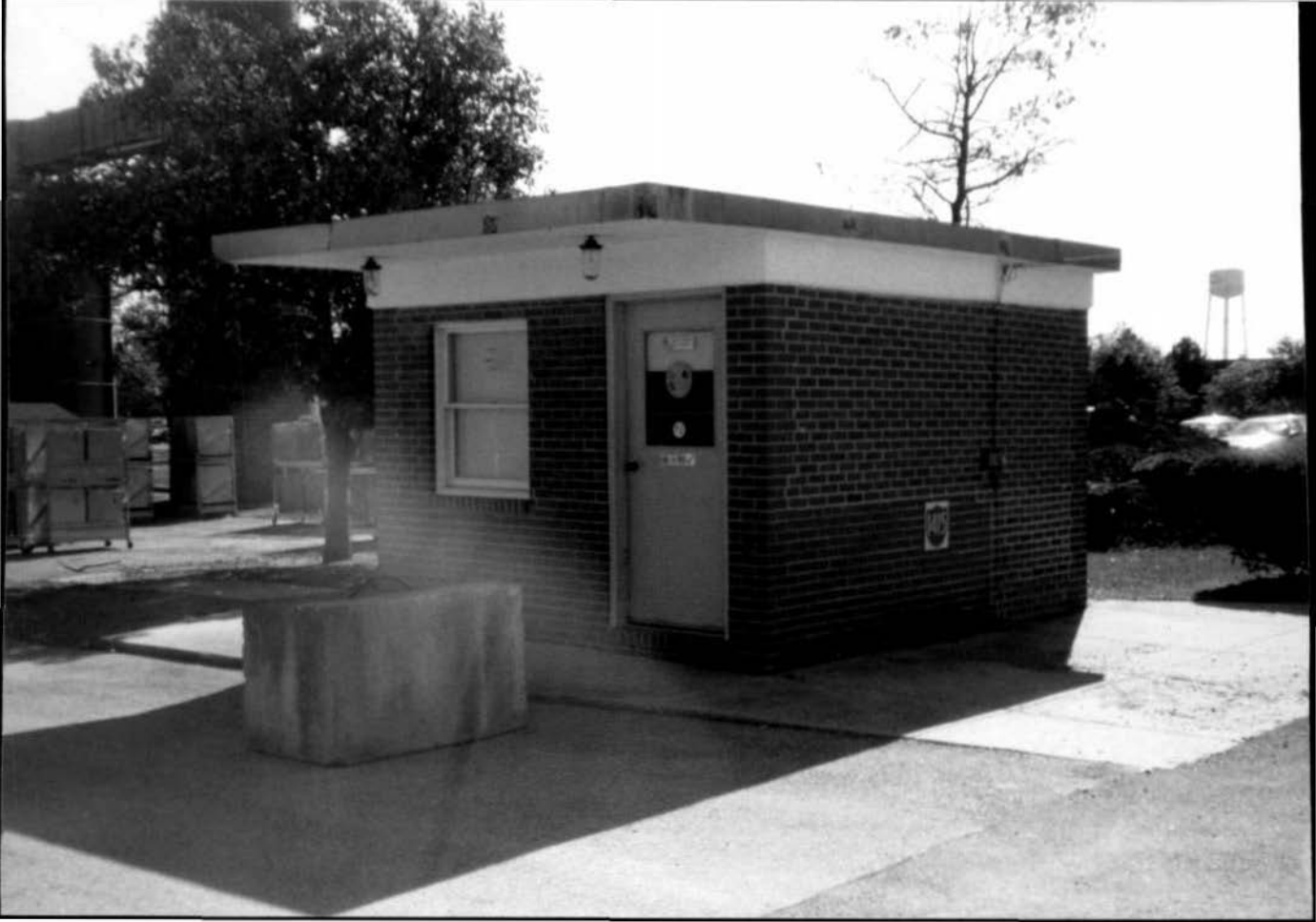


FIGURE 1: SITE LOCATION, FORT DETRICK, MARYLAND

USGS 7.5 Minute Quad Sheet
Frederick, Maryland
1980

F-3-161

1. F-3-161
2. BUILDING 375, FORT DETRICK
3. FREDERICK COUNTY, MARYLAND
4. US ARMY CORPS OF ENGINEERS, BALTIMORE DISTRICT
5. OCTOBER 1998
6. USACE, BALTIMORE DISTRICT
7. VIEW TO EAST ALONG SOUTH ELEVATION
8. 8 OF 60



1. F-3-161
2. BUILDING 1415, FORT DETRICK
3. FREDERICK COUNTY, MARYLAND
4. US ARMY CORPS OF ENGINEERS, BALTIMORE DISTRICT
5. OCTOBER 1998
6. USACE, BALTIMORE DISTRICT
7. VIEW SOUTH
8. 51 OF 60

APPENDIX C

RECORD OF NON-APPLICABILITY (RONA) AND AIR QUALITY CALCULATIONS

GENERAL CONFORMITY – RECORD OF NON-APPLICABILITY

Project/Action Name:	**Fort Detrick Proposed Demolition and Decommissioning of the Laboratory Sewer System (LSS) and Steam Sterilization Plant (SSP)**
Project/Action Point of Contact:	**Rhonda Wolf**
Begin Date (Anticipated): January 2021	**End Date (Anticipated): December 2021**

General Conformity under the Clean Air Act, Section 176 has been evaluated for the project described above according to the requirements of 40 CFR 93, Subpart B. The requirements of this rule are not applicable to this project/action because the total project emissions (presented as tons per year) have been estimated to be:

Total Project Emissions

Volatile Organic Compounds (VOC)	3.9 tpy
Nitrogen Oxides (NO_x)	32.0 tpy
Particulate Matter Less than 2.5 μm ($PM_{2.5}$)	1.8 tpy

These emission rates, including any combination of $PM_{2.5}$ and its potential precursors (i.e., NO_x and VOC), are below the conformity threshold values established at 40 CFR 93.153(b):

Conformity Threshold Rate

VOC	50 tpy
NO_x	100 tpy
$PM_{2.5}$	100 tpy

Supporting documentation and emissions estimates are attached.

SIGNED _____

Rhonda Wolf
Air Program Manager
Environmental Management Division
Directorate of Public Works
201 Beasley Drive
Fort Detrick, MD 21702

SUPPORTING DOCUMENTATION

Description of Project/Action:

The Proposed Action will consist of the decommissioning and demolition of the SSP and LSS. Building 375 (the existing SSP) will be decommissioned when the new USAMRIID SSP is completed. The demolition project will remove 24,138 gsf (the existing SSP). Approximately 5,440 linear feet of existing LSS piping will be abandoned-in-place or demolished. Building 375, all tanks, and the LSS will all be decontaminated prior to demolition. The main trunk line of the LSS between Buildings 1425 and 375 will be abandoned-in-place or demolished. The collection systems and laterals from NCI buildings that enter the LSS from the north and south will be decontaminated, capped and abandoned-in-place at the point where they meet the LSS trunk line. Once the new SSP is operational the existing plant will be decommissioned.

Input Parameters and Assumptions:

Project-specific parameters were entered for estimating emissions from the Proposed Action activities. A demolition and construction schedule has not yet been finalized. However, anticipated project emissions have been conservatively estimated and are temporary and will cease once operations are completed in year 2019.

Project Duration and Combustion Equipment

Construction crews and equipment are estimated to be onsite 52 weeks per year, seven days per week until demolition and construction activities are complete.

Daily use of nonroad and transport combustion equipment is estimated in the attached emission tables.

Construction Emissions Assumptions

Based on information available at the time of this writing, it is important to note that projected changes are re-evaluated on a continuing basis. Best engineering judgment has been applied to quantify the emissions inventory for combustion equipment types, quantity, size, usage, the vehicle transport fleet, and emission factors to conservatively estimate air emissions.

Nonroad combustion emissions are estimated based on the assumption that at least one of each construction equipment type listed in Table 2, may be used for 8 hours a day and 365 days a year. It is unlikely that the total operating hours per year will be exceeded for any of the listed equipment. For the Nonroad equipment, average horsepower ratings were estimated based on the San Joaquin Valley Air Pollution Control District, Road Construction Emissions Model, Version 7.1.5.1 (SJVAPCD 2013).

The vehicle transport fleet was estimated to include 5 passenger gasoline vehicles, 5 gasoline pickup trucks, and 5 heavy duty diesel trucks each travelling 200 miles per day for 365 days a year. It is unlikely that the estimated total vehicle miles traveled per year for the vehicle transportation fleet will be exceeded for the Proposed Action.

Fugitive dust emissions due to land disturbance are anticipated to be negligible because the proposed projects disturbance area is anticipated to be less than 100 acres which would produce less than 0.03 tpy of TSP, based on a screening level assessment using conservative emissions factors from AP-42 Chapters 11.9 for Western Surface Coal Mining from wind erosion and maintenance operations (see Table 5).

Ongoing Operation Emissions and Assumptions

Once the demolition and decommissioning activities are completed, the emissions will cease. There are no annual operating plans for the Proposed Action beyond year 2019.

Results

The ROI for the Proposed Action at Fort Detrick is in the Central Maryland Air Quality Control Region (AQCR) for the state of Maryland (40 CFR Part 81.155). Fort Detrick is located in Frederick County and is classified as a non-attainment area for the 8-hour Ozone NAAQS and as an attainment maintenance area for the $PM_{2.5}$ NAAQS. This area currently attains the NAAQS standards for all other criteria pollutants. The general conformity requirements and thresholds only apply to criteria pollutants in the ROI which are in nonattainment or maintenance of the NAAQS. Therefore, *de minimis* levels for the project area are 100 tons per year for $PM_{2.5}$ and NO_X. The VOC *de minimis* level is 50 tons per year as established for nonattainment areas located in an O_3 transport area. New Source Review (NSR) thresholds are 250 tons per year of any pollutant. For planning purposes, these thresholds are used in the absence of applicable *de minimis* thresholds.

Table 1: Estimated Annual Construction Emissions						
Estimated Emissions	**Emissions (tons/year)**					
	VOC	**CO**	**NOX**	**SO2**	**PM10**	**PM2.5**
Alternative 1 Construction Emissions	3.9	20.1	32.0	0.037	1.8	1.8
de minimis/New Source Review (NSR) threshold	50	250	100	250	250	100
Exceeds de minimis/NSR threshold?	No	No	No	No	No	No

Table 2: Estimated Annual GHG Construction Emissions at Fort Detrick	
Scenario/Activity	**Emissions CO_2e (metric tons/year)**
Alternative 1 Construction Emissions	**3,492**
CEQ GHG Reporting threshold	**25,000**
Exceeds CEQ threshold?	**No**

Table 3: COMBUSTION EMISSIONS FOR NONROAD EQUIPMENT

Equipment Type	Estimated NONROAD Inventory					Emission Factor (grams/hour)[1]						Emission Rate (pounds/year)[2]						Annual Emissions (tons/year)[3]					
	No. Units	HP	hr/day	day/yr	hr/yr	VOC	CO	NOX	SO2	PM10	PM2.5	VOC	CO	NOX	SO2	PM10	PM2.5	VOC	CO	NOX	SO2	PM10	PM2.5
Air Compressors	1	120	8	365	2,920	30.7	144	194	0.25	16.7	16.7	198	926	1,249	1.6	107	107	0.10	0.46	0.62	8.0E-04	0.05	0.05
Cement and Mortar Mixers	1	25	8	365	2,920	11.4	35	66	0.10	3.4	3.4	73	228	425	0.6	22	22	0.04	0.11	0.21	3.2E-04	0.01	0.01
Concrete/Industrial Saws	1	50	8	365	2,920	35.5	125	120	0.18	9.3	9.3	229	802	774	1.1	60	60	0.11	0.40	0.39	5.7E-04	0.03	0.03
Crawler Tractors	1	250	8	365	2,920	41.1	247	534	0.44	20.6	20.6	264	1,591	3,440	2.8	133	133	0.13	0.80	1.72	1.4E-03	0.07	0.07
Crushing/Proc. Equipment	1	175	8	365	2,920	75.2	433	580	0.85	31.8	31.8	484	2,789	3,736	5.5	205	205	0.24	1.39	1.87	2.7E-03	0.10	0.10
Excavators	1	175	8	365	2,920	22.4	142	250	0.28	12.3	12.3	144	915	1,609	1.8	79	79	0.07	0.46	0.80	9.0E-04	0.04	0.04
Forklifts	1	120	8	365	2,920	13.3	47	109	0.08	9.2	9.2	86	303	704	0.5	59	59	0.04	0.15	0.35	2.7E-04	0.03	0.03
Generator Sets	1	120	8	365	2,920	40.4	217	296	0.41	21.5	21.5	260	1,400	1,906	3	139	139	0.13	0.70	0.95	1.3E-03	0.07	0.07
Graders	1	175	8	365	2,920	53.4	168	522	0.31	29.4	29.4	344	1,079	3,362	2.0	189	189	0.17	0.54	1.68	9.9E-04	0.09	0.09
Other Construction Equipment	5	175	8	365	14,600	36.9	181	395	0.32	20.7	20.7	1,189	5,838	12,703	10	666	666	0.59	2.92	6.35	5.1E-03	0.33	0.33
Other Material Handling Equipment	2	175	8	365	5,840	31.4	156	323	0.29	17.5	17.5	404	2,007	4,153	4	225	225	0.20	1.00	2.08	1.8E-03	0.11	0.11
Pavers	1	120	8	365	2,920	23.5	101	203	0.16	15.8	15.8	151	653	1,307	1.1	102	102	0.08	0.33	0.65	5.3E-04	0.05	0.05
Paving Equipment	1	120	8	365	2,920	21.8	104	193	0.16	14.8	14.8	140	672	1,244	1.0	95	95	0.07	0.34	0.62	5.1E-04	0.05	0.05
Pressure Washers	1	25	8	365	2,920	4.5	15	28	0.04	1.5	1.5	29	97	179	0.3	9	9	0.01	0.05	0.09	1.3E-04	0.00	0.00
Pumps	5	50	8	365	14,600	37.7	130	134	0.20	10.1	10.1	1,213	4,199	4,329	6.5	327	327	0.61	2.10	2.16	3.2E-03	0.16	0.16
Rollers	1	120	8	365	2,920	23.3	92	204	0.16	15.2	15.2	150	595	1,316	1.1	98	98	0.08	0.30	0.66	5.3E-04	0.05	0.05
Rubber Tired Dozers	1	250	8	365	2,920	63.6	205	666	0.42	32.9	32.9	409	1,322	4,286	2.7	211	211	0.20	0.66	2.14	1.3E-03	0.11	0.11
Rubber Tired Loaders	1	250	8	365	2,920	31.6	182	400	0.37	13.7	13.7	204	1,173	2,575	2.4	88	88	0.10	0.59	1.29	1.2E-03	0.04	0.04
Scrapers	1	500	8	365	2,920	90.9	435	1,120	0.92	45.2	45.2	585	2,797	7,207	5.9	291	291	0.29	1.40	3.60	3.0E-03	0.15	0.15
Signal Boards	1	50	8	365	2,920	42.3	146	143	0.21	11.1	11.1	272	942	919	1.4	71	71	0.14	0.47	0.46	6.8E-04	0.04	0.04
Skid Steer Loaders	1	120	8	365	2,920	8.0	87	99	0.13	5.7	5.7	51	560	638	0.8	37	37	0.03	0.28	0.32	4.2E-04	0.02	0.02
Surfacing Equipment	1	250	8	365	2,920	21.1	163	333	0.33	9.8	9.8	136	1,052	2,144	2.1	63	63	0.07	0.53	1.07	1.1E-03	0.03	0.03
Sweepers/Scrubbers	1	120	8	365	2,920	30.8	108	243	0.18	21.6	21.6	198	695	1,566	1.1	139	139	0.10	0.35	0.78	5.7E-04	0.07	0.07
Tractors/Loaders/Backhoes	1	120	8	365	2,920	18.1	75	165	0.15	12.9	12.9	117	486	1,063	1.0	83	83	0.06	0.24	0.53	5.0E-04	0.04	0.04
											TOTAL	**7,330**	**33,120**	**62,833**	**60**	**3,498**	**3,498**	**3.7**	**16.6**	**31.4**	**0.030**	**1.7**	**1.7**

Notes:

1. Emission factors are referenced from the South Coast Air Quality Management District website (http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html).
   Although construction activities will occur after 2015, emission factors for the year 2015 were applied for these calculations as they are higher than years greater than 2015 and result in more conservative emission estimates.
2. Conversion of 453.6 grams per pound.
3. Conversion of 2000 pounds per ton.

Source:

NONROAD EMISSION FACTORS, San Joaquin Valley Air Pollution Control District, Road Construction Emissions Model, Version 7.1.5.1, 2013.

Table 4: ASSUMPTIONS FOR ON-HIGHWAY VEHICLE EMISSIONS									
Pollutant	**Emission Factors (g/mile)[1]**			**No. Cars[2]**	**No. Trucks[2]**	**No. Heavy Duty Trucks[2]**	**Miles per Vehicle per day[2]**	**Days/yr[2]**	**Tons/yr**
	Passenger Cars	**Pickup Trucks**	**Heavy Duty Trucks**						
VOC	0.17	0.28	0.077	5	5	5	200	365	0.21
CO	2.9	4.9	1.01	5	5	5	200	365	3.6
NOX	0.12	0.31	0.94	5	5	5	200	365	0.55
SO2	0.0044	0.0057	0.0070	5	5	5	200	365	0.0069
PM10	0.0076	0.013	0.014	5	5	5	200	365	0.014
PM2.5	0.0070	0.012	0.014	5	5	5	200	365	0.013
CO2[3]	368.0	501.0	1456.0	5	5	5	200	365	935.4
CH4	0.012	0.027	0.075	5	5	5	200	365	0.046
N2O	0.0044	0.0079	0.0031	5	5	5	200	365	0.0062

Notes:

1. Average annual emissions and fuel consumption for gasoline-fueled passenger cars (gasoline) and light trucks (gasoline) and short haul trucks (diesel). Emission rates are referenced from the Argonne National Laboratory Report, Updated Emission Factors of Air Pollutants from Vehicle Operations in GREET Using MOVES (ANL 2013). Emission Factors are based on Model Year 2015 vehicles.

2. Estimated annual vehicle fleet for Fort Detrick demolition and construction operations.

3. Emission Factor is based on Table 8 of the EPA GHG Inventory, last modified in April 2014. (EPA, 2014)

Emission Factor Source:
Argonne National Laboratory, September 2013.

Table 5: NONROAD EMISSION FACTORS													
Based on year 2015		g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
Equipment	MaxHP	VOC	CO	NOX	SOX	PM	CO2	VOC	CO	NOX	SOX	PM	CO2
Aerial Lifts	50	0.080	0.866	1.212	0.002	0.042	179.282	3.69	39.91	55.89	0.08	1.93	8,267
Aerial Lifts	120	0.061	0.778	0.960	0.002	0.044	161.199	4.55	57.61	71.03	0.11	3.26	11,932
Aerial Lifts	175	0.058	0.778	0.835	0.002	0.036	161.168	7.58	101.52	109.01	0.20	4.66	21,028
Aerial Lifts	250	0.354	0.778	3.646	0.002	0.189	161.179	74.34	163.42	765.74	0.32	39.78	33,848
Aerial Lifts	500	0.077	0.778	1.424	0.002	0.032	161.179	29.34	295.70	541.17	0.58	11.98	61,248
Air Compressors	15	0.402	1.753	2.487	0.004	0.149	272.784	4.82	21.04	29.84	0.05	1.78	3,273
Air Compressors	25	0.427	1.275	2.345	0.003	0.129	272.784	10.24	30.61	56.27	0.08	3.10	6,547
Air Compressors	50	0.893	2.860	2.506	0.004	0.220	272.784	33.03	105.83	92.71	0.13	8.15	10,093
Air Compressors	120	0.394	1.843	2.488	0.003	0.214	272.784	30.70	143.77	194.06	0.25	16.68	21,277
Air Compressors	175	0.273	1.545	2.157	0.003	0.118	272.784	40.19	227.09	317.11	0.45	17.29	40,099
Air Compressors	250	0.183	0.578	1.902	0.003	0.058	272.784	39.83	126.02	414.72	0.67	12.72	59,467
Air Compressors	500	0.170	0.573	1.654	0.003	0.054	272.784	65.39	220.58	636.74	1.03	20.91	105,022
Air Compressors	750	0.172	0.573	1.718	0.003	0.056	272.784	102.14	340.90	1,022.29	1.63	33.08	162,306
Air Compressors	1000	0.196	0.653	2.475	0.003	0.068	272.784	158.40	527.57	2,000.05	2.22	55.35	220,409
Bore/Drill Rigs	50	0.445	1.208	2.665	0.003	0.191	300.704	17.49	47.45	104.66	0.11	7.48	11,810
Bore/Drill Rigs	120	0.167	1.026	2.024	0.002	0.120	255.370	13.77	84.47	166.63	0.20	9.90	21,025
Bore/Drill Rigs	175	0.159	1.068	1.962	0.003	0.088	265.780	23.60	158.60	291.41	0.38	13.11	39,478
Bore/Drill Rigs	250	0.112	1.046	1.671	0.002	0.050	260.280	23.30	217.24	347.07	0.52	10.39	54,074
Bore/Drill Rigs	500	0.105	1.032	1.509	0.002	0.048	256.887	36.59	360.37	526.93	0.86	16.82	89,700
Bore/Drill Rigs	750	0.085	1.075	1.194	0.003	0.041	267.458	52.07	657.55	730.52	1.56	24.83	163,674
Bore/Drill Rigs	1000	0.057	1.055	1.504	0.003	0.029	262.720	52.81	969.97	1,382.56	2.31	27.03	241,440
Bore/Drill Rigs	9999	0.094	1.056	2.142	0.003	0.053	262.792	249.58	2,815.34	5,713.21	6.69	140.08	700,778
Cement and Mortar Mixers	15	0.372	1.943	2.334	0.005	0.096	318.248	3.35	17.49	21.01	0.04	0.86	2,864
Cement and Mortar Mixers	25	0.454	1.417	2.639	0.004	0.134	318.248	11.36	35.43	65.98	0.10	3.36	7,956
Concrete/Industrial Saws	25	0.500	1.708	3.163	0.005	0.119	414.859	9.01	30.75	56.93	0.09	2.14	7,467
Concrete/Industrial Saws	50	1.076	3.774	3.644	0.005	0.283	414.859	35.52	124.53	120.25	0.18	9.33	13,690
Concrete/Industrial Saws	120	0.500	2.663	3.500	0.005	0.273	414.859	40.53	215.73	283.49	0.39	22.10	33,604
Concrete/Industrial Saws	175	0.348	2.247	3.007	0.005	0.152	414.859	60.89	393.15	526.23	0.82	26.56	72,600
Cranes	50	0.629	0.826	1.750	0.002	0.173	165.349	25.56	33.55	71.11	0.06	7.03	6,718
Cranes	120	0.366	0.749	2.898	0.001	0.215	149.914	32.55	66.59	257.80	0.13	19.13	13,334
Cranes	175	0.236	0.757	2.399	0.001	0.130	151.512	34.87	111.89	354.71	0.21	19.18	22,406
Cranes	250	0.194	0.754	2.196	0.001	0.100	150.978	42.02	163.60	476.48	0.31	21.75	32,762
Cranes	500	0.143	0.752	1.764	0.001	0.073	150.610	48.14	252.78	593.01	0.48	24.53	50,621
Cranes	750	0.086	0.751	1.242	0.001	0.044	150.355	48.90	425.86	704.59	0.81	24.81	85,280
Cranes	1000	0.315	0.748	3.351	0.001	0.166	149.777	295.22	701.27	3,142.09	1.34	155.81	140,431
Cranes	9999	0.040	0.752	0.661	0.001	0.016	150.667	40.73	774.95	680.96	1.48	16.45	155,187
Crawler Tractors	50	1.128	1.328	2.735	0.002	0.318	245.076	47.94	56.45	116.25	0.10	13.50	10,418
Crawler Tractors	120	0.397	1.228	3.213	0.002	0.270	226.639	34.48	106.66	279.10	0.19	23.46	19,685
Crawler Tractors	175	0.283	1.215	2.937	0.002	0.161	224.211	42.39	181.68	439.21	0.32	24.10	33,529
Crawler Tractors	250	0.202	1.219	2.634	0.002	0.102	224.909	41.06	247.20	534.33	0.44	20.60	45,622
Crawler Tractors	500	0.183	1.225	2.351	0.002	0.091	225.994	62.39	417.20	801.04	0.74	31.03	76,994
Crawler Tractors	750	0.158	1.218	2.094	0.002	0.077	224.752	89.87	694.30	1,193.73	1.22	43.72	128,134
Crawler Tractors	1000	0.215	1.223	3.200	0.002	0.094	225.756	178.04	1,013.06	2,650.35	1.79	78.12	186,964
Crawler Tractors	9999	0.153	1.168	2.599	0.002	0.069	215.490	234.20	1,782.39	3,966.82	3.14	104.99	328,945
Crushing/Proc. Equipment	50	1.405	4.681	4.054	0.006	0.349	443.274	63.23	210.66	182.43	0.26	15.70	19,947
Crushing/Proc. Equipment	120	0.624	3.011	3.936	0.005	0.336	443.274	53.01	255.97	334.55	0.44	28.59	37,678
Crushing/Proc. Equipment	175	0.439	2.534	3.393	0.005	0.186	443.274	75.15	433.25	580.27	0.85	31.80	75,800
Crushing/Proc. Equipment	250	0.299	0.937	2.970	0.005	0.092	443.274	74.67	234.33	742.50	1.25	22.97	110,818
Crushing/Proc. Equipment	500	0.280	0.924	2.580	0.004	0.086	443.274	106.92	352.98	985.48	1.66	32.74	169,331
Crushing/Proc. Equipment	750	0.280	0.917	2.668	0.004	0.087	443.274	168.45	552.32	1,606.15	2.68	52.20	266,851
Crushing/Proc. Equipment	9999	0.329	1.048	3.915	0.004	0.109	443.274	440.49	1,401.65	5,233.84	5.96	146.02	592,657
Dumpers/Tenders	25	0.265	0.893	1.673	0.003	0.071	215.954	4.23	14.29	26.77	0.04	1.14	3,455
Excavators	50	0.333	1.083	1.878	0.002	0.143	222.420	11.90	38.70	67.12	0.08	5.11	7,949
Excavators	120	0.203	0.962	1.917	0.002	0.143	197.683	16.57	78.70	156.75	0.15	11.66	16,166
Excavators	175	0.153	0.973	1.711	0.002	0.084	199.837	22.40	142.08	249.90	0.28	12.33	29,184
Excavators	250	0.115	0.974	1.597	0.002	0.051	199.981	25.21	212.71	348.94	0.42	11.10	43,690
Excavators	500	0.093	0.969	1.227	0.002	0.040	199.126	30.48	318.60	403.38	0.62	13.08	65,441
Excavators	750	0.097	0.963	1.326	0.002	0.043	197.882	55.92	556.78	766.52	1.09	24.93	114,364
Excavators	1000	0.125	0.969	2.116	0.002	0.057	199.131	105.53	817.15	1,783.73	1.60	47.73	167,843
Excavators	9999	0.084	0.963	1.380	0.002	0.036	197.811	132.46	1,511.16	2,165.83	2.96	56.38	310,393
Forklifts	50	0.436	0.638	1.192	0.001	0.129	117.014	18.49	27.04	50.56	0.05	5.48	4,963
Forklifts	120	0.162	0.572	1.327	0.001	0.111	105.000	13.32	47.13	109.28	0.08	9.18	8,649
Forklifts	175	0.119	0.573	1.233	0.001	0.067	105.128	16.81	80.94	174.22	0.14	9.51	14,853
Forklifts	250	0.119	0.574	1.346	0.001	0.060	105.400	24.73	119.55	280.18	0.21	12.46	21,939
Forklifts	500	0.095	0.575	1.072	0.001	0.048	105.464	32.80	197.53	368.39	0.35	16.36	36,250
Forklifts	1000	0.327	0.573	3.140	0.001	0.175	105.117	288.17	504.07	2,762.92	0.88	154.30	92,503
Generator Sets	15	0.551	2.703	3.794	0.007	0.207	420.542	6.06	29.73	41.74	0.07	2.28	4,626
Generator Sets	25	0.585	1.966	3.615	0.005	0.190	420.542	11.12	37.35	68.68	0.10	3.60	7,990
Generator Sets	50	0.943	3.351	3.592	0.005	0.261	420.542	31.12	110.58	118.54	0.18	8.61	13,878
Generator Sets	120	0.480	2.588	3.524	0.005	0.256	420.542	40.36	217.43	296.03	0.41	21.54	35,326
Generator Sets	175	0.325	2.174	3.056	0.005	0.141	420.542	49.68	332.64	467.52	0.72	21.58	64,343
Generator Sets	250	0.212	0.815	2.686	0.005	0.074	420.542	48.48	186.55	615.05	1.08	16.97	96,304
Generator Sets	500	0.190	0.821	2.385	0.004	0.070	420.542	69.11	298.11	865.60	1.50	25.23	152,657
Generator Sets	750	0.197	0.821	2.472	0.004	0.071	420.542	115.56	481.24	1,448.52	2.48	41.60	246,438
Generator Sets	9999	0.259	0.933	3.568	0.004	0.092	420.542	292.90	1,054.30	4,031.52	4.78	103.63	475,212
Graders	50	1.334	1.157	2.685	0.002	0.357	223.053	52.24	45.33	105.15	0.08	13.98	8,735
Graders	120	0.530	1.105	3.980	0.002	0.332	212.987	48.23	100.57	362.15	0.19	30.24	19,381
Graders	175	0.361	1.133	3.530	0.002	0.198	218.262	53.41	167.56	522.27	0.31	29.37	32,291
Graders	250	0.169	1.122	2.341	0.002	0.076	216.134	34.62	229.19	478.36	0.42	15.50	44,168
Graders	500	0.139	1.111	1.521	0.002	0.059	214.032	40.89	325.60	445.87	0.60	17.28	62,748
Graders	1000	0.303	1.109	3.798	0.002	0.132	213.737	241.58	882.83	3,023.02	1.62	105.21	170,135
Graders	9999	0.190	1.107	2.687	0.002	0.081	213.348	378.82	2,206.16	5,355.26	4.06	162.28	425,161
Off-Highway Tractors	50	0.710	1.300	2.408	0.002	0.233	252.805	26.72	48.98	90.67	0.09	8.76	9,521
Off-Highway Tractors	120	0.307	1.181	2.642	0.002	0.215	229.502	22.91	87.99	196.93	0.16	16.04	17,105
Off-Highway Tractors	175	0.183	1.174	2.057	0.002	0.104	228.294	28.94	185.64	325.19	0.34	16.47	36,088
Off-Highway Tractors	250	0.183	1.167	2.407	0.002	0.087	226.772	39.03	249.46	514.79	0.46	18.52	48,493
Off-Highway Tractors	500	0.125	1.170	1.635	0.002	0.058	227.483	41.82	391.36	546.72	0.73	19.24	76,078
Off-Highway Tractors	750	0.120	1.171	1.687	0.002	0.055	227.614	68.56	671.55	967.72	1.25	31.52	130,545
Off-Highway Tractors	1000	0.044	1.172	1.002	0.002	0.024	227.753	43.78	1,171.61	1,001.58	2.17	24.30	227,753
Off-Highway Tractors	9999	0.184	1.198	2.547	0.002	0.082	232.958	317.89	2,068.71	4,396.35	3.84	140.98	402,143

Based on year 2015		g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
Equipment	**MaxHP**	**VOC**	**CO**	**NOX**	**SOX**	**PM**	**CO2**	**VOC**	**CO**	**NOX**	**SOX**	**PM**	**CO2**
Off-Highway Trucks	50	0.666	0.652	2.230	0.002	0.232	215.238	19.41	18.99	64.98	0.06	6.76	6,272
Off-Highway Trucks	120	0.272	0.596	2.166	0.002	0.176	196.896	23.72	51.90	188.57	0.16	15.31	17,142
Off-Highway Trucks	175	0.203	0.602	1.949	0.002	0.109	198.671	32.27	95.57	309.74	0.30	17.26	31,567
Off-Highway Trucks	250	0.189	0.600	2.002	0.002	0.087	198.322	39.93	126.70	422.46	0.40	18.27	41,849
Off-Highway Trucks	500	0.154	0.610	1.729	0.002	0.066	201.459	57.23	227.16	643.99	0.72	24.60	75,027
Off-Highway Trucks	750	0.181	0.609	1.957	0.002	0.080	200.991	118.42	399.15	1,283.60	1.26	52.22	131,834
Off-Highway Trucks	1000	0.164	0.604	2.398	0.002	0.070	199.622	147.41	542.27	2,151.90	1.71	63.25	179,107
Off-Highway Trucks	9999	0.167	0.608	2.201	0.002	0.069	200.841	294.22	1,072.76	3,882.43	3.38	121.17	354,321
Other Construction Equipment	50	0.569	1.338	2.311	0.002	0.209	243.421	21.63	50.86	87.84	0.09	7.95	9,252
Other Construction Equipment	120	0.314	1.191	2.715	0.002	0.213	216.722	25.63	97.18	221.46	0.17	17.34	17,676
Other Construction Equipment	175	0.242	1.189	2.588	0.002	0.136	216.355	36.94	181.37	394.67	0.32	20.68	32,992
Other Construction Equipment	250	0.175	1.203	2.359	0.002	0.087	218.814	37.98	260.92	511.68	0.45	18.79	47,462
Other Construction Equipment	500	0.141	1.203	1.834	0.002	0.068	218.857	50.32	429.37	654.51	0.75	24.11	78,102
Other Construction Equipment	750	0.108	1.197	1.593	0.002	0.051	217.679	64.60	715.23	952.29	1.24	30.57	130,101
Other Construction Equipment	1000	0.099	1.192	1.852	0.002	0.049	216.873	81.91	989.77	1,537.09	1.72	40.69	180,038
Other Construction Equipment	9999	0.126	1.168	2.057	0.002	0.057	212.371	142.39	1,315.40	2,317.12	2.28	64.07	239,271
Other General Industrial Equipment	50	0.535	0.972	1.888	0.002	0.182	199.186	18.77	34.13	66.26	0.07	6.39	6,992
Other General Industrial Equipment	120	0.272	0.869	2.222	0.002	0.189	177.921	19.91	63.57	162.60	0.12	13.83	13,022
Other General Industrial Equipment	175	0.177	0.872	1.844	0.002	0.100	178.621	26.40	130.06	275.08	0.25	14.98	26,642
Other General Industrial Equipment	250	0.162	0.875	1.928	0.002	0.078	179.141	33.81	182.83	403.11	0.36	16.40	37,451
Other General Industrial Equipment	500	0.126	0.874	1.512	0.002	0.057	179.029	44.79	310.02	536.31	0.61	20.25	63,504
Other General Industrial Equipment	750	0.090	0.875	1.150	0.002	0.037	179.232	53.12	517.60	680.19	1.01	22.06	106,023
Other General Industrial Equipment	1000	0.127	0.872	2.203	0.002	0.059	178.698	112.47	772.06	1,949.89	1.51	51.82	158,148
Other General Industrial Equipment	9999	0.082	0.872	1.505	0.002	0.040	178.698	164.92	1,744.77	3,010.07	3.41	79.54	357,397
Other Material Handling Equipment	50	0.717	1.196	2.293	0.002	0.232	229.351	25.64	42.74	81.95	0.08	8.29	8,198
Other Material Handling Equipment	120	0.218	1.081	1.970	0.002	0.151	207.401	20.34	100.73	183.51	0.18	14.09	19,322
Other Material Handling Equipment	175	0.217	1.078	2.231	0.002	0.121	206.802	31.41	155.86	322.57	0.29	17.49	29,897
Other Material Handling Equipment	250	0.175	1.076	2.187	0.002	0.082	206.479	38.24	234.96	477.37	0.43	17.87	45,071
Other Material Handling Equipment	500	0.138	1.074	1.689	0.002	0.065	205.960	45.66	355.79	559.64	0.65	21.68	68,248
Other Material Handling Equipment	750	0.101	1.078	1.377	0.002	0.048	206.729	56.88	608.45	777.44	1.11	26.84	116,716
Other Material Handling Equipment	1000	0.021	1.078	0.892	0.002	0.007	206.729	19.39	994.72	823.65	1.82	6.44	190,811
Other Material Handling Equipment	9999	0.061	1.078	1.367	0.002	0.027	206.729	64.32	1,131.59	1,435.10	2.07	28.31	217,066
Pavers	50	0.806	1.429	2.342	0.002	0.241	242.599	31.11	55.20	90.45	0.09	9.29	9,370
Pavers	120	0.296	1.275	2.551	0.002	0.199	216.385	23.52	101.45	203.01	0.16	15.85	17,221
Pavers	175	0.213	1.280	2.300	0.002	0.115	217.349	33.65	202.48	363.70	0.33	18.22	34,370
Pavers	250	0.093	1.285	1.728	0.002	0.044	218.123	19.86	273.98	368.49	0.44	9.44	46,506
Pavers	500	0.077	1.267	1.212	0.002	0.040	214.992	25.06	414.65	396.75	0.67	13.17	70,384
Pavers	750	0.076	1.280	1.015	0.002	0.044	217.241	56.87	959.87	761.24	1.56	32.96	162,931
Paving Equipment	50	0.364	1.293	1.785	0.002	0.144	204.648	12.69	45.02	62.16	0.07	5.03	7,125
Paving Equipment	120	0.246	1.177	2.182	0.002	0.167	186.351	21.76	104.32	193.32	0.16	14.81	16,511
Paving Equipment	175	0.153	1.170	1.763	0.002	0.086	185.162	22.66	173.63	261.68	0.26	12.77	27,479
Paving Equipment	250	0.117	1.174	1.694	0.002	0.056	185.801	25.25	253.19	365.44	0.38	12.16	40,071
Paving Equipment	500	0.119	1.166	1.647	0.002	0.059	184.483	40.39	394.88	558.10	0.60	20.04	62,495
Paving Equipment	750	0.084	1.174	1.407	0.002	0.033	185.772	50.61	710.16	851.11	1.07	19.80	112,392
Paving Equipment	1000	0.083	1.175	1.633	0.002	0.040	185.931	70.08	989.20	1,375.15	1.50	33.61	156,554
Plate Compactors	15	0.284	1.492	1.781	0.004	0.069	244.369	2.28	11.94	14.25	0.03	0.55	1,955
Pressure Washers	15	0.223	1.096	1.538	0.003	0.084	170.490	2.90	14.24	20.00	0.03	1.09	2,216
Pressure Washers	25	0.237	0.797	1.465	0.002	0.077	170.490	4.51	15.14	27.84	0.04	1.46	3,239
Pressure Washers	50	0.291	1.148	1.405	0.002	0.090	170.490	11.07	43.62	53.38	0.08	3.41	6,479
Pressure Washers	120	0.170	1.001	1.364	0.002	0.089	170.490	10.87	64.05	87.28	0.13	5.71	10,911
Pumps	15	0.619	2.703	3.834	0.007	0.229	420.542	4.95	21.62	30.67	0.05	1.83	3,364
Pumps	25	0.658	1.966	3.615	0.005	0.199	420.542	13.81	41.29	75.91	0.11	4.19	8,831
Pumps	50	1.018	3.525	3.635	0.005	0.274	420.542	37.68	130.44	134.50	0.20	10.15	15,560
Pumps	120	0.501	2.629	3.578	0.005	0.269	420.542	42.09	220.81	300.55	0.41	22.58	35,326
Pumps	175	0.340	2.207	3.103	0.005	0.148	420.542	51.38	333.25	468.55	0.71	22.33	63,502
Pumps	250	0.223	0.828	2.729	0.005	0.077	420.542	48.40	179.75	592.29	1.03	16.74	91,258
Pumps	500	0.201	0.836	2.414	0.004	0.072	420.542	74.96	310.94	898.09	1.54	26.83	156,442
Pumps	750	0.208	0.836	2.503	0.004	0.074	420.542	127.77	514.06	1,539.44	2.60	45.32	258,633
Pumps	9999	0.267	0.950	3.609	0.004	0.094	420.542	390.55	1,386.97	5,269.73	6.17	136.98	613,991
Rollers	50	0.515	1.181	2.013	0.002	0.181	218.675	18.36	42.12	71.83	0.07	6.44	7,802
Rollers	120	0.268	1.064	2.353	0.002	0.175	197.028	23.31	92.40	204.39	0.16	15.23	17,114
Rollers	175	0.143	1.059	1.737	0.002	0.081	196.218	20.55	152.32	249.79	0.27	11.62	28,212
Rollers	250	0.136	1.062	1.850	0.002	0.064	196.767	29.06	226.54	394.61	0.40	13.67	41,961
Rollers	500	0.146	1.072	1.888	0.002	0.073	198.479	48.77	358.84	632.18	0.63	24.50	66,466
Rollers	750	0.179	1.061	1.875	0.002	0.090	196.512	93.29	552.23	975.81	0.98	46.70	102,285
Rough Terrain Forklifts	50	0.500	1.273	2.086	0.002	0.173	234.116	23.65	60.20	98.65	0.11	8.20	11,070
Rough Terrain Forklifts	120	0.142	1.145	1.721	0.002	0.099	210.518	13.69	110.28	165.74	0.19	9.58	20,279
Rough Terrain Forklifts	175	0.091	1.142	1.375	0.002	0.053	210.012	11.82	148.01	178.19	0.26	6.91	27,216
Rough Terrain Forklifts	250	0.059	1.145	0.990	0.002	0.023	210.550	12.26	238.52	206.22	0.42	4.87	43,859
Rough Terrain Forklifts	500	0.073	1.132	1.415	0.002	0.031	208.195	27.38	423.33	529.17	0.74	11.59	77,842
Rough Terrain Forklifts	750	0.035	1.143	0.527	0.002	0.004	210.233	21.76	714.57	329.62	1.25	2.25	131,396
Rubber Tired Dozers	50	1.231	1.059	2.637	0.002	0.349	226.483	51.19	44.06	109.68	0.09	14.50	9,418
Rubber Tired Dozers	120	0.504	0.980	3.742	0.002	0.335	209.407	41.13	79.92	305.28	0.16	27.33	17,086
Rubber Tired Dozers	175	0.399	0.970	3.891	0.002	0.223	207.401	59.73	145.22	582.48	0.30	33.39	31,044
Rubber Tired Dozers	250	0.301	0.973	3.156	0.002	0.156	208.081	63.58	205.35	665.84	0.42	32.85	43,901
Rubber Tired Dozers	500	0.293	0.982	3.161	0.002	0.147	209.864	103.66	347.56	1,119.29	0.71	52.22	74,303
Rubber Tired Dozers	750	0.214	0.969	2.829	0.002	0.102	207.187	125.23	566.08	1,652.69	1.16	59.73	121,018
Rubber Tired Loaders	50	0.798	0.987	2.211	0.002	0.244	210.033	33.28	41.17	92.21	0.08	10.18	8,758
Rubber Tired Loaders	120	0.324	0.878	2.537	0.002	0.219	186.853	27.91	75.67	218.54	0.15	18.89	16,097
Rubber Tired Loaders	175	0.225	0.888	2.206	0.002	0.123	188.868	33.80	133.18	330.90	0.27	18.49	28,330
Rubber Tired Loaders	250	0.154	0.885	1.943	0.002	0.066	188.293	31.62	182.26	399.99	0.37	13.66	38,770
Rubber Tired Loaders	500	0.157	0.881	1.816	0.002	0.069	187.353	50.27	281.57	580.57	0.57	21.92	59,895
Rubber Tired Loaders	750	0.149	0.862	1.648	0.002	0.065	183.260	89.76	517.32	989.76	1.05	38.91	110,043
Rubber Tired Loaders	1000	0.159	0.887	2.429	0.002	0.071	188.711	133.01	742.38	2,032.31	1.51	59.55	157,916
Rubber Tired Loaders	9999	0.161	0.884	2.316	0.002	0.068	187.956	244.97	1,343.95	3,522.49	2.73	102.67	285,882
Scrapers	50	1.632	1.260	3.253	0.003	0.437	279.274	58.98	45.54	117.58	0.10	15.79	10,094
Scrapers	120	0.369	1.168	3.427	0.002	0.258	258.776	31.12	98.45	289.03	0.21	21.76	21,822
Scrapers	175	0.360	1.155	3.746	0.002	0.200	255.949	59.89	191.88	622.40	0.41	33.26	42,530
Scrapers	250	0.368	1.130	4.179	0.002	0.191	250.394	82.87	254.15	940.19	0.54	42.89	56,332
Scrapers	500	0.238	1.139	2.936	0.002	0.119	252.554	90.92	434.52	1,119.56	0.92	45.22	96,311
Scrapers	750	0.182	1.140	2.334	0.002	0.088	252.621	102.58	643.90	1,318.68	1.36	49.55	142,718
Scrapers	1000	0.593	1.138	6.460	0.002	0.301	252.280	562.94	1,081.30	6,137.29	2.29	286.14	239,666

Based on year 2015		g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr	g/hp/hr	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)	(g/hr)
Equipment	**MaxHP**	**VOC**	**CO**	**NOX**	**SOX**	**PM**	**CO2**	**VOC**	**CO**	**NOX**	**SOX**	**PM**	**CO2**
Scrapers	9999	0.263	1.163	3.562	0.002	0.135	257.796	506.08	2,236.99	6,851.39	4.73	259.18	495,821
Signal Boards	15	0.542	2.845	3.397	0.007	0.133	466.006	3.25	17.07	20.38	0.04	0.80	2,796
Signal Boards	50	1.143	3.956	3.857	0.006	0.299	443.274	42.28	146.38	142.71	0.21	11.05	16,401
Signal Boards	120	0.538	2.828	3.741	0.005	0.291	443.274	44.09	231.91	306.78	0.43	23.84	36,348
Signal Boards	175	0.371	2.381	3.232	0.005	0.161	443.274	58.59	376.21	510.58	0.79	25.39	70,037
Signal Boards	250	0.297	1.069	3.411	0.006	0.099	535.623	64.24	231.00	736.68	1.30	21.48	115,695
Skid Steer Loaders	50	0.247	1.378	1.635	0.002	0.099	215.335	10.72	59.89	71.06	0.09	4.28	9,360
Skid Steer Loaders	120	0.113	1.234	1.404	0.002	0.081	192.790	7.99	87.01	99.05	0.13	5.72	13,599
Skid Steer Loaders	175	0.118	1.224	1.500	0.002	0.068	191.337	17.98	187.22	229.36	0.28	10.47	29,260
Skid Steer Loaders	250	0.101	1.214	1.376	0.002	0.050	189.731	20.33	243.44	275.98	0.36	10.09	38,047
Skid Steer Loaders	500	0.089	1.201	1.133	0.002	0.040	187.666	24.66	332.20	313.48	0.50	11.05	51,921
Skid Steer Loaders	750	0.057	1.233	0.887	0.002	0.037	192.714	30.36	653.51	470.21	0.98	19.63	102,138
Skid Steer Loaders	1000	0.089	1.233	1.441	0.002	0.045	192.714	89.03	1,233.03	1,440.57	1.84	45.49	192,714
Surfacing Equipment	50	0.324	0.845	1.584	0.002	0.121	177.833	11.57	30.14	56.51	0.06	4.32	6,343
Surfacing Equipment	120	0.173	0.747	1.620	0.002	0.114	157.289	15.32	66.27	143.69	0.13	10.11	13,948
Surfacing Equipment	175	0.151	0.748	1.729	0.002	0.083	157.415	22.74	112.92	260.97	0.23	12.55	23,766
Surfacing Equipment	250	0.098	0.756	1.541	0.002	0.045	159.114	21.12	163.35	333.01	0.33	9.81	34,379
Surfacing Equipment	500	0.076	0.745	1.176	0.001	0.038	156.752	27.53	269.88	426.12	0.54	13.82	56,800
Surfacing Equipment	750	0.056	0.749	0.991	0.002	0.031	157.590	34.48	460.55	609.52	0.93	19.28	96,930
Surfacing Equipment	1000	0.095	0.752	1.735	0.002	0.043	158.243	77.15	612.24	1,412.43	1.23	34.65	128,855
Surfacing Equipment	9999	0.053	0.737	1.158	0.001	0.026	155.194	60.22	841.35	1,321.83	1.69	30.00	177,076
Sweepers/Scrubbers	50	0.862	1.544	2.630	0.003	0.278	265.154	30.67	54.93	93.58	0.09	9.91	9,436
Sweepers/Scrubbers	120	0.397	1.393	3.137	0.002	0.278	239.305	30.81	108.00	243.23	0.18	21.56	18,552
Sweepers/Scrubbers	175	0.400	1.390	3.962	0.002	0.218	238.803	63.79	221.69	631.87	0.36	34.82	38,082
Sweepers/Scrubbers	250	0.245	1.381	3.073	0.002	0.122	237.291	49.98	282.36	628.12	0.46	24.93	48,504
Sweepers/Scrubbers	500	0.222	1.387	2.755	0.002	0.120	238.264	67.22	419.57	833.42	0.69	36.20	72,075
Sweepers/Scrubbers	1000	0.082	1.387	1.852	0.002	0.048	238.264	69.89	1,176.17	1,570.74	1.93	40.75	202,048
Tractors/Loaders/Backhoes	50	0.504	0.986	1.960	0.002	0.176	210.545	19.31	37.77	75.10	0.08	6.73	8,065
Tractors/Loaders/Backhoes	120	0.220	0.913	1.998	0.002	0.156	194.965	18.15	75.46	165.14	0.15	12.93	16,114
Tractors/Loaders/Backhoes	175	0.163	0.898	1.782	0.002	0.090	191.692	23.39	129.21	256.50	0.26	12.96	27,591
Tractors/Loaders/Backhoes	250	0.126	0.899	1.763	0.002	0.057	192.049	25.66	183.67	359.95	0.37	11.69	39,220
Tractors/Loaders/Backhoes	500	0.120	0.903	1.602	0.002	0.055	192.893	38.52	289.20	512.98	0.59	17.59	61,753
Tractors/Loaders/Backhoes	750	0.119	0.893	1.542	0.002	0.056	190.737	68.15	513.28	886.12	1.05	32.20	109,601
Tractors/Loaders/Backhoes	1000	0.068	0.912	1.407	0.002	0.032	194.700	59.23	794.55	1,226.21	1.62	27.61	169,661
Tractors/Loaders/Backhoes	9999	0.127	0.904	1.969	0.002	0.061	193.002	255.40	1,812.80	3,949.88	3.70	121.76	387,090
Trenchers	50	0.662	1.634	2.716	0.003	0.248	293.765	26.33	65.01	108.05	0.11	9.86	11,685
Trenchers	120	0.430	1.474	3.607	0.003	0.282	264.849	35.26	120.92	296.00	0.21	23.16	21,733
Trenchers	175	0.367	1.449	3.856	0.002	0.199	260.505	52.74	208.53	554.78	0.36	28.62	37,479
Trenchers	250	0.264	1.465	3.271	0.003	0.131	263.326	57.63	320.01	714.50	0.55	28.54	57,516
Trenchers	500	0.164	1.453	2.203	0.002	0.082	261.218	58.72	521.06	789.70	0.89	29.30	93,651
Trenchers	750	0.060	1.471	0.816	0.003	0.027	264.337	37.02	910.75	505.15	1.56	16.53	163,691
Trenchers	1000	0.597	1.462	6.603	0.003	0.300	262.792	513.26	1,257.44	5,678.99	2.16	258.04	226,001
Welders	15	0.377	1.643	2.331	0.004	0.139	255.735	4.14	18.08	25.64	0.04	1.53	2,813
Welders	25	0.400	1.196	2.198	0.003	0.121	255.735	8.00	23.91	43.96	0.06	2.43	5,115
Welders	50	0.767	2.497	2.299	0.003	0.193	255.735	35.30	114.87	105.77	0.15	8.89	11,764
Welders	120	0.347	1.682	2.281	0.003	0.188	255.735	24.27	117.72	159.69	0.21	13.17	17,901
Welders	175	0.239	1.410	1.979	0.003	0.104	255.735	41.56	245.32	344.38	0.50	18.02	44,498
Welders	250	0.158	0.529	1.744	0.003	0.052	255.735	33.39	111.59	367.99	0.61	11.02	53,960
Welders	500	0.145	0.527	1.525	0.003	0.049	255.735	43.17	156.62	452.85	0.75	14.45	75,953
Water Trucks	50	0.666	0.652	2.230	0.002	0.232	215.238	19.408	18.990	64.985	0.060	6.758	6272.125
Water Trucks	120	0.272	0.596	2.166	0.002	0.176	196.896	23.721	51.901	188.569	0.164	15.308	17142.259
Water Trucks	175	0.203	0.602	1.949	0.002	0.109	198.671	32.274	95.572	309.739	0.301	17.256	31566.547
Water Trucks	250	0.189	0.600	2.002	0.002	0.087	198.322	39.927	126.704	422.459	0.400	18.272	41848.985
Water Trucks	500	0.154	0.610	1.729	0.002	0.066	201.459	57.231	227.155	643.993	0.716	24.598	75027.015
Water Trucks	750	0.181	0.609	1.957	0.002	0.080	200.991	118.417	399.146	1283.603	1.259	52.217	131833.730
Water Trucks	1000	0.164	0.604	2.398	0.002	0.070	199.622	147.408	542.271	2151.897	1.710	63.249	179106.645
Water Trucks	9999	0.167	0.608	2.201	0.002	0.069	200.841	294.224	1072.759	3882.428	3.384	121.174	354321.133

Notes:

Updated with California Air Resource Board 2011 Inventory Model for In-Use Off-Road Equipment. Categories not yet in OffRoad2011 were updated from OffRoad2007 (Air Compressors, Cement and Mortar Mixers, Concrete/Industrial Saws, Crushing/Proc. Equipment, Dumpers/Tenders, Generator Sets, Plate Compactors, Pressure Washers, Pumps, Signal Boards, Water Trucks, and Welders)

This spreadsheet was prepared by Jones & Stokes and TIAX LLC with the financial support and direction of the Sacramento Metropolitan Air Quality Management District.

Source:

San Joaquin Valley Air Pollution Control District, Road Construction Emissions Model, Version 7.1.5.1, 2013; OFFROADS2008: *EQUIP.CSV*

Wind Erosion - Disturbed Areas

Table 6: Wind Erosion of Surface Disturbance Areas (AP-42 Table 11.9-4)

Pollutant	Wind Speed (mph)[1]	Particle Size Multiplier, k[2]	Emission Factor (lb/acre-yr)[3]	Total Acreage of Disturbance[4]	Potential Uncontrolled Emissions (lbs/yr)	Potential Uncontrolled Emissions (tons/year)	Control Efficiency[5]	Potential Controlled Emissions (tons/year)[6]
TSP	8.3	1	0.38	100.0	38.00	0.0190	0%	0.019
PM_{10}	8.3	0.35	0.13	100.0	13.30	0.0067	0%	0.0067
$PM_{2.5}$	8.3	0.053	0.02	100.0	2.01	0.00101	0%	0.0010

Notes:

1. The mean wind speed of 8.3 mph is based on the annual average wind speed for Baltimore, Maryland by WeatherDB (wind-speed.weatherdb.com). This value is provided for reference only and is not used in the calculations.
2. AP-42 Table 11.9-1 and 11.9-4 indicates that for the wind erosion emission factor, "To estimate emissions on a shorter time scale (e. g., worst-case day), see the procedure presented in Section 13.2.5". AP-42 13.2.5 provides particle size multipliers which are applied to estimate size distribution from the TSP emission factor provided in AP-42 Table 11.9-1 and 11.9-4.
3. Uncontrolled particulate emissions from wind erosion of disturbance acreage are calculated from the TSP emission factor provided in AP-42 11.9-4 for exposed areas.
4. Assumed conservative estimate of up to 100 disturbed acres for the Fort Detrick Proposed Action.
5. Emissions are calculated assuming no watering for dust control of surface disturbance areas.
6. Potential controlled emissions equal potential uncontrolled emissions because no control efficiency is assumed.

Sample Calculations:

TSP uncontrolled emissions (tons/yr) = TSP emission factor (lb/acre-yr) * disturbed area (acres) * 1 ton/2,000 lb
PM10 uncontrolled emissions (tons/yr) = TSP emission factor (lb/acre-yr) * PM10 particle size multiplier (k, dimensionless) * disturbed area (acres) * 1 ton/2,000 lb
PM2.5 uncontrolled emissions (tons/yr) = TSP emission factor (lb/acre-yr) * PM2.5 particle size multiplier (k, dimensionless) * disturbed area (acres) * 1 ton/2,000 lb

Uncontrolled PM_{10} and $PM_{2.5}$ emissions generated from wind erosion of disturbance acreage are calculated from the TSP emission factor provided in AP-42 Section 11.9-4 (7/98). The TSP emission factor is then multiplied by the disturbed acreage and the PM_{10} and $PM_{2.5}$ aerodynamic particle size multiplier from AP-42 Table 13.2.4. Emissions were calculated with no water control. This equation is:

$$EF = 0.38 * A * k \text{ tons/acre-year*acre}$$

Where:
EF = is the emissions

A = is the acreage of the source

k = is the Aerodynamic Particle Size Multiplier (dimensionless), (0.35 for PM_{10}, 0.053 for $PM_{2.5}$)

Table 11.9-4 (English And Metric Units). UNCONTROLLED PARTICULATE EMISSION FACTORS FOR OPEN DUST SOURCES AT WESTERN SURFACE COAL MINES

Source	Material	Mine Location[a]	TSP Emission Factor[b]	Units	EMISSION FACTOR RATING
Wind erosion of exposed areas[d]	Seeded land, stripped overburden, graded overburden	Any	0.38	T / (acre)(yr)	C
			0.85	Mg / (hectare)(yr)	C

[a] Roman numerals I through V refer to specific mine locations for which the corresponding emission factors were developed (Reference 5). Tables 11.9-4 and 11.9-5 present characteristics of each of these mines. See text for correct use of these "mine-specific" emission factors. The other factors (from Reference 7, except for overburden drilling from Reference 1) can be applied to any western surface coal mine.
[b] Total suspended particulate (TSP) denotes what is measured by a standard high volume sampler (see Section 13.2).
[c] Predictive emission factor equations, which generally provide more accurate estimates of emissions, are presented in Chapter 13.
[d] To estimate wind erosion on a shorter time scale (e. g., worst-case day), see Section 13.2.5.