

DRAFT ENVIRONMENTAL ASSESSMENT



Utility Bridge Replacement Naval Support Activity Annapolis Annapolis, Maryland

June 2020

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Abstract

Designation:	Environmental Assessment
Title of Proposed Action:	Utility Bridge Replacement
Project Location:	Naval Support Activity Annapolis, Maryland
Lead Agency for the EA:	Department of the Navy
Affected Region:	Annapolis, Maryland
Action Proponent:	Naval Support Activity Annapolis
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Date:	May 2020

The Department of the Navy is preparing this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA), as implemented by the Council on Environmental Quality (CEQ) Regulations and Navy regulations for implementing NEPA. The Proposed Action would replace the utility bridge at College Creek at Naval Support Activity (NSA) Annapolis. Specifically, the Proposed Action includes construction of a new utility bridge, connection of new utility lines, and demolition and removal of the existing bridge. This project would incorporate a system for personnel to access the new structure safely to conduct inspections, maintenance, and repairs. In addition, an underground utility option will be analyzed. Under this option, all of the utilities would be installed underground via directional boring in the banks of College Creek, except for one utility line. The existing bridge is aging with multiple failed components and other components in critical need of repair related to the piles, support beams, reinforcements, and surface coatings. The EA evaluates in detail the potential environmental impacts associated with three action alternatives and the No Action Alternative on the following resource areas: air quality, water resources, geological resources, cultural resources, biological resources, noise, infrastructure, public health and safety, and hazardous materials and wastes.



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Executive Summary

ES.1 Proposed Action

The Department of the Navy (Navy) proposes to replace the utility bridge at College Creek at Naval Support Activity (NSA) Annapolis. The utility bridge carries utility lines over College Creek between the Upper Yard and the Lower Yard of the U.S. Naval Academy (USNA). If the bridge fails, utility services would be interrupted. The utility bridge is currently in a deteriorated state. The Proposed Action includes construction of a new utility bridge, connection of new utility lines, and demolition and removal of the existing bridge. This project would incorporate a system for personnel to access the new structure safely to conduct inspections, maintenance, and repairs. In addition, an underground utility option will be analyzed. Under this option, all of the utilities would be installed underground via directional boring in the banks of College Creek, except for one utility. Construction of the proposed utility bridge is expected to occur in fiscal year 2023.

ES.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to ensure continued utility service to portions of the USNA. The Proposed Action is needed because the current utility bridge is in a severely deteriorated state and requires extensive repair.

The utility bridge carries utility lines over College Creek between the Upper Yard and the Lower Yard of the USNA. An inspection of the utility bridge in 2019 determined the bridge is in poor condition overall, and numerous deficiencies require correction within 12 months. The 2019 inspection report concluded that the superstructure is in fair condition while the substructure is in poor condition. The inspection report also determined that the lack of catwalks and ladders to provide access for future inspection, maintenance, or repair posed a safety concern. If the bridge fails due to impaired superstructure components, utility services would be interrupted. Sudden failure of the bridge could sever the utility lines that cross College Creek, resulting in a rupture that is capable of damaging nearby infrastructure or natural systems.

ES.3 Alternatives Considered

Alternatives were developed for analysis based on the following reasonable screening factors:

- The bridge abutments must be on Navy property to provide security for military utility services.
- The utility lines need to be in close proximity to existing infrastructure and utility connections; therefore, the utility bridge should be no further than approximately 350 feet to the northeast of the existing alignment.

The Navy is considering three action alternatives and the No Action Alternative:

- **No Action Alternative:** Under the No Action Alternative, the Proposed Action would not be implemented. Routine maintenance to the bridge would continue, but no major repairs would occur. If the bridge fails, utility services would be interrupted, which could interfere with the training of midshipmen. The worst-case scenario under the No Action Alternative would be a sudden failure of the bridge, possibly severing the utility lines that cross College Creek. Instantaneous ruptures of pressurized lines could be capable of damaging nearby infrastructure or natural systems. Infrastructure systems that cross on the utility bridge have emergency shut

off protocols in place to minimize the likelihood for catastrophic damage under this worst-case scenario.

- **Alternative 1:** Under Alternative 1, the proposed utility bridge would be constructed within 50 feet of the existing utility bridge alignment, which is adjacent to the King George Street Bridge. Given that the King George Street Bridge and the installation boundary are directly south of the current utility bridge, the proposed bridge must be located to the northeast of the current utility bridge location. Therefore, under Alternative 1, the bridge could be constructed in any location between the current utility bridge alignment and 50 feet to the northeast. Upon completion of the new utility bridge, the existing bridge would be demolished, and the pile caps would be removed and hauled off-site.
- **Alternative 2:** Under Alternative 2, the proposed utility bridge would be constructed within 115 feet of the Decatur Avenue Bridge (Hill Bridge). The utility bridge needs to be situated southwest of the Decatur Avenue Bridge in order to tie back into utility infrastructure without major realignment. Upon completion of the new utility bridge, the existing bridge would be demolished, and the pile caps would be removed and hauled off-site.
- **Alternative 3:** Under Alternative 3, the proposed utility bridge would be constructed between the locations of Alternatives 1 and 2 (i.e., the remaining approximate 250-foot-width between Alternatives 1 and 2, while also avoiding Hubbard Hall [Building 260] and its associated docks). Upon completion of the new utility bridge, the existing bridge would be demolished, and the pile caps would be removed and hauled off-site.

ES.4 Summary of Environmental Resources Evaluated in the Environmental Assessment

Council on Environmental Quality (CEQ) regulations, the National Environmental Policy Act (NEPA), and Navy instructions for implementing NEPA, specify that an EA should address resource areas that are potentially subject to impacts. In addition, the level of analysis should be commensurate with the anticipated level of environmental impact.

The Proposed Action involves in-water demolition and construction, which has the potential to affect sensitive aquatic environments, including essential fish habitat. A Federal Consistency Determination will be prepared. USNA is a National Historic Landmark and listed on the National Register of Historic Places. Anne Arundel County is in nonattainment for ozone and sulfur dioxide; a conformity applicability analysis and Record of Non-Applicability have been prepared.

This EA addresses in detail the following resource areas: air quality, water resources, geological resources, cultural resources, biological resources, noise, infrastructure, public health and safety, and hazardous materials and wastes. It does not analyze in detail resources for which potential impacts were considered negligible or nonexistent; these include land use, visual resources, airspace, transportation, socioeconomics, and environmental justice.

ES.5 Summary of Potential Environmental Consequences of the Action Alternatives

Table ES-1 summarizes the potential impacts on the resources associated with the No Action Alternative and the action alternatives analyzed in this EA, as well as the underground utility option.

Table ES-1 Summary of Potential Impacts on Resource Areas

<i>Resource Area</i>	<i>No Action Alternative</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Underground Utility Option</i>
Air Quality	Negligible air emissions from ongoing, routine maintenance. Temporary, minor, adverse, localized impacts from airborne dust and debris under a worst-case scenario of bridge failure. No significant impacts.	Similar to but slightly less than Alternative 2. No significant impacts.	Short-term, minor emissions during construction. No significant impacts.	Similar to but slightly less than Alternative 2. No significant impacts.	Short-term, minor emissions from operating boring equipment. No significant impacts, when combined with any of the action alternatives.
Water Resources	Short-term, moderate, adverse impacts from a worst-case scenario of a rupture that results in discharges into College Creek. No significant impacts.	Short-term, minor adverse impacts from construction within College Creek. No long-term impacts. No significant impacts.	Similar to Alternative 1 but slightly greater due to more trenching. No significant impacts.	Similar to Alternative 1. No significant impacts.	Negligible impacts since utilities would be below creek sediment bed. No significant impacts, when combined with any of the action alternatives.
Geological Resources	No change in baseline condition. No significant impacts.	Short-term, minor, adverse effects from soil erosion and sedimentation. Minor, localized changes in topography from bridge construction and demolition. No significant impacts.	Similar to Alternative 1 but slightly greater due to more trenching. No significant impacts.	Similar to Alternative 1. No significant impacts.	Short-term, minor potential for drilling fluid or other fluid to leak into soils. No significant impacts, when combined with any of the action alternatives.

Resource Area	No Action Alternative	Alternative 1	Alternative 2	Alternative 3	Underground Utility Option
Cultural Resources	Possible direct adverse effects from a worst-case scenario depending on the extent of a rupture. Possible indirect, adverse effects from the worst-case scenario due to the vibrations from a rupture. No significant impacts.	Minor-to-moderate, adverse effects on unknown archaeological deposits due to ground disturbance of the new bridge; a Phase I survey would be completed. No adverse effects on viewsheds in the APE. No adverse effects on the Colonial Annapolis Historic District. No significant impacts.	Minor-to-moderate, adverse effects on unknown archaeological deposits due to ground disturbance of the new bridge; a Phase I survey would be completed. No adverse effects on viewsheds in the APE. No adverse effects on the Colonial Annapolis Historic District. No significant impacts.	Minor-to-moderate, adverse effects on unknown archaeological deposits due to ground disturbance of the new bridge; a Phase I survey would be completed. No adverse effects on viewsheds in the APE. No adverse effects on the Colonial Annapolis Historic District. No significant impacts.	The Navy would follow the Standard Operating Procedure on unanticipated discoveries. No significant impacts, when combined with any of the action alternatives.
Biological Resources	Potential short-term, moderate adverse impacts from a worst-case scenario of a rupture that results in discharges into College Creek. No significant impacts.	Short-term, minor, adverse impacts from construction activity on marine species. No significant impacts.	Similar to Alternative 1. No significant impacts.	Similar to Alternative 1. No significant impacts.	Short-term, minor impacts on bottom-dwelling species from vibrations during directional drilling. No significant impacts, when combined with any of the action alternatives.
Noise	Short-term, moderate impacts from a worst-case scenario of a rupture. No long-term impacts. No significant impacts.	Short-term, minor impacts on airborne and underwater receptors from construction. No long-term impacts. No significant impacts.	Similar to Alternative 1. No significant impacts.	Similar to Alternative 1. No significant impacts.	Short-term, minor impacts from construction; minor impacts from vibration. No long-term impacts. No significant impacts when combined with any of the action alternatives.

Resource Area	No Action Alternative	Alternative 1	Alternative 2	Alternative 3	Underground Utility Option
Infrastructure	Likely impacts include partial or total bridge failure affecting the distribution of utility service. Under a worst-case scenario of catastrophic bridge failure, impacts would be major but utility service would be restored in the long term. Infrastructure deterioration is a driving need for the Proposed Action.	Short-term, minor impacts on utility service during interconnections. Long-term, beneficial effects from a safer, more reliable bridge to carry utilities. No significant impacts.	Similar to Alternative 1. No significant impacts.	Similar to Alternative 1. No significant impacts.	Short-term, minor impacts on utility service during interconnections. Long-term increased reliability and protection from lines being underground. No significant impacts, when combined with any of the action alternatives.
Public Health and Safety	The potential for a bridge failure is a public health and safety threat. Addressing infrastructure deterioration that threatens property damage or public safety is a driving need for the Proposed Action.	Short-term, minor adverse safety risks during construction and demolition. Long-term beneficial effects from improved bridge safety. No significant impacts.	Similar to Alternative 1. No significant impacts.	Similar to Alternative 1. No significant impacts.	Short-term, minor adverse safety risks during boring activities. Long-term beneficial effects from better-protected underground utilities. No significant impacts, when combined with any of the action alternatives.
Hazardous Materials and Wastes	Potential short-term, moderate adverse impacts from a worst-case scenario of a bridge failure or rupture resulting in special hazards such as lead and asbestos being released into the water, air, or surrounding area in the form of dust and debris. No significant impacts.	Short-term increase in use of hazardous materials and generation of hazardous wastes. Demolished bridge components may contain special hazards; wastes would be characterized and disposed of appropriately. No significant impacts.	Similar to Alternative 1. No significant impacts.	Similar to Alternative 1. No significant impacts.	Additional short-term, minor use of hazardous materials and generation of hazardous wastes. No significant impacts, when combined with any of the action alternatives.

Key: APE = Area of Potential Effect; NRHP = National Register of Historic Places.

ES.6 Public Involvement

The Navy will publish a Notice of Availability for the Draft EA for three consecutive days in the *Capital Gazette*. The Navy will coordinate or consult with agencies associated with the EA including the U.S. Fish and Wildlife Service, National Marine Fisheries Service, Maryland Department of the Environment, Maryland Department of Natural Resources, Maryland Department of Transportation, Maryland Historical Trust, Maryland Department of Planning (Maryland State Clearinghouse), and U.S. Army Corps of Engineers regarding the Proposed Action. In addition, a Federal Consistency Determination will be submitted to the Maryland Department of the Environment.

ENVIRONMENTAL ASSESSMENT
Utility Bridge Replacement at
Naval Support Activity Annapolis
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Abbreviations and Acronyms

Acronym	Definition	Acronym	Definition
ACM	asbestos-containing materials	NHL	National Historic Landmark
APE	area of potential effect	NHPA	National Historic Preservation Act
BMP	best management practice	NOAA	National Oceanic and Atmospheric Administration
CEQ	Council on Environmental Quality	NRHP	National Register of Historic Places
CFR	Code of Federal Regulations	NSA	Naval Support Activity
CHRIMP	Consolidated Hazardous Material Reutilization and Inventory Management Program	PCB	polychlorinated biphenyl
dB	decibel	PM _{2.5}	fine particulate matter less than or equal to 2.5 micrometers in diameter
dBA	A-weight decibels	PM ₁₀	suspended particulate matter less than or equal to 10 micrometers in diameter
EA	Environmental Assessment	SAV	submerged aquatic vegetation
EFH	essential fish habitat	SHPO	State Historic Preservation Office
GHG	greenhouse gas	SOP	Standard Operating Procedure
IPaC	Information for Planning and Consultation	U.S.	United States
LBP	lead-based paint	U.S.C.	United States Code
MDE	Maryland Department of the Environment	USACE	U.S. Army Corps of Engineers
MDNR	Maryland Department of Natural Resources	USEPA	U.S. Environmental Protection Agency
MHT	Maryland Historical Trust	USFWS	U.S. Fish and Wildlife Service
NAAQS	National Ambient Air Quality Standards	USNA	United States Naval Academy
NAVFAC	Naval Facilities Engineering Command		
NEPA	National Environmental Policy Act		

1 Purpose of and Need for the Proposed Action

1.1 Introduction

The Department of the Navy (Navy) proposes to replace the utility bridge at College Creek at Naval Support Activity (NSA) Annapolis, Maryland. There are three main areas of NSA Annapolis: the Upper Yard and Lower Yard of the United States Naval Academy (USNA), and North Severn. NSA Annapolis supports multiple tenants, of which the USNA is the main tenant.

The utility bridge carries utility lines over College Creek between the Upper Yard and the Lower Yard of the USNA. Each utility line is approximately 600 linear feet. The utility bridge is currently in a deteriorated state. The Proposed Action includes construction of a new utility bridge, connection of new utility lines, and demolition and removal of the existing bridge. During construction of the new utility bridge, the existing bridge and utilities would remain in place until the new structure is completed. This project would incorporate a system for personnel to access the new structure safely to conduct inspections, maintenance, and repairs. In addition, an underground utility option will be analyzed. Under this option, all except one utility line would be installed underground via directional boring in the banks of College Creek. Construction of the proposed utility bridge is expected to occur in fiscal year 2023.

The Navy has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA), as implemented by the Council on Environmental Quality (CEQ) Regulations and Navy regulations for implementing NEPA.

1.2 Background

Utility bridges are structures that can be used for moving piping, equipment, and lines across rivers, railways, highways, or other obstructions. The utility bridge connects the Lower Yard and Upper Yard of USNA. The bridge was originally constructed in 1931 as a train trestle bridge and retrofitted in 1986 to its current use. During this rehabilitation process, the bridge was converted to carry steam infrastructure, and concrete encasements were installed at the piers. Currently, the utility bridge is a service infrastructure bridge; it does not support vehicular or pedestrian traffic. The bridge is composed of two rolled steel beams, seventeen reinforced concrete bents, and two reinforced concrete abutments. The existing utility bridge carries utility lines over College Creek between the Upper Yard and the Lower Yard of USNA. Figure 1-1 is a photograph of the utility bridge.

The USNA was first established in 1845 and consisted of a naval school on a ten-acre parcel on Fort Severn, located along the Severn River in Annapolis, Maryland. The USNA grew over the next century, and the Navy commissioned Naval Station Annapolis in 1947 as a support facility for enlisted personnel assigned to USNA. In 2006, NSA Annapolis was established, which streamlined operations at the installation to better support the USNA and provide a more efficient and responsive organization for the training of Navy midshipmen and the support of USNA faculty, staff, and family members.



Figure 1-1 Utility Bridge, West View

NSA Annapolis projects power by expertly supporting the development of midshipmen into fleet leaders. The installation provides: exceptional security by maintaining a secure environment for 4,400 midshipmen and over 6,000 employees while managing thousands of special events and over 2 million annual visitors despite increased force protection pressure; stewardship by maintaining more than 120 aging, historic facilities and associated infrastructure in superb condition as required by university accreditation standards and as appropriate for being listed on the National Register of Historic Places (NRHP); and Community Relationships by promoting high services and quality of life initiatives, meanwhile coordinating closely and communicating openly with city, county, state and community leaders whose well-being is inextricably linked to that of the installation (CNIC Naval Support Activity Annapolis, 2019). As the supporting installation for the USNA, NSA Annapolis comprises the core USNA campus, as well as lands and facilities that support typical installation functions.

In addition to USNA, other large tenants at NSA Annapolis include the Naval Health Clinic Annapolis, Naval Facilities Engineering Command, the USNA Alumni Association/Naval Academy Foundation, and the Naval Academy Athletic Association (NAVFAC Washington, 2018a).

1.3 Location

NSA Annapolis is in Anne Arundel County, Maryland, along the Severn River and Chesapeake Bay in Annapolis, approximately 30 miles southeast of Baltimore and 33 miles east of Washington, DC. There are three main areas of NSA Annapolis: the Upper Yard and Lower Yard of the USNA, and North Severn. The Upper Yard and Lower Yard along the southern shore of the Severn River are separated by College Creek (Figure 1-2). The USNA campus is within these areas. North Severn is on the northern shore of the Severn River at the confluence with the Chesapeake Bay. The Upper Yard and Lower Yard are surrounded by the fairly dense development of Annapolis, but the North Severn area is more suburban and buffered by forest.



Figure 1-2 Naval Support Activity Annapolis Location Map

1.4 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to ensure continued utility service to portions of the USNA. The Proposed Action is needed because the current utility bridge is in a severely deteriorated state and requires extensive repair.

The utility bridge carries utility lines over College Creek between the Upper Yard and the Lower Yard of the USNA. If the bridge fails, utility services would be interrupted. Sudden failure of the bridge could sever the utility lines that cross College Creek, resulting in a rupture that is capable of damaging nearby infrastructure or natural systems.

An inspection of the utility bridge from June 2019 determined the bridge is in poor condition overall, and numerous deficiencies require correction within 12 months. The 2019 inspection report concluded that the superstructure is in fair condition while the substructure is in poor condition (NAVFAC EXWC, 2019). The bridge superstructure (i.e., the parts of the bridge that are mounted on a supporting system) includes the deck, slab, and girders. The bridge substructure supports the superstructure and transfers the structural load to the foundations (i.e., piers and abutments).

The existing bridge is aging with multiple failed components and other components in critical need of repair related to the piles, support beams, reinforcements, and surface coatings. Specific findings of the inspection report included the following:

- The transverse support beam at the top of the south tower is severely twisted, and two rollers are missing in the main span.
- The transverse support beam at the top of the tower over Pier 9 is severely twisted.
- The bottom of the pile caps at Piers 10 and 16 exhibit large spalls, with exposed longitudinal and transverse steel reinforcement members, and up to 100 percent section loss.
- Loose and corroded anchor bolt nuts are at the northwest and northeast columns of the north tower above Pier 10.
- Twisted pipeline transverse support beams are above Pier 7 and on the north approach.
- A large scaled area is at the bottom of Abutment 1, with exposed and corroded steel reinforcement and up to 100 percent section loss at the ends.
- The abutments, concrete pile caps, pedestals, and fascia panels show vertical and horizontal cracks, peeling, and flaking, which leads to internal structural weakness.
- The steel superstructure, beams, main span frame members, bearings, and connection hardware have moderate surface corrosion.
- The bearing hardware (i.e., anchor rods, nuts, and washers) at the abutments and at isolated piers exhibit moderate-to-severe surface corrosion with up to 50 percent section loss.
- Twenty-three piles (16 percent of the total piles) are in critical or failed condition, and 14 piles (10 percent of the total piles) are in poor condition. These piles exhibit varying degrees of cracking and exposure of reinforcing steel.

The inspection report also determined that the lack of catwalks and ladders to provide access for future inspection, maintenance, or repair posed a safety concern.

1.5 Scope of Environmental Analysis

This EA includes an analysis of potential environmental impacts associated with three action alternatives and the No Action Alternative. The environmental resource areas analyzed in detail in this EA include air quality, water resources, geological resources, cultural resources, biological resources, noise, infrastructure, public health and safety, and hazardous materials and waste. The study area for each resource analyzed may differ due to how the Proposed Action interacts with or impacts the resource. For instance, the study area for geological resources may only include the construction footprint of a facility whereas the noise study area would expand out to include areas that may be affected by facility operations, traffic, or construction.

The Navy has prepared this EA based on federal and state laws, statutes, regulations, and policies pertinent to the implementation of the Proposed Action, which are presented in Appendix A.

1.6 Public and Agency Participation and Intergovernmental Coordination

Regulations from the CEQ direct agencies to involve the public in preparing and implementing their NEPA procedures. All public involvement and agency correspondence materials will be added to Appendix B as they occur.

The Navy will publish a Notice of Availability for the Draft EA for three consecutive days in the *Capital Gazette*. The notice will describe the Proposed Action, solicit public comments on the Draft EA, provide dates of the public comment period, and announce where a copy of the EA is available for review.

The Navy will coordinate or consult with agencies associated with the EA including the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service, Maryland Department of the Environment (MDE), Maryland Department of Natural Resources (MDNR), Maryland Department of Transportation, Maryland Historical Trust (MHT), Maryland Department of Planning (Maryland State Clearinghouse), and U.S. Army Corps of Engineers (USACE) regarding the Proposed Action. In addition, a Federal Consistency Determination will be submitted to MDE.

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2 Proposed Action and Alternatives

2.1 Proposed Action

The Proposed Action involves replacing the utility bridge at College Creek at NSA Annapolis, Maryland. Specifically, this includes construction of a new utility bridge, connection of new utility lines, and demolition and removal of the existing bridge. During construction of the new utility bridge, the existing bridge and utilities would remain in place until the new structure is completed. The utility bridge over College Creek is approximately 18 feet wide and 474 feet long. The new bridge would be approximately the same width and length, and the bridge deck would be located at approximately the same elevation. The proposed bridge would be designed to ensure that boats, specifically those from the adjacent Hubbard Hall (Building 260), would be able to access the waterway on both sides of the bridge.

As previously discussed, the existing bridge carries utility lines over College Creek between the Upper Yard and the Lower Yard of the USNA. All current utility connections would be included in the proposed utility bridge; there would be no long-term changes in services or capacity. Utilities would be reattached to the bridge structure; however, an underground utility option is also being considered as discussed in Section 2.1.1.

The existing utility bridge does not provide the infrastructure to access the bridge; as a result, the utilities currently must be inspected by boat. Under the Proposed Action, infrastructure would be included so that personnel could access the new bridge safely to conduct future inspections, maintenance, and repairs. Infrastructure to access the proposed bridge would likely include catwalks and ladders. In addition, the proposed bridge would meet codes for safety and security. Security measures would include devices such as fencing and locks.

2.1.1 Underground Utility Option

The utility lines would be replaced and reattached for all the action alternatives. The Proposed Action includes reattaching the utilities to the bridge structure, which is how they are currently situated. Aboveground utilities are generally easier to install and maintain than underground utilities. However, the presence of utility conduit on bridges in the long term can make maintenance of the structure more difficult as the utilities may also be more vulnerable to damage. In addition, implementing safety and security measures can be more difficult. Therefore, as part of the decision-making process, the Navy will evaluate an underground utility option to determine if there are substantial differences or notable environmental impacts associated with aboveground or belowground utilities for this Proposed Action.

Under the underground utility option, all of the utilities would be situated underground except for one utility line that cannot be bored underground; therefore, one line would remain aboveground and attached to the proposed utility bridge structure.

Placing utilities underground provides increased protection of those infrastructure components from weather and accidents, which increases long-term utility reliability and safety. Codes for safety and security measures would be easier to implement if the utilities were underground. In addition, utilities are also often less affected by temperature and humidity because these factors are more constant underground. However, repair of underground utilities, if needed, can be more challenging due to limited access as compared to aboveground utilities.

Directional boring would occur on the banks of College Creek. Boring would occur for all alternatives at the same locations. The boring would start on the northern side of the creek bed and move towards the southern side. The boring would not directly affect water resources as it would occur on the banks and under the sediment bed. As a result, no dams or cofferdams would be used. At this time, the required depth of the borings has not been determined, but the area would likely be approximately 32 inches by 32 inches.

2.2 Screening Factors

NEPA implementing regulations provide guidance on the consideration of alternatives to a federally proposed action and require rigorous exploration and objective evaluation of reasonable alternatives. Only those alternatives determined to be reasonable and that meet the purpose and need (see Section 1.4) require detailed analysis.

Potential alternatives that meet the Proposed Action's purpose and need were evaluated against the following screening factors:

- The bridge abutments must be on Navy property to provide security for military utility services.
- The utility lines need to be in close proximity to existing infrastructure and utility connections. Rerouting the utility lines to the northeast of Decatur Avenue (Hill Bridge) would involve extensive relocation to tie back into utility infrastructure. In addition, the creek bed on the southern side of College Creek curves further south, expanding the width of the creek in this region. Therefore, the length of the utility bridge immediately northeast of Decatur Avenue would be considerably longer. Consequently, the utility bridge should be no further than approximately 350 feet to the northeast of the existing alignment.

Various alternatives were evaluated against the screening factors. The alternatives considered include the following, which are shown on Figure 2-1:

- No Action Alternative
- Alternative 1: King George Street Bridge Alignment
- Alternative 2: Decatur Avenue Bridge Alignment
- Alternative 3: Between King George Street and Decatur Avenue Bridge Alignment

2.3 Alternatives Carried Forward for Analysis

Based on the reasonable alternative screening factors and meeting the project purpose and need, three action alternatives were identified and are analyzed in the EA, as well as the No Action Alternative, as further described in the following text.

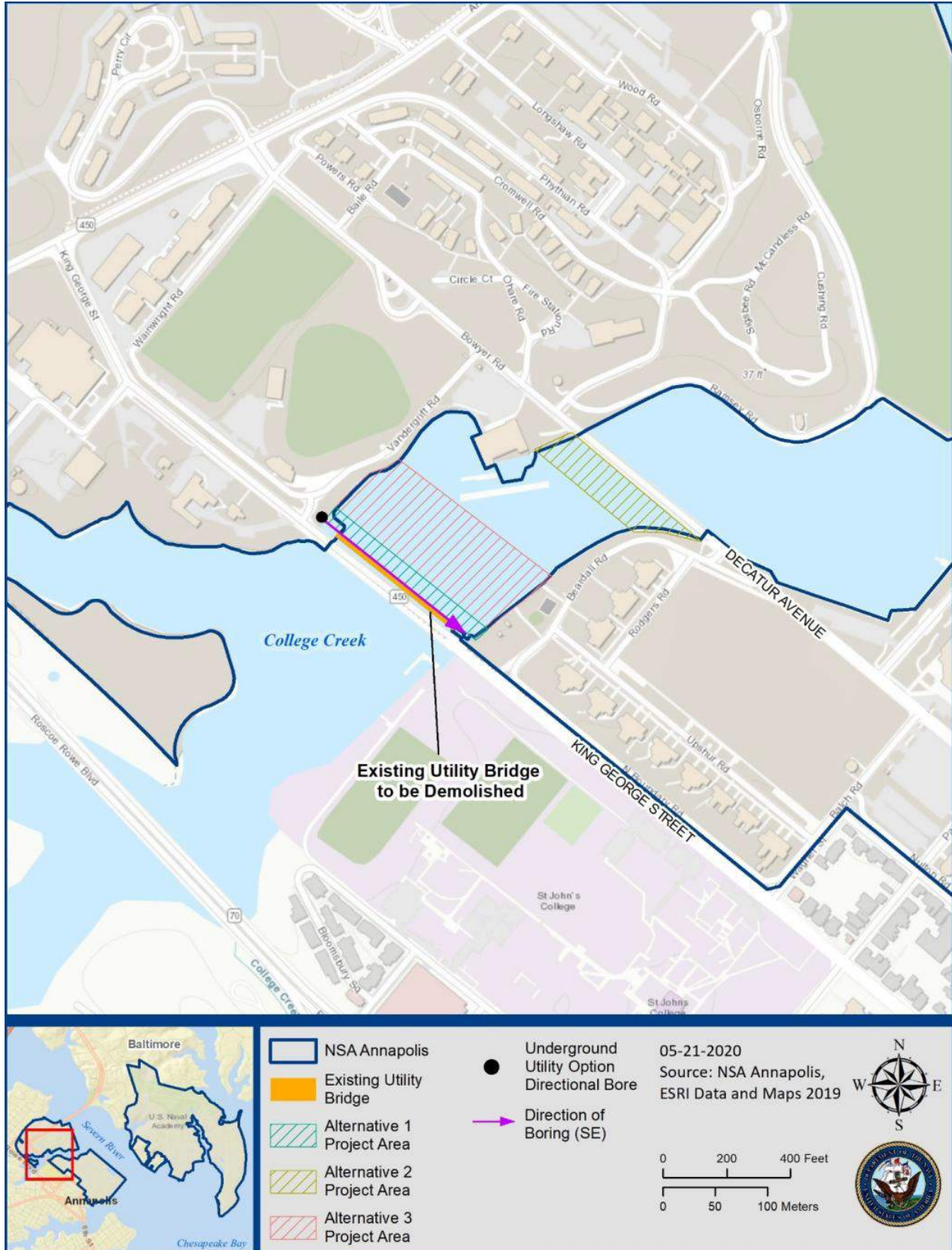


Figure 2-1 Locations of Alternatives

2.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented. The existing utility bridge would continue to deteriorate until failure is imminent or occurs. As discussed in Section 1.4, the utility bridge over College Creek carries utility lines between the Upper Yard and the Lower Yard of the USNA. If the bridge fails, these services would be interrupted, which could interfere with the training of midshipmen.

Currently, the bridge undergoes routine maintenance to ensure the utilities and the surrounding populations are safe. Routine maintenance to the bridge would continue, but no major repairs would occur. The worst-case scenario under the No Action Alternative would be a sudden failure of the bridge, possibly severing the utility lines that cross College Creek. Instantaneous ruptures of pressurized lines could be capable of damaging nearby infrastructure or natural systems. Infrastructure systems that cross on the utility bridge have emergency shut-off protocols in place to minimize the likelihood for catastrophic damage under this worst-case scenario.

The No Action Alternative would not meet the purpose of and need for the Proposed Action; however, the No Action Alternative is carried forward for analysis in this EA to establish a comparative baseline for analysis.

2.3.2 Alternative 1: King George Street Bridge Alignment

Under Alternative 1, the proposed utility bridge would be constructed within 50 feet of the existing utility bridge alignment, which is adjacent to the King George Street Bridge (see Figure 2-2). Given that the King George Street Bridge and the installation boundary are directly south of the current utility bridge, the proposed bridge must be located to the northeast of the current utility bridge location. Therefore, under Alternative 1, the bridge could be constructed in any location between the current utility bridge alignment and 50 feet to the northeast.

The Proposed Action would be implemented as discussed in Section 2.1. During construction of the new utility bridge, the existing bridge and utilities would remain in place until the new structure is completed. Upon completion of the new utility bridge, the existing bridge would be demolished, and the pile caps would be removed and hauled off-site. Pile driving and minor excavation for new pile caps would likely occur. This alternative includes consideration of the environmental impacts associated with the aboveground utility option. A discussion of an underground utility option will also be included, as discussed in Section 2.1.1.

2.3.3 Alternative 2: Decatur Avenue Bridge Alignment

Under Alternative 2, the proposed utility bridge would be constructed within 115 feet of the Decatur Avenue Bridge (Hill Bridge) (see Figure 2-3). As discussed in Section 2.2, the utility bridge needs to be situated southwest of the Decatur Avenue Bridge in order to tie back into utility infrastructure without major realignment. The Proposed Action would be implemented as discussed in Section 2.1, and construction would occur as discussed under Alternative 1 (Section 2.3.2). This alternative includes consideration of the environmental impacts associated with the aboveground utility option. A discussion of an underground utility option will also be included, as discussed in Section 2.1.1.



Figure 2-2 Alternative 1 Site General Location

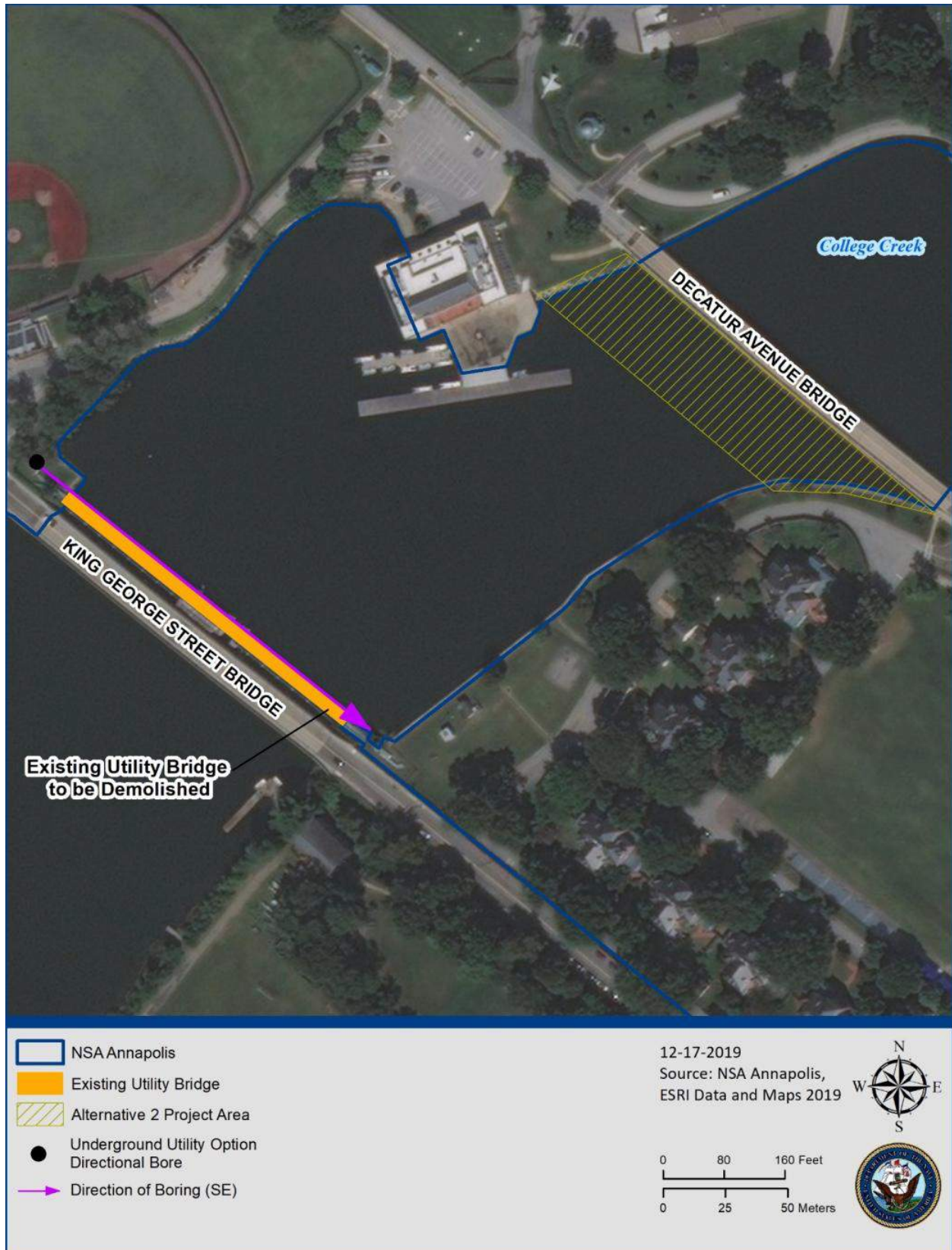


Figure 2-3 Alternative 2 Site General Location

2.3.4 Alternative 3: Between King George Street and Decatur Avenue Bridge Alignment

Under Alternative 3, the proposed utility bridge would be constructed between the locations of Alternatives 1 and 2 (i.e., the remaining approximate 250-foot-width between Alternatives 1 and 2, while also avoiding Hubbard Hall [Building 260] and its associated docks) as shown on Figure 2-4. The Proposed Action would be implemented as discussed in Section 2.1, and construction would occur as discussed under Alternative 1 (Section 2.3.2). This alternative includes consideration of the environmental impacts associated with the aboveground utility option. A discussion of an underground utility option will also be included, as discussed in Section 2.1.1.

2.4 Alternatives Considered but not Carried Forward for Detailed Analysis

The following alternatives were considered but not carried forward for detailed analysis in this EA because they did not satisfy the screening factors in Section 2.2. The three alternatives discussed in Sections 2.3.2, 2.3.3, and 2.3.4 are the only alternatives that fully meet the purpose and need discussed in Section 1.4.

2.4.1 Repair of Existing Utility Bridge

As discussed in Section 1.4, the existing utility bridge structure is aging with multiple failed components and other components in critical need of repair related to the piles, support beams, reinforcements, and surface coatings. Repair of the existing bridge as a possible alternative was considered to extend its life by 5 to 10 years. However, due to the advanced state of deterioration present, the bridge cannot be feasibly repaired to return it to its original weight limits capable of supporting the utilities distribution system. Logistically, bridge repairs would be challenging given that utility lines would have to be removed, which would interrupt service. Therefore, this alternative was eliminated from further analysis.

2.4.2 Attach Utilities to Decatur Avenue Bridge

Placing the utility lines on the existing Decatur Avenue Bridge was considered as an alternative. While Decatur Avenue Bridge is in fair condition, repairs are recommended within 24 months, and the bridge will likely need to be replaced in 5 to 10 years. Given that the proposed utilities are estimated to be replaced in fiscal year 2023, the new utilities would only be in service on Decatur Avenue Bridge for a few years before that bridge would need to be replaced.

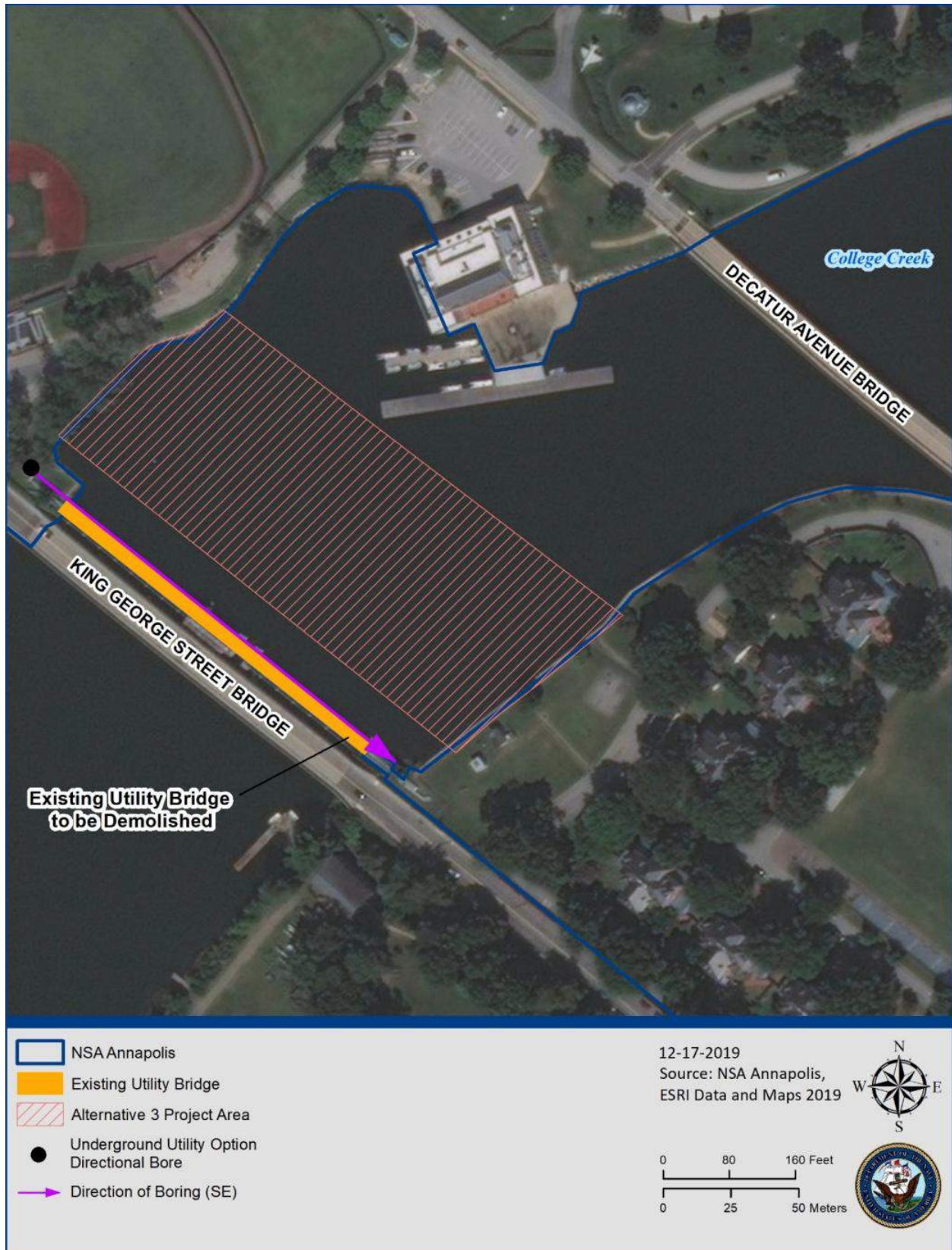


Figure 2-4 Alternative 3 Site General Location

2.5 Best Management Practices Included in the Proposed Action

This section presents an overview of the best management practices (BMPs) that are incorporated into the Proposed Action in this document. BMPs are existing policies, practices, and measures that the Navy would adopt to reduce the environmental impacts of designated activities, functions, or processes. Although BMPs mitigate potential impacts by avoiding, minimizing, or reducing/eliminating impacts, BMPs are distinguished from potential mitigation measures because BMPs are (1) existing requirements for the Proposed Action; (2) ongoing, regularly occurring practices; or (3) not unique to this Proposed Action. In other words, the BMPs identified in this document are inherently part of the Proposed Action and are not potential mitigation measures proposed as a function of the NEPA environmental review process for the Proposed Action. Table 2-1 includes a list of BMPs. Mitigation measures, if applicable, will be discussed separately in Chapter 3.

Table 2-1 Best Management Practices

<i>Best Management Practice</i>	<i>Description</i>	<i>Impacts Reduced/Avoided</i>
Fugitive dust practices	Examples of measures could include wetting soil, covering soil stockpiles, and ceasing operations during high winds.	Control fugitive dust emissions.
Construction equipment	Good housekeeping measures for construction equipment (i.e., petroleum, oil, and/or lubricants) for optimal performance.	Prevent leeching of contaminants into groundwater and surface water.
Erosion and sediment control	Would depend on site conditions and design. Could include silt fences, silt or turbidity curtains, inlet and outlet protection, erosion-control matting, sediment logs, construction entrances, temporary and permanent seeding, mulching, and check dams.	Minimize sediment transport into surface water.

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3 Affected Environment and Environmental Consequences

This chapter presents a description of the environmental resources and baseline conditions that could be affected from implementing any of the alternatives and an analysis of the potential direct and indirect effects of each alternative.

All potentially relevant environmental resource areas were initially considered for analysis in this EA. In compliance with NEPA per CEQ and Navy guidelines, the discussion of the affected environment (i.e., existing conditions) focuses only on those resource areas potentially subject to impacts. In addition, the level of detail used in describing a resource is commensurate with the anticipated level of potential environmental impact.

“Significantly,” as used in NEPA, requires considerations of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole (e.g., human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of a proposed action. For instance, in the case of a site-specific action, significance would usually depend on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant. Intensity refers to the severity or extent of the potential environmental impact, which can be thought of in terms of the potential amount of the likely change. In general, the more sensitive the context, the less intense a potential impact needs to be in order to be considered significant. Likewise, the less sensitive the context, the more intense a potential impact needs to be in order to be considered significant.

This chapter discusses in detail air quality, water resources, geological resources, cultural resources, biological resources, noise, infrastructure, public health and safety, and hazardous materials and wastes. The potential impacts on the following resource areas are considered to be negligible or nonexistent, so they were not analyzed in detail in this EA.

Land Use: The Proposed Action would replace a deteriorating utility bridge. There would be no long-term changes in functional land use at NSA Annapolis; land use off the installation; or regulations, policies, or zoning that could affect land use. Therefore, land use is not analyzed in detail.

Visual Resources: Under the Proposed Action, a replacement bridge would not be expected to dramatically change the viewshed or degrade the visual character of NSA Annapolis. The existing bridge is deteriorating; if left as-is, the bridge would continue to degrade and would be more of a visual detraction. The replacement bridge would be constructed with similar materials and have similar proportions as the existing bridge. Potential visual impacts on historic resources are discussed in Section 3.4, Cultural Resources. Therefore, visual impacts are not analyzed in detail.

Airspace: The Proposed Action would not interfere with airspace use at any point during or after construction. Therefore, airspace is not analyzed in detail.

Transportation: The existing and proposed utility bridge is a service infrastructure bridge; it does not support vehicular or pedestrian traffic. The Proposed Action would result in short-term, localized increases in construction-related traffic in the vicinity of the utility bridge. Gate 6 at the Vandergrift Road intersection is the closest access point to the site alternatives. This gate is along King George Street and provides access to the ballfield area, with the existing utility bridge, Alternative 1 site, and Alternative 3 site to the immediate right upon entering. However, Gate 8 on Bowyer Road is the main access point for contractors, deliveries, and large automobiles, and this is the gate that would likely be used for any project-related construction activities (NAVFAC Washington, 2018a).

Large construction equipment would be transported to the site and generally remain for the duration of construction (approximately one year). Others, such as heavy trucks for hauling construction/demolition debris and delivering construction materials, would arrive more frequently, perhaps one to several per day, depending on the intensity of construction. Construction workers would also arrive to and from the installation each day. Short-term, construction-related traffic would only occur while these activities are on-going and would not contribute to long-term changes in transportation volume at NSA Annapolis. Therefore, transportation is not analyzed in detail.

Socioeconomics: Direct, beneficial effects on the local economy would be expected from the generation of short-term construction jobs, as well as indirect, beneficial effects on the economy from the increase in jobs and income in the area. These effects would be negligible given the size of the regional economy and workforce and would not result in noticeable changes in the population, employment characteristics, schools, or housing occupancy status in the region. No long-term socioeconomic impacts would occur. Therefore, socioeconomic resources are not analyzed in detail.

Environmental Justice: Anne Arundel County is in the 42nd (state) and 23rd (national) percentiles for low-income populations and 39th (state) and 50th (national) for minority populations (USEPA, 2019a). These levels do not meet the U.S. Environmental Protection Agency's (USEPA) recommended threshold of the 80th percentile for further assessing at-risk populations for environmental justice concerns (USEPA, 2016). The Proposed Action would not disproportionately affect minorities or economically disadvantaged populations protected under Executive Order 12898, *Environmental Justice for Low-Income and Minority Populations*. Therefore, environmental justice is not analyzed in detail.

3.1 Air Quality

This discussion of air quality includes criteria pollutants, standards, sources, permitting, and greenhouse gases (GHGs). Air quality in a given location is defined 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.

Most air pollutants originate from human-made sources, including mobile sources (e.g., cars, trucks, buses), stationary sources (e.g., factories, refineries, power plants), and indoor sources (e.g., some building materials and cleaning solvents). Air pollutants can also be released from natural sources such as forest fires. A more detailed discussion of the full regulatory setting applicable to air quality is in Appendix A.

3.1.1 Affected Environment

Under the Clean Air Act, USEPA established National Ambient Air Quality Standards (NAAQS) (40 Code of Federal Regulations [CFR] part 50) for principal pollutants. These pollutants, called "criteria pollutants," include carbon monoxide, sulfur dioxide, nitrogen dioxide, ozone, suspended particulate matter less than or equal to 10 micrometers in diameter (PM₁₀), fine particulate matter less than or equal to 2.5 micrometers in diameter (PM_{2.5}), and lead. Areas that violate a federal air quality standard are designated as nonattainment areas. State Implementation Plans are then prepared to identify the measures by which that area will achieve attainment. Areas that have transitioned from nonattainment to attainment are designated as maintenance areas and are required to adhere to maintenance plans to ensure continued attainment.

NSA Annapolis is in Anne Arundel County, which is within the Metropolitan Baltimore Intrastate Air Quality Control Region (40 CFR 81.28). MDE is responsible for implementing and enforcing state and federal air quality regulations in Maryland. Anne Arundel County is designated as a nonattainment area for eight-hour ozone, with a classification of moderate for the 2008 standard and marginal for the 2015 standard (USEPA, 2019b). A portion of the county, which includes NSA Annapolis, is also in nonattainment for sulfur dioxide under the 2010 standard. Anne Arundel County was formerly classified as a maintenance area for the 1997 PM_{2.5} standard, but this standard was revoked in 2016.

NSA Annapolis is also within an ozone transport region, meaning that regional urban influences from well outside Annapolis and the Metropolitan Baltimore Intrastate Air Quality Control Region also contribute substantially to local ozone pollution. The ozone transport region was established by the 1990 Clean Air Act Amendments and includes Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, the District of Columbia, and portions of the Northern Virginia suburbs. Because Anne Arundel County is in nonattainment for ozone and sulfur dioxide, a General Conformity evaluation is required.

The most recent emissions inventory for Anne Arundel County is shown in Table 3-1. Volatile organic compound and nitrogen oxide emissions are used to represent ozone generation because they are precursors of ozone.

USNA operates under Title V permit no. 24-003-00310 that includes a central heating plant, portable boilers, water heaters, a spray paint booth, and emergency generators (MDE, 2019a). Recent annual criteria pollutant and hazardous air pollutants emissions for USNA are shown in Table 3-2.

In addition to criteria pollutants, USNA quantifies and reports facility-wide GHG emissions annually under the Title V permit requirements, though Prevention of Significant Deterioration requirements for GHG emissions have not been triggered for any construction projects to date. Recent GHG emissions for USNA are shown in Table 3-3.

CEQ's NEPA regulations require evaluation of the degree to which a proposed action affects public health (40 CFR 1508.27). Children, elderly people, and people with illnesses are especially sensitive to the effects of air pollutants; therefore, hospitals, schools, convalescent facilities, and residential areas are sensitive receptors for air quality impacts. The John T. Harrison Health Center at St. John's College, just outside the Lower Yard boundary, is a medical facility within one mile of the project area. Preschools and schools within one mile of the utility bridge include Annapolis Elementary School; St. Mary's Elementary, Middle, and High Schools; Adams Park Elementary School; Calvary Center School; Book of Life Academy; West Annapolis Elementary School; and The Learning Community. Furthermore, Eastport Elementary School, Sunny Acre Private School, Wiley Bates Middle School, Germantown Elementary School, Phoenix Academy, and Weems Creek Nursery School and Kindergarten are just outside the one-mile-radius from the project area. Family housing areas on NSA Annapolis and other residences outside of NSA Annapolis are also within one mile of the project area.

Table 3-1 Anne Arundel County Air Emissions Inventory (2011)

<i>Location</i>	<i>NO_x (tpy)</i>	<i>VOC (tpy)</i>	<i>CO (tpy)</i>	<i>SO₂ (tpy)</i>	<i>PM₁₀ (tpy)</i>	<i>PM_{2.5} (tpy)</i>
Anne Arundel County	16,008	10,652	66,357	13,696	5,477	1,895
Metropolitan Baltimore Intrastate Air Quality Control Region	59,761	45,570	278,054	18,164	40,537	10,332

Source: USEPA, 2014

Note: The Metropolitan Baltimore Intrastate Air Quality Control Region includes Anne Arundel, Baltimore, Carroll, Harford, and Howard Counties and Baltimore City.

Key: NO_x = nitrogen oxides; VOC = volatile organic compound; CO = carbon monoxide; SO₂ = sulfur dioxide; PM₁₀ = suspended particulate matter less than or equal to 10 micrometers in diameter; PM_{2.5} = fine particulate matter less than or equal to 2.5 micrometers in diameter; tpy = tons per year.

Table 3-2 U.S. Naval Academy Air Emissions Inventory

<i>Year</i>	<i>NO_x (tpy)</i>	<i>VOC (tpy)</i>	<i>CO (tpy)</i>	<i>SO₂ (tpy)</i>	<i>PM₁₀ (tpy)</i>	<i>Total HAP (tpy)</i>
2017	13.7	0.8	16.3	0.1	0.30	0.0450
2018	8.2	0.8	11.6	0.8	0.34	0.0140
2019	9.5	0.8	12.5	0.1	0.30	0.0140
Total Potential to Emit	219	8.48	112	446	25.3	2.58

Sources: MDE, 2019a; USNA, 2018

Key: NO_x = nitrogen oxides; VOC = volatile organic compound; CO = carbon monoxide; SO₂ = sulfur dioxide; PM₁₀ = suspended particulate matter less than or equal to 10 micrometers in diameter; HAP = hazardous air pollutants; tpy = tons per year.

Table 3-3 U.S. Naval Academy Greenhouse Gas Emissions Summaries

<i>Year</i>	<i>CO_{2e} from CO₂ (tpy)</i>	<i>CO_{2e} from CH₄ (tpy)</i>	<i>CO_{2e} from N₂O (tpy)</i>	<i>Total CO_{2e} (tpy)</i>
2017	14,959	0.61	0.27	15,055
2018	17,450	0.325	0.313	17,551
2019	16,947	0.357	0.309	17,048
Total Potential to Emit	237,779	3.18	3.31	238,845

Sources: MDE, 2019a; USNA, 2018

Note: Conversion factors for CO_{2e} are different for each greenhouse gas. CO₂ = 1, CH₄ = 25, and N₂O = 298.

Key: CO_{2e} = carbon dioxide equivalents; CO₂ = carbon dioxide; CH₄ = methane; N₂O = nitrous oxide; tpy = tons per year; NR = not reported.

3.1.2 Environmental Consequences

Effects on air quality are based on estimated direct and indirect emissions associated with the action alternatives. The study area for assessing air quality impacts is the air basin in which the project is located, the Metropolitan Baltimore Intrastate Air Quality Control Region.

Estimated emissions from a proposed federal action are typically compared with relevant national and state standards to assess the potential for increases in pollutant concentrations.

3.1.2.1 No Action Alternative

Annapolis is a developed, urban area. Air quality in Anne Arundel County and the Metropolitan Baltimore Intrastate Air Quality Control Region would continue to be affected by local and regional urban influences, such as mobile emissions from vehicles, area sources (e.g., drycleaners and consumer products), and stationary sources (e.g., power plants), as well as sources outside the Metropolitan Baltimore Intrastate Air Quality Control Region as evidenced by Maryland's designation as an ozone transport region. Regional population is expected to increase gradually in the long term, an estimated 6 percent increase from 2015 to 2035 in Anne Arundel County (Anne Arundel County, 2009).

Air quality is expected to continue to be adversely affected by these sources, with some increases possible from the additional population, though continued enforcement of criteria pollutant limits and control measures established in Maryland's State Implementation Plans would continue to be enacted with the long-term goal of achieving attainment with the NAAQS.

Under the No Action Alternative, the Proposed Action would not occur. The Navy would continue to maintain the bridge portions of the structure, which could have localized, intermittent, negligible air emissions from operation of small, hand-held equipment while these activities occur. Conducting routine maintenance as needed is the status quo and would have no noticeable effects on air quality. Under a worst-case scenario of a bridge failure, airborne dust and debris would settle out shortly and have temporary, minor, adverse, localized impacts on air quality. Therefore, no significant impacts on air quality or air resources would occur under the No Action Alternative.

3.1.2.2 Alternative 1 Potential Impacts

Alternative 1 would result in short-term, minor air emissions during construction-related activities. For this analysis, construction activities include both construction of the new utility bridge and demolition of the existing utility bridge. No increases in long-term emissions would be expected because there would be no changes in operations associated with the new utility bridge or new stationary sources of air emissions. Estimated construction emissions would be comparable to but slightly less than those discussed in Section 3.1.2.3 for Alternative 2 because Alternative 1 would require less trenching.

Air Quality Potential Impacts:

- No Action: Negligible air emissions from ongoing, routine maintenance. Temporary, minor, adverse, localized impacts from airborne dust and debris under a worst-case scenario of bridge failure. No significant impacts.
- Alternative 1: Similar to but slightly less than Alternative 2. No significant impacts.
- Alternative 2: Short-term, minor emissions during construction. No significant impacts.
- Alternative 3: Similar to but slightly less than Alternative 2. No significant impacts.
- Option: Additional, short-term, minor emissions from operating boring equipment. No significant impacts.

Appendix C contains more detailed information about project inputs and assumptions used in estimating air emissions. Implementation of Alternative 1 would not result in significant impacts.

3.1.2.3 Alternative 2 Potential Impacts

Alternative 2 would result in short-term, minor air emissions during construction-related activities. For this analysis, construction activities include both construction of the new utility bridge and demolition of the existing utility bridge. Estimated construction emissions are shown in Table 3-4. Appendix C contains more detailed information about project inputs and assumptions used in estimating air emissions. Implementation of Alternative 2 would not result in significant impacts on air quality, as discussed in the following analysis.

Table 3-4 Estimated Air Emissions from Proposed Construction Activities

<i>Activity</i>	<i>NO_x</i> <i>(tpy)</i>	<i>VOC</i> <i>(tpy)</i>	<i>CO</i> <i>(tpy)</i>	<i>SO₂</i> <i>(tpy)</i>	<i>PM₁₀</i> <i>(tpy)</i>	<i>PM_{2.5}</i> <i>(tpy)</i>
Total Construction (1 Year)	0.44	2.06	2.62	0.01	1.07	0.31
Applicable <i>de minimis</i> Thresholds	100	50	–	100	–	–

Key: NO_x = nitrogen oxides; VOC = volatile organic compound; CO = carbon monoxide; SO₂ = sulfur dioxide; PM₁₀ = suspended particulate matter less than or equal to 10 micrometers in diameter; PM_{2.5} = fine particulate matter less than or equal to 2.5 micrometers in diameter; tpy = tons per year.

Criteria Pollutants

Air quality impacts from construction would occur from combustion emissions due to the use of fossil fuel-powered equipment and fugitive dust emissions (i.e., PM₁₀ and PM_{2.5}) during earth-moving activities, construction, demolition, and the operation of equipment on bare soil. As this project is in the planning stages, a detailed construction schedule is not known, though construction is expected to occur in fiscal year 2023. The emissions from the total construction project were estimated based on averages of criteria pollutants emitted from a variety of construction equipment over time or the estimated total miles vehicles would operate. Emissions would include those emitted directly from the construction site, including tractors, loaders, backhoes, graders, dozers, forklifts, cranes, rollers, and trenchers; and those emitted indirectly from various diesel-powered heavy delivery trucks, concrete trucks, and dump trucks and gasoline-powered passenger trucks from construction workers that would travel to and from the site from outside NSA Annapolis. As shown in Table 3-4 and Appendix C, construction equipment emissions would be minor.

Fugitive dust emissions would also occur during construction activities. Fugitive dust occurs directly from vehicles disturbing and suspending particulate matter while operating on unpaved surfaces, or from soil stockpiles on an active construction site; it also occurs indirectly from dust and dirt being brought onto paved surfaces from nonroad construction operations, and then disturbed and suspended as vehicles drive over it. Site preparation and grading activities generally have the greatest potential to generate fugitive dust because excavation, clearing, grading, digging, earthwork, and temporary soil stockpiling are at the highest levels. Measures would be implemented to control fugitive dust emissions, such as wetting dry soil to minimize wind erosion, stabilizing/covering soil stockpiles, or stabilizing/planting disturbed areas that are not being actively worked.

Construction activities would increase the concentration of criteria pollutants in the environment immediately surrounding the construction site. Ambient air quality is generally marginal in and around NSA Annapolis, as evidenced by its status as an ozone and sulfur dioxide nonattainment area. However, estimated emissions under Alternative 2 would not be expected to noticeably diminish air quality or affect sensitive receptors such as nearby medical facilities, schools, and residences outside NSA Annapolis because project emissions would be well below *de minimis* thresholds. Furthermore, emissions would be short term, produced only during construction activities. Projected emissions from Alternative 2 would represent minor regional increases within Anne Arundel County and the Metropolitan Baltimore Intrastate Air Quality Control Region (refer to Table 3-4) and would not violate any NAAQS. Therefore, implementation of Alternative 2 would not result in significant impacts on air quality from criteria pollutant emissions.

General Conformity

A Record of Non-Applicability was prepared and is included in Appendix C. As demonstrated in the Air Conformity Applicability Analysis, also in Appendix C, air emissions would be well below *de minimis* thresholds. Therefore, a full conformity determination is not required.

Greenhouse Gases

Implementation of Alternative 2 would contribute directly to emissions of greenhouse gases from the combustion of fossil fuels. Construction and demolition activities would generate approximately 690 tons (626 metric tons) of carbon dioxide equivalents. These limited emissions would have a negligible effect on the concentration of GHG emissions in the region. Therefore, implementation of Alternative 2 would not result in significant impacts on air quality from GHG emissions.

3.1.2.4 Alternative 3 Potential Impacts

Alternative 3 would result in short-term, minor air emissions during construction-related activities. For this analysis, construction activities include both construction of the new utility bridge and demolition of the existing utility bridge. Estimated construction emissions would be comparable to but slightly less than those discussed in Section 3.1.2.3 for Alternative 2 because Alternative 3 would require less trenching. Appendix C contains more detailed information about project inputs and assumptions used in estimating air emissions. Implementation of Alternative 3 would not result in significant impacts on air quality.

3.1.2.5 Potential Impacts of Underground Utility Option

Short-term, minor emissions would be expected during directional boring to install utilities underground. Estimated utility emissions, which would be in addition to those for general bridge construction and demolition activities, are shown in Table 3-5. Appendix C contains more detailed information about project inputs and assumptions used in estimating air emissions. For a maximum impact scenario, it is assumed that the directional bore would be powered by several large diesel-powered engines, generating localized, short-term, criteria pollutant and GHG emissions. Given the small size of the bore, fugitive dust emissions would be negligible. Implementation of the underground utility option, combined with any of the action alternatives, would not result in significant impacts on air quality.

Table 3-5 Estimated Air Emissions from Proposed Construction Added to Underground Utility Option

<i>Activity</i>	<i>NO_x</i> <i>(tpy)</i>	<i>VOC</i> <i>(tpy)</i>	<i>CO</i> <i>(tpy)</i>	<i>SO₂</i> <i>(tpy)</i>	<i>PM₁₀</i> <i>(tpy)</i>	<i>PM_{2.5}</i> <i>(tpy)</i>
Total Construction (see Table 3-4)	0.44	2.06	2.62	0.01	1.07	0.31
Total Underground Utility Option	2.03	0.06	0.46	0.68	0.06	0.06
Total Construction + Option Emissions	2.47	2.12	3.08	0.69	1.13	0.36
Applicable <i>de minimis</i> Thresholds	100	50	–	100	–	–

Key: NO_x = nitrogen oxides; VOC = volatile organic compound; CO = carbon monoxide; SO₂ = sulfur dioxide; PM₁₀ = suspended particulate matter less than or equal to 10 micrometers in diameter; PM_{2.5} = fine particulate matter less than or equal to 2.5 micrometers in diameter; tpy = tons per year.

3.2 Water Resources

This discussion of water resources includes groundwater, surface water, wetlands, floodplains, shorelines, and coastal zone management. This section also discusses the physical characteristics of water and wetlands; wildlife and vegetation are addressed in Section 3.5, Biological Resources. Bathymetry is discussed in Section 3.3, Geological Resources.

3.2.1 Affected Environment

The following discussions provide a description of the existing conditions for each of the categories under water resources at NSA Annapolis.

3.2.1.1 Groundwater

Groundwater is water that flows or seeps downward and saturates soil or rock, supplying springs and wells. Groundwater is used for water consumption, agricultural irrigation, and industrial applications. Groundwater properties are often described in terms of depth to aquifer, aquifer or well capacity, water quality, and surrounding geologic composition.

Drinking water for the USNA is provided from the Patapsco Aquifer by three groundwater wells located in the Upper and Lower Yards (NSA Annapolis, 2012). The Patapsco Aquifer, which is approximately 600 to 700 feet below the ground surface, continues to experience additional demand as saltwater intrusion concerns for more shallow aquifers has encouraged increased use of this deeper aquifer (U.S. Geological Survey, 2012). The NSA Annapolis Environmental Department monitors groundwater to ensure that surface activities do not affect water quality. A draft wellhead protection plan is under development and will be implemented once finalized.

3.2.1.2 Surface Water

Surface water resources generally consist of wetlands, lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale. A water body can be deemed impaired if water quality analyses conclude that exceedances of water quality standards occur.

The Chesapeake Bay and Severn River are the major surface water features in the vicinity of NSA Annapolis. NSA Annapolis is within the Severn River watershed, which has a drainage area of 70 square miles (USNA, 2001). The Severn River watershed is within the Chesapeake Bay watershed, which comprises all tributaries, backwaters, and side channels and their watersheds that drain into the

Chesapeake Bay in Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia. The Severn River watershed contains the following subbasins near the project area: Carr Creek, College Creek, Mill Creek, Severn River, Shady Lake, and Spa Creek. This portion of the Severn River is at its confluence with the Chesapeake Bay, so tidally interconnected surface waters are brackish in salinity.

The 12.5-mile long Severn River is a tidal tributary of the Chesapeake Bay. It was declared a Scenic River by the General Assembly of Maryland in 1971. Maryland water quality standards specify that all surface waters of the State shall be protected for water contact recreation, fishing, and protection of aquatic life and wildlife. The designated use of the Severn River is Class II, Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting. MDE has identified the waters of the Severn River as impaired by the nutrients nitrogen and phosphorus (1996), sediments (1996), fecal coliform in tidal portions of the basin (1996), and polychlorinated biphenyls (PCBs) in fish tissue (2006) (MDE, 2019b). MDE classifies the tidal areas of the Severn River for nursery use from February 1 to May 31, shallow water submerged aquatic vegetation use from April 1 to October 30 to a depth of one meter, and open water fish and shellfish use year-round (COMAR, 2014).

College Creek is a small tidal creek that flows into the Severn River. The USNA is located at the mouth of College Creek at its confluence with the Severn River. The shoreline of College Creek is mostly natural and forested above the King George Street Bridge, and mostly altered (i.e., bulkhead and riprap shoreline) below the King George Street Bridge along the areas owned by USNA. A watershed assessment was conducted for the College Creek Watershed in 2007, and water quality in the creek was similar to what was measured in nearby Severn River and Magothy River (Friends of College Creek, 2007).

3.2.1.3 Wetlands

Wetlands are jointly defined by USEPA and the USACE as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Wetlands generally include “swamps, marshes, bogs and similar areas.”

An estimated 56 acres of wetlands are found at NSA Annapolis within the installation boundary. At the USNA, the National Wetlands Inventory conducted by the Department of the Interior identified approximately two acres of estuarine emergent and scrub-shrub wetlands adjacent to Shady Lake in the northern Upper Yard. The Shady Lake site is composed of a shallow tidal lagoon connected to the Severn River by a narrow tidal connection. There are no jurisdictional wetlands on NSA Annapolis near the College Creek utility bridge and the action alternatives considered in this EA.

Outside of the installation boundary, the National Wetlands Inventory has defined the surface waters adjacent to the installation (i.e., College Creek, Carr Creek, Mill Creek, Spa Creek, and the Severn River) as estuarine and marine deepwater systems. The estuarine system consists of deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land (NWI, 2013). There are estuarine and marine wetland and freshwater forested/shrub wetlands located in College Creek above the Rowe Boulevard Bridge and within the upland College Creek stream corridor, respectively (NWI, 2019).

3.2.1.4 Floodplains

Floodplains are areas of low-level ground present along rivers, stream channels, large wetlands, or coastal waters. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, and nutrient cycling. Floodplains also help to maintain water quality and are often home to a diverse array of plants and animals. In their natural vegetated state, floodplains slow the rate at which the incoming overland flow reaches the main water body. Floodplain boundaries are most often defined in terms of frequency of inundation, that is, the 100-year and 500-year flood. Floodplain delineation maps are produced by the Federal Emergency Management Agency and provide a basis for comparing the locale of a proposed action to floodplains.

At the USNA, approximately 44.5 acres (13 percent) are within the 100-year floodplain and another 76.59 acres (22 percent) are within the 500-year floodplain. The existing utility bridge is located within the 100-year floodplain, and the three areas analyzed within this EA for the replacement utility bridge are also located within the 100-year floodplain (see Figure 3-1). The 500-year floodplain is just outside of the alternative project boundaries to the south of College Creek.

3.2.1.5 Shorelines

Shorelines can be located along marine (oceans), brackish (estuaries), or fresh (lakes) bodies of water. Physical dynamics of shorelines include tidal influences, channel movement, and hydrological systems, flooding or storm surge areas, erosion and sedimentation, water quality and temperature, presence of nutrients and pathogens, and sites with potential for protection or restoration. Shoreline ecosystems are vital habitat for multiple life stages of many fish, birds, reptiles, amphibians, and invertebrates. Different shore zones provide different kinds and levels of habitat, and, when aggregated, can significantly influence life. Organic matter that is washed onto the shore, or “wrack,” is an important component of shoreline ecosystems, providing habitat for invertebrates, soil and organic matter, and nutrients to both the upland terrestrial communities and aquatic ecosystems.

The USNA has approximately four miles of shoreline along the Severn River, College Creek, and Spa Creek. The College Creek shoreline below the King George Street Bridge, where the action alternatives would occur, consists of hardened seawalls, such as bulkhead and riprap. The seawalls along this shoreline have been assessed as being in varying condition, and the Navy plans to restore and repair all the College Creek seawalls below the King George Street Bridge over the next 20 years as funding becomes available (Navy, 2019).

3.2.1.6 Coastal Zone Management

The USNA is located entirely within Maryland’s coastal zone. Activities conducted along shorelines are reasonably likely to affect use of lands, waters, or natural resources of the coastal zone beyond the boundaries of federal property and must be consistent to the maximum extent practicable with the enforceable policies of Maryland’s Coastal Zone Management Program in accordance with the federal Coastal Zone Management Act of 1972. Maryland’s Coastal Zone Management Program addresses coastal hazards, growth management, habitat and living resources, non-point source pollution, non-tidal wetlands, provision of public access, and tidal wetlands, and it encompasses several state laws and regulatory programs, of which the Clean Water Act is specifically applicable to the Proposed Action.

A memorandum of understanding between the State of Maryland and the Department of Defense, signed May 2013, outlines the application and implementation of certain enforceable policies of Maryland’s Coastal Zone Management Program as they relate to federal actions (State of Maryland and Department of Defense, 2013).

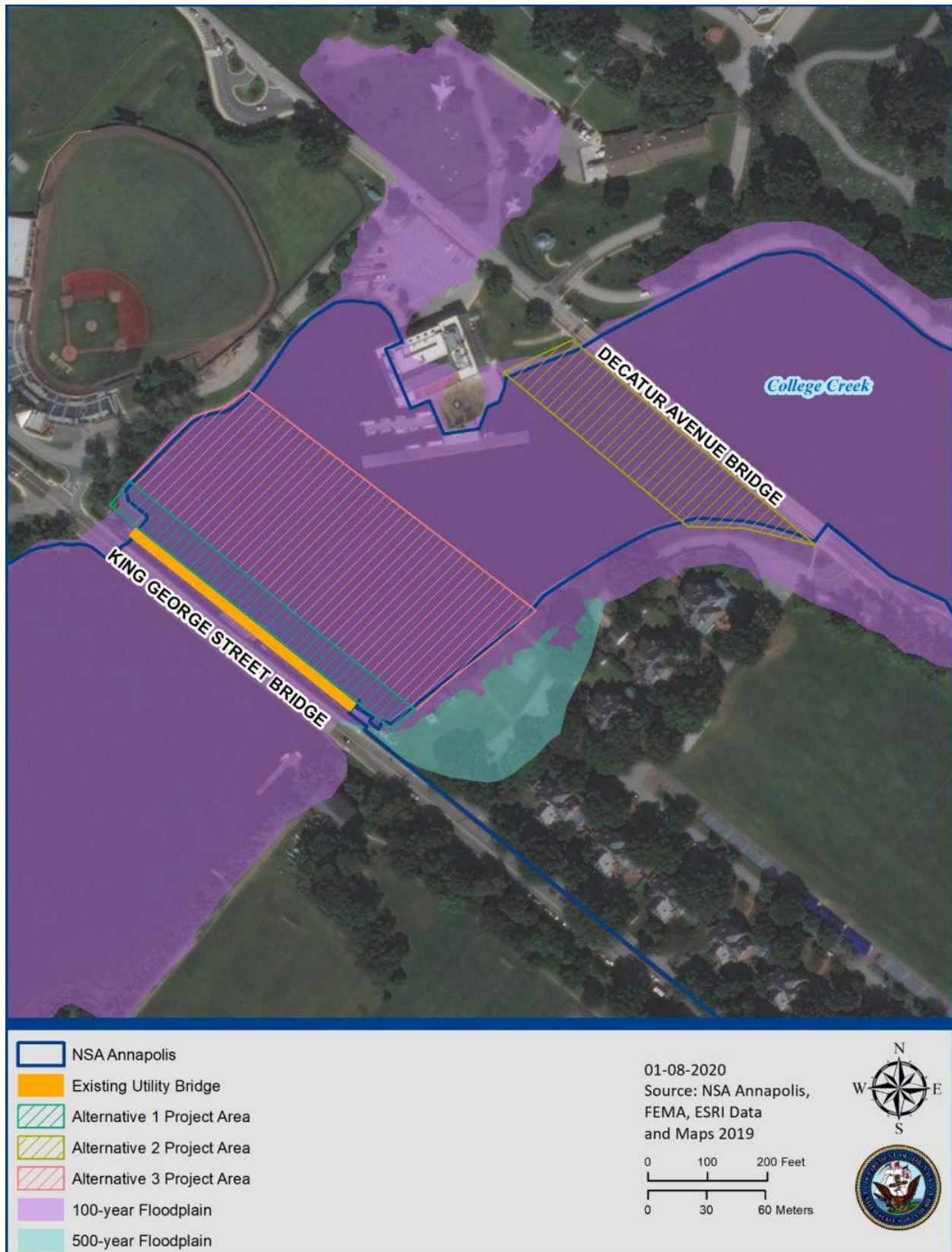


Figure 3-1 Floodplains near the Utility Bridge

3.2.2 Environmental Consequences

In this EA, the analysis of water resources looks at the potential impacts on groundwater, surface water, wetlands, floodplains, shorelines, and coastal zone management. Groundwater analysis focuses on the potential for impacts on the quality, quantity, and accessibility of the water. The analysis of surface water quality considers the potential for impacts that could change the water quality, including both improvements in and degradation of current water quality. The impact assessment of wetlands considers the potential for impacts that could change the local hydrology, soils, or vegetation that support a wetland. The analysis of floodplains considers if any new construction is proposed within a floodplain or could impede the functions of floodplains in conveying floodwaters. The analysis of shorelines considers if the Proposed Action would affect shoreline ecological functions such as channel movement and hydrological systems, flooding or storm surge areas, areas of erosion and sedimentation, water quality and temperature, presence of nutrients and pathogens, and sites with the potential for protection or restoration. Coastal zone management discusses the Proposed Action's consistency with the federally enforceable policies of Maryland's Coastal Zone Management Program, as outlined in the 2013 memorandum of understanding (State of Maryland and Department of Defense, 2013).

3.2.2.1 No Action Alternative

Under the No Action Alternative, the proposed utility bridge replacement would not occur. The conditions of the current utility bridge would continue to decline. According to the 2019 inspection report, the bridge is in poor condition overall, and numerous deficiencies require correction within 12 months. Direct, short-term, moderate impacts on College Creek would be expected under the No Action Alternative if the bridge failed. Under a worst-case scenario of a bridge failure, utility lines could be severed. A sudden discharge of materials into College Creek could kill aquatic wildlife and vegetation and locally decrease dissolved oxygen levels. The depletion of dissolved oxygen would likely create a temporary "dead zone" within College Creek from hypoxia until the creek recovers. Given the proximity of the utility bridge to the confluence with the Severn River, indirect, adverse impacts on water quality within the Severn River would also be expected in the event of a sudden bridge failure.

No impacts on groundwater, wetlands, floodplains, or shorelines would be expected. The potential impacts on surface water would be temporary, and the College Creek aquatic system would recover in time. Therefore, the No Action Alternative would not result in significant impacts.

Water Resources Potential Impacts:

- No Action: Short-term, moderate adverse impacts from a worst-case scenario of a rupture that results in discharges into College Creek. No significant impacts.
- Alternative 1: Short-term, minor adverse impacts from construction within College Creek. No long-term impacts. No significant impacts.
- Alternative 2: Similar to but slightly greater due to more trenching. Alternative 1. No significant impacts.
- Alternative 3: Similar to Alternative 1. No significant impacts.
- Option: Additional negligible impacts since utilities would be below creek sediment bed. No significant impacts.

3.2.2.2 Alternative 1 Potential Impacts

The study area for water resources under Alternative 1 includes groundwater, surface water, wetlands, floodplains, shorelines, and coastal waters in the vicinity of the existing utility bridge and the Alternative 1 project area where construction would occur. Implementation of Alternative 1 would not result in significant impacts on water resources, as discussed in the following sections.

Groundwater

Use of BMPs (e.g., good housekeeping measures for construction equipment containing petroleum, oil, and/or lubricants) would prevent leeching of construction-related contaminants into groundwater resources. Furthermore, implementation of Alternative 1 would not increase the demand on pumped groundwater. Therefore, no effects on groundwater resources would be expected as a result of implementing Alternative 1.

Surface Water

Implementation of Alternative 1 would temporarily affect the water quality of College Creek. Potential impacts would occur during in-water demolition and construction of the utility bridge (bridge piles and supports) from ground disturbance, which leads to increased sedimentation and turbidity. Construction would directly affect surface water within College Creek and indirectly affect surface water bodies downstream from the project area (i.e., the Severn River). Use of BMPs such as turbidity or silt curtains would minimize underwater sediment transport and minimize the short-term impacts on water quality. Although increases in turbidity would occur, impacts would be localized and temporary, lasting only during the removal and installation of bridge piles and supports. Sediments would resettle to the creek bed following completion of in-water activities.

Impacts on water resources from runoff during land construction activities would be minimized by construction management and planning. The Navy would prepare a soil erosion- and sediment-control plan and a stormwater management plan when proposed earth disturbance is more than 5,000 square feet or 100 cubic yards. These plans would be developed in accordance with Maryland soil erosion- and sediment-control guidelines. BMPs specific to each construction site would be identified in these plans. Examples of such BMPs include silt fences, silt or turbidity curtains, inlet and outlet protection, erosion-control matting, sediment logs, construction entrances, temporary and permanent seeding, mulching, check dams, and other measures deemed appropriate for that specific action. The use of appropriate sediment- and erosion-control BMPs during the construction phase would minimize short-term adverse impacts on water resources. Therefore, no significant impacts on surface water would be expected.

Wetlands

Section 404 of the Clean Water Act regulates the discharge of dredged or fill material into waters of the United States. USACE issues this permit, which requires that steps be taken to avoid impacts on aquatic resources, that potential impacts be minimized, and that compensation be provided for all remaining unavoidable impacts. Although the specific construction methods for the proposed bridge have not been completed, Alternative 1 would likely require an individual permit from USACE, and the Navy would comply with any provisions determined under the permit. No jurisdictional wetlands are within or near this area. The Navy would also coordinate with the U.S. Coast Guard to receive authorization for bridge construction under Section 9 of the Rivers and Harbors Act.

College Creek is a non-jurisdictional estuarine and marine deepwater wetland, and work would occur within this tidal wetland. Consequently, a joint federal and state permit for the Alteration of Any Tidal Wetland in Maryland would be required for temporary, construction-related impacts. This permit requires that the action implement BMPs applicable to work in tidal waters and wetlands to mitigate adverse effects. Impacts within College Creek would be temporary and minimized by these BMPs. As such, there would be no net long-term, adverse impacts on estuarine and marine deepwater wetlands from implementation of Alternative 1.

Floodplains

Alternative 1 would be within the 100-year floodplain. Executive Order 11988 directs agencies to avoid impacts on floodplains or, if impacts cannot be avoided, to develop measures to minimize impacts and restore and preserve the floodplain, as appropriate. Under Alternative 1, there would be short-term, minor impacts on floodplains from construction activities adjacent to the shoreline. After construction and demolition are completed, equipment would be removed from the floodplains and the disturbed area restored to the extent practicable to preconstruction conditions. There would be no increase in impervious surface associated with Alternative 1, so runoff characteristics within the floodplain would not be expected to change. Therefore, no significant impacts on floodplains would occur.

Shorelines

Under Alternative 1, the riprap and bulkhead shoreline along College Creek would be integrated or avoided during design or repaired as necessary. The utilities would interconnect just beyond the seawalls on USNA property. Therefore, no significant impacts on shorelines would occur.

Coastal Zone Management

The Alternative 1 project area is within Maryland's coastal zone. In accordance with Section 307 of the Coastal Zone Management Act, the Navy will submit a Federal Consistency Determination to MDE. The determination shows that the Navy finds the activities conducted under Alternative 1 are consistent to the maximum extent practicable with the enforceable policies of Maryland's Coastal Zone Management Program as they relate to federal actions. The MDE will provide comments or concurrence on the Navy's determination, and all correspondence will be included in Appendix B of this EA.

3.2.2.3 Alternative 2 Potential Impacts

The study area for water resources under Alternative 2 includes groundwater, surface water, wetlands, floodplains, shorelines, and coastal waters in the vicinity of the existing utility bridge and the Alternative 2 project area where construction would occur. Impacts from Alternative 2 would be comparable to those described under Alternative 1, though the potential impacts under Alternative 2 could be slightly greater due to the distance between the existing bridge and the Alternative 2 site, resulting in more potential for utility trenching. As the total difference in length would be at most 2,100 feet and along pavements, additional impacts would be negligible. Therefore, implementation of Alternative 2 would not result in significant impacts on water resources.

3.2.2.4 Alternative 3 Potential Impacts

The study area for water resources under Alternative 3 includes groundwater, surface water, wetlands, floodplains, shorelines, and coastal waters in the vicinity of the existing utility bridge and the Alternative 3 project area where construction would occur. Impacts from Alternative 3 would be the same as those described under Alternative 1. Therefore, implementation of Alternative 3 would not result in significant impacts on water resources.

3.2.2.5 Potential Impacts of Underground Utility Option

The study area for the underground utility option includes water resources in the vicinity of the underground utility line (i.e., College Creek and its shoreline). Negligible impacts on water resources would be expected under this utility option. Utility boring and horizontal directional drilling would occur on the banks of the creek and below the sediment bed. In the long term, utility repairs, if needed, would typically be addressed using a guided drill head at the same entry points used for installing the utility piping. If such extensive repairs were needed to require trenching within the creek bed, the Navy would adhere to all necessary permits and regulations. Since the area for the underground utility option would already be disturbed from bridge demolition, impacts would be further minimized. Implementation of the underground utility option, in addition to any of the alternatives, would not result in significant impacts on water resources.

3.3 Geological Resources

Geological resources include topography, geology, and soils. Within water bodies, geological resources also include bathymetry.

The Farmland Protection Policy Act minimizes federal losses of prime or unique farmlands. The project area considered in this EA is primarily aquatic and surrounded by urban development. None of the sites would be considered available for use as farmland. Therefore, prime farmland is not considered further in this EA.

3.3.1 Affected Environment

3.3.1.1 Topography

Topography is typically described with respect to the elevation, slope, and surface features found within a given area. NSA Annapolis is within the Western Shore Lowlands of the Atlantic Coastal Plain Physiographic Province. The topography of USNA is relatively flat, ranging from sea level to 80 feet above mean sea level, with most of the installation around 20 to 40 feet above mean sea level. The project areas along College Creek are between 0 and 15 feet above mean sea level (NAVFAC Washington, 2011).

3.3.1.2 Geology

The geology of an area can include bedrock materials, mineral deposits, and fossil remains. The Atlantic Coastal Plain is underlain by unconsolidated sediments containing gravels, sands, and clays of the Triassic to Quaternary Periods, 100 million years old or younger. Geologic formations occurring in the area include the Aquia Greensand and Matawan Formation, which overlie the Magothy Formation (Navy, 2012). No major geographical structural features or active fault lines are in the Annapolis area; therefore, geologic hazards are not discussed further in this EA.

3.3.1.3 Soils

Soil refers to unconsolidated earthen materials overlying bedrock or other parent material. Soil structure, elasticity, strength, shrink-swell potential, and erodibility determine the ability for the ground to support structures and facilities. Soils are typically described in terms of their type, slope, physical characteristics, and relative compatibility or limitations regarding construction activities and types of land use. Table 3-6 summarizes the soils mapped in the project area.

Table 3-6 Soil Descriptions in the Project Area

<i>Soil Name</i>	<i>Percent Slope</i>	<i>Brief Description of Dominant Soil</i>	<i>Location Within Project Area</i>	<i>Percent of Project Area</i>
Annapolis-Urban land complex	0 to 5%	Annapolis soils: · fine sandy loam texture · strongly acidic · well drained · low shrink-swell potential · nonhydic	Shoreline of Upper and Lower Yards, existing bridge and all alternatives	78%
Annapolis-Urban land complex	5 to 15%	(see previous)	Shoreline of Lower Yard, existing bridge and Alternative 1	19%
Donlonton-Urban land complex	0 to 5%	Donlonton soils: · fine sandy loam and sandy clay loam textures · strongly acidic · moderately well to somewhat poorly drained · low to moderate shrink-swell potential · nonhydic but with hydric components	Shoreline of Upper Yard, Alternative 2	3%

Sources: NRCS, 2017; NRCS, 2015a; NRCS, 2015b; NAVFAC Washington, 2011

Notes: Percent of project area is approximate and excludes College Creek, which is mapped as water.

3.3.1.4 Bathymetry

Bathymetry is described in terms of the topography of the sea floor or river bottoms where a project would occur. In College Creek, between the King George Street Bridge and the Decatur Avenue Bridge, depth is approximately 1 to 2 feet along the Upper Yard shoreline; 9.8 to 10.8 feet in the center of the channel; and 1 to 8.9 feet along the Lower Yard shoreline, as the channel deepens near the Decatur Avenue Bridge (GPS Nautical Charts, 2019).

3.3.2 Environmental Consequences

Geological resources are analyzed in terms of drainage, erosion, and land subsidence. The analysis of topography and soils focuses on the area of soils that would be disturbed, the potential for erosion of soils from construction areas, and the potential for eroded soils to become pollutants in downstream surface water during storm events. Standards and controls would minimize soil impacts and prevent or control pollutant releases into stormwater.

3.3.2.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur, and there would be no change in baseline geological resources. Therefore, no significant impacts on geological resources would occur with implementation of the No Action Alternative.

3.3.2.2 Alternative 1 Potential Impacts

The study area for geological resources under Alternative 1 includes the existing utility bridge and the Alternative 1 project area where construction would occur.

The on-land area of disturbance, including construction of the new bridge followed by demolition of the existing bridge, would disturb an estimated 5,000 square feet. MDE requires preparation of an erosion- and sediment-control plan for activities that disturb more than 5,000 square feet (MDE, 2015). Even if the total area of disturbance were slightly less, given this project's location on the College Creek shoreline, the Navy would use BMPs to limit soil runoff from the construction site into College Creek and downstream water bodies.

Most of the project shoreline is Annapolis-Urban land complex, 0 to 5 percent slopes; Annapolis soils have a medium to very high index for surface runoff (NRCS, 2015a). The existing bridge terminus on the Lower Yard as well as a portion of the Alternative 1 construction area are underlain by Annapolis-Urban land complex, 5 to 15 percent slope. Due to the greater slope, this portion of the project area is more prone to erosion. BMPs would ultimately be selected during design and construction that are best suited for site-specific soil and topography. Alternative 1 could also result in minor changes in the localized topography on-land following completion of construction and demolition, limited to the areas where the new bridge would be constructed, and where the former bridge was situated. Any changes in topography would be consistent with the existing slopes between the shoreline and the creek and would not result in significant changes in drainage.

In-water construction of bridge piles and supports, as well as demolition of the existing bridge, would disturb creek sediments while these activities are occurring. College Creek along the Alternative 1 site is approximately 582 feet across and 9.8 feet at its deepest (GPS Nautical Charts, 2019). In-water construction would use BMPs such as turbidity or silt curtains to minimize sediment transport from the active construction site. Sediments would resettle to the creek bed following completion of in-water activities.

With the use of BMPs, on-land and in-water potential for soil and sediment transport would be short term and minor. Negligible long-term effects would be expected from localized changes in topography. Therefore, implementation of Alternative 1 would not result in significant impacts on geological resources.

Geological Resources Potential Impacts:

- No Action: No change in baseline condition. No significant impacts.
- Alternative 1: Short-term, minor, adverse effects from soil erosion and sedimentation. Minor, localized changes in topography from bridge construction and demolition. No significant impacts.
- Alternative 2: Similar to Alternative 1 but slightly greater due to more trenching. No significant impacts.
- Alternative 3: Similar to Alternative 1. No significant impacts.
- Option: Short-term, minor potential for drilling fluid or other fluid to leak into soils. No significant impact, when combined with any of the action alternatives.

3.3.2.3 Alternative 2 Potential Impacts

The study area for geological resources under Alternative 2 includes the existing utility bridge and the Alternative 2 project area where construction would occur. Alternative 2 would disturb an estimated 5,000 square feet during on-land construction and demolition activities, primarily affecting Annapolis-Urban land complex and Donlonton-Urban land complex, both 0 to 5 percent slope, with a small area having Annapolis-Urban land complex, 5 to 15 percent slope, at the existing bridge. In-water, College Creek is approximately 320 to 500 feet across and 10.8 feet at its deepest (GPS Nautical Charts, 2019). On-land and in-water impacts on geological resources under Alternative 2 would be similar to those described under Alternative 1. However, on-land utility trenching has slightly more potential for soil disturbance under Alternative 2 (a maximum of approximately 2,100 feet more of trenching, accounting for both sides of College Creek). Conversely, the new bridge length over-water would be less than Alternative 1, so Alternative 2 could have slightly less in-water sedimentation. The use of site-specific BMPs would limit the potential for soil erosion and sediment transport. Long-term, localized changes in topography would be minor. Therefore, implementation of Alternative 2 would not result in significant impacts on geological resources.

3.3.2.4 Alternative 3 Potential Impacts

The study area for geological resources under Alternative 3 includes the existing utility bridge and the Alternative 3 project area where construction would occur. Alternative 3 would disturb an estimated 5,000 square feet during on-land construction and demolition activities, primarily affecting Annapolis-Urban land complex (0 to 5 percent slope), as this is the mapped soil beneath the project area on the Upper and Lower Yard, with a small area having 5 to 15 percent slope at the existing bridge. In-water, College Creek is approximately 610 feet across and 9.8 feet at its deepest (GPS Nautical Charts, 2019). On-land and in-water impacts on geological resources under Alternative 3 would be similar to those described under Alternative 1. The use of site-specific BMPs would limit the potential for soil erosion and sediment transport. Long-term, localized changes in topography would be minor. Therefore, implementation of Alternative 3 would not result in significant impacts on geological resources.

3.3.2.5 Potential Impacts of Underground Utility Option

The study area for the underground utility option includes the directional boring near the existing utility bridge, to include the subsurface soils through which the bore would pass. Annapolis soils, which are in the boring vicinity, are typically very deep with a moderately high saturated hydraulic conductivity in the subsoil. The typical pedon is strongly to extremely acidic throughout its profile (NRCS, 2015a). A geotechnical report would be prepared prior to initiating construction activities to ensure that site-specific soil and geologic features are appropriately considered during design. At this time, the required depth of the boring has not been determined. Along the bore path, the depth of College Creek is 9.8 feet deep, therefore, the depth would be deeper than that to ensure avoidance of sensitive aquatic environments.

Short-term risks include the potential for exposure to and leaks of drilling fluid into the soil. High hydraulic conductivity in the deeper Annapolis soil horizons suggests potential for contamination to move within the soil or groundwater in the event of a leak. Construction contractors are responsible for ensuring that the transport, use, storage, and disposal of fluids complies with all applicable federal and state regulations, and that good housekeeping measures are employed so that equipment is in appropriate working order. Adherence to policies, procedures, and regulations would minimize the potential impacts from exposure and accidental releases during construction.

In the long term, the highly acidic Annapolis soils could accelerate corrosion of steel or concrete utility casings or conduits. However, compared with the Proposed Action of attaching utilities to the exterior of the utility bridge, the possibility for underground corrosion is probably not greater than potential surface corrosion and weathering. The selection of appropriate underground casings and conduits for the soil properties would minimize possible long-term damages.

For these reasons, implementation of the underground utility option, in addition to any of the alternatives, would not result in significant impacts on geological resources.

3.4 Cultural Resources

This discussion of cultural resources includes prehistoric and historic archaeological sites; historic buildings, structures, and districts; and physical entities and human-made or natural features important to a culture, a subculture, or a community for traditional, religious, or other reasons. Cultural resources can be divided into three major categories:

- Archaeological resources (prehistoric and historic) are locations where human activity measurably altered the earth or left deposits of physical remains.
- Architectural resources include standing buildings, structures, landscapes, and other built-environment resources of historic or aesthetic significance.
- Traditional cultural properties include archaeological resources, structures, neighborhoods, prominent topographic features, habitat, plants, animals, and minerals that Native Americans or other groups consider essential for the preservation of traditional culture.

3.4.1 Affected Environment

Cultural resources listed in the NRHP or eligible for listing in the NRHP are “historic properties” as defined by the National Historic Preservation Act (NHPA). The list was established under the NHPA and is administered by the National Park Service on behalf of the Secretary of the Interior. The NRHP includes properties on public and private land. Properties can be determined eligible for listing in the NRHP by the Secretary of the Interior or by a federal agency official with concurrence from the applicable State Historic Preservation Office (SHPO). An NRHP-eligible property has the same protections as a property listed in the NRHP. Historic properties include archaeological and architectural resources.

The Navy has conducted inventories of cultural resources at the USNA to identify historic properties that are listed or potentially eligible for listing in the NRHP (NAVFAC Washington, 2018b).

The area of potential effect (APE) for cultural resources is the geographic area or areas within which an undertaking (project, activity, program, or practice) may cause changes in the character or use of any historic properties present. The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking. For this Proposed Action, the Navy determined that the APE is defined as a 400-foot radius around all the alternative project boundaries to include views from which the proposed construction would be visible with an extended APE boundary to the north that includes views to and from Halligan Hall on the Upper Yard. This APE includes a portion of both the Upper and Lower Yards, and a portion of the Colonial Annapolis Historic District. See location map of the Colonial Annapolis Historic District in Figure 3-2 and APE boundaries in Figure 3-3.

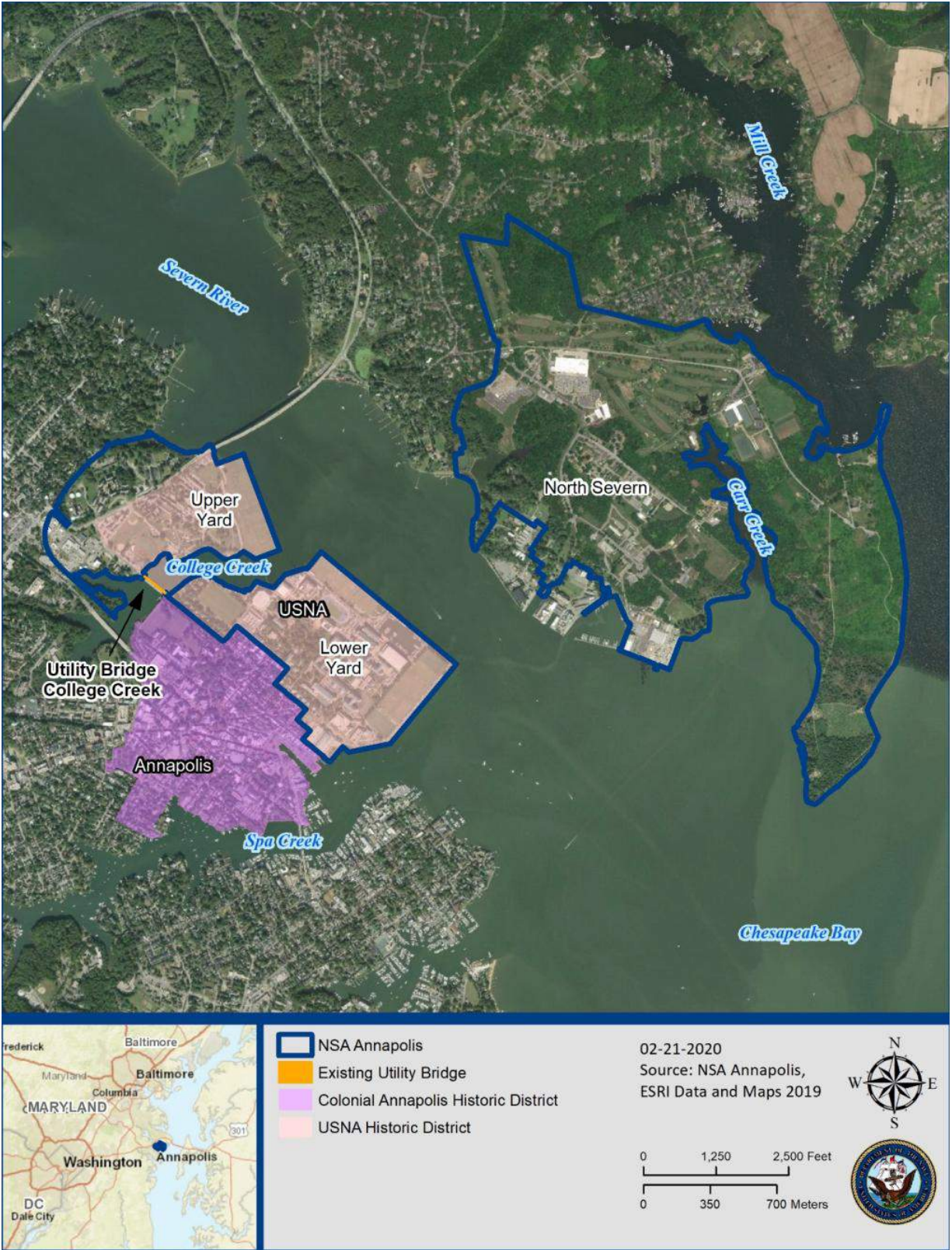


Figure 3-2 Location of Undertaking, the USNA Historic District, and the Colonial Annapolis Historic District



Figure 3-3 Location of Historic Properties Within or Adjacent to the Area of Potential Effect

3.4.1.1 Archaeological Resources

Forty-three archaeological surveys have been conducted at NSA Annapolis including both the Upper and Lower Yards and North Severn Complex. A total of 46 archaeological sites have been identified, counting prehistoric sites and historic domestic and military sites; most of these have not been evaluated. Five sites have been determined NRHP-eligible, and one is listed in the NRHP. None of these sites would be affected by ground disturbance from the undertaking. Four sites are located within approximately a quarter-mile of the three alternatives. Of these four sites, three have been determined not eligible and one has not been evaluated. These would also not be affected by ground disturbance from the Proposed Action (Table 3-7).

Table 3-7 National Register of Historic Places-eligible Archaeological Sites at Naval Support Activity Annapolis and Archaeological Sites Near the Proposed Undertaking

<i>Site Number</i>	<i>NRHP Status</i>	<i>Location</i>	<i>Within 0.25 mile of Proposed Undertaking</i>
18AN550	Listed	North Severn Complex	No
18AP46	Not Evaluated	Upper Yard	Yes
18AP78	Not Eligible	Lower Yard	Yes
18AP79	Not Eligible	Upper Yard	Yes
18AP81	Eligible	Lower Yard	No
18AP82	Eligible	Lower Yard	No
18AP83	Eligible	Lower Yard	No
18AP86	Not Eligible	Upper Yard	Yes
18AN944	Eligible	North Severn Complex	No
18AN1127	Eligible	North Severn Complex	No

Source: NAVFAC Washington, 2018b

Key: NRHP = National Register of Historic Places

3.4.1.2 Architectural Resources

The USNA was designated a National Historic Landmark (NHL) in 1961 and a National Register Historic District in 1966. Both district designations share the same boundary and encompass most of the USNA property. The district includes 139 buildings, structures, and sites that define the USNA character and significance. A variety of landscape features contribute to the district's historical significance, including historic views and vistas, small- and large-scale features, vegetation, and land use (Kuhn & Groesbeck, 2013). Several NRHP-contributing buildings and one NRHP-eligible view are located within the APE (Table 3-8).

A portion of public-private venture housing, managed by the Mid-Atlantic Military Family Communities, LLC, is sited within the APE. These resources are located along Upshur and Rodgers Roads in the Lower Yard of the USNA. Each of these public-private venture-managed resources are NRHP-contributing to the NHL District. This housing is managed under a Programmatic Agreement between the Navy, MHT, and the Advisory Council on Historic Preservation.

Adjacent to the USNA to the southwest is the Colonial Annapolis Historic District, designated an NHL in 1965 and a National Register Historic District in 1966. It covers approximately 230 acres. The only aboveground resource associated with the Colonial Annapolis Historic District that is within view of the proposed project is the Beneficial-Hodson Boathouse located at St. John's College. This resource is sited immediately adjacent to King George Street and faces College Creek.

Table 3-8 Historic Properties within the Area of Potential Effect of the Proposed Undertaking

<i>Facility Number</i>	<i>Facility Name</i>	<i>NRHP Status</i>	<i>Location</i>	<i>Built Date</i>	<i>MHT ID Number</i>	<i>PPV-Managed</i>
41-42	Public Quarters	Contributing	Lower Yard	1897	AA-359	Yes
42a	Detached Garage	Contributing	Lower Yard	1924	AA-359	Yes
43-44	Public Quarters	Contributing	Lower Yard	1899	AA-359	Yes
43a	Detached Garage	Contributing	Lower Yard	1924	AA-359	Yes
44a	Detached Garage	Contributing	Lower Yard	1924	AA-359	Yes
45-46	Public Quarters	Contributing	Lower Yard	1899	AA-359	Yes
46a	Detached Garage	Contributing	Lower Yard	1924	AA-359	Yes
47-48	Public Quarters	Contributing	Lower Yard	1899	AA-359	Yes
47a	Detached Garage	Contributing	Lower Yard	1924	AA-359	Yes
49-50	Public Quarters	Contributing	Lower Yard	1899	AA-359	Yes
49a	Detached Garage	Contributing	Lower Yard	1924	AA-359	Yes
51*	Public Quarters	Contributing	Upper Yard	1904	AA-359; AA-2201	—
146A	W. H. G. Fitzgerald Clubhouse	Non-contributing	Upper Yard	1995	AA-359	—
146B	Locker house	Not Evaluated	Upper Yard	N/A	—	—
181	Halligan Hall	Contributing	Upper Yard	1903	AA-2202	—
194*	Public Works Maintenance Storage	Contributing	Upper Yard	1904	AA-359; AA-2201	—
260	Hubbard Hall	Contributing	Upper Yard	1930	AA-359; AA-2201	—
263	Grounds Equipment Shed	Contributing	Lower Yard	1928	AA-359; AA-2201	—
273	Lower Field Substation	Contributing	Upper Yard	1932	AA-359	—
326	Sewage Pumping Station	Not Evaluated	Lower Yard	1944	—	—
370	Pump Station #2	Contributing	Upper Yard	1957	AA-359	—
446	Fire Station #1	Not Evaluated	Upper Yard	1997	—	—
448	Well	Not Evaluated	Lower Yard	1962	—	—
683	Pump House for Well #16	Not Evaluated	Lower Yard	1991	—	—
687	Class of 1941 Observatory	Not Evaluated	Upper Yard	1991	—	—
n/a	View to and from Halligan Hall	Contributing (significant landscape feature)	Upper and Lower Yard	1920s–present	—	—
n/a	Beneficial-Hodson Boathouse, St. John's College	Contributing: Colonial Annapolis Historic District	St. John's College	1934	AA-2046; AA-2208	—

Source: NAVFAC Washington, 2018b

Note: *Buildings 51 and 194 are planned for demolition prior to the construction of the utility bridge under a separate and unrelated action.

Key: ID = identification; MHT = Maryland Historical Trust; NRHP = National Register of Historic Places; and PPV = Public-Private Venture.

3.4.1.3 Traditional Cultural Properties

No traditional cultural properties are known to be located within the Upper and Lower Yards of USNA.

3.4.2 Environmental Consequences

Analysis of potential impacts on cultural resources considers both direct and indirect impacts. Direct impacts can be the result of physically altering, damaging, or destroying all or part of a resource. Indirect impacts is defined as altering characteristics of the surrounding environment that contribute to the importance of the resource; introducing visual, atmospheric, or audible elements that are out of character for the period the resource represents (thereby altering the setting); or neglecting the resource to the extent that it deteriorates or is destroyed.

3.4.2.1 No Action Alternative

Under the No Action Alternative, the utility bridge would continue to deteriorate, and various utilities provided to the USNA, such as heat and hot water, would be negatively affected. In the worst-case scenario of the No Action Alternative, the bridge would fail and cause a utility line rupture, which could cause possible adverse effects on nearby cultural resources. The extent of such a rupture is unknown, but there could be possible direct effects on nearby historic properties. In addition, a rupture could cause indirect adverse effects due to the vibrations caused by such an event. The vibrations could potentially damage foundations, windows, framing, plaster, chimneys, and aesthetic features of nearby historic buildings, the majority of which are contributing to the NHL district. These adverse effects would not affect the NRHP status of these affected cultural resources and their ability to convey their historic significance to the historic district. Therefore, the No Action Alternative would not result in significant impacts on cultural resources.

3.4.2.2 Alternative 1 Potential Impacts

The APE for cultural resources under Alternative 1 is the same for all three alternatives: a 400-foot buffer around the alternative project boundaries with an extended boundary to the north that includes views to and from Halligan Hall (Building 181) on the Upper Yard. This includes all cultural resources that may have the project area within its viewshed.

Cultural Resources Potential Impacts:

- No Action: Possible direct adverse effects from worst-case scenario depending on the extent of a rupture. Possible indirect adverse effects from the worst-case scenario due to the vibrations from a rupture. No significant impacts.
- Alternative 1: Minor-to-moderate, adverse effects on unknown archaeological deposits due to ground disturbance of the new bridge; a Phase I survey would be completed. No adverse effects on viewsheds in the APE. No adverse effects on the Colonial Annapolis Historic District. No significant impacts.
- Alternative 2: Minor-to-moderate, adverse effects on unknown archaeological deposits due to ground disturbance of the new bridge; a Phase I survey would be completed. No adverse effects on viewsheds in the APE. No adverse effects on the Colonial Annapolis Historic District. No significant impacts.
- Alternative 3: Minor-to-moderate, adverse effects on unknown archaeological deposits due to ground disturbance of the new bridge; a Phase I survey would be completed. No adverse effects on viewsheds in the APE. No adverse effects on the Colonial Annapolis Historic District. No significant impacts.
- Option: The Navy would follow SOP on unanticipated discoveries. No significant impacts.

The construction of the new utility bridge adjacent to the current bridge could have minor-to-moderate, adverse effects on unknown archaeological resources along the shoreline and in College Creek where there would be ground disturbance. The northwest shoreline is previously disturbed from the construction of the baseball stadium, Vandergrift Road, Hubbard Hall boathouse and associated parking, installation of underground utilities, and hardened seawalls lining College Creek. Therefore, intact archaeological resources are unlikely to be present on the northwest shoreline of College Creek. A Phase 1 survey of the southeast shoreline would be conducted prior to any ground disturbance.

There would be no direct adverse effects on architectural resources from the construction of a new utility bridge and the demolition of the current bridge under Alternative 1.

On USNA, the construction of the new utility bridge would introduce a new element within the viewshed to and from Halligan Hall, as well as all of the NRHP-eligible resources in the APE: USNA Buildings 41–51, 194, 260, 263, 273, and 370, as shown in Figure 3-4. It must be noted that Buildings 51 and 194 are planned for demolition prior to the construction of the utility bridge under a separate, unrelated action. The bridge would be along the edge of the district line and along an existing roadway and would not obstruct the view from Halligan Hall across College Creek to the Lower Yard. Furthermore, this location is within the same approximate location of the current utility bridge, which was in place when the viewshed was determined contributing. Therefore, Alternative 1 would have no adverse effect on the USNA.

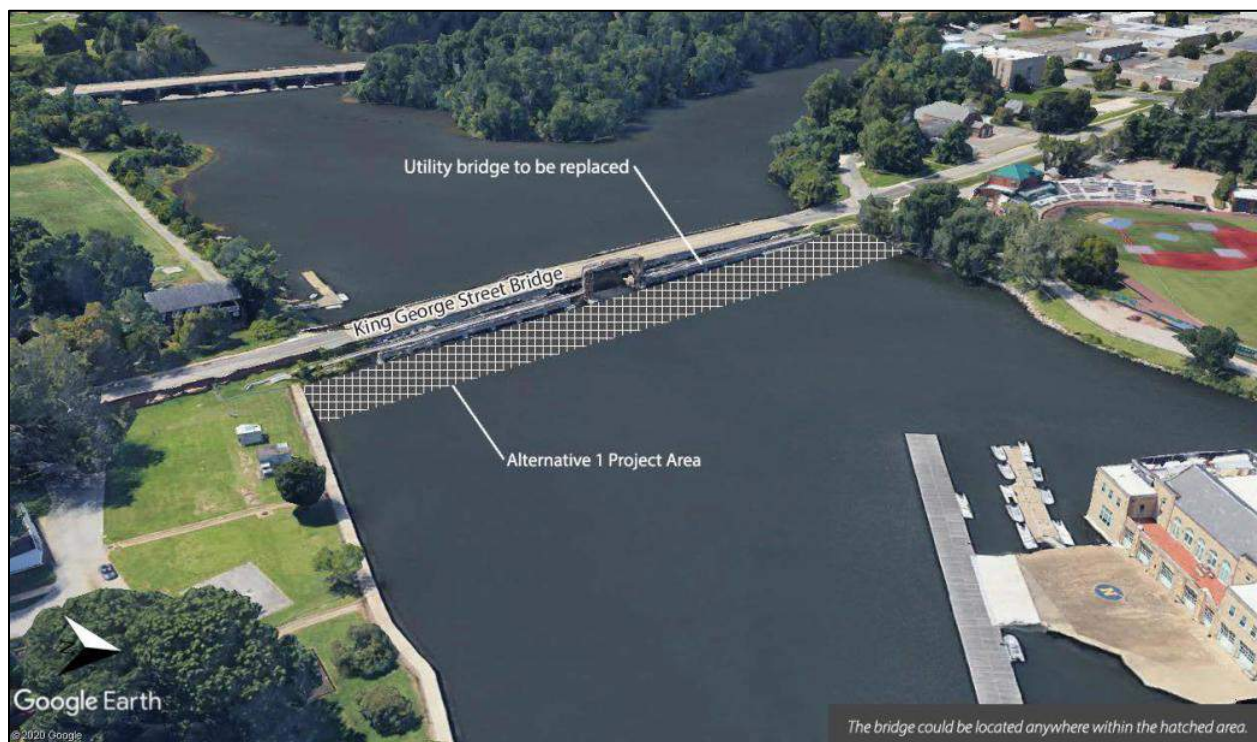


Figure 3-4 Viewshed around Alternative 1 Location

The new utility bridge under Alternative 1 would be only minimally visible from the Colonial Annapolis Historic District, specifically from the St. Johns College Beneficial-Hodson Boathouse, which is sited immediately adjacent to King George Street and faces College Creek. Visibility would be limited to the northern corner of the Historic District and would be partially obstructed by the King George Street Bridge. No significant viewsheds within the Colonial Annapolis Historic District would be affected; therefore, Alternative 1 would have no adverse effect on the Historic District.

There could be minor-to-moderate, adverse effects on unknown archaeological deposits due to ground disturbance of the new bridge. No adverse effects on viewsheds in the APE or the Colonial Annapolis Historic District would occur. Implementation of Alternative 1 would not result in significant impacts on cultural resources.

3.4.2.3 Alternative 2 Potential Impacts

The APE for cultural resources under Alternative 2 is the same as Alternative 1 and includes a 400-foot buffer around the alternative project boundaries with an extended boundary to the north that includes views to and from Halligan Hall (Building 181) on the Upper Yard. There could be adverse effects on unknown archaeological resources similar to Alternative 1; a Phase 1 survey of the southeast shoreline would be conducted prior to any ground disturbance.

On USNA, the construction of the new utility bridge would introduce a new element within the viewshed to and from Halligan Hall (see Figure 3-5). The new bridge would also introduce a new visual element to and from Hubbard Hall (Building 260), and to and from Quarters 41–50. This alternative may alter the visual connection between the Upper and Lower Yards, which is historically significant; however, the closer proximity to the Decatur Avenue Bridge minimizes its potential visual impact on surrounding viewsheds. Furthermore, this would not obstruct the view from Halligan Hall across College Creek to the Lower Yard. Therefore, Alternative 2 would have no adverse effect on the USNA.

There could be minor-to-moderate, adverse effects on unknown archaeological deposits due to ground disturbance of the new bridge. No adverse effects on viewsheds in the APE or the Colonial Annapolis Historic District would occur. This alternative is not within the viewshed of Colonial Annapolis Historic District nor USNA Buildings 51 and 194, and, therefore, would have no adverse effects on these cultural resources. Therefore, implementation of Alternative 2 would not result in significant impacts on cultural resources.

3.4.2.4 Alternative 3 Potential Impacts

The APE for cultural resources under Alternative 3 is the same as Alternative 1 and includes a 400-foot buffer around the alternative project boundaries with an extended APE boundary to the north that includes views to and from Halligan Hall on the Upper Yard. There could be adverse effects on unknown archaeological resources similar to Alternative 1; a Phase 1 survey of the southeast shoreline would be conducted prior to any ground disturbance.

On USNA, the construction of the new utility bridge would introduce a new element within the viewshed to and from Halligan Hall, as well as to and from Hubbard Hall (Building 260) and to and from Quarters 41–50 (see Figure 3-6). The utility bridge within this alternative would be independent of other built resources and associated features that could minimize its impact, as in Alternative 1. The utility bridge would be constructed on “open” water in an open viewshed. There could be minor, adverse effects on the viewshed associated with USNA Building 51 due to the distance and obstructing vegetation, until such time as Building 51 is demolished under a separate and unrelated action. However, the new bridge would not obstruct the view from Halligan Hall across College Creek to the Lower Yard. Therefore, Alternative 3 would have no adverse effect on the USNA.



Figure 3-5 Viewshed around Alternative 2 Location

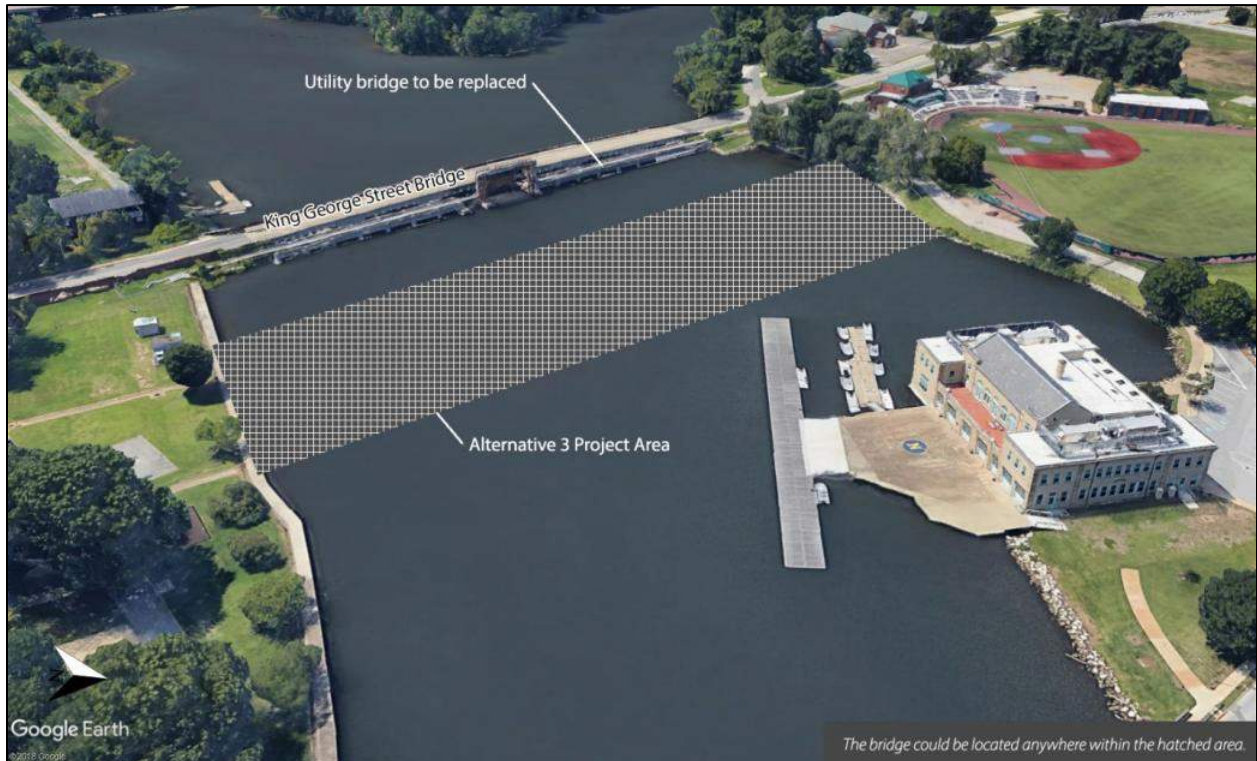


Figure 3-6 Viewshed around Alternative 3 Location

This alternative may also be visible, although minimally, from the Colonial Annapolis Historic District. Visual obstruction by the King Street Bridge reduces the effects of a new bridge in this location to the Colonial Annapolis Historic District. Therefore, this alternative would have no adverse effect on the Colonial Annapolis Historic District.

Therefore, implementation of Alternative 3 would not result in significant impacts on cultural resources.

3.4.2.5 Potential Impacts of Underground Utility Option

The APE for the underground utility option is the same as Alternative 1 and includes a 400-foot buffer around the alternative project boundaries with an extended APE boundary to the north to include views to and from Halligan Hall on the Upper Yard. The underground utility option would bore all the utilities underground except for one utility line, which would remain aboveground and attached to the proposed utility bridge structure. The utilities would be bored underneath College Creek using a technique such as horizontal directional drilling. However, because survey of the area under the creek is not possible using traditional survey methods, there is the potential to encounter unanticipated discoveries during this option. Similar to Alternative 1, there could be minor-to-moderate, adverse effects on unknown archaeological deposits due to ground disturbance of the underground utilities. In the event on an unanticipated discovery, the Navy would follow specific procedures detailed in Standard Operating Procedure (SOP) 4 of the Integrated Cultural Resources Management Plan. Therefore, implementation of the underground utility option, in addition to any of the alternatives, would not result in significant impacts on cultural resources.

3.5 Biological Resources

Biological resources include living, native, or naturalized plant and animal species and the habitats within which they occur. Plant associations are referred to generally as vegetation, and animal species are referred to generally as wildlife. Habitat can be defined as the resources and conditions present in an area that support a plant or animal.

Within this EA, biological resources are divided into three major categories: (1) terrestrial vegetation, (2) terrestrial wildlife, and (3) marine species.

3.5.1 Affected Environment

No federal rare, threatened, or endangered species are known to occur at NSA Annapolis, but several protected species have potential to occur. Northern long-eared bat (*Myotis septentrionalis*), a federally threatened species, has not been documented on NSA Annapolis (NAVFAC Washington, 2017), but is considered by USFWS to be potentially present within the project area (USFWS, 2020a). The bald eagle (*Haliaeetus leucocephalus*), which is delisted but still protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act, is present in the vicinity. The closest bald eagle nest is documented south of the Chesapeake Bay Bridge, approximately two miles east of NSA Annapolis (NAVFAC Washington, 2011).

In addition, some protected fish and marine mammals have potential to be present in the waters near NSA Annapolis. Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and shortnose sturgeon (*Acipenser brevirostrum*), both listed as endangered under the Endangered Species Act, are present in the Chesapeake Bay and some of its tributary rivers but are unlikely to be present in College Creek or the Severn River. Several federally protected marine mammal and sea turtle species also have the potential to occur in the Chesapeake Bay; bottlenose dolphin (*Tursiops truncatus*) has been observed in the

Severn River near NSA Annapolis but other marine mammals and sea turtles have not. These species are discussed further in Section 3.5.2.3. Protected species, including state-listed species, are discussed in each respective section below.

3.5.1.1 Terrestrial Vegetation

Terrestrial vegetation includes plants in upland and freshwater aquatic (e.g., wetlands, freshwater streams and rivers) environments.

NSA Annapolis contains diverse vegetation communities including forested areas, grasslands, improved (developed) land, and agricultural fields. The Upper and Lower Yards of the USNA are predominantly landscaped areas and improved lands apart from a small four-acre forested peninsula reaching into College Creek approximately 450 feet upstream from the utility bridge. This four-acre peninsula is the last tract of mature natural forest within the City of Annapolis (NAVFAC Washington, 2011).

No forests or woodlands exist along the College Creek banks where the utility bridge and alternative project boundaries are located; the land in these locations consists of maintained lawn with some landscaped and urban trees and shrubs along the existing seawall.

No federally listed threatened, endangered, or candidate plant species occur on NSA Annapolis. Terrestrial surveys were conducted at USNA and Greenbury Point (part of North Severn) in 1996, but aquatic surveys of the adjacent creeks and rivers were not conducted. The 1996 survey identified Lancaster's sedge (*Cyperus lancastris*), which is considered "Status Uncertain" by MDNR Wildlife and Heritage Service. Subsequent surveys also identified grass-leaved arrowhead (*Sagittaria graminea*), also listed as "Status Uncertain," and broad-fruited bur-reed (*Sparganium eurycarpum*), classified as S3, rare-to-uncommon in the state. Carolina milkvine (*Matelea carolinensis*) is considered state endangered and classified as S2S3, rare-to-vulnerable in the state (MDNR, 2019). The species has been observed in several locations in North Severn but does not exist along the College Creek shoreline.

3.5.1.2 Terrestrial Wildlife

Terrestrial wildlife includes all animal species (i.e., insects and other invertebrates, freshwater fish, amphibians, reptiles, birds, and mammals) focusing on the species and habitat features of greatest importance or interest. Fish resources at and near NSA Annapolis are found in the brackish/saltwater fisheries of the Severn River, College Creek, Spa Creek, Carr Creek, and Mill Creek. Since these water bodies are not freshwater, fish are described in Section 3.5.2.3, Marine Species.

NSA Annapolis provides food, cover, and nesting opportunities for a variety of wildlife species, many of which use NSA Annapolis for all or part of their life cycle requirements. Generally, the wildlife species (mammals, birds, reptiles, amphibians, and insects) known to occur at NSA Annapolis are consistent with native fauna communities throughout the mid-Atlantic coastal region. Although detailed fauna surveys have not been completed, the habitat diversity at NSA Annapolis provides valuable breeding, foraging, and stopover habitat for many species in the increasingly urbanized Annapolis area. NSA Annapolis is also home to a variety of nuisance wildlife and feral pets. White-tailed deer (*Odocoileus virginianus*), resident Canada goose (*Branta canadensis*), raccoon (*Procyon lotor*), and feral cats (*Felis catus*) are the most prominent nuisance species of concern.

Amphibians and Reptiles

An amphibian and reptile survey was conducted in 1997 and 1998 at Greenbury Point on North Severn and the four-acre woods peninsula on the Upper Yard along College Creek. Eight species of frogs and toads were observed over the two-year period, including the American toad (*Bufo americanus*), gray treefrog (*Hyla versicolor*), spring peeper (*Pseudacris crucifer*), bullfrog (*Rana catesbeiana*), green frog (*Rana clamitans*), pickerel frog (*Rana palustris*), wood frog (*Rana sylvatica*), and southern leopard frog (*Rana utricularia*). Five species of turtles, five species of snakes, and one salamander species were also observed. The turtles found include the common snapping turtle (*Chelydra serpentina*), northern diamondback terrapin (*Malaclemys terrapin*), eastern mud turtle (*Kinosternon subrubrum*), eastern painted turtle (*Chrysemys picta*), and eastern box turtle (*Terrapene carolina*). Snake species include the eastern worm snake (*Carphophis amoenus*), northern black racer (*Coluber constrictor*), black rat snake (*Elaphe obsoleta*), northern water snake (*Nerodia sipedon*), and eastern garter snake (*Thamnophis sirtalis*). The redback salamander (*Plethodon cinereus*) was also observed (NAVFAC Washington, 2016).

Mammals

General observations of mammals at NSA Annapolis include white-tailed deer, groundhog (*Marmota monax*), eastern cottontail (*Sylvilagus floridanus*), raccoon, gray squirrel (*Sciurus carolinensis*), gray fox (*Urocyon cinereoargenteus*), and red fox (*Vulpes vulpes*). Small mammals that have been observed at NSA Annapolis include short-tailed shrew (*Blarina brevicauda*), eastern mole (*Scalopus aquaticus*), meadow vole (*Microtus pennsylvanicus*), and house mouse (*Mus musculus*) (NAVFAC Washington, 2011). An acoustic survey for bats was conducted in May 2016, documenting the following bat species at NSA Annapolis: the big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), silver-haired bat (*Lasionycteris noctivagans*), evening bat (*Nycticeius humeralis*), and hoary bat (*Lasiurus cinereus*) (NAVFAC Washington, 2017). An acoustic bat survey conducted in June 2019 also documented little brown bat (*Myotis lucifugus*) at NSA Annapolis (NAVFAC Washington, 2020). A list of federally protected species potentially present within the project area was obtained from the USFWS through their Information for Planning and Consultation (IPaC) tool, and the northern long-eared bat (*Myotis septentrionalis*), a federally threatened species, was listed as potentially occurring (USFWS, 2020a). Acoustic and mist-net bat surveys were conducted at NSA Annapolis in 2016, and northern long-eared bat was not observed (NAVFAC Washington, 2017).

Birds

Over 150 bird species have been documented at NSA Annapolis and the adjacent water bodies, including songbirds, shorebirds, wading birds, waterfowl, and raptors. Common bird species in the region frequently use the installation's open areas, forested areas, and urban settings. The marshes and shoreline of NSA Annapolis provide habitat for several shorebirds and wading birds including several gull species, the great blue heron (*Ardea herodias*), snowy egret (*Egretta thula*), and green heron (*Butorides virescens*), as well as numerous red-winged blackbirds (*Agelaius phoeniceus*). Osprey (*Pandion haliaetus*), bald eagle, forest interior dwelling birds, and waterfowl are common in the region.

The ecological communities at NSA Annapolis provide important stopover habitat for migratory birds during spring and fall migration, which are protected under the Migratory Bird Treaty Act. Maryland is an important stopover for breeding and overwintering in the Atlantic Flyway, a major migratory flight route in North America, especially for waterfowl in winter and wading birds in summer (NAVFAC Washington, 2011). College Creek is considered a historic waterfowl concentration area by the Maryland Department of Natural Resources Wildlife and Heritage Service.

Several state-listed endangered bird species—mourning warbler (*Geothlypis philadelphia*), royal tern (*Thalasseus maximus*), and short-eared owl (*Asio flammeus*)—and one state-listed threatened species—least tern (*Sterna antillarum*)—have been observed at or near North Severn.

Invertebrates

Many butterfly species are known to occur at Greenbury Point on North Severn. The most commonly occurring butterflies include the orange sulphur (*Colias eurytheme*), clouded sulphur (*Colias philodice*), common buckeye (*Junonia coenia*), cabbage white (*Pieris rapae*), and monarch (*Danaus plexippus*). Monarch butterfly is under USFWS review for listing under the Endangered Species Act (USFWS, n.d.).

3.5.1.3 Marine Species

Marine Vegetation

Marine vegetation includes plants occurring in marine or estuarine waters, which may include algae and various grasses.

Submerged aquatic vegetation (SAV) beds are considered Special Aquatic Sites under Section 404 of the Clean Water Act (40 CFR Part 230, Section 404 (b)(1)) and are an important resource in the Chesapeake Bay. SAV provide protection and nursery habitat for a broad range of aquatic organisms and contribute to the oxygenation of the water.

NSA Annapolis has not conducted surveys for SAV on or near the installation. However, ongoing mapping of SAV by organizations such as the Chesapeake Bay Foundation and local watershed groups such as Friends of College Creek have mapped SAV in several rivers and creeks along NSA Annapolis. Mapping efforts in College Creek indicates SAV occurring in the area but limited to the upper portions of the creek. No SAV has been found in the portions of the creek to the east of King George Street Bridge, and the shoreline of bulkhead and riprap along this section does not provide suitable SAV habitat (Friends of College Creek, 2007). Based on available regional data, one species of SAV, claspingleaf pondweed (*Potamogeton perfoliatus*), which is classified as S3 by MDNR Wildlife and Heritage Service, has been mapped in the upper portion of College Creek (NAVFAC Washington, 2011).

Marine Mammals and Sea Turtles

The National Oceanic and Atmospheric Administration (NOAA) Fisheries maintains jurisdiction over whales, dolphins, porpoises, seals, and sea lions. USFWS maintains jurisdiction for certain other marine mammal species, including walrus, polar bears, dugongs, sea otters, and manatees. USFWS and NOAA Fisheries share federal jurisdiction for sea turtles with the USFWS having lead responsibility on the nesting beaches and NOAA Fisheries on the marine environment.

Ten marine mammal species and five sea turtle species have been recorded in the Chesapeake Bay and may occur, if rarely, in the vicinity of NSA Annapolis. Table 3-9 lists the species that have known occurrence within the Chesapeake Bay, and provides details regarding the likelihood of these species occurring near NSA Annapolis.

Table 3-9 Marine Mammals and Sea Turtles With Potential to Occur Near NSA Annapolis

<i>Common Name</i>	<i>Scientific Name</i>	<i>ESA Status</i>	<i>Stranding, bycatch or sightings near NSA Annapolis</i>
North Atlantic right whale	<i>Eubalaena glacialis</i>	FE	No
Humpback whale – West Indies DPS	<i>Megaptera novaeangliae</i>	Not listed	No
Fin whale	<i>Balaenoptera physalus</i>	FE	No
West Indian manatee	<i>Trichechus manatus</i>	FT	No
Bottlenose dolphin	<i>Tursiops truncatus</i>	Not listed	Observed at the mouth of the Severn River near NSA Annapolis in 2016 and in 2018 (Jedra, 2016; Dance, 2018)
Common dolphin	<i>Delphinus delphis</i>	Not listed	No
Harbor porpoise	<i>Phocoena phocoena</i>	Not listed	No
Harbor seal	<i>Phoca vitulina</i>	Not listed	No
Grey seal	<i>Halichoerus grypus</i>	Not listed	No
Harp seal	<i>Pagophilus groenlandicus</i>	Not listed	No
Leatherback sea turtle	<i>Dermochelys coriacea</i>	FE	Have stranded as far north as Kent Island in the Chesapeake Bay, approximately 7 miles east of NSA Annapolis (Litwiler, 2001)
Loggerhead sea turtle	<i>Caretta caretta</i>	FT	Have stranded as far north as Hart Miller Island in the Chesapeake Bay approximately 20 miles north of NSA Annapolis (Litwiler, 2001)
Atlantic green sea turtle	<i>Chelonia mydas</i>	FT	No
Atlantic hawksbill sea turtle	<i>Eretmochelys imbricata</i>	FE	No
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	FE	Have stranded as far north as Kent Island in the Chesapeake Bay, approximately 7 miles east of NSA Annapolis (Litwiler, 2001)

Source: NAVFAC Washington, 2011

Key: DPS = distinct population segment; ESA = Endangered Species Act; FE = federally endangered; FT = federally threatened; NSA = Naval Support Activity.

Areas of the Chesapeake Bay are designated as “primary occurrence” for sea turtles in the areas and habitats where species are expected to be primarily found; areas of “secondary occurrence” are areas and habitat where species may be found, especially during anomalous environmental conditions like a hurricane; and areas of “rare occurrence” are where the species is not expected to be found with any regularity. The vicinity of NSA Annapolis is designated as an area of primary occurrence for Kemp’s ridley (endangered) and green (threatened) sea turtles from May to October; an area of secondary occurrence for the loggerhead (threatened) from May to June and September to October; and an area of rare occurrence for leatherback (endangered) from May to October. During the months of July and August, the mouth of the Severn River is designated a primary area of occurrence and the tributaries secondary areas of occurrence for the loggerhead turtle. Hawksbill turtles are considered extralimital in the Chesapeake Bay. No stranding, bycatch, or sightings have been documented for NSA Annapolis for any of the sea turtles (NAVFAC Washington, 2011).

Fish

MDNR conducted fish surveys in the Severn River from 1989 through 1994. Fish that occur in the Severn River are influenced by the salinity, with freshwater fish dominating the fresher tidal headwater areas of the tributaries, and more salt-tolerant marine fish in the major tidal waters. Of the 40 species captured during the surveys, most were estuarine residents; however, 12 species were marine migrants and 7 were primarily freshwater species. The most commonly observed fish include the inland silverside (*Menidia beryllina*), Atlantic menhaden (*Brevoortia tyrannus*), striped killifish (*Fundulus majalis*), striped bass (*Morone saxatilis*), mummichog (*Fundulus heteroclitus*), Atlantic silverside (*Menidia menidia*), bay anchovy (*Anchoa mitchilli*), Atlantic croaker (*Micropogonias undulatus*), white perch (*Morone americana*), and spot (*Leiostomus xanthurus*). Shellfish within the zones of higher salinity within the Severn River include blue crab (*Callinectes sapidus*), oyster, and clam.

The 2007 College Creek Watershed Assessment surveyed for macrofaunal species via beach seine and observed 20 species of fish. The most commonly observed fish along bulkhead shorelines include Atlantic menhaden, pumpkinseed (*Lepomis gibbosus*), Atlantic silverside, mummichog, white perch, striped killifish, bluefish (*Pomatomus saltatrix*), and Atlantic needlefish (*Strongylura marina*) (Friends of College Creek, 2007).

Essential Fish Habitat

Fish are vital components of the marine ecosystem. They have great ecological and economic aspects. To protect this resource, NOAA Fisheries works with the regional fishery management councils to identify the essential habitat for every life stage of each federally managed species using the best available scientific information. Essential fish habitat (EFH) has been described for approximately 1,000 managed species to date. EFH includes all types of aquatic habitat including wetlands, coral reefs, seagrasses, and rivers, and all locations where fish spawn, breed, feed, or grow to maturity.

EFH has been designated for 11 fish species in College Creek. In accordance with the Magnuson-Stevens Fisheries Conservation and Management Act, consultation with NOAA Fisheries is required when any land use changes, shoreline stabilization, or military operations are planned that have the potential to affect EFH. EFH has been designated for the species listed in Table 3-10 in College Creek. For context within the EFH descriptions below the table, the salinity of the Severn River averages between approximately 6 and 12 parts per thousand (ppt) throughout the year, with lower salinity occurring in the spring and the higher salinity occurring in the fall (Severn Riverkeeper, 2012). Salinity within College Creek ranges from approximately 6 to 11 ppt (Friends of College Creek, 2007). Five of the species with designated EFH are unlikely to occur within College Creek due to salinity levels of the creek: little skate (*Leucoraja erinacea*), Atlantic herring (*Clupea harengus*), red hake (*Urophycis chuss*), winter skate (*Leucoraja ocellata*), and clearnose skate (*Raja eglanteria*).

No NOAA Fisheries-designated Habitat Areas of Particular Concern are present within the project area (NOAA Fisheries, 2019).

Table 3-10 Essential Fish Habitat and Life Stages Near Proposed Action

<i>Common Name</i>	<i>Scientific Name</i>	<i>Eggs</i>	<i>Larvae</i>	<i>Juveniles</i>	<i>Adults</i>
Bluefish	<i>Pomatomus saltatrix</i>	—	—	Yes	Yes
Scup	<i>Stenotomus chrysops</i>	—	—	Yes	Yes
Summer flounder	<i>Paralichthys dentatus</i>	—	Yes	Yes	Yes
Black sea bass	<i>Centropristis striata</i>	—	—	Yes	Yes
Atlantic butterfish	<i>Peprilus triacanthus</i>	Yes	Yes	—	Yes
Little skate	<i>Leucoraja erinacea</i>	—	—	—	Yes
Atlantic herring	<i>Clupea harengus</i>	—	—	Yes	Yes
Red hake	<i>Urophycis chuss</i>	Yes	Yes	Yes	Yes
Windowpane flounder	<i>Scophthalmus aquosus</i>	—	—	Yes	Yes
Winter skate	<i>Leucoraja ocellata</i>	—	—	—	Yes
Clearnose skate	<i>Raja eglanteria</i>	—	—	Yes	Yes

Source: NOAA Fisheries, 2019

Bluefish (*Pomatomus saltatrix*): Bluefish is a highly migratory, schooling pelagic species found along the Atlantic coast. EFH for juvenile and adult bluefish includes the pelagic water column and inland with the mixing (0.5–25.0 ppt) and seawater (>25 ppt) salinity zones (NOAA, 1998a).

Scup (*Stenotomus chrysops*): Scup is a migratory, schooling, bottom-dwelling species found along the Atlantic coast. Inshore EFH for juvenile and adult scup includes the estuaries within mixing- and seawater-salinity zones. Generally found during the summer and spring in estuaries and bays with various sands, mud, mussel, and eelgrass bed-type substrates in water temperatures greater than 45 degrees Fahrenheit and salinities greater than 15 ppt (NOAA, 1998b).

Summer Flounder (*Paralichthys dentatus*): EFH for juvenile and adult summer flounder includes bottom waters, including tidal guts. Juveniles may use estuarine habitats such as SAV beds and open bay areas as nursery areas, and adults generally inhabit shallow estuarine waters during warmer months. Inshore EFH for summer flounder larvae is within the mixing (0.5–25.0 ppt) and seawater (>25 ppt) salinity zones. In general, summer flounder larvae are most abundant nearshore (12–50 miles from shore) at depths between 30 and 230 feet. Within the southern part of the Mid-Atlantic Bight, summer flounder larvae are most frequently found from November to May (NOAA, 1998c).

Black Sea Bass (*Centropristis striata*): EFH for juvenile and adult black sea bass includes estuaries within mixing- and seawater-salinity zones with temperatures warmer than 43 degrees Fahrenheit. Juveniles are found during summer and spring in estuaries with salinities greater than 18 ppt, and typically found in association with rough bottom, shellfish, and eelgrass beds, and man-made structures in sandy, shelly areas. Wintering adult black sea bass are typically found offshore (NOAA, 1998d).

Atlantic Butterfish (*Peprilus triacanthus*): EFH for Atlantic butterfish eggs, larvae, and adults include pelagic habitats in inshore esuaries and embayments fom Massachusetts to North Carolina, including the Chesapeake Bay. EFH for eggs is generally found over bottom depths of 1,500 meters or less where average temperatures in the upper 200 meters of the water column are 43 to 70 degrees Fahrenheit. Larvae EFH is within similar temperature ranges, and generally found over bottom depths between 41 and 350 meters. Adult EFH is generally found over bottom depths between 10 and 250 meters and where salinities are above 5 ppt (NOAA, 2011).

Little Skate (*Leucoraja erinacea*): EFH for adult little skate includes intertidal and sub-tidal benthic habitat, extending to a maximum depth of approximately 330 feet, and including high-salinity zones in the Chesapeake Bay. EFH occurs primarily on sand and gravel substrates but also occasionally mud (New England Fishery Management Council, 2017). The Proposed Action is entirely within the mixing-salinity zone of College Creek, which has a lower salinity than typical adult little skate habitat. Therefore, this species is not likely to be affected and is not discussed further.

Atlantic Herring (*Clupea harengus*): Atlantic herring is a pelagic schooling species found at various depths depending on life stage, season, and geographic location. EFH for juveniles include intertidal and sub-tidal pelagic habitats; young juveniles can tolerate low salinities, but older juveniles avoid brackish water. EFH for adult Atlantic herring includes the seawater-salinity zone of the Chesapeake Bay (New England Fishery Management Council, 2017). The Proposed Action would occur entirely within the mixing-salinity zone of College Creek, which has a lower salinity than typical juvenile and adult Atlantic herring habitat. Therefore, this species is not likely to be affected and is not discussed further.

Red Hake (*Urophycis chuss*): Juvenile and adult seasonal visitors in the Chesapeake Bay are common during the late winter and spring months. The species occurs in the deeper channels of the bay mainstem as well as the deep channels of Hampton Roads Harbor and occasionally in the upper bay extending as far north as the Patuxent River, which is approximately 45 miles south of the Severn River. Red hake eggs and larvae are found in pelagic habitats but are unlikely to be found within Chesapeake Bay estuaries and embayments. Adult red hake EFH includes the seawater-salinity zone of the Chesapeake Bay (New England Fishery Management Council, 2017). The Proposed Action is entirely within the mixing-salinity zone of College Creek, which has a lower salinity than typical juvenile and adult red hake habitat. Therefore, this species is not likely to be affected and is not discussed further.

Windowpane Flounder (*Scopthalmus aquosus*): EFH for juvenile and adult windowpane flounder includes bottom habitats with a substrate of mud and fine-grained sand, water temperatures below 77 degrees Fahrenheit, and salinities between 5.5 and 36 ppt (mixing- and high-salinity zones) within the Chesapeake Bay (New England Fishery Management Council, 2017).

Winter Skate (*Leucoraja ocellata*): EFH for adult winter skate includes sub-tidal benthic habitats in coastal waters from the shoreline to a maximum depth of approximately 260 feet, including the high-salinity zones of the Chesapeake Bay. EFH occurs on sand and gravel substrates, but this species is also found on mud (New England Fishery Management Council, 2017). The Proposed Action is entirely within the mixing-salinity zone of College Creek, which has a lower salinity than typical adult winter skate habitat. Therefore, this species is not likely to be affected and is not discussed further.

Clearnose Skate (*Raja eglanteria*): EFH for adult clearnose skate includes sub-tidal benthic habitats in coastal waters from the shoreline to approximately 130 feet, including the high-salinity zones of the Chesapeake Bay. EFH occurs primarily on mud and sand but also gravelly and rocky bottom (New England Fishery Management Council, 2017). The Proposed Action is entirely within the mixing-salinity zone of College Creek, which has a lower salinity than typical juvenile and adult clearnose skate habitat. Therefore, this species is not likely to be affected and is not discussed further.

Other Protected Fish Species

Shortnose and Atlantic sturgeon are the only two sturgeon species on the Atlantic Coast; both are protected under the Endangered Species Act.

The Atlantic sturgeon Chesapeake Bay Distinct Population Segment is federal- and state-listed as endangered. The Chesapeake Bay Distinct Population Segment includes five critical habitat units for the species: Potomac River, Rappahannock River, York River system (including Pamunkey and Mattaponi Rivers), James River, and Nanticoke River/Marshyhope Creek (Federal Register, 2017). Atlantic sturgeon is an anadromous fish that spends most of its life in saltwater and migrates into freshwater to spawn. There is a small spawning population in Virginia's James River and York River, approximately 140 miles and 120 miles south of NSA Annapolis, respectively. Spawning is not known to occur in Maryland waters (MDNR, n.d.). The species has not been found in the Severn River and is unlikely to inhabit College Creek near the Proposed Action.

Shortnose sturgeon, federal- and state-listed as endangered, is found in the Chesapeake Bay. This anadromous fish spends most of its life in brackish or saltwater and migrates into freshwater to spawn from February through April. This species prefers large, low-salinity river systems, and, near the Chesapeake Bay, is primarily found in the Potomac and Susquehanna Rivers (approximately 110 miles south and 45 miles north of NSA Annapolis, respectively); it has not been found in the Severn River or its tributaries (NOAA Fisheries, n.d.). As such, shortnose sturgeon is unlikely to be located in College Creek near the Proposed Action.

3.5.2 Environmental Consequences

This analysis focuses on wildlife or vegetation types that are important to the function of the ecosystem or are protected under federal or state law or statute.

3.5.2.1 No Action Alternative

Under the No Action Alternative, the proposed utility bridge replacement would not occur. The conditions of the current utility bridge would continue to decline. According to the 2019 inspection report, the bridge is in poor condition overall, and numerous deficiencies require correction within 12 months (NAVFAC EXWC, 2019). Direct, short-term, moderate impacts on aquatic resources within College Creek could occur if the bridge failed and severed utility lines. Under a worst-case scenario, a sudden discharge of materials into College Creek could kill aquatic wildlife and vegetation within the creek. Locally decreased dissolved oxygen levels in could also affect the water quality and aquatic habitat within College Creek. The depletion of dissolved oxygen would temporarily likely create a "dead zone" within College Creek from hypoxia until the creek recovers. Given the proximity of the utility bridge to the confluence with the Severn River, indirect impacts within the Severn River could also occur. These impacts from a worst-case scenario bridge failure would result in moderate impacts on the biological resources within College Creek, but impacts would be short term. Therefore, no significant impacts on biological resources would occur under the No Action Alternative.

3.5.2.2 Alternative 1 Potential Impacts

The study area for biological resources under Alternative 1 includes the lower portion of College Creek, and the aquatic habitat near the existing utility bridge and the Alternative 1 project area where construction would occur.

Construction activity associated with the Alternative 1 utility bridge construction and demolition would result in short-term, minor impacts on biological resources. Impacts would result from installation of bridge piles (including underwater noise resulting from pile driving) and demolition of the existing utility bridge, which would have minor impacts on wildlife from noise, potential increased sedimentation and turbidity within the water column, and alteration of aquatic habitats. These would be short-term, negligible-to-minor impacts on biological resources on, near, and downstream of the project site. The proposed utility bridge would not result in any permanent loss of vegetation or habitat or other long-term impacts. Implementation of Alternative 1 would not result in significant impacts on biological resources, as discussed in the following.

Terrestrial Vegetation

As previously described in Section 3.5.1.1, no forests or woodlands exist within the Alternative 1 project footprint; the land that would be disturbed under Alternative 1 is maintained lawn with some landscaped and urban trees and shrubs along the existing seawall. Potential short-term, minor impacts on the vegetation within the project area could occur during the construction period from the use of heavy construction equipment to connect the utilities and construct the utility bridge. Temporary construction areas, if needed, could also result in temporary impacts on vegetation. Trees, shrubs, and grasses may be damaged, removed, or trampled during the construction phase. The Navy would implement erosion- and sediment-control BMPs (as described in Sections 3.2.2 and 3.3.2) and prescribed by applicable permits, minimizing short-term impacts from ground disturbance on terrestrial vegetation. If any trees must be removed, they would be replaced at a 1:1 ratio to retain tree canopy.

Terrestrial Wildlife

Short-term, negligible impacts on terrestrial wildlife species could occur from noise and disturbance associated with construction of the utility bridge. Increases in noise levels from construction would be minor and temporary, likely resulting in wildlife avoidance of the area while noise is occurring. Many of the terrestrial species that occur in the project area are highly mobile and would be temporarily displaced during construction activity but would likely return when construction is complete.

Biological Resource Potential Impacts:

- No Action: Potential short-term, moderate impacts from a worst-case scenario of a rupture that results in discharges into College Creek. No significant impacts.
- Alternative 1: Short-term, minor impacts from construction activity on marine species. No significant impacts.
- Alternative 2: Similar to Alternative 1. No significant impacts.
- Alternative 3: Similar to Alternative 1. No significant impacts.
- Option: Short-term, minor impacts on bottom-dwelling species from vibrations during directional drilling. No significant impacts.

Many species of migratory birds are found at NSA Annapolis. College Creek is considered a historic waterfowl concentration area by the MDNR Wildlife and Heritage Service. Construction and demolition of the utility bridge under Alternative 1 could have short-term, minor impacts on migratory birds and waterfowl from noise, minor habitat alterations, and general disturbance. No migratory bird nesting is known to occur in the project area, and birds would be expected to relocate to areas not undergoing active construction and demolition. Takes of migratory birds are not expected under Alternative 1.

Marine Species

Short-term effects on aquatic resources and habitats would be expected during construction activities. Ground-disturbing activities along the College Creek shorelines can lead to increased sedimentation and turbidity, which affects aquatic life by reducing light. Construction would directly affect College Creek as construction occurs, and indirectly affect downstream water bodies like the Severn River. These impacts would be minimized through BMPs to protect against soil erosion and sedimentation into receiving water bodies. Shellfish, if present within the immediate area where the bridge pilings are installed, could be affected by increased sedimentation from pile installation. Fish in the immediate construction area would be affected by those activities, increased noise, and a temporary decrease in water quality due to sedimentation. These impacts would be minor, and fish could avoid the area until construction is complete.

As previously discussed, SAV is not present in College Creek in the Alternative 1 project area. SAV has been observed in the upper portions of College Creek, but these SAV communities would not likely be affected during construction under Alternative 1 since construction would be limited to the lower portions of the creek.

BMPs would be incorporated in accordance with project permits and regulations to avoid and minimize impacts on shellfish and fish during in-water construction. BMPs would limit sediment disturbance during construction and minimize the effects of turbidity within the immediate area of construction. After construction activity is complete, sedimentation and turbidity levels would return to pre-construction levels. Any potential impacts on marine species would be short term and minor.

Noise from construction activity, particularly from pile driving to place the bridge piles and pile demolition, would affect marine species. Underwater sound pressure caused by in-water pile driving could distress, injure, or kill fish in College Creek. Noise impacts are described in more detail in Section 3.6.2.2, but pile-driving activities have the potential to impact fish species. Juvenile and adult fish near the project area are highly mobile and would be able to avoid the area immediately surrounding construction and increased noise. Coordinating the timing and duration of pile-driving activities and the life phase of the fish exposed to the noise can also reduce impacts on the fish within the vicinity.

Threatened, Endangered, and Special-Status Species

No threatened or endangered species are known to occur within the study area of Alternative 1. The USFWS IPaC report generated for this project indicates that northern long-eared bat is potentially present (NAVFAC Washington, 2017). In addition, protected sea turtle and marine mammal species have the potential to be present within the study area.

Northern Long-Eared Bat: Multiple bat surveys have been conducted on NSA Annapolis, though no presence of this species has been documented via acoustic or mist-net surveys (USFWS, 2020a). Because Alternative 1 would not result in substantial tree clearing (i.e., not equal to or greater than 15 acres), potential habitat for the species would not be affected. This allows NSA Annapolis to reply upon the

finding of the programmatic biological opinion for the 4(d) rule to fulfill its project-specific section 7 responsibilities (USFWS, 2020b). Following this measure, along with completing the determination key for this species in the USFWS IPaC process, included in Appendix B, allows the installation to avoid completing a formal section 7 consultation. Alternative 1 would have no effect on this species.

Monarch Butterfly: Vegetation that provides nectar and pollen is commonly found in scrub-shrub habitat along ecotones such as forest edges and in wetland habitat. The College Creek shorelines that would be altered under Alternative 1 consists of manicured lawn with some landscaped trees and bushes. There is no quality habitat for monarch butterflies that would be affected by Alternative 1, and monarchs are unlikely to use the habitat at the project site during their annual migration. Alternative 1 would have no effect on monarch butterfly.

Marine Mammals and Sea Turtles: Marine mammals and sea turtles are unlikely to be within College Creek. As such, no effect on Endangered Species Act-listed species are anticipated under Alternative 1. In addition, takes of marine mammals pursuant to the Marine Mammal Protection Act are not reasonably foreseeable.

Atlantic Sturgeon and Shortnose Sturgeon: As discussed in Section 3.5.1.3, neither Atlantic sturgeon nor shortnose sturgeon are known to occur in College Creek or the Severn River or likely to be present. As such, no effect on these protected species would be expected under Alternative 1.

Threatened, Endangered, and Special-Status Species Conclusion: There would be no effect on terrestrial or marine threatened and endangered species, and no consultation between the Navy and USFWS or NOAA Fisheries would be required. Consultation with MDNR Wildlife and Heritage Service will occur through the Maryland Clearinghouse. Responses will be included in Appendix B.

Essential Fish Habitat

EFH is found at the Alternative 1 site in College Creek for 11 species of fish. During the construction and demolition for Alternative 1, potential stressors that may affect these species and their habitat would include increased underwater noise and a possible decrease in water quality from turbidity. No long-term habitat alterations would occur under Alternative 1. Impacts on EFH are summarized in the following text. In-water construction would likely occur in stages and would not affect the flow of College Creek at any time. As explained in Section 3.5.1.3, little skate, Atlantic herring, red hake, winter skate, and clearnose skate are unlikely to occur within the mixing salinity zone of College Creek and are not analyzed further.

Bluefish: Juvenile and adult bluefish EFH could be affected during construction activity. Short-term impacts on EFH could occur from disturbances in the water column causing suspended sediments. In addition, underwater noise resulting from bridge demolition and pile driving from new bridge constructed would affect EFH. No changes in water depth, tidal flow, or salinity of College Creek would be expected. There would be no long-term impacts on bluefish EFH.

Scup: Juvenile and adult scup EFH could be affected during construction activity. Short-term impacts on EFH could occur from disturbances in the water column causing suspended sediments. In addition, underwater noise resulting from bridge demolition and pile driving from new bridge constructed would affect EFH. No changes in water depth, tidal flow, water temperature, or salinity of College Creek would be expected. There would be no long-term impacts on scup EFH.

Summer Flounder: EFH exists for larval, juvenile, and adult summer flounder, a bottom-dwelling species. Short-term impacts on EFH could occur from disturbances in the water column causing suspended sediments. In addition, underwater noise resulting from bridge demolition and pile driving from new bridge constructed would affect EFH. No changes in water depth, tidal flow, substrates, water temperature, or salinity of College Creek would be expected. There would be no long-term impacts on summer flounder EFH.

Black Sea Bass: Juvenile and adult black sea bass EFH could be affected during construction activity. Short-term impacts on EFH could occur from disturbances in the water column causing suspended sediments. In addition, underwater noise resulting from bridge demolition and pile driving from new bridge constructed would affect EFH. No changes in water depth, tidal flow, substrates, water temperature, or salinity of College Creek would be expected. There would be no long-term impacts on black sea bass EFH.

Atlantic Butterfish: EFH exists for Atlantic butterfish eggs, larvae, and adults. Atlantic butterfish EFH is within pelagic habitats in inshore estuaries and embayments. Short-term impacts on EFH could occur from disturbances in the water column causing suspended sediments. In addition, underwater noise resulting from bridge demolition and pile driving from new bridge constructed would affect EFH. No changes in water depth, tidal flow, substrates, water temperature, or salinity of College Creek would be expected. There would be no long-term impacts on Atlantic butterfish EFH.

Windowpane Flounder: Windowpane flounder is a bottom-dwelling species and could be affected during construction activity. EFH exists at Alternative 1 for juvenile and adult windowpane flounder. Short-term impacts on EFH could occur from disturbances in the water column causing suspended sediments. In addition, underwater noise resulting from bridge demolition and pile driving from new bridge constructed would affect EFH. No changes in water depth, tidal flow, substrates, water temperature, or salinity of College Creek would be expected. There would be no long-term impacts on windowpane flounder EFH.

No Habitat Areas of Particular Concern are present within the project area.

Alternative 1 may adversely affect EFH in the short term due to a reduction in water quality from suspended sediments and noise during construction. Therefore, consultation with NOAA Fisheries will occur. There would be no anticipated long-term effects on EFH.

Therefore, implementation of Alternative 1 would not result in significant impacts on EFH.

3.5.2.3 Alternative 2 Potential Impacts

The study area for biological resources under Alternative 2 includes the lower portion of College Creek, and the aquatic habitat near the existing utility bridge and the Alternative 2 project area where construction would occur.

Impacts under Alternative 2 would be the same as those described under Alternative 1. The impacts would occur along a different portion of College Creek, but terrestrial and marine vegetation and wildlife would be expected to be the same under Alternative 2, and potential impacts would remain consistent to those described in Section 3.5.2.2. Therefore, implementation of Alternative 2 would not result in significant impacts on biological resources.

3.5.2.4 Alternative 3 Potential Impacts

The study area for biological resources under Alternative 3 includes the lower portion of College Creek, and the aquatic habitat near the existing utility bridge and the Alternative 1 project area where construction would occur.

Impacts under Alternative 3 would be the same as those described under Alternative 1. The impacts would occur along a different portion of College Creek, but terrestrial and marine vegetation and wildlife would be expected to be the same under Alternative 3, and potential impacts would remain consistent to those described in Section 3.5.2.2. Therefore, implementation of Alternative 3 would not result in significant impacts on biological resources.

3.5.2.5 Potential Impacts of Underground Utility Option

The study area for the underground utility option includes the aquatic habitat near the proposed underground utility line. Short-term, minor impacts on biological resources would be expected from this utility option. Utility boring and horizontal directional drilling would occur on the banks of the creek, creating negligible impacts on terrestrial species and habitat given that this area is landscaped and not high-quality habitat. Drilling would occur below the sediment bed in College Creek. Bottom-dwelling aquatic species would experience vibrations from the drilling activity, causing disruptions and prompting them to leave the area. These impacts would be short term and minor. No long-term impacts on species or their habitats would be expected. Implementation of the underground utility option, in addition to any of the alternatives, would not result in significant impacts on biological resources.

3.6 Noise

This discussion of noise includes the types or sources of noise and the associated sensitive receptors in the human environment.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water, and are sensed by the human ear. Sound is all around us. The perception and evaluation of sound involves three basic physical characteristics:

- Intensity—the acoustic energy, which is expressed in terms of sound pressure, in decibels
- Frequency—the number of cycles per second the air vibrates, in Hertz
- Duration—the length of time the sound can be detected

Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although continuous and extended exposure to high noise levels (e.g., through occupational exposure) can cause hearing loss, the principal human response to noise is annoyance. The response of different individuals to similar noise events is diverse and is influenced by the type of noise; perceived importance of the noise; its appropriateness in the setting, time of day, and type of activity during which the noise occurs; and sensitivity of the individual.

Basics of Sound and A-Weighted Sound Level

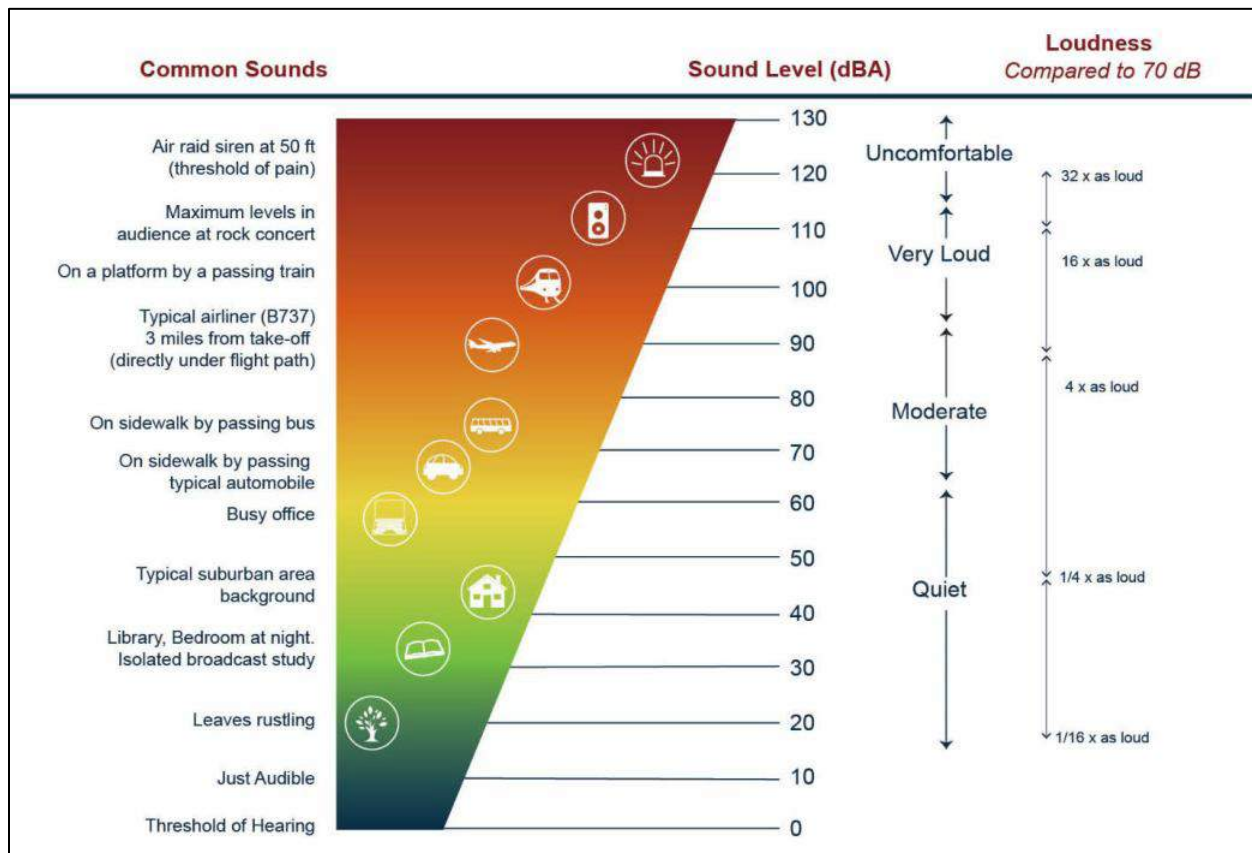
The loudest sounds that can be detected comfortably by the human ear have intensities that are a trillion times higher than those of sounds that can barely be detected. This vast range means that using a linear scale to represent sound intensity is not feasible. The decibel is a logarithmic unit used to represent the intensity of a sound, also referred to as the sound level. All sounds have a spectral content, which means their magnitude or level changes with frequency, where frequency is measured in

cycles per second or Hertz. To mimic the human ear’s non-linear sensitivity and perception of different frequencies of sound the spectral content is weighted. For example, environmental noise measurements are usually on an “A-weighted” scale that filters out very low and very high frequencies to replicate human sensitivity. It is common to add the “A” to the measurement unit to identify that the measurement has been made with this filtering process (i.e., dBA). In this document, the decibel unit refers to A-weighted sound levels for human receptors. Table 3-11 provides a comparison of how the human ear perceives changes in loudness on the logarithmic scale.

Figure 3-7 provides a chart of A-weighted sound levels from typical noise sources. Some noise sources (e.g., air conditioner, vacuum cleaner) are continuous sounds that maintain a constant sound level for some period (Cowan, 1994). Other sources (e.g., automobile, heavy truck) are the maximum sound produced during an event like a vehicle passing by. Other sounds (e.g., urban daytime, urban nighttime) are averages taken over extended periods of time. A variety of noise metrics have been developed to describe noise over different time periods, as discussed in the following text.

Table 3-11 Subjective Responses to Changes in A-Weighted Decibels

<i>Change</i>	<i>Change in Perceived Loudness</i>
3 decibels	Barely perceptible
5 decibels	Quite noticeable
10 decibels	Dramatic—twice or half as loud
20 decibels	Striking—fourfold change



Source: Adapted from Cowan, 1994

Figure 3-7 A-Weighted Sound Levels from Typical Sources

Noise Metrics

A metric is a system for measuring or quantifying a characteristic of a subject. Since noise is a complex physical phenomenon, different noise metrics help to quantify the noise environment.

Maximum Sound Level

The highest A-weighted sound level measured during a single event where the sound level changes value with time (e.g., an aircraft overflight) is called the maximum A-weighted sound level or L_{max}. During an aircraft overflight, the noise level starts at the ambient or background noise level, rises to the maximum level as the aircraft flies closest to the observer, and returns to the background level as the aircraft recedes into the distance. L_{max} defines the maximum sound level occurring for a fraction of a second. For aircraft noise, the “fraction of a second” over which the maximum level is defined is generally one-eighth second (American National Standards Institute, 1988).

For additional information on noise, see Appendix A.

3.6.1 Affected Environment

3.6.1.1 Airborne Noise

Many components may generate noise and warrant analysis as contributors to the total noise impact. Existing noise levels at and near the alternative project boundaries along the Upper and Lower Yards can be characterized as moderately dense urban, which would be typical of nearby land uses and activities and with the overall level of development in the area. The primary source of noise is vehicular traffic. Noise levels are low to moderate.

The federal government supports conditions free from noise that threaten human health and welfare and the environment. Response to noise varies, depending on the type and characteristics of the noise, distance between the noise source and whoever hears it (the receptor), receptor sensitivity, and time of day. A noise-sensitive receptor is defined as a land use where people involved in indoor or outdoor activities may be subject to stress or considerable interference from noise. Such locations or facilities often include residential dwellings, hospitals, nursing homes, educational facilities, and libraries. Sensitive receptors may also include noise-sensitive cultural practices, some domestic animals, or certain wildlife species.

3.6.1.2 Underwater Noise

Noise from underwater sources cannot be directly compared to airborne noise. A reference pressure of 20 micropascal is used in air compared to 1 micropascal in water. While airborne noise dissipates by 6 decibels (dB) per doubling of distance, underwater noise only dissipates by approximately 4.5 dB per doubling of distance. This is because underwater sound is bound by the water surface and the seafloor, creating a channel, which prevents sound from dissipating (Anchor QEA and Greenbusch, 2015).

Exposure to low levels of underwater sound for a relatively long period of time, or exposure to higher levels of sound for shorter periods of time, may result in auditory tissue damage or temporary hearing loss on fish (CalTrans, 2015). Sound generated by pile driving, which is one of the loudest noises from construction and is used to drive piles into the water, has the potential to affect fish in several ways. The range of effects can include alteration of behavior to physical injury or mortality, depending on the intensity and characteristics of the sound, the distance and location of the fish in the water column relative to the sound source, the size and mass of the fish, and the fish’s anatomical characteristics.

3.6.2 Environmental Consequences

Analysis of potential noise impacts includes estimating likely noise levels from the Proposed Action and determining potential effects on sensitive receptor sites.

3.6.2.1 No Action Alternative

Routine maintenance under the No Action Alternative would not result in noise impacts beyond what the adjacent populations are accustomed to, including underwater species. Under the worst-case scenario, a loud rupture caused by the failure of the existing utility bridge would cause moderate, adverse impacts; however, these impacts would be short term. In the long term, if King George Street Bridge is not accessible, vehicles would have to use another route. Given that Bladen Street/Rowe Boulevard is approximately 1,100 feet southwest of the King George Street Bridge, it is likely that this road would be used as a detour. Populations would not likely experience long-term impacts from noise given that they are already accustomed to the noise from traffic. Therefore, no significant impacts on the noise environment would occur under the No Action Alternative.

3.6.2.2 Alternative 1 Potential Impacts

The study area for noise under Alternative 1 includes the project area and populations adjacent to the utility bridge that could be affected by noise.

There are no forests or woodlands within or immediately adjacent to the Alternative 1 project area. The land that would be disturbed is maintained lawn with some landscaped and urban trees and shrubs along the existing seawall. There would not be any long-term noise impacts from the implementation of Alternative 1, only short-term impacts from construction. Terrestrial species and birds that occur in the project area are highly mobile and would be temporarily displaced during construction activity but would likely return when construction is complete. No migratory bird nesting is known to occur in the project area, and birds would be expected to relocate to areas not undergoing active construction and demolition. Therefore, short-term, negligible impacts would occur from noise impacts on terrestrial species and birds.

Short-term impacts from Alternative 1 would include noise from construction and demolition activities. Noise from these activities would consist of peak sound levels and would be intermittent, as equipment and activities would not occur at one continuous level. Overall, peak noise levels diminish with distance from the active project site. Table 3-12 shows typical noise levels at 50 feet from the source of heavy equipment that could be used during proposed construction and demolition activities.

Noise Potential Impacts:

- No Action: Short-term, moderate impacts from a worst-case scenario of a rupture. No significant impacts.
- Alternative 1: Short-term, minor impacts on airborne and underwater receptors from construction. No significant impacts.
- Alternative 2: Similar to Alternative 1. No significant impacts.
- Alternative 3: Similar to Alternative 1. No significant impacts.
- Option: Short-term, minor impacts from vibration. No significant impacts.

Table 3-12 Construction Equipment Noise Emission Levels

<i>Equipment</i>	<i>Typical Noise Level (dBA) 50 feet from Source</i>
Air compressor	81
Backhoe	80
Ballast equalizer	82
Ballast tamper	83
Compactor	82
Concrete mixer	85
Concrete pump	82
Concrete vibrator	76
Crane, derrick	88
Crane, mobile	83
Dozer	85
Generator	81
Grader	85
Impact wrench	85
Jack hammer	88
Loader	85
Paver	89
Pile-driver (impact)	101
Pile-driver (sonic)	96
Pneumatic tool	85
Pump	76
Rail saw	90
Rock drill	98
Roller	74
Saw	76
Scarifier	83
Scraper	89
Shovel	82
Spike driver	77
Tie cutter	84
Tie handler	80
Tie inserter	85
Truck	88

Source: Federal Transit Administration, 2006

Key: dBA = A-weighted decibels.

Note: Table based on a U.S. Environmental Protection Agency Report, which measured data from railroad construction equipment taken during the Northeast Corridor Improvement Project, and other measured data.

Noise-sensitive receptors closest to the proposed construction site under Alternative 1 include residences on Beardall Road and the French Soldiers Monument, which are south of College Creek. As shown in Table 3-12, peak noise (L_{max}) from construction equipment can range from 74 dBA to 101 dBA at 50 feet (which includes noise from pile driving). Given those levels, noise at 100 feet would range from 68 dBA to 95 dBA at the French Soldiers Monument (see Appendix D, Noise Calculations). The closest residences on Beardall Road are about 150 feet from the project area and would be exposed to levels from 64 dBA to 91 dBA from construction equipment. However, these noise levels would be short term and intermittent.

Short-term impacts would result from dump trucks hauling materials to and from the construction area. As shown in Table 3-12, construction trucks typically produce noise levels of approximately 88 dBA at 50 feet from the road. Consequently, short-term, minor impacts would occur to populations adjacent to the roadways for the duration of the construction period.

Under Alternative 1, pile driving and minor excavation for new pile caps would likely occur. The timing and duration of pile-driving activities and the life stage of fish exposed to noise are important factors in determining effects on the various species of fish that could be present during pile-driving activities. Pile-driving activities would be intermittent and temporary and would not occur for the entire duration of the project. Fish could avoid the area immediately surrounding construction during those activities. Marine mammals are unlikely to be within College Creek. If present, the closest marine mammals would be in Severn River, which is more than 2,000 feet from the project site and would be able to avoid the confluence of Severn River and College Creek if necessary. Consequently, impacts to fish and marine mammals from noise would not be significant.

As previously described in Section 3.5.2.3, EFH is within the project area. Short-term impacts on EFH could occur from underwater noise as a result of demolition and pile driving activities. Consequently, consultation with NOAA Fisheries will occur. The noise environment would return to current levels following completion of construction; therefore, no long-term effects on EFH from noise are expected.

Once the new bridge has been constructed and the existing bridge demolished, short-term noise impacts would cease, and the ambient noise environment would return to the existing levels for both airborne and underground environments. No long-term impacts would occur. Therefore, implementation of Alternative 1 would not result in significant impacts on the noise environment.

3.6.2.3 Alternative 2 Potential Impacts

The project area for Alternative 2 is the Decatur Avenue Bridge, which is similar to the project area for Alternative 1. Short-term impacts from Alternative 2 would include noise from construction and demolition activities. Noise impacts on terrestrial species, birds, and underwater biological receptors would be the same as described under Alternative 1. Noise from these activities would consist of peak sound levels and would be intermittent, as equipment and activities would not occur at one continuous level.

Noise-sensitive receptors closest to the proposed construction site under Alternative 2 include residences on Beardall Road and the French Soldiers Monument, which are south of College Creek. The French Soldiers Monument is about 400 feet from the Alternative 2 project area and would be exposed to noise levels of approximately 56 dBA to 83 dBA. The closest residences on Beardall Road are about 65 feet from the project area and would be exposed to levels from 72 dBA to 99 dBA from construction equipment. However, these noise levels would be short term and intermittent.

Once the new bridge has been constructed and the existing bridge demolished, short-term noise impacts would cease, and the ambient noise environment would return to the existing levels for both airborne and underwater environments. No long-term impacts would occur. Therefore, implementation of Alternative 2 would not result in significant impacts on the noise environment.

3.6.2.4 Alternative 3 Potential Impacts

The project area for Alternative 3 spans between the project areas for Alternatives 1 and 2. Therefore, noise levels from construction activities would be similar to those discussed under Alternatives 1 and 2 for human and biological receptors. Noise from construction and demolition would be intermittent, as equipment and activities would not occur at one continuous level, and temporary.

Once the new bridge has been constructed and the existing bridge demolished, short-term noise impacts would cease, and the ambient noise environment would return to the existing levels for both airborne and underwater environments. No long-term impacts would occur. Therefore, implementation of Alternative 3 would not result in significant impacts on the noise environment.

3.6.2.5 Potential Impacts of Underground Utility Option

If this option is implemented, directional drilling would be used to install the utilities underground. Noise from directional drilling would not be louder than noise from pile driving. However, the construction period would be longer, and there would be more vibration as compared to installing aboveground utilities, which would cause disruptions and prompt aquatic species to leave the area. These impacts would be short term and minor. No long-term impacts on species or their habitats would be expected. Implementation of the underground utility option, in addition to any of the alternatives, would not result in significant impacts on the noise environment.

3.7 Infrastructure

This section discusses infrastructure such as utilities (including drinking water production, storage, and distribution; wastewater collection treatment and disposal; stormwater management; energy production, transmission, and distribution; and communications) and facilities.

3.7.1 Affected Environment

The following discussions provide a description of the existing conditions for utilities and facilities. Unless otherwise cited, all information in this section derives from the Installation Development Plan (NAVFAC Washington, 2018a).

3.7.1.1 Utilities

Table 3-13 summarizes the status of utility systems on the Upper and Lower Yards at NSA Annapolis.

Table 3-13 Utilities on the Upper and Lower Yards at Naval Support Activity Annapolis

Utility System	Provider(s)	Presence at Sites	Base Concerns?
Potable Water	<ul style="list-style-type: none"> · Provided by three on-base wells, one of which is operational at any given time. · Water treatment plant is on the Upper Yard. 	Yes: raw waterlines, potable waterlines, and a well and pumphouse are in the vicinity of the utility bridge and surrounding areas.	None noted regarding capacity; current treatment capacity is adequate for current and anticipated demand. Aging water piping results in occasionally discolored water.
Wastewater	<ul style="list-style-type: none"> · Treatment provided by City of Annapolis. · Navy owns and maintains on-base wastewater lines. 	No: sanitary sewer lines are not within the site alternatives.	None noted for USNA.
Stormwater	<ul style="list-style-type: none"> · NSA Annapolis owns and maintains stormwater infrastructure. · There are no storm sewers. 	Yes: while no stormwater conveyance lines cross the utility bridge, outfalls discharge into College Creek at several locations within the alternative sites along the east and west banks.	Stormwater management at NSA Annapolis is a challenge due to the installation's low elevation, significant areas of 100-year floodplain, made land areas, and aging system; conveyance lines on the Lower Yard are inadequate.
Electricity	<ul style="list-style-type: none"> · Purchased under DLA contract. · Distributed by BGE. · NSA Annapolis owns and maintains the on-base distribution including a substation supporting USNA. 	Yes: electric lines are in the vicinity of the utility bridge and surrounding areas.	None noted regarding capacity; system has redundant feeders and automatic transfer capabilities in the event of a service interruption, including some facilities with oil-fired and natural gas back-up generators.
Heating, Hot Water, and Steam	<ul style="list-style-type: none"> · NSA Annapolis owns and operates the heating, hot water, and steam system. · Central heating plant generates high temperature hot water, which is converted into steam for heat in facilities. 	Yes: high temperature hot water lines are in the vicinity of the utility bridge and surrounding areas.	Capacity exceeds current and anticipated demand; however, two of three generators are nearing the end of their useful service, and the utility bridge has structural issues.
Natural Gas	<ul style="list-style-type: none"> · Purchased under DLA contract for central heating plant and Lower Yard; and then distributed by BGE. · BGE provides service to remainder of installation. 	No: natural gas lines are not in the immediate vicinity of the utility bridge or any of the site alternatives.	System is noted as being in good condition, and volume and pressure are able to meet current and anticipated needs.

<i>Utility System</i>	<i>Provider(s)</i>	<i>Presence at Sites</i>	<i>Base Concerns?</i>
Communications	<ul style="list-style-type: none"> · The Navy provides communication and IT infrastructure to buildings across NSA Annapolis. · Some facilities use private IT providers. 	Yes: communications lines are in the vicinity of the utility bridge and surrounding areas.	None noted for USNA.

Source: NAVFAC Washington, 2018a

Key: BGE = Baltimore Gas and Electric; DLA = Defense Logistics Agency; IT = information technology; NSA = Naval Support Activity; USNA = U.S. Naval Academy

Note: Utilities at North Severn are not included in this table as they would not be affected by the Proposed Action.

3.7.1.2 Facilities

Facilities within the affected environment are limited to those within and adjacent to the site alternatives. The utility bridge that is the subject of this EA is in a severely deteriorated state. Originally constructed in 1931 as a train trestle bridge, this structure was retrofitted in 1986 to carry utility lines across College Creek between the Upper and Lower Yards. Bridge safety inspections noted that 37 of the bridge piles (26 percent) are in poor to critical or failing condition. Portions of the concrete abutments, pier pile caps, and fascia panel components are also damaged or deteriorated. Two pipeline support beams are twisted and out of plumb. Superstructure and bearing hardware exhibit moderate-to-severe corrosion. This utility bridge provides needed utility services to the Lower Yard (NAVFAC EXWC, 2019).

The bank of College Creek along the Upper Yard is armored with riprap and assessed as being in fair condition, while the bank along the Lower Yard is bulkhead and assessed as being in satisfactory condition (NAVFAC, 2017). The Decatur Avenue Bridge is adjacent to the Alternative 2 site. This bridge is serviceable but will likely need major repairs or replacement in the next 5 to 10 years. Hubbard Hall (Building 260) is situated between the Alternative 2 and Alternative 3 sites on the Upper Yard. A concrete wharf (Facility 261) and associated floating docks provide general purpose and small craft berthing adjacent to Hubbard Hall. Hubbard Hall is assessed as being in overall poor condition and slated for future renovations and floodproofing (NAVFAC Washington, 2018a).

3.7.2 Environmental Consequences

This section analyzes the magnitude of anticipated increases or decreases in public works infrastructure demands considering historic levels, existing management practices, and storage capacity, and evaluates potential impacts on public works infrastructure associated with implementation of the alternatives. Impacts are evaluated by whether they would result in the use of a substantial proportion of the remaining system capacity, reach or exceed the current capacity of the system, or require development of facilities and sources beyond those existing or currently planned.

3.7.2.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. Routine maintenance would continue to occur, including activities such as spot painting, securing hardware that has loosened, or replacing severely deteriorated timbers. This level of maintenance would not address the deterioration of the bridge substructure. According to the 2019 inspection report, the bridge is in poor condition overall, and numerous deficiencies require correction within 12 months. The No Action Alternative has the potential to interrupt utility service in the event of a partial or catastrophic bridge failure. Impacts would likely not be significant on the Upper and Lower Yards because functions would be disconnected

temporarily, with possibly major interruptions while lines are being repaired and service restored. Infrastructure deterioration is a driving need for the Proposed Action.

3.7.2.2 Alternative 1 Potential Impacts

The study area associated with Alternative 1 includes the utility systems and facilities within the existing utility bridge and Alternative 1 project area, with consideration for how the project could affect installation utility service.

Implementation of Alternative 1 would not result in significant impacts on infrastructure, as discussed in the following sections for utilities and facilities.

Utilities

Alternative 1 includes in-kind replacement of all existing utility lines crossing College Creek and would not change the existing capacity or demand of these utilities. Short-term disruptions would be expected during connection and disconnection of utilities, but these would be minor and coordinated to minimize operational impacts. Construction of the new bridge would occur prior to demolition of the existing bridge, minimizing possible service disruptions.

Several stormwater outfalls are located along the east and west banks of College Creek. Depending on the location of the bridge in the Alternative 1 project area, bridge design would account for existing stormwater infrastructure and revise outfall locations, as needed. Other than the utility lines on the existing bridge and the aforementioned stormwater outfalls, no other utilities would require relocation.

Relative to the No Action Alternative, Alternative 1 would improve long-term reliability of all utilities crossing College Creek by reducing the risk of bridge failure. No long-term changes in capacity or demand would occur from Alternative 1.

Facilities

Alternative 1 includes the construction of a new utility bridge and subsequent demolition of the existing, aging utility bridge. The new bridge would provide a safer and more reliable structure to convey utility lines between the Upper and Lower Yards. Construction and demolition activities would affect the riprap and bulkhead shoreline structures where the bridge connects on-land; bridge design would account for shoreline facilities to integrate them into the design and/or repair them as necessary to protect the shoreline. No effects on Hubbard Hall or the Decatur Avenue Bridge would occur.

Infrastructure Potential Impacts:

- No Action: Likely impacts include partial or total bridge failure affecting the distribution of utility service. Under a worst-case scenario of catastrophic bridge failure, impacts would be major, but utility service would be restored in the long term. Infrastructure deterioration is a driving need for the Proposed Action.
- Alternative 1: Short-term, minor impacts on utility service during interconnections. Long-term, beneficial effects from safer, more reliable bridge to carry utilities. No significant impacts.
- Alternative 2: Similar to Alternative 1. No significant impacts.
- Alternative 3: Similar to Alternative 1. No significant impacts.
- Option: Additional short-term, minor impacts on utility service during interconnections. Long-term increased reliability and protection from lines being underground. No significant impacts.

3.7.2.3 Alternative 2 Potential Impacts

The study area associated with Alternative 2 includes the utility systems and facilities within the existing utility bridge and Alternative 2 project area, with consideration for how the project could affect installation utility service. Short-term disruptions would be expected during connection and disconnection of utilities, but these would be minor and coordinated to minimize operational impacts. Construction of the new bridge would occur prior to demolition of the existing bridge, minimizing possible service disruptions. Stormwater outfalls are also present in the Alternative 2 area that could require relocation. Construction would not affect nearby Hubbard Hall or the Decatur Avenue Bridge. Riprap and bulkhead shoreline facilities in the immediate vicinity of the on-land bridge ends would be repaired as necessary. No long-term changes in capacity or demand would occur.

Impacts on infrastructure under Alternative 2 would be essentially the same as those described under Alternative 1. Relative to the No Action Alternative, Alternative 2 would improve long-term reliability of all utilities crossing College Creek by reducing the risk of bridge failure. Implementation of Alternative 2 would not result in significant impacts on infrastructure.

3.7.2.4 Alternative 3 Potential Impacts

The study area associated with Alternative 3 includes the utility systems and facilities within the vicinity of the existing utility bridge and Alternative 3 project area, with consideration for how the project could affect installation utility service. Short-term disruptions would be expected during connection and disconnection of utilities, but these would be minor and coordinated to minimize operational impacts. Construction of the new bridge would occur prior to demolition of the existing bridge, minimizing possible service disruptions. Stormwater outfalls are also present in the Alternative 3 area that could require relocation. Construction would not affect Hubbard Hall or the Decatur Avenue Bridge. Riprap and bulkhead shoreline facilities in the immediate vicinity of the on-land bridge ends would be repaired as necessary. No long-term changes in capacity or demand would occur.

Impacts on infrastructure under Alternative 3 would be essentially the same as those described under Alternative 1. Relative to the No Action Alternative, Alternative 3 would improve long-term reliability of all utilities crossing College Creek by reducing the risk of bridge failure. Implementation of Alternative 3 would not result in significant impacts on infrastructure.

3.7.2.5 Potential Impacts of Underground Utility Option

The study area for the underground utility option includes the location of the directional boring near the existing utility bridge, with consideration for how the project could affect installation utility service.

Under this option, all utility lines except one would be bored under College Creek. One utility line would still be installed on the proposed utility bridge as it cannot be located underground. A geotechnical report would be prepared prior to initiating any construction activities to ensure that site-specific conditions are appropriately considered during design and materials selection.

Short-term, minor disruptions in service for interconnection could occur from boring utility lines underground, similar to installing them on the bridge as discussed under Alternative 1. Underground utilities would experience long-term increased reliability and safety, compared with aboveground options. However, construction costs of boring utilities would be greater, and future access to utilities for repairs or replacements would also be more expensive, difficult, and possibly time-consuming than aboveground options.

For these reasons, implementation of the underground utility option, in addition to any of the alternatives, would not result in significant impacts on infrastructure.

3.8 Public Health and Safety

This discussion of public health and safety includes consideration for any activities, occurrences, or operations that have the potential to affect the safety, well-being, or health of members of the public. A safe environment is one in which there is no, or optimally reduced, potential for death, serious bodily injury or illness, or property damage. The primary goal is to identify and prevent potential accidents or impacts on the general public. Public health and safety within this EA pertains to community emergency services, construction activities, operations, and environmental health and safety risks to children.

3.8.1 Affected Environment

Community emergency services are organizations that ensure public safety and health by addressing different emergencies. Police, fire, and rescue service, and emergency medical service are the primary emergency service functions. NSA Annapolis has its own police department and fire department, as well as a mutual aid agreement with Annapolis and Anne Arundel County.

Operational safety refers to the actual use of facilities, or training or testing activities and potential risks to inhabitants or users of adjacent or nearby land and water parcels. Safety measures are often implemented through designated safety zones, warning areas, or other types of designations. No operational explosive safety quantity distance arcs are within the project sites, though small arms ammunition is transported along the Decatur Avenue Bridge, adjacent to the Alternative 2 site. There are no areas with unexploded ordnance or electromagnetic concerns (NAVFAC Washington, 2018a).

3.8.2 Environmental Consequences

The safety and environmental health analysis contained in the respective sections addresses issues related to the health and well-being of military personnel and civilians living on or in the vicinity of USNA.

3.8.2.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. Bridge safety inspections noted that 37 of the bridge piles (26 percent) are in poor-to-critical or failed condition. Portions of the concrete abutments, pier pile caps, and fascia panel components are also damaged or deteriorated. Two pipeline support beams are twisted and out of plumb. Superstructure and bearing hardware exhibit moderate-to-severe corrosion (NAVFAC EXWC, 2019).

Routine maintenance would continue to occur, including activities such as spot painting, securing hardware that has loosened, or replacing severely deteriorated timbers. This level of maintenance would not address the main safety concerns with the degraded bridge substructure. A 2019 bridge inspection report determined the bridge is in poor condition overall, and numerous deficiencies require correction within 12 months (NAVFAC EXWC, 2019).

The current utility bridge does not have any structural means to facilitate inspections or repairs. Inspections or repairs must be conducted via boat, which introduce short-term safety risks while these activities are occurring. Bridge inspection reports have noted this safety deficit, which would persist under the No Action Alternative.

As previously described, as a worst-case scenario, continued deterioration could result in the bridge suddenly failing, severing utility lines. Instantaneous ruptures of pressurized lines could be capable of damaging nearby infrastructure. This is an unacceptable safety risk, putting the general public traversing the King George Street Bridge at risk, as well as military and civilian personnel on USNA. A more probable scenario would be partial bridge failure that damages or imminently threatens to damage one or more of the utility lines. In that case, emergency shut off protocols would be enacted to prevent further damage or catastrophic failure, though this course would result in a loss of utility service on the Lower Yard, until these services could be safely restored.

In the unlikely event of a catastrophic bridge failure, there could be major risks that threaten a safe environment. In the more likely scenario of a partial bridge failure, the No Action Alternative would result in moderate safety risks, which would not result in significant impacts. Addressing infrastructure deterioration that threatens property damage or public safety is a driving need for the Proposed Action.

3.8.2.2 Alternative 1 Potential Impacts

The study area for public health and safety under Alternative 1 includes the existing utility bridge and the Alternative 1 project area where construction would occur; safety concerns include all of USNA.

Public health and safety during bridge construction and demolition activities is generally associated with the safety of personnel within or adjacent to construction zones. Construction activities increase short-term safety risks. Contractors performing construction activities would be required to prepare and follow safety protocols appropriate for specific construction and demolition tasks, and to comply with applicable worker safety laws. The construction site would be clearly marked to discourage members of the public from illegally accessing the on-land construction area, which would occur within installation boundaries.

Replacing the bridge would provide an operationally safe structure for utility crossings. The new bridge would be further away from the publicly accessible King George Street Bridge, which would improve security by placing utility infrastructure further within the USNA boundary. Furthermore, the new bridge would include infrastructure so that personnel can safely access the new bridge to conduct future inspections, repairs, and maintenance. Other safety measures would be included in the design to ensure the bridge meets applicable security requirements. Collectively, these are all long-term safety improvements.

Public Health and Safety Potential Impacts:

- No Action: The potential for a bridge failure is a public health and safety threat. Addressing infrastructure deterioration that threatens property damage or public safety is a driving need for the Proposed Action.
- Alternative 1: Short-term, minor adverse safety risks during construction and demolition. Long-term beneficial effects from improved bridge safety. No significant impacts.
- Alternative 2: Similar to Alternative 1. No significant impacts.
- Alternative 3: Similar to Alternative 1. No significant impacts.
- Option: Additional short-term, minor adverse safety risks during boring activities. Long-term beneficial effects from better-protected underground utilities. No significant impacts.

Implementation of Alternative 1 would not result in changes in operations. No changes in police, fire, rescue, and emergency medical service would occur. No other operational safety considerations are present at the Alternative 1 project area.

Implementation of Alternative 1 would not result in significant impacts on public health and safety.

3.8.2.3 Alternative 2 Potential Impacts

The study area for public health and safety under Alternative 2 includes the existing utility bridge and the Alternative 2 project area where construction would occur; safety concerns include all of USNA. Alternative 2 would increase short-term safety risks associated with construction and demolition activities. Construction sites would be clearly marked to discourage unauthorized access, and contractors performing construction activities would be required to prepare and follow safety protocols appropriate for specific construction and demolition tasks, and to comply with applicable worker safety laws. Long-term safety would be improved by providing an operationally safe structure for utility crossings that has access infrastructure for safe inspections, repairs, and maintenance. These impacts are essentially the same as those described under Alternative 1. The Alternative 2 site is adjacent to the explosives transportation route along Decatur Avenue. As all small arms would be handled and transported in accordance with existing plans and protocols, their presence would have no effect on the safety of the construction or operations of the proposed utility bridge. Therefore, implementation of Alternative 2 would not result in significant impacts on public health and safety.

3.8.2.4 Alternative 3 Potential Impacts

The study area for public health and safety under Alternative 3 includes the existing utility bridge and the Alternative 3 project area where construction would occur; safety concerns include all of USNA. Alternative 3 would increase short-term safety risks associated with construction and demolition activities. Construction sites would be clearly marked to discourage unauthorized access, and contractors performing construction activities would be required to prepare and follow safety protocols appropriate for specific construction and demolition tasks, and to comply with applicable worker safety laws. Long-term safety would be improved by providing an operationally safe structure for utility crossings that has access infrastructure for safe inspections, repairs, and maintenance. These impacts are essentially the same as those described under Alternative 1. Therefore, implementation of Alternative 3 would not result in significant impacts on public health and safety.

3.8.2.5 Potential Impacts of Underground Utility Option

The study area for the underground utility option includes the location of the directional boring near the existing utility bridge; safety concerns extend to include all of USNA. Boring utilities underground would increase short-term safety risks as a result of operating drilling equipment. Similar to general construction activities for the bridge, contractors would be responsible for employing best practices and procedures for safe boring. Locations of existing underground utilities would be clearly identified and marked prior to boring to minimize unintended underground strikes. These kinds of construction-related safety risks would be short-term and managed via following standard practices. Locating utilities underground could improve long-term safety by protecting those lines and conduits from accidental or intentional damage. Implementation of the underground utility option, in addition to any of the alternatives, would not result in significant impacts on public health and safety.

3.9 Hazardous Materials and Wastes

This section discusses hazardous materials, hazardous waste, and toxic substances management at USNA, with a focus on the presence of these materials near the project area.

Two installation restoration program sites and two munitions response sites are on North Severn, and a closed solid waste management unit adjacent to Shady Lake is on the northern side of the Upper Yard, all of which are well removed from the project area (NAVFAC Washington, 2018a). Therefore, contaminated sites are not discussed further in this EA.

3.9.1 Affected Environment

The Navy has implemented a strict Hazardous Material Control and Management Program and a Hazardous Waste Minimization Program for all activities. These programs are governed Navy-wide by applicable Office of the Chief of Naval Operations instructions and at the installation by specific instructions issued by the Base Commander. The Navy continuously monitors its operations to find ways to minimize the use of hazardous materials and to reduce the generation of hazardous wastes.

3.9.1.1 Hazardous Materials

NSA Annapolis has a Spill Prevention, Control, and Countermeasure Plan for USNA that details the equipment, workforce, procedures, and steps to prevent, control, and provide adequate countermeasures of an oily discharge (NSA Annapolis, 2019). The installation also has a pollution prevention program aimed at reducing use and controlling, managing, and reusing hazardous materials. Hazardous materials are managed in a central location on-site according to the Navy's Consolidated Hazardous Material Reutilization and Inventory Management Program (CHRIMP).

The various departments, divisions, and tenants of the installation use different types of hazardous materials (Navy, 2009). Hazardous materials used on the installation include paints, aerosols, oils, cleaning solutions, and fluorescent bulbs. Building 194 serves as the central hazardous materials storage and distribution facility for USNA (NSA Annapolis, 2019). The largest bulk oil storage tanks (i.e., between 325,000 and 350,000 gallons of fuel) have appropriate secondary containment sized for the volume of the container. Smaller oil storage containers are either double walled, have secondary containment, or are stored in locations where the facility structure provides adequate containment. USNA has only aboveground storage tanks, though some piping is below-grade. A 50-gallon generator tank is along the eastern bank of College Creek near the Alternative 2 area (NSA Annapolis, 2019).

3.9.1.2 Hazardous Waste

NSA Annapolis is a large-quantity generator of hazardous waste (NSA Annapolis, 2017). Hazardous waste typically produced at the installation includes spent solvents, used oils, organic substances, waste paint, laboratory chemicals, dirt contaminated with oil and other organic liquids, batteries, and battery fluids. The CHRIMP in Building 194 also provides hazardous waste storage in addition to hazardous materials storage on the Upper Yard. On the Lower Yard, several facilities store hazardous waste where it is generated until the maximum amount of waste is reached—55 pounds of hazardous waste or 1 quart of acutely hazardous waste—and then waste containers must be transferred to a less-than-90 day storage area to await final transport and disposal (NSA Annapolis, 2017).

3.9.1.3 Special Hazards

Special hazards are those substances that might pose a threat to human health, including asbestos-containing materials (ACM), lead-based paint (LBP), and PCBs. ACMs were commonly used in pipe insulation, sprayed concrete/gunite, bridge expansion joints, gaskets around electrical components, and epoxy coatings. LBP was widely used prior to its ban in 1978. Similarly, PCBs were widely used in paint, caulk, and sealants prior to its ban in 1979. As the bridge was originally constructed in 1931 and underwent a major retrofit in 1986, ACM, LBP, and PCBs are likely to be present.

3.9.2 Environmental Consequences

The hazardous materials and wastes analysis for this EA addresses issues related to the use and management of hazardous materials and wastes and the presence of special hazards in near the project area at NSA Annapolis.

3.9.2.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur, and there would be no change associated with use or management of hazardous materials and wastes. The Navy would continue to maintain the existing utility bridge, though the bridge is in poor condition overall with numerous deficiencies. Routine maintenance activities would have negligible impacts on hazardous materials and wastes due to the very small quantities that could be used or generated for these repairs. Under a worst-case scenario of a bridge failure, bridge components containing special hazards such as lead and asbestos could be released into College Creek or into the air and surrounding area in the form of dust and debris. Sources of special hazards on the utility bridge include primarily paints, caulks, and coatings; asbestos and lead have varying solubilities in water, depending on temperature, pH, and other factors. Clean-up following such an event could necessitate soil and sediment testing and removal. Therefore, no significant impacts on hazardous materials and wastes would occur under the No Action Alternative.

3.9.2.2 Alternative 1 Potential Impacts

The study area for hazardous materials and wastes under Alternative 1 includes the existing utility bridge and the Alternative 1 project area where construction would occur; management of hazardous materials and wastes includes all of USNA.

Construction activities would use hazardous materials and generate hazardous wastes in small quantities. Common hazardous materials include diesel fuel, gasoline, propane, hydraulic fluids, oils,

Hazardous Material and Waste Potential Impacts:

- No Action: Potential short-term, moderate adverse impacts from a worst-case scenario of a bridge failure or rupture resulting in special hazards such as lead and asbestos being released into the water, air, or surrounding area in the form of dust and debris. No significant impacts.
- Alternative 1: Short-term increase in use of hazardous materials and generation of hazardous wastes. Demolished bridge components may contain special hazards; wastes would be characterized and disposed of appropriately. No significant impacts.
- Alternative 2: Similar to Alternative 1. No significant impacts.
- Alternative 3: Similar to Alternative 1. No significant impacts.
- Option: Additional short-term, minor use of hazardous materials and generation of hazardous wastes. No significant impact, when combined with any of the action alternatives.

lubricants, and batteries. Common hazardous wastes include empty containers from hazardous materials, spent solvents, waste oil, lead-acid batteries, and any spill cleanup materials if used. Construction contractors are responsible for ensuring that the transport, use, storage, and disposal of hazardous materials and wastes complies with all applicable federal and state regulations. Adherence to policies, procedures, and regulations would minimize the potential impacts from exposure and accidental releases during construction. In the event of an accidental release, contaminated media would be treated on-site or would be promptly removed and disposed of in accordance with applicable Navy spill contingency plans and federal and state regulations.

Bridge demolition waste would include various components that could be hazardous waste or special hazards. The original bridge structure was constructed in 1931 as a railroad trestle, and then converted to a utility bridge. Paints, coatings, joints, pipe insulation, gaskets, sprayed concrete, and any other materials potentially suspect for ACM, LBP, or PCBs must be properly characterized for appropriate disposal in accordance with federal and state regulations. If any hazardous waste is discovered during the work, the PWD-A-EV HW program manager would sign all manifests for waste leaving NSA Annapolis.

For these reasons, implementation of Alternative 1 would not result in significant impacts with hazardous materials and wastes.

3.9.2.3 Alternative 2 Potential Impacts

The study area for hazardous materials and wastes under Alternative 2 includes the existing utility bridge and the Alternative 2 project area where construction would occur; management of hazardous materials and wastes includes all of USNA. Alternative 2 would increase short-term use of hazardous materials and generation of hazardous wastes from construction activities. The existing bridge likely contains ACM, LBP, and PCBs due the age of construction; suspect materials would require testing and, if present, appropriate disposal. These impacts are essentially the same as those described under Alternative 1. Therefore, implementation of Alternative 2 would not result in significant impacts with hazardous materials and wastes.

3.9.2.4 Alternative 3 Potential Impacts

The study area for hazardous materials and wastes under Alternative 3 includes the existing utility bridge and the Alternative 3 project area where construction would occur; management of hazardous materials and wastes includes all of USNA. Alternative 3 would increase short-term use of hazardous materials and generation of hazardous wastes from construction activities. The existing bridge likely contains ACM, LBP, and PCBs due the age of construction; suspect materials would require testing and, if present, appropriate disposal. These impacts are essentially the same as those described under Alternative 1. A generator and associated fuel storage tank are close to the project boundary on the eastern bank of College Creek; these would be avoided during construction activities. Therefore, implementation of Alternative 3 would not result in significant impacts with hazardous materials and wastes.

3.9.2.5 Potential Impacts of Underground Utility Option

The study area for the underground utility option includes the location of the directional boring near the existing utility bridge; management of hazardous materials and wastes includes all of USNA. Boring underground utility lines could require short-term use of additional hazardous materials, such as drilling fluid, and generate some additional hazardous wastes. Construction contractors are responsible for

ensuring that the transport, use, storage, and disposal of hazardous materials and wastes complies with all applicable federal and state regulations. Adherence to policies, procedures, and regulations would minimize the potential impacts from exposure and accidental releases during construction. In the event of an accidental release, contaminated media would be treated on-site or would be promptly removed and disposed of in accordance with applicable Navy spill contingency plans and federal and state regulations. Therefore, implementation of the underground utility option, in addition to any of the alternatives, would not result in significant impacts with hazardous materials and wastes.

3.10 Summary of Potential Impacts on Resources and Impact Avoidance and Minimization

Table 3-14 provides a tabular summary of the potential impacts on the resources associated with the No Action Alternative and the three action alternatives as well as the underground utility option.

Table 3-14 Summary of Potential Impacts on Resource Areas

<i>Resource Area</i>	<i>No Action Alternative</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Underground Utility Option</i>
Air Quality	Negligible air emissions from ongoing, routine maintenance. Temporary, minor, adverse, localized impacts from airborne dust and debris under a worst-case scenario of bridge failure. No significant impacts.	Similar to but slightly less than Alternative 2. No significant impacts.	Short-term, minor emissions during construction. No significant impacts.	Similar to Alternative 2. No significant impacts.	Short-term, minor emissions from operating boring equipment. No significant impacts, when combined with any of the action alternatives.
Water Resources	Short-term, moderate, adverse impacts from a rupture that results in discharges into College Creek. No significant impacts.	Short-term, minor adverse impacts from construction within College Creek. No long-term impacts. No significant impacts.	Similar to Alternative 1 but slightly greater due to more trenching. No significant impacts.	Similar to Alternative 1. No significant impacts.	Negligible impacts since utilities would be below creek sediment bed. No significant impacts, when combined with any of the action alternatives.
Geological Resources	No change in baseline condition. No significant impacts.	Short-term, minor, adverse effects from soil erosion and sedimentation. Minor, localized changes in topography from bridge construction and demolition. No significant impacts.	Similar to Alternative 1 but slightly greater due to more trenching. No significant impacts.	Similar to Alternative 1. No significant impacts.	Short-term, minor potential for drilling fluid or other fluid to leak into soils. No significant impacts, when combined with any of the action alternatives.

Resource Area	No Action Alternative	Alternative 1	Alternative 2	Alternative 3	Underground Utility Option
Cultural Resources	Possible direct adverse effects from a worst-case scenario depending on the extent of a rupture. Possible indirect, adverse effects from the worst-case scenario due to the vibrations from a rupture. No significant impacts.	Minor-to-moderate, adverse effects on unknown archaeological deposits due to ground disturbance of the new bridge; a Phase I survey would be completed. No adverse effects on viewsheds in the APE. No adverse effects on the Colonial Annapolis Historic District. No significant impacts.	Minor-to-moderate, adverse effects on unknown archaeological deposits due to ground disturbance of the new bridge; a Phase I survey would be completed. No adverse effects on viewsheds in the APE. No adverse effects on the Colonial Annapolis Historic District. No significant impacts.	Minor-to-moderate, adverse effects on unknown archaeological deposits due to ground disturbance of the new bridge; a Phase I survey would be completed. No adverse effects on viewsheds in the APE. No adverse effects on the Colonial Annapolis Historic District. No significant impacts.	The Navy would follow the Standard Operating Procedure on unanticipated discoveries. No significant impacts, when combined with any of the action alternatives.
Biological Resources	Potential short-term, moderate adverse impacts from a worst-case scenario of a rupture that results in discharges into College Creek. No significant impacts.	Short-term, minor, adverse impacts from construction activity on marine species. No significant impacts.	Similar to Alternative 1. No significant impacts.	Similar to Alternative 1. No significant impacts.	Short-term, minor impacts on bottom-dwelling species from vibrations during directional drilling. No significant impacts, when combined with any of the action alternatives.
Noise	Short-term, moderate impacts from a worst-case scenario of a rupture. No long-term impacts. No significant impacts.	Short-term, minor impacts on airborne and underwater receptors from construction. No long-term impacts. No significant impacts.	Similar to Alternative 1. No significant impacts.	Similar to Alternative 1. No significant impacts.	Short-term, minor impacts from construction; minor impacts from vibration. No long-term impacts. No significant impacts when combined with any of the action alternatives.

Resource Area	No Action Alternative	Alternative 1	Alternative 2	Alternative 3	Underground Utility Option
Infrastructure	Likely impacts include partial or total bridge failure affecting the distribution of utility service. Under a worst-case scenario of catastrophic bridge failure, impacts would be major but utility service would be restored in the long term. Infrastructure deterioration is a driving need for the Proposed Action.	Short-term, minor impacts on utility service during interconnections. Long-term, beneficial effects from a safer, more reliable bridge to carry utilities. No significant impacts.	Similar to Alternative 1. No significant impacts.	Similar to Alternative 1. No significant impacts.	Short-term, minor impacts on utility service during interconnections. Long-term increased reliability and protection from lines being underground. No significant impacts, when combined with any of the action alternatives.
Public Health and Safety	The potential for a bridge failure is a public health and safety threat. Addressing infrastructure deterioration that threatens property damage or public safety is a driving need for the Proposed Action.	Short-term, minor adverse safety risks during construction and demolition. Long-term beneficial effects from improved bridge safety. No significant impacts.	Similar to Alternative 1. No significant impacts.	Similar to Alternative 1. No significant impacts.	Short-term, minor adverse safety risks during boring activities. Long-term beneficial effects from better-protected underground utilities. No significant impacts, when combined with any of the action alternatives.
Hazardous Materials and Wastes	Potential short-term, moderate adverse impacts from a worst-case scenario of a bridge failure or rupture resulting in special hazards such as lead and asbestos being released into the water, air, or surrounding area in the form of dust and debris. No significant impacts.	Short-term increase in use of hazardous materials and generation of hazardous wastes. Demolished bridge components may contain special hazards; wastes would be characterized and disposed of appropriately. No significant impacts.	Similar to Alternative 1. No significant impacts.	Similar to Alternative 1. No significant impacts.	Additional short-term, minor use of hazardous materials and generation of hazardous wastes. No significant impacts, when combined with any of the action alternatives.

Key: APE = Area of Potential Effect; NRHP = National Register of Historic Places.

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4 Cumulative Impacts

This section (1) defines cumulative impacts; (2) describes past, present, and reasonably foreseeable future actions relevant to cumulative impacts; (3) analyzes the incremental interaction the proposed action may have with other actions; and (4) evaluates cumulative impacts potentially resulting from these interactions.

4.1 Definition of Cumulative Impacts

The approach taken in the analysis of cumulative impacts follows the objectives of NEPA, CEQ regulations, CEQ guidance, and Navy regulations. A cumulative impact is defined in 40 CFR section 1508.7 as “the impact on the environment which results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.”

To determine the scope of environmental impact analyses, agencies shall consider cumulative actions, which, when viewed with other proposed actions, have cumulatively significant impacts and should therefore be discussed in the same impact analysis document.

In addition, CEQ and USEPA have published guidance addressing implementation of cumulative impact analyses—*Guidance on the Consideration of Past Actions in Cumulative Effects Analysis* (CEQ, 2005) and *Consideration of Cumulative Impacts in EPA Review of NEPA Documents* (USEPA, 1999). CEQ guidance entitled *Considering Cumulative Impacts Under NEPA* (1997) states that cumulative impact analyses should

“ . . . determine the magnitude and significance of the environmental consequences of the proposed action in the context of the cumulative impacts of other past, present, and future actions . . . identify significant cumulative impacts . . . [and] . . . focus on truly meaningful impacts.”

Cumulative impacts 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 period. Actions overlapping with or near a proposed action would be expected to have more potential for a relationship than those more geographically separated. Similarly, relatively concurrent actions would tend to offer a higher potential for cumulative impacts. To identify cumulative impacts, the analysis needs to address the following three fundamental questions.

- 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?
- 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?
- If such a relationship exists, then does an assessment reveal any potentially significant impacts not identified when the Proposed Action is considered alone?

4.2 Scope of Cumulative Impacts Analysis

The scope of the cumulative impacts 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 study area delimits the

geographic extent of the cumulative impacts analysis. In general, the study area includes those areas previously identified in Chapter 3 for the respective resource areas. The time frame for cumulative impacts centers on the timing of the Proposed Action.

Another factor influencing the scope of cumulative impacts analysis involves identifying other actions to consider. Beyond determining that the geographic scope and time frame for the actions interrelated to the Proposed Action, the analysis employs the measure of “reasonably foreseeable” to include or exclude other actions. For the purposes of this analysis, public documents prepared by federal, state, and local government agencies form the primary sources of information regarding reasonably foreseeable actions. Documents used to identify other actions include notices of intent for Environmental Impact Statements and EAs, management plans, land use plans, and other planning related studies.

4.3 Past, Present, and Reasonably Foreseeable Actions

This section focuses on past, present, and reasonably foreseeable future projects at, and near, the Proposed Action locale. In determining which projects to include in the cumulative impacts analysis, a preliminary determination was made regarding past, present, or reasonably foreseeable actions. Specifically, using the first fundamental question included in Section 4.1, it was determined if a relationship exists such that the affected resource areas of the Proposed Action (included in this EA) might interact with the affected resource area of a past, present, or reasonably foreseeable action. If no such potential relationship exists, the project was not carried forward into the cumulative impacts analysis. In accordance with CEQ guidance (CEQ, 2005), these actions that were considered but excluded from further cumulative effects analysis are not catalogued here as the intent is to focus the analysis on the meaningful actions relevant to informed decision making. Projects included in this cumulative impact analysis are listed in Table 4-1, shown on Figures 4-1 through 4-3, and briefly described in the following subsections.

Table 4-1 Cumulative Action Evaluation

Action	Level of NEPA Analysis Completed
Past Actions	
Navy Exchange, Commissary, Health Clinic	Environmental Assessment
Halligan Hall Energy Repairs	Categorical Exclusion
Perry Center Seawall Repair	Categorical Exclusion
Present and Reasonably Foreseeable Future Actions	
Wastewater Treatment Plant Upgrades	Environmental Assessment
Center for Cyber Security Studies	Environmental Assessment
Porter Road Stormwater Management Repairs	Categorical Exclusion
Chapel Roof Repairs	Categorical Exclusion
Chapel and Leahy Hall Steam Distribution Repairs	Categorical Exclusion
Sampson Hall Roof and Exterior Repairs	Categorical Exclusion
U.S. Naval Academy Alumni Association and Foundation Headquarters	Environmental Assessment
Mail Center and CHRIMP Relocation	Environmental Assessment
Perry Center Riprap Repair	Categorical Exclusion
Beach Hall Conference Center Addition	Categorical Exclusion
Seawall Repair and Restoration	Environmental Assessment (ongoing)
Decatur Avenue Bridge Repair/Replacement	To be determined

Sources: NAVFAC Washington, 2015; NAVFAC Washington, 2018a; NAVFAC Washington, 2018c

Key: CHRIMP = Consolidated Hazardous Material Reutilization Inventory Management Program; NEPA = National Environmental Policy Act.

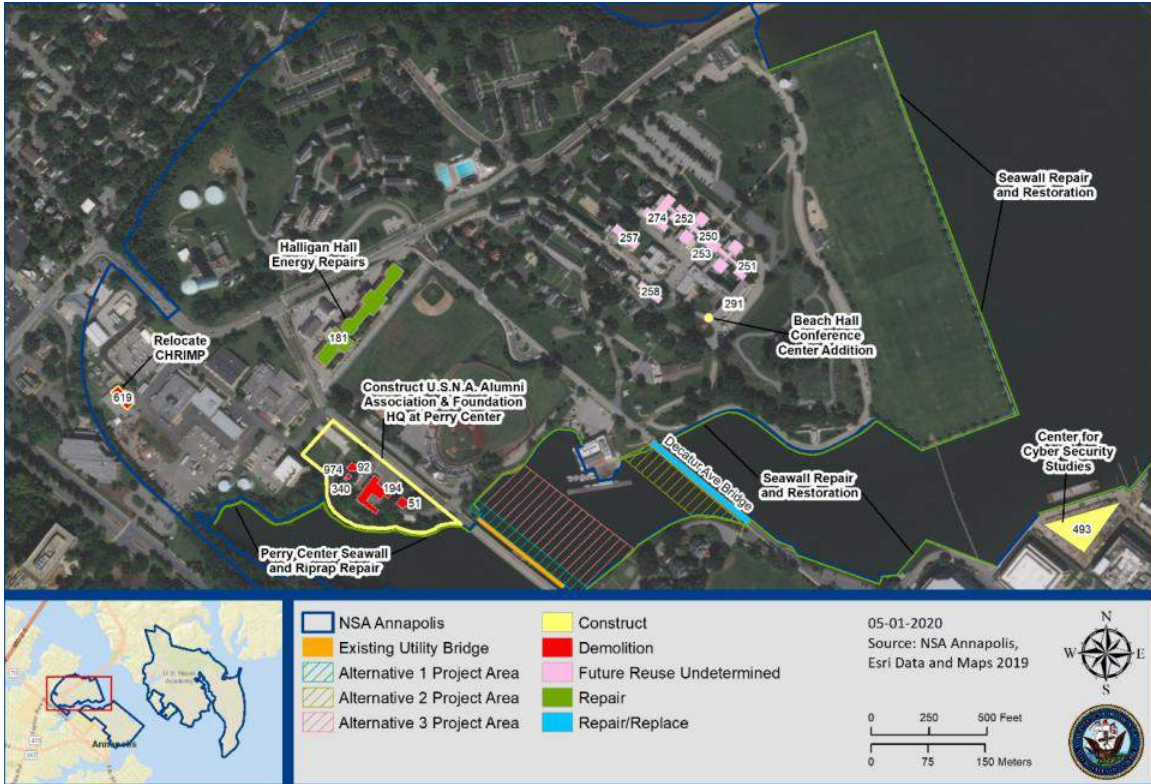


Figure 4-1 Cumulative Projects on the Upper Yard

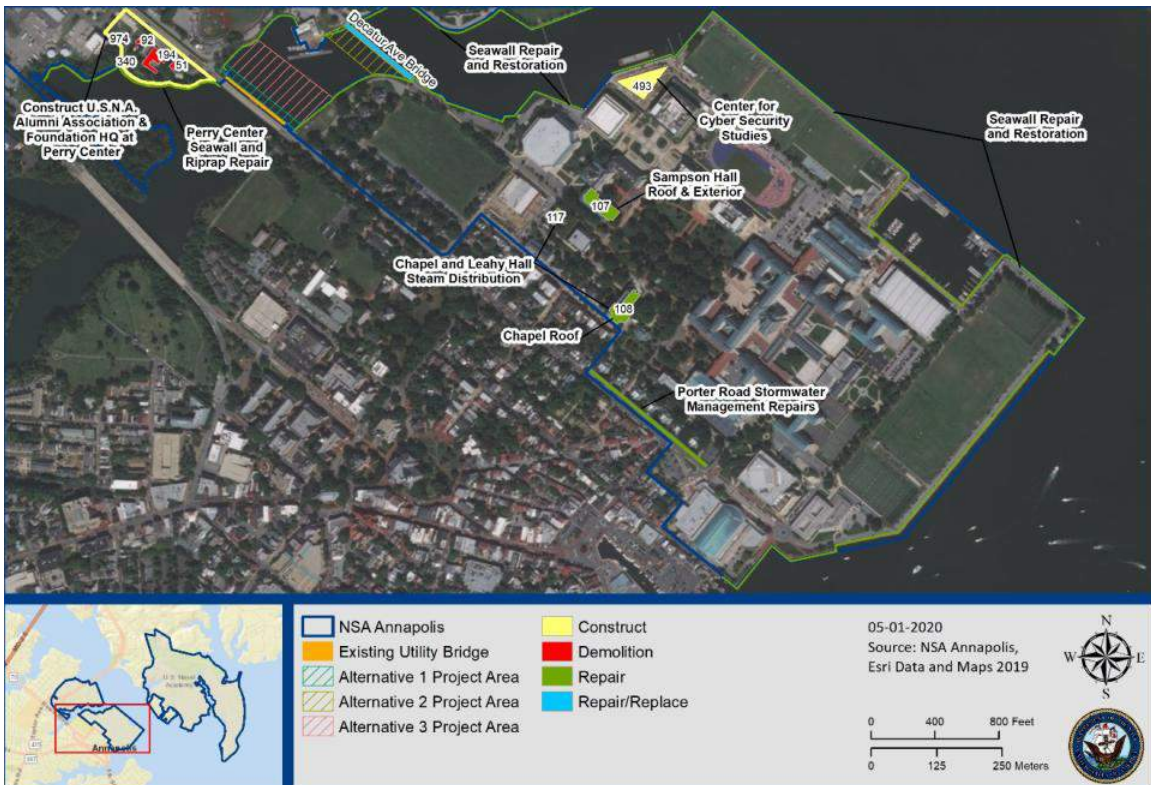


Figure 4-2 Cumulative Projects on the Lower Yard

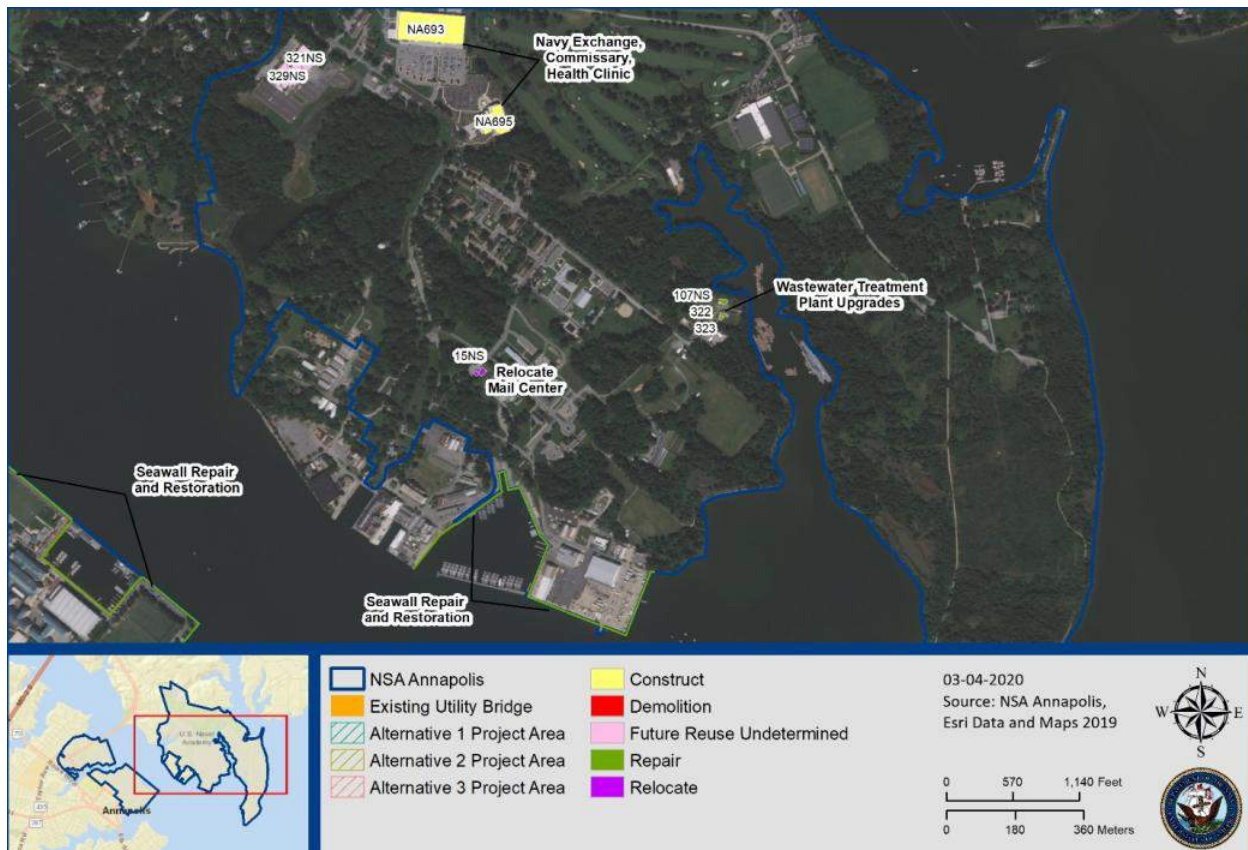


Figure 4-3 Cumulative Projects on North Severn

4.3.1 Past Actions

Navy Exchange, Commissary, Health Clinic. The Navy prepared an EA to assess the potential environmental impacts of constructing and operating a new Navy Exchange, Commissary, and Health Clinic on North Severn. The Navy Exchange and Commissary complex, located between Kinkaid and Greenbury Point Roads, includes a one-story building with an 88,000-square-foot Navy Exchange and a 51,500-square-foot Commissary. A three-story 105,500-square foot-Health Clinic is located adjacent to the northwestern boundary of the golf course. A supporting 550-space parking area was constructed between the Navy Exchange and Commissary complex and the Health Clinic. The Navy Exchange and Commissary replace the existing facilities on North Severn; the existing Navy Exchange and Commissary buildings and their associated parking would be reused (potential reuse has not yet been determined). The new Health Clinic on North Severn replaced the Naval Health Clinic on the Upper Yard. The Navy Exchange/Commissary opened in September 2014, and construction of the Health Clinic was completed in 2017 (NAVFAC Washington, 2018c).

Halligan Hall Energy Repairs. This project consisted of replacing the existing steam service and heating and air conditioning system in Halligan Hall (Building 181) with a more energy efficient ground-source heat pump, also known as a geothermal well system. Approximately 190 six-inch-diameter wells were installed at a depth of up to 400 feet below Lawrence Field for the proposed ground-source heat pump system. The project also included restoring and selectively replacing the existing windows to improve the building's thermal performance (NAVFAC Washington, 2018c).

Perry Center Seawall Repair. The Navy conducted repairs to the seawall along College Creek.

4.3.2 Present and Reasonably Foreseeable Actions

Wastewater Treatment Plant Upgrades. The Navy plans to modernize and repair the North Severn wastewater treatment plant to comply with regulatory requirements for denitrification (NAVFAC Washington, 2018a).

Center for Cyber Security Studies. This project consists of the construction of an approximately 206,000-square-foot new multistory facility at the Lower Yard to house the Center for Cyber Security Studies and a supporting two-story parking garage structure. The facilities were designed and will be constructed for energy efficiency and sustainability including, at a minimum, a Leadership in Energy and Environmental Design Silver certification (NAVFAC Washington, 2018c).

Porter Road Stormwater Management Repairs. This project consists of repairs to stormwater management along Porter Road on the Lower Yard.

Chapel Roof Repairs. This project consists of roof repairs to the historic USNA Chapel (Building 108), located on the Lower Yard of NSA Annapolis.

Chapel and Leahy Hall Steam Distribution Repairs. This project consists of repairs to the water and steam distribution lines that provide heating at the USNA Chapel (Building 108) and Leahy Hall (Building 117) on the Lower Yard.

Sampson Hall Roof and Exterior. This project consists primarily of replacing the roof on Sampson Hall (Building 107) and other minor facility repairs.

Construct U.S. Naval Academy (USNA) Alumni Association and Foundation Headquarters at Perry Center. The USNA Alumni Association and Naval Academy Foundation will construct a new 29,000–square-foot Alumni Service Center and Headquarters facility with a 90- to 120-vehicle parking lot on NSA Annapolis property located at the Perry Center in the southwestern portion of the Upper Yard. Construction of the facility and parking lot will require excavation, grading, and tree/vegetation removal resulting in 5,928 cubic yards of excavated material, 5,585 cubic yards of fill material, and 20,650 square feet of tree/vegetation removal. Project implementation is anticipated to begin in 2020 with a 24-month construction period (NAVFAC Washington, 2018c).

Relocation of Mail Center and Consolidated Hazardous Material Reutilization Inventory Management Program (CHRIMP) Facilities. Two functions within the Perry Center require relocation prior to the new USNA Alumni Association and Naval Academy Foundation Headquarters. The Navy plans to relocate the Mail Center from Building 51 (which would be demolished) to Building 15NS on North Severn.

The CHRIMP is located in Building 194, which would also be demolished. The Navy plans to relocate the CHRIMP to Buildings 619. Building 619, a public works shop storage area, is not needed and would be demolished (NAVFAC Washington, 2018c).

Perry Center Riprap Repair. The Navy plans to conduct further repairs to the riprap along College Creek.

Beach Hall Conference Center Addition. The U.S. Naval Institute, which is in Beach Hall (Building 291), is constructing a conference center addition on the western side of the building. The addition will include a 400-seat auditorium/conference room with an open-air area for tables and chairs on the roof (NAVFAC Washington, 2018a). The addition is currently under construction.

Seawall Repair and Restoration. NSA Annapolis plans to repair and restore approximately 19,334 linear feet of seawall on the shorelines of the Lower Yard along the Severn River, College Creek, Spa Creek, and Santee Basin; portions of the Upper Yard along the Seven River and College Creek; and portions of the North Severn area along the Severn River and Yard Patrol Basin. The repairs and restoration would address existing structural deficiencies and potential impacts from future extreme weather events, storm surge, sea level rise, and land subsidence. Construction would occur over the next 10 to 20 years as funding becomes available. An EA is currently being prepared to assess a range of techniques to repair and design designated reaches, primarily hardened structures, but also log toe stabilization and living shoreline where those techniques might be feasible.

Decatur Avenue Bridge Repair/Replacement. Currently, the Decatur Avenue Bridge is in fair condition. Some repairs of this bridge could occur in the next 24 months. Furthermore, the bridge may need major repairs or replacement within the next 5 to 10 years. However, details about possible repairs or replacement are not known at this time, so this project is only considered notionally in this cumulative analysis.

4.4 Cumulative Impact Analysis

Where feasible, the cumulative impacts were assessed using quantifiable data; however, for many of the resources included for analysis, quantifiable data are not available, and a qualitative analysis was undertaken. In addition, where an analysis of potential environmental effects for future actions has not been completed, assumptions were made regarding cumulative impacts related to this EA where possible. The analytical methodology presented in Chapter 3, which was used to determine potential impacts on the various resources analyzed in this document, was also used to determine cumulative impacts.

4.4.1 Air Quality

4.4.1.1 Description of Geographic Study Area

The study area for cumulative impacts on air quality is the Metropolitan Baltimore Intrastate Air Quality Control Region.

4.4.1.2 Relevant Past, Present, and Future Actions

All present and reasonably foreseeable future actions listed in Table 4-1 have the potential to affect air quality.

4.4.1.3 Cumulative Impact Analysis

Cumulative air quality impacts from past, present, and future actions within the study area would be less than significant. For present and future actions, construction would generate short-term criteria pollutant and fugitive dust emissions while ground-disturbing activities are occurring. Air emissions are based on the size and complexity of the project and whether construction activities would disturb the soil. All present and reasonably foreseeable future actions could collectively increase emissions of criteria pollutants temporarily in and around construction sites at NSA Annapolis, but variations in the timing of projects would distribute emissions temporally. Estimated construction emissions from the proposed utility bridge replacement are well below *de minimis* thresholds. Per regulation, by demonstrating that this project would be below *de minimis* thresholds as discussed in Section 3.1, the project is not considered significant individually or cumulatively within the airshed. Therefore,

implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts on air quality within the study area.

4.4.2 Water Resources

4.4.2.1 Description of Geographic Study Area

The study area for assessment of cumulative impacts on water resources includes College Creek, the downstream water resources, wetlands, and groundwater.

4.4.2.2 Relevant Past, Present, and Future Actions

All projects listed in Table 4-1 could contribute directly or indirectly to impacts on water resources.

4.4.2.3 Cumulative Impact Analysis

For past, present, and future projects at NSA Annapolis, all construction projects would be expected to increase sedimentation and turbidity, which could directly affect water resources within the study area or indirectly affect downstream water resources. The Perry Center seawall and riprap repair along College Creek would aid in reducing sedimentation into the creek. In addition, NSA Annapolis plans to repair and restore approximately 19,334 linear feet of seawall on the Lower Yard and Upper Yard along the Seven River and College Creek, which would also aid in reducing sedimentation. Individually, projects would be expected to have negligible-to-minor impacts, depending on the specific water resources (e.g., surface water, coastal zones) where the construction occurs, and varying with the size, intensity, and duration of construction activities.

Development pressures in urbanized areas have the potential for contributing to long-term, adverse, cumulative effects by increasing impervious surfaces from parking, sidewalks, and facilities, which can exacerbate stormwater and flooding issues and decrease groundwater infiltration. However, the Proposed Action would not increase the amount of impervious surface. Implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant water resource impacts within the study area.

4.4.3 Geological Resources

4.4.3.1 Description of Geographic Study Area

The study area for assessment of cumulative impacts on geological resources is NSA Annapolis and adjacent areas that could receive indirect impacts.

4.4.3.2 Relevant Past, Present, and Future Actions

All projects listed in Table 4-1 could contribute directly or indirectly to impacts on geological resources.

4.4.3.3 Cumulative Impact Analysis

Most of the projects listed in Table 4-1 involve activities that result in soil disturbance. Given the NSA Annapolis' location along the shorelines of the Severn River, College Creek, and other surface water bodies, soil disturbance can increase sedimentation into those water bodies. However, erosion- and sediment-control plans are required for grading activities that disturb 5,000 square feet or more of land area or 100 cubic yards or more of earth, reducing sedimentation into water. Given the low-lying topography of the installation, the cumulative projects would not change the topography of the area. If

any of the projects change the runoff characteristics and create points of concentrated flow where previously there was sheet flow, MDE may require additional water quantity management to minimize adverse impacts from the change in drainage patterns. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts on geological resources within the study area.

4.4.4 Cultural Resources

4.4.4.1 Description of Geographic Study Area

The study area for assessment of cumulative impacts on cultural resources is NSA Annapolis.

4.4.4.2 Relevant Past, Present, and Future Actions

All past, present, and reasonably foreseeable future actions on USNA listed in Table 4-1 have the potential to affect cultural resources, either directly if a building is within the USNA and the National Historic Landmark/Historic District boundaries, or if visible from the district.

4.4.4.3 Cumulative Impact Analysis

The Navy meets its stewardship requirements for cultural resources under Sections 106 and 110 of the NHPA. The installation has an Integrated Cultural Resources Management Plan that is a reference and a planning tool for management and preservation of cultural resources while maintaining mission readiness (NAVFAC Washington, 2018b). Any alterations of a resource eligible for the NRHP must be done to meet the Secretary of the Interior's Standards for the Treatment of Historic Properties. Consultation with the SHPO (and other appropriate parties) must be undertaken prior a project's commencement. In this way, the Navy works to identify, avoid, minimize, and/or mitigate any potential impacts on cultural resources when implementing individual projects.

The Cyber Security Studies Programmatic Agreement identified the Navy's commitment to design the facility for compatibility with its surroundings, minimizing height and massing of the top floor, and to provide designs, once available, to consulting parties for review at various phases in the design process. A Programmatic Agreement is also anticipated for the shoreline repairs, though details for that project have not yet been defined. Considering the location of the utility bridge where shoreline repairs would occur at some point in the future (likely following bridge relocation), requirements identified in that Programmatic Agreement may have some cumulative considerations. The Navy would abide by any and all Programmatic Agreement commitments and consult further, as appropriate. The Navy is also consulting with the SHPO regarding this Proposed Action. Implementation of the Proposed Action, when combined with past, present, and reasonably foreseeable future projects, would not be expected to result in significant impacts within the study area.

4.4.5 Biological Resources

4.4.5.1 Description of Geographic Study Area

The study area for assessment of cumulative impacts on biological resources is NSA Annapolis and the surrounding terrestrial and aquatic biological community.

4.4.5.2 Relevant Past, Present, and Future Actions

All projects listed in Table 4-1 could contribute directly or indirectly to impacts on biological resources.

4.4.5.3 Cumulative Impact Analysis

For past, present, and future projects at NSA Annapolis, all construction projects would be expected to generate some noise and fugitive dust, which could directly or indirectly affect wildlife species. Individually, projects would be expected to have negligible-to-minor impacts, depending on the biological community where the construction occurs, and would vary with the size, intensity, and duration of construction activities. Given the amount of terrestrial and aquatic habitat in the vicinity of NSA Annapolis, wildlife would be able to retreat if disturbed by noise, dust, or increased human activities.

Construction activities occurring along College Creek, including the Center for Cyber Security Studies, Alumni Service Center and Headquarters facility, seawall and shoreline repair and restoration activities, and the Proposed Action, could have cumulative contributions of increased turbidity affecting aquatic organisms in College Creek and further downstream. Shoreline repairs and the utility bridge would have the greatest likelihood of cumulative contributions as these activities would occur within and along the shorelines of College Creek. Construction activities would adhere to all federal and state regulations and permits and would use sediment- and erosion-control measures and, if applicable, stormwater controls. Long-term, adverse cumulative impacts on aquatic species or EFH are not expected from construction activities.

Implementation of the Proposed Action, combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts within the study area.

4.4.6 Noise

4.4.6.1 Description of Geographic Study Area

The study area for assessment of cumulative impacts on the noise environment are the populations adjacent to the installation and the underwater receptors.

4.4.6.2 Relevant Past, Present, and Future Actions

All of the present and foreseeable future projects listed in Table 4-1 could contribute directly or indirectly to impacts on noise.

4.4.6.3 Cumulative Impact Analysis

Cumulative noise impacts from present and future actions within the study area could occur during construction activities if they were adjacent to noise-sensitive receptors and were occurring at the same time. However, noise from construction would be intermittent and temporary. Long-term impacts from the operation of the Alumni Service Center and Headquarters facility and Center for Cyber Security Studies are not expected to be significant, and according to project schedules, construction of these facilities would not overlap with this Proposed Action (NAVFAC Washington, 2015). The Proposed Action in this EA would not have long-term impacts; combined, these projects would not be expected to have long-term cumulative impacts on noise.

4.4.7 Infrastructure

4.4.7.1 Description of Geographic Study Area

The study area for assessment of cumulative impacts on infrastructure is NSA Annapolis.

4.4.7.2 Relevant Past, Present, and Future Actions

All projects listed in Table 4-1 could contribute directly or indirectly to impacts on infrastructure.

4.4.7.3 Cumulative Impact Analysis

Individual construction activities have varying infrastructure requirements. Utility systems on NSA Annapolis are generally adequate. Individual projects could have temporary impacts during utility interconnections, but these kinds of impacts would be minor and short term in nature. Larger projects, such as the Center for Cyber Security Studies and Alumni Service Center and Headquarters facility, contribute cumulatively with localized upgrades and replacements of infrastructure components, which have long-term benefits for installation-wide infrastructure. The Proposed Action would not increase demand for or change the capacity of the existing utility infrastructure. However, the replaced bridge would enhance long-term safety, security, and reliability of the utilities crossing College Creek on that bridge, which would have long-term cumulative contributions to improved utilities at NSA Annapolis. Implementation of the Proposed Action, combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts on infrastructure within the study area.

4.4.8 Public Health and Safety

4.4.8.1 Description of Geographic Study Area

The study area for the assessment of cumulative impacts on public health and safety is NSA Annapolis.

4.4.8.2 Relevant Past, Present, and Future Actions

All past, present, and reasonably foreseeable future actions listed in Table 4-1 have the potential to affect public health and safety.

4.4.8.3 Cumulative Impact Analysis

All construction activities have minor safety risks while these activities are ongoing but would not cumulatively pose unacceptable safety risks. Other ongoing and future activities would not present notable long-term safety concerns. The replaced bridge would enhance long-term safety and security by correcting conditions that currently pose safety hazards. Implementation of the Proposed Action, combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts on public health and safety within the study area.

4.4.9 Hazardous Materials and Wastes

4.4.9.1 Description of Geographic Study Area

The study area for assessment of cumulative impacts on hazardous materials and wastes is NSA Annapolis.

4.4.9.2 Relevant Past, Present, and Future Actions

All present and reasonably foreseeable future actions listed in Table 4-1 have the potential to affect hazardous materials and wastes.

4.4.9.3 Cumulative Impact Analysis

Construction and demolition activities would be expected to use small quantities of hazardous materials and generate small quantities of hazardous wastes while these activities are occurring. Activities would adhere to existing hazardous materials, waste, and spill management plans. The Navy continually monitors its operations to find ways to minimize the use of hazardous materials and to reduce the generation of hazardous wastes. Therefore, implementation of the Proposed Action, combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts on hazardous materials and wastes within the study area.

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Appendix A

Relevant Laws and Regulations

The Navy has prepared this Environmental Assessment (EA) based upon federal and state laws, statutes, regulations, and policies pertinent to the implementation of the Proposed Action, including the following:

- National Environmental Policy Act (NEPA; 42 United States Code [U.S.C.] sections 4321–4370h), which requires an environmental analysis for major federal actions that have the potential to significantly affect the quality of the human environment
- CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] parts 1500–1508)
- Navy’s Procedures for Implementing NEPA (32 CFR part 775), which provides Navy policy for implementing CEQ regulations and NEPA
- Clean Air Act (42 U.S.C. section 7401 et seq.)
- Clean Water Act (33 U.S.C. section 1251 et seq.)
- Rivers and Harbors Act (33 U.S.C. section 407)
- Coastal Zone Management Act (16 U.S.C. section 1451 et seq.)
- National Historic Preservation Act (54 U.S.C. section 306108 et seq.)
- Endangered Species Act (16 U.S.C. section 1531 et seq.)
- Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (16 U.S.C. section 1801 et seq.)
- Marine Mammal Protection Act (16 U.S.C. section 1361 et seq.)
- Migratory Bird Treaty Act (16 U.S.C. section 703–712)
- Bald and Golden Eagle Protection Act (16 U.S.C. section 668–668d)
- Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. section 9601 et seq.)
- Emergency Planning and Community Right-to-Know Act (42 U.S.C. sections 11001–11050)
- Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. section 136 et seq.)
- Resource Conservation and Recovery Act (42 U.S.C. section 6901 et seq.)
- Toxic Substances Control Act (15 U.S.C. sections 2601–2629)
- Farmland Protection Policy Act (7 U.S.C. 4201 et seq.)
- Executive Order (EO) 11988, *Floodplain Management*
- EO 11990, *Protection of Wetlands*
- EO 12088, *Federal Compliance with Pollution Control Standards*
- EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*
- EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*
- EO 13175, *Consultation and Coordination with Indian Tribal Governments*
- EO 13834, *Efficient Federal Operations*

The following describes the regulatory setting pursuant to relevant laws according to the resource areas analyzed in detail in Chapter 3 of the EA.

Regulatory Setting

Air Quality

Criteria Pollutants and National Ambient Air Quality Standards

The principal pollutants defining air quality, called “criteria pollutants,” include carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), ozone, suspended particulate matter less than or equal to 10 micrometers in diameter (PM₁₀), fine particulate matter less than or equal to 2.5 micrometers in diameter (PM_{2.5}), and lead (Pb). CO, SO₂, Pb, and some particulates are emitted directly into the atmosphere from emissions sources. Ozone, NO₂, and some particulates are formed through atmospheric chemical reactions that are influenced by weather, ultraviolet light, and other atmospheric processes.

Under the Clean Air Act (CAA), the U.S. Environmental Protection Agency (USEPA) has established National Ambient Air Quality Standards (NAAQS) (40 CFR part 50) for these pollutants. NAAQS are classified as primary or secondary. Primary standards protect against adverse health effects; secondary standards protect against welfare effects, such as damage to farm crops and vegetation and damage to buildings. Some pollutants have long-term and short-term standards. Short-term standards are designed to protect against acute, or short-term, health effects, while long-term standards were established to protect against chronic health effects.

Areas that are and have historically been in compliance with the NAAQS are designated as attainment areas. Areas that violate a federal air quality standard are designated as nonattainment areas. Areas that have transitioned from nonattainment to attainment are designated as maintenance areas and are required to adhere to maintenance plans to ensure continued attainment.

The CAA requires states to develop a general plan to attain and maintain the NAAQS in all areas of the country and a specific plan to attain the standards for each area designated nonattainment for a NAAQS. These plans, known as State Implementation Plans (SIPs), are developed by state and local air quality management agencies and submitted to USEPA for approval.

In addition to the NAAQS for criteria pollutants, national standards exist for hazardous air pollutants (HAPs), which are regulated under Section 112(b) of the 1990 CAA Amendments. The *National Emission Standards for Hazardous Air Pollutants* regulate HAP emissions from stationary sources (40 CFR part 61).

Mobile Sources

HAPs emitted from mobile sources are called Mobile Source Air Toxics (MSATs). MSATs are compounds emitted from highway vehicles and non-road equipment that are known or suspected to cause cancer or other serious health and environmental effects. In 2001, USEPA issued its first MSAT Rule, which identified 201 compounds as being HAPs that require regulation. A subset of six of the MSAT compounds was identified as having the greatest influence on health and included benzene, butadiene, formaldehyde, acrolein, acetaldehyde, and diesel particulate matter. More recently, USEPA issued a second MSAT Rule in February 2007, which generally supported the findings in the first rule and provided additional recommendations of compounds having the greatest impact on health. The rule also identified several engine emission certification standards that must be implemented (40 CFR parts 59, 80, 85, and 86; *Federal Register* Volume 72, No. 37, pp. 8427–8570, 2007). Unlike the criteria pollutants,

there are no NAAQS for benzene and other HAPs. The primary control methodologies for these pollutants for mobile sources involves reducing their content in fuel and altering the engine operating characteristics to reduce the volume of pollutant generated during combustion.

General Conformity

The USEPA General Conformity Rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emissions thresholds that trigger requirements for a conformity analysis are called *de minimis* levels. *De minimis* levels (in tons per year [tpy]) vary by pollutant and also depend on the severity of the nonattainment status for the air quality management area in question.

A conformity applicability analysis is the first step of a conformity evaluation and assesses if a federal action must be supported by a conformity determination. This is typically done by quantifying applicable direct and indirect emissions that are projected to result due to implementation of the federal action. Indirect emissions are those emissions caused by the federal action and originating in the region of interest, but which can occur at a later time or in a different location from the action itself and are reasonably foreseeable. The federal agency can control and will maintain control over the indirect action due to a continuing program responsibility of the federal agency. Reasonably foreseeable emissions are projected future direct and indirect emissions that are identified at the time the conformity evaluation is performed. The location of such emissions is known and the emissions are quantifiable, as described and documented by the federal agency based on its own information and after reviewing any information presented to the federal agency. If the results of the applicability analysis indicate that the total emissions would not exceed the *de minimis* emissions thresholds, then the conformity evaluation process is completed. *De minimis* threshold emissions are presented in Table A-1.

Permitting: New Source Review (Preconstruction Permit)

New major stationary sources and major modifications at existing major stationary sources are required by the CAA to obtain an air pollution permit before commencing construction. This permitting process for major stationary sources is called New Source Review and is required whether the major source or major modification is planned for nonattainment areas or attainment and unclassifiable areas. In general, permits for sources in attainment areas and for other pollutants regulated under the major source program are referred to as Prevention of Significant Deterioration (PSD) permits, while permits for major sources emitting nonattainment pollutants and located in nonattainment areas are referred to as nonattainment new source review permits. In addition, a proposed project may have to meet the requirements of nonattainment new source review for the pollutants for which the area is designated as nonattainment and PSD for the pollutants for which the area is attainment. Additional PSD permitting thresholds apply to increases in stationary source greenhouse gas (GHG) emissions. PSD permitting can also apply to a new major stationary source (or any net emissions increase associated with a modification to an existing major stationary source) that is constructed within 6.2 miles of a Class I area, and which would increase the 24-hour average concentration of any regulated pollutant in the Class I area by 1 microgram per cubic meter ($\mu\text{g}/\text{m}^3$) or more. Navy installations shall comply with applicable permit requirements under the PSD program per 40 CFR section 51.166.

Table A-1 General Conformity *de minimis* levels

Pollutant	Area Type	tpy
Ozone (VOC or NO _x)	Serious nonattainment	50
	Severe nonattainment	25
	Extreme nonattainment	10
	Other areas outside an ozone transport region	100
Ozone (NO _x)	Marginal and moderate nonattainment within an ozone transport region	100
	Maintenance	100
Ozone (VOC)	Marginal and moderate nonattainment within an ozone transport region	50
	Maintenance within an ozone transport region	50
	Maintenance outside an ozone transport region	100
Carbon monoxide, sulfur dioxide, and nitrogen dioxide	All nonattainment and maintenance	100
PM ₁₀	Serious nonattainment	70
	Moderate nonattainment and maintenance	100
PM _{2.5} Direct emissions of PM _{2.5} , sulfur dioxide, NO _x (unless determined not to be a significant precursor), VOC or ammonia (if determined to be significant precursors)	All nonattainment and maintenance	100
Lead	All nonattainment and maintenance	25

Key: tpy = tons per year; VOC = volatile organic compound; NO_x = nitrogen oxides; CO = carbon monoxide; SO₂ = sulfur dioxide; NO₂ = nitrogen dioxide; PM₁₀ = suspended particulate matter less than or equal to 10 micrometers in diameter; PM_{2.5} = fine particulate matter less than or equal to 2.5 micrometers on diameter.

Permitting: Title V (Operating Permit)

The Title V Operating Permit Program consolidates all CAA requirements applicable to the operation of a source, including requirements from the SIP, preconstruction permits, and the air toxics program. It applies to stationary sources of air pollution that exceed the major stationary source emission thresholds, as well as other non-major sources specified in a particular regulation. The program includes a requirement for payment of permit fees to finance the operating permit program whether implemented by USEPA or a state or local regulator. Navy installations subject to Title V permitting shall comply with the requirements of the Title V Operating Permit Program, which are detailed in 40 CFR Part 70 and all specific requirements contained in their individual permits.

Greenhouse Gases

GHGs are gas emissions that trap heat in the atmosphere. These emissions occur from natural processes and human activities. Scientific evidence indicates a trend of increasing global temperature over the past century due in part to an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce negative economic and social consequences across the globe. CEQ's most recent draft guidance on the consideration of GHGs states that a projection of a proposed action's direct and reasonably foreseeable indirect GHG emissions may be used as a proxy for assessing potential climate effects (*Federal Register* Vol 84, No 123, June 26, 2019, pp 30097–30099). GHG emissions are standardized to carbon dioxide, which has a value of one. The carbon dioxide equivalent (CO_{2e}) rate is calculated by multiplying the emissions of each GHG by its

global warming potential and adding the results together to produce a single, combined emissions rate representing all GHGs.

Water Resources

The Safe Drinking Water Act is the federal law that protects public drinking water supplies throughout the nation. Under the Safe Drinking Water Act, USEPA sets standards for drinking water quality. Groundwater quality and quantity are regulated under several statutes and regulations, including the Safe Drinking Water Act.

EO 13508, *Chesapeake Bay Protection and Restoration*, was signed on May 12, 2009, to renew efforts by the federal government to restore and protect the Chesapeake Bay watershed. In addition, the Chesapeake Bay Watershed Agreement was signed on June 16, 2014, which sets goals for a partnership of states (Delaware, District of Columbia, Maryland, Pennsylvania, New York, Virginia, and West Virginia) in ten areas: sustainable fisheries, vital habitats, water quality, toxic contaminants, healthy watersheds, stewardship, land conservation, public access, environmental literacy, and climate resiliency.

The CWA establishes federal limits, through the National Pollutant Discharge Elimination System (NPDES) program, on the amounts of specific pollutants that can be discharged into surface waters to restore and maintain the chemical, physical, and biological integrity of the water. The NPDES program regulates the discharge of point (i.e., end of pipe) and nonpoint sources (i.e., stormwater) of water pollution. Within Maryland, Maryland Department of the Environment (MDE) is the administrative authority for water quality under the Clean Water Act.

The Maryland NPDES stormwater program requires construction site operators engaged in clearing, grading, and excavating activities that disturb one acre or more to obtain coverage under an NPDES Construction General Permit for stormwater discharges. Construction or demolition that necessitates an individual permit also requires preparation of a Notice of Intent to discharge stormwater and a Stormwater Pollution Prevention Plan that is implemented during construction. As part of the 2014 Final Rule for the Clean Water Act, titled *Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category*, activities covered by this permit must implement non-numeric erosion and sediment controls and pollution prevention measures.

Wetlands are currently regulated by the U.S. Army Corps of Engineers (USACE) under Section 404 of the CWA as a subset of all "Waters of the United States." Waters of the United States are defined as (1) traditional navigable waters, (2) wetlands adjacent to navigable waters, (3) nonnavigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow perennially or have continuous flow at least seasonally (e.g., typically 3 months), and (4) wetlands that directly abut such tributaries under Section 404 of the CWA, as amended, and are regulated by USEPA and the USACE. The CWA requires that Maryland establish a Section 303(d) list to identify impaired waters and establish TMDLs for the sources causing the impairment.

Section 404 of the CWA authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredge or fill into wetlands and other Waters of the United States. Any discharge of dredge or fill into Waters of the United States requires a permit from the USACE.

Freshwater wetlands in Maryland are protected by the Nontidal Wetlands Protection Program, which sets a state goal of no overall net-loss of nontidal wetlands acreage and functions. Activities in nontidal wetlands require a nontidal wetland permit or a letter of exemption, unless the activity is exempt by regulation. Any activity that involves excavating, filling, changing drainage patterns, disturbing the water

level or water table, grading, and removing vegetation in a nontidal wetland or within a 25-foot buffer, requires a permit.

Section 438 of the Energy Independence and Security Act establishes stormwater design requirements for development and redevelopment projects. Under these requirements, federal facility projects larger than 5,000 square feet must “maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.”

Section 10 of the Rivers and Harbors Act provides for USACE permit requirements for any in-water construction. USACE and some states require a permit for any in-water construction. Permits are required for construction of piers, wharfs, bulkheads, pilings, marinas, docks, ramps, floats, moorings, and like structures; construction of wires and cables over the water, and pipes, cables, or tunnels under the water; dredging and excavation; any obstruction or alteration of navigable waters; depositing fill and dredged material; filling of wetlands adjacent or contiguous to waters of the U.S.; construction of riprap, revetments, groins, breakwaters, and levees; and transportation of dredged material for dumping into ocean waters.

The National Wild and Scenic Rivers System was created by Congress in 1968 to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Act is notable for safeguarding the special character of these rivers, while also recognizing the potential for their appropriate use and development. It encourages river management that crosses political boundaries and promotes public participation in developing goals for river protection.

The Coastal Zone Management Act of 1972 (CZMA) provides assistance to states, in cooperation with federal and local agencies, for developing land and water use programs in coastal zones. Actions occurring within the coastal zone commonly have several resource areas that may be relevant to the CZMA. The CZMA regulatory setting discussion is discussed in Water Resources.

Executive Order 11990, *Protection of Wetlands*, requires that federal agencies adopt a policy to avoid, to the extent possible, long- and short-term adverse impacts associated with destruction and modification of wetlands and to avoid the direct and indirect support of new construction in wetlands whenever there is a practicable alternative.

Executive Order 11988, *Floodplain Management*, requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development unless it is the only practicable alternative. Flood potential of a site is usually determined by the 100-year floodplain, which is defined as the area that has a one percent chance of inundation by a flood event in a given year.

Geological Resources

Consideration of geologic resources extends to prime or unique farmlands. The Farmland Protection Policy Act was enacted in 1981 to minimize the loss of prime farmland and unique farmlands because of federal actions. The implementing procedures of the Farmland Protection Policy Act require federal agencies to evaluate the adverse effects of their activities on farmland, which includes prime and unique farmland and farmland of statewide and local importance, and to consider alternative actions that could avoid adverse effects.

Cultural Resources

Cultural resources are governed by other federal laws and regulations, including the National Historic Preservation Act (NHPA), Archeological and Historic Preservation Act (AHPA), American Indian Religious Freedom Act (AIRFA), Archaeological Resources Protection Act of 1979 (ARPA), and the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA). Federal agencies' responsibilities for protecting historic properties are defined primarily by Sections 106 and 110 of the NHPA. Section 106 requires federal agencies to take into account the effects of their undertakings on historic properties. Section 110 of the NHPA requires federal agencies to establish—in conjunction with the Secretary of the Interior—historic preservation programs for the identification, evaluation, and protection of historic properties. Cultural resources also may be covered by state, local, and territorial laws.

Biological Resources

Special-status species, for the purposes of this assessment, are those species listed as threatened or endangered under the Endangered Species Act and species afforded federal protection under the Marine Mammal Protection Act or the Migratory Bird Treaty Act.

The purpose of the Endangered Species Act is to conserve the ecosystems upon which threatened and endangered species depend and to conserve and recover listed species. Section 7 of the Endangered Species Act requires action proponents to consult with the U.S. Fish and Wildlife Service (USFWS) or National Oceanic and Atmospheric Administration (NOAA) Fisheries to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species or result in the destruction or adverse modification of designated critical habitat. Critical habitat cannot be designated on any areas owned, controlled, or designated for use by the Department of Defense (DoD) where an Integrated Natural Resources Management Plan has been developed that, as determined by the Department of the Interior or Department of Commerce Secretary, provides a benefit to the species subject to critical habitat designation.

All marine mammals are protected under the provisions of the Marine Mammal Protection Act. This act prohibits any person or vessel from “taking” marine mammals in the United States or the high seas without authorization. The Marine Mammal Protection Act defines “take” to mean “to harass, hunt, capture, or kill or attempt to harass, hunt, capture, or kill any marine mammal.”

Birds, including migratory and most native-resident bird species, are protected under the Migratory Bird Treaty Act, and their conservation by federal agencies is mandated by EO 13186, *Migratory Bird Conservation*. Under the Migratory Bird Treaty Act, it is unlawful by any means or in any manner to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, [or] possess migratory birds or their nests or eggs at any time, unless permitted by regulation.

Bald and golden eagles are protected by the Bald and Golden Eagle Protection Act. This act prohibits anyone, without a permit issued by the Secretary of the Interior, from taking these eagles, including their parts, nests, or eggs. The Act defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.”

The Magnuson-Stevens Fishery Conservation and Management Act provides for the conservation and management of fisheries. Under the Act, essential fish habitat (EFH) consists of the waters and substrate needed by fish to spawn, breed, feed, or grow to maturity.

Noise

Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although continuous and extended exposure to high noise levels (e.g., through occupational exposure) can cause hearing loss, the principal human response to noise is annoyance. The response of different individuals to similar noise events is diverse and is influenced by the type of noise; perceived importance of the noise; its appropriateness in the setting, time of day, and type of activity during which the noise occurs; and sensitivity of the individual.

Noise Effects

An extensive amount of research has been conducted regarding noise effects including annoyance, speech interference, sleep disturbance, noise-induced hearing impairment, nonauditory health effects, performance effects, noise effects on children, effects on domestic animals and wildlife, property values, structures, terrain, and archaeological sites.

Potential Hearing Loss

People living in high-noise environments for an extended period (40 years) can be at risk for hearing loss called noise-induced permanent threshold shift. Noise-induced permanent threshold shift defines a permanent change in hearing level, or threshold, caused by exposure to noise (USEPA, 1982). According to USEPA (1974), changes in hearing level of less than 5 dB are generally not considered noticeable. There is no known evidence that a noise-induced permanent threshold shift of less than 5 dB is perceptible or has any practical significance for the individual affected. Furthermore, the variability in audiometric testing is generally assumed to be plus or minus 5 dB. The preponderance of available information on hearing loss risk is from the workplace with continuous exposure throughout the day for many years.

Based on a report by Ludlow and Sixsmith (1999), there were no major differences in audiometric test results between military personnel who, as children, had lived in or near installations where fast jet operations were based, and a similar group who had no such exposure as children. Hence, for the purposes of this EA, the limited data are considered applicable to the general population, including children, and are used to provide a conservative estimate of the risk of potential hearing loss.

Speech Interference

Speech interference can cause disruption of routine activities, such as enjoyment of radio or television programs, telephone use, or family conversation, giving rise to frustration or irritation. In extreme cases, speech interference can cause fatigue and vocal strain to individuals who try to communicate over the noise.

Classroom Criteria and Noise Effects on Children

Research suggests that environments with sustained high background noise can have variable effects, including effects on learning and cognitive abilities and various noise-related physiological changes. Research on the impacts of noise in general on the cognitive abilities of school-aged children has received more attention in recent years.

Workplace Noise

In 1972, the National Institute for Occupational Safety and Health (NIOSH) published a criteria document with a recommended exposure limit of 85 dBA as an eight-hour time-weighted average. This exposure limit was reevaluated in 1998 when NIOSH made recommendations that went beyond conserving hearing by focusing on the prevention of occupational hearing loss. Following the reevaluation using a

new risk assessment technique, NIOSH published another criteria document in 1998, which reaffirmed the 85-dB recommended exposure limit (NIOSH, 1998).

Regulatory Setting

Under the Noise Control Act of 1972, the Occupational Safety and Health Administration established workplace standards for noise. The minimum requirement states that constant noise exposure must not exceed 90 dBA over eight hours. The highest allowable sound level to which workers can be constantly exposed is 115 dBA and exposure to this level must not exceed 15 minutes within an eight-hour period. The standards limit instantaneous exposure, such as impact noise, to 140 dBA. If noise levels exceed these standards, employers are required to provide hearing protection equipment to reduce sound levels to acceptable limits.

Infrastructure

Executive Order 13834, *Efficient Federal Operations*, requires federal departments and agencies to meet statutory requirements related to energy and environmental performance in a manner that increases efficiency, optimizes performance, eliminates unnecessary use of resources, and protects the environment. Agencies are directed to ensure that new construction conforms to applicable energy efficiency requirements and sustainable design principles, to implement space utilization and optimization practices, and to annually assess and report on building conformance to sustainability metrics.

Chief of Naval Operation Instruction 4100.5E outlines the Secretary of the Navy's vision for shore energy management. The focus of this instruction is establishing the energy goals and implementing strategy to achieve energy efficiency.

DoD Instruction (DoDI) 2000.12 governs DoD's antiterrorism program generally. DoDI O-2000.16, Volumes 1 and 2 provide the minimum construction standards to mitigate antiterrorism vulnerabilities and terrorist threats.

Public Health and Safety

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, requires federal agencies to "make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children and shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks."

Hazardous Materials and Wastes

Hazardous materials are defined by 49 CFR section 171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table, and materials that meet the defining criteria for hazard classes and divisions in 49 CFR part 173." Transportation of hazardous materials is regulated by the U.S. Department of Transportation.

Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments, as "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal

wastes and their associated regulatory requirements are specified in 40 CFR part 273. Four types of waste are currently covered under the universal waste regulations: hazardous waste batteries, hazardous waste pesticides that are either recalled or collected in waste pesticide collection programs, hazardous waste thermostats, and hazardous waste lamps, such as fluorescent light bulbs.

Special hazards are those substances that might pose a risk to human health and are addressed separately from other hazardous substances. Special hazards include asbestos-containing material (ACM), lead-based paint (LBP), and PCBs. USEPA is given authority to regulate special hazard substances by the Toxic Substances Control Act. Asbestos is also regulated by USEPA under the Clean Air Act, and the Comprehensive Environmental Response, Compensation, and Liability Act.

DoD established the Defense Environmental Restoration Program (DERP) to facilitate thorough investigation and cleanup of contaminated sites on military installations (active installations, installations subject to Base Realignment and Closure, and formerly used defense sites). The Installation Restoration Program (IRP) and the Military Munitions Response Program are components of the DERP. The IRP requires each DoD installation to identify, investigate, and clean up hazardous waste disposal or release sites. The Military Munitions Response Program addresses nonoperational rangelands that are suspected or known to contain unexploded ordnance, discarded military munitions, or munitions constituent contamination. The Environmental Restoration Program is the Navy's initiative to address DERP.

Consistency of this Proposed Action with Federal, State, and Local Laws, Plans, Policies, and Regulation

In accordance with 40 CFR section 1502.16(c), analysis of environmental consequences shall include discussion of possible conflicts between the Proposed Action and the objectives of federal, regional, state and local land use plans, policies, and controls. Table A-2 identifies the principal federal and state laws and regulations that are applicable to the Proposed Action and describes briefly how compliance with these laws and regulations would be accomplished.

Table A-2 Principal Federal and State Laws Applicable to the Proposed Action

<i>Federal, State, Local, and Regional Land Use Plans, Policies, and Controls</i>	<i>Status of Compliance</i>
NEPA; CEQ NEPA-implementing regulations; Navy procedures for implementing NEPA	This Environmental Assessment has been prepared in accordance with NEPA, as implemented by the CEQ and Navy regulations.
Clean Air Act	The Proposed Action would comply with applicable federal and state air quality regulations. The project area is in an eight-hour ozone and a sulfur dioxide nonattainment area. Estimated emissions would not exceed applicable <i>de minimis</i> thresholds. A general conformity applicability analysis and Record of Non-Applicability are in Appendix C.
Clean Water Act	All of the action alternatives would require an individual permit from USACE. No jurisdictional wetlands are within or near any of the project areas.
Rivers and Harbors Act	A permit for bridge construction under Section 9 would be required from the U.S. Coast Guard.
Coastal Zone Management Act	A Federal Consistency Determination for the Proposed Action will be submitted to the MDE.
National Historic Preservation Act	Possibility of encountering unknown archaeological deposits. No direct effects on archaeological resources would be expected; but indirect, adverse effects on the views to and from Halligan Hall, to and from Hubbard Hall (Building 260), and to and from Quarters 41–50 could occur. Coordination pursuant to Section 106 is underway.
Endangered Species Act	No effect on threatened or endangered species would be expected. No consultation with the U.S. Fish and Wildlife Service or NOAA Fisheries under section 7 is required.
Magnuson-Stevens Fishery Conservation and Management Act	The Proposed Action may adversely affect essential fish habitat. Consultation with NOAA Fisheries will occur.
Marine Mammal Protection Act	Marine mammals are unlikely to occur at NSA Annapolis. Takes of marine mammals are not reasonably foreseeable.
Migratory Bird Treaty Act	No impacts on migratory birds would be expected.
Bald and Golden Eagle Protection Act	No impacts on eagles would be expected.
Comprehensive Environmental Response, Compensation, and Liability Act	Not applicable. The Proposed Action does not involve using or storing hazardous or toxic chemicals, beyond minimal quantities associated with construction.
Emergency Planning and Community Right-to-Know Act	Not applicable. Chemical substances would remain the same; reporting requirements would continue.

<i>Federal, State, Local, and Regional Land Use Plans, Policies, and Controls</i>	<i>Status of Compliance</i>
Federal Insecticide, Fungicide, and Rodenticide Act	Not applicable. The Navy would continue to use any pesticides or pesticide-treated products in accordance with applicable labeling.
Resource Conservation and Recovery Act	No changes would occur in the way that hazardous wastes are handled, stored, or disposed of.
Toxic Substances Control Act	Not applicable. Chemical substances would remain the same; reporting requirements would continue.
Farmland Protection Policy Act	The project area is water surrounded by urban uses and not considered available for use as farmland; no effects would occur.
EO 11988, <i>Floodplain Management</i>	All of College Creek and the immediately adjacent banks encompassing the projects areas would be within the 100-year floodplain. No long-term increases in impervious surface or changes in the floodplain would occur.
EO 11990, <i>Protection of Wetlands</i>	There are no jurisdictional wetlands located within or near the project areas.
EO 12088, <i>Federal Compliance with Pollution Control Standards</i>	The Proposed Action would comply with applicable pollution controls required by construction permits.
EO 12898, <i>Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations</i>	No disproportionately high or adverse effects on minority or low-income populations would occur.
EO 13045, <i>Protection of Children from Environmental Health Risks and Safety Risks</i>	No disproportionate effects on children would occur.
EO 13089, <i>Coral Reef Protection</i>	Not applicable.
EO 13175, <i>Consultation and Coordination with Indian Tribal Governments</i>	No traditional cultural properties are known to be located within or near the project reaches.
EO 13834, <i>Efficient Federal Operations</i>	The Proposed Action does not include changes in operations.

Key: CEQ=Council on Environmental Quality; EO = Executive Order; NEPA=National Environmental Policy Act; NOAA=National Oceanic and Atmospheric Administration; NSA = Naval Support Activity; SHPO=State Historic Preservation Office; USACE=U.S. Army Corps of Engineers.

Appendix A References

- Ludlow, B., & Sixsmith, K. (1999). Long-term Effects of Military Jet Aircraft Noise Exposure during Childhood on Hearing Threshold Levels. *Noise and Health*, 33-39.
- National Institute for Occupational Health and Safety. (1998). *Criteria for a Recommended Standard Occupational Noise Exposure, Revised Criteria*. Cincinnati: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.
- NAVFAC Washington. (2016, March). Navy District Washington Resource Area Standard Language.
- United States Environmental Protection Agency. (1974). *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. EPA 550/9-74-004. Washington, DC: Office of Noise Abatement and Control.
- United States Environmental Protection Agency. (1982). *Guidelines for Noise Impact Analysis*. EPA 550/9-82-105. Washington, DC: Office of Noise Abatement and Control.

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Appendix B

Public Involvement and Agency Correspondence Materials

Contents of Appendix B

U.S. Fish and Wildlife Service List of Threatened and Endangered Species (IPaC).....B-3

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U.S. Fish and Wildlife Service List of Threatened and Endangered Species (IPaC)**United States Department of the Interior**

FISH AND WILDLIFE SERVICE
Chesapeake Bay Ecological Services Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401-7307
Phone: (410) 573-4599 Fax: (410) 266-9127



<http://www.fws.gov/chesapeakebay/>
<http://www.fws.gov/chesapeakebay/endsppweb/ProjectReview/Index.html>

In Reply Refer To:
Consultation Code: 05E2CB00-2020-SLI-0862
Event Code: 05E2CB00-2020-E-02319
Project Name: Utility Bridge 269

March 24, 2020

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

To Whom It May Concern:

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

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

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

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

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

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

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

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

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

Attachment(s):

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

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1

Official Species List

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

This species list is provided by:

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

03/24/2020

Event Code: 05E2CB00-2020-E-02319

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Project Summary

Consultation Code: 05E2CB00-2020-SLI-0862

Event Code: 05E2CB00-2020-E-02319

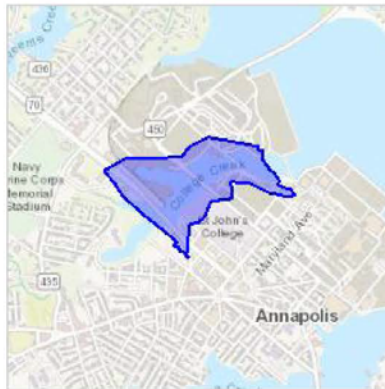
Project Name: Utility Bridge 269

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Description: This project involves the replacement of the utility bridge 269 at College Creek at Naval Support Activity Annapolis (USNA). The project will be roughly 18 feet wide and 474 feet long, and will provide utilities between the lower and upper yards of USNA. All utilities except for one will be situated under ground through boring techniques. The project is expected to occur through fiscal year 2023.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/38.984135922000064N76.49587100032184W>



Counties: Anne Arundel, MD

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Endangered Species Act Species

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

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

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

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

Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: <ul style="list-style-type: none"> Projects with a federal nexus that have tree clearing = to or > 15 acres: 1. REQUEST A SPECIES LIST 2. NEXT STEP: EVALUATE DETERMINATION KEYS 3. SELECT EVALUATE under the Northern Long-Eared Bat (NLEB) Consultation and 4(d) Rule Consistency key Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

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

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USFWS National Wildlife Refuge Lands And Fish Hatcheries

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

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

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Wetlands

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

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

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

ESTUARINE AND MARINE DEEPWATER

- [Estuarine](#)

RIVERINE

- [Riverine](#)

U.S. Fish and Wildlife Service Verification Letter for Proposed Action Under the 4(d) Rule for Northern Long-eared Bat



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Ecological Services Field Office
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<http://www.fws.gov/chesapeakebay/>
<http://www.fws.gov/chesapeakebay/endsppweb/ProjectReview/Index.html>



In Reply Refer To:
Consultation Code: 05E2CB00-2020-TA-0862
Event Code: 05E2CB00-2020-E-02320
Project Name: Utility Bridge 269

March 24, 2020

Subject: Verification letter for the 'Utility Bridge 269' project under the January 5, 2016, Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-eared Bat and Activities Excepted from Take Prohibitions.

Dear Shelbi Pullen:

The U.S. Fish and Wildlife Service (Service) received on March 24, 2020 your effects determination for the 'Utility Bridge 269' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. This IPaC key assists users in determining whether a Federal action is consistent with the activities analyzed in the Service's January 5, 2016, Programmatic Biological Opinion (PBO). The PBO addresses activities excepted from "take"^[1] prohibitions applicable to the northern long-eared bat under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, the Action is consistent with activities analyzed in the PBO. The Action may affect the northern long-eared bat; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the PBO satisfies and concludes your responsibilities for this Action under ESA Section 7(a)(2) with respect to the northern long-eared bat.

Please report to our office any changes to the information about the Action that you submitted in IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation. If the Action is not completed within one year of the date of this letter, you must update and resubmit the information required in the IPaC key.

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If the Action may affect other federally listed species besides the northern long-eared bat, a proposed species, and/or designated critical habitat, additional consultation between you and this Service office is required. If the Action may disturb bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act is recommended.

[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

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3

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

Utility Bridge 269

2. Description

The following description was provided for the project 'Utility Bridge 269':

This project involves the replacement of the utility bridge 269 at College Creek at Naval Support Activity Annapolis (USNA). The project will be roughly 18 feet wide and 474 feet long, and will provide utilities between the lower and upper yards of USNA. All utilities except one will be situated under ground through boring techniques. The project is expected to occur through fiscal year 2023.

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/38.984135922000064N76.49587100032184W>

**Determination Key Result**

This Federal Action may affect the northern long-eared bat in a manner consistent with the description of activities addressed by the Service's PBO dated January 5, 2016. Any taking that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o). Therefore, the PBO satisfies your responsibilities for this Action under ESA Section 7(a)(2) relative to the northern long-eared bat.

Determination Key Description: Northern Long-eared Bat 4(d) Rule

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This key was last updated in IPaC on May 15, 2017. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for Federal actions is to assist determinations as to whether proposed actions are consistent with those analyzed in the Service's PBO dated January 5, 2016.

Federal actions that may cause prohibited take of northern long-eared bats, affect ESA-listed species other than the northern long-eared bat, or affect any designated critical habitat, require ESA Section 7(a)(2) consultation in addition to the use of this key. Federal actions that may affect species proposed for listing or critical habitat proposed for designation may require a conference under ESA Section 7(a)(4).

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Determination Key Result

This project may affect the threatened Northern long-eared bat; therefore, consultation with the Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.) is required. However, based on the information you provided, this project may rely on the Service's January 5, 2016, *Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions* to fulfill its Section 7(a)(2) consultation obligation.

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?
Yes
2. Have you determined that the proposed action will have "no effect" on the northern long-eared bat? (If you are unsure select "No")
No
3. Will your activity purposefully **Take** northern long-eared bats?
No
4. Is the project action area located wholly outside the White-nose Syndrome Zone?
Automatically answered
No
5. Have you contacted the appropriate agency to determine if your project is near a known hibernaculum or maternity roost tree?

Location information for northern long-eared bat hibernacula is generally kept in state Natural Heritage Inventory databases – the availability of this data varies state-by-state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited. A web page with links to state Natural Heritage Inventory databases and other sources of information on the locations of northern long-eared bat roost trees and hibernacula is available at www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html.

Yes

03/24/2020

Event Code: 05E2CB00-2020-E-02320

6

6. Will the action affect a cave or mine where northern long-eared bats are known to hibernate (i.e., hibernaculum) or could it alter the entrance or the environment (physical or other alteration) of a hibernaculum?

No

7. Will the action involve Tree Removal?

No

03/24/2020

Event Code: 05E2CB00-2020-E-02320

7

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type '0' in questions 1-3.

1. Estimated total acres of forest conversion:

0

2. If known, estimated acres of forest conversion from April 1 to October 31

0

3. If known, estimated acres of forest conversion from June 1 to July 31

0

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type '0' in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type '0' in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type '0' in question 10.

03/24/2020

Event Code: 05E2CB00-2020-E-02320

8

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?

0

Draft EA Agency Mailing Letter (May 6, 2020)

The following letter was sent to the agencies list beginning on page B-21.

**DEPARTMENT OF THE NAVY**

NAVAL SUPPORT ACTIVITY ANNAPOLIS
58 BENNING ROAD
ANNAPOLIS, MARYLAND 21402

IN REPLY REFER TO:

5090

Ser ENV-048

06 May 2020

Ms. Kathy Anderson
Chief, Maryland Section Southern
U.S. Army Corps of Engineers
2 Hopkins Plaza
Baltimore, MD 21201

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR A UTILITY BRIDGE
REPLACEMENT AT NAVAL SUPPORT ACTIVITY ANNAPOLIS,
MARYLAND

Dear Ms. Anderson:

The Department of the Navy is preparing an Environmental Assessment (EA) in compliance with the National Environmental Policy Act of 1969 (NEPA) to evaluate the potential effects associated with replacing the utility bridge over College Creek at Naval Support Activity (NSA) Annapolis, Annapolis, Maryland. The utility bridge carries utility lines over College Creek between the Upper Yard to the Lower Yard of the U.S. Naval Academy (USNA). The existing bridge is in a severely deteriorated state and would require extensive repair to address the multiple failed and failing components.

The Proposed Action includes constructing a new bridge structure, replacing the utilities that are attached to the existing utility bridge, and then demolishing and removing the existing bridge. The new bridge would be similar in size, elevation, and materials to the existing bridge. No long-term changes in services or capacity are included with this action. Construction of the new bridge is expected to occur in fiscal year 2023.

The Navy is considering three alternative areas where the new bridge could be constructed between the King George Street Bridge and the Decatur Avenue Bridge, in addition to the No Action Alternative. Under all action alternatives, the existing bridge would be demolished following construction of the new

5090
Ser ENV-048
06 May 2020

bridge. The Navy is also considering the option of locating the utilities underground. With this option, all of the utilities would be situated underground except for one utility line which cannot be bored underground; therefore, it would remain aboveground and attached to the proposed utility bridge structure. Directional drilling techniques would be used to avoid direct impacts on aquatic resources. The bore location under this option would occur along the banks of College Creek in the general vicinity of the existing bridge, with the bore starting on the northern bank and running towards the southern bank. The three bridge location alternatives and the optional underground bore location are shown on the enclosed map.

Under Alternative 1, the proposed utility bridge would be constructed within 50 feet of the existing utility bridge alignment, which is adjacent to the King George Street Bridge.

Under Alternative 2, the proposed utility bridge would be constructed within 115 feet of the Decatur Avenue Bridge.

Under Alternative 3, the proposed utility bridge would be constructed in the area between Alternatives 1 and 2 while also avoiding Hubbard Hall (Building 260) and its associated docks.

Under the No Action Alternative, the Navy would not replace the utility bridge; the existing bridge would continue to deteriorate until failure occurs. If the bridge fails, utility services would be interrupted.

The Navy would like to invite your organization and other consulting parties to review the Draft EA, which is available for a 30-day review period online at: https://www.cnmc.navy.mil/regions/ndw/installations/nsa_annapolis/om/environmental-/environmental-assessment.html. Comments on the Draft EA may be submitted via email to navfacwashnepa@navy.mil, or via U.S. mail, no later than 30 days from receipt of this letter, to Naval Facilities Engineering Command Washington, ATTN: Ms. Shelbi Pullen, 1314 Harwood Street SE, Building 212, Washington Navy Yard, DC 20374.

5090
Ser ENV-048
06 May 2020

If you have any questions, comments or need additional information, please contact Ms. Shelbi Pullen at navfacwashnepa@navy.mil.

Sincerely,
ALHARAZIM.MA
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136
M. M. Alharazim
By direction

Digitally signed by
ALHARAZIM.MADINA.M.136
2686136
Date: 2020.05.07 23:43:25
-0400'

Enclosure: Location of NSA Annapolis and Alternatives for Proposed Utility Bridge

Copy to: Shelbi Pullen, NAVFAC Washington NEPA Project Manager

Agency Distribution List for the Draft EA

Kathy Anderson
Chief, Maryland Section Southern
U.S. Army Corps of Engineers
2 Hopkins Plaza
Baltimore, MD 21201

Jennifer Anderson
Assistant Regional Administrator for Protected
Resources
Greater Atlantic Region Fisheries Office
NOAA Fisheries
55 Great Republic Drive
Gloucester, MA 01930-2276

Karen Greene
Mid-Atlantic Field Office Supervisor and EFH
Coordinator
Greater Atlantic Region Fisheries Office
NOAA Fisheries
55 Great Republic Drive
Gloucester, MA 01930-2276

Hal Pitts
Commander, Fifth Coast Guard District (dpb)
Federal Building
431 Crawford Street
Portsmouth, VA 23704-5004

Dennis Montagna
Monument Research & Preservation Program
National Park Service Northeast Region
200 Chestnut Street, 3rd Floor
Philadelphia, PA 19106

Denise Keehner
Federal Consistency Coordinator
Deputy Program Administrator
Maryland Department of the Environment
Wetlands and Waterways Program
1800 Washington Boulevard, Suite 430
Baltimore, MD 21230-1708

Joe Abe
Maryland Department of Natural Resources
Chesapeake and Coastal Service
580 Taylor Avenue
Tawes State Office Building, E-2
Annapolis, MD 21401

Lisa Hoerger
Maryland Department of Natural Resources
Critical Area Commission for the Chesapeake &
Atlantic Coastal Bays
1804 West Street, Suite 100
Annapolis, MD 21401

Paul A. Peditto, Director
Maryland Department of Natural Resources
Wildlife and Heritage Service
Tawes State Office Building E-1
580 Taylor Avenue
Annapolis, MD 21401

Elizabeth Hughes
State Historic Preservation Officer
Maryland Historical Trust
100 Community Place
Crownsville, MD 21032-2023

Maryland State Clearinghouse
Maryland Department of Planning
301 W. Preston Street, Suite 1101
Baltimore, MD 21201
mdpclearinghouse@maryland.gov

Sally Nash, Acting Director
City of Annapolis Department of Planning &
Zoning
145 Gorman Street, 3rd Floor
Annapolis, MD 21401

Roberta Laynor, Chief
Historic Preservation Division
City of Annapolis Department of Planning and
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145 Gorman Street, 3rd Floor
Annapolis, MD 21401

Patricia Zeno
City of Annapolis Historic Preservation
Commission
160 Duke of Gloucester Street
Annapolis, MD 21401

Karen Theimer Brown, Vice President
Historic Annapolis, Inc.
42 East Street
Annapolis, MD 21401

Mayor Gavin Buckley, Chair
City of Annapolis Waterways Cabinet
160 Duke of Gloucester Street
Annapolis, MD 21401

Charlie Kreter, Acting Chair
The Severn River Commission
Heritage Complex
P.O. Box 6675
Annapolis, MD 21401

Dave Barker, President
Severn River Association
P.O. Box 146
Annapolis, MD 21404

Ally Gontang-Highfield
St. Johns College
60 College Avenue
Annapolis, MD 21401

NOAA Fisheries Essential Fish Habitat Letter (April 30, 2020)

**DEPARTMENT OF THE NAVY**NAVAL SUPPORT ACTIVITY ANNAPOLIS
58 BENNING ROAD
ANNAPOLIS, MARYLAND 21402IN REPLY REFER TO:
5090
Ser ENV-059
April 30, 2020

Ms. Jennifer Anderson
Assistant Regional Administrator
for Protected Resources
NOAA Fisheries Service
Greater Atlantic Regional Fisheries Office
55 Great Republic Drive
Gloucester, MA 01930-2276

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR A UTILITY BRIDGE
REPLACEMENT AT NAVAL SUPPORT ACTIVITY ANNAPOLIS,
MARYLAND

Dear Ms. Anderson:

The Department of the Navy (Navy) is preparing an Environmental Assessment (EA) in compliance with the National Environmental Policy Act of 1969 (NEPA) to evaluate the potential effects associated with replacing the utility bridge over College Creek at Naval Support Activity (NSA) Annapolis, located in Annapolis, Maryland (Figure 1). This letter is to initiate consultation with NOAA Fisheries on the Essential Fish Habitat (EFH) present within College Creek and the area analyzed within the EA.

The Proposed Action includes constructing a new bridge structure, replacing the utilities that are attached to the existing utility bridge, and then demolishing and removing the existing bridge. The utility bridge over College Creek is approximately 18 feet wide and 474 feet long. The new bridge would be similar in size, elevation, and materials to the existing bridge. No long-term changes in services or capacity are included within the Proposed Action. The existing bridge is in a severely deteriorated state and would require extensive repair to address the multiple failed and failing components. Construction of the new bridge would be expected to occur in fiscal year 2023.

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Ser ENV-059
April 30, 2020

The Navy is considering three action alternatives where the new bridge could be constructed over College Creek between the King George Street Bridge and the Decatur Avenue Bridge (Figure 2), as well as a No Action Alternative. Under all action alternatives, the existing bridge would be demolished following construction of the new bridge. Construction work for any of the alternatives would be completed from land, in-water, or a combination of the two, depending on the land and water constraints in the various work areas. The Navy has not yet begun the design phase for this Proposed Action, so preliminary designs are not available at this time.

Under Alternative 1, the proposed utility bridge would be constructed within 50 feet of the existing utility bridge, which is adjacent to the King George Street Bridge. Given that the King George Street Bridge and the NSA Annapolis boundary are directly south of the current utility bridge, the proposed bridge must be located northeast of the current utility bridge. Therefore, under Alternative 1, the bridge could be constructed in any location between the current utility bridge and 50 feet to the northeast.

Under Alternative 2, the proposed utility bridge would be constructed within 115 feet of the Decatur Avenue Bridge (Hill Bridge).

Under Alternative 3, the proposed utility bridge would be constructed between the locations of Alternatives 1 and 2 (the approximate 250-foot width between Alternatives 1 and 2 while also avoiding Hubbard Hall and its associated docks along College Creek).

The Navy is also considering the option of locating the utilities underground. With this option, all of the utilities would be situated underground except for one utility line which cannot be bored underground; therefore, it would remain aboveground and attached to the proposed utility bridge structure. Directional drilling techniques would be used to avoid direct impacts on aquatic resources. The bore location under this option would occur along the banks of College Creek in the general vicinity of the existing bridge, with the bore starting on the northern bank and running towards the southern bank.

Under the No Action Alternative, the Navy would not replace the utility bridge; the existing bridge would continue to

5090
Ser ENV-059
April 30, 2020

deteriorate until failure occurs. If the bridge fails, utility services would be interrupted.

EFH has been designated for 11 fish species in College Creek: bluefish (*Pomatomus saltatrix*), scup (*Stenotomus chrysops*), summer flounder (*Paralichthys dentatus*), black sea bass (*Centropristis striata*), Atlantic butterfish (*Peprilus triacanthus*), little skate (*Leucoraja erinacea*), Atlantic herring (*Clupea harengus*), red hake (*Urophycis chuss*), windowpane flounder (*Scophthalmus aquosus*), winter skate (*Leucoraja ocellata*), and clearnose skate (*Raja eglanteria*). The salinity of College Creek ranges from approximately 6 to 11 parts per thousand (ppt). Of the species with EFH in the vicinity of College Creek, little skate, Atlantic herring, red hake, winter skate, and clearnose skate would not be expected to occur in the mixing salinity zone of College Creek, as these species are found in high salinity zones. A more detailed analysis of the EFH within the project area and impacts are included within the EA.

The Navy has determined that the replacement of the utility bridge and associated utility lines at NSA Annapolis may adversely affect EFH due to a reduction in quality from suspended sediments and noise resulting from bridge demolition and pile driving for new bridge construction. However, no long-term effects on EFH are expected.

The potential environmental impacts of the three action alternatives and the No Action Alternative are analyzed in a Draft EA. The Navy would like to invite your organization and other consulting parties to review the Draft EA, which is available for a 30-day review period online at: https://www.cnic.navy.mil/regions/ndw/installations/nsa_annapolis/om/environmental-/environmental-assessment.html. Advanced notification of significant concerns would be greatly appreciated. Please direct all written correspondence to:

Naval Facilities Engineering Command Washington
ATTN: Ms. Shelbi Pullen
1314 Harwood Street SE, Building 212
Washington Navy Yard, DC 20374

5090
Ser ENV-059
April 30, 2020

If you have any questions, comments or need additional information, please contact Ms. Shelbi Pullen at navfacwashnepa@navy.mil.

Sincerely,

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Date: 2020.04.30 15:29:07 -0400'

M. M. Alharazim
By direction

Enclosures: 1. Figure 1 Naval Support Activity Annapolis
Location Map
2. Figure 2 Proposed Utility Bridge Location of
Alternatives

Copy to: Shelbi Pullen, NAVFAC Washington NEPA Project Manager
Karen Green, Mid-Atlantic Field Office Supervisor and
EFH Coordinator

Federal Consistency Determination (May 7, 2020)**DEPARTMENT OF THE NAVY**

NAVAL SUPPORT ACTIVITY ANNAPOLIS
58 BENNION ROAD
ANNAPOLIS, MARYLAND 21402

IN REPLY REFER TO:
5090
Ser ENV-060
07 May 2020

Ms. Denise Keehner
Federal Consistency Coordinator
Maryland Department of the Environment
Wetlands and Waterways Program
1800 Washington Boulevard, Suite 430
Baltimore, MD 21230-1708

SUBJECT: UTILITY BRIDGE REPLACEMENT AT NAVAL SUPPORT ACTIVITY
ANNAPOLIS COASTAL CONSISTENCY DETERMINATION
CONSULTATION

Dear Ms. Keehner:

The Department of the Navy is preparing an Environmental Assessment (EA) to evaluate the potential effects associated with replacing the utility bridge over College Creek at Naval Support Activity (NSA) Annapolis, Annapolis, Maryland. This letter is intended to initiate early consultation in accordance with the Federal Coastal Zone Management Act of 1972 (CZMA), as amended, and the 2013 CZMA Memorandum of Understanding (MOU) between the state of Maryland and the United States Department of Defense, Naval Facilities Engineering Command (NAVFAC) Washington.

Under the Proposed Action, the Navy would construct a new bridge structure, replace the utilities that are attached to the existing utility bridge, and then demolish and remove the existing bridge. The new bridge would be similar in size, elevation, and materials to the existing bridge. No long-term changes in services or capacity are included with this action. Construction of the new bridge is expected to occur in fiscal year 2023.

As required by the 2013 MOU, enclosures (1) through (3) provide the proposed project description and location, descriptions of alternatives, public and agency participation, and the basis for this Federal Consistency Determination as

5090
Ser ENV-060
07 May 2020

relevant to the enforceable coastal policies. The Navy finds these actions to be consistent, to the maximum extent practicable, with the requirements of the CZMA and will presume concurrence if a response is not received within 60 days.

Please direct all written correspondence to:

Ms. Shelbi Pullen
Project Manager
NAVFAC Washington, EV2
1314 Harwood Street SE, Building 212
Washington Navy Yard, DC 20374.

For more information, please contact Ms. Shelbi Pullen at 202-685-0164 or navfacwashnepa@navy.mil.

Sincerely,

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136
Date: 2020.05.07 10:27:20 -04'00'

M. M. Alharazim
By direction

Enclosures: 1. Proposed Project Description
2. Site Location
3. Basis of Determination

Copies to:

Joe Abe, Maryland Department of Natural Resources, Coastal Policy Coordination Section Chief
Lisa Hoerger, Department of Natural Resources, Regulations Coordinator
Rick Ayella, Maryland Department of the Environment, Tidal Wetlands Division
Amanda Sigillito, Maryland Department of the Environment, Nontidal Wetlands and Waterways Division
Marian Hozeczy, Maryland Department of Natural Resources Supervisor of Urban Programs & FCA Coordinator
Elizabeth J. Cole, Maryland Historical Trust, Administrator, Review & Compliance
Catherine McCall, Maryland Department of Natural Resources, Coastal & Marine Assessment
Shelbi Pullen, NAVFAC Washington NEPA Project Manager

ENCLOSURE 1: PROPOSED PROJECT DESCRIPTION

a Project Location

Naval Support Activity (NSA) Annapolis is located in Anne Arundel County, Maryland, along the Severn River and Chesapeake Bay in Annapolis, approximately 30 miles southeast of Baltimore and 33 miles east of Washington, DC. The Upper Yard and Lower Yard are along the southern shore of the Severn River, separated by College Creek. The U.S. Naval Academy (USNA) campus is located within these areas. This EA focuses on the portion of College Creek between the Upper and Lower Yards of the USNA, which is the location of the current utility bridge.

b Project Description

The Department of the Navy proposes to replace the utility bridge over College Creek at NSA Annapolis. The utility bridge carries utility lines over College Creek between the Upper Yard and the Lower Yard of the U.S. Naval Academy (USNA). The existing bridge is in a severely deteriorated state and would require extensive repair to address the multiple failed and failing components.

The Proposed Action includes constructing a new bridge structure, replacing the utilities that are attached to the existing utility bridge, and then demolishing and removing the existing bridge. The new bridge would be similar in size, elevation, and materials to the existing bridge. No long-term changes in services or capacity are included with this action. Construction of the new bridge is expected to occur in fiscal year 2023.

The Navy is considering three alternative areas where the new bridge could be constructed between the King George Street Bridge and the Decatur Avenue Bridge, in addition to the No Action Alternative. Under all action alternatives, the existing bridge would be demolished following construction of the new bridge. The Navy is also considering the option of locating the utilities underground. With this option, all of the utilities would be situated underground except for one utility line which cannot be bored underground; therefore, it would remain aboveground and attached to the proposed utility bridge structure. Directional drilling techniques would be used to avoid direct impacts on aquatic resources. The bore location under this option would occur along the banks of College Creek in the general vicinity of the existing bridge, with the bore

starting on the northern bank and running towards the southern bank. The three bridge location alternatives and the optional underground bore location are shown on the map in Enclosure 2. Under Alternative 1, the proposed utility bridge would be constructed within 50 feet of the existing utility bridge alignment, which is adjacent to the King George Street Bridge. Under Alternative 2, the proposed utility bridge would be constructed within 115 feet of the Decatur Avenue Bridge. Under Alternative 3, the proposed utility bridge would be constructed in the area between Alternatives 1 and 2 while also avoiding Hubbard Hall (Building 260) and its associated docks. Under the No Action Alternative, the Navy would not replace the utility bridge; the existing bridge would continue to deteriorate until failure occurs. If the bridge fails, utility services would be interrupted.

c Public Participation

The Navy will publish a Notice of Availability for the Draft EA for three consecutive days in a local newspaper. The notice will describe the Proposed Action, solicit public comments on the Draft EA, provide dates of the public comment period, and announce the website¹ where a copy of the EA will be available for review.

d Other Consultations

The Navy will coordinate or consult with the National Marine Fisheries Service, Maryland Department of the Environment, Maryland Department of Natural Resources, Maryland Department of Transportation, Maryland Historical Trust, Maryland Department of Planning (Maryland State Clearinghouse), U.S. Coast Guard, and U.S. Army Corps of Engineers regarding the Proposed Action.

¹ https://www.enic.navy.mil/regions/ndw/installations/nsa_annapolis/om/environmental/-environmental-assessment.html

ENCLOSURE 3: BASIS OF DETERMINATION FOR PROPOSED ACTION

The Navy finds that the Proposed Action is consistent to the maximum extent practicable with the substantive requirements of Maryland's Enforceable Coastal Policies, as described in the following under General Policies, Coastal Policies, and Coastal Uses.

a General Policies**i Core Policies**

The Proposed Action would not create or alter point source air emissions; this action would not affect the existing Title V air permit. Although there would be temporary, minor noise impacts during construction activities, these impacts would not significantly affect noise-sensitive receptors. Visually, the replacement bridge would be similar to the existing bridge, so it would be in character with the affected environment. The Proposed Action would not affect State wild lands, parks, forests, reserves, scenic preserves, parkways, or recreational areas. The Proposed Action would not affect water appropriation or use. Hazardous substances would not be stored, treated, dumped, or discharged at the site.

ii Water Quality

Under the Proposed Action, construction and demolition would occur in College Creek, within the Severn River watershed. In-water construction and demolition activities could temporarily increase sedimentation and turbidity in College Creek and the Severn River. Use of Best Management Practices (BMPs) such as turbidity or silt curtains would minimize underwater sediment transport and minimize the short-term impacts on water quality. Although increases in turbidity would occur, impacts would be localized and temporary, lasting only during the removal and installation of bridge piles and supports. Sediments would resettle to the creek bed following completion of in-water activities.

Impacts on water resources from runoff during land construction activities would be minimized by construction management and planning. The Navy would prepare a soil erosion- and sediment-control plan and a stormwater management plan when proposed earth disturbance is more than 5,000 square feet or 100 cubic yards. These plans would be developed in accordance with Maryland soil erosion and sediment control guidelines. BMPs

specific to each construction site would be identified in these plans. Examples of such BMPs include silt fences, silt or turbidity curtains, inlet and outlet protection, erosion control matting, sediment logs, construction entrances, temporary and permanent seeding, mulching, check dams, and other measures deemed appropriate for that specific action.

Specific construction methods and designs have not yet been developed for the Proposed Action. It is likely that an individual permit pursuant to Section 404 of the Clean Water Act would be required from U.S. Army Corps of Engineers, and the Navy would comply with any provisions under this permit. The Navy would also coordinate with the U.S. Coast Guard to receive authorization for bridge construction under Section 9 of the Rivers and Harbors Act. College Creek is a non-jurisdictional estuarine and marine deepwater wetland, and work would occur within this tidal wetland. Consequently, a joint federal and state permit for the Alteration of Any Tidal Wetland in Maryland would be required for temporary, construction-related impacts.

iii Flood Hazards

Much of the project area is within the 100-year or 500-year floodplain of College Creek. However, the proposed construction of the new utility bridge, subsequent demolition of the existing utility bridge, and directional drilling would not result in any long-term increases in impervious surfaces within the floodplain or change runoff characteristics.

b Coastal Resources

i Tidal Wetlands

Estuarine and marine deepwater tidal wetlands have been mapped for College Creek, and construction would occur within this area. The existing project area consists of hardened seawalls; therefore, the immediate project area does not have habitat for spawning or nursery grounds for fisheries. Indirect impacts would be minimized through the implementation of a joint federal and state permit for the Alteration of Any Tidal Wetland in Maryland. This permit may require the implementation of BMPs to mitigate adverse effects. In the long term, there would be a reduction in the disturbance of estuarine and marine deepwater wetlands associated with sedimentation during flood and stormwater runoff events with the repair of the seawalls, resulting in long-term beneficial effects.

Submerged aquatic vegetation is not present along the project area, or downstream to the Severn River. Submerged aquatic vegetation is present in the upstream portions of College Creek, but these communities would not be affected during construction of the Proposed Action.

ii Non-tidal Wetlands

Non-tidal wetlands are not within the project area.

iii Forests

Forests areas greater than 40,000 square feet are not within the project area. Several trees are present on the Upper Yard bank near the existing utility bridge, and it is possible that one or more of these might need to be removed to accommodate construction in the Alternative 1 or Alternative 3 sites. If any trees must be removed, they would be replaced at a 1:1 ratio to retain tree canopy.

iv Historic and Archaeological Sites

USNA is a National Historic Landmark and a National Register Historic District. The Navy identified a buffer of 400 feet around the three alternative sites as the Area of Potential Effect for the Proposed Action. Hubbard Hall (Building 260), a pump station (Building 370), housing units managed under a public-private ventures, and several other facilities have been identified as contributing resources. The view from Halligan Hall (Building 181), which contributes to the district's historical significance, is also within the Area of Potential Effect. A small portion of the Colonial Annapolis Historic District, also a National Historic Landmark and National Register Historic District, is also within the Area of Potential Effect. All alternatives will likely be visible within the Historic Districts, but visual impacts are considered minimal.

No known archaeological sites would be affected under the Proposed Action. In the event of an unanticipated archaeological discovery, standard operating procedures in the Integrated Cultural Resources Management Plan would be followed. The Navy is coordinating with the Maryland State Historic Preservation Office regarding the Proposed Action.

v Living Aquatic Resources

No threatened or endangered species are known to occur within the project area.

Essential Fish Habitat is in College Creek for 11 species of fish. The Navy has determined that the replacement of the utility bridge and associated utility lines at NSA Annapolis may adversely affect Essential Fish Habitat due to a reduction in quality from suspended sediments and noise resulting from bridge demolition and pile driving for new bridge construction. However, no long-term effects on Essential Fish Habitat are expected. All Essential Fish Habitat in the vicinity of the project area is for highly mobile species and life stages. Juvenile and adult fish could avoid the project area during construction. The Navy commits to implementing appropriate avoidance and minimization measures and BMPs in accordance with regulations and ongoing consultations.

The Navy is coordinating with the Maryland Department of Natural Resources and consulting with National Oceanic and Atmospheric Administration Fisheries regarding the Proposed Action.

c Coastal Uses

i Mineral Extraction

The Proposed Action would not involve mineral extraction activities.

ii Electrical Generation and Transmission

All utility work involving electrical lines would be associated with existing lines. No increased electrical generation or transmission would be associated with the Proposed Action.

iii Tidal Shore Erosion Control

The existing shoreline along the project area consists of hardened materials, including bulkhead on the Lower Yard bank and riprap on the Upper Yard bank. Any portions of the existing hardened shoreline that would be affected during construction of the new utility bridge or demolition of the existing bridge would be integrated/avoided during design or repaired as necessary.

iv Oil and Natural Gas Facilities

The Proposed Action would not involve oil or natural gas facilities.

v Dredging and Disposal of Dredged Material

Dredging is not currently anticipated to occur during construction of the proposed bridge in order to place bridge pilings and supports. However, designs and construction plans are not finalized. The Navy would follow all regulations concerning dredging, if required.

Submerged aquatic vegetation is not present along the project area, or downstream to the Severn River. Submerged aquatic vegetation is present in the upstream portions of College Creek, but these communities would not be affected during construction of the Proposed Action.

vi Navigation

The navigability of College Creek would not be affected in the long term, and any short-term closures or safety concerns during in-water construction would be published in Local Notices to Mariners. The portion of the waterway where the bridge is proposed has limitations on vessel navigation given the two low-lying bridges that are adjacent to each other. This includes the utility bridge and Decatur Avenue and King George Street Bridges, which supports vehicular and pedestrian traffic.

vii Transportation

The Proposed Action would not involve transportation facilities. The existing utility bridge is not used for vehicle traffic, and its replacement—including demolition—would not be expected to affect transportation along the nearby Decatur Avenue or King George Street Bridges.

viii Agriculture

The Proposed Action would not involve agricultural land management activities or agricultural operations.

ix Development

The Proposed Action would not involve new development as it would replace an existing utility bridge.

x Sewage Treatment

The Proposed Action would not involve sewage treatment facilities or infrastructure.

Letter to U.S. Coast Guard (May 7, 2020)

**DEPARTMENT OF THE NAVY**NAVAL SUPPORT ACTIVITY ANNAPOLIS
58 BENNING ROAD
ANNAPOLIS, MARYLAND 21402IN REPLY REFER TO:
5090
Ser ENV-071
07 May 2020Mr. Hal Pitts
U.S. Coast Guard
Fifth Coast Guard District (dpb)
Federal Building
431 Crawford Street
Portsmouth, VA 23704-5004SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR A UTILITY BRIDGE
REPLACEMENT AT NAVAL SUPPORT ACTIVITY ANNAPOLIS,
MARYLAND

Dear Mr. Pitts:

The Department of the Navy is preparing an Environmental Assessment (EA) in compliance with the National Environmental Policy Act of 1969 (NEPA) to evaluate the potential effects associated with replacing the utility bridge over College Creek at Naval Support Activity (NSA) Annapolis, Annapolis, Maryland. The utility bridge carries utility lines over College Creek between the Upper Yard and the Lower Yard of the U.S. Naval Academy (USNA). The existing bridge is in a severely deteriorated state and would require extensive repair to address the multiple failed and failing components. The Navy would like to initiate coordination with the U.S. Coast Guard for the planned replacement of this utility bridge. Given the existing navigation constraints within College Creek from bridges upstream and downstream from the proposed utility bridge, the Navy would like to request a waiver to the bridge permit.

The Proposed Action includes constructing a new bridge structure, replacing the utilities that are attached to the existing utility bridge, and then demolishing and removing the existing bridge. The new bridge would be approximately the same width and length, and the bridge deck would be located at approximately the same elevation as the existing bridge. The proposed bridge would be designed to ensure that boats, specifically those from the adjacent Hubbard Hall (Building

5090
Ser ENV-071
07 May 2020

260), would be able to access the waterway on both sides of the bridge, similar to current conditions. However, the portion of the waterway where the bridge is proposed has limitations on vessel navigation given the two low-lying bridges that are adjacent to each other. This includes the utility bridge, King George Street Bridge and Decatur Avenue Bridge, which support vehicular and pedestrian traffic. See the enclosure for photos of the bridges. The proposed utility bridge replacement would not impact navigation within College Creek. No long-term changes in services or capacity are included with this action. Construction of the new bridge is expected to occur in fiscal year 2023.

The Navy is considering three alternative areas where the new bridge could be constructed between the King George Street Bridge and the Decatur Avenue Bridge, in addition to the No Action Alternative. Under all action alternatives, the existing bridge would be demolished following construction of the new bridge. The Navy is also considering the option of locating the utilities underground. With this option, all of the utilities would be situated underground except for one utility line, which cannot be bored underground; therefore, it would remain aboveground and attached to the proposed utility bridge structure. Directional drilling techniques would be used to avoid direct impacts on aquatic resources. The bore location under this option would occur along the banks of College Creek in the general vicinity of the existing bridge, with the bore starting on the northern bank and running towards the southern bank. The three bridge location alternatives and the optional underground bore location are shown on the enclosed map.

Under Alternative 1, the proposed utility bridge would be constructed within 50 feet of the existing utility bridge alignment, which is adjacent to the King George Street Bridge.

Under Alternative 2, the proposed utility bridge would be constructed within 115 feet of the Decatur Avenue Bridge.

Under Alternative 3, the proposed utility bridge would be constructed in the area between Alternatives 1 and 2 while also avoiding Hubbard Hall (Building 260) and its associated docks.

Under the No Action Alternative, the Navy would not replace the utility bridge; the existing bridge would continue to

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deteriorate until failure is imminent or occurs. If the bridge fails, utility services would be interrupted.

The Navy would like to invite the Fifth Coast Guard District Bridge Branch and other consulting parties to review the Draft EA, which is available for a 30-day review period online at: https://www.cnic.navy.mil/regions/ndw/installations/nsa_annapolis/om/environmental-/environmental-assessment.html. Comments on the Draft EA may be submitted via email to navfacwashnepa@navy.mil, or via U.S. mail, no later than 30 days from receipt of this letter, to Naval Facilities Engineering Command Washington, ATTN: Ms. Shelbi Pullen, 1314 Harwood Street SE, Building 212, Washington Navy Yard, DC 20374.

If you have any questions or comments, need additional information, please contact Ms. Shelbi Pullen at navfacwashnepa@navy.mil.

Sincerely,

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M. M. Alharazim
By direction

- Enclosures:
1. Location of NSA Annapolis and Alternatives for Proposed Utility Bridge
 2. Photos of Existing Utility Bridge, King George Street Bridge, and Decatur Avenue Bridge

Copy to: Shelbi Pullen, NAVFAC Washington NEPA Project Manager

ENCLOSURE 2: PHOTOS OF EXISTING UTILITY BRIDGE, KING GEORGE STREET BRIDGE, AND DECATUR AVENUE BRIDGE



King George Street Bridge and Utility Bridge, west view



King George Street Bridge and Utility Bridge, looking west



Decatur Avenue Bridge, east view

Letter to Maryland Clearinghouse (May 7, 2020)**DEPARTMENT OF THE NAVY**

NAVAL SUPPORT ACTIVITY ANNAPOLIS
58 BENNING ROAD
ANNAPOLIS, MARYLAND 21402

IN REPLY REFER TO:

5090
Ser ENV-073
07 May 2020

State Clearinghouse
Maryland Department of Planning
301 West Preston Street, Suite 1104
Baltimore, MD 21201-2365

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR A UTILITY BRIDGE
REPLACEMENT AT NAVAL SUPPORT ACTIVITY ANNAPOLIS,
MARYLAND

To Whom It May Concern:

The Department of the Navy is preparing an Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA) to evaluate the potential effects associated with replacing the utility bridge over College Creek at Naval Support Activity (NSA) Annapolis, Annapolis, Maryland. The utility bridge carries utility lines over College Creek between the Upper Yard and the Lower Yard of the U.S. Naval Academy (USNA). The existing bridge is in a severely deteriorated state and would require extensive repair to address the multiple failed and failing components.

The Proposed Action includes constructing a new bridge structure, replacing the utilities that are attached to the existing utility bridge, and then demolishing and removing the existing bridge. The new bridge would be similar in size, elevation, and materials to the existing bridge. No long-term changes in services or capacity are included with this action. Construction of the new bridge is expected to occur in fiscal year 2023.

The Navy is considering three alternative areas where the new bridge could be constructed between the King George Street Bridge and the Decatur Avenue Bridge, in addition to the No Action Alternative. Under all action alternatives, the existing bridge would be demolished following construction of the new bridge. The Navy is also considering the option of locating the

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utilities underground. With this option, all of the utilities would be situated underground except for one utility line which cannot be bored underground; therefore, it would remain aboveground and attached to the proposed utility bridge structure. Directional drilling techniques would be used to avoid direct impacts on aquatic resources. The bore location under this option would occur along the banks of College Creek in the general vicinity of the existing bridge, with the bore starting on the northern bank and running towards the southern bank. The three bridge location alternatives and the optional underground bore location are shown on the enclosed map.

Under Alternative 1, the proposed utility bridge would be constructed within 50 feet of the existing utility bridge alignment, which is adjacent to the King George Street Bridge.

Under Alternative 2, the proposed utility bridge would be constructed within 115 feet of the Decatur Avenue Bridge.

Under Alternative 3, the proposed utility bridge would be constructed in the area between Alternatives 1 and 2 while also avoiding Hubbard Hall (Building 260) and its associated docks.

Under the No Action Alternative, the Navy would not replace the utility bridge; the existing bridge would continue to deteriorate until failure is imminent. If the bridge fails, utility services would be interrupted.

As part of the EA process, the Navy respectfully submits the Draft EA for distribution through the Maryland State Clearinghouse for coordinated review and comment to the following agencies:

- Maryland Department of Planning
- Maryland Department of the Environment
- Maryland Department of Natural Resources
- Maryland Department of Transportation
- Maryland Historical Trust
- Anne Arundel County
- City of Annapolis

The Navy would like to invite your organization and other consulting parties to review the Draft EA, which is available for a 30-day review period online at:

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https://www.cnic.navy.mil/regions/ndw/installations/nsa_annapolis/om/environmental-/environmental-assessment.html. An electronic copy of the Draft EA document will also be provided through the DOD's SAFE file sharing system. A separate email will be sent to mdp.clearinghouse@maryland.gov providing the link for document download. Comments on the Draft EA may be submitted via email to navfacwashnepa@navy.mil, or via U.S. mail, no later than 30 days from receipt of this letter, to Naval Facilities Engineering Command Washington, ATTN: Ms. Shelbi Pullen, 1314 Harwood Street SE, Building 212, Washington Navy Yard, DC 20374.

If you have any questions or comments, need additional information, please contact Ms. Shelbi Pullen at navfacwashnepa@navy.mil.

Sincerely,

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M. M. Alharazim
By direction

Enclosure: Location of NSA Annapolis and Alternatives for
Proposed Utility Bridge

Copy to: Shelbi Pullen, NAVFAC Washington NEPA Project Manager

Letter to Maryland Historical Trust (May 28, 2020)

**DEPARTMENT OF THE NAVY**NAVAL SUPPORT ACTIVITY ANNAPOLIS
58 BENNING ROAD
ANNAPOLIS, MARYLAND 21402

IN REPLY REFER TO:

5090
Ser ENV-075
28 May 2020

Ms. Elizabeth Hughes
State Historic Preservation Officer
Maryland Historical Trust
100 Community Place
Crownsville, MD 21032-2023

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT SECTION 106
CONSULTATION FOR UTILITY BRIDGE REPLACEMENT AT COLLEGE
CREEK FOR NAVAL SUPPORT ACTIVITY ANNAPOLIS, ANNE
ARUNDEL COUNTY, MARYLAND

Dear Ms. Hughes:

The purpose of this letter is to open consultation with the State Historic Preservation Office (SHPO) under Section 106 of the National Historic Preservation Act of 1966 as amended, on the replacement of the utility bridge that crosses College Creek parallel to King George Street at Naval Support Activity (NSA) Annapolis, Anne Arundel County, Maryland (Enclosure 1). Construction of the proposed utility bridge is expected to occur in fiscal year 2023. A feasibility study to determine the most appropriate location of the utility bridge will be completed. We are requesting preliminary comments on the proposed alternatives. .

Purpose and Need: The current utility bridge is in a severely deteriorated state and requires extensive repair. If the bridge failed, utility services would be interrupted. The replacement utility bridge would support reliable utility service between the Upper and Lower Yards of the United States Naval Academy. The replacement utility bridge would also incorporate access for personnel to safely conduct inspections, maintenance, and repairs, a critical deficiency of the existing utility bridge.

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28 May 2020

Description of Undertaking: Under all Alternatives, the replacement utility bridge would be approximately the same width, length, and deck elevation as the existing utility bridge. The existing bridge and utilities would remain in place until construction of the new utility bridge was completed. Upon completion of the new utility bridge, the existing utility bridge would be demolished, and the pile caps would be removed and hauled off-site. Given that the King George Street Bridge and the installation's property line are directly south of the current utility bridge, the proposed utility bridge must be located to the northeast of the current utility bridge location. See Enclosure 2.

Alternative 1: Under Alternative 1, the proposed utility bridge would be constructed within 50 feet northeast of the existing utility bridge alignment, which is parallel and adjacent to the King George Street Bridge.

Alternative 2: Under Alternative 2, the proposed utility bridge would be constructed parallel to and within 115 feet southwest of the Decatur Avenue Bridge (Hill Bridge).

Alternative 3: Under Alternative 3, the proposed utility bridge would be constructed between the locations of Alternatives 1 and 2 (i.e., the remaining approximate 250-foot width between Alternatives 1 and 2). The bridge would be constructed on "open" water in an open viewshed.

Underground Utility Option: In addition to a replacement utility bridge, an underground utility option will be analyzed, which would involve horizontal directional boring underneath College Creek. With this option, all of the utilities would be situated underground except for one utility line, which cannot be bored underground; therefore, it would remain aboveground and attached to the proposed utility bridge structure. The bore location under this option would occur along the banks of College Creek in the general vicinity of the existing bridge, with the bore starting on the northern bank and running towards the southern bank.

Area of Potential Effect:

Built Environment: The Area of Potential Effect (APE) for the built environment is defined as a 400-foot radius around the boundaries for all alternatives and encompasses the limits of visibility, including views to and from Halligan Hall (Building

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28 May 2020

181). The APE includes a portion of the United States Naval Academy Upper and Lower Yards and a portion of the Colonial Annapolis Historic District. See APE boundaries in Enclosure 2.

Archaeological Sites: The APE for archaeological resources is expected to be within the land area bounded by the northwest shore of College Creek and the southeast shore of College Creek. The area of ground disturbance will include the abutments for each end of the proposed utility bridge and any trenching required to carry existing utility lines to and from the bridge. We consider the northwest shoreline disturbed due to known ground disturbances. Additional archaeology determinations are warranted for the southeast shore of the creek.

Identification of Historic Properties and Affected Historic Properties:

To identify historic properties within the APE, NAVFAC Washington consulted records held by the Maryland Historical Trust, the City of Annapolis and the Public Works Department of Naval Support Activity Annapolis. The APE for all alternatives falls entirely within the boundaries of the United States Naval Academy National Historic Landmark and Colonial Annapolis National Historic Landmark. Therefore, all built historic resources within the APE contribute to one of the NHLs. See Table 1 for the historic property within the Colonial Annapolis Historic District and a significant landscape features within the APE and Enclosure 2 for the location of contributing resources within the USNA Historic District.

United States Naval Academy: The United States Naval Academy National Historic Landmark was designated on July 4, 1961 and was automatically placed on the NRHP in 1966. The USNA is nationally significant for its pivotal role in American naval affairs and the education of naval officers in both military and academic studies, and for exemplifying the design principles of Beaux Arts architecture and the work of New York architect Ernest Flagg, who designed the plan of the main campus and its core buildings in the early twentieth century. A variety of landscape features contribute to the district's historic significance, including historic views and vistas. The view to and from Halligan Hall (Building 181) contributes to the USNA Historic District and is described in the *Historic Landscape Survey, Naval Support Activity Annapolis, Maryland* (Kuhn & Groesbeck, 2013):

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Historical and Existing Conditions

After the construction of the Marine Barracks (Halligan Hall) in 1903, a parade ground fronting the building allowed views toward College Creek and the Lower Yard. The view changed in 1923 with the construction of the baseball stadium and ball fields but did not completely obstruct views across the parade ground. The current view from Halligan Hall across Terwilliger Brothers Field provides a glimpse of the Chapel dome, Alumni Hall, and Nimitz Library.

Analysis

The view from Halligan Hall toward the Lower Yard changed in the 1920s when the former parade ground became the site of athletic fields and a baseball stadium. Although the 1920s baseball stadium has been replaced, the Lower Yard continues to be visible from Halligan Hall. This view contributes to the historic landscape as it visually connects the Upper and Lower yards and has not substantially changed since the period of significance.

Colonial Annapolis Historic District: The Colonial Annapolis Historic District was designated an NHL in 1965 and included in the NRHP in 1966. The NRHP district was expanded in 1984. In addition, the Local Annapolis Historic District follows nearly the same boundaries as the NHL. Colonial Annapolis has national significance as the site of the Continental Congress in 1783-1784 and the Annapolis Convention in 1786, which led to the Constitutional Convention in 1787. The district is also nationally significant in the areas of architecture and urban planning as one of the first planned cities in colonial America, as a rare example of a modified baroque plan, and for its several outstanding examples of high Georgian design. The Historic District also has significance as the center of colonial and state government, politics, and commerce.

Archaeological: The APE for archaeological resources has not been previously surveyed. Due to ground disturbance associated with the construction of Terwilliger Brothers Field, Vandergrift Road, Hubbard Hall boathouse and associated parking, installation of underground utilities, and the hardened seawalls lining College Creek, archaeological resources are unlikely on the northwest shoreline. However, Phase I survey will be

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conducted on the southeast shoreline for the areas of ground disturbance associated with each Alternative.

Table 1. Historic Properties within the Area of Potential Effect of the Proposed Undertaking

Facility Number	Facility Name	NRHP Status	Location	Built Date	MHT ID Number
United States Naval Academy MHL Resources					
Significant Landscape Features					
n/a	View to and from Halligan Hall	Contributing	Upper and Lower Yard	1920s-present	—
Colonial Annapolis Historic District					
n/a	Beneficial-Hodson Boathouse, St. John's College	Contributing	St. John's College	1934	AA-2046; AA-2208

Source: NAVFAC Washington. (2018). *Integrated Cultural Resource Management Plan, 2017-2021, Naval Support Activity Annapolis*. Prepared by Kristie Baynard (Marstel-Day).
 Key: ID = identification; MHT = Maryland Historical Trust; NRHP = National Register of Historic Places.

Effects on Historic Properties and Application of Criteria of Adverse Effect:

Alternative 1: Under Alternative 1, the proposed utility bridge would be constructed within 50 feet northeast of the existing utility bridge alignment.

- **United States Naval Academy:** Alternative 1 would place a new element within the viewshed to and from Halligan Hall. However, this would not obstruct the view from Halligan Hall across College Creek to the Lower Yard. Therefore, Alternative 1 would have no adverse effect on the United States Naval Academy.
- **Colonial Annapolis Historic District:** Alternative 1 would be only minimally visible from the Colonial Annapolis Historic District, specifically from the St. Johns College Beneficial-Hodson Boathouse, which is sited immediately adjacent to King George Street and faces College Creek. Visibility would be limited to the northern corner of the Historic District and would be partially obstructed by the King George Street Bridge.

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No significant viewsheds within the Colonial Annapolis Historic District would be affected, therefore Alternative 1 would have no adverse effect on the Historic District.

- **Archaeological Sites:** Effects on archaeological resources cannot be determined until Phase I survey is completed for the area of ground disturbance.

Alternative 2: Under Alternative 2, the proposed utility bridge would be constructed parallel to and within 115 feet southwest of the Decatur Avenue Bridge (Hill Bridge).

- **United States Naval Academy:** Alternative 2 would place a new element within the viewshed to and from Halligan Hall. However, this would not obstruct the view from Halligan Hall across College Creek to the Lower Yard. Therefore, Alternative 2 would have no adverse effect on the United States Naval Academy.
- **Colonial Annapolis Historic District:** Alternative 2 is not within the viewshed of Colonial Annapolis Historic District and therefore would have no effect on that resource.
- **Archaeological Sites:** Effects on archaeological resources cannot be determined until Phase I survey is completed for the area of ground disturbance.

Alternative 3: Under Alternative 3, the proposed utility bridge would be constructed within the remaining approximate 250-foot-width between Alternatives 1 and 2.

- **United States Naval Academy:** Alternative 3 would place a new element within the viewshed to and from Halligan Hall. Alternative 3 would not obstruct the viewshed from Halligan Hall to the Lower Yard. Therefore, Alternative 3 would have no adverse effect on the United States Naval Academy.
- **Colonial Annapolis Historic District:** Alternative 3 would be minimally visible from the Colonial Annapolis Historic District. The King George Street bridge would visually obstruct the view from the Historic District.

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Therefore, Alternative 3 would have no adverse effect on the Colonial Annapolis Historic District.

- **Archaeological Sites:** Effects on archaeological resources cannot be determined until Phase I survey is completed for the area of ground disturbance.

Underground Utility Option: Under the underground utility option, all of the utilities would be situated underground except for one utility line which cannot be bored underground; therefore, it would remain aboveground and attached to the proposed utility bridge structure.

- **United States Naval Academy:** Underground utility option would place a new element within the viewshed to and from Halligan Hall. However, this would not obstruct the view from Halligan Hall across College Creek to the Lower Yard. Therefore, the underground utility option would have no adverse effect on the United States Naval Academy.
- **Colonial Annapolis Historic District:** Underground utility option would be only minimally visible from the Colonial Annapolis Historic District, specifically from the St. Johns College Beneficial-Hodson Boathouse, which is sited immediately adjacent to King George Street and faces College Creek. Visibility would be limited to the northern corner of the Historic District and would be partially obstructed by the King George Street Bridge. No significant viewsheds within the Colonial Annapolis Historic District would be affected, therefore the underground utility option would have no adverse effect on the Historic District.
- **Archaeological Sites:** Effects on archaeological resources cannot be determined until Phase I survey is completed for the area of ground disturbance.

Naval Support Activity Annapolis hereby requests preliminary comments concerning the proposed undertaking. Continued consultation will be completed as information from the feasibility study becomes available. If you have any questions or would like to visit the project area, please contact Kimberly

5090
Ser ENV-075
28 May 2020

Hickey either by email at kimberly.hickey@navy.mil, or by telephone at (410) 293-1116. We look forward to your response.

Sincerely,

ALHARAZIM.MAD
NA.M.1362686136

M. M. Alharazim
By direction

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Date: 2020.06.02 09:00:47
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Enclosures: 1. Location of Undertaking, the USNA Historic District, and the Colonial Annapolis Historic District
2. Location of Historic Properties Within the APE

Copy to: Shelbi Pullen, NAVFAC Washington NEPA Project Manager

Appendix C

Air Conformity Applicability Analysis and Record of Non-Applicability

Abbreviations and Acronyms

Acronym	Definition
CFR	Code of Federal Regulations
NAAQS	National Ambient Air Quality Standards
NO _x	nitrogen oxides
NSA	Naval Support Activity
PM _{2.5}	fine particulate matter less than or equal to 2.5 micrometers in diameter
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

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Air Quality Applicability Analysis

Introduction

The Clean Air Act requires federal actions in air pollutant nonattainment or maintenance areas to conform to the applicable State Implementation Plan. A State Implementation Plan is designed to achieve or maintain an attainment designation of air pollutants, as defined by the National Ambient Air Quality Standards (NAAQS). The regulations governing this requirement are found in 40 Code of Federal Regulations (CFR) part 93, also known as the General Conformity Rule. The threshold (*de minimis*) emission rates have been established for actions with the potential to have significant air quality impacts. A federal agency must determine if a project/action in a nonattainment area or maintenance area exceeds the *de minimis* rates, which would require a general conformity determination be prepared to address significant impacts.

The Navy proposes to replace the utility bridge at College Creek at Naval Support Activity (NSA) Annapolis, Maryland. NSA Annapolis is in Anne Arundel County, which is within the Metropolitan Baltimore Intrastate Air Quality Control Region (40 CFR 81.28). Anne Arundel County is designated as a nonattainment area for 8-hour ozone, with a classification of moderate for the 2008 standard and marginal for the 2015 standard (USEPA, 2019). A portion of the county, which includes NSA Annapolis, is also in nonattainment for sulfur dioxide under the 2010 standard. It is unclassified or in attainment for all other criteria pollutants. Anne Arundel County was formerly classified as a maintenance area for the 1997 standard for particulate matter less than or equal to 2.5 micrometers (PM_{2.5}), but this standard was revoked in 2016.

Potential emissions from all criteria pollutants are presented in this appendix; however, only the *de minimis* thresholds for the ozone precursor pollutants, nitrogen oxides (NO_x) and volatile organic compounds (VOC), and sulfur dioxide apply to the conformity applicability analysis. Because this region is also within the ozone transport region that was established by the 1990 Clean Air Act Amendments, the *de minimis* threshold for VOC is further reduced.

Project Description

The Navy proposes to replace the utility bridge at College Creek at NSA Annapolis. During construction of the new utility bridge, the existing bridge and utilities would remain in place until the new structure is completed. Following completion of the new bridge, the existing bridge would be demolished. The new bridge would be approximately the same width and length as the existing bridge (approximately 18 feet wide and 474 feet long), and the bridge deck would be located at approximately the same elevation. The proposed bridge would be designed to ensure that boats, specifically those from the adjacent Hubbard Hall (Building 260), would be able to access the waterway on both sides of the bridge. Construction is expected to occur in fiscal year 2023.

The Navy is considering the No Action Alternative and three location alternatives for the new utility bridge on NSA Annapolis, as well as an additional option of locating some utility components underground using directional boring techniques:

- No Action Alternative: Minimal maintenance to the bridge would continue, but no major repairs would occur. Continued deterioration places the bridge at risk of suddenly failing.
- Alternative 1: The proposed utility bridge would be constructed at any location within 50 feet northeast of the existing utility bridge alignment, adjacent to the King George Street Bridge.

- Alternative 2: The proposed utility bridge would be constructed at any location within 115 feet southwest of the Decatur Avenue Bridge (Hill Bridge). Following completion of the new bridge, the existing bridge would be demolished.
- Alternative 3: The proposed utility bridge would be constructed between Alternative 1 and Hubbard Hall (Building 260) and its associated docks. Following completion of the new bridge, the existing bridge would be demolished.
- Underground Utility Option: All utilities would be situated underground except one utility line, which cannot be bored underground. This utility line would remain aboveground and attached to the proposed utility bridge structure. Under any of the alternatives selected, the bore entry point would be on the Upper Yard in the vicinity of the existing bridge and exit directly across College Creek on the Lower Yard.

Federal Requirements

Section 176(c) of the Clean Air Act, as amended, requires federal agencies to ensure that actions undertaken in nonattainment or maintenance areas are consistent with the Clean Air Act and with federally enforceable air quality management plans. The Clean Air Act places responsibility on individual states to achieve and maintain the NAAQS through USEPA-approved State Implementation Plans.

Under the General Conformity Rule (40 CFR part 93, subpart B), emissions of criteria pollutants and their precursors that are associated with an action in a nonattainment area for a given pollutant must be below *de minimis* emission rates for that pollutant to be exempt from a formal conformity determination. The *de minimis* rates for the NAAQS pollutants of concern are listed in Table C-1. Actions that contribute less than these amounts and have no other conformity requirements are exempt from the General Conformity Rule. Actions that exceed the pollutant *de minimis* rates in any given year must undergo a detailed analysis, and a formal conformity determination is required. Finally, mitigation would be required if the detailed analysis indicates an exceedance of the *de minimis* levels for any of the pollutants of concern.

Table C-1 Criteria Pollutant *de minimis* Emission Rates Applicable to the Proposed Action

<i>Pollutant</i>	<i>Attainment Status</i>	<i>Criteria Pollutant (tpy)</i>	<i>Precursor (tpy)</i>
NO _x	Moderate ozone nonattainment	—	100
VOC	Moderate ozone nonattainment, inside an ozone transport region	—	50
Sulfur dioxide	Nonattainment	100	—

Sources: 40 CFR 93.153; USEPA, 2019.

Key: NO_x = nitrogen oxides; VOC = volatile organic compound; tpy = tons per year.

Methodology

In accordance with 40 CFR part 93, subpart B, the incremental increase in emissions above the existing conditions has been considered and includes reasonably foreseeable direct and indirect emissions. The total estimated emissions from the Proposed Action have been evaluated to assess if any of the applicable *de minimis* rates would be exceeded.

Specific construction schedules and design plans under any location alternative are not yet known. Considering the variability of possible construction, emissions resulting from the Proposed Action were estimated based on the maximum expected number, type, and duration of construction operations to complete the Proposed Action. This analysis considers estimated impacts from construction and demolition as if occurring in one calendar year to present a maximum impact.

Once construction is complete, long-term operations from the new bridge would be comparable to existing conditions. The proposed bridge would have no new or modified operational air sources. No long-term changes in air emissions would occur.

The only measurable difference between the alternatives is the distance for underground utilities trenching (approximately 2,100 feet total, along both sides of the College Creek). Alternative 2 would be expected to require the most trenching as it is furthest from the existing bridge, so emissions for Alternative 2 are estimated in this applicability analysis. However, the actual differences of trencher operations would account for minimal differences in emissions among the alternatives, and this difference does not warrant quantitative estimation. The option of installing utilities underground is considered separately.

Construction Emissions

Emissions resulting from the Proposed Action were estimated based on the expected number, type, and duration of construction operations to complete the Proposed Action. Construction emissions would result from the operation of heavy equipment, delivery trucks, and construction workers. The project would require a mix of construction equipment that would vary as the construction activity progresses. To estimate emissions, methodologies were used based on the kind of equipment (which all have varying rates of criteria pollutant emissions, referred to as emissions factors), and either the average hours to complete the work or the average distance traveled.

Nonroad Emissions from Construction Equipment

Nonroad emissions are those from the construction equipment operating immediately at the project site (such as backhoes, forklifts, impact hammers, pile drivers, saws, diesel generators, and cranes). Conservative construction equipment assumptions were developed based on review of other projects. Emissions for nonroad equipment were estimated using composite emissions factors. Table C-2 and Table C-3 contain the emissions factors and operating hours assumptions and the total estimated emissions for nonroad construction equipment, respectively.

Onroad Emissions from Construction Equipment

Onroad emissions are those that come to and leave the site via the road network on a more frequent basis (including diesel-powered heavy delivery trucks and gasoline-powered passenger trucks from construction workers). Conservative construction equipment assumptions were developed based on review of other projects. Emissions for nonroad equipment were estimated using composite emissions factors. Table C-4 and Table C-5 contain the emissions factors and operating hours assumptions and the total estimated emissions for nonroad construction equipment, respectively.

Fugitive Dust Emissions

Fugitive dust occurs directly from vehicles disturbing and suspending particulate matter while operating on unpaved surfaces, or from soil stockpiles on an active construction site; it also occurs indirectly from dust and dirt being brought onto paved surfaces from nonroad construction operations, and then disturbed and suspended as onroad vehicles drive over it. A conservative empirical estimate for fugitive dust was used for this analysis; actual fugitive dust emissions would likely be lower as they are directly proportional to the amount of activity that is being worked. Higher activity days have greater potential for generating fugitive dust than lower activity days that do not involve equipment actively disturbing the site. This analysis assumes that entire site would be uncovered and worked at any given time during construction. Fugitive dust controls would be implemented; this analysis assumes an 80 percent control efficiency. See estimates and notes Table C-6.

Table C-2 Construction: Nonroad Equipment Emissions Factors and Operating Hours Assumptions

<i>Equipment Description</i>	<i>Total Operating Hours</i>	<i>NO_x (lb/hr)</i>	<i>ROG (lb/hr)</i>	<i>CO (lb/hr)</i>	<i>SO_x (lb/hr)</i>	<i>PM (lb/hr)</i>
Site Preparation						
Tractors/Loaders/Backhoes Composite	168	0.041	0.361	0.251	0.0008	0.011
Graders Composite	168	0.086	0.575	0.521	0.0015	0.025
Rubber Tired Dozers Composite	168	0.202	0.766	1.466	0.0025	0.058
Demolition						
Rubber Tired Dozers Composite	336	0.202	0.766	1.466	0.0025	0.058
Excavators Composite	336	0.069	0.511	0.358	0.0013	0.016
Tractors/Loaders/Backhoes Composite	336	0.041	0.361	0.251	0.0008	0.011
Forklifts Composite	336	0.029	0.215	0.146	0.0006	0.006
Construction						
Tractors/Loaders/Backhoes Composite	2,016	0.021	0.212	0.154	0.0004	0.004
Forklifts Composite	2,016	0.029	0.215	0.146	0.0006	0.006
Cranes Composite	4,032	0.085	0.387	0.603	0.0014	0.023
Generator Sets Composite	2,016	0.036	0.271	0.298	0.0007	0.013
Miscellaneous						
Trenchers Composite	504	0.087	0.423	0.433	0.0007	0.031

Source: SCAQMD, 2018.

Key: NO_x = nitrogen oxides; ROG = reactive organic gases (= volatile organic compounds); CO = carbon monoxide; SO_x = sulfur oxides; PM = particulate matter; lb = pounds; hr = hour.

Notes: Particulate matter is estimated to be 10 micrometers with 92 percent of that fraction being less than 2.5 micrometers in diameter. A fleet year of 2021 was used, which provides more conservative emissions factors.

Table C-3 Construction: Nonroad Emissions

<i>Equipment</i>	<i>NO_x</i>	<i>VOC</i>	<i>CO</i>	<i>SO₂</i>	<i>PM₁₀</i>	<i>PM_{2.5}</i>
Total Nonroad Construction Emissions (tons)	0.36	2.04	2.49	0.01	0.10	0.09

Source: SCAQMD, 2018.

Key: NO_x = nitrogen oxides; VOC = volatile organic compounds; CO = carbon monoxide; SO₂ = sulfur dioxide; PM₁₀ = suspended particulate matter less than or equal to 10 micrometers in diameter; PM_{2.5} = fine particulate matter less than or equal to 2.5 micrometers in diameter.

Notes:

Emissions (tons) = emissions factor (pounds/hour) × total hours operated × 1 ton/2,000 pounds, *for each kind of equipment.*

Example: Nonroad NO_x emissions = [(168 hr × 0.041 lb/hr) + (168 hr × 0.086 lb/hr) + (168 hr × 0.202 lb/hr) + (336 hr × 0.202 lb/hr) + (336 hr × 0.069 lb/hr) + (336 hr × 0.041 lb/hr) + (336 hr × 0.029 lb/hr) + (2,016 hr × 0.021 lb/hr) + (2,016 hr × 0.029 lb/hr) + (4,032 hr × 0.085 lb/hr) + (2,016 hr × 0.036 lb/hr) + (504 hr × 0.087 lb/hr) + (1 ton/2,000 lb) = 0.4 tons NO_x.

For PM_{2.5}, the emissions factor was multiplied by 0.92 to obtain the PM_{2.5} fraction of total particulate matter.

Table C-4 Construction: Onroad Equipment Emissions Factors and Vehicle Miles Traveled Assumptions

<i>Equipment Description</i>	<i>VMT</i>	<i>NO_x</i> <i>(lb/mi)</i>	<i>ROG</i> <i>(lb/mi)</i>	<i>CO</i> <i>(lb/mi)</i>	<i>SO_x</i> <i>(lb/mi)</i>	<i>PM₁₀</i> <i>(lb/mi)</i>	<i>PM_{2.5}</i> <i>(lb/mi)</i>
Heavy-Duty Diesel Truck (33,001+ lb) ¹	12,600	0.0118	0.001	0.005	0.00004	0.001	0.0009
Passenger Vehicles, Gasoline ²	45,360	0.0004	0.0005	0.0042	0.00001	0.0001	0.0001

Sources: SCAQMD, 2008a, 2008b.

Key: NO_x = nitrogen oxides; ROG = reactive organic gases (=volatile organic compounds); CO = carbon monoxide; SO_x = sulfur oxides; PM₁₀ = particulate matter less than 10 micrometers in diameter; PM_{2.5} = particulate matter less than 2.5 micrometers in diameter; VMT = vehicle miles traveled; lb = pounds; mi = mile.

Notes: A fleet year of 2021 was used, which provides more conservative emissions factors.

¹ Approximate VMT = 1 truck per day × 50 miles per day × 252 days of construction.

² Approximate VMT = 6 workers per day × 30 miles per day × 252 days of construction.

Table C-5 Construction: Onroad Emissions

<i>Equipment</i>	<i>NO_x</i>	<i>VOC</i>	<i>CO</i>	<i>SO₂</i>	<i>PM₁₀</i>	<i>PM_{2.5}</i>
Total Onroad Construction Emissions (tons)	0.08	0.02	0.13	0.001	0.01	0.01

Sources: SCAQMD, 2008a, 2008b.

Key: NO_x = nitrogen oxides; VOC = volatile organic compounds; CO = carbon monoxide; SO₂ = sulfur dioxide; PM₁₀ = suspended particulate matter less than or equal to 10 micrometers in diameter. PM_{2.5} = fine particulate matter less than or equal to 2.5 micrometers in diameter.

Notes: Emissions (tons) = emissions factor (pounds/mile) × total vehicle miles traveled × 1 ton/2,000 pounds, for each kind of equipment.

Example: Onroad NO_x emissions = [(12,600 mi × 0.0118 lb/mi) + (45,360 mi × 0.0004 lb/mi)] × 1 ton/2,000 lb = 0.1 tons NO_x.

Table C-6 Construction: Fugitive Dust Emissions

<i>Calculation</i>	<i>PM₁₀</i>	<i>PM_{2.5}</i>
Emissions factor (tons particulate matter/acre/month)	1.2	1.2
Fractional contents of particulate matter by size ¹	59.4%	21.2%
Total (tons)²	1.0	0.2

Sources: USEPA, 1996; SCAQMD, 2006.

Key: PM₁₀ = suspended particulate matter less than or equal to 10 micrometers in diameter; PM_{2.5} = fine particulate matter less than or equal to 2.5 micrometers in diameter.

Notes:

¹ PM₁₀ is assumed to be 59.4 percent of total particulate emissions, and PM_{2.5} is assumed to be 21.2 percent of PM₁₀.

² Emissions PM₁₀ (tons) = 1.2 tons/acre/month × 0.594 × 0.56 acres × 12 months × (1 - 0.8);

Emissions PM_{2.5} (tons) = PM₁₀ emissions in tons × 0.212.

Underground Utility Option

Installation of underground utilities would result in criteria pollutant emissions similar to those described for general construction activities from equipment operations. Due to the small size of the bore hole, fugitive dust emissions are expected to be negligible. See estimates and notes in Table C-7.

Table C-7 Underground Utility Option Emissions

Activity	NO_x	VOC	CO	SO₂	PM₁₀	PM_{2.5}
Emissions factor for large stationary diesel engine (lb/hp-hr)	0.024	0.000705	0.0055	0.00809	0.0007	0.0007
Total Horizontal Boring Emissions (tons)	2.03	0.06	0.46	0.68	0.06	0.06

Sources: USEPA, 2001, for large diesel engine emission factors; ERG, 2015, to provide upper boundary operating equipment surrogates for horizontal drilling.

Key: NO_x = nitrogen oxides; VOC = volatile organic compounds; CO = carbon monoxide; SO₂ = sulfur dioxide; PM_{2.5} = fine particulate matter less than or equal to 2.5 micrometers in diameter.

Notes: Emissions (tons) = emissions factor (pounds/horsepower-hour) × engine output in horsepower × approximate hours of operation × number of engines × average load as a percentage × 1 ton/2,000 pounds.

Example: Option NO_x emissions = 0.024 lb/hp-hr × 1,340 hp engine × 70 hours × 3 engines × 60% average load × 1 ton/2,000 lb = 2.03 tons NO_x.

Results and Conclusion

Total estimated emissions for the proposed utility bridge under Alternative 2 (as a maximum impact) and optional underground utilities installation are shown in Table C-8. The total short-term construction emissions represent minor increases in regional air emissions.

Activities would be well below the *de minimis* thresholds for a marginal/moderate ozone nonattainment area in an ozone transport region and sulfur dioxide nonattainment area. Therefore, the action is exempt from the General Conformity Rule requirements to prepare a full conformity determination.

Table C-8 Summary of Total Criteria Pollutant Emissions

Activity	NO_x	VOC	CO	SO₂	PM₁₀	PM_{2.5}
Applicable <i>de minimis</i> Thresholds	100	50	—	100	—	—
Maximum Estimated Emissions (Alternative 2 + Underground Utility Option)	2.5	2.1	3.1	0.7	1.1	0.4
Alternative 2: Construction (total tons)	0.44	2.06	2.62	0.01	1.07	0.31
Construction Phase: Nonroad (tons)	0.36	2.04	2.49	0.01	0.10	0.09
Construction Phase: Onroad (tons)	0.08	0.02	0.13	0.001	0.01	0.01
Construction Phase: Fugitive Dust (tons)	—	—	—	—	0.96	0.20
Underground Utility Option (total tons)	2.03	0.06	0.46	0.68	0.06	0.06

Key: VOC = volatile organic compound; CO = carbon monoxide; NO_x = nitrogen oxides; SO₂ = sulfur dioxide; PM₁₀ = suspended particulate matter less than or equal to 10 micrometers in diameter; PM_{2.5} = fine particulate matter less than or equal to 2.5 micrometers in diameter; tpy = tons per year.

Note: Emissions may not total precisely due to rounding.

Appendix C References

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General Conformity Rule—Record of Non-Applicability (RONA) for Clean Air Act Conformity

Environmental Assessment for Utility Bridge Replacement at Naval Support Activity Annapolis

Proposed Action

Action Proponent:	Naval Support Activity (NSA) Annapolis
Proposed Action Name:	Utility Bridge Replacement
Location:	NSA Annapolis, Maryland
Project Construction Period:	2023
Proposed Action Point of Contact:	Ms. Shelbi Pullen NAVFAC Washington 1314 Harwood Street SE Washington Navy Yard, DC 20374 navfacwashnepa@navy.mil

Proposed Action Summary:

The Clean Air Act requires federal actions in air pollutant nonattainment or maintenance areas to conform to the applicable State Implementation Plan. The State Implementation Plan is designed to achieve or maintain an attainment designation of air pollutants as defined by the National Ambient Air Quality Standards. The regulations governing this requirement are found in 40 Code of Federal Regulations (CFR) part 93, also known as the “General Conformity Rule,” which applies to federal actions occurring in regions designated as nonattainment or areas subject to maintenance plans. The threshold (*de minimis*) emission rates have been established for actions with the potential to have significant air quality impacts. A project/action in an area designated as nonattainment and exceeding the *de minimis* rates must have a general conformity determination prepared to address significant impacts.

NSA Annapolis is in Anne Arundel County, Maryland, which is within the Metropolitan Baltimore Intrastate Air Quality Control Region (40 CFR 81.28). This area is designated as being in moderate nonattainment for the 2008 8-hour ozone standard, marginal nonattainment for the 2015 8-hour ozone standard, and nonattainment for the 2010 sulfur dioxide standard. Anne Arundel County was formerly classified as a maintenance area for the 1997 PM_{2.5} standard, but this standard was revoked in 2016. Therefore, the *de minimis* thresholds for ozone precursors (i.e., nitrogen oxides [NO_x] and volatile organic compounds [VOCs]) and sulfur dioxide apply to the conformity applicability analysis. Because this region is also with the ozone transport region, established by the 1990 Clean Air Act Amendments, the *de minimis* threshold for VOCs is further reduced.

Air Emissions Summary

Based on the maximum total project emission estimates identified in the table on the following page, a general conformity determination is not required because the total maximum direct and indirect emission estimates for the Proposed Action, including the underground utility option, are well below the *de minimis* thresholds.

Supporting documentation and emissions estimates can be found in the Environmental Assessment in Section 3.1, Air Quality, and Appendix C, Air Quality Conformity Applicability Analysis.

**Summary of Total Criteria Pollutant Emissions
Compared to Applicable *de minimis* Thresholds**

Activity	NO_x	VOC	SO₂
Applicable <i>de minimis</i> Thresholds	100	50	100
Exceeds <i>de minimis</i>?	No	No	No
Proposed Action (Maximum, total)	2.47	2.12	0.69
Construction Emissions (total tons)	0.44	2.06	0.01
Additional Underground Utility Option (total tons)	2.03	0.06	0.68

Key: NO_x = nitrogen oxides; VOC = volatile organic compound; SO₂ = sulfur dioxide; tpy = tons per year.

Date RONA Prepared: June 2020

RONA Prepared by: Naval Facilities Engineering Command Washington

RONA Approval

Signature

Date

Appendix D Noise Calculations

Distance Calculations for Construction Noise

$$dB1 - 10 \times a \times \text{Log}_{10} \left(\frac{R2}{R1} \right) = dB2$$

Where:

dB1 = noise level at construction site

dB2 = noise level at receptor (in dBA, or A-weighted decibels)

a = conventional drop-off rate coefficient

a = 2.0 for point source, no ground or atmospheric absorption

R1 = distance from referenced noise level

R2 = distance from receptor

{Log₁₀ is base 10 logarithm}

Specific Calculations for Utility Bridge EA

Alternative 1

Construction site is 100 feet from receptor; noise level is 74 dBA at construction site.

$$74 - 10 \times 2 \times \text{Log}_{10} \left(\frac{100}{50} \right) = 67.98 \text{ dBA}$$

Construction site is 100 feet from receptor; noise level is 101 dBA at construction site.

$$101 - 10 \times 2 \times \text{Log}_{10} \left(\frac{100}{50} \right) = 94.98 \text{ dBA}$$

Construction site is 150 feet from receptor; noise level is 74 dBA at construction site.

$$74 - 10 \times 2 \times \text{Log}_{10} \left(\frac{150}{50} \right) = 64.46 \text{ dBA}$$

Construction site is 150 feet from receptor; noise level is 101 dBA at construction site.

$$101 - 10 \times 2 \times \text{Log}_{10} \left(\frac{150}{50} \right) = 91.46 \text{ dBA}$$

Alternative 2

Construction site is 400 feet from receptor; noise level is 74 dBA at construction site.

$$74 - 10 \times 2 \times \text{Log}_{10}\left(\frac{400}{50}\right) = 55.94 \text{ dBA}$$

Construction site is 400 feet from receptor; noise level is 101 dBA at construction site.

$$101 - 10 \times 2 \times \text{Log}_{10}\left(\frac{400}{50}\right) = 82.94 \text{ dBA}$$

Construction site is 65 feet from receptor; noise level is 74 dBA at construction site.

$$74 - 10 \times 2 \times \text{Log}_{10}\left(\frac{65}{50}\right) = 71.72 \text{ dBA}$$

Construction site is 65 feet from receptor; noise level is 101 dBA at construction site.

$$101 - 10 \times 2 \times \text{Log}_{10}\left(\frac{65}{50}\right) = 98.72 \text{ dBA}$$