

Water and Wastewater Systems Improvements Projects

Fort George G. Meade



Final Environmental Assessment

**ANNE ARUNDEL COUNTY
MARYLAND**

DECEMBER 2012



**DEPARTMENT OF THE ARMY
FORT GEORGE G. MEADE
FT. MEADE, MARYLAND 20755-5115**

**FINDING OF NO SIGNIFICANT IMPACT
ENVIRONMENTAL ASSESSMENT
Water and Wastewater Systems Improvements
Fort George G. Meade, Anne Arundel County, Maryland**

NAME OF ACTION: Water and Wastewater Systems Improvements, Fort George G. Meade (FGGM).

BACKGROUND: Pursuant to the provisions of the National Environmental Policy Act (NEPA) of 1969, Executive Order 12114, Council on Environmental Quality (CEQ) Regulations [40 Code of Federal Regulations (CFR) Parts 1500-1508], 32 CFR Part 989, the Department of the Army, has conducted an Environmental Assessment (EA) of the potential environmental consequences of constructing, operating and maintaining proposed water and wastewater system improvements identified at FGGM.

The EA documents the purpose and need for the Proposed Action, the site selection process, the alternatives developed, and the analysis of potential environmental impacts for the Proposed Action and the No-Action Alternative. This Finding of No Significant Impact summarizes the results of the evaluations of the activities associated with the proposed improvements to the water system and wastewater system.

DESCRIPTION OF THE PROPOSED ACTION: The Proposed Action includes upgrades to the water and wastewater treatment plants, including the conversion of the Wastewater Treatment Plant (WWTP) to a Biological Nitrogen Removal (BNR) system. Proposed pipe work includes replacing a minimum of 62,000 linear feet (LF) of waterline, installing a minimum of 1,600 LF of new water line to expand service, and replacing a minimum of 2,024 LF of existing sewer piping. This work will be completed through a variety of different technologies including open cut, horizontal directional drill, pigging, and pipe bursting. Other work includes installing fencing at wells and pump stations, installing emergency generators at wells, and replacing booster pumps. Also included is the construction of an approximately 6,000 square-foot slab on grade Operations Center near the existing water treatment plant.

NO-ACTION ALTERNATIVE: The No-Action alternative reflects the status quo and serves as a benchmark against which federal actions can be evaluated. For this analysis, under the No-Action alternative, the work would not be performed. Impacts associated with this alternative include long-term adverse impacts to the water supply and sewer systems as the leaking water and sewer lines would continue to deteriorate disrupting services. Leaking systems would also enter soils and streams threatening water quality and aquatic habitat. In addition, the WWTP would not be upgraded to meet new permit requirements for nitrogen and phosphorus.

ENVIRONMENTAL IMPACTS: Pursuant to the provisions of the regulations issued by the Council on Environmental Quality, November 29, 1978 (40 CFR Parts 1500-1508), and based on

the attached Environmental Assessment as incorporated by reference, the Proposed Action, will not have any significant adverse effects on the human environment.

The Proposed Action would result in short-term, minor, adverse impacts to air quality, noise, and traffic during construction. Localized, short-term disruptions of water and wastewater services are expected as these systems are worked on. Short-term and long-term minor adverse impacts to previously disturbed soils, stormwater, aesthetics, and terrestrial resources (vegetation and wildlife habitat) could also be expected. Short-term and long-term minor adverse impacts to floodplains could result from capital improvements, such as the construction of the BNR system within the 500-year floodplain at the WWTP. Short-term and long-term minor adverse impacts to surface waters or nontidal wetlands could occur during utility upgrades; impacts would be limited to less than 5,000 SF and 200 LF of streams. Short-term benefits to the local economy would be expected from the hiring of construction workers to construct the project. Long-term benefits to water supply and wastewater treatment are anticipated from this work. By repairing leaks and failed water and sewer lines, these systems would be able to function properly, without disruptions to service. The WWTP would meet new permit requirements for treatment and discharge which would benefit the discharge stream. Long-term benefits to wetlands, streams and soils would also be anticipated as the leaking and failing systems are replaced.

MITIGATION: Mitigation measures in association with the Proposed Action include a variety of applicable BMPs to be implemented both during and after construction to avoid and minimize adverse environmental effects. These include:

- Compliance with an MDE-approved stormwater management plan and erosion and sediment control plan, using stormwater management and erosion control BMPs required by MDE.
- Compliance with the MD FCA to the maximum extent practical. Impacts will be mitigated on the installation in accordance with the current FGGM FCA and Tree Management Policy. Tree preservation measures will be incorporated into construction plans.
- Compliance with a Clean Water Act Section 404 permit and Maryland's Nontidal Wetland Protection Act. Any required mitigation measures in the permit will be complied with.
- All construction equipment will be treated according to BMPs, in a manner that would minimize the spread of invasive species.
- Compliance with all applicable federal, state, and local air regulations.
- Conducting construction activities during normal weekday work hours (generally 7 a.m. to 5 p.m.) and avoiding conducting construction activities on evenings and weekends to the extent practical.
- Using native vegetation to stabilize soil and preservation of natural areas where possible.

PUBLIC REVIEW: Public participation opportunities with respect to this EA and decision making on the Proposed Action are guided by 32 CFR Part 651. The EA was made available to the public for 15 days, along with a draft Finding of No Significant Impact (FNSI). A notice of availability was published in The Baltimore Sun (Baltimore, Maryland) and the Annapolis Capital (Annapolis, Maryland), on December 4; and was posted on Fort Meade's website under the Public Notices section. Copies of the EA and draft FNSI were available for review at the Medal of Honor Memorial Library, Fort Meade, and online at www.ftmeade.army.mil. No comments or responses were received.

CONCLUSION/FINDING OF NO SIGNIFICANT IMPACT: I have reviewed the EA and find that the Proposed Action to improve the water and wastewater systems at Fort Meade will have no significant impacts on the natural environment, cultural resources or the human environment. Based on these findings, an Environmental Impact Statement is not required for this project and a Finding of No Significant Impact shall be issued.

Date: 07 JAN 2013



EDWARD C. ROTHSTEIN
Colonel, Military Intelligence
Commanding

Water and Wastewater Systems

Improvements Projects

Fort George G. Meade

ENVIRONMENTAL ASSESSMENT

December 2012

FINAL ENVIRONMENTAL ASSESSMENT

WATER AND WASTEWATER SYSTEMS IMPROVEMENTS PROJECTS

Fort George G. Meade
Anne Arundel County, Maryland

Reviewed and Recommended for Approval by:



Michael P. Butler
Chief, Environmental Division
Directorate of Public Works

20 DEC 2012

Date

Approved by:



TEJBIR SINGH
Directorate of Public Works
Fort George G. Meade

20 DEC 2012

Date

Approved by:



EDWARD C. ROTHSTEIN
Colonel, Military Intelligence
Commanding

07 JAN 2013

Date

EXECUTIVE SUMMARY

An Environmental Assessment (EA) has been prepared for the expansion, upgrades and rehabilitation of the water and waste water systems that service Fort George G. Meade (FGGM or the Installation) in Anne Arundel County, Maryland. The water and wastewater systems were privatized in 2009 and are now owned and operated by American Water Enterprises (AW). All improvements will be completed by AW and coordinated with FGGM.

AW proposes several projects to repair, rehabilitate, and upgrade water and wastewater systems throughout the Installation. Much of the water and wastewater pipe systems throughout the Installation are old and in failing condition. Leaking systems and several sewer line breaks threaten service. In addition, the existing wastewater treatment plant (WWTP) will not meet the new permit loads for nitrogen and phosphorous.

These projects include upgrades to the water and wastewater treatment plants, including the conversion of the WWTP to a Biological Nitrogen Removal (BNR) system. Proposed pipe work includes replacing a minimum of 62,000 linear feet (LF) of waterline, installing a minimum of 1,600 LF of new water line to expand service, and replacing a minimum of 2,024 LF of existing sewer piping. This work will be completed through a variety of different technologies including open cut, horizontal directional drill, pigging, and pipe bursting. Other work includes installing fencing at wells and pump stations, installing emergency generators at wells, and replacing booster pumps. Also included is the construction of a slab on grade Operations Center, approximately 6,000 square-feet (SF) in size, near the existing water treatment plant.

The EA was prepared in compliance with the National Environmental Policy Act and supporting regulations promulgated by the Council on Environmental Quality (40 CFR 1500-1508). The only alternatives identified for this project are the Proposed Action and No-Action. All natural and social environmental factors that may be relevant to the Proposed Action, including the cumulative effects thereof, were considered.

Short-term, minor, adverse impacts from the proposed project include dust, air emissions, and noise from earthmoving equipment, and increased traffic associated with construction activities. Additionally, localized, short-term disruptions of water and wastewater services are expected as these systems are worked on. Short-term and long-term minor adverse impacts to previously disturbed soils, stormwater, aesthetics, and terrestrial resources (vegetation and wildlife habitat) could also be expected. Short-term and long-term minor adverse impacts to floodplains could result from capital improvements, such as the construction of the BNR system within the 500-year floodplain at the WWTP. Short-term and long-term minor adverse impacts to surface waters or nontidal wetlands could occur during utility upgrades; impacts would be limited to less than 5,000 SF and 200 LF of streams. Short-term benefits to the local economy would be expected from the hiring of workers to construct the project. Long-term benefits to water supply and wastewater treatment are anticipated from this work. By replacing leaking and failed water and sewer lines, these systems would be able to function more effectively, without disruptions to service. The WWTP would meet new permit requirements for treatment and discharge which would benefit the discharge stream. Long-term benefits to wetlands, streams and soils would also be anticipated as the leaking and failing systems are replaced.

Required permits include, but are not limited to, Maryland Department of the Environment approved stormwater management plans, erosion and sediment control plans, a 404 permit and wetlands permits. Prior to the start of construction, all required permits or approvals would be obtained by AW.

Under the No-Action alternative, the work would not be performed. Impacts associated with this alternative include long-term adverse impacts to the water supply and sewer systems as the leaking water and sewer lines would continue to deteriorate, working ineffectively and disrupting services. Leaking systems would also enter soils and streams threatening aquatic water quality and habitat. In addition, the WWTP would not meet new permit requirements for nitrogen and phosphorus.

Based on this evaluation of environmental effects, there are no significant impacts from the Proposed Action, and a Finding of No Significant Impact has been prepared.

TABLE ES-1: COMPLIANCE WITH FEDERAL ENVIRONMENTAL STATUTES AND EXECUTIVE ORDERS

Acts	Compliance
Clean Air Act, as amended (Public Law 88-206)	FULL
Clean Water Act, as amended (Public Law 95-217)	FULL
Coastal Zone Management Act (Public Law 92-583)	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 (Public Law 93-205)	Not Applicable
Farmland Protection Policy Act (Public Law 97-98)	Not Applicable
Fish and Wildlife Coordination Act, as amended (16 United States Code [U.S.C.] 661, et seq.)	FULL
Migratory Bird Treaty Act	FULL
National Environmental Policy Act of 1969 (Public Law 91-190)	FULL
National Historic Preservation Act of 1966, as amended (Public Law 89-665)	FULL
Noise Control Act of 1972, as amended (Public Law 92-574)	FULL
Resource Conservation and Recovery Act (Public Law 94-580)	FULL
Safe Drinking Water Act, as amended (Public Law 93-523)	FULL
Solid Waste Disposal Act of 1965, as amended (Public Law 89-272, Title II)	FULL
Toxic Substances Control Act of 1976 (Public Law 94-469)	FULL
Watershed Protection and Flood Prevention Act of 1954 (16 U.S.C. §1101, et seq.)	FULL
Wetlands Conservation Act (Public Law 101-233)	FULL
Wild and Scenic Rivers Act (Public Law 90-542, as amended)	FULL
Sikes Act	FULL
Archaeological Resources Protection Act	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)	Not Applicable
Federal Compliance with Pollution Control Standards (EO 12088)	FULL
Protection of Children from Environmental Health Risks and Safety Risks (EO 13045)	Not Applicable
Consultation and Coordination with Indian Tribal Governments (EO 13175)	FULL
Strengthening Federal Environmental, Energy, and Transportation Management (EO 13514)	FULL

TABLE ES-2: SUMMARY OF EFFECTS OF THE PROPOSED ACTION AND THE NO-ACTION ALTERNATIVE		
Resource Area	Proposed Action	No-Action
Physical Environment		
Land Use	Short-term and Long-term Minor Adverse Impacts	No Impacts
Visual and Aesthetic Value	Short-term and Long-term Minor Adverse Impacts	No Impacts
Geology and Soils	Short-term and Long-term Minor Adverse Impacts and Long-term Benefits	Long-term Adverse Impacts
Prime and Unique Farmland	No Impacts	No Impacts
Air Quality	Short-term Minor Adverse Impacts	No Impacts
Noise	Short-term Minor Adverse Impacts	No Impacts
Water Resources		
Surface Waters	Possible Short-term Minor Adverse Impacts and Long-term Benefits	Long-term Adverse Impacts
Stormwater	Possible Short-term and Long-term Minor Adverse Impacts	No Impacts
Floodplains	Short-term and Long-term Minor Adverse Impacts	No Impacts
Groundwater	No Impacts	No Impacts
Coastal Zone	Possible Short-term and Long-term Minor Adverse Impacts and Long-term Benefits	Long-term Adverse Impacts
Biological Resources		
Wetlands	Possible Short-term and Long-term Minor Adverse Impacts and Long-term Benefits	Long-term Adverse Impacts
Terrestrial Resources-Vegetation and Wildlife	Short-term and Long-term Minor Adverse Impacts	No Impacts
Rare, Threatened, or Endangered Species	No Impacts	No Impacts
Cultural Resources	Possible Short-term Minor Adverse Impacts	No Impacts
Hazardous, Toxic, and Radioactive Substances	No Impacts	No Impacts
Infrastructure And Utilities		
Traffic and Transportation Systems	Short-term Minor Adverse Impacts	No Impacts
Potable Water	Short-term Minor Adverse Impacts and Long-term Benefits	Long-term Adverse Impacts
Sanitary Sewer/ Wastewater	Short-term Minor Adverse Impacts and Long-term Benefits	Long-term Adverse Impacts
Power	No Impacts	No Impacts
Socioeconomic	Short-term Minor Beneficial Impacts	No Impacts
Environmental Justice/ Protection of Children	No Impacts	No Impacts
Cumulative Impacts	No Impacts	No Impacts

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1.0 INTRODUCTION

1.1 INTRODUCTION AND BACKGROUND

Fort George G. Meade (FGGM or the Installation), Maryland is a U.S. Army installation located between Baltimore, Maryland, and Washington, DC, encompassing about 5,067 acres in Anne Arundel County, Maryland (Figure 1-1). FGGM supports over 95 tenant organizations including military services, and several federal agencies. The major tenants include the National Security Agency (NSA), the Defense Information School (DINFOS), the 704th Military Intelligence Brigade, 902nd Military Intelligence Group, the U.S. Environmental Protection Agency (USEPA) Science Center, Asymmetric Warfare Group (AWG), Defense Medial Agency (DMA), Defense Adjudication Activities, Defense Information System Agency (DISA), and First Army Division East.

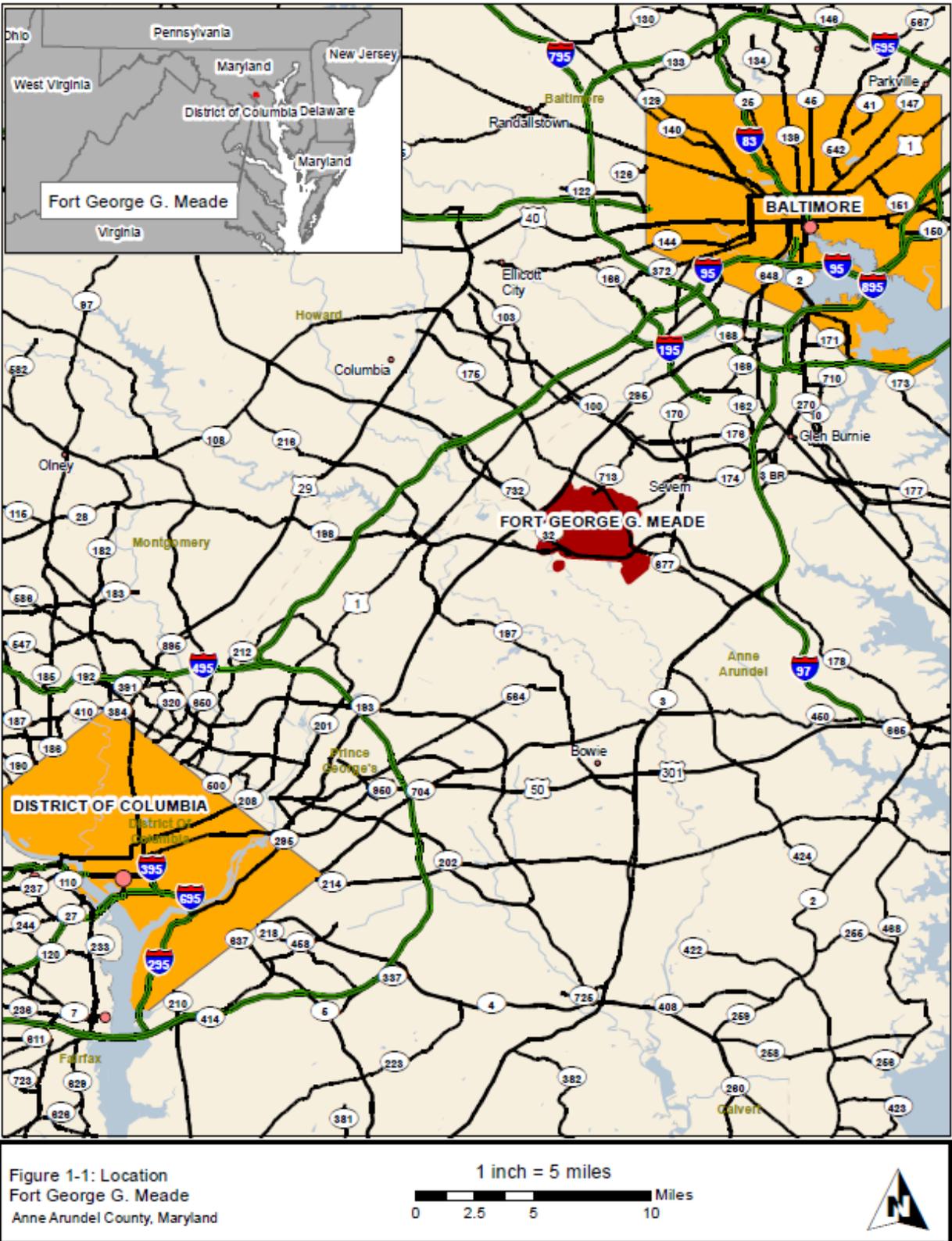
In 2009, American Water Enterprises (AW) was awarded the contract to own and operate the water and wastewater services at FGGM. AW developed an Initial System Deficiency Corrections (ISDC) and Initial Renewals and Replacements (R&R) Plan to address the long term safe and reliable operation of all components of the FGGM water system. The plan presented a multi-year program to upgrade, repair, and rehabilitate the water and wastewater systems throughout the Installation.

The existing water supply and wastewater treatment systems at FGGM have been in operation for many years and are now showing signs that they are reaching the end of their designed life. Both systems have experienced leaks, pipe breaks, and treatment systems that fail to meet regulatory requirements. Personnel growth at the Installation and changes to the regulatory environment have made it necessary to make improvements to the systems to meet not only the use requirements but also the applicable regulatory standards.

1.2 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

This Environmental Assessment (EA) was prepared in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500 – 1508), and 32 Code of Federal Regulations (CFR) Part 651 (*Environmental Analysis of Army Actions*) to assess the environmental consequences of several water and wastewater system projects at FGGM.

This EA identifies, documents, and evaluates environmental effects of the proposed projects at FGGM, Maryland. Environmental effects include those related to construction and operation of the proposed action. The proposed action is described in Section 2.0, and alternatives, including the no action alternative, are described in Section 3.0. Conditions existing as of 2012, considered to be the “baseline” conditions, are described in Section 4.0, Affected Environment. The expected effects of the proposed action are described in Section 5.0, Environmental Consequences. Section 5.0 also addresses the potential for cumulative effects, and mitigation measures are identified where appropriate. Findings and conclusions are presented in Section 6.0.



The EA focuses on impacts likely to occur within the areas of potential effect. The document analyzes direct effects (those resulting from the alternatives and occurring at the same time and place) and indirect effects (those distant or occurring at a future date). The potential for cumulative impacts as defined by 40 CFR 1508.7 is also addressed. In addressing environmental considerations, FGGM is guided by relevant statutes (and their implementing state and federal regulations) and Executive Orders that establish standards and provide guidance on environmental and natural resources management and planning.

1.3 PUBLIC INVOLVEMENT

Coordination with federal and state agencies including the U.S. Fish and Wildlife Service (USFWS) and the Maryland Department of Natural Resources (MDNR) was initiated for the Proposed Action in September 2012. Copies of coordination letters and agency responses are located in Appendix B – Agency Coordination.

Public participation opportunities with respect to this EA and decision making on the Proposed Action are guided by 32 CFR Part 651. The EA was made available to the public for 15 days, along with a draft Finding of No Significant Impact (FNSI). A notice of availability was published in The Baltimore Sun (Baltimore, Maryland) and the Annapolis Capital (Annapolis, Maryland), on December 4; and was posted on FGGM's website under the Public Notices section. Copies of the EA and draft FNSI were available for review at the Medal of Honor Memorial Library, FGGM, and online at www.ftmeade.army.mil. No comments or responses were received. FGGM will execute a FNSI and will proceed with implementation of the Proposed Action.

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2.0 PROPOSED ACTION

The Proposed Action is comprised of a number of projects that are planned over a multi-year period to maintain, improve, and expand the water and wastewater systems at FGGM. The locations of the proposed work is shown on Figure 2-1 in Appendix A. Also included is general discussion about future anticipated improvements. The immediate potable water supply work includes the replacement of water transmission lines, redrilling existing wells, improvements to the water treatment plant (WTP) and the construction of a new Operations Center. The wastewater treatment work includes the replacement of lines, and improvements to the wastewater treatment plant (WWTP).

WATER SYSTEM PROJECTS

The project numbers below are for the purposes of the EA only and do not reflect priority or the order in which projects will be completed.

Project #1: WTP Facility–Clear Wells

Provide continuous or intermittent water monitoring as needed for regulatory compliance. Install a new system to provide the WTP’s water laboratory with continuous water sample directly from the Clear Well Effluent Area of the System. Project consists of one (1) sampling pump and related yard piping and interior building piping to carry water from the High Lift Pump Station (HLPS) Facility to the Existing Lab Area.

Project # 2: WTP Facility– Final Basin

The basin suffers from severe concrete degradation and excessive lime scaling. The concrete is spalling and cracking which may be causing infiltration/exfiltration. The structural steel reinforcement is exposed and rusting which may result in potential structural failure of the basin. The scope of the project includes the removal of the old basin and addition of a 24-inch pipe to replace the basin. The basin is no longer needed for the current WTP Treatment Process.

Project # 3: High Lift Pump Station (HLPS) No. 1 (Facility No. 8698)

Replace the seven pumps located in the HLPS No. 1 located near the WTP. Pumps No. 1A and 1B are backwash pumps; Pump Nos. 2 and 5 each have a rated capacity of 1,000 gpm (1.44 million gallons per day (MGD)), while Pump Nos. 3 and 4 each have a capacity of 700 gpm (1.0 MGD). Pump No. 6 is an electric / diesel powered pump, which has a capacity of 2,100 gpm (3.0 MGD) and can be used during power outages to supply water to the distribution system. The pumps have exceeded their expected useful life and will need to be replaced in the near future. This project entails replacement of 7 pumps at High Lift Pump Station No. 1. Minor piping modifications at each pump may be required to accommodate the new pumps. Check valves and isolation valves will be reused. A back-up generator will be installed that will operate pumps 5 and 6, eliminating the need for the existing diesel-driven Pump 6, and providing more economical operation. The pumps included in the project are:

- Pumps #1A and #1B – The backwash pumps will be replaced in kind with horizontal split case pumps.
- Pumps #2, 3, 4, and 5 – The existing pumps will be replaced in kind.
- Pump #6 – The existing diesel pump will be replaced with an electric pump.

Project # 4: HLPS No. 2 (Facility No. 8699)

Replace the four pumps located in the HLPS No. 2 near the WTP. Pump Nos. 1 and 2 each have a rated capacity of 1,200 gpm (1.73 MGD). Pump No. 1 can operate either electrically or by a diesel engine. Pump No. 3 has a rated capacity of 1,500 gpm (2.16 MGD) and Pump No. 4 has a rated capacity of 2,500 gpm (3.60 MGD). The pumps have exceeded their expected useful life and will need to be replaced in the near future. This project entails replacement of 4 pumps at High Lift Pump Station No. 2. Minor piping modifications at each pump may be required to accommodate the new pumps. Check valves and isolation valves will be reused. A back-up generator will be installed that will operate Pumps 1 and 2, which will provide a more economical operating solution than replacing Pump 1 in kind (i.e. a pump operated either electrically or by diesel engine). The pumps included in the project are:

- Pump #1 – The existing horizontal split case pump which is both diesel and electric-driven will be replaced with an electric-driven horizontal split case pump.
- Pumps #2, 3, and 4 – The existing horizontal split case pumps will be replaced in kind.

Project # 5: Aeration Towers

Replace Aeration Tower No. 1 located near the WTP. The plates in the aeration tower which help to remove the iron and manganese from the raw water from the wells are becoming less efficient and may fail. This tower is beyond repair in that the manufacturer no longer provides parts for this particular model. This project consists of the complete removal and replacement of the Aeration Tower #1. AW will remove and dispose of the existing Raw Water Aerator, and install a new aerator rated at 4.0 MGD onto the existing foundation. The existing influent piping will be removed and subsequently reconnected. The existing effluent piping will be disconnected and subsequently reconnected in the same configuration. New electrical connections will be made for aeration blowers.

Project # 6: Construct an On-site Operations Center

This project will provide a common location from which to conduct daily operations and capital project delivery. This will allow the staff to have a common facility and central offices to stage operations, allow for meeting space. Currently, this facility is proposed to be in an open area to the east of the WTP. The Operations Center building proposal is approximately 6,000 SF. The building materials will consist of a single story pre-engineered steel building with slab on grade, 50% metal studs & gypsum board interior finish will provide office space with acoustical ceilings, and tile and carpet floor finishes, approximately 50% will provide open bay garage with up to three overhead doors. Any new construction would be expected to meet Leadership in Energy and Environmental Design (LEED) standards. The proposed site for the Operations Center is next to the Water Treatment Plant (Building 8688) which is considered significant under National Register C for its association with architecture as an example of Art Moderne design.

Project # 7: Chaffee Hill Facility No. 8900

Repair / replace Chaffee Hill booster pump station's two 1,000 gallons per minute (gpm) pumps as needed. The pumps which serve the higher pressure zone (NSA) are on the verge of failure. This project consists of replacing the two (2) existing booster pumps at the Chaffee Hill Pump

Station. Each pump will be isolated and replaced one at a time in order to maintain service to the NSA pressure zone. The replacement pumps will be 1,000 gpm @ 110' TDH horizontal split case, 50 HP.

Project # 8: Water Tanks

Clean and inspect the insides of the water storage tanks. Replace the failing altitude valves on the tanks. Install new cathodic protection systems to protect the steel water storage tanks. Repair /replace the ladder safety systems on the tanks. Repair the internal structural elements of the water storage tanks at Annapolis Hill (Facility No. WT003). AW will clean and inspect the 7 water storage tanks, repair structural elements on the tanks, repair or replace the existing ladder safety systems, remove and replace two 8-inch altitude valves, replace two existing valve vault access hatches, install new tank level measure instruments and install a float switch in the valve vault to signal the presence of water in the vault.

Project # 9: NSA's Transite Distribution Pipe

Replace NSA's distribution system including roughly 61,567 LF of deteriorated pipe and approximately 325 main valves. The pipe needs to be replaced due to its condition, pipe age and material type. The work includes installation of new water main piping to replace approximately 61,567 LF of transite pipe ranging in size from less than 4 inches in diameter to 16 inches in diameter, and 204 main valves which are located in the NSA area. The planned replacement method is to install the new pipe via open cut method, place the pipe into service, reconnect all services and branch lines, and decommission the existing transite pipe. Once the existing pipe is decommissioned, it will be capped and abandoned in place. All existing hydrants will be removed from the abandoned pipe, and existing valve boxes will be removed.

Project # 10: Service to NSA's Colony 7 Facility

Extend potable water service from the existing distribution system to serve NSA's Colony 7 facilities. Currently, the potable water to the facility is pumped from a ground water well.

Project # 11: New 20-Inch Water Transmission Main:

Install approximately 8,500 LF of new water transmission line from Hawkins Road & Mapes Road intersection to the Annapolis Hill Booster Station. Work will be done along existing roadways and/or along previously disturbed areas. Project will consist of a combination of the following construction techniques; Open Trench Direct Replacement, Trenchless Technology Pipe Bursting and Trenchless Technology Horizontal Directional Drill of new pipe. The work may require the construction of a temporary above grade water line to bypass the work area so services are not disrupted.

Project # 12: Redrill Well No. 2

Project includes design, permitting and construction of a new water supply well to replace the current well which is damaged beyond repair. Work would be done in the immediate vicinity of existing well.

Project # 13: Replacing the Existing Recycle Tank

Project will consist of design & construction of a new elevated water storage tank with a larger tank to meet anticipated growth needs.

GENERAL FUTURE CAPITAL UPGRADE WATER SYMETM PROJECTS

Project F-1: Miscellaneous Security Improvements:

Install antiterrorism measures in order to enhance security of the drinking water. Projects may include security fencing, electronic surveillance measures and alarm systems to protect WTP Facility, Water Storage Tanks, water pumping facilities and personnel from physical terrorist threats.

Project F-2: Water System Piping Replacements:

General rehabilitation and/or replacement of deteriorated water piping throughout the main Installation communities. Projects will consist of existing system segments being replaced by one or a combination of the following construction techniques: Open Trench Direct Replacement, Trenchless Technology Pipe Bursting and Trenchless Technology Horizontal Directional Drill. The work may require the construction of a temporary above grade water line to bypass the work area so services are not disrupted.

Project F-3: Existing Raw Water System Piping Replacements:

General rehabilitation and/or replacement of deteriorated raw water piping from existing supply wells to the WTP. Projects will consist of existing system segments being replaced by one or a combination of the following construction techniques; Open Trench Direct Replacement, Trenchless Technology Pipe Bursting, and/or Trenchless Technologies. The work may require the construction of a temporary above grade water line to bypass the work area so services are not disrupted.

Project F-4: WTP Facility Yard Piping Replacement:

General rehabilitation and/or replacement of the existing large diameter yard piping within the water treatment property.

WASTEWATER SYSTEM PROJECTS

Project # 14: WWTP's Aeration Basins

Restore the hydraulic capacity of the plant aeration basins and insure compliance of the plant with present and future permit limitations associated with the Chesapeake Bay Initiative. The plant will be converted to an automated Biological Nutrient Removal (BNR) plant to achieve removal of nitrogen and phosphorus. The existing vertical turbine aerators will be replaced by a flexible disc air diffuser system with three centrifugal air blowers or equal. Additional process pumps will be installed for mixed-liquor return and the activated sludge and waste activated sludge pumps will be replaced. The existing wet weather surge basin will be converted to an equalization basin.

- **BIOLOGICAL NUTRIENT REMOVAL PLANT:** The current discharge permit, effective February 2008, contains yearly mass limits for total nitrogen and total phosphorus that were generated in response to the Chesapeake Bay Initiative. In terms of daily operation, plant staff has set 4 mg/l and 0.3 mg/l as the target values for total nitrogen and total phosphorus, respectively. The concept of converting the existing

aeration basins into a Biological Nutrient Removal (BNR) system is based on the implementation of a modified Bardenpho process to comply with these stringent effluent limitations. The 5-stage configuration includes a fermentation (anaerobic) zone, anoxic zone, aerobic zone, second anoxic zone, and second aerobic zone for phosphorus, nitrogen, and carbon removal which minimizes the need for upstream chemical feeds.

- **EQUALIZATION BASIN:** Additionally, this project will convert the existing Wet Weather Surge Basin into an Equalization Basin to maintain a consistent influent flow rate through the WWTP. The basin shall be converted to control the peak influent flows by replacing the fixed wet weather weir with a new automated electric adjusting weir gate. A new concrete structure will be built to contain this electric operated weir gate. This new control weir gate will allow peak flows to be diverted via the existing piping infrastructure to the existing basin.

Project # 15: WWTP's Grit Removal System

Install two new fine screens. Project will replace the existing comminutor with fine screen units with auger conveyor to reduce solids in the downstream processes.

Project # 16: WWTP's Sludge Processing System

Install a packaged sludge processing plant to reduce the liquid content of the sludge produced during the WWTP operations thus reducing the weight and volume of sludge requiring disposal. The sludge plant will consist of a new screw press and gas sludge dryer to dewater the sludge. The sludge system will be automated for all operating parameters controlled by a programmable logic controller which will be incorporated into the WWTP SCADA system. The new sludge processing system will be designed to meet federal regulations under 40 CFR part 503 to achieve Class "A" Biosolids.

Project #17: WWTP Facility – Chlorine Contact Chamber

The chlorine contact chamber flow monitoring system is not adequately configured. This project consists of investigation & survey work required to ensure the existing weirs are properly installed and level, as well as the removal & replacement of the existing flow monitoring devices.

Project WW # 18: WWTP Methanol System Upgrade:

Project will consist of upgrading / replacing the Methanol Storage and Feed System at the WWTP to meet current regulations for the aboveground storage tank, filling system, chemical feed system, and a fire detection and foam-water suppression system.

Project # 19: Collection System – Identification and Removal of Cross Connections

The project includes replacement of approximately 6,700 LF of the wastewater lines that have deteriorated. The project also includes replacement of all service connections and removal of abandoned lines from the collection system and cutting & plugging areas of the existing sanitary system that have been abandoned.

Project # 20: Wastewater Collection

This project will replace approximately 2,024 LF of existing sewer piping. Approximate quantities include: 1,120 LF of 15-inch pipe to be upsized to 18-inch, 160 LF of 15-inch pipe to be upsized to 20-inch, 63 LF of 18-inch to be upsized to 20-inch, 462 LF of 24-inch to be replaced in like size, and 219 LF of 24-inch to be upsized to 36-inch.

Project #21: Decant/6th Armored Calvary Sewer Lift Station (Sewer Lift Station (SLS))

Address the following problem associated with the decant water and the 6th Armored Calvary sewage lift station. If both the sewage pumps are running simultaneously at the 6th Armored Calvary SLS, upstream receiving components routinely overflow into the environment. This project will consist of cleaning and Closed Circuit Television (CCTV) of approximately 860 LF of existing 8-inch sanitary sewer line, pipe burst of the 860 LF of existing 8-inch Vitrified Clay (VC) pipe and upsize to 10-inch IPS SDR17 (or approved equal). Provide by-pass pumping and reconnection of existing service laterals.

Project # 22: Service to NSA's Colony 7 Facility

Extend wastewater collection service from the existing collection system to serve NSA's Colony 7 facilities. Currently, the wastewater is collected and stored in a septic tank until it is trucked to the WWTP for treatment and disposal. Work includes installation of a new sewer connection in order to extend the sanitary sewer collection system to the existing collection system at NSA Colony 7. A sanitary lift station will be constructed and located next to the existing septic tank. The duplex submersible pump lift station will be appropriately sized to pump sanitary flows via approximately 2500 LF of 3" force main piping to the existing FGGM collection system. The lift station will be provided with a SCADA compatible control panel and a manual transfer switch for connection to a portable emergency generator. This project will be constructed concurrently with the NSA Colony 7 water service line project.

GENERAL FUTURE CAPITAL UPGRADE WASTEWATER SYSTEM PROJECTS**Project F-5: Misc. Security Improvements - WWTP Facility and Critical Lift Stations:**

Install antiterrorism measures in order to enhance security. Projects may include security fencing, electronic surveillance measures and alarm systems to protect facilities and personnel from physical terrorist threats.

Project F-6: Rehabilitation and/or Replacement of Sanitary Sewer Force Mains:

General rehabilitation and/or replacement of deteriorated force main piping throughout the main Installation communities. Projects will consist of existing system segments being replaced by one or a combination of the following construction techniques; Open Trench Direct Replacement, Trenchless Technology Pipe Bursting, and/or other Trenchless Technologies.

Project F-7: Rehabilitation and/or Replacement of Existing System Piping for Sanitary Sewer Collection System:

General rehabilitation and/or replacement of deteriorated gravity sewer system piping throughout the main Installation communities. Projects will consist of existing system segments being replaced by one or a combination of the following construction techniques; Open Trench Direct

Replacement, Trenchless Technology Pipe Bursting, and/or other Trenchless Technology Pipe Lining.

Project F-8: WWTP Post Aeration Improvements:

Project will replace existing surface aerators in the Post-Aeration Basins. Alternative aeration systems will be evaluated.

ENVIRONMENTAL FEATURES AND POTENTIAL IMPACTS OF THE PROPOSED ACTIONS

All planned projects are shown in Figure 2-1 in Appendix A. Figures 4-1 through 4-3 (also in Appendix A) highlight environmental features that may be impacted by the Proposed Actions. The paragraphs below provide an overview of the possible environmental concerns. These resources and impacts to them are described in more detail in Chapters 4 and 5, respectively.

Projects #1-6 and # F-4 are located at or adjacent to the existing WTP. The site lies at the southeast corner of Mapes Road and O'Brien Road. A wooded area lies to the south of this developed area.

Projects #7 and #8 are both located in developed areas and are not located near any wetlands, waterbodies, or floodplains.

Projects # 9 and #10 as well as Project # 22 are located in the NSA complex. While no floodplains are located in this area, no wetland mapping has been conducted. A wooded area is located along the proposed alignment of the Colony 7 water and sewer service projects (Projects # 10 and #22).

Project #11 extends along a wooded area on Mapes Road. The western terminus of the project may lie in the 100-year floodplain of Middle Branch.

Project #12 lies near the 100-year floodplain of Middle Branch.

Some proposed locations for Project #F-2 may lie along wetlands and near a 100-year floodplain. During design, the exact alignment of work would need to consider these resources and methods to minimize impacts.

Projects #14-18 and #F-8 are located at or adjacent to the existing WWTP. The location off of Savage Road can be found on Figure 2-1. This area is surrounded by forested area and lies within the 500-year floodplain of the Lower Patuxent River. Wetlands are located approximately 600 feet to the west of the site.

Project #20 runs near wetlands and through wooded areas. During design the alignment would need to take into consideration these constraining environmental features.

Based on the Memorandum from the Office of the Assistant Secretary of the Army dated 5 January 2006 entitled "Sustainable Design and Development Policy Update - SPiRiT to LEED

Transition,” the Army requires construction projects to be rated according to the United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) rating system effective with FY2008 construction projects (USACE 2008). Under this mandatory program, new projects are to meet a minimum of a Silver rating, or 33-38 points out of a possible 80 points. The design and construction of the proposed Operations Center would need to achieve the LEED minimum certifiable level of Silver. These efforts are anticipated to be rewarded with a reduced environmental “footprint,” lower operational costs and a pleasant and productivity-enhancing work environment. Design considerations that may be included to meet this requirement include:

Sustainable Sites:

- Erosion, Sedimentation and Water Quality Control
- Site Selection
- Landscape and Exterior Design to Reduce Heat Islands
- Light Pollution Reduction
- Facility Impact

Water Efficiency:

- Water Efficient Landscaping
- Water Use Reduction

Energy and Atmosphere:

- Fundamental Building Energy Systems Commissioning
- Minimum Energy Performance
- CFC Reduction in HVAC&R Equipment
- Optimize Energy Performance

Materials and Resources:

- Storage and Collection of Recyclables
- Regional Materials, 20% Extracted & Manufactured Locally

Indoor Environmental Quality:

- Minimum Indoor Air Quality (IAQ) Performance
- Increase Ventilation Effectiveness
- Construction IAQ Management Plan, During Construction
- Construction IAQ Management Plan, Before Occupancy
- Low-Emitting Materials, Adhesives & Sealants
- Low-Emitting Materials, Paints & Coatings
- Low-Emitting Materials, Carpet Systems
- Low-Emitting Materials, Composite Wood & Agrifiber Products
- Indoor Chemical & Pollutant Source Control
- Controllability of Systems
- Thermal Comfort
- Daylight & Views, Daylight 75% of Spaces
- Daylight & Views, Views for 90% of Spaces
- Acoustic Environment/Noise Control

3.0 ALTERNATIVES TO THE PROPOSED ACTION

NEPA requires that an EA evaluate all reasonable alternatives to the Proposed Action, including the No-Action alternative. The only alternative identified for this action is the No-Action alternative. During the planning stages of the Project, other project alternatives were considered and eliminated from further consideration as described below. The Proposed Action is described in Section 2.0.

3.1 NO-ACTION ALTERNATIVE

NEPA documents refer to the continuation of the present course of action without the implementation of or in the absence of the proposed action, as the “No-Action Alternative.” Inclusion of the No-Action alternative is the baseline against which Federal actions are evaluated, and is prescribed by the CEQ regulations.

Under the No-Action alternative, FGGM would not construct the project. As result the existing water and sewer lines would continue to deteriorate leading to disruptions in water and wastewater services. In addition, the WWTP would not be upgraded to meet new permit requirements for nitrogen and phosphorus. The impacts associated with the No-Action alternative are discussed further in Chapter 5.

3.2 ALTERNATIVES ELIMINATED FROM DETAILED STUDY

No other alternatives have been identified for evaluation in the EA. In developing its plan for the proposed project, FGGM examined the most efficient methods to upgrade the WTP and WWTP as well as the water and wastewater systems throughout the Installation. Minor changes to the alignment were considered during planning. However none of the alignments would alter the basic layout or impacts associated with the project. There were no significant alternative locations for placement of these service lines or of the existing facilities. By keeping within the existing water and sewer line alignments impacts to soils, vegetation, and habitats were minimized. As designs are developed, changes to the alignments may be developed to further minimize or avoid impacts.

AW considered various locations for the Operations Center. However most of the locations were not in proximity of the existing WWTP and WTP for operations to be effective. One alternative site that was considered near the WTP was located in a wooded area immediately south of the existing WTP. Placement of the Operation Center at that location would have short-term and long-term impacts to soils, forests, and terrestrial habitat. As a result, this site was dropped from further consideration. The proposed location for the Operations Center lies in a mainly open area to the east of the existing WTP.

3.3 PREFERRED ALTERNATIVE

The preferred alternative for providing the needed repairs and upgrades to the water and wastewater system is described in Chapter 2 of this EA.

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4.0 EXISTING CONDITIONS

This section describes the affected environment and the existing conditions for the natural and socioeconomic resource categories applicable to the area affected by the Project. Each environmental, cultural, and social resource category typically considered in an EA was reviewed for its applicability to the project to be funded under the Proposed Action. Through this analysis, which is summarized in Table 4-1, resource categories clearly not applicable to the alternatives were screened from further evaluation. Only those affected resources applicable to the Proposed Action are discussed further in this section and in Section 5.0, Environmental Effects.

For the purpose of describing existing conditions and environmental effects, the project area is defined as the areas directly affected by project construction, as shown in Figure 2-1 in Appendix A.

TABLE 4-1: COMPLIANCE WITH FEDERAL ENVIRONMENTAL STATUTES AND EXECUTIVE ORDERS		
Resource Category	Potentially Affected by Proposed Project?	Reason for Non-Applicability Determination
Land Use	Yes	
Visual and Aesthetic Value	Yes	
Geology and Soils	Yes	
Prime and Unique Farmlands	No	There would be no impacts to this resource. However it is discussed in Section 4.4.
Air Quality	Yes	
Noise	Yes	
Surface Water Resources (surface water, aquatic life)	Yes	
Floodplains	Yes	
Groundwater	No	No impacts anticipated. However it is discussed in Sections 4.7 and 5.6.
Coastal Zone	No	No impacts anticipated. However, this resource is discussed in Sections 4.10 and 5.9.
Wetlands	Yes	
Terrestrial Resources	Yes	
Threatened and endangered species	No	There are no known occurrences of rare, threatened, or endangered species at the proposed site. However this resource is discussed in Sections 4.12 and 5.11.
Cultural Resources	Yes	
Hazardous, Toxic, and Radioactive Substances	Yes	
Traffic and Roadways	Yes	

TABLE 4-1: COMPLIANCE WITH FEDERAL ENVIRONMENTAL STATUTES AND EXECUTIVE ORDERS

Resource Category	Potentially Affected by Proposed Project?	Reason for Non-Applicability Determination
Infrastructure and Utilities	Yes	
Socioeconomics	Yes	
Environmental Justice	No	While there are no impacts to Environmental Justice from this project, this topic is discussed in Sections 4.17 and 5.17.
Child Health and Safety	No	No impacts to children’s health and safety are anticipated. However, this topic is discussed in Sections 4.17 and 5.14. All construction would occur in areas where few or no children live or visit.

4.1 LAND USE

FGGM encompasses approximately 5,067 acres and is located in the northwest corner of Anne Arundel County, Maryland. The Installation is located approximately 17 miles southwest of downtown Baltimore, Maryland, and approximately 24 miles northeast of Washington, DC.

4.1.1 Regional Land Use at FGGM

FGGM is surrounded to the north, west, and east by residential areas, commercial centers, a mix of light industrial uses, and open space and undeveloped areas. Directly to the south of FGGM are the Tipton Airport and the 12,750-acre Patuxent Research Refuge, part of USFWS's National Wildlife Refuge System. To the southwest of FGGM is the 800-acre parcel that houses DC’s New Beginnings Youth Development Center (Atkins, 2011). The community land use encompasses a mix of facilities including religious, family support, personnel services, professional services, medical, community, housing, commercial, and recreational services. The professional/institutional land use provides for non-tactical organizations including military schools, headquarters, major commands, and non-industrial research, development, test, and evaluation.

4.1.2 Installation Land Use at FGGM

FGGM is home to over 95 partner organizations from the Army, Navy, Air Force, Marines and Coast Guard, as well as several federal agencies such as NSA, the USEPA, and the Office of Personnel Management. The Installation has administrative buildings, industrial areas in the form of motor pools and warehouses, and a significant number of family housing units which are currently being upgraded under the Residential Communities Initiative (RCI). The Installation has recreational areas and a shopping complex with a main Post Exchange, commissary, bank, gas station, post office, and bowling alley. Existing land use mapping can be found in Figure 4-1 in Appendix A.

4.2 VISUAL AND AESTHETIC VALUE

Visual resources are the natural and human-made features on the installation landscape. They can include cultural and historic landmarks, landforms of particular beauty or significance, water surfaces, or vegetation. Together, these features, called the “viewshed,” form the overall impression that a viewer receives of the area or its landscape.

The topography of FGGM is mostly level to gently rolling, and generally slopes from north to south. Elevations range between 97 feet above mean sea level (MSL) in the southwestern corner of the Installation at the Little Patuxent River to 307 feet above MSL near the 1st Army Radio Station (Building 2844) FGGM, 2005).

Areas around the WWTP and WTP have been developed as have most areas where water and/or sewer lines pass through. Additionally, the WTP is a National Register Eligible Art Moderne-designed building that was constructed in 1941 and contributes to the historic viewshed at FGGM.

4.3 GEOLOGY AND SOILS

FGGM lies in the Atlantic Coastal Plain Physiographic Province (Maryland Geological Survey, 2005). It is underlain by unconsolidated sediments that lie over a crystalline substrate consisting of gabbro, diorite, and other igneous and metamorphic rocks.

The most prevalent soils on FGGM are part of the Evesboro and Galestown complexes, covering approximately 42 percent of the Installation area (Natural Resources Conservation Service [NRCS], 2012). Evesboro soil is a very deep, excessively drained sandy loam soil found on uplands. Other soil series occurring on FGGM include the Bibb-Iuka, Downer, Hambrook, Hammonton, Ingleside, Keyport, Muirkirk, Patapsco, Runclint, Sassafras, Udorthents, and Woodstown. Bibb and Evesboro soils are Entisols, which are recent mineral soils that have been only slightly modified from the geologic material in which they formed. All the other soil series are Ultisols, which are excessively weathered soils with well-developed horizons and argillic B horizons.

“Urban land” and “Cut and fill land” were also identified as map units in the soil survey (NRCS 2012). Urban land includes areas in the vicinity of pavements and buildings. Cut and fill land includes miscellaneous soil types in severely disturbed areas to the extent that identification by soil series cannot be determined. Both Urban and Cut and fill lands are common in developed sites that have been severely modified by earth-moving equipment (R&K Engineering, 2005).

Of the 39 distinct soil mapping units on FGGM, the Muirkirk Loamy Sand, Keyport Sandy Loam, and Evesboro and Galestown Loamy Sand units are classified as highly erodible lands (HEL), as defined by The Anne Arundel County Code, § 2-101 (22E). Several soil mapping units have severe limitations to development due to slope and/or wetness, including the Bibb-Iuka Silt Loams, Downer Loamy Sand, Downer Sandy Loam, Evesboro and Galestown Loamy Sands, Evesboro-Urban Complex, Fallsington Sandy Loam, Ingleside Sandy Loam, Muirkirk Loamy

Sand, Muirkirk-Urban Complex, Sassafras Sandy Loam, Sassafras-Urban Complex, and Udorthents (USACE, 2007).

At FGGM, activities that could disturb soils are managed in accordance with the provisions of Code of Maryland Regulations (COMAR) Title 26.17.01.05 (Activities for which approved Erosion and Sediment Control Plans are required). COMAR 26.17.01.05 A requires clearing and grading activities that disturb more than 5,000 SF of land area and disturb more than 100 cubic yards (CY) of earth to obtain an approved Erosion and Sediment Control Plan (ESCP). Federal Projects are not exempt to 26.17.01.05B requirements calling for “the approval of the plan by the authority affiliated with the entity undertaking the activity or for whose benefit the activity is being undertaken.”

4.4 PRIME AND UNIQUE FARMLAND

Of the soils identified at FGGM, only the Woodstown Sandy Loam, which covers approximately 1.8 percent of the Installation is considered either prime farmland soil, or farmland soil of statewide importance, as determined by the NRCS (NRCS, 2005). Prime farmland, as defined by the U.S. Department of Agriculture (USDA), is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. This land could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. While there are soils within the Installation classified as Prime Farmland soils, acquisition or use of farmland by a Federal agency for national defense purposes is exempted by section 1547(b) of the Farmland Protection Policy Act, and as a result, it is not regarded as prime farmland.

4.5 AIR QUALITY

Air quality in a given location is described by the concentration of various pollutants in the atmosphere. A region’s air quality is influenced by many factors including the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. The significance of the pollutant concentration is determined by comparing it to the federal and state ambient air quality standards. The Clean Air Act and its subsequent amendments (CAAA) established the National Ambient Air Quality Standards (NAAQS) for constituents commonly referred to as “criteria” pollutants:

- ozone (O₃);
- carbon monoxide (CO);
- nitrogen dioxide (NO₂);
- sulfur dioxide (SO₂);
- particulate matter (PM) less than 10 microns (PM₁₀);
- PM less than 2.5 microns (PM_{2.5}); and
- lead (Pb).

These standards represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety. Short-term standards (1-, 8-, and 24-hour periods) are established for pollutants contributing to acute

health effects. Long-term standards (quarterly and annual averages) are established for pollutants contributing to chronic health effects.

Areas that comply with NAAQS are designated as attainment areas. Areas that violate ambient air quality standards are designated as non-attainment areas. Areas that have improved air quality from non-attainment to attainment are designated as attainment/maintenance areas. Areas that lack monitoring data to demonstrate attainment or non-attainment status are designated as unclassified and are treated as attainment areas for regulatory purposes.

FGGM is located in the Metropolitan Baltimore Intrastate Air Quality Control Region (AQCR), which is defined in 40 CFR Part 81.28. This AQCR includes Anne Arundel County, Baltimore City, Baltimore County, Carroll County, Harford County, and Howard County. FGGM is located in Anne Arundel County. The Metropolitan Baltimore Intrastate AQCR (40 CFR 81.321) is classified as:

- nonattainment for PM_{2.5} (annual NAAQS);
- unclassifiable/attainment for PM_{2.5} (24-hour NAAQS)
- better than national standards for SO₂;
- unclassifiable/attainment for CO;
- Subpart2/moderate nonattainment for 8-hour O₃;
- not designated for Pb or PM₁₀; and
- cannot be classified or better than national standards for NO₂.

4.5.1 Regulatory Requirements – Hazardous Air Pollutants

In addition to the ambient air quality standards for criteria pollutants, national standards exist for hazardous air pollutants (HAPs). The National Emission Standards for Hazardous Air Pollutants regulates 188 HAPs based on available control technologies. Examples of HAPs include benzene, which is found in gasoline, and methylene chloride, which is used as a solvent and paint stripper. Examples of other listed air toxics include dioxin, asbestos, toluene, and metals such as cadmium, mercury, chromium, and lead compounds. The majority of HAPs are Volatile Organic Compounds (VOCs).

Air emissions data for FGGM is provided in the Emissions Certification Report that is submitted to the Maryland Department of the Environment (MDE) annually. The report currently collects data for criteria pollutants that include SO₂, CO, nitrogen oxides (NO_x), PM₁₀, VOCs¹, and HAPs. Beginning in 2007, the report began requiring data for GHGs, which FGGM is currently providing data for carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). Major sources of air emissions at FGGM include boilers, generators, storage tanks, and an on-site landfill that was closed in 1996. Emission data from 2003 to 2009 is shows the declining trend of HAPs emissions from a high of 0.27 TPY in 2003 to 0.18 TPY in 2009.

¹ VOCs are not considered to be “criteria pollutants,” but are tracked and reported due to their interaction with NO_x to form ozone.

4.5.2 Greenhouse Gas Emissions and Hazardous Air Pollutants

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 (CO₂), methane (CH₄), and N₂O. 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 CO₂, which has a value of one. For example, CH₄ has a GWP of 21, which means that it has a global warming effect 21 times greater than CO₂ on an equal-mass basis (Intergovernmental Panel on Climate Change, 2007). To simplify GHG analyses, total GHG emissions from a source are often expressed as a CO₂ equivalent (CO₂e). The CO₂e 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 CH₄ and N₂O have much higher GWPs than CO₂, CO₂ is emitted in such higher quantities that it is the overwhelming contributor to CO₂e 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 are EOs 13423 *Strengthening Federal Environmental, Energy, and Transportation Management* and 13514 *Federal Leadership in Environmental, Energy, and Economic Performance*, and the USEPA Final Mandatory Reporting of Greenhouse Gases Rule. Several states have promulgated laws as a means of reducing statewide levels of GHG emissions.

On 18 February 2010, the CEQ proposed for the first time draft guidance on how federal agencies should evaluate the effects of climate change and GHG emissions for NEPA documentation (CEQ, 2010). Specifically, if a proposed action emits 25,000 metric tons or more of CO₂e 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 effects 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. However, the CEQ states that it is not currently useful for NEPA analyses to attempt to link specific climatic changes or environmental impacts to proposed GHG emissions, as such direct linkage is difficult to isolate and to understand.

Air emissions data for FGGM is provided in the Emissions Certification Report that is submitted to MDE annually. Greenhouse gas emissions have been tracked at FGGM since 2007, with the latest reported emissions of 0.11 TPY of GHG.

4.5.3 Regulatory Requirements – New Source Review and Prevention of Significant Deterioration

As part of the CAAA of 1977, Congress established the New Source Review (NSR) program. This program is designed to ensure that air quality is not significantly degraded from the addition of new and modified factories, industrial boilers, and power plants. In areas with unhealthy air, NSR assures that new emissions do not slow progress toward cleaner air. In areas with clean air, especially pristine areas like designated Class I areas, NSR assures that new emissions do not significantly worsen air quality.

The construction activities associated with the proposed action are temporary and would not be an issue with regard to Class I Prevention of Significant Deterioration (PSD) areas, nor would any new major sources (greater than 250 tons per year of any pollutant) be constructed as a result of the proposed action. Therefore, NSR and PSD requirements are not carried forward in the air quality analysis.

4.5.4 General Conformity Rule

Federal actions proposed to occur in areas that are classified as nonattainment or maintenance by the EPA must demonstrate that emissions from the action will not exceed emission budgets established in a state's plan to attain or maintain the NAAQS. The General Conformity Rule establishes *de minimis* threshold rates of emissions for federal actions with the potential to have significant air quality impacts. If a project/action located in an area designated as non-attainment or maintenance exceeds the *de minimis* thresholds, a general conformity analysis determination is required. FGGM is in an area designated as a moderate ozone (8-hour) non-attainment area and a nonattainment area for the annual PM_{2.5} standard. Due to the proximity to the urbanized east coast of the United States, Anne Arundel County is considered an Ozone Transport Region (OTR). The OTR has a moderate ozone nonattainment classification by definition. Because ozone forms from other emissions, the analysis focuses on ozone precursors, volatile organic compounds (VOCs) and nitrogen oxides (NO_x), as well as PM_{2.5}. The region is in attainment for other criteria pollutants.

4.6 NOISE

Noise is traditionally defined as unwanted sound that interferes with normal activities in a way that reduces the quality of the environment. Magnitudes of sound, whether wanted or unwanted, are usually described by sound pressure. There are two primary types of sources of sound that generate noise: stationary and transient. Sounds produced by these sources can be intermittent or continuous. A stationary source is usually associated with a specific land use or site, such as construction activities or the operation of generators. Transient sound sources, such as vehicles and aircraft, move through the area. The human auditory system is sensitive to fluctuations in air pressure above and below the barometric static pressure. The loudness of sound as heard by the

human ear is measured on the A-weighted decibel (dBA) scale. Examples can be found in Table 4-2.

The Noise Control Act (NCA) of 1972 establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. The Act also serves to (1) establish a means for effective coordination of Federal research and activities in noise control; (2) authorize the establishment of Federal noise emission standards for products distributed in commerce; and (3) provide information to the public respecting the noise emission and noise reduction characteristics of such products. The Act provided the framework for states and local authorities to establish noise regulations.

According to the Department of Defense (DoD), Federal Aviation Administration, and U.S. Department of Housing and Urban Development criteria, residential units and other noise-sensitive land uses are “clearly unacceptable” in areas where the noise exposure exceeds the day-night level (DNL) of 75 dB, “normally unacceptable” in regions exposed to noise between the DNL of 65 to 75 dB, and “normally acceptable” in areas exposed to noise where the DNL is 65 dB or less. The Federal Interagency Committee on Noise developed land use compatibility guidelines for noise in terms of DNL. For outdoor activities, USEPA recommends DNL of 55 dB as the sound level below which there is no reason to suspect that the general population will be at risk from any of the effects of noise.

TABLE 4-2: COMMON NOISE LEVELS		
Source	Decibel Level	Exposure Concern
Soft Whisper	30	Normal safe levels.
Quiet Office	40	
Average Home	50	
Conversational Speech	65	
Highway Traffic	75	May affect hearing in some individuals
Noisy Restaurant	80	
Average Factory	80-90	
Pneumatic Drill	100	
Automobile Horn	120	
Jet Plane	140	Noises at or over 140 dB may cause pain.
Gunshot Blast	140	

Source: USEPA 2012b

4.7 WATER RESOURCES

4.7.1 Groundwater

The Patuxent, Upper Patapsco, and Lower Patapsco aquifers lie under the Installation (Michael Baker Jr. Inc., 2007). The Lower Patapsco and Patuxent aquifers are separated by the Arundel Clay formation. The Patuxent Aquifer consists of lenticular interfingering sands, silts, and clays capable of yielding large quantities of water. This aquifer is 200 to 400 feet thick and is the

deepest of the three aquifers beneath FGGM. The Upper Patapsco Aquifer is unconfined and is considered the water table aquifer.

AW owns and operates the potable water system that serves FGGM. AW obtains potable water from six wells under a Water Appropriation and Use permit from the MDE: two wells located north of Route 32 and four wells located south of Route 32 (Atkins, 2011). The wells draw from the Patuxent Aquifer and range in depth from 500 to 800 feet below ground surface. Individual wells range in capacity from 720 gallons per minute (GPM) to 1,000 GPM (USACE, 2007). Total capacity of the wells is 5,000 GPM or 2.75 million gallons per day (MGD). The Water Appropriation and Use Permit (Permit No. AA1969G021[7]) allows an average withdrawal of approximately 3.3 MGD from these wells.

4.7.2 Surface Water

FGGM is located within the greater Chesapeake Bay watershed. The Chesapeake Bay is North America's largest and most biologically diverse estuary, home to more than 3,600 species of plants, fish, and animals (Chesapeake Bay Project, 2000). To protect and restore this valuable ecosystem, Maryland joined a consortium of State and Federal agencies to establish the Chesapeake Bay Program partnership. The Army's conservation mission supports the Chesapeake Bay Programs, and FGGM is implementing Best Management Practices (BMPs) that support the guidelines established by the partnership.

The installation lies almost entirely within the Little Patuxent River watershed (MD watershed code number 02131105), of the Patuxent River Basin. A very small area in the northeast corner of the Post drains to the Severn River. The Patuxent River drains an area of 932 square miles before emptying into the Chesapeake Bay on the western shore, and is designated a "scenic river" under the Maryland Scenic and Wild Rivers Act of 1968. The Act mandates the preservation and protection of natural values associated with each designated river, and State and local governments are required to take whatever actions necessary to protect and enhance the qualities of the designated rivers. The Little Patuxent River is currently listed on Maryland's list of impaired waters under Section 303(d) of the CWA. Impairments include sediments, metals (cadmium) and biological. As Total Maximum Daily Loads (TMDLs) for these impairments are developed, facilities could be impacted by requirements for reducing loads in the watershed.

FGGMM contains approximately 7.2 miles of perennial streams as well as other intermittent and ephemeral channels. The majority of the installation is drained by Midway Branch and its primary tributary, the Franklin Branch. Both are tributaries to the Little Patuxent River. Midway Branch flows for the entire length of FGGM from the northern end to the southern end, then confluences with the Little Patuxent River off-site. Franklin Branch also flows on Post from the northern end through Burba Lake, an 8.2 acre man-made lake, and confluences with Midway Branch.

Streams that are proximate to project areas would be identified and field delineated in accordance with the USACE 1987 Wetland Delineation Manual and the Atlantic and Coastal Plain Supplement (November 2010); and classified using the Cowardin classification system. Additionally, riparian buffers were incorporated into the FGGM Comprehensive

Expansion Management Plan and subsequent Base Realignment and Closure projects to minimize impacts and degradation to waterbodies leading to the Chesapeake Bay. FGGM would maintain voluntary 100 foot riparian forest buffers along streams and abutting wetlands to the maximum extent practical.

FGGM contains wetland resources, the majority of which are concentrated near the Little Patuxent River. Wetland resources are described in Section 4.9 of this EA. There are also several stormwater management features, particularly ponds, spread across FGGM.

4.7.3 Stormwater

Stormwater runoff is conveyed to the three primary drainages, with the majority carried by Midway and Franklin Branches. All the natural drainages discharge into the Little Patuxent River. Runoff from developed areas is conveyed through an extensive network of drainpipes and associated drainage structures, supplemented by swales, ditches, other drains, and retention ponds (FGGM, 2005). In recent years, FGGM has constructed new retention ponds to reduce concentrated flows to the main branch channels and prevent bank overflows and flooding.

In addition, FGGM employs a number of stormwater management initiatives, including low impact development, throughout the Installation to manage stormwater. Some examples of these include low impact development, installation of rain gardens, stormwater ponds, and replacing concrete storm drains with grass swales.

Provisions of COMAR 26.17.02.01 (Department of the Environment, Water Management, Purpose and Scope) require that all jurisdictions in Maryland implement a stormwater management program to control the quality and quantity of stormwater runoff resulting from new development. The regulations state:

- A. The primary goals of the State and local stormwater management programs are to maintain after development, as nearly as possible, the predevelopment runoff characteristics, and to reduce stream channel erosion, pollution, siltation and sedimentation, and local flooding by implementing environmental site design to the maximum extent practicable and using appropriate structural best management practices only when necessary.
- B. These regulations for stormwater management apply to the development or redevelopment of land for residential, commercial, industrial, or institutional use, but do not apply to agricultural land management practices. These provisions specify the minimum content of county and municipal ordinances, responsibilities of the Administration regarding the review of the county and municipal stormwater management programs, and approval of State-constructed projects for stormwater management by the Department of the Environment.
- C. These provisions apply to all new development and redevelopment projects that do not have final approval for erosion and sediment control and stormwater management plans by May 4, 2010.

COMAR Title 26.17.02.05 (When Stormwater Management is Required) requires developments disturbing over 5,000 SF of land or 100 CY of earth to submit a Stormwater Management Plan (SWMP) for approval. The requirements are outlined in COMAR 26.17.02.09.

Environmental Site Design requires a developer to demonstrate that all reasonable opportunities for meeting stormwater requirements using ESD have been exhausted by using natural areas and landscape features to manage runoff from impervious surfaces and that structural BMPs have been used only where absolutely necessary. The 2010 Stormwater Management Guidelines for State and Federal Projects will be followed for work at FGGM.

Furthermore, FGGM maintains a Stormwater Pollution Prevention Plan (SWPPP) that provides BMPs for controlling and preventing siltation and other contaminants associated with construction and industrial activity sites from reaching area surface waters.

4.8 FLOODPLAINS

EO 11988, *Floodplain Management*, requires federal agencies to determine whether a proposed action would occur within a floodplain. The determination of whether a proposed action occurs within a floodplain typically involves consultation of appropriate Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), which contain enough general information to determine the relationship of the project area to nearby floodplains. EO 11988 directs federal agencies to avoid floodplains unless the agency determines that there is no practicable alternative to undertaking the action in a floodplain. Where the only practicable alternative is to site in a floodplain, a specific step-by-step process must be followed to comply with EO 11988. This “eight-step” process is detailed in the FEMA document *Further Advice on EO 11988 Floodplain Management*.

A flood zone area is an area that the FEMA has defined according to varying levels of flood risk. These zones are depicted on a community’s or county’s FIRM or Flood Hazard Boundary Map. Each zone reflects the severity or type of flooding in the area. Examples of flood zones include the 1-percent-annual-chance flood hazard area (this is also known as a 100-year flood event) and the 0.2-percent-annual-chance flood hazard area (this is also known as a 500-year flood event).

Historically, FEMA does not map Federal lands on their FIRMs unless data is available at the time of the mapping effort. As such, there are no floodplains delineated for Midway Branch and Franklin Branch at FGGM on the Anne Arundel County FIRM. Floodplains are delineated for the Little Patuxent River. A portion of the western section of FGGM (where the WWTP lies) is located within the 500-year floodplain boundary for the Little Patuxent River. A floodplain study conducted in 2008 (USACE, 2008) maps areas along the streams on FGGM. The locations of projects with regard to floodplains are shown in Figure 4-3 in Appendix A.

4.9 WETLANDS

Wetlands are jointly defined by the USEPA and the USACE as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include “swamp marshes, bogs and similar areas” (40 CFR 230.3(t) and 33 CFR 328.3(b)). The USACE regulates the discharge of dredged or fill material in waters of the United States, including jurisdictional wetlands pursuant to Section 404 of the Clean Water Act.

Section 404 of the Clean Water Act requires Federal regulation of most activities that impact wetlands. The Section 404 requirements support the goal of no net loss of wetlands. Wetlands protection and management applies to all Army facilities’ engineering activities. FGGM lies within the Chesapeake Bay watershed, a region supporting some of the most important wetland areas in the United States.

The goal of the Maryland’s Nontidal Wetlands Act is no overall net loss of nontidal wetland acreage and function. A permit is required for any activity that alters a nontidal wetland or its 25-foot buffer. The 25-foot buffer is expanded to 100 feet for wetlands of special state concern as defined and designated in COMAR 26.23.06. No wetlands of special state concern are located at FGGM.

For activities impacting wetlands, the Coastal Zone Consistency determination is issued as part of the State’s wetland authorization. Anyone wishing to engage in an activity that would result in discharge of material into a protected water body must obtain a Section 404 permit. Additionally, under Section 401 of the Clean Water Act, an applicant for a permit to discharge dredged or fill material into wetlands is also required to obtain a certification from the State where the activity is located that the proposed discharge will not result in the violation of the state’s water quality standards.

There are approximately 271 acres of wetlands on FGGM (FGGM Personal Communication 2012). The majority of these wetlands are situated on the floodplain of the Little Patuxent River, in the southwestern section of the installation, or along the Midway and Franklin Branch. The locations of the projects with respect to previously mapped wetlands can be found in Figure 4-2 in Appendix A. Planning level data has been collected within most of FGGM, but not all wetlands have been mapped. Wetlands that are proximate to project areas would be identified and field delineated in accordance with the USACE 1987 Wetland Delineation Manual and the Atlantic and Coastal Plain Supplement (November 2010); and classified using the Cowardin classification system.

4.10 COASTAL ZONE MANAGEMENT ACT

All of FGGM is located within the Maryland Coastal Zone Management (CZM) Program area. MDE regulates activities that are proposed within the CZM Program through federal consistency requirements. Under these requirements, applicants for federal and state licenses or permits must certify their proposed activity will be conducted in a manner consistent with the State’s CZM Program. If a state permit is not required for a project, MDE has the authority to “concur” or

“object” to the federal consistency determination. The state’s consistency decision is required prior to the federal consistency determination being issued. States are not required to concur with a Negative Determination. However, if a response from the state is not received by the 60th day of submittal (unless a one-time extension was requested), the federal agency may presume state agency concurrence. If the state objects, the federal agency may only proceed if federal law prohibits the agency from being fully consistent.

4.11 BIOLOGICAL RESOURCES

Biological resources include native or naturalized plants and animals and the habitats (i.e., wetlands, forests, and grasslands) in which they live. Protected biological resources include plant and animal species listed by the State of Maryland as rare, threatened, or endangered or by the 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.

4.11.1 Vegetation

Vegetative cover at FGGM consists of forest land, open land/meadow, and developed areas with maintained turf, and street trees. These components constitute FGGM’s green infrastructure. Maryland’s green infrastructure was mapped into hubs and corridors using satellite imagery, road and stream locations, biological data, and other information. Hubs are typically unfragmented forest areas hundreds or thousands of acres in size, and are vital to maintaining the state’s ecological health. They provide habitat for native plants and animals, protect water quality and soils, regulate climate, and perform other critical functions. Corridors are linear remnants of natural land such as stream valleys and mountain ridges that allow animals, seeds, and pollen to move from one area to another. They also protect the health of streams and wetlands by maintaining adjacent vegetation. Preserving linkages (corridors) between the remaining blocks of habitat (hubs) will ensure the long- term survival and continued diversity of Maryland’s plants, wildlife, and environment. FGGM maintains both green infrastructure hubs and corridors.

One third of the Installation, approximately 1,795 acres, is forested. Many native forests were cleared prior to the formation of FGGM for agriculture. Larger remaining forested tracts are located towards the perimeter of the Installation. Many of these larger tracts are connected by riparian forest corridors. Larger tracts are around 70 years old, but some stands predate the installation. Development at FGGM has resulted in forest fragments as well as recently planted reforestation areas.

Forest cover within FGGM consists primarily of mixed pine-hardwood in uplands and bottomland hardwoods in riparian areas. Dominant species in upland areas are a mixture of pitch pine (*Pinus rigida*) and Virginia pine (*Pinus virginiana*) and hardwoods consisting of white oak (*Quercus alba*), southern red oak (*Quercus falcata*), and chestnut oak (*Quercus montana*). Bottomland hardwood species are predominantly red maple (*Acer rubrum*), American sycamore (*Platanus occidentalis*), sweetgum (*Liquidambar styraciflua*), and American holly (*Ilex opaca*).

Due to extensive development at FGGM, urban forests are an important biological resource. The installation has actively planted street trees for over 50 years and promoted landscaping with native plant material for over 15 years. Many specimen trees predate the installation and have been preserved throughout multiple phases of Post development. Urban forests provide valuable ecosystem services such as improving water quality, reducing the urban heat island effect, reducing air pollution, providing wildlife habitat, as well as enhancing recreation opportunities and aesthetics.

It is the intent of FGGM to maintain a campus like environment and protect forested areas to the maximum extent practical in accordance with the Maryland Forest Conservation Act (FCA) while continuing to sustain and support current and future missions. FGGM manages its forest conservation program in accordance with the Maryland Department of Natural Resources (MDNR). The installation supports Army, federal, state, and local laws, regulations, policies, and initiatives to the fullest extent possible (USACE Mobile District 2007).

Development and construction projects are required to follow the current FGGM Forest Conservation Act and Tree Management Policy. In keeping with the FCA standards, FGGM requires that the equivalent of 20% of the Project area be forested. All projects 40,000 SF or larger must comply with the FGGM policy. Other projects are evaluated on a case by case basis. As per MD FCA, site developments must preserve or establish 20% forest cover, regardless if the site was forested before the construction. Generally, linear utility and road projects are only required to preserve or establish 20% of the forest cover removed for the actual project. Street trees are to be replaced at a minimum of a 1:1 ratio, with preference given to the preservation of specimen trees. Specimen tree replacement ratios will be calculated on a case by case basis. Forestation that cannot feasibly be performed within the project area shall be performed on other designated land areas within FGGM.

The Installation participates in the Army's conservation reimbursable and fee collection program for forestry. This program exists to provide ecosystem-level management that supports and enhances the land's ability to support each installation's respective military missionscape, while simultaneously obtaining ecologically responsible results that satisfy all federally mandated requirements for natural resources. Program revenues are generated through the sale of forest products. The fair market value of all forest products removed due to the proposed action shall be deposited into the Army's Forestry Account which will be utilized for natural resource activities and ecosystem management at Army installations.

4.11.2 Wildlife Resources

FGGM contains interior/core, edge, aquatic and urban wildlife habitats. The installation is home to 71 bird, 10 mammal, 22 insect, and no less than 6 reptile and amphibian species (USACE 2009). Due to development and forest fragmentation, the majority of wildlife found on Post is characteristic of species found in suburban and urban areas. However, portions of FGGM have been identified as habitat for Forest Interior Dwelling Birds (FIDS) by Maryland DNR. FIDS require large forest areas to breed successfully and maintain viable populations. Forest interior refers to the area in the center of the forest greater than 300 feet from the forest edge. Edge habitat is the forest area within 300 feet of a forest edge.

Wildlife species found on FGGM include white-tail deer (*Odocoileus virginianus*), groundhogs (*Marmota monax*), gray squirrel (*Sciurus carolinensis*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), eastern chipmunk (*Tamias striatus*), field mouse and vole (*Microtus* spp.), mole (*Scalopus aquaticus*), and fox (*Vulpes vulpes*). Common birds are American robin (*Turdus migratorius*), catbird (*Dumetella carolinensis*), mockingbird (*Mimus polyglottos*), Carolina chickadee (*Poecile carolinensis*), Carolina wren (*Thryothorus ludovicianus*), house wren (*Troglodytes aedon*), downy woodpecker (*Picoides pubescens*), common flicker (*Colaptes auratus*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), rock dove (*Columba livia*), mourning dove (*Zenaida macroura*), and song sparrow (*Melospiza melodia*) (Michael Baker Jr. Inc., 2007).

Eight species of birds were listed on both the Global and Maryland State Heritage designation list including, purple finch (*Carpodacus purpureus*), hermit thrush (*Catharus guttatus*), blue-throated blue warbler (*Dendroica caerulescens*), dark-eyed junco (*Junco hyemalis*), golden-crowned kinglet (*Regulus satrapa*), red-breasted nuthatch (*Sitta canadensis*), yellow-bellied sapsucker (*Sphyrapicus varius*) and winter wren (*Troglodytes troglodytes*). The purple finch and hermit thrush are also listed as Maryland State Species of Concern. Most of the observed animal species are common to Anne Arundel County and the Central Maryland area.

As of November 2009, Partners in Flight Species of Concern present on FGGM include:

- Baltimore oriole (*Icterus galbula*)
- Wood thrush (*Hylocichla mustelina*)

The Migratory Bird Treaty Act (MBTA), implemented in 1918, makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, 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.

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.

4.12 THREATENED AND ENDANGERED SPECIES

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. The ESA requires FGGM to conserve any threatened and endangered species found within its property. Section 7 of the ESA requires federal agencies to consult with the USFWS on any action that may affect endangered or threatened species or candidate species, or that may result in adverse modification of critical habitat. Critical habitats, as defined by the ESA, are areas with physical or biological features essential to the preservation of a species that

may require special management or protection. Federal agencies are required to take precautions to not destroy or harm areas designated as critical habitat. The following considerations are made when determining critical habitat for a species: space for individual and population growth and normal behavior; cover or shelter; food, water, air, light, minerals, or other nutritional or physiological requirements; sites for breeding and rearing offspring; and habitats that are protected from disturbances or are representative of the historic geographical and ecological distributions of a species.

No federally listed or proposed endangered or threatened species are known to occur on FGGM. Correspondence from USFWS dated November 8, 2012 indicated that except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project impact area (Appendix B). Rare, threatened, and endangered species survey conducted in 2001 (Eco-Science Professionals) as well as a 2009 Flora and Fauna Survey (USACE Baltimore District 2009) did not identify federally listed endangered or threatened species on FGGM.

State-listed species are not protected under the Endangered Species Act; however, whenever feasible, the installation cooperates with State authorities in an effort to identify and conserve State-listed species (Army and Air Force Exchange Service, 2006). A 2002 survey identified the State rare mud salamander (*Pseudotriton montanus*) located along the western boundary of the installation (Versar, Inc.). The Little Patuxent River, adjacent to the waste water treatment plant, supports one of only two populations of the State threatened Glassy darter (*Etheostoma vitreum*) in Maryland. The Glassy darter is a member of the Perch family named for its translucent body.

FGGM also contains the following Maryland species of concern:

- Downy bushclover (*Lespedeza stuevei*) – Maryland Watchlist
- Pubescent sedge (*Carex hirtifolia*) Maryland Watchlist (Berman Tract)
- Purple chokeberry (*Aronia prunifloia*) – Maryland Watchlist
- Roughish panicgrass (*Panicum leucothrix*) – Maryland status uncertain

FGGM voluntarily maintains four Habitat Protection Areas (HPAs) on the installation. HPAs are self-designated sensitive areas. One of these areas is located proximate to the waste water treatment plant. HPAs are included in FGGM's Integrated Natural Resource Management Plan and are protected as a BMP. FGGM coordinates with MDNR and tries to avoid impacting these areas to the maximum extent practical.

4.13 CULTURAL RESOURCES

Cultural resources are “historic properties” as defined by the National Historic Preservation Act (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 the NHPA of 1966, the Archaeological and Historic Preservation Act of 1974, the American Indian Religious Freedom Act of 1978, the Archaeological Resource Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1990—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”.

Section 106 of NHPA of 1966 (as amended) requires federal agencies to consider the effects of any undertaking on properties listed in or eligible for listing in the National Register of Historic Places. This process is known as Section 106 review. The NHPA also requires each state and the District of Columbia to designate a State Historic Preservation Officer (SHPO) to coordinate local participation in the implementation of the NHPA and to serve as a key participant in the analysis of and protection of historic resources.

The most recent ICRMP for FGGM was prepared in 2011 by the Baltimore District of the U.S. Army Corps of Engineers (USACE, 2011a). All of the known resources at FGGM that are fifty years old, or older, have been evaluated for National Register eligibility. FGGM has one archeological site and 17 architectural resources that are eligible for listing in the NRHP.

The Water Treatment Plant (Building 8688) is a National Register Eligible Art Moderne-designed building that was constructed in 1941. This building houses the water filtration system and is considered significant under National Register C for its association with architecture as an example of Art Moderne design.

4.14 HAZARDOUS, TOXIC, AND RADIOACTIVE SUBSTANCES

A hazardous material is defined as any substance that is 1) listed in Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); 2)

designated as a biologic agent and other disease causing agent which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any person, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations in such persons or their offspring; 3) listed by the U.S. Department of Transportation as hazardous materials under 49 CFR 172.101 and appendices; or 4) defined as a hazardous waste per 40 CFR 261.3 or 49 CFR 171. Hazardous materials are federally regulated by the USEPA in accordance with the Federal Water Pollution Control Act; CWA; Toxic Substance Control Act (TSCA); Resource Conservation and Recovery Act (RCRA); CERCLA; and CAA.

4.14.1 Resource Conservation and Recovery Act

RCRA defines hazardous waste as wastes or combination of wastes that, because of quantity, concentration, or physical, chemical, or infectious characteristics, may either cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible illness, or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed. All hazardous wastes are classified as solid wastes. A solid waste is any material that is disposed, incinerated, treated, or recycled except those exempted under 40 CFR 261.4.

4.14.2 Spill Prevention Control and Countermeasures Plan and Installation Spill Contingency Plan

FGGM's Directorate of Public Works Environmental Division is responsible for managing hazardous materials and waste. The Installation operates under a Spill Prevention Control and Countermeasures Plan (SPCCP)/ Installation Spill Contingency Plan (ISCP) (Sept 2012) for all facilities where hazardous materials are stored. The SPCCP/ISCP Plan delineates measures and practices that require implementation to prevent and/or minimize spill/release from storage and handling of hazardous materials to protect ground and water surfaces. In accordance with State and Federal law and Army regulations, the SPCCP/ISCP is updated at least every 3 years, or when significant changes in operations occur that could impact the likelihood of a spill. The ISCP provides emergency response instructions for spills and uncontrolled releases of hazardous materials. Instructions include notification, probable spill routes, control measures, exposure limits, and evacuation guidelines. Material Safety Data Sheets (MSDS) that provide information about health hazards and first-aid procedures are included in the ISCP.

FGGM also has an Installation Hazardous Waste Management Plan (DoD, 2011). Those who handle or manage hazardous materials or hazardous waste are trained in accordance with Federal, State, local, and Army requirements. Each facility has appointed an emergency management coordinator, who is responsible for emergency response actions until relieved by hazardous materials spill response personnel.

4.14.3 Integrated Pest Management

The Integrated Pest Management Plan provides a framework through which pest problems can be effectively addressed at FGGM (DoD, 2007). The plan was prepared in 2007 and was validated annually since then because no significant changes were required. The plan will be validated again for FY 2013. Elements of the program, including health and environmental safety, pest identification, pest management, pesticide storage, transportation, use and disposal are defined within the plan. Used as a tool, this plan reduces reliance on pesticides, enhances environmental protection, and maximizes the use of integrated pest management techniques. Pesticides are stored at the entomology building, and used on FGGM in accordance with all applicable Federal, State, and Installation guidelines.

4.14.4 Asbestos Containing Materials and Lead-Based Paint

The possibility of asbestos-containing materials (ACM) exists at FGGM. These include materials that contain more than 1 percent asbestos and are categorized as either friable or non-friable. ACM may be found within older buildings at FGGM and on buried steam lines at the Installation. The FGGM 2008 Asbestos Management Program Standard Operating Procedure (DoD, 2008) provides the procedures for identifying, controlling, and disposing of asbestos containing materials.

Lead-Based Paint (LBP) may also exist in older buildings at FGGM. LBP includes paint having lead levels equal to or exceeding 0.5 percent by weight. LBP may be found in structures older than 1978. The installation's 2006 Lead Hazard Management Plan (DoD, 2006) procedures and protocols used in the identification, control and removal of LBP from real property at FGGM.

4.14.5 Installation Restoration Program

The Department of Defense (DoD) established the Installation Restoration Program (IRP) in 1975 to provide guidance and funding for the investigation and remediation of hazardous waste sites caused by historical disposal activities at military installations. The fundamental goal of the FGGM IRP is to protect human health, safety and the environment. The IRP is carried out in accordance with all federal, state and local laws. The primary federal laws are Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Superfund Amendments and Reauthorization Act (SARA). In 2009, FGGM signed a Federal Facility Agreement (FFA) with the USEPA, U.S. Department of the Interior (DoI) and U.S. Architect of the Capitol (AoC). This document establishes the role that FGGM and the EPA each play in the restoration of the Installation and the formal mechanisms of this process. The IRP's staff works closely with the EPA, MDE, and local government agencies to ensure that cleanup processes are conducted properly and efficiently. The staff also receives input from community groups and nearby residential areas.

The planned water and wastewater projects occur within or in close proximity to numerous active IRP sites. These IRP sites were identified based on historic use (i.e. former motor pools, post laundry, repair shops, etc.) or on an aerial photograph survey that identified areas of interest (i.e. possible dump sites, disturbed areas, surface storage areas, etc.) Potential soil and

groundwater contamination may exist at or near these IRP sites, which are actively under investigation, therefore hazards may exist from exposure to soil and/or groundwater. It is necessary to review possible site hazards from these active IRP sites in more detail on a project by project basis prior to site work.

4.14.6 Military Munitions Response Program

The DoD recognizes its responsibility to protect the public from the potential hazards associated with military operations, both past and present. This is particularly true with regard to DoD's use of military munitions in training and testing. To address munitions-related issues and the potential hazards munitions pose on property that the DoD once used, DoD developed the Military Munitions Response Program (MMRP). The MMRP addresses non-operational range lands that are suspected or known to contain unexploded ordnance (UXO), discarded military munitions (DMM) or munitions constituent (MC) contamination.

A portion of Project #9 (along O'Brien Road between Emory and Rockenbach Roads) is located within an MMRP site, the former Mortar Range Munitions Response Area (MRA). The MRA is made up of the Training Area and the Mortar Area Munitions Response Sites (MRSs). Based on previous investigations, the entire MRA is considered a 'low risk' for munitions of explosive concern (MEC) and material potentially presenting an explosive hazard (MPPEH). According to the September 2012 Final Record of Decision, the selected remedial action for the MRA is Land Use Controls (LUCs) with Long Term Management (LTM). Existing LUCs at the MRA will be maintained and enhanced including requirements to obtain dig permits from DPW for any intrusive activity; Master Plan Regulations; and the FGGM GIS Database. UXO Construction Support is required for all intrusive construction projects, and UXO avoidance procedures are required for any other intrusive activity. Additionally, an education program will be initiated for potential future site workers, users, and emergency responders; and residential land use at the MRA is prohibited. Signage (warning signs) specific each MRS, describing restrictions on site use at key locations of the site will be installed. Annual inspections of the MRS will be performed to establish that all on-site LUCs are in good condition; to confirm that the land use of the site had not changed; and, through an instrument-assisted surface sweep, that no MEC / MPPEH or munitions debris had been exposed through erosion or frost heave. The LUCs and LTM will be incorporated into CERCLA required procedures in the forthcoming Remedial Design.

Proposed future Projects #F-1 and # F-3) are adjacent to the High Explosives Impact (HEI) Area (a BRAC MMRP site). This area consists of the Patuxent Research Refuge-North Tract (PRR-NT) which was transferred to the DOI in the early 1990s. Numerous ordnance and explosive (OE) training and MEC items were found in this tract during site investigations. The potential munitions suspected on the PRR-NT are representative of troop training and fighting using live and practice items designed to simulate a service item in weight and ballistic properties. These items may be inert or have a small quantity of explosive filler. Over the course of previous investigations, a Non-Time Critical Removal Action was completed for 24 areas located within the PRR-NT identified by the USFWS as high traffic areas. A 2001 Action Memorandum selected LUCs with surface and subsurface clearance to depth in selected areas. Continued measures outlined by the LUCs, include the education of workers and recreational users

regarding potential residual OE hazards that may be associated with the property and identification of proper notifications if any OE is encountered. The Army will develop a PP/ROD for the HEI Area in FY13. A LUC RD will also be developed in FY13 to better enforce and maintain the existing MEC LUCs. Inspection, monitoring, and documentation procedures will be incorporated into the CERCLA process for the HEI Area.

The Southern portions on Future Projects #F-1 and #F-3 are located east of Range Road are also within or adjacent to the FGGM's active range area. The active ranges are classified as a Confidence Course and Maneuver/Training Area. According to the 2008 Operational Range Phase I Qualitative Assessment Summary, there is no historic or current munitions use associated with these ranges.

4.15 UTILITIES

4.15.1 Potable Water

AW owns and operates the potable water system that serves FGGM. Water is drawn from six groundwater wells located throughout the Installation to AW's water treatment plant, which is located in the southwest quadrant of the cantonment area near the intersection of Mapes and O'Brien Roads. The maximum allowed draw capacity permitted by MDE is 3.3 MGD, or approximately 1,200 million gallons per year (Permit No. AA1969G021 (07), effective 1 June 2012, expires 1 June 2024). The permit is issued to AW.

4.15.2 Domestic and Industrial Wastewater

Sanitary sewer collection and pumping system at FGGM is comprised of 58 miles of piping on and around the Installation, 55 miles of gravity sewers, three miles of force mains, and nine pumping stations. The pipe diameter of the gravity sewers, installed between 1941 and 1987, range from four to 30 inches. The force mains have pipe diameters that range from three inches to 24 inches. Wastewater from the gravity sewers and force mains flow to two major pump stations: the Leonard Wood and the East Side pump stations. Each station has three pumps, each rated at approximately 1500 GPM, at average operating head, thereby providing total station capacity of 4500 GPM (9000 GPM between the two stations). The WWTP has a design flow of 12.3 MGD. The average flow the WWTP is currently approximately 2.5 MGD. AW owns and operates the wastewater system at FGGM.

4.15.3 Electric and Gas at FGGM

Electrical power is supplied to the Installation by Baltimore Gas and Electric (BG&E) through four distribution substations. The primary source for FGGM (non-NSA) is a 110 kilovolt (kV) redundant feeder pair from the BG&E Waugh Chapel Power Station along the south and east sides of the Installation, following MD Route 32 that terminates at substation #3. A second pair of 110 kV feeders originates in the BG&E High Ridge Power Station west of the Installation and back feeds the substation utilizing the Waugh Chapel distribution line. Several secondary sources of electrical power consisting of 18 engine-driven emergency standby generators at 15 locations exist on FGGM.

Natural gas is supplied by BG&E. Natural gas is supplied via high pressure (100 pound force per square inch gauge) mains owned by BG&E, which form a loop on the Installation. The extensive natural gas distribution system includes BG&E and government owned systems. Most buildings are within a few hundred feet of an active supply line (USACE, 2007).

4.16 TRANSPORTATION

FGGM is located in Anne Arundel County and is served by the surrounding roadway network:

- Baltimore-Washington Parkway (Maryland [MD] Route 295)
- MD Route 175 (Annapolis Road)
- MD Route 32

The FGGM Installation is accessible from the following five access gates:

- Gate 1: Mapes Road and MD Route 32
- Gate 2: Mapes Road and MD Route 175
- Gate 3: Rockenbach Road and MD Route 175
- Gate 6: Llewellyn Avenue and MD Route 175
- Gate 7: Reece Road and MD Route 175 (Demps Visitor Control Center)

Most of the internal roadways are two-lane roads, one lane in each direction, with signals or stop signs (two-way, three-way or four-way stops) at most intersections. The main Installation roadways include Rockenbach Road, Mapes Road, Ernie Pyle Street, MacArthur Road, Cooper Avenue and Reece Road.

4.17 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND PROTECTION OF CHILDREN

The Region of Influence (ROI) for socioeconomic impacts is defined for FGGM as Anne Arundel County, Maryland. Socioeconomic data are provided in this section to establish baseline conditions. Data consist primarily of publicly-available information about Anne Arundel and to provide perspective with regard to the State of Maryland.

In February, 1994 President Clinton signed Executive Order 12898, entitled “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.” This EO 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.

In 2010 Anne Arundel County had a population of 427,239, making it the fourth most populous county in Maryland (fifth if Baltimore City is included). Similar to the national and statewide trend, population growth in Anne Arundel County has slowed since 1990, as population growth from 1990 to 2000 exceeded population growth from 2000 to 2010. Over the 20 year period from 1990 to 2010, Anne Arundel County grew at a quicker rate than Maryland and the nation overall (US Census 2012).

In 2010, the population of Anne Arundel County was 77.9 percent White, 16.9 percent Black or African American, 4.4 percent Asian, 2.5 percent Hispanic or Latino, 1 percent American Indian or Native Alaskan, and 0.2 percent Native Hawaiian or Other Pacific Islander (US Census 2012).

Educationally as of 2010, of the population aged 25 or older, 10 percent of Anne Arundel residents had not completed high school, 26 percent had completed high school but not attended college, 28 percent had attended some college or received an Associate degree, and 36 percent had earned a Bachelor's degree or advanced degree. In general, Anne Arundel County had a higher level of educational attainment in comparison to Maryland and the Nation overall. As of 2010, a higher percentage of the population of Anne Arundel County had completed some college or received an Associate degree than the populations of Maryland and the Nation overall; also, an equal or greater proportion of Anne Arundel County residents had earned a Bachelors or advanced degree. Anne Arundel County had an equal or lower proportion of its population that had either not completed high school or had completed high school but not attended college than Maryland and the Nation overall (US Census 2012).

As of 2010, Anne Arundel County had a household population of 508,132 and 195,999 total households. The average household size was 2.6 persons per household, the same as Maryland and the Nation overall. Anne Arundel County had a higher median household income and a higher income per household member than Maryland and the Nation overall. The number of Anne Arundel County households with incomes below the poverty line numbered 9,678, or 4.9 percent of county households, a rate lower than Maryland and the Nation overall (US Census 2012).

In 2010, the labor force of Anne Arundel County was 294,513; 273,710 individuals were employed and 20,803 were unemployed implying an unemployment rate of 7.1 percent. The unemployment rate in Anne Arundel County in 2010 was lower than Maryland's (7.8 percent) and lower than the Nation overall (9.6 percent). From 1990 to 2010, the labor force, the number of employed, and the number of unemployed in Anne Arundel expanded at a greater rate than Maryland and the Nation overall; the number of individuals who were employed in Anne Arundel County increased by 23 percent while the number of unemployed increased by 164.5 percent (US Census 2012).

FGGM does not meet the definition of having a minority population that could be impacted disproportionately. No children reside or play in areas where the Proposed Action would be accomplished.

5.0 ENVIRONMENTAL EFFECTS

The environmental assessment of the Proposed Action was based on an evaluation of the impacts from construction, system upgrades and repairs associated with the proposed projects. For the assessment of the No-Action alternative, it was assumed that the proposed projects would not be constructed.

Operation of the project was also considered to determine potential long-term impacts after construction is completed. When appropriate, mitigation measures to be implemented are included under the discussion of specific resource effects.

The impacts of the Proposed Action on the human and natural environment may be reduced by adherence to LEED requirements and recommended measures. These reductions are noted in appropriate locations throughout the sections below.

5.1 LAND USE

Proposed Action

Implementation of the Proposed Action is not expected to impact land use around FGGM. All projects would occur within the FGGM boundary.

Within FGGM, no significant changes to the current land use zones within FGGM are expected from the Proposed Action. Short-term minor impacts to land use would be expected as a result of construction activities. Once work is completed, land use would return to existing conditions at most sites.

Long-term minor adverse impacts to land use associated with the construction of the Operations Center would be expected as up to approximately 1 acre of open area would be cleared for the construction of the 6,000 SF building and associated parking area. The Proposed Action site was selected based on functional adjacencies and land use compatibility, in accordance with the LEED requirements, and will not significantly impact land use in the area.

The proposed expansion work at the WWTP is consistent with the land use at the site. However, it is estimated that the work could permanently impact up to 2 acres of land around the WWTP. The proposed work would be designed to maximize the reuse of existing structures and minimize the permanent impacts to land use.

No-Action Alternative

Implementation of the No-Action alternative would not alter the existing land use on the Installation.

5.2 VISUAL AND AESTHETIC VALUE

Proposed Action

Short-term, minor, adverse impacts to local visual aesthetics are expected due to construction equipment and excavation work. Since the lines are being located underground, no visual impacts are expected following the completion of construction. Short-term minor adverse impacts to the historic viewshed of the WTP could also be impacted during construction of the Operations Center to the east of the building.

Long-term minor adverse impacts to local aesthetics at the proposed location of the Operations Center would result from the construction of the facility in a currently open area near the existing WTP.

No-Action

This alternative would have no impact on the aesthetics of the area.

5.3 GEOLOGY AND SOILS

Proposed Action

The implementation of the Proposed Action is expected to have short-term minor adverse impacts on up to approximately 20 acres of mainly previously disturbed soils within FGGM. Soil disturbance in the form of excavation, grading, earthmoving, and compaction would result from new construction activities. As a result, soils would be compacted, soil layer structure would be disturbed and modified, and soils would be exposed, increasing the overall potential for erosion at the site. Soil productivity, (i.e., the capacity of the soil to produce vegetative biomass), would decline in disturbed areas and be completely eliminated for those areas within the footprint of building structures, and parking facilities. Adverse impacts to soils from the proposed construction 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.

AW will obtain ESCP, Stormwater Management Plans, and NPDES permits from the MDE for any work as required. The ESCP would be designed in accordance with MDE regulations as published in the “2011 Standards and Specifications for Soil Erosion and Sediment Control” (MDE 2011) in addition to any subsequent applicable changes. Standard erosion and sediment 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. Maryland’s “Stormwater Management Guidelines for State and Federal Projects” in affect at the time of the work, would be followed to minimize adverse stormwater impacts from any work (MDE 2012).

In accordance with COMAR Title 26.17.01.05, any work that involves clearing and grading activities that disturb more than 5,000 SF of land area and disturb more than 100 cubic yards of earth would require the preparation of an ESCP. AW would ensure that the ESCP is prepared and submitted through the FGGM Environmental Office as needed.

The Proposed Action could be expected to have a long-term minor adverse impact to approximately 1 acre of previously disturbed soil through the construction of the new Operations Center and associated parking. BMP would be utilized to minimize long-term impacts to the soils and stormwater. EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, requires that all new construction comply with the *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings* (Guiding Principles). This includes employing design and construction strategies that reduce stormwater runoff. Furthermore, Section 438 of the Energy Independence and Security Act of 2007 require 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 of permeable pavements where practical, and break up flow directions from large paved surfaces.

Work at the WWTP could impact up to another 2 acres of land. The proposed work would be designed to maximize the reuse of existing structures and minimize the permanent impacts to previously disturbed soils. BMPs would be incorporated by AW into the design to minimize impacts and to meet any permit requirements.

The project would have long-term benefits to soils by reducing the threat of pipe breaks that can lead to erosion. In addition, by repairing and/or replacing sewer lines, the threat of nutrients (nitrogen and phosphorus) from contaminating soils is reduced.

No-Action

This alternative would have long-term minor adverse impact to soils at FGGM. Leaking and/or breaking water and sewer lines can lead to localized erosion. In addition, leaking sewer lines release nitrogen and phosphorus to the environment.

5.4 AIR QUALITY

Proposed Action

Short-term, minor, adverse impacts to local air quality are expected due to dust and emissions during construction. Pollutant emissions resulting from proposed construction and operation activities have been evaluated for the proposed action. Air quality impacts would be significant if emissions associated with the proposed action would: 1) increase ambient air pollution concentrations above the NAAQS, 2) contribute to an existing violation of the NAAQS, 3) interfere with, or delay timely attainment of the NAAQS, or 4) for mobile source emissions, result in an increase in emissions to exceed 250 tons per year for any pollutant. Pollutants considered in this air quality analysis include the criteria pollutants and HAPs measured by federal standards.

In accordance with the LEED requirements, construction of the Operations Center would be designed to reduce potential impacts on air quality. These activities would result in dust, from airborne soil particles and the manipulation of construction materials (e.g., timber, drywall, piping), and volatiles from adhesives, flooring, and roofing. In order to meet LEED requirements, low-emitting types of these products will be specified for this project.

In order to assess the air quality impacts of the proposed action, emissions for the construction and operation segments of the action were compared to the General Conformity Rule *de minimis* thresholds for the ozone precursors VOC and NO₂, as well as PM_{2.5} and its precursor SO₂. For the criteria pollutants that the Metropolitan Baltimore Intrastate AQCR is designated as unclassifiable/better than national standards, the calculated emissions are compared to the 250-ton threshold. Appendix C contains the detailed emission calculations prepared to assess the air quality impacts of the proposed action and the Record or Non-Applicability (RONA).

Typically, annual emissions are calculated and compared with the *de minimis* thresholds to determine whether the annual emissions from direct and indirect sources for each pollutant exceed the *de minimis* thresholds. The calculations examined the direct and indirect emissions from the entire multi-year Proposed Action as a worse case.

Emissions of VOCs were insignificant compared to NO_x and were not reported in the emission summary. The *de minimis* level for VOCs for a moderate nonattainment area inside an OTR is 50 tons per year. The total direct emissions for the Proposed Action are estimated at 3.887 tons of PM_{2.5} and 85.707 tons of NO_x. Both of these figures are below the annual *de minimis* limits.

Commuting traffic for construction crews is assumed to be the source of indirect emissions impacts of this project. Emissions from construction personnel traffic were calculated using the USEPA's *MOBILE6*. It is assumed that the construction crew would consist of an average of 80 workers per day for a total of 1300 days. The total indirect emissions for the construction were estimated to be 0.06 tons of PM_{2.5} and 3.385 tons of NO_x. Therefore the total construction (direct and indirect) emissions for the Proposed Action over a five year period would be 3.947 tons of PM_{2.5} and 89.092 tons of NO_x. Both of these figures are below the annual *de minimis* limits.

For operating emissions, it is estimated that five emergency generators may be required. These generators would be tested monthly with an annual expected run time of 12 hours each. The annual operating emissions calculated are 0.0265 tons per year of PM_{2.5} and 0.8466 tons per year of NO_x. To maintain a consistent analysis, the five year operating emissions would be 0.1325 tons of PM_{2.5} and 4.235 tons of NO_x.

Adding the total direct, indirect, and operating emissions, the total predicted emission for PM_{2.5} is 4.0795 tons. The total estimated emission for NO_x is 93.327 tons. Because total projected construction and operating emissions are below the annual threshold levels, the action is exempt from further Conformity analysis. The emissions associated with the proposed construction are summarized in Table 5-1.

Project construction equipment would emit minor amounts of HAPs that could potentially impact public health. The main source of HAPs would occur in the form of diesel exhaust organic gases

and particulates from the combustion of diesel fuel. The operation of proposed diesel-powered construction equipment would be mobile and intermittent over the course of the construction period, and would produce minimal ambient impacts of HAPs in a localized area. However, the operation of the diesel-powered equipment should include some BMPs, to include a restriction on excessive idling, adherence to equipment maintenance programs to ensure excessive emissions are generated as a result of poor maintenance, and the use of particulate filters and ultra low sulfur diesel fuel for applicable equipment. As a result, HAP emissions from construction equipment would produce insignificant impacts to public health.

TABLE 5-1: ESTIMATED EMISSIONS FROM IMPLEMENTATION OF THE PROPOSED ACTION		
Estimated Emissions	Emissions (tons)	
	O₃ (as VOC and NO_x)	PM_{2.5}
Direct Construction Emissions	85.707	3.887
Indirect Emissions	3.385	0.06
Operational Emissions	4.235	0.1325
Total Emissions	93.325	4.0795
<i>de minimis</i> threshold (tons/year)	100	100
Exceeds <i>de minimis</i> threshold?	No	No

Annual GHG emissions associated with the project construction are estimated to be below the 25,000 metric tons of CO_{2e} level proposed in the draft NEPA guidance by the CEQ (CEQ, 2010). Annual operating emissions would be minor and less than significant, and would disperse quickly within the project area. In addition, potential effects of GHG emissions are by nature global and cumulative impacts, as individual sources of GHG emissions are not large enough to have an appreciable effect on climate change.

No-Action Alternative

Under the No-Action alternative the work would not be performed. There would be no changes to the air emissions that occur at present. In addition, the No-Action alternative in conjunction with past, present, or reasonably foreseeable future actions, would not cause cumulative air quality impacts.

5.5 NOISE

Proposed Action

Minor, short-term, adverse noise impacts would be expected. Noise impacts from construction-related activities are expected to be minor because construction would occur during normal business hours and the equipment would be used for a short period of time. Therefore, while there may be a minor increase in the number of people annoyed by construction noise, the impact would not be significant. Table 5-3 provides representative noise levels associated with construction. These impacts would cease after construction.

With the exception of possible occasional emergency generator usage, there would not be any operational noise associated with the Proposed Action.

No-Action

This alternative would have no impact to noise.

TABLE 5-2: TYPICAL NOISE LEVELS OF CONSTRUCTION EQUIPMENT	
(noise Level in dBA at 50 Feet)	
Construction Vehicle Type	dBA
Bulldozers	80
Backhoe	72-93
Bobcat	72-93
Jack Hammer	81-98
Crane	75-77
Pick-Up Truck	83-94
Dump Truck	83-94

Source: USEPA,2012b.

5.6 WATER RESOURCES

Proposed Action

No impacts to groundwater are anticipated from the Proposed Action. All anticipated water withdrawals are consistent with the existing withdrawal rates at the wells. All work associated with the wells would be in accordance with the existing MDE permit.

Possible short-term minor adverse impacts to surface waters could result from the Proposed Action. The locations of waterbodies and the Proposed Action projects can be seen in Figure 4-2 in Appendix A. During construction, sediment could enter the streams and turbidity could impact water quality. Projects located near streams would need to be designed to minimize potential impacts to surface waters. Designs would include maintaining a 100 ft riparian buffer around any waterbody.

Any work that involves clearing and grading activities that disturb more than 5,000 SF of land area and disturb more than 100 CY of earth would require the preparation of an ESCP and a SWP. During the design of each separate project appropriate, ESCPs and SWPs would be developed by AW and submitted through the FGGM Environmental Office to MDE for review and approval. AW would obtain all necessary permits prior to the start of construction. Where possible, the designs would be developed to avoid or minimize impacts to these resources.

Project proponents would avoid working in streams and associated riparian areas to the maximum extent practical. Where this is unavoidable due to existing infrastructure and utility requirements, MDE and USACE permits would be obtained for projects that require working within a stream or a stream crossing. Stream impacts would be less than 200 LF. AW would pursue MDE permits during design of future projects as needed. In addition, during design AW would include strategies to minimize any potential impacts. These design features would include

jack and boring of pipework below stream channels, and crossing sensitive areas in a perpendicular manner so as to avoid or minimize impacts to streams.

While the Operations Center component of the Proposed Action would increase the amount of impervious surface located on this site, resulting in increased stormwater runoff, implementation of project-specific BMPs and LID practices would minimize impacts to water quality. In addition, the use of pervious pavement and similar materials for the parking lot area could be included which will allow for stormwater infiltration on site. The use of structural soils is also a possibility, which will allow for increased infiltration of stormwater and reduce the impacts to surface water from increased impervious surface. By applying these measures, it is not anticipated that there would be any significant impacts (short or long term) on surface or storm water.

The Proposed Actions are expected to have long-term benefits to water resources by reducing the threat of nutrients (nitrogen and phosphorus) from entering the waterways. In addition, the improvements to the WWTP will bring the facility into compliance with the MDE discharge permit.

No-Action Alternative

Implementation of the No-Action alternative would have long-term minor adverse impacts on water resources. Water lines and sewer lines would continue to deteriorate and potentially leak in to the soils and waterbodies. In addition, failure to upgrade the WWTP would result in the plant not meeting MDE permit requirements and the discharge of nitrogen and phosphorus into surface waters at the Installation.

5.7 FLOODPLAINS

Proposed Action

Projects #11 and #12 lie near 100-year floodplains. During design of these projects the exact location of the work with regard to floodplains would be determined. Wherever possible, floodplain impacts would be avoided. Short-term, minor, adverse impacts could occur while equipment and excavated materials are within the floodplain for one to two days during construction activities associated with water and/or wastewater systems. No materials or equipment would be stored in the floodplain during anticipated flood conditions. The water and wastewater lines are being placed underground and the surface restored to its pre-construction condition. Projects located near floodplains would need to be designed to minimize potential impacts to surface waters. Designs would include maintaining a 100 ft riparian buffer, to the maximum extent practical, around streams and abutting wetlands. Where floodplain impacts are unavoidable, projects will be permitted in accordance with applicable State and federal regulations.

The construction of the BNR system at the WWTP would occur in the 500-year floodplain and would entail the replacement of the existing aeration system with the BNR system. The designs for this facility would be developed to avoid or minimize impacts to this resource. As no fill or

construction that could impact the floodplain is allowed, the designs would include analysis to ensure that no impacts to flood storage are caused by the Proposed Actions.

No-Action

This alternative would have no impact to floodplains.

5.8 WETLANDS

Proposed Action

Possible short-term and minor long term adverse impacts to wetlands could occur from some projects associated with the Proposed Action. The locations of mapped wetlands and the Proposed Action projects can be seen in Figure 4-2 in Appendix A. No work is currently proposed within known wetlands, but design constraints and the location of existing utilities may require minor impacts less than 5,000 SF. Only two projects are proposed near known wetlands and could have potential impacts to this resource. The WWTP is located less than 100 feet from the nearest wetland. Some of the work associated with future security improvements (Project F-1) and future water system piping improvements (Project #F-2) are located near wetlands. AW would obtain wetland delineations in areas where wetland and wetland buffer mapping has not been completed, such as locations for Projects #8, #9, and #22.

Additionally, AW would obtain Jurisdictional Determinations and prepare Joint-Permit Applications to be submitted to the MDE/USACE for any proposed impacts to the wetlands and/or 25-foot MDE wetland buffer. Designs would include avoidance or minimization of impacts to wetlands, inclusion of the 25-foot wetland buffer, a voluntary 100-foot riparian buffer to the maximum extent practical. If possible, designs would be developed to relocate lines that are in sensitive areas. Avoidance and minimization would be demonstrated to regulators to justify any potential impacts to wetland resources. Mitigation for impacts is generally not required for less than 5,000 SF of nontidal wetland impacts in a Use I-P watershed designation. Mitigation for greater than 5,000 SF of impacts would be required, either by creating wetlands on FGGM property, purchasing credit in an existing wetland mitigation bank, or paying into the MDE Nontidal Wetland Compensation Fund.

During design for work in these areas, AW would ensure that all Federal and state regulations as well as FGGM's NPDES permit stipulations are followed during construction. During the design, appropriate ESCP would be developed and necessary permits would be obtained by AW. While no long-term adverse impacts are currently planned, any adverse impacts would be minor. Long-term benefits to wetlands would be expected through reducing the threat of sewer line discharges into these areas.

No-Action Alternative

Implementation of the No-Action alternative would have long-term minor impacts on this resource. Deteriorated sewer lines and manholes have discharged into wetlands at FGGM. By allowing the existing conditions to continue, the threat to wetlands would continue.

5.9 COASTAL ZONE MANAGEMENT ACT

Proposed Action

No impacts to the CZM Program area are anticipated. Implementation of the Proposed Action is expected to be consistent with Maryland's enforceable policies. As some of the projects may impact waterways or wetlands at FGGM, compliance with Maryland's Coastal Zone Management Program is required. Possible short-term impacts to wetlands could occur. Designs would be developed to avoid or minimize impacts to wetlands. AW would coordinate with MDE during design and permits would be obtained for any area that would impact wetlands and streams. No construction would begin until compliance requirements are met. Erosion and Sediment Control Plans and SWM plans would be designed and approved by MDE prior to project construction which would include measures to protect the "Coastal Zone". As the work would benefit wetlands by reducing the threat of sewer discharges, the work would be expected to have a long-term benefit to wetlands and the CZM Program area.

No-Action Alternative

Implementation of the No-Action alternative would have long-term minor impacts on this resource. Deteriorated sewer lines and manholes have discharged into wetlands at FGGM. By allowing the existing conditions to continue, the threat to wetlands and the CZM Program area would continue.

5.10 BIOLOGICAL RESOURCES

Proposed Action

The proposed project would be expected to have short-term, minor, adverse impacts to vegetation and wildlife and within the project areas. Projects would be designed so they are constructed within existing paved roadways and along shoulders, to minimize loss of vegetation. Where possible, impacts to vegetation would be limited to turf grasses, weed species, and small brush. Any disturbed areas would be seeded and returned to original conditions following construction.

Wildlife within project area would be displaced during construction activities, mainly in the form of noise from construction equipment and physical disturbances of wildlife habitat. Songbirds, squirrels would be the most impacted during construction. Upon project completion, noise levels would return to current levels and vegetation restored. Disbursed wildlife would likely return. These impacts are expected to be short-term and minor.

Long-term minor adverse impacts would be expected in areas where work would extend through wooded areas. It is possible that up to 1 acre of forest could be disturbed during the construction associated with the water and wastewater pipeline work and result in the removal of some trees and the permanent loss or conversion of some wildlife habitat. Animals would likely relocate to remaining forested areas at FGGM. The projects that would most likely impact these forested areas are Projects #10, #11, #20, and #22. During design of these projects AW would work closely with FGGM to minimize impacts to forested areas and terrestrial habitats. Where possible, work would impact the edge of forested tracts or work within existing utility corridors.

Projects would be designed to minimize the potential for forest fragmentation that could impact wildlife habitat. Habitat protection areas would be avoided where possible. Alignments would be designed to accommodate existing forests and individual trees. In addition, design for Project #20 would be developed to maintain a healthy riparian buffer along Franklin Branch. Designs would also include reforestation of disturbed wooded areas with indigenous plant species. The planting plan and specifications would be part of all AW designs.

Impacts on FGGM land would be mitigated on the installation in accordance with the current FGGM Forest Conservation Act (FCA) and Tree Policy, through forest preservation or reforestation. In keeping with the FCA standards, FGGM requires that the equivalent of 20% of the Project area be forested. All projects greater than or equal to 40,000 SF must comply, while other projects would be evaluated on a case by case basis. Site developments would preserve or establish 20% forest cover, regardless if the site was forested before the construction. Linear utility projects would be required to preserve or establish 20% of the forest cover removed for the actual project. Street trees would be replaced at a minimum of a 1:1 ratio, with preference given to the preservation of specimen trees. Specimen tree replacement ratios would be calculated on a case by case basis. Forestation that cannot feasibly be performed within the project area shall be performed on other designated land areas within FGGM.

AW will preserve existing, healthy landscape and street trees where ever possible. Construction will also be planned to provide for the preservation of specimen trees. Existing trees that cannot be preserved will be considered for transplanting to a different location on site or to a different site. All designs would incorporate tree protection practices including, but not limited to, protective fencing around the critical root zone of trees, trunk protection, and root pruning. Tree preservation measures and required pruning should be performed by a certified arborist and shall be in accordance with American National Standards Institute (ANSI) standards.

Native species will be used in the landscaping plans and invasive species currently on the site will be removed or controlled as appropriate. Reforestation plantings will be made contiguous to groups of existing trees where possible. Reforestation, planting plans and specifications would be part of all AW designs. The fair market value of all forest products removed due to the proposed action shall be deposited into the Army's Forestry Account.

No-Action

This alternative would have no impact to terrestrial vegetation or wildlife.

5.11 THREATENED AND ENDANGERED SPECIES

Proposed Action

No federally listed or proposed endangered or threatened species are known to occur on FGGM, therefore no impacts to federally listed threatened or endangered species would occur. Rare, threatened, and endangered species habitat searches performed in 2001 (Eco-Science Professionals) as well as a 2009 Flora and Fauna Survey (USACE Baltimore District 2009) did not identify federally listed endangered or threatened species on FGGM.

No impacts to state listed species are anticipated. Project proponents would design projects to avoid state-listed species and identify any potential impacts that become unavoidable. FGGM and AW will cooperate with MDNR, to the maximum extent practical, to relocate state listed species that cannot be avoided.

No-Action

This alternative would have no impact to threatened and endangered species.

5.12 CULTURAL RESOURCES

Proposed Action

As stated above, most of the project would be conducted with existing paved roadways and in other locations that have been previously disturbed. Although a review of base mapping found some Cultural Resource Management (CRM) features at various locations of the AW proposed undertakings, previous CRM studies have determined that there are no existing Cultural Resource issues with respect to the proposed correction of deficiencies in the water and wastewater systems at FGGM by AW. If any archaeological resources are discovered at the various work locations, stop work immediately in the area of discovery. Within 24 hours of the discovery the contractor shall notify FGGM's Cultural Resource Manager in the Directorate of Public Works - Environmental Division (DPW-ED) at 301-677-9179.

The WTP (Building 8688) is considered significant under National Register C for its association with architecture as an example of Art Moderne design. The site of the proposed Operations Center is next to and within the viewshed of the WTP. Possible short-term minor adverse impacts to the view of the WTP could occur during construction of the Operations Center. Coordination with SHPO will occur prior to construction of the Center. No other impacts associated with these projects would occur to cultural resources.

No-Action

This alternative would have no impact to cultural resources.

5.13 UTILITIES

Proposed Action

Minor, short-term adverse effects would be expected as waterlines are excavated and replaced, causing localized short-term disruptions in water service. These disruptions could be expected to last several days. Long-term improvement to the water supply system would be anticipated as leaking lines are replaced during the Proposed Action. Long-term benefits to the wastewater collection and treatment system are also anticipated as both water and wastewater treatment systems are brought up to applicable regulatory standards. The Proposed Action sites are located within existing utility service areas and would be designed to comply with LEED requirements by reducing water usage, optimize energy performance of new facilities and equipment.

No-Action

This alternative would have a long-term adverse impact on water and wastewater systems at FGGM. The existing water supply and wastewater treatment systems at FGGM have been in operation for many years and are now showing signs that they are reaching the end of their designed life. Personnel growth at the Installation and changes to the regulatory environment have made it necessary to make improvements to the systems to meet not only the use requirements but also the applicable regulatory standards.

5.14 TRANSPORTATION

Proposed Action

Short-term, minor, adverse impacts to transportation would be expected due to increased construction traffic and temporary road closure while the trenching is performed. No long-term impacts are anticipated from the proposed work.

No-Action

This alternative would have no impact to transportation within FGGM.

5.15 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND PROTECTION OF CHILDREN

Proposed Action

The project is expected to have short-term minor benefits to the area's socioeconomic conditions. Short-term benefits would come from the temporary increase in construction workforce, which would only last for the length of construction. No long-term impacts would be anticipated from this project.

Implementation of the Proposed Action would not be expected to impact any demographic group working or living in the economic ROI. Therefore, there would be no disproportionately high adverse human health concerns for minority or low-income populations at FGGM or in the surrounding community.

The Proposed Action would not be expected to impact children's safety. All applicable local jurisdictional safety requirements would be implemented during construction to ensure the protection of the public, including children. All proposed construction would be carried out in areas where few or no children reside or visit. In all cases, proper precautions including the placement of fencing and other types of barriers would be used to prevent potential harm to all civilians, including children.

No-Action

This alternative would have no impact to the socioeconomics of the area.

5.16 ENVIRONMENTAL JUSTICE

Proposed Action

Implementation of the Proposed Action would not be expected to result in adverse impacts. As indicated in Chapter 4, there are no minority or impoverished areas near the Proposed Action sites, therefore, there are no environmental justice concerns.

No-Action Alternative

The No-Action alternative would not be expected to create disproportionately high and adverse human health or environmental effects to minority or low-income populations at FGGM or in the surrounding area.

5.17 CUMULATIVE EFFECTS

CEQ regulations stipulate that the cumulative effects analysis within an EA should consider the potential environmental impacts resulting from “the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions” (40 CFR 1508.7). CEQ guidance in Considering Cumulative Effects affirms this requirement, stating that the first steps in assessing cumulative effects involve defining the scope of the other actions and their interrelationship with the proposed action. The scope must consider geographic and temporal overlaps among the proposed action and other actions. It must also evaluate the nature of interactions among these actions.

Cumulative effects are most likely to arise when a relationship or synergism exists between a proposed action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in close proximity to the proposed action would be expected to have more potential for a relationship than those more geographically separated. Similarly, actions that coincide, even partially, in time would tend to offer a higher potential for cumulative effects.

To identify cumulative effects the analysis needs to address three fundamental questions:

1. Does a relationship exist such that affected resource areas of the proposed action might interact with the affected resource areas of past, present, or reasonably foreseeable actions?
2. If one or more of the affected resource areas of the proposed action and another action could be expected to interact, would the proposed action affect or be affected by impacts of the other action?
3. If such a relationship exists, then does an assessment reveal any potentially significant impacts not identified when the proposed action is considered alone?

The scope of the cumulative effects analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. For this EA, the ROI delimits the geographic extent of the cumulative effects analysis. Due to the geographic scope and relatively locally isolated environmental interactions that are anticipated, the ROI for this

cumulative impacts analysis is the same for each resource as previously described in Chapter 4. The time frame for cumulative effects centers on the timing of the proposed action; specifically, which would start in 2013.

The USEPA, in their September 18, 2012 letter (Appendix B) indicated their concern about the potential for cumulative impacts associated with the Proposed Action. Projects that could contribute to cumulative effects at FGGM are listed in Table 5-3.

TABLE 5-3: CUMULATIVE ACTIONS AT FGGM		
Project	Description	NEPA Documentation
Army And Air Force Exchange Services (AAFES)	Demolition of AAFES shopping center and parking lot at Reece Road and MacArthur Road and construction of a new 169,000 SF building at the same site.	REC
Mini Child Development Center	A 4,460 SF child development center has been proposed for construction at FGGM near the proposed SCIF. This facility would provide 24-hour care for up to 20 children at a time. The facility would support extended hours care for shift workers, respite, crisis, and overnight care for children of wounded soldiers.	REC
Asymmetric Warfare Group (AWG) Compound and Motor Pool Site.	Construction and operation of an AWG Compound providing administrative, operational, and storage areas, and construction of a Motor Pool Site (a vehicle maintenance facility). The AWG Compound is proposed for an approximately 46-acre parcel of land on FGGM, in Anne Arundel County, Maryland with an associated structure on an additional, adjacent 4-acre parcel.	EA
East Campus	A portion of FGGM, known as Site M is under construction, would be developed as an operational complex for Intelligence Community use. The EIS addressed Phase I of this proposal which included 1.8 million SF of facilities for a data center and associated administrative space for up to 6,500 personnel.	EIS
Defense Information School (DINFOS) Renovation and Expansion	Construction of a 60,273 SF multi-story addition to existing DINFOS building (Bldg 6500). Less than 5 acres of previously disturbed land would be impacted.	REC
BGE Substation	Construction of a new electrical substation and supporting infrastructure to support future expansion. Approximately 22 acres of undeveloped land and forest would be disturbed.	EA
Howard County Water Reclamation Project	NSA, in coordination with Howard County's Department of Public Works, proposed to create a reclaimed water delivery system on FGGM property for the purpose of providing reclaimed water to cooling towers located on NSA's east and main campuses. Project would disturb approximately 14.5 acres of land.	EA
Widening of MD 175	Maryland Department of Transportation has begun work on several BRAC actions in MD to include widening MD175 from MD 295 to MD170. Bicycles and pedestrian accommodations will be provided where appropriate. The project would address current and future congestion along MD 175 and improve access to FGGM.	EA

Notes: EA = Environmental Assessment; EIS = Environmental Impact Statement; REC = Record of Environmental Consideration; TBD = To be Determined

5.17.1 Potential Cumulative Impacts by Environmental Resource Area

Land Use

Projects listed in Table 5-3 could cumulatively result in the loss of up to 886 acres, or 32 percent, of open space on FGGM. Implementation of the Proposed Action would be consistent with existing designated land uses and policies. Up to 1 additional acre of land could be lost for the construction of the Operations Center and work at the WWTP. Up to 1 acre of forested land could be disturbed during construction of water and wastewater lines. Implementation of the Proposed Action would not contribute to any long-term significant adverse cumulative impacts.

Visual Resources and Aesthetics

Implementation of the Proposed Action would have less than significant short-term and long-term impacts on the aesthetics and visual resources within the immediate area of the work. The vacant area is currently open space; however, the proposed construction is consistent with the proposed future development of the area. Moreover, views of the Installation are limited to personnel, contractors, and civilians working on or visiting the Installation, and these viewers are cognizant of the missions that occur at and near FGGM. The projects described in Table 5-3 would not substantially change the existing visual condition and would be consistent with proposed development for the area. The impacts associated with aesthetics from the projects listed in Table 3 would result mainly from the loss of forested areas. Implementation of Proposed Action would have no significant cumulative impact to visual resources and aesthetics.

Air Quality

In terms of short-term cumulative impacts, new construction associated with Proposed Action, as well as other construction projects could produce a short-term additive amount of emissions if they occur concurrently; however, these projects are expected to produce only a nominal amount which would be below the *de minimis* levels and not regionally significant. Any potential overlaps in emissions would be dispersed over a large geographical area and would occur over multiple years. Furthermore, implementation of recommended fugitive dust control measures would minimize particulate matter emissions. The Proposed Action would not contribute any long-term cumulative impacts to air quality.

Noise

Other construction projects have the potential to contribute cumulatively to the potential impacts associated with the construction or renovations proposed under the proposed action. However, it is assumed that any construction-related noise generated from other projects at FGGM would be temporary, lasting only the duration of the respective project(s) and would be confined to the Installation boundaries. For example, construction noise would attenuate to background levels (conservatively, approximately 55 dB) in approximately 245 m (800 ft). In addition, noise from construction-related activities would be confined to general working hours (8:00 AM to 5:00 PM). There would be no significant long-term cumulative increases in noise from any project listed in Table 5-3. Therefore, no significant cumulative impacts associated with the implementation of Proposed Action are anticipated at this time.

Geology and Soils

Impacts to soil are localized and typically site-specific. The proposed construction-related projects, as well as other construction projects at FGGM are required to adhere to a site specific ESCP to ensure minimal soil erosion occurs during construction. In addition, the ESCP and SWPPP would require the implementation of BMPs including using silt fencing, soil stabilization blankets, and matting around areas of land disturbance during construction. Bare soils would be vegetated after construction to reduce erosion and stormwater runoff velocities. Therefore, implementation of Proposed Action would not have any significant cumulative impacts on soils.

Water Resources

Short-term cumulative impacts to surface water quality from soil erosion during construction activities could occur if the projects are located in close proximity and time. Projects listed in Table 5-3, such as the BGE substation, could impact surface waters. Conservatively, however, these impacts would be temporary and confined to the respective project areas as all projects are required to follow state and federal guidelines to ensure water quality is protected from possible erosion and sedimentation. This includes implementing project specific BMPs as part of the proposed construction projects to minimize impacts to water quality and using stormwater engineering controls (e.g., culvert/channels directing stormwater to retention basins) to decrease future impacts to water quality following construction. The use of ESCPs and SWPPPs during construction would also minimize impacts to water quality.

Long-term cumulative impacts to water resources are possible due to the increase in impervious surfaces for the new construction. EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, requires a 2-percent annual reduction in potable, industrial, landscaping, and agricultural water intensity by FY20. In addition, the EO requires that all new construction comply with the *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings*. This includes employing design and construction strategies that reduce stormwater runoff. Furthermore, Section 438 of the Energy Independence and Security Act of 2007 require 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 to maintain or restore the predevelopment hydrology of the property with regard to temperature, rate, volume, and duration of flow.

Overall, implementation of Proposed Action would not result in significant cumulative impacts on water resources.

Floodplains

Projects #11 and #12 lie near 100-year floodplains. The proposed BNR work at the WWTP would be constructed within the 500-year floodplain. The Howard County Water Reclamation Project and the BGE Substation Project are also located within floodplains. The Proposed Action would include the replacement of existing structures at the WWTP and be designed to

have no or minimal long-term impact on floodplains. Therefore, there is no potential for cumulative impacts for implementation of Proposed Action.

Coastal Zone Management Act

Implementation of the Proposed Action would be consistent to the maximum extent possible with the enforceable policies of the Maryland's Coastal Zone Management Program and no significant cumulative impacts are expected.

Biological Resources

Work for the Proposed Action would be mainly in previously disturbed areas. Only minor impacts are anticipated to existing forests and trees since most of the project areas consist of grasses and herbaceous vegetation. Plans would incorporate existing trees into the project design to the maximum extent possible. Some proposed pipework extends through forested area and could impact up to 1 acre of forest cover. Forest impacts from projects listed in Table 5-3 would be mitigated in accordance with the current FGGM FCA and Tree Management Policy through reforestation or afforestation. It is unlikely for cumulative impacts to result from the removal of vegetated areas for the Proposed Action when combined with other projects listed in Table 5-3.

No federally listed or proposed endangered or threatened species are known to occur on FGGM, therefore no cumulative impacts would occur. No impacts to state listed species are anticipated to occur from this project, the above listed projects or any recently completed projects. Adverse cumulative impacts to state listed species should not occur. The impact of the proposed action on resident wildlife would be additive to other stressors for these species, which include increasing urbanization and development in the area. Certain species, particularly bird species, could flee to nearby habitat during the construction phase of projects when habitat is disrupted and/or altered. However, given the temporary nature of construction-related impacts to wildlife and migratory birds and the likely separations in implementation timeframes, there is little potential for cumulative impact to resident wildlife from construction activities associated with the proposed action. Therefore, there would be no significant impacts to wildlife from implementation of Proposed Action.

Cultural Resources

There is the potential for a short-term impact to the visual aesthetic of the historically significant WTP during construction of the Operations Center nearby. No long-term impacts to cultural resources would be anticipated from implementation of Proposed Action. There is no potential for cumulative impacts for implementation of Proposed Action.

Hazardous, Toxic, and Radioactive Substances

Cumulative impacts associated with the amounts of hazardous materials used, toxic substances generated, or hazardous waste disposed would be short-term and managed in accordance with existing Installation procedures, as well as federal and state standard operating procedures and

regulatory requirements. Therefore, there would be no significant cumulative impacts to hazardous materials, toxic substances, or hazardous waste with the implementation of Proposed Action.

Traffic and Roadways

In terms of short-term cumulative impacts, construction traffic associated with the proposed action and other projects on FGGM could create additional, but temporary, impacts to traffic. The timing of these projects is not well-known, but if the projects are staggered, impacts would be negligible to minor for implementation of the Proposed Action. However, even if the projects are not separated in time, the temporary increases in construction-related traffic would not likely result in a long-term disruption to current transportation patterns, nor would it change existing traffic safety. There would no long-term cumulative impacts associated with the Proposed Action.

Infrastructure and Utilities

Implementation of the Proposed Action would have long-term benefits to water and wastewater systems at FGGM. The Proposed Action would have no significant impacts on other infrastructure and utilities. Possible localized short-term disruptions to utility service could result from construction activities as existing buried water and sewer lines are accessed. Cumulatively, the projects described in Table 5-3 would have less than significant impacts to infrastructure and utilities. Cumulative projects along with the Proposed Action would not create excess burden on systems. Consequently, cumulative impacts to infrastructure and utilities would not be significant.

Socioeconomics, Environmental Justice, and Protection of Children

Implementation of the Proposed Action would have no long-term cumulative impacts on socioeconomics when combined with other actions at FGGM. There would be short-term beneficial impacts from construction.

Implementation of the Proposed Action would not significantly impact human health or the environment or result in significant impacts to environmental justice and protection of children. The proposed action would comply with EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-income Populations*, which requires that “each Federal Agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health effects of its programs, policies, and activities on minority populations and low income populations” (59 Federal Register, 1994). The proposed alternatives would have no impact on minority populations or low-income populations as defined in EO 12898. The proposed alternatives and all other cumulative projects listed in Table 5-3 would be required to comply with EO 12898; therefore, the proposed alternatives in conjunction with other past, present, and reasonably foreseeable projects would not impose disproportionately high and adverse human health effects or displacement of or disproportionate cumulative impact to minority and low-income populations.

5.18 SUMMARY

Table 5-4 summarizes the level of compliance of the Proposed Action with environmental protection statutes and other environmental requirements. Table 5-5 summarizes the degree of impact, if any, expected from the Proposed Action and the No-Action alternative for all resource categories.

The Proposed Action would have short-term, minor, adverse impacts from the proposed projects and include dust, air emissions, and noise from earthmoving and construction activities. Other short-term, minor, adverse impacts include placing construction equipment within a floodplain, altered aesthetics, viewsheds of cultural resources, and increased construction traffic. Short-term impacts would cease with the completion of the projects. Additionally, localized, short-term disruptions of water and wastewater services are expected as these systems are worked on. Short-term and long-term minor adverse impacts to previously disturbed soils, stormwater, and terrestrial resources (vegetation and wildlife habitat) could also be expected. Long-term minor adverse impacts to floodplains could result from capital improvements, such as the construction of the BNR system within the 500-year floodplain at the WWTP. Short-term and long-term minor adverse impacts to surface waters or nontidal wetlands could occur during utility upgrades; impacts would be limited to less than 5,000 SF and 200 LF of streams. Short-term benefits to the local economy would be expected from the hiring of construction workers to construct the project. Long-term benefits to water supply and wastewater treatment are anticipated from this work. By repairing leaks and failed water and sewer lines, these systems would be able to function properly, without disruptions to service. The WWTP would meet new permit requirements for treatment and discharge which would benefit the discharge stream. Long-term benefits to wetlands, streams and soils would also be anticipated as the leaking and failing systems are replaced.

Future work identified in Chapter 2 would be expected to have similar impacts as those discussed above and would include short-term, minor, adverse impacts to floodplains, air quality, noise, terrestrial resources, traffic, and aesthetics during construction activities. Short-term impacts to surface waters and wetlands could occur from the movement of sediment into these areas during construction of some future water and wastewater system projects. Localized, short-term disruptions of water and wastewater services could also be expected as these systems are worked on. Short-term and long-term minor adverse impacts to previously disturbed soils and stormwater could also be expected. Short-term benefits to the local economy would be expected from the hiring of construction workers to construct the project. Long-term benefits to water supply and wastewater treatment are anticipated from the future actions as the work would continue to repair leaks and failed water and sewer lines. Long-term benefits to wetlands, streams and soils would also be anticipated as the leaking and failing systems are replaced. These projects would also need to be designed to minimize impacts on environmental resources such as streams, wooded areas, and wetlands.

TABLE 5-4: COMPLIANCE WITH FEDERAL ENVIRONMENTAL STATUTES AND EXECUTIVE ORDERS

Acts	Compliance
Clean Air Act, as amended (Public Law 88-206)	FULL
Clean Water Act, as amended (Public Law 95-217)	FULL
Coastal Zone Management Act (Public Law 92-583)	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 (Public Law 93-205)	Not Applicable
Farmland Protection Policy Act (Public Law 97-98)	Not Applicable
Fish and Wildlife Coordination Act, as amended (16 United States Code [U.S.C.] 661, et seq.)	FULL
Migratory Bird Treaty Act	FULL
National Environmental Policy Act of 1969 (Public Law 91-190)	FULL
National Historic Preservation Act of 1966, as amended (Public Law 89-665)	FULL
Noise Control Act of 1972, as amended (Public Law 92-574)	FULL
Resource Conservation and Recovery Act (Public Law 94-580)	FULL
Safe Drinking Water Act, as amended (Public Law 93-523)	FULL
Solid Waste Disposal Act of 1965, as amended (Public Law 89-272, Title II)	FULL
Toxic Substances Control Act of 1976 (Public Law 94-469)	FULL
Watershed Protection and Flood Prevention Act of 1954 (16 U.S.C. §1101, et seq.)	FULL
Wetlands Conservation Act (Public Law 101-233)	FULL
Wild and Scenic Rivers Act (Public Law 90-542, as amended)	FULL
Sikes Act	FULL
Archaeological Resources Protection Act	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)	Not Applicable
Federal Compliance with Pollution Control Standards (EO 12088)	FULL
Protection of Children from Environmental Health Risks and Safety Risks (EO 13045)	Not Applicable
Consultation and Coordination with Indian Tribal Governments (EO 13175)	FULL
Strengthening Federal Environmental, Energy, and Transportation Management (EO 13514)	FULL

TABLE 5-5 : SUMMARY OF EFFECTS OF THE PROPOSED ACTION AND THE NO-ACTION ALTERNATIVE		
Resource Area	Proposed Action	No-Action
Physical Environment		
Land Use	Short-term and Long-term Minor Adverse Impacts	No Impacts
Visual and Aesthetic Value	Short-term and Long-term Minor Adverse Impacts	No Impacts
Geology and Soils	Short-term and Long-term Minor Adverse Impacts. Long-term Benefits	Long-term Adverse Impacts
Prime and Unique Farmland	No Impacts	No Impacts
Air Quality	Short-term Minor Adverse Impacts	No Impacts
Noise	Short-term Minor Adverse Impacts	No Impacts
Water Resources		
Surface Waters	Possible Short-term Minor Adverse Impacts and Long-term Benefits	Long-term Adverse Impacts
Stormwater	Possible Short-term and Long-term Minor Adverse Impacts	No Impacts
Floodplains	Short-term and Long-term Minor Adverse Impacts	No Impacts
Groundwater	No Impacts	No Impacts
Coastal Zone	Possible Short-term and Long-term Minor Adverse Impacts and Long-term Benefits	Long-term Adverse Impacts
Biological Resources		
Wetlands	Possible Short-term and Long-term Minor Adverse Impacts and Long-term Benefits	Long-term Adverse Impacts
Terrestrial Resources-Vegetation and Wildlife	Short-term and Long-term Minor Adverse Impacts	No Impacts
Rare, Threatened, or Endangered Species	No Impacts	No Impacts
Cultural Resources	Possible short-term minor adverse impacts	No Impacts
Hazardous, Toxic, and Radioactive Substances	No Impacts	No Impacts
Infrastructure And Utilities		
Traffic and Transportation Systems	Short-term Minor Adverse Impacts	No Impacts
Potable Water	Short-term Minor Adverse Impacts and Long-term Benefits	Long-term Adverse Impacts
Sanitary Sewer/ Wastewater	Short-term Minor Adverse Impacts and Long-term Benefits	Long-term Adverse Impacts
Power	No Impacts	No Impacts
Socioeconomic	Short-term Minor Beneficial Impacts	No Impacts
Environmental Justice/ Protection of Children	No Impacts	No Impacts
Cumulative Impacts	No Impacts	No Impacts

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6.0 CONCLUSION

This EA has been prepared to assess several projects to repair, rehabilitate, and upgrade water and wastewater systems throughout the Installation. These projects include the conversion of the WWTP to a BNR system, replacing a minimum of 63,000 LF of waterline, cleaning a minimum of 43,000 LF of waterline, installing approximately 1,600 LF of new water line to expand service, installing fencing, emergency generators at wells, replacing booster pumps, and replacing a minimum of 2,024 LF of existing sewer piping. Also included is the construction of an approximately 6,000 square-foot slab on grade Operations Center. Currently, this facility is proposed to be sited in an open area to the east of the WTP.

As indicated in Section 5.18, the Proposed Action would have short-term, minor, adverse impacts that include dust, air emissions, and noise from earthmoving equipment, and increased traffic associated with construction activities. Additionally, localized, short-term disruptions of water and wastewater services are expected as these systems are worked on. Short-term and long-term minor adverse impacts to previously disturbed soils, stormwater, aesthetics, and terrestrial resources (vegetation and wildlife habitat) could also be expected. Short-term and long-term minor adverse impacts to floodplains could result from capital improvements, such as the construction of the BNR system within the 500-year floodplain at the WWTP. Short-term and long-term minor adverse impacts to surface waters or nontidal wetlands could occur during utility upgrades; impacts would be limited to less than 5,000 SF and 200 LF of streams. Short-term benefits to the local economy would be expected from the hiring of workers to construct the project. Long-term benefits to water supply and wastewater treatment are anticipated from this work. By repairing leaks and failed water and sewer lines, these systems would be able to function properly, without disruptions to service. The WWTP would meet new permit requirements for treatment and discharge which would benefit the discharge stream. Long-term benefits to wetlands, streams and soils would also be anticipated as the leaking and failing systems are replaced.

Required permits include, but are not limited to MDE approved SWM plans, ESCP, 404 permits and wetland permits. Prior to the start of construction, all required permits or approvals would be obtained by AW.

Under the No-Action alternative, the work would not be performed. Impacts associated with this alternative include long-term adverse impacts to the water supply and sewer systems as the leaking water and sewer lines would continue to deteriorate, disrupting services. Leaking systems would also enter soils and streams threatening aquatic water quality and habitat. In addition, the WWTP would not be upgraded to meet new permit requirements for nitrogen and phosphorus.

Based on the evaluation of environmental effects described in Chapter 5 and summarized in Table 5-5, there are no significant impacts from the Proposed Action, and a Finding of No Significant Impact has been prepared.

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7.0 REFERENCES

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8.0 ACRONYMS AND ABBREVIATIONS

ACM	Asbestos Containing Material
ANSI	American National Standards Institute
AQCR	Air Quality Control Region
AR	Army Regulation
AW	American Water
BG&E	Baltimore Gas & Electric
BMP	Best Management Practice
BNR	Biological Nitrogen Removal
CAAA	Clean Air Act Amendments
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH ₄	Methane
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
COMAR	Code of Maryland Regulations
Corps	U.S. Army Corps of Engineers
CRM	Cultural Resource Management
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
dBA	A-weighted decibel
DNL	Day-Night Level
DoD	Department of Defense
DINFOS	Defense Information School
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESCP	Erosion Sediment Control Plan
FCA	Forest Conservation Act
FEMA	Federal Emergency Management Agency
FGGM	Fort George G. Meade
FIRM	Flood Insurance Rate Map
FNSI	Finding of No Significant Impact
GPM	Gallons per Minute
GHG	Greenhouse Gas
GWP	Global Warming Potential
HAP	Hazardous Air Pollutants
HDD	Horizontal Directional Drill
HEI	High Explosives Impact
HEL	Highly Erodible Lands
HPA	Habitat Protection Area
IRP	Installation Restoration Program
ISCP	Installation Spill Contingency Plan

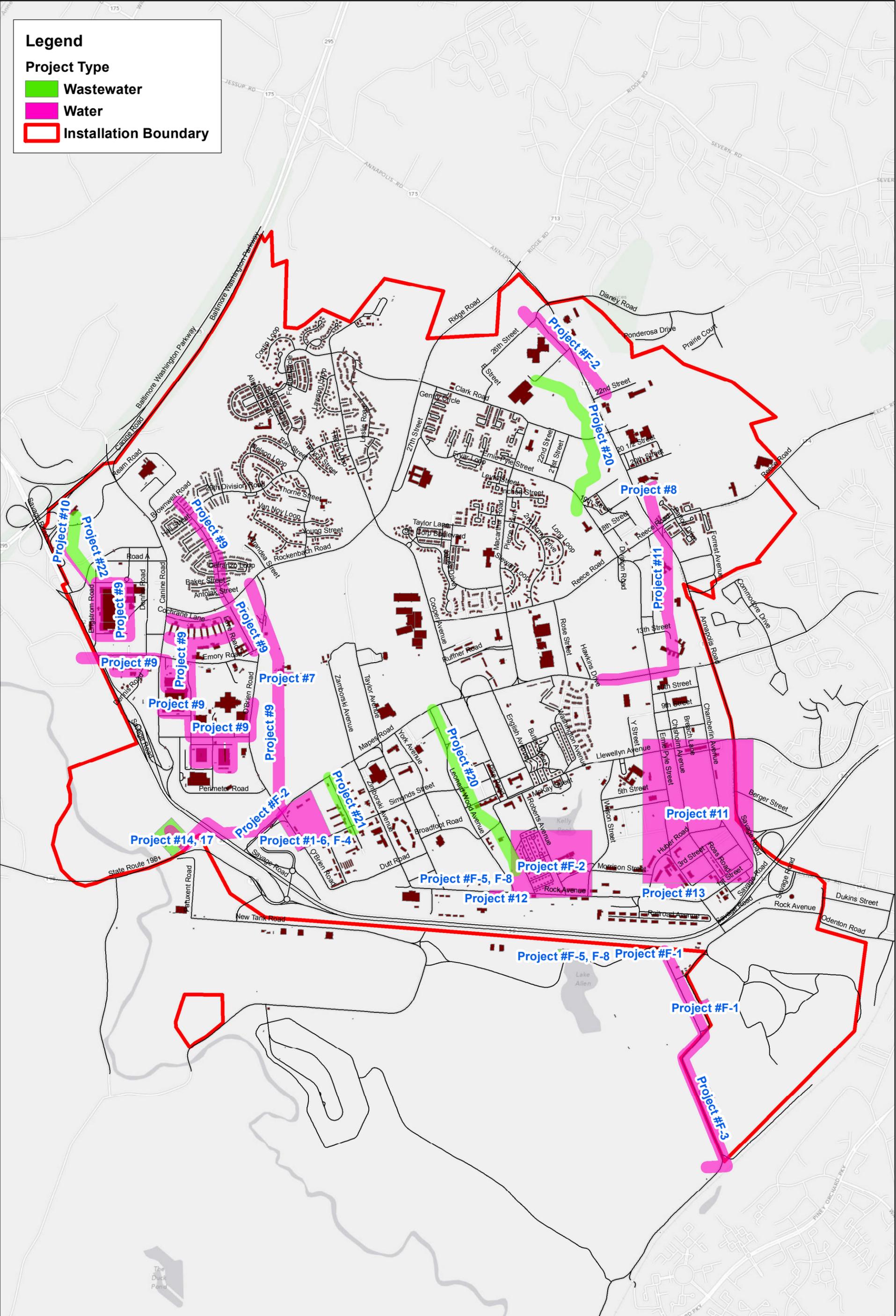
ISDC	Initial System Deficiency Corrections
kV	kilovolt
LBP	Lead-Based Paint
LEED	Leadership in Energy and Environmental Design
LF	Linear feet
LID	Low Impact Development
MBTA	Migratory Bird Treaty Act
MD	Maryland
MDE	Maryland Department of the Environment
MDNR	Maryland Department of Natural Resources
MGD	Million Gallons per Day
MMRP	Military Munitions Response Program
MSDS	Material Safety Data Sheet
MSL	mean sea level
N/A	Not applicable
NAAQS	National Ambient Air Quality Standards
NCA	Noise Control Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSR	New Source Review
O ₃	Ozone
OTR	Ozone Transport Region
Pb	Lead
PM _{2.5}	Particulate matter less than 2.5 microns
PM ₁₀	Particulate matter less than 10 microns
PSD	Prevention of Significant Deterioration
R&R	Renewals and Replacements
RCRA	Resource Conservation and Recovery Act
REC	Record of Environmental Consideration
ROI	Region of Influence
RONA	Record of Non-Applicability
SF	Square Feet
SHPO	State Historic Preservation Officer
SO ₂	Sulfur Dioxide
SOP	Standard Operating Procedure
SPCC	Spill Prevention Control and Countermeasure Plan
SWP	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan
TSCA	Toxic Substance Control Act
TMDL	Total Maximum Daily Loads
TPY	Tons per Year

USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USDHUD	U.S. Department of Health and Urban Development
VOC	Volatile Organic Compound
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

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Appendix A

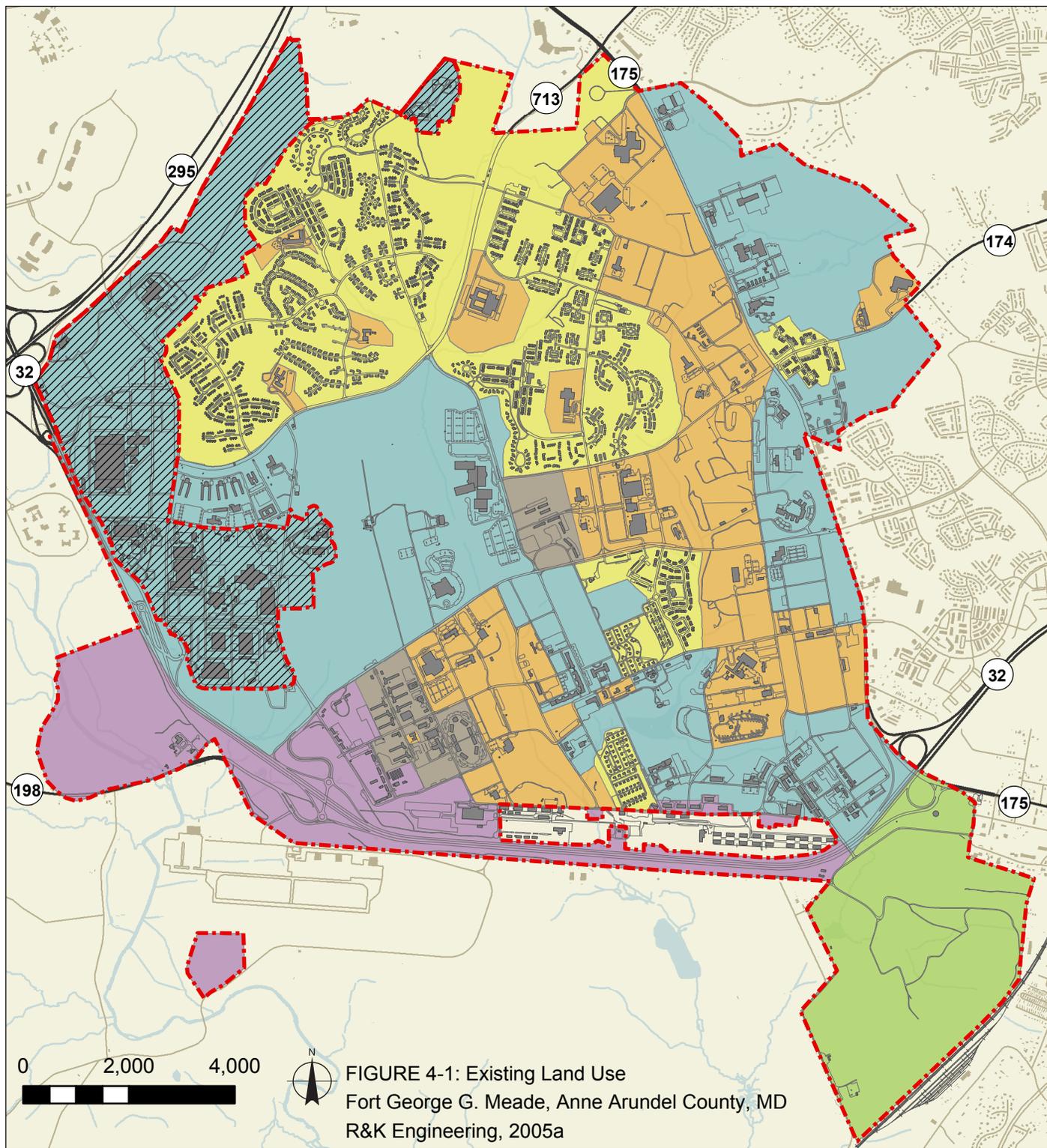
Maps



Legend

Project Type

- Wastewater
- Water
- Installation Boundary



- Installation Boundary
- NSA Exclusive Use
(not in study area)
- Community
- Industrial
- Professional/Institutional
- Ranges and Training
- Residential
- Troop
- Rail Line
- Road and Parking Area
- Existing Structure



Source: Land Use data defined using descriptions contained in Real Property Master Plan - Long Range Component Fort Meade, MD. R&K Engineering (2005)

FIGURE 4-1: Existing Land Use
Fort George G. Meade, Anne Arundel County, MD
R&K Engineering, 2005a

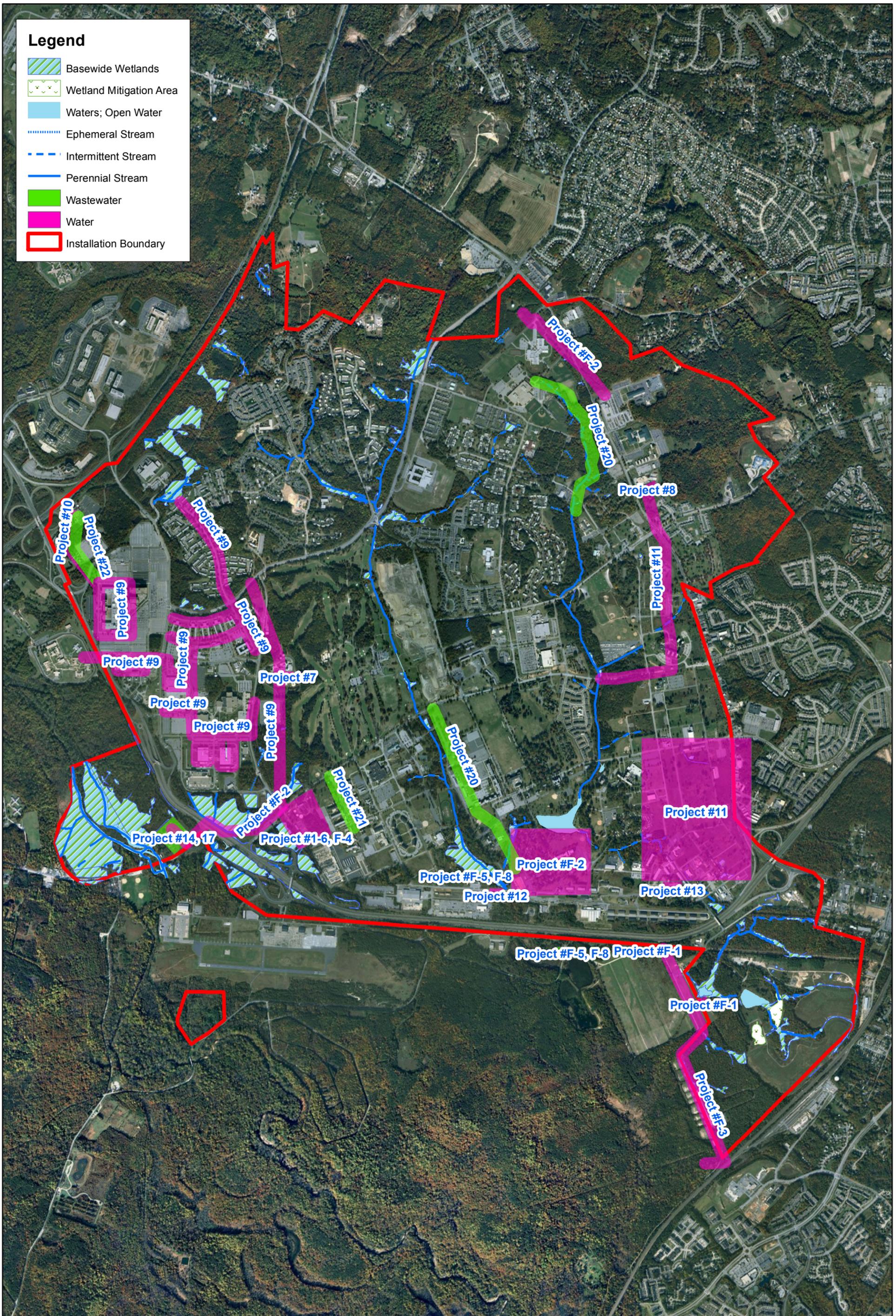
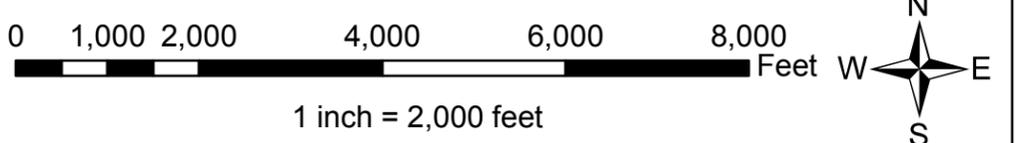
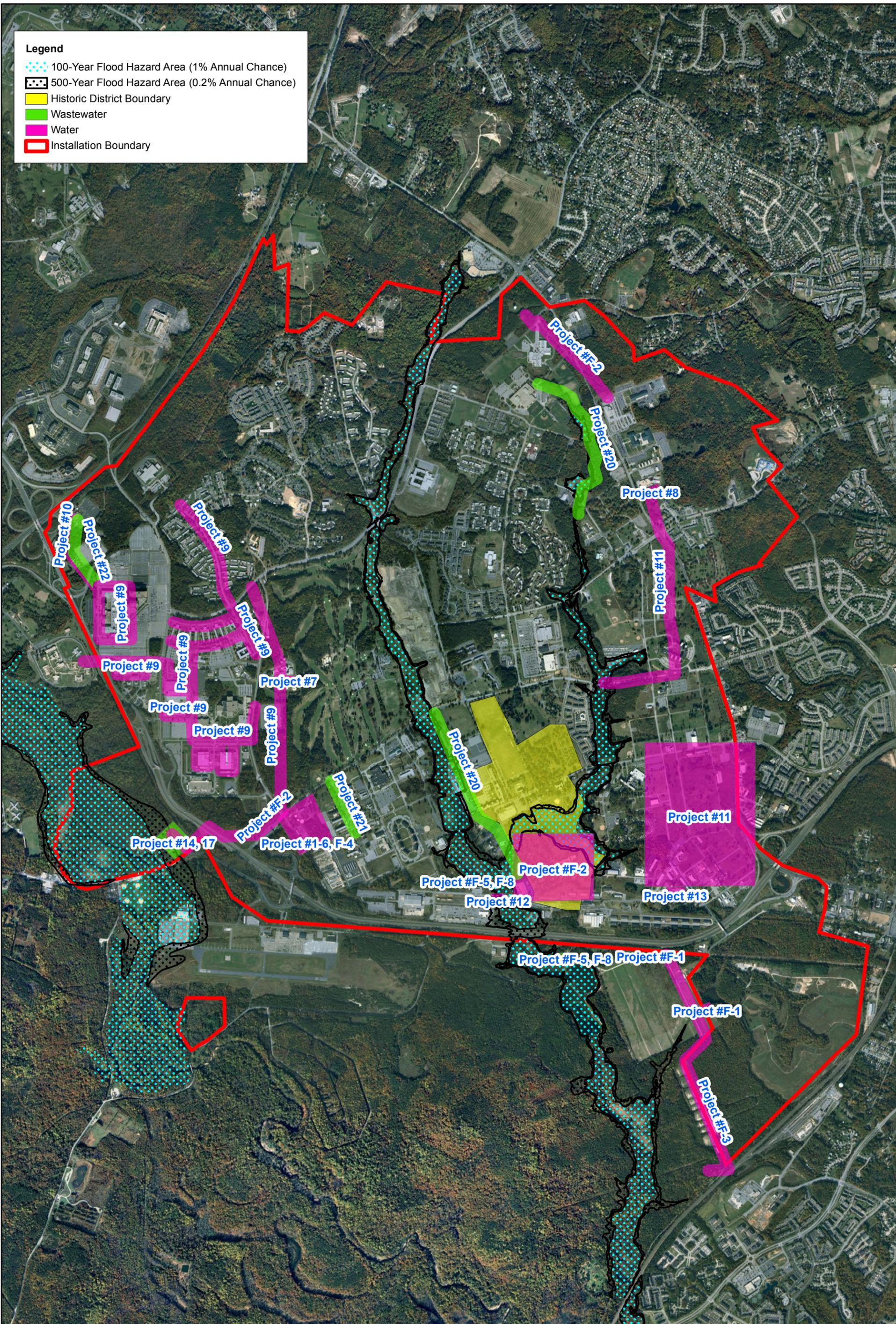


Figure 4-2
WETLANDS AND SURFACE WATER FEATURES
 Water and Wastewater Systems Improvement Project
 Fort George G. Meade, MD





Legend

- 100-Year Flood Hazard Area (1% Annual Chance)
- 500-Year Flood Hazard Area (0.2% Annual Chance)
- Historic District Boundary
- Wastewater
- Water
- Installation Boundary

Appendix B

Correspondence



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON
4551 LLEWELLYN AVENUE, SUITE 5000
FORT GEORGE G. MEADE, MARYLAND 20755-5000

SEP 20 2012

Directorate of Public Works

Mrs. Elizabeth J. Cole
State Historic Preservation Office
Maryland Historical Trust
100 Community Place
Crownsville, Maryland 21032-2023

Dear Mrs. Cole:

The purpose of this letter is to consult with your office pursuant to Section 106 of the National Historic Preservation Act regarding the preparation of an Environmental Assessment (EA) for the Water and Wastewater Systems Improvements Projects on Fort George G. Meade (FGGM).

The Proposed Action to be evaluated in the EA consists of several projects to repair, rehabilitate, and upgrade water and wastewater systems throughout the installation. FGGM's water and wastewater utility systems were privatized in 2010 and are now owned by American Water Enterprises, Inc. These projects include upgrades to the water and wastewater treatment plants, cleaning and/or replacing existing waterlines and sewer lines, installing new water and sewer lines to expand service, installing fencing and emergency generators at wells, replacing booster pumps, rehabilitating the water treatment and wastewater treatment plants, and converting the wastewater treatment plant to an automated Biological Nutrient Removal plant. Also included is the construction of an approximately 6,000 square foot pre-engineered slab on grade Operations Center.

Building 8688 (Water Treatment Plant) is a National Register Eligible Art Moderne-designed building that was constructed in 1941. The concrete and brick building houses the water filtration system for FGGM. The building is significant under National Register C for its association with architecture as an example of Art Moderne design.

Building 9581 (Wastewater Treatment Plant) is a concrete and brick building constructed in 1983 that does not meet the 50 year threshold.

Questions regarding this matter should be directed to Mr. Jerald Glodek, at (301) 677-9179 or at gerald.w.glodek.civ@mail.mil.

Sincerely,

Michael P. Butler
Chief, Environmental Division

Concur: _____ Non-Concur: _____
Elizabeth J. Cole - Administrator, Project Review and Compliance
Maryland State Historic Preservation Office



DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1715
BALTIMORE, MARYLAND 21203-1715

REPLY TO
ATTENTION OF

August 29, 2012

Planning Division

Ms. Brigid E. Kenney
Office of the Secretary
Maryland Department of Environment
1800 Washington Blvd.
Baltimore, MD 21230

Dear Ms. Kenney:

On behalf of Fort George G. Meade (FGGM), the U.S. Army Corps of Engineers, Baltimore District, is preparing an Environmental Assessment (EA) for the Water and Wastewater Systems Improvements Projects on FGGM. The base, which encompasses 5,140 acres, is located in northern Anne Arundel County, Maryland, southeast of the Baltimore-Washington Parkway and west of I-97.

The Proposed Action to be evaluated in the EA consists of several projects to repair, rehabilitate, and upgrade water and wastewater systems throughout the installation. FGGM's water and wastewater utility systems were privatized in 2010 and are now owned by American Water Enterprises, Inc. These projects include upgrades to the water and wastewater treatment plants, cleaning and/or replacing existing waterlines and sewer lines, installing new water and sewer lines to expand service, installing fencing and emergency generators at wells, replacing booster pumps, rehabilitating the water treatment and wastewater treatment plants, and converting the wastewater treatment plant to an automated Biological Nutrient Removal plant. Also included is the construction of an approximately 6,000 square foot pre-engineered slab on grade Operations Center. Currently, this facility is proposed to be sited in the wooded area south of the existing water treatment plant.

To assist us in identifying issues that may affect the implementation of this project, please provide written comments within 30 days of receipt of this letter to: U.S. Army Corps of Engineers, Baltimore District, ATTN: CENAB-PL-E, P.O. Box 1715, Baltimore, Maryland 21203-1715. If you have any questions please contact Ms. TJ Flanagan at 410-962-3314.

Sincerely,

A handwritten signature in cursive script that reads "Maria Franke".

fr Lawrence D. Eastman
Chief, Planning and Environmental
Services Branch



DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1715
BALTIMORE, MARYLAND 21203-1715

REPLY TO
ATTENTION OF

August 29, 2012

Planning Division

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

Dear Ms. Janey:

On behalf of Fort George G. Meade (FGGM), the U.S. Army Corps of Engineers, Baltimore District, is preparing an Environmental Assessment (EA) for the Water and Wastewater Systems Improvements Projects on FGGM. The base, which encompasses 5,140 acres, is located in northern Anne Arundel County, Maryland, southeast of the Baltimore-Washington Parkway and west of I-97.

The Proposed Action to be evaluated in the EA consists of several projects to repair, rehabilitate, and upgrade water and wastewater systems throughout the installation. FGGM's water and wastewater utility systems were privatized in 2010 and are now owned by American Water Enterprises, Inc. These projects include upgrades to the water and wastewater treatment plants, cleaning and/or replacing existing waterlines and sewer lines, installing new water and sewer lines to expand service, installing fencing and emergency generators at wells, replacing booster pumps, rehabilitating the water treatment and wastewater treatment plants, and converting the wastewater treatment plant to an automated Biological Nutrient Removal plant. Also included is the construction of an approximately 6,000 square foot pre-engineered slab on grade Operations Center. Currently, this facility is proposed to be sited in the wooded area south of the existing water treatment plant.

To assist us in identifying issues that may affect the implementation of this project, please provide written comments within 30 days of receipt of this letter to: U.S. Army Corps of Engineers, Baltimore District, ATTN: CENAB-PL-E, P.O. Box 1715, Baltimore, Maryland 21203-1715. If you have any questions please contact Ms. TJ Flanagan at 410-962-3314.

Sincerely,

A handwritten signature in cursive script that reads "Maria Frank".

fr Lawrence D. Eastman
Chief, Planning and Environmental
Services Branch



DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1715
BALTIMORE, MARYLAND 21203-1715

REPLY TO
ATTENTION OF

August 29, 2012

Planning Division

Mr. William Arguto
U.S. Environmental Protection Agency,
Region III
1650 Arch Street
Philadelphia, PA 19103

Dear Mr. Arguto:

On behalf of Fort George G. Meade (FGGM), the U.S. Army Corps of Engineers, Baltimore District, is preparing an Environmental Assessment (EA) for the Water and Wastewater Systems Improvements Projects on FGGM. The base, which encompasses 5,140 acres, is located in northern Anne Arundel County, Maryland, southeast of the Baltimore-Washington Parkway and west of I-97.

The Proposed Action to be evaluated in the EA consists of several projects to repair, rehabilitate, and upgrade water and wastewater systems throughout the installation. FGGM's water and wastewater utility systems were privatized in 2010 and are now owned by American Water Enterprises, Inc. These projects include upgrades to the water and wastewater treatment plants, cleaning and/or replacing existing waterlines and sewer lines, installing new water and sewer lines to expand service, installing fencing and emergency generators at wells, replacing booster pumps, rehabilitating the water treatment and wastewater treatment plants, and converting the wastewater treatment plant to an automated Biological Nutrient Removal plant. Also included is the construction of an approximately 6,000 square foot pre-engineered slab on grade Operations Center. Currently, this facility is proposed to be sited in the wooded area south of the existing water treatment plant.

To assist us in identifying issues that may affect the implementation of this project, please provide written comments within 30 days of receipt of this letter to: U.S. Army Corps of Engineers, Baltimore District, ATTN: CENAB-PL-E, P.O. Box 1715, Baltimore, Maryland 21203-1715. If you have any questions please contact Ms. TJ Flanagan at 410-962-3314.

Sincerely,

A handwritten signature in cursive script that reads "Maria Franko".

for Lawrence D. Eastman
Chief, Planning and Environmental
Services Branch



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

September 18, 2012

Ms. TJ Flanagan
U.S. Army Corps of Engineers
Baltimore District
ATTN: CENAB-PL-E
P.O. Box 1715
Baltimore, Maryland 21203-1715

RE: Fort George G. Meade Water and Wastewater Systems Improvement Project,
Anne Arundel County, Maryland

Dear Ms. Flanagan:

EPA has received and reviewed your August 29, 2012 letter regarding the proposed Water and Wastewater Systems Improvement Project on Fort George G. Meade in Anne Arundel County, Maryland and any potential environmental issues that may need to be considered during the preparation of an Environmental Assessment (EA). The proposed project includes several projects to repair, rehabilitate, and upgrade water and wastewater systems throughout the installation. The project also includes the construction of an approximately 6,000 square foot pre-engineered slab on grade Operations Center. Based on the limited information provided in your letter, we are unable to provide a comprehensive set of comments.

Information regarding the purpose and need, alternatives analysis, avoidance and minimization of resources, and cumulative effects for the proposed project should be included in the EA. The purpose and need statement is important because it helps explain why the proposed action is being undertaken and what objectives the project intends to achieve. The purpose of the proposed action is typically the specific objective of the activity. The need should explain the underlying problem for why the project is necessary. The currently proposed project, particularly the Operations Center, is very detailed; the project purpose and need should be broad as it is unlikely that the proposed action is the only alternative that will meet identified needs. The alternatives analysis should include different sized facilities, alternate site layouts and alternative locations at Fort Meade.

EPA encourages that adverse impacts to natural resources, especially wetlands and other aquatic resources, should be avoided and minimized wherever possible. It is not clear if the proposed project will impact wetlands or streams, however the letter stated that a forested parcel

may be impacted. The EA should include a description of the total size or length of any wetland or stream, and impact amount by each proposed alternative. Stormwater ponds and best management practices (BMPs) should not be located in wetlands and streams. Another area of potential concern is the project's affect on air quality in the study area. Based on information available to EPA, the project area is located within non-attainment areas for both ozone and PM-2.5.

The August 29, 2012 letter briefly notes that the Operations Center is proposed to be sited in a wooded area. The EA should include the amount of forest that may be impacted, a description of the forest species composition, and potential wildlife habitat. EPA suggests that avoidance and minimization opportunities be considered, as well as the possible inclusion of low impact development techniques where appropriate. EPA suggests coordinating with appropriate federal, state and local official regarding potential forest loss and any affects on rare, threatened or endangered species and possible impacts to forest interior dwelling species and habitat. The area may be a wildlife hub or corridor as defined by Maryland Department of Natural Resources' Green Infrastructure assessment; ways to minimize impacts to wildlife passage should be considered.

EPA is aware of several other past, present, and reasonably foreseeable projects occurring in the area of the proposed project, including improvements to Maryland Route 198 and 175, the proposed Anne Arundel Gateway project, the proposed Tipton substation, the Fort Meade Picerne Military Housing project, as well as several other activities proposed at Fort Meade. EPA strongly encourages a thorough cumulative impact analysis for past, present and reasonably foreseeable projects occurring in the project area. EPA is concerned about the potential for indirect and cumulative effects in this area.

Thank you for coordinating with EPA on this project. We look forward to working with you on this project as more information becomes available and as the EA becomes available. If you have any questions and would like to discuss our comments, the staff contact for this project is Ms. Alaina DeGeorgio; she can be reached at 215-814-2741 or degeorgio.alaina@epa.gov.

Sincerely,



Barbara Rudnick
NEPA Team leader
Office of Environmental Programs



DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1715
BALTIMORE, MARYLAND 21203-1715

REPLY TO
ATTENTION OF

August 29, 2012

Planning Division

Ms. Lori Byrne
Maryland Department of Natural Resources
Tawes State Office Building
580 Taylor Avenue
Annapolis, MD 21401

Dear Ms. Byrne:

On behalf of Fort George G. Meade (FGGM), the U.S. Army Corps of Engineers, Baltimore District, is preparing an Environmental Assessment (EA) for the Water and Wastewater Systems Improvements Projects on FGGM. The base, which encompasses 5,140 acres, is located in northern Anne Arundel County, Maryland, southeast of the Baltimore-Washington Parkway and west of I-97.

The Proposed Action to be evaluated in the EA consists of several projects to repair, rehabilitate, and upgrade water and wastewater systems throughout the installation. FGGM's water and wastewater utility systems were privatized in 2010 and are now owned by American Water Enterprises, Inc. These projects include upgrades to the water and wastewater treatment plants, cleaning and/or replacing existing waterlines and sewer lines, installing new water and sewer lines to expand service, installing fencing and emergency generators at wells, replacing booster pumps, rehabilitating the water treatment and wastewater treatment plants, and converting the wastewater treatment plant to an automated Biological Nutrient Removal plant. Also included is the construction of an approximately 6,000 square foot pre-engineered slab on grade Operations Center. Currently, this facility is proposed to be sited in the wooded area south of the existing water treatment plant.

To assist us in identifying issues that may affect the implementation of this project, please provide written comments within 30 days of receipt of this letter to: U.S. Army Corps of Engineers, Baltimore District, ATTN: CENAB-PL-E, P.O. Box 1715, Baltimore, Maryland 21203-1715. If you have any questions please contact Ms. TJ Flanagan at 410-962-3314.

Sincerely,

A handwritten signature in cursive script that reads "Maria Franklin".

Handwritten initials "fer" in cursive script.

Lawrence D. Eastman
Chief, Planning and Environmental
Services Branch



DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1715
BALTIMORE, MARYLAND 21203-1715

REPLY TO
ATTENTION OF

August 29, 2012

Planning Division

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

Dear Ms. LaRouche:

On behalf of Fort George G. Meade (FGGM), the U.S. Army Corps of Engineers, Baltimore District, is preparing an Environmental Assessment (EA) for the Water and Wastewater Systems Improvements Projects on FGGM. The base, which encompasses 5,140 acres, is located in northern Anne Arundel County, Maryland, southeast of the Baltimore-Washington Parkway and west of I-97.

The Proposed Action to be evaluated in the EA consists of several projects to repair, rehabilitate, and upgrade water and wastewater systems throughout the installation. FGGM's water and wastewater utility systems were privatized in 2010 and are now owned by American Water Enterprises, Inc. These projects include upgrades to the water and wastewater treatment plants, cleaning and/or replacing existing waterlines and sewer lines, installing new water and sewer lines to expand service, installing fencing and emergency generators at wells, replacing booster pumps, rehabilitating the water treatment and wastewater treatment plants, and converting the wastewater treatment plant to an automated Biological Nutrient Removal plant. Also included is the construction of an approximately 6,000 square foot pre-engineered slab on grade Operations Center. Currently, this facility is proposed to be sited in the wooded area south of the existing water treatment plant.

The purpose of this letter is to request a review of the project area and to solicit comments from your agency regarding impacts, if any, to threatened and endangered species in accordance with the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.) and Section 7 of the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq).

To assist us in identifying issues that may affect the implementation of this project, please provide written comments within 30 days of receipt of this letter to: U.S. Army Corps of Engineers, Baltimore District, ATTN: CENAB-PL-E, P.O. Box 1715, Baltimore, Maryland 21203-1715. If you have any questions please contact Ms. TJ Flanagan at 410-962-3314.

Sincerely,

Mania Franka

for Lawrence D. Eastman
Chief, Planning and Environmental
Services Branch



United States Department of the Interior

U.S. Fish & Wildlife Service
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401
410/573 4575



Online Certification Letter

Today's date:

Project:

Dear Applicant for online certification:

Thank you for choosing to use the U.S. Fish and Wildlife Service Chesapeake Bay Field Office online list request certification resource. This letter confirms that you have reviewed the conditions in which this online service can be used. On our website (www.fws.gov/chesapeakebay) are the USGS topographic map areas where **no** federally proposed or listed endangered or threatened species are known to occur in Maryland, Washington D.C. and Delaware.

You have indicated that your project is located on the following USGS topographic map

Based on this information and in accordance with section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*), we certify that except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project area. Therefore, no Biological Assessment or further section 7 consultation with the U.S. Fish and Wildlife Service is required. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

This response relates only to federally protected threatened or endangered species under our jurisdiction. For additional information on threatened or endangered species in Maryland, you should contact the Maryland Wildlife and Heritage Division at (410) 260-8540. For information in Delaware you should contact the Delaware Natural Heritage and Endangered Species Program, at (302) 653-2880. For information in the District of Columbia, you should contact the National Park Service at (202) 535-1739.

The U.S. Fish and Wildlife Service also works with other Federal agencies and states to minimize loss of wetlands, reduce impacts to fish and migratory birds, including bald eagles, and restore habitat for wildlife. Information on these conservation issues and how development projects can avoid affecting these resources can be found on our website (www.fws.gov/chesapeakebay).

We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interest in these resources. If you have any questions or need further assistance, please contact Chesapeake Bay Field Office Threatened and Endangered Species program at (410) 573-4531.

Sincerely,

Genevieve LaRouche
Field Supervisor

OFFICE OF

The Capital

Published by

Capital Gazette Communications, Inc.

HOLDER OF CONTRACT FOR ANNE ARUNDEL COUNTY ADVERTISING

CERTIFICATE OF PUBLICATION

Annapolis, MD, December 4, 20 12

We hereby certify that the annexed _____

EA : FNSI Ft. Meade Project

was published in The Capital, a newspaper published in the City of
Annapolis, Anne Arundel County, MD

once a week for one successive weeks

before the 18th day of December, 20 12.

The insertions being made the 4th

day of December, 20 12.

Capital Gazette Communications, Inc.

By Jenny [Signature]

539553

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JPECK

PUBLIC NOTICE

Availability of Environmental Assessment (EA) and Draft Finding of No Significant Impact (FNSI) for Water and Wastewater Systems Improvement Projects at Fort Meade, MD.

The U.S. Army has prepared an EA that considers the proposed implementation of improvements to the water and wastewater systems at Fort Meade, Maryland.

The Proposed Action includes upgrades to the water and wastewater treatment plants, including the conversion of the WWTP to a Biological Nitrogen Removal (BNR) system, construction of a 6,000 square foot Operations Center, installation of pump stations and new water and sewer lines that will be completed by a variety of technologies including open cut, horizontal directional drill, pigging, and pipe bursting, and other related improvements. The results, as found in the EA, show that the Proposed Action would not have a significant adverse impact on the environment. At the conclusion of the public comment period, it is anticipated that a FNSI would be appropriate and would be signed for the Proposed Action. An Environmental Impact Statement therefore, is not necessary to implement the Proposed Action.

Copies of the draft EA and draft FNSI are available online at www.ftmeade.army.mil by clicking on the 'Environmental Programs' tab under 'Public Notices'. The documents can also be found at the Medal of Honor Memorial Library on Fort Meade and the West County Area Library, 1325 Annapolis Road, Odenton, MD. Additionally, copies can be obtained by contacting Suzanne Teague, Directorate of Public Works, Environmental Division, 2212 Chisholm Avenue, Suite 5115, Fort Meade, MD 20755, or by phone at 301-677-9185, or by e-mail at suzanne.m.teague.civ@mail.mil.

Comments on the draft EA and draft FNSI should be submitted to Ms. Teague at the above mailing or e-mail address no later than 15 days from the publication of this notice.

539553 12/4

Appendix C
Air Conformity Analysis
And
Record of Non-Applicability
(RONA)

**RECORD OF NON-APPLICABILITY (RONA)
FOR CLEAN AIR ACT CONFORMITY
Fort George G. Meade, Anne Arundel County, MD**

The proposed action falls under the Record of Non-Applicability (RONA) category and is documented with this RONA.

Project/Action Name: Fort George G. Meade Water and Wastewater Systems Improvements Projects

Project/Action Point of Contact: Michael P. Butler
Chief, Environmental Division
Fort George G. Meade

Begin Date: January 2013

End Date: December 2017

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 General Conformity Rule applies to federal actions occurring in regions designated as being in nonattainment for the NAAQS or attainment areas subject to maintenance plans (maintenance areas). Threshold (*de minimis*) rates of emissions have been established for federal actions with the potential to have significant air quality impacts. If a project/action located in an area designated as non-attainment or maintenance exceeds these *de minimis* levels, a general conformity determination is required. Anne Arundel County is designated as a moderate ozone (8- hour) non-attainment area and a nonattainment area for the annual PM_{2.5} standard. Due to the proximity to the urbanized east coast of the United States, Anne Arundel County is considered an Ozone Transport Region (OTR). The OTR has a moderate ozone nonattainment classification by definition. Because ozone forms from other emissions, the analysis focuses on ozone precursors, volatile organic compounds (VOCs) and nitrogen oxides (NOX), as well as PM_{2.5}. The region is in attainment for other criteria pollutants.

A General Conformity applicability analysis of this project/action was performed to assess the air emissions associated with the proposed action to determine if maximum annual direct and indirect emissions from this project/action would exceed *de minimis thresholds*. Total emissions resulting from construction activities have been estimated using available project data, general air quality assumptions, and USEPA emission factors. Based on the air quality analysis for the Proposed Action, the maximum estimated emissions would be below conformity *de minimis* levels (Table 1).

Table 1. Estimated Emissions from Implementation of the Proposed Action

Estimated Emissions	Emissions (tons)	
	O ₃ (as VOC and NO _x)	PM _{2.5}
Total Direct Construction Emissions	85.707	3.887
Total Indirect Emissions	3.385	0.06
Total Operational Emissions	4.235	0.1325
Total Emissions	93.325	4.0795
<i>de minimis</i> threshold (tons/year)	100	100
Exceeds <i>de minimis</i> threshold?	No	No

Attached to this RONA is a summary of the calculations, methodology, and data including the estimated construction and operational emissions due to implementation of the Proposed Action.

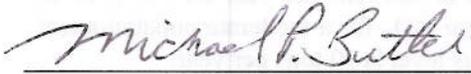
CONCLUSION

The project area is nonattainment area for the PM_{2.5} and the 8-hour O₃ NAAQS; VOCs and NO_x are precursors to the formation of O₃. Emissions associated with construction and operational activities for the Proposed Action were calculated based on standardized methodologies. Emissions were then compared with *de minimis* thresholds for the Metropolitan Baltimore Intrastate Air Quality Control Region, which includes Fort Meade, Maryland.

The U.S. Army concludes that *de minimis* thresholds for applicable criteria pollutants would not be exceeded as a result of implementation of the Proposed Action. The emissions data supporting that conclusion is shown in Table 1, which is a summary of the calculations, methodology, and data attached to this RONA. Therefore, the U.S. Army concludes that further formal Conformity Determination procedures are not required, resulting in this RONA.

RONA APPROVAL

To the best of my knowledge, the information presented in this RONA is correct and accurate, and I concur in the finding that the Proposed Action does not require a formal CAA Conformity Determination.



MICHAEL P. BUTLER
Chief, Environmental Division
Directorate of Public Works

20 DEC 2012
Date

General Conformity Analysis

Background

The Proposed Action is the multi-year assessment and correction of the water and wastewater systems at Fort George G. Meade in Anne Arundel County, Maryland. This action is scheduled over a five year period and includes replacement of water and wastewater lines, installation of new service lines, repairs and improvements to the Water Treatment Plant, and Waste Water Treatment Plant, and construction of a new operations center.

The Clean Air Act General Conformity Rule (58 FR 63214, November 30, 1993, Final Rule, Determining Conformity of General Federal Actions to State or Federal Implementation Plans) dictates that a conformity review be performed when a Federal action generates air pollutants in a region that has been designated a non-attainment or maintenance area for one or more NAAQS.

The general conformity rule was designed to ensure that Federal actions do not impede local efforts to control air pollution. It is called a conformity rule because Federal agencies are required to demonstrate that their actions "conform with" (i.e., do not undermine) the approved State Implementation Plan for their geographic area. The purpose of conformity is to (1) ensure Federal activities do not interfere with the air quality budgets in the SIPs; (2) ensure actions do not cause or contribute to new violations, and (3) ensure attainment and maintenance of the NAAQS. Federal agencies make this demonstration by performing a conformity review.

The Proposed Action would be subject to detailed conformity determinations unless these actions are clearly considered *de minimus* emissions; use of these thresholds assures that the conformity rule covers only major federal actions. EPA has set the *de minimus* threshold at 100 tons per year for PM_{2.5} in all nonattainment areas (including precursors). The *de minimis* level for NO_x for a moderate nonattainment area inside an OTR is 100 tons per year and for VOCs the *de minimis* level is 50 tons per year.

Methodology

A conformity review requires consideration of both direct and indirect air emissions associated with the proposed action. Direct emissions are those that occur as a direct result of the action, and occur at the same time and place as the action. Sources that would contribute to direct emissions from this project would include demolition or construction activities associated with the proposed action and equipment used to facilitate the action (e.g., construction vehicles). Indirect emissions are those that occur at a later time or distance from the place where the action takes place, but may be reasonably anticipated because of the proposed action. To be counted as an indirect emission, the Federal proponent for the action must have continuing control over the source of the indirect emissions. Sources of indirect emissions for the project would include commuter activity to and from the construction site (e.g., employee vehicle emissions).

Both stationary and mobile sources must be included when calculating the total of direct and indirect emissions, but this project involves only mobile sources. Air pollutant emissions generated by the proposed action were calculated to determine whether the total of direct and indirect emissions for PM_{2.5}, and ozone would be below the conformity *de minimus* limits.

Direct Emissions:

The Proposed Action was assessed in detail in order to ensure a conservative evaluation. As no construction schedule was provided by the design engineer, the equipment use was developed to cover the approximately five year construction period. Table 2 shows a list of equipment that could be used during

construction of the project and provides the total estimated usage for each piece of equipment as well as the total emissions of PM_{2.5} and NO_x over the construction period.

Given the hours of operation assumed, emissions were estimated based on equipment-specific emission factors recommended by the EPA for fuel-burning equipment that could be used from their AP-42: Compilation of Air Pollutant Emission Factors (website: <http://www.epa.gov/otaq/nonrmdml.htm>). The tons of emission produced by each piece of equipment are determined by the basic equation:

Tons of emissions for 1 piece of equipment = (Emission factor g/hp hr) x (hp of equipment) x (hours of use) x (1 lb /453.5924 g) x (1 ton/2000 lbs)

Using the information in Table 2 for a compactor, the calculations for PM_{2.5} would be:

Tons of emissions for 1 compactor walk behind = (0.75 g/hp hr) x (10 hp) x (1062 hrs) x (1lb/453.5924 g) x (1 ton/2000lbs)

Tons of PM_{2.5} emission = 0.009 tons

As stated earlier, the emissions calculated in Table 2 reflect the totals for entire estimated five year construction period. If these figures had exceeded the *de minimus* levels, a more detailed analysis would have been conducted to assess the annual emissions. The total direct emissions for the Proposed Action are estimated at 3.887 tons of PM_{2.5} and 85.707 tons of NO_x. Both of these figures are below the *de minimus* limits.

Indirect Emissions:

Commuting traffic for construction crews are assumed to be the indirect emissions impacts of this project. Emissions from construction personnel traffic were calculated using the USEPA's *MOBILE6*. It is assumed that the construction crew would consist of an average of 80 workers per day for 260 days per year (1300 days total). For a conservative analysis, it was assumed each person would drive to the site and that the average number of workers would drive approximately 40 miles each day. Based on *MOBILE6*, the automobile emission factor for NO_x is 0.760 grams/mile/vehicle, and PM_{2.5} is 0.01333 grams/mile/vehicle.

The equation used to calculate the emissions is:

(# of vehicles)x (#miles/day) x (#days/year)x (emissions factor grams/mile) x (1 lb/453.59 grams) x (1 ton/2000 lb) = tons of vehicle emissions per year

The calculations for NO_x are:

(80 vehicles) x (40 miles/day) x (260 days/year) x (0.76 grams/mile/vehicle) x (1 lb/453.59 grams) x (1ton/2000 lb) = 0.697 tons NO_x of vehicle emissions per year

Similarly the results for PM_{2.5} are calculated as:

(80 vehicles) x (40 miles/day) x (260 days/year) x (0.0133 grams/mile/vehicle) x (1 lb/453.59 grams) x (1ton/2000 lb) = 0.012 tons PM_{2.5} of vehicle emissions per year

Based upon these figures, the emissions over a five year period would be 0.06 tons of PM_{2.5} and 3.385 tons of NO_x.

Operating Emissions:

Operating emissions for the Proposed Action need to examine the increase in the use of emergency generators and other equipment. The Proposed Action would not increase commuter traffic, so this source was not evaluated.

For operating emissions, it is estimated that five emergency generators may be required. These engines would be tested monthly with an annual expected run time of 12 hours each. The tons of emission produced by the engines are determined by the basic equation:

$$\text{Tons of emissions for 1 piece of equipment} = (\text{Emission factor g/hp hr}) \times (\text{hp of equipment}) \times (\text{hours of use}) \times (1 \text{ lb} / 453.5924 \text{ g}) \times (1 \text{ ton} / 2000 \text{ lbs})$$

The annual operating emissions calculated are 0.0265 tons per year of PM_{2.5} and 0.8466 tons per year of NO_x (Table 3). To maintain a consistent analysis, the five year operating emissions would be 0.1325 tons of PM_{2.5} and 4.235 tons of NO_x.

Conclusion

Typically, annual emissions are calculated and compared with the *de minimis* thresholds to determine whether the annual emissions from direct and indirect sources for each pollutant exceed the *de minimis* thresholds. As no construction schedule was provided, the calculations examined the direct and indirect emissions from the entire multi-year Proposed Action as a worse case. Estimated emissions did not exceed the threshold limits. Table 1 shows the summary of projected total direct and indirect emissions for the Proposed Action based upon an expected construction period of five years. Emissions of VOCs were insignificant compared to NO_x and were not reported in the emission summary. The *de minimis* level for VOCs for a moderate nonattainment area inside an OTR is 50 tpy. Adding in the indirect emissions calculated above, the total predicted emission for PM_{2.5} is 4.0795 tpy. The total estimated emission for NO_x is 93.325 tpy. Both of these total project emissions are below the annual limits.

Because total projected construction and operating emissions are below threshold levels, the action is exempt from further Conformity analysis.

Table 1: Estimated Emissions from Implementation of the Proposed Action		
Estimated Emissions	Emissions (tons)	
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Direct Construction Emissions	85.707	3.887
Indirect Emissions	3.385	0.06
Operational Emissions	4.235	0.1325
Total Emissions	93.325	4.0795
<i>de minimis</i> threshold (tons/year)	100	100
Exceeds <i>de minimis</i> threshold?	No	No

Note: The ROI is a nonattainment area for the 8-hour O₃ NAAQS (VOCs and NO_x are precursors to the formation of O₃), and is in nonattainment of the PM_{2.5} NAAQS. *de minimis* thresholds are defined in 40 CFR 93 Section 153. VOC *de minimis* established for nonattainment areas located in an O₃ transport area.

Sources: USEPA 2012.

Table 2. Estimated Total Emissions Calculations for the Proposed Action

Resource	Description	Total Usage				Motor (hp)	Particulate Matter (PM2.5)				Ozone (NOx)			
		Use Factor	days	Total usage			Emission Factor		Estimate (lbs)	Estimate (Tons)	Emission Factor	Estimate (lbs)	Estimate (Tons)	
Rubber Tired Backhoe	Backhoe Loader 150 HP	0.5	1605	6420	hrs	150	0.39	g/hp hr	823.7	0.412	8.3	g/hp hr	17,621.3	8.811
Compact. Walk behind	Roller-Walk Behind Bomag BW75S	0.15	885	1062	hrs	10	0.75	g/hp hr	17.6	0.009	5.2298	g/hp hr	122.4	0.061
Excavator Cat 300	Mini excavator--100 HP	1	3697	29576	hrs	100	0.26	g/hp hr	1,714.9	0.857	5.55	g/hp hr	36,188.2	18.094
Excavator Cat 350	350 HP excavator	1	1350	10800	hrs	350	0.20	g/hp hr	1,700.0	0.850	6.15	g/hp hr	51,250.9	25.625
Loader Track Cat 955	Loader Track Cat 955	0.7	1572	8803	hrs	115	0.22	g/hp hr	491.0	0.246	5.6523	g/hp hr	12,615.3	6.308
Pump - Water	Water Pump	0.5	245	980	hrs	25	0.31	g/hp hr	16.7	0.008	4.49	g/hp hr	242.5	0.121
Hydroseeder	Hydroseeder	0.2	120	192	hrs	15	0.26	g/hp hr	1.7	0.001	5.5	g/hp hr	34.9	0.017
Skid Steer	Skid Steer	0.7	1545	8652	hrs	100	0.39	g/hp hr	740.1	0.370	2.8	g/hp hr	5,340.8	2.670
Truck Concrete	Concrete Truck	0.5	151	604	hrs	335	0.39	g/hp hr	173.1	0.087	8.3	g/hp hr	3,702.5	1.851
Truck Mini-Dump	Mini Dump Truck	0.5	885	3540	hrs	250	0.39	g/hp hr	757.0	0.379	8.3	g/hp hr	16,194.1	8.097
Truck Dump	Dump Truck	0.9	1165	8388	hrs	275	0.26	g/hp hr	1,337.5	0.669	5.5	g/hp hr	27,969.7	13.985
Horizontal Directional Drill	Horizontal Directional Drill	0.05	165	66	hrs	300	0.02	g/hp hr	0.7	0.000	3	g/hp hr	131.0	0.065
Total							TONS OF PM2.5			3.887	TONS OF NOX			85.707

Table 3: Emission Calculations for Operations

Resource	Description	Total Usage		Motor (hp)	Particulate Matter (PM2.5)			NOx		
					Emission Factor	Estimate (lbs)	Estimate (Tons)	Emission Factor	Estimate (lbs)	Estimate (Tons)
Emergency Generators	Emergency Engine (5 engines for 12hr/yr)	60	hrs	2682	0.15 g/hp hr	52.9	0.0265	4.7725578 g/hp hr	1,693.2	0.8466
Total						52.9	0.02646		1,693.2	0.84658